TITLE: CAMP_NSCSSJ_TMEX_Alishan_20021001_20030331.sfc.txt

CONTACT(S):

==
===============
        | Contact 1 | Contact 2
 --------------+-----------------------------+----------------------------
    Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+-----------------------------+----------------------------
    Address | Depertment of Geological and | Depertment of Atmospheric Sciences
        | Atmospheric Sciences | National Central University
        | Iowa State University | Chung-Li 32054,
        | 3010 Agronomy Hall | Taiwan
        | Ames, IA 50011, USA |
 --------------+-----------------------------+----------------------------
    Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
 --------------+-----------------------------+----------------------------
    Fax.No. | +1-515-294-2619 | +1-886-3422-3283
 --------------+-----------------------------+----------------------------
    E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
===============

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Alishan     | 23.51  | 120.80  | 2413 | 1 hour
 --------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+------------------------------------------
 Wind speed(WS)   | RM Young Model 05103
-------------------+------------------------------------------
 Rainfall(P)      | TK-1
```

```
================================================================
=====
```

   Ps(2.5m)   : Air pressure at the 2.5m height (hPa)
   Ts(1.4m)   : Air temperature at the 1.4m height (deg.C)
   RH(1.4m)   : Relative humidity at the 1.4m height (%)
   Td(1.4m)   :Dewpoint Temperature at the 1.4m height(deg.)
   WD(15.1m): Wind direction at the 15.1m height (deg.)
   Ws(15.1m) : Wind speed at the 15.1m height (m/s)
   P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using "CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112 * \exp((17.67 * Td)/(Td + 243.5));$
$q = (0.622 * e)/(p - (0.378 * e));$
   where:
     e = vapor pressure in mb;
     Td = dew point in deg C;
     p = surface pressure in mb;
     q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

   PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

   No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

   Original data was collected and is provided by CWB of Taiwan, funded by
   Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Anpu_20021001_20030331.sfc.txt

CONTACT(S):

==

	Contact 1	Contact 2
Name	Tsing-Chang (Mike) Chen	Ming-Cheng Yen
Address	Depertment of Geological and Atmospheric Sciences Iowa State University 3010 Agronomy Hall Ames, IA 50011, USA	Depertment of Atmospheric Sciences National Central University Chung-Li 32054, Taiwan
Tel.No.	+1-515-294-9874	+1-886-3422-7151 ext. 65538
Fax.No.	+1-515-294-2619	+1-886-3422-3283
E-mail.	tmchen@iastate.edu	tyenmc@atm.ncu.edu.tw

==

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

The winter weather system that affects Taiwan and its vicinity is characterized by the
long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
surges, cold fronts and shallow Taiwan perturbations within the context of the
East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
the causes of the long rainy season and formation of the Taiwan front and shallow
perturbation have not been disclosed, and possible impacts of cold surges on the
surface weather condition over Taiwan and on the global climate system have not been
well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Anpu       | 25.18  | 121.52  |837.6 | 1 hour
 ------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
=====================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
  ------------------+----------------------------------------------
  Wind speed(WS)   | RM Young Model 05103
  ------------------+----------------------------------------------
  Rainfall(P)      | TK-1
```

===
=====

   Ps(1.3m)   : Air pressure at the 1.3m height (hPa)
   Ts(1.8m)   : Air temperature at the 1.8m height (deg.C)
   RH(1.8m)   : Relative humidity at the 1.8m height (%)
   Td(1.8m)   :Dewpoint Temperature at the 1.8m height(deg.)
   WD(7.31m) : Wind direction at the 7.31m height (deg.)
   Ws(7.31m) : Wind speed at the 7.31m height (m/s)
   P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

    Data are downloaded from the AWS monthly. Then, data are sent to CWB,
    where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

    And the two parameters indicated below were computed by using
    "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I",

    Specific Humidity were computed by using (Bolton 1980):
     e = 6.112*exp((17.67*Td)/(Td + 243.5));
     q = (0.622 * e)/(p - (0.378 * e));
       where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

    U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Chengkung_20021001_20030331.sfc.txt

CONTACT(S):

==
                | Contact 1 | Contact 2
 --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
            | Atmospheric Sciences | National Central University
            | Iowa State University | Chung-Li 32054,
            | 3010 Agronomy Hall | Taiwan
            | Ames, IA 50011, USA |
 --------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
 --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
 --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 -------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Chengkung    | 23.10  | 121.37  | 33.5 | 1 hour
 -------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
======================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
  Wind speed(WS)   | RM Young Model 05103
-------------------+----------------------------------------------
  Rainfall(P)      | TK-1
```

```
================================================================
=====
```

   Ps(0.8m)   : Air pressure at the 0.8m height (hPa)
   Ts(1.5m)   : Air temperature at the 1.5m height (deg.C)
   RH(1.5m) : Relative humidity at the 1.5m height (%)
   Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
   WD(12.8m): Wind direction at the 12.8m height (deg.)
   Ws(12.8m) : Wind speed at the 12.8m height (m/s)
   P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
  $e = 6.112 * \exp((17.67 * Td)/(Td + 243.5));$
  $q = (0.622 * e)/(p - (0.378 * e));$
   where:
     e = vapor pressure in mb;
     Td = dew point in deg C;
     p = surface pressure in mb;
     q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Chiayi_20021001_20030331.sfc.txt

CONTACT(S):

===

| Contact 1 | Contact 2
--------------+------------------------------+----------------------------
Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+------------------------------+----------------------------
Address | Depertment of Geological and | Depertment of Atmospheric Sciences
| Atmospheric Sciences | National Central University
| Iowa State University | Chung-Li 32054,
| 3010 Agronomy Hall | Taiwan
| Ames, IA 50011, USA |
--------------+------------------------------+----------------------------
Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
--------------+------------------------------+----------------------------
Fax.No. | +1-515-294-2619 | +1-886-3422-3283
--------------+------------------------------+----------------------------
E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

The winter weather system that affects Taiwan and its vicinity is characterized by the
long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
surges, cold fronts and shallow Taiwan perturbations within the context of the
East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
the causes of the long rainy season and formation of the Taiwan front and shallow
perturbation have not been disclosed, and possible impacts of cold surges on the
surface weather condition over Taiwan and on the global climate system have not been
well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

  The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Chiayi     | 23.50  | 120.42  | 26.9 | 1 hour
 -------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

  Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

  http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
=====================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+-------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+-------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+-------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+-------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+-------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)   | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)      | TK-1
```

```
================================================================
=====
```

   Ps(0.8m)   : Air pressure at the 0.8m height (hPa)
   Ts(1.6m)   : Air temperature at the 1.6m height (deg.C)
   RH(1.6m)   : Relative humidity at the 1.6m height (%)
   Td(1.6m)   :Dewpoint Temperature at the 1.6m height(deg.)
   WD(14.5m) : Wind direction at the 14.5m height (deg.)
   Ws(14.5m) : Wind speed at the 14.5m height (m/s)
   P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
  $e = 6.112 * \exp((17.67 * Td)/(Td + 243.5))$;
  $q = (0.622 * e)/(p - (0.378 * e))$;
   where:
    e = vapor pressure in mb;
    Td = dew point in deg C;
    p = surface pressure in mb;
    q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Chutzehu_20021001_20030331.sfc.txt

CONTACT(S):

==

         | Contact 1 | Contact 2
 --------------+------------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+------------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
          | Atmospheric Sciences | National Central University
          | Iowa State University | Chung-Li 32054,
          | 3010 Agronomy Hall | Taiwan
          | Ames, IA 50011, USA |
 --------------+------------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
 --------------+------------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
 --------------+------------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

  The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ---------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
          |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Chutzehu    | 25.16  | 121.54  | 607  | 1 hour
 ---------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

  Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

  http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:


```
=================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
  Wind speed(WS)    | RM Young Model 05103
-------------------+----------------------------------------------
  Rainfall(P)       | TK-1


===============================================================
=====

   Ps(0.5m)     : Air pressure at the 0.5m height (hPa)
   Ts(1.8m)     : Air temperature at the 1.8m height (deg.C)
   RH(1.8m)    : Relative humidity at the 1.8m height (%)
   Td(1.8m)    :Dewpoint Temperature at the 1.8m height(deg.)
   WD(11.03m)         : Wind direction at the 11.03m height (deg.)
   Ws(11.03m): Wind speed at the 11.03m height (m/s)
   P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

    Data are downloaded from the AWS monthly. Then, data are sent to CWB,
    where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

    And the two parameters indicated below were computed by using
    "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I",

    Specific Humidity were computed by using (Bolton 1980):
     $e = 6.112*exp((17.67*Td)/(Td + 243.5))$;
     $q = (0.622 * e)/(p - (0.378 * e))$;
       where:
         e = vapor pressure in mb;
         Td = dew point in deg C;
         p = surface pressure in mb;
         q = specific humidity in kg/kg.

    U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

  PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

  No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

6.1.1 Instruments problems

None.

6.1.2 Quality issues
Both wind direction and speed of from on October 1, 2002 to
December 25 2002 of this station are not correct. It was the
Typhoon Sinlaku (on September 8, 2002) that caused the damage
of the sensor. These wind direction and wind speed's data flag
were put "B".

7.0 REFERENCE REQUIREMENTS:

  Original data was collected and is provided by CWB of Taiwan, funded by
  Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.

J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Hengchun_20021001_20030331.sfc.txt

CONTACT(S):

==
================
          | Contact 1 | Contact 2
  --------------+------------------------------+----------------------------
    Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+------------------------------+----------------------------
    Address | Depertment of Geological and | Depertment of Atmospheric Sciences
          | Atmospheric Sciences | National Central University
          | Iowa State University | Chung-Li 32054,
          | 3010 Agronomy Hall | Taiwan
          | Ames, IA 50011, USA |
  --------------+------------------------------+----------------------------
    Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+------------------------------+----------------------------
    Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+------------------------------+----------------------------
    E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

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DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

The winter weather system that affects Taiwan and its vicinity is characterized by the
long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
surges, cold fronts and shallow Taiwan perturbations within the context of the
East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
the causes of the long rainy season and formation of the Taiwan front and shallow
perturbation have not been disclosed, and possible impacts of cold surges on the
surface weather condition over Taiwan and on the global climate system have not been
well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Hengchun    | 22.00  | 120.74  | 22.1 | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
=====================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)   | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)      | TK-1
```

```
================================================================
=====
```

```
Ps(0.7m)    : Air pressure at the 0.7m height (hPa)
Ts(1.8m)    : Air temperature at the 1.8m height (deg.C)
RH(1.8m)   : Relative humidity at the 1.8m height (%)
Td(1.8m)   :Dewpoint Temperature at the 1.8m height(deg.)
WD(14.3m) : Wind direction at the 14.3m height (deg.)
Ws(14.3m)  : Wind speed at the 14.3m height (m/s)
P(0.8m)     : Precipitation at the 0.8m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used

Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using "CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112*exp((17.67*Td)/(Td + 243.5))$;
$q = (0.622 * e)/(p - (0.378 * e))$;
  where:
    e = vapor pressure in mb;
    Td = dew point in deg C;
    p = surface pressure in mb;
    q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Hsinchu_20021001_20030331.sfc.txt

CONTACT(S):

```
================================================================
===============
          | Contact 1              | Contact 2
  --------------+-----------------------------+----------------------------
     Name    | Tsing-Chang (Mike) Chen      | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and  | Depertment of Atmospheric Sciences
           | Atmospheric Sciences         | National Central University
           | Iowa State University        | Chung-Li 32054,
           | 3010 Agronomy Hall           | Taiwan
           | Ames, IA 50011, USA          |
  --------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874              | +1-886-3422-7151 ext. 65538
  --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619              | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu           | tyenmc@atm.ncu.edu.tw


================================================================
===============
```

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

The winter weather system that affects Taiwan and its vicinity is characterized by the
long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
surges, cold fronts and shallow Taiwan perturbations within the context of the
East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
the causes of the long rainy season and formation of the Taiwan front and shallow
perturbation have not been disclosed, and possible impacts of cold surges on the
surface weather condition over Taiwan and on the global climate system have not been
well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Hsinchu     | 24.83  | 121.01  | 26.9 | 1 hour
 ------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
=================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+--------------------------------------------
 Wind speed(WS)    | RM Young Model 05103
-------------------+--------------------------------------------
 Rainfall(P)       | TK-1


================================================================
=====

   Ps(2.0m)    : Air pressure at the 2.0m height (hPa)
   Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)    : Relative humidity at the 1.5m height (%)
   Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
   WD(15.6m)   : Wind direction at the 15.6m height (deg.)
   Ws(15.6m)   : Wind speed at the 15.6m height (m/s)
   P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
   Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
   Wind speed and direction are instantaneous values.
   Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
   http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
   also put the data flag "I",

   Specific Humidity were computed by using (Bolton 1980):
    $e = 6.112*\exp((17.67*Td)/(Td + 243.5))$;
    $q = (0.622 * e)/(p - (0.378 * e))$;
      where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

   U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Hualien_20021001_20030331.sfc.txt

CONTACT(S):

===
          | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
    Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
    Address | Depertment of Geological and | Depertment of Atmospheric Sciences
          | Atmospheric Sciences | National Central University
          | Iowa State University | Chung-Li 32054,
          | 3010 Agronomy Hall | Taiwan
          | Ames, IA 50011, USA |
  --------------+-----------------------------+----------------------------
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  --------------+-----------------------------+----------------------------
    Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
    E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Hualien     | 23.98  | 121.60  | 16.1 | 1 hour
 ------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:


```
=================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)       | TK-1
```

```
==============================================================
=====
```

   Ps(3.1m)   : Air pressure at the 3.1m height (hPa)
   Ts(1.5m)   : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)   : Relative humidity at the 1.5m height (%)
   Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
   WD(12.0m) : Wind direction at the 12.0m height (deg.)
   Ws(12.0m) : Wind speed at the 12.0m height (m/s)
   P(0.4m)   : Precipitation at the 0.4m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112*\exp((17.67*Td)/(Td + 243.5));$
$q = (0.622 * e)/(p - (0.378 * e));$
  where:
    e = vapor pressure in mb;
    Td = dew point in deg C;
    p = surface pressure in mb;
    q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Ilan_20021001_20030331.sfc.txt

CONTACT(S):

==
                | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
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             | Ames, IA 50011, USA |
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  --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

  The winter weather system that affects Taiwan and its vicinity is characterized by the
  long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
  surges, cold fronts and shallow Taiwan perturbations within the context of the
  East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
  the causes of the long rainy season and formation of the Taiwan front and shallow
  perturbation have not been disclosed, and possible impacts of cold surges on the
  surface weather condition over Taiwan and on the global climate system have not been
  well explored. A mini-field experiment was designed and proposed to search for the
  resolutions of these long-standing problems.

1.2 Time period covered by the data

 The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
 All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
        |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Ilan      | 24.77  | 121.75  | 7.2 | 1 hour
 ------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

 Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

 http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+----------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+----------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+----------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+----------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)       | TK-1


===============================================================
=====
```

   Ps(0.8m)   : Air pressure at the 0.8m height (hPa)
   Ts(1.5m)   : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)   : Relative humidity at the 1.5m height (%)
   Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
   WD(26.0m) : Wind direction at the 26.0m height (deg.)
   Ws(26.0m) : Wind speed at the 26.0m height (m/s)
   P(0.6m)   : Precipitation at the 0.6m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

    Data are downloaded from the AWS monthly. Then, data are sent to CWB,
    where they are processed.

 3.2 Description of derived parameters and processing techniques used
     Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
     Wind speed and direction are instantaneous values.
     Precipitation is accumulated on the previous minute.

    And the two parameters indicated below were computed by using
    "CEOP Derived Parameter Equations:
     http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
     also put the data flag "I",

    Specific Humidity were computed by using (Bolton 1980):
     e = 6.112*exp((17.67*Td)/(Td + 243.5));
     q = (0.622 * e)/(p - (0.378 * e));
       where:
         e = vapor pressure in mb;
         Td = dew point in deg C;
         p = surface pressure in mb;
         q = specific humidity in kg/kg.

    U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

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Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

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Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Jiyuehtan_20021001_20030331.sfc.txt

CONTACT(S):

==
               | Contact 1 | Contact 2
  --------------+--------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+--------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
             | 3010 Agronomy Hall | Taiwan
             | Ames, IA 50011, USA |
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     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+--------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
  All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
        |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Jiyuehtan   | 23.88  | 120.90  | 1015 | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
=====================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+-----------------------------------------------
  Air pressure(Ps)  | Setra Model 270
 ------------------+-----------------------------------------------
  Airtemperature(Ts)| MetOne T-200
 ------------------+-----------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
 ------------------+-----------------------------------------------
  Dewpoint Temp(Td) | Pt1000
 ------------------+-----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
 Wind speed(WS)    | RM Young Model 05103
-------------------+----------------------------------------------
 Rainfall(P)       | TK-1
```

```
==============================================================
=====
```

   Ps(0.8m)   : Air pressure at the 0.8m height (hPa)
   Ts(1.6m)   : Air temperature at the 1.6m height (deg.C)
   RH(1.6m)   : Relative humidity at the 1.6m height (%)
   Td(1.6m)   :Dewpoint Temperature at the 1.6m height(deg.)
   WD(8.0m)   : Wind direction at the 8.0m height (deg.)
   Ws(8.0m)   : Wind speed at the 8.0m height (m/s)
   P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I",

   Specific Humidity were computed by using (Bolton 1980):
    e = 6.112*exp((17.67*Td)/(Td + 243.5));
    q = (0.622 * e)/(p - (0.378 * e));
      where:
        e = vapor pressure in mb;
       Td = dew point in deg C;
       p = surface pressure in mb;
       q = specific humidity in kg/kg.

   U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Kaohsiung_20021001_20030331.sfc.txt

CONTACT(S):

==
                | Contact 1 | Contact 2
  --------------+--------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+--------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
             | 3010 Agronomy Hall | Taiwan
             | Ames, IA 50011, USA |
  --------------+--------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+--------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+--------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Kaohsiung    | 22.57  | 120.31  | 2.3  | 1 hour
 ------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
------------------+---------------------------------------------
Wind speed(WS)   | RM Young Model 05103
------------------+---------------------------------------------
Rainfall(P)      | TK-1


=============================================================
=====
```

```
Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
RH(1.5m)    : Relative humidity at the 1.5m height (%)
Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
WD(14.0m)   : Wind direction at the 14.0m height (deg.)
Ws(14.0m)   : Wind speed at the 14.0m height (m/s)
P(0.7m)     : Precipitation at the 0.7m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
  $e = 6.112*exp((17.67*Td)/(Td + 243.5))$;
  $q = (0.622 * e)/(p - (0.378 * e))$;
    where:
      e = vapor pressure in mb;
      Td = dew point in deg C;
      p = surface pressure in mb;
      q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Keelung_20021001_20030331.sfc.txt

CONTACT(S):

```
================================================================
===============
          | Contact 1              | Contact 2
  --------------+-----------------------------+----------------------------
    Name    | Tsing-Chang (Mike) Chen     | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
    Address | Depertment of Geological and   | Depertment of Atmospheric Sciences
            | Atmospheric Sciences           | National Central University
            | Iowa State University          | Chung-Li 32054,
            | 3010 Agronomy Hall             | Taiwan
            | Ames, IA 50011, USA            |
  --------------+-----------------------------+----------------------------
    Tel.No. | +1-515-294-9874             | +1-886-3422-7151 ext. 65538
  --------------+-----------------------------+----------------------------
    Fax.No. | +1-515-294-2619             | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
    E-mail. | tmchen@iastate.edu          | tyenmc@atm.ncu.edu.tw

================================================================
===============
```

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

The winter weather system that affects Taiwan and its vicinity is characterized by the
long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
surges, cold fronts and shallow Taiwan perturbations within the context of the
East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
the causes of the long rainy season and formation of the Taiwan front and shallow
perturbation have not been disclosed, and possible impacts of cold surges on the
surface weather condition over Taiwan and on the global climate system have not been
well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
-------------------------------------------------------------------------
Station name |Latitude|Longitude| Alt  |Measurement interval
        |decimal | decimal | (m)  |
-------------+--------+---------+------+---------------------------------
Keelung     | 25.13  | 121.73  | 26.7 | 1 hour
-------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
================================================================
=====
Parameter/Variable |Source
Description       |
------------------+----------------------------------------------
Air pressure(Ps)  | Setra Model 270
------------------+----------------------------------------------
Airtemperature(Ts)| MetOne T-200
------------------+----------------------------------------------
Rela. Humidity(RH)| MetOne DP-200B
------------------+----------------------------------------------
Dewpoint Temp(Td) | Pt1000
------------------+----------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
--------------------+---------------------------------------------
 Wind speed(WS)   | RM Young Model 05103
--------------------+---------------------------------------------
 Rainfall(P)      | TK-1
```

```
==============================================================
=====
```

   Ps(1.0m)   : Air pressure at the 1.0m height (hPa)
   Ts(1.8m)   : Air temperature at the 1.8m height (deg.C)
   RH(1.8m)   : Relative humidity at the 1.8m height (%)
   Td(1.8m)   :Dewpoint Temperature at the 1.8m height(deg.)
   WD(34.6m): Wind direction at the 34.6m height (deg.)
   Ws(34.6m) : Wind speed at the 34.6m height (m/s)
   P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112*\exp((17.67*Td)/(Td + 243.5))$;
$q = (0.622 * e)/(p - (0.378 * e))$;
   where:
     e = vapor pressure in mb;
     Td = dew point in deg C;
     p = surface pressure in mb;
     q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Lanyu_20021001_20030331.sfc.txt

CONTACT(S):

==
===============
            | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
           | Atmospheric Sciences | National Central University
           | Iowa State University | Chung-Li 32054,
           | 3010 Agronomy Hall | Taiwan
           | Ames, IA 50011, USA |
  --------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
===============

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 -------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Lanyu      | 22.04  | 121.55 | 324  | 1 hour
 -------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------
 Wind speed(WS)    | RM Young Model 05103
-------------------+----------------------------------------
 Rainfall(P)       | TK-1
```

===
=====

```
 Ps(1.1m)    : Air pressure at the 1.1m height (hPa)
 Ts(1.42m)   : Air temperature at the 1.42m height (deg.C)
 RH(1.42m) : Relative humidity at the 1.42m height (%)
 Td(1.42m)   :Dewpoint Temperature at the 1.42m height(deg.)
 WD(12.5m) : Wind direction at the 12.5m height (deg.)
 Ws(12.5m)  : Wind speed at the 12.5m height (m/s)
 P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112*exp((17.67*Td)/(Td + 243.5));$
$q = (0.622 * e)/(p - (0.378 * e));$
   where:
     e = vapor pressure in mb;
     Td = dew point in deg C;
     p = surface pressure in mb;
     q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Pengchiayu_20021001_20030331.sfc.txt

CONTACT(S):

==
| Contact 1 | Contact 2
--------------+-----------------------------+----------------------------
    Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+-----------------------------+----------------------------
    Address | Depertment of Geological and | Depertment of Atmospheric Sciences
            | Atmospheric Sciences | National Central University
            | Iowa State University | Chung-Li 32054,
            | 3010 Agronomy Hall | Taiwan
            | Ames, IA 50011, USA |
--------------+-----------------------------+----------------------------
    Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
--------------+-----------------------------+----------------------------
    Fax.No. | +1-515-294-2619 | +1-886-3422-3283
--------------+-----------------------------+----------------------------
    E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Pengchiayu   | 25.63  | 122.07  | 99.0 | 1 hour
 -------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+---------------------------------------------
  Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
  Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
  Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)       | TK-1
```

```
================================================================
=====
```

```
    Ps(0.8m)     : Air pressure at the 0.8m height (hPa)
    Ts(1.5m)     : Air temperature at the 1.5m height (deg.C)
    RH(1.5m)     : Relative humidity at the 1.5m height (%)
    Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
    WD(7.2m)     : Wind direction at the 7.2m height (deg.)
    Ws(7.2m)     : Wind speed at the 7.2m height (m/s)
    P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

    Data are downloaded from the AWS monthly. Then, data are sent to CWB,
    where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

    And the two parameters indicated below were computed by using
    "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I",

    Specific Humidity were computed by using (Bolton 1980):
     e = 6.112*exp((17.67*Td)/(Td + 243.5));
     q = (0.622 * e)/(p - (0.378 * e));
       where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

    U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Penghu_20021001_20030331.sfc.txt

CONTACT(S):

===
                | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
      Address | Depertment of Geological and | Depertment of Atmospheric Sciences
              | Atmospheric Sciences | National Central University
              | Iowa State University | Chung-Li 32054,
              | 3010 Agronomy Hall | Taiwan
              | Ames, IA 50011, USA |
  --------------+-----------------------------+----------------------------
      Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+-----------------------------+----------------------------
      Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
      E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ----------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
        |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Penghu     | 23.57  | 119.56  | 10.7 | 1 hour
 ----------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
====================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
  Wind speed(WS)    | RM Young Model 05103
-------------------+----------------------------------------------
  Rainfall(P)      | TK-1


===============================================================
=====

  Ps(0.7m)     : Air pressure at the 0.7m height (hPa)
  Ts(1.5m)     : Air temperature at the 1.5m height (deg.C)
  RH(1.5m)    : Relative humidity at the 1.5m height (%)
  Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
  WD(14.6m) : Wind direction at the 14.6m height (deg.)
  Ws(14.6m)  : Wind speed at the 14.6m height (m/s)
  P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
  $e = 6.112*\exp((17.67*Td)/(Td + 243.5));$
  $q = (0.622 * e)/(p - (0.378 * e));$
    where:
      e = vapor pressure in mb;
      Td = dew point in deg C;
      p = surface pressure in mb;
      q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

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An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Suao_20021001_20030331.sfc.txt

CONTACT(S):

===
================
         | Contact 1 | Contact 2
  --------------+------------------------------+----------------------------
    Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+------------------------------+----------------------------
    Address | Depertment of Geological and | Depertment of Atmospheric Sciences
            | Atmospheric Sciences | National Central University
            | Iowa State University | Chung-Li 32054,
            | 3010 Agronomy Hall | Taiwan
            | Ames, IA 50011, USA |
  --------------+------------------------------+----------------------------
    Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+------------------------------+----------------------------
    Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+------------------------------+----------------------------
    E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
===============

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

  The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Suao        | 24.60  | 121.86  | 24.9 | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

  Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

  http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
=================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+--------------------------------------------
 Wind speed(WS)    | RM Young Model 05103
-------------------+--------------------------------------------
 Rainfall(P)       | TK-1


=============================================================
=====

   Ps(0.7m)     : Air pressure at the 0.7m height (hPa)
   Ts(1.6m)     : Air temperature at the 1.6m height (deg.C)
   RH(1.6m)     : Relative humidity at the 1.6m height (%)
   Td(1.6m)     : Dewpoint Temperature at the 1.6m height(deg.)
   WD(34.0m)    : Wind direction at the 34.0m height (deg.)
   Ws(34.0m)    : Wind speed at the 34.0m height (m/s)
   P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used

Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112*\exp((17.67*Td)/(Td + 243.5));$
$q = (0.622 * e)/(p - (0.378 * e));$
  where:
    e = vapor pressure in mb;
    Td = dew point in deg C;
    p = surface pressure in mb;
    q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Taichung_20021001_20030331.sfc.txt

CONTACT(S):

==
===============
            | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
      Address | Depertment of Geological and | Depertment of Atmospheric Sciences
              | Atmospheric Sciences | National Central University
              | Iowa State University | Chung-Li 32054,
              | 3010 Agronomy Hall | Taiwan
              | Ames, IA 50011, USA |
  --------------+-----------------------------+----------------------------
      Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+-----------------------------+----------------------------
      Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
      E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

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===============

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Taichung    | 24.15  | 120.68  |  84  | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+---------------------------------------------
  Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
  Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
  Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
  -------------------+----------------------------------------------
  Wind speed(WS)   | RM Young Model 05103
  -------------------+----------------------------------------------
  Rainfall(P)      | TK-1


  ==============================================================
  =====

  Ps(1.5m)    : Air pressure at the 1.5m height (hPa)
  Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
  RH(1.5m)    : Relative humidity at the 1.5m height (%)
  Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
  WD(17.2m)  : Wind direction at the 17.2m height (deg.)
  Ws(17.2m)  : Wind speed at the 17.2m height (m/s)
  P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used

Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
  e = 6.112*exp((17.67*Td)/(Td + 243.5));
  q = (0.622 * e)/(p - (0.378 * e));
    where:
      e = vapor pressure in mb;
      Td = dew point in deg C;
      p = surface pressure in mb;
      q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Tainan_20021001_20030331.sfc.txt

CONTACT(S):

===
|Contact 1 | Contact 2
--------------+-----------------------------+----------------------------
Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+-----------------------------+----------------------------
Address | Depertment of Geological and | Depertment of Atmospheric Sciences
        | Atmospheric Sciences | National Central University
        | Iowa State University | Chung-Li 32054,
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===

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

  The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Tainan      | 23.00  | 120.20  | 13.8 | 1 hour
 ------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

  Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

  http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
======================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
 Wind speed(WS)   | RM Young Model 05103
-------------------+----------------------------------------------
 Rainfall(P)      | TK-1


==============================================================
=====
```

Ps(0.9m)   : Air pressure at the 0.9m height (hPa)
Ts(1.5m)   : Air temperature at the 1.5m height (deg.C)
RH(1.5m)   : Relative humidity at the 1.5m height (%)
Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
WD(36.6m)   : Wind direction at the 36.6m height (deg.)
Ws(36.6m)   : Wind speed at the 36.6m height (m/s)
P(0.6m)   : Precipitation at the 0.6m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
     Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
     Wind speed and direction are instantaneous values.
     Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
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    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I",

   Specific Humidity were computed by using (Bolton 1980):
    $e = 6.112 * exp((17.67 * Td)/(Td + 243.5))$;
    $q = (0.622 * e)/(p - (0.378 * e))$;
      where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

   U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

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Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Taipei_20021001_20030331.sfc.txt

CONTACT(S):

==
                | Contact 1 | Contact 2
 --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
             | 3010 Agronomy Hall | Taiwan
             | Ames, IA 50011, USA |
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     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

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   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
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   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ---------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Taipei     | 25.03 | 121.52 |  8  | 1 hour
 ---------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)       | TK-1
```

```
=============================================================
=====
```

Ps(1.3m)   : Air pressure at the 1.3m height (hPa)
Ts(1.7m)   : Air temperature at the 1.7m height (deg.C)
RH(1.7m)   : Relative humidity at the 1.7m height (%)
Td(1.7m)   :Dewpoint Temperature at the 1.7m height(deg.)
WD(34.9m) : Wind direction at the 34.9m height (deg.)
Ws(34.9m) : Wind speed at the 34.9m height (m/s)
P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112 * \exp((17.67 * Td)/(Td + 243.5))$;
$q = (0.622 * e)/(p - (0.378 * e))$;
  where:
    e = vapor pressure in mb;
    Td = dew point in deg C;
    p = surface pressure in mb;
    q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
    U = -sin(direction) * wind_speed;
    V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Taitung_20021001_20030331.sfc.txt

CONTACT(S):

===
                | Contact 1 | Contact 2
 --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
            | Atmospheric Sciences | National Central University
            | Iowa State University | Chung-Li 32054,
            | 3010 Agronomy Hall | Taiwan
            | Ames, IA 50011, USA |
 --------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
 --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
 --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

The winter weather system that affects Taiwan and its vicinity is characterized by the
long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
surges, cold fronts and shallow Taiwan perturbations within the context of the
East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
the causes of the long rainy season and formation of the Taiwan front and shallow
perturbation have not been disclosed, and possible impacts of cold surges on the
surface weather condition over Taiwan and on the global climate system have not been
well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
  --------------------------------------------------------------------------
  Station name |Latitude|Longitude| Alt  |Measurement interval
          |decimal | decimal | (m)  |
  -------------+--------+---------+------+----------------------------------
  Taitung     | 22.75  | 121.15  |  9   | 1 hour
  --------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:


```
===================================================================
=====
  Parameter/Variable |Source
  Description        |
  ------------------+---------------------------------------------
  Air pressure(Ps)  | Setra Model 270
  ------------------+---------------------------------------------
  Airtemperature(Ts)| MetOne T-200
  ------------------+---------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
  ------------------+---------------------------------------------
  Dewpoint Temp(Td) | Pt1000
  ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
------------------+---------------------------------------------
 Wind speed(WS)   | RM Young Model 05103
------------------+---------------------------------------------
 Rainfall(P)      | TK-1
```

```
==============================================================
=====
```

   Ps(0.7m)   : Air pressure at the 0.7m height (hPa)
   Ts(1.5m)   : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)   : Relative humidity at the 1.5m height (%)
   Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
   WD(11.4m) : Wind direction at the 11.4m height (deg.)
   Ws(11.4m) : Wind speed at the 11.4m height (m/s)
   P(0.9m)   : Precipitation at the 0.9m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112*exp((17.67*Td)/(Td + 243.5))$;
$q = (0.622 * e)/(p - (0.378 * e))$;
  where:
   e = vapor pressure in mb;
   Td = dew point in deg C;
   p = surface pressure in mb;
   q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Taitung_20021001_20030331.sfc.txt

CONTACT(S):

===
================
         | Contact 1 | Contact 2
--------------+-------------------------------+----------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+-------------------------------+----------------------------
      Address | Depertment of Geological and | Depertment of Atmospheric Sciences
              | Atmospheric Sciences | National Central University
              | Iowa State University | Chung-Li 32054,
              | 3010 Agronomy Hall | Taiwan
              | Ames, IA 50011, USA |
--------------+-------------------------------+----------------------------
      Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
--------------+-------------------------------+----------------------------
      Fax.No. | +1-515-294-2619 | +1-886-3422-3283
--------------+-------------------------------+----------------------------
      E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
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DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Taitung    | 22.75  | 121.15  |  9  | 1 hour
 -----------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)       | TK-1
```

```
===============================================================
=====
```

   Ps(0.7m)   : Air pressure at the 0.7m height (hPa)
   Ts(1.5m)   : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)   : Relative humidity at the 1.5m height (%)
   Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
   WD(11.4m) : Wind direction at the 11.4m height (deg.)
   Ws(11.4m) : Wind speed at the 11.4m height (m/s)
   P(0.9m)   : Precipitation at the 0.9m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used

Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using "CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$$e = 6.112*exp((17.67*Td)/(Td + 243.5));$$
$$q = (0.622 * e)/(p - (0.378 * e));$$
   where:
     e = vapor pressure in mb;
     Td = dew point in deg C;
     p = surface pressure in mb;
     q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Tawu_20021001_20030331.sfc.txt

CONTACT(S):

==
===============
         | Contact 1 | Contact 2
 --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
         | Atmospheric Sciences | National Central University
         | Iowa State University | Chung-Li 32054,
         | 3010 Agronomy Hall | Taiwan
         | Ames, IA 50011, USA |
 --------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
 --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
 --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
===============

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Tawu       | 22.36  | 120.90  | 8.1  | 1 hour
 --------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
  Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
  Rainfall(P)      | TK-1


=================================================================
=====

  Ps(0.8m)     : Air pressure at the 0.8m height (hPa)
  Ts(1.5m)     : Air temperature at the 1.5m height (deg.C)
  RH(1.5m)    : Relative humidity at the 1.5m height (%)
  Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
  WD(12.7m) : Wind direction at the 12.7m height (deg.)
  Ws(12.7m)  : Wind speed at the 12.7m height (m/s)
  P(0.7m)      : Precipitation at the 0.7m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I",

   Specific Humidity were computed by using (Bolton 1980):
    e = 6.112*exp((17.67*Td)/(Td + 243.5));
    q = (0.622 * e)/(p - (0.378 * e));
     where:
       e = vapor pressure in mb;
       Td = dew point in deg C;
       p = surface pressure in mb;
       q = specific humidity in kg/kg.

   U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Tungchitao_20021001_20030331.sfc.txt

CONTACT(S):

==

| | Contact 1 | Contact 2
--------------+--------------------------------+----------------------------
Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+--------------------------------+----------------------------
Address | Depertment of Geological and | Depertment of Atmospheric Sciences
        | Atmospheric Sciences | National Central University
        | Iowa State University | Chung-Li 32054,
        | 3010 Agronomy Hall | Taiwan
        | Ames, IA 50011, USA |
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--------------+--------------------------------+----------------------------
E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ---------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Tungchitao   | 23.26  | 119.66  | 45.0 | 1 hour
 ---------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:


```
=====================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
 Wind speed(WS)    | RM Young Model 05103
-------------------+----------------------------------------------
 Rainfall(P)       | TK-1
```

```
==============================================================
=====
```

```
   Ps(0.9m)    : Air pressure at the 0.9m height (hPa)
   Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)    : Relative humidity at the 1.5m height (%)
   Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
   WD(9.1m)    : Wind direction at the 9.1m height (deg.)
   Ws(9.1m)    : Wind speed at the 9.1m height (m/s)
   P(0.4m)     : Precipitation at the 0.4m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112 * exp((17.67 * Td)/(Td + 243.5));$
$q = (0.622 * e)/(p - (0.378 * e));$
   where:
     e = vapor pressure in mb;
     Td = dew point in deg C;
     p = surface pressure in mb;
     q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Wuchi_20021001_20030331.sfc.txt

CONTACT(S):

==
===============
            | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
             | 3010 Agronomy Hall | Taiwan
             | Ames, IA 50011, USA |
  --------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
===============

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
-------------------------------------------------------------------------
Station name |Latitude|Longitude| Alt  |Measurement interval
        |decimal | decimal | (m)  |
-------------+--------+---------+------+----------------------------------
Wuchi       | 24.26  | 120.52  |  7.2 | 1 hour
-------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
========================================================================
=====
Parameter/Variable |Source
Description        |
-------------------+--------------------------------------------
Air pressure(Ps)   | Setra Model 270
-------------------+--------------------------------------------
Airtemperature(Ts) | MetOne T-200
-------------------+--------------------------------------------
Rela. Humidity(RH) | MetOne DP-200B
-------------------+--------------------------------------------
Dewpoint Temp(Td)  | Pt1000
-------------------+--------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
 Wind speed(WS)   | RM Young Model 05103
-------------------+---------------------------------------------
 Rainfall(P)      | TK-1
```

==
=====


```
 Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
 Ts(1.7m)    : Air temperature at the 1.7m height (deg.C)
 RH(1.7m)    : Relative humidity at the 1.7m height (%)
 Td(1.7m)    :Dewpoint Temperature at the 1.7m height(deg.)
 WD(33.2m)   : Wind direction at the 33.2m height (deg.)
 Ws(33.2m)   : Wind speed at the 33.2m height (m/s)
 P(0.4m)     : Precipitation at the 0.4m height (mm)
```


3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

    Data are downloaded from the AWS monthly. Then, data are sent to CWB,
    where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

    And the two parameters indicated below were computed by using
    "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I",

    Specific Humidity were computed by using (Bolton 1980):
     $e = 6.112*exp((17.67*Td)/(Td + 243.5));$
     $q = (0.622 * e)/(p - (0.378 * e));$
       where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

    U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

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An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Yushan_20021001_20030331.sfc.txt

CONTACT(S):

===

          | Contact 1 | Contact 2
 --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
          | Atmospheric Sciences | National Central University
          | Iowa State University | Chung-Li 32054,
          | 3010 Agronomy Hall | Taiwan
          | Ames, IA 50011, USA |
 --------------+-----------------------------+----------------------------
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 --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
 --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
03 August 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The First half CEOP EOP-3 time period (01 October 2002 to 31 March 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ---------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Yushan      | 23.49  | 120.95  | 3845 | 1 hour
 ---------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
======================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
------------------+---------------------------------------------
 Wind speed(WS)    | RM Young Model 05103
------------------+---------------------------------------------
 Rainfall(P)       | TK-1
```

```
===============================================================
=====
```

    Ps(0.9m)   : Air pressure at the 0.9m height (hPa)
    Ts(1.5m)   : Air temperature at the 1.5m height (deg.C)
    RH(1.5m)   : Relative humidity at the 1.5m height (%)
    Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
    WD(9.2m) : Wind direction at the 9.2m height (deg.)
    Ws(9.2m)   : Wind speed at the 9.2m height (m/s)
    P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I",

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112*exp((17.67*Td)/(Td + 243.5));$
$q = (0.622 * e)/(p - (0.378 * e));$
  where:
    e = vapor pressure in mb;
    Td = dew point in deg C;
    p = surface pressure in mb;
    q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):

```
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;
```

4.0 QUALITY CONTROL PROCEDURES

PI performed visual checks on this data set.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Alishan_20030401_20030930.sfc.txt

CONTACT(S):

===
          | Contact 1 | Contact 2
  --------------+----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
          | Atmospheric Sciences | National Central University
          | Iowa State University | Chung-Li 32054,
          | 3010 Agronomy Hall | Taiwan
          | Ames, IA 50011, USA |
  --------------+----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 -------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Alishan     | 23.51  | 120.80  | 2413 | 1 hour
 -------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
==================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
 Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
 Rainfall(P)       | TK-1
```

```
==============================================================
=====
```

   Ps(2.5m)   : Air pressure at the 2.5m height (hPa)
   Ts(1.4m)   : Air temperature at the 1.4m height (deg.C)
   RH(1.4m)   : Relative humidity at the 1.4m height (%)
   Td(1.4m)   :Dewpoint Temperature at the 1.4m height(deg.)
   WD(15.1m) : Wind direction at the 15.1m height (deg.)
   Ws(15.1m) : Wind speed at the 15.1m height (m/s)
   P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

    Data are downloaded from the AWS monthly. Then, data are sent to CWB,
    where they are processed.

 3.2 Description of derived parameters and processing techniques used
     Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
     Wind speed and direction are instantaneous values.
     Precipitation is accumulated on the previous minute.

    And the two parameters indicated below were computed by using
    "CEOP Derived Parameter Equations:
     http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
     also put the data flag "I", In the case of calculated by using
     dubious value fagged "D", the data flag was put "D".

    Specific Humidity were computed by using (Bolton 1980):
      e = 6.112*exp((17.67*Td)/(Td + 243.5));
      q = (0.622 * e)/(p - (0.378 * e));
        where:
          e = vapor pressure in mb;
          Td = dew point in deg C;
          p = surface pressure in mb;
          q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

   No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

   Original data was collected and is provided by CWB of Taiwan, funded by
   Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Anpu_20030401_20030930.sfc.txt

CONTACT(S):

===

| Contact 1 | Contact 2
--------------+-----------------------------+----------------------------
Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+-----------------------------+----------------------------
Address | Depertment of Geological and | Depertment of Atmospheric Sciences
| Atmospheric Sciences | National Central University
| Iowa State University | Chung-Li 32054,
| 3010 Agronomy Hall | Taiwan
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--------------+-----------------------------+----------------------------
Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
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--------------+-----------------------------+----------------------------
E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

The winter weather system that affects Taiwan and its vicinity is characterized by the
long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
surges, cold fronts and shallow Taiwan perturbations within the context of the
East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
the causes of the long rainy season and formation of the Taiwan front and shallow
perturbation have not been disclosed, and possible impacts of cold surges on the
surface weather condition over Taiwan and on the global climate system have not been
well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

  The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
  All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
        |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Anpu       | 25.18  | 121.52  |837.6 | 1 hour
 ------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

  Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

  http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:


```
===================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
 Wind speed(WS)   | RM Young Model 05103
-------------------+----------------------------------------------
 Rainfall(P)      | TK-1
```

```
================================================================
=====
```

```
   Ps(1.3m)    : Air pressure at the 1.3m height (hPa)
   Ts(1.8m)    : Air temperature at the 1.8m height (deg.C)
   RH(1.8m)    : Relative humidity at the 1.8m height (%)
   Td(1.8m)    :Dewpoint Temperature at the 1.8m height(deg.)
   WD(7.31m) : Wind direction at the 7.31m height (deg.)
   Ws(7.31m)  : Wind speed at the 7.31m height (m/s)
   P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
   Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
   Wind speed and direction are instantaneous values.
   Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
   http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
   also put the data flag "I", In the case of calculated by using
   dubious value fagged "D", the data flag was put "D".

   Specific Humidity were computed by using (Bolton 1980):
    $e = 6.112*exp((17.67*Td)/(Td + 243.5))$;
    $q = (0.622 * e)/(p - (0.378 * e))$;
      where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

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Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Chengkung_20030401_20030930.sfc.txt

CONTACT(S):

==
               | Contact 1 | Contact 2
 --------------+---------------------------+----------------------------
    Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+---------------------------+----------------------------
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            | Iowa State University | Chung-Li 32054,
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            | Ames, IA 50011, USA |
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 --------------+---------------------------+----------------------------
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    E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

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   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Chengkung    | 23.10  | 121.37  | 33.5 | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
========================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+---------------------------------------------
  Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
  Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
  Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)       | TK-1
```

```
================================================================
=====
```

```
Ps(0.8m)     : Air pressure at the 0.8m height (hPa)
Ts(1.5m)     : Air temperature at the 1.5m height (deg.C)
RH(1.5m)    : Relative humidity at the 1.5m height (%)
Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
WD(12.8m) : Wind direction at the 12.8m height (deg.)
Ws(12.8m)  : Wind speed at the 12.8m height (m/s)
P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I", In the case of calculated by using
    dubious value fagged "D", the data flag was put "D".

   Specific Humidity were computed by using (Bolton 1980):
    $e = 6.112*\exp((17.67*Td)/(Td + 243.5))$;
    $q = (0.622 * e)/(p - (0.378 * e))$;
      where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Chiayi_20030401_20030930.sfc.txt

CONTACT(S):

==
===============
           | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
            | Atmospheric Sciences | National Central University
            | Iowa State University | Chung-Li 32054,
            | 3010 Agronomy Hall | Taiwan
            | Ames, IA 50011, USA |
  --------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

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DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
-------------------------------------------------------------------------
Station name |Latitude|Longitude| Alt  |Measurement interval
             |decimal | decimal | (m)  |
-------------+--------+---------+------+----------------------------------
Chiayi       | 23.50  | 120.42  | 26.9 | 1 hour
-------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
==================================================================
=====
Parameter/Variable |Source
Description         |
-------------------+-------------------------------------------
Air pressure(Ps)   | Setra Model 270
-------------------+-------------------------------------------
Airtemperature(Ts) | MetOne T-200
-------------------+-------------------------------------------
Rela. Humidity(RH) | MetOne DP-200B
-------------------+-------------------------------------------
Dewpoint Temp(Td)  | Pt1000
-------------------+-------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)       | TK-1
```

```
==============================================================
=====
```

```
Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
Ts(1.6m)    : Air temperature at the 1.6m height (deg.C)
RH(1.6m)    : Relative humidity at the 1.6m height (%)
Td(1.6m)    :Dewpoint Temperature at the 1.6m height(deg.)
WD(14.5m)  : Wind direction at the 14.5m height (deg.)
Ws(14.5m)  : Wind speed at the 14.5m height (m/s)
P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
   Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
   Wind speed and direction are instantaneous values.
   Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
   http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
   also put the data flag "I", In the case of calculated by using
   dubious value fagged "D", the data flag was put "D".

   Specific Humidity were computed by using (Bolton 1980):
    e = 6.112*exp((17.67*Td)/(Td + 243.5));
    q = (0.622 * e)/(p - (0.378 * e));
      where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
   U = -sin(direction) * wind_speed;
   V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Chutzehu_20030401_20030930.sfc.txt

CONTACT(S):

==
===============
            | Contact 1 | Contact 2
 --------------+------------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+------------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
            | Atmospheric Sciences | National Central University
            | Iowa State University | Chung-Li 32054,
            | 3010 Agronomy Hall | Taiwan
            | Ames, IA 50011, USA |
 --------------+------------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
 --------------+------------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
 --------------+------------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
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DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
        |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Chutzehu     | 25.16  | 121.54  | 607  | 1 hour
 ------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
==================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+--------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+--------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+--------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+--------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+--------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
 Wind speed(WS)    | RM Young Model 05103
-------------------+----------------------------------------------
 Rainfall(P)       | TK-1
```

===
=====

   Ps(0.5m)   : Air pressure at the 0.5m height (hPa)
   Ts(1.8m)   : Air temperature at the 1.8m height (deg.C)
   RH(1.8m)   : Relative humidity at the 1.8m height (%)
   Td(1.8m)   :Dewpoint Temperature at the 1.8m height(deg.)
   WD(11.03m)   : Wind direction at the 11.03m height (deg.)
   Ws(11.03m): Wind speed at the 11.03m height (m/s)
   P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
   Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
   Wind speed and direction are instantaneous values.
   Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
   http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
   also put the data flag "I", In the case of calculated by using
   dubious value fagged "D", the data flag was put "D".

   Specific Humidity were computed by using (Bolton 1980):
    e = 6.112*exp((17.67*Td)/(Td + 243.5));
    q = (0.622 * e)/(p - (0.378 * e));
      where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
   U = -sin(direction) * wind_speed;
   V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

   No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

   Original data was collected and is provided by CWB of Taiwan, funded by
   Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Hengchun_20030401_20030930.sfc.txt

CONTACT(S):

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================
            | Contact 1 | Contact 2
  --------------+------------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+------------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
             | 3010 Agronomy Hall | Taiwan
             | Ames, IA 50011, USA |
  --------------+------------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+------------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+------------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
================

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Hengchun    | 22.00  | 120.74  | 22.1 | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:


```
==================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+----------------------------------------------
  Air pressure(Ps)  | Setra Model 270
 ------------------+----------------------------------------------
  Airtemperature(Ts)| MetOne T-200
 ------------------+----------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
 ------------------+----------------------------------------------
  Dewpoint Temp(Td) | Pt1000
 ------------------+----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
 Wind speed(WS)   | RM Young Model 05103
-------------------+---------------------------------------------
 Rainfall(P)      | TK-1
```

==
=====

```
 Ps(0.7m)     : Air pressure at the 0.7m height (hPa)
 Ts(1.8m)     : Air temperature at the 1.8m height (deg.C)
 RH(1.8m)     : Relative humidity at the 1.8m height (%)
 Td(1.8m)    :Dewpoint Temperature at the 1.8m height(deg.)
 WD(14.3m) : Wind direction at the 14.3m height (deg.)
 Ws(14.3m)  : Wind speed at the 14.3m height (m/s)
 P(0.8m)      : Precipitation at the 0.8m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I", In the case of calculated by using
    dubious value fagged "D", the data flag was put "D".

    Specific Humidity were computed by using (Bolton 1980):
     e = 6.112*exp((17.67*Td)/(Td + 243.5));
     q = (0.622 * e)/(p - (0.378 * e));
       where:
         e = vapor pressure in mb;
         Td = dew point in deg C;
         p = surface pressure in mb;
         q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Hsinchu_20030401_20030930.sfc.txt

CONTACT(S):

==
===============
           | Contact 1 | Contact 2
 --------------+-----------------------------+----------------------------
    Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+-----------------------------+----------------------------
    Address | Depertment of Geological and | Depertment of Atmospheric Sciences
           | Atmospheric Sciences | National Central University
           | Iowa State University | Chung-Li 32054,
           | 3010 Agronomy Hall | Taiwan
           | Ames, IA 50011, USA |
 --------------+-----------------------------+----------------------------
    Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
 --------------+-----------------------------+----------------------------
    Fax.No. | +1-515-294-2619 | +1-886-3422-3283
 --------------+-----------------------------+----------------------------
    E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
===============

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Hsinchu     | 24.83  | 121.01  | 26.9 | 1 hour
 --------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
==================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+-----------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+-----------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+-----------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+-----------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+-----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
------------------+----------------------------------------------
Wind speed(WS)    | RM Young Model 05103
------------------+----------------------------------------------
Rainfall(P)       | TK-1
```

```
==============================================================
=====
```

```
Ps(2.0m)    : Air pressure at the 2.0m height (hPa)
Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
RH(1.5m)    : Relative humidity at the 1.5m height (%)
Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
WD(15.6m)  : Wind direction at the 15.6m height (deg.)
Ws(15.6m)  : Wind speed at the 15.6m height (m/s)
P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I", In the case of calculated by using
dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112 \cdot \exp((17.67 \cdot Td)/(Td + 243.5));$
$q = (0.622 \cdot e)/(p - (0.378 \cdot e));$
   where:
     e = vapor pressure in mb;
     Td = dew point in deg C;
     p = surface pressure in mb;
     q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Hualien_20030401_20030930.sfc.txt

CONTACT(S):

==
===============
             | Contact 1 | Contact 2
 --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
             | 3010 Agronomy Hall | Taiwan
             | Ames, IA 50011, USA |
 --------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
 --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
 --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
===============

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Hualien    | 23.98  | 121.60  | 16.1 | 1 hour
 ------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
Wind speed(WS)   | RM Young Model 05103
-------------------+----------------------------------------------
Rainfall(P)      | TK-1
```

```
================================================================
=====
```

```
Ps(3.1m)     : Air pressure at the 3.1m height (hPa)
Ts(1.5m)     : Air temperature at the 1.5m height (deg.C)
RH(1.5m)    : Relative humidity at the 1.5m height (%)
Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
WD(12.0m) : Wind direction at the 12.0m height (deg.)
Ws(12.0m)  : Wind speed at the 12.0m height (m/s)
P(0.4m)      : Precipitation at the 0.4m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used

Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using "CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I", In the case of calculated by using dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112*exp((17.67*Td)/(Td + 243.5));$
$q = (0.622 * e)/(p - (0.378 * e));$
where:
e = vapor pressure in mb;
Td = dew point in deg C;
p = surface pressure in mb;
q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
   U = -sin(direction) * wind_speed;
   V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

   No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

   Original data was collected and is provided by CWB of Taiwan, funded by
   Ministry of Transportation and Communications of Taiwan.

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Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

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An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
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Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
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Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Ilan_20030401_20030930.sfc.txt

CONTACT(S):

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===============
            | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
    Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
    Address | Depertment of Geological and | Depertment of Atmospheric Sciences
            | Atmospheric Sciences | National Central University
            | Iowa State University | Chung-Li 32054,
            | 3010 Agronomy Hall | Taiwan
            | Ames, IA 50011, USA |
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  --------------+-----------------------------+----------------------------
    Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
    E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
===============

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
---------------------------------------------------------------------
Station name |Latitude|Longitude| Alt  |Measurement interval
        |decimal | decimal | (m)  |
-------------+--------+---------+------+---------------------------------
Ilan       | 24.77  | 121.75  | 7.2 | 1 hour
---------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
=====================================================================
=====
Parameter/Variable |Source
Description      |
------------------+---------------------------------------------
Air pressure(Ps)  | Setra Model 270
------------------+---------------------------------------------
Airtemperature(Ts)| MetOne T-200
------------------+---------------------------------------------
Rela. Humidity(RH)| MetOne DP-200B
------------------+---------------------------------------------
Dewpoint Temp(Td) | Pt1000
------------------+---------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
 Wind speed(WS)    | RM Young Model 05103
-------------------+----------------------------------------------
 Rainfall(P)       | TK-1
```

```
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=====
```

```
   Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
   Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)    : Relative humidity at the 1.5m height (%)
   Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
   WD(26.0m)   : Wind direction at the 26.0m height (deg.)
   Ws(26.0m)   : Wind speed at the 26.0m height (m/s)
   P(0.6m)     : Precipitation at the 0.6m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

    Data are downloaded from the AWS monthly. Then, data are sent to CWB,
    where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

    And the two parameters indicated below were computed by using
    "CEOP Derived Parameter Equations:
     http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
     also put the data flag "I", In the case of calculated by using
     dubious value fagged "D", the data flag was put "D".

    Specific Humidity were computed by using (Bolton 1980):
      e = 6.112*exp((17.67*Td)/(Td + 243.5));
      q = (0.622 * e)/(p - (0.378 * e));
        where:
          e = vapor pressure in mb;
          Td = dew point in deg C;
          p = surface pressure in mb;
          q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
   U = -sin(direction) * wind_speed;
   V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

   No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

   Original data was collected and is provided by CWB of Taiwan, funded by
   Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Jiyuehtan_20030401_20030930.sfc.txt

CONTACT(S):

===
================
           | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
    Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
    Address | Depertment of Geological and | Depertment of Atmospheric Sciences
            | Atmospheric Sciences | National Central University
            | Iowa State University | Chung-Li 32054,
            | 3010 Agronomy Hall | Taiwan
            | Ames, IA 50011, USA |
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    Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
    E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
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DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Jiyuehtan    | 23.88  | 120.90  | 1015 | 1 hour
 --------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+--------------------------------------------
  Air pressure(Ps)  | Setra Model 270
 ------------------+--------------------------------------------
  Airtemperature(Ts)| MetOne T-200
 ------------------+--------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
 ------------------+--------------------------------------------
  Dewpoint Temp(Td) | Pt1000
 ------------------+--------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)       | TK-1
```

```
==============================================================
=====
```

Ps(0.8m)   : Air pressure at the 0.8m height (hPa)
Ts(1.6m)   : Air temperature at the 1.6m height (deg.C)
RH(1.6m)   : Relative humidity at the 1.6m height (%)
Td(1.6m)   :Dewpoint Temperature at the 1.6m height(deg.)
WD(8.0m)   : Wind direction at the 8.0m height (deg.)
Ws(8.0m)   : Wind speed at the 8.0m height (m/s)
P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I", In the case of calculated by using
dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
  e = 6.112*exp((17.67*Td)/(Td + 243.5));
  q = (0.622 * e)/(p - (0.378 * e));
    where:
      e = vapor pressure in mb;
      Td = dew point in deg C;
      p = surface pressure in mb;
      q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Kaohsiung_20030401_20030930.sfc.txt

CONTACT(S):

===
| Contact 1 | Contact 2
--------------+-------------------------------+-----------------------------
Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+-------------------------------+-----------------------------
Address | Depertment of Geological and | Depertment of Atmospheric Sciences
        | Atmospheric Sciences | National Central University
        | Iowa State University | Chung-Li 32054,
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E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
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   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Kaohsiung    | 22.57  | 120.31  | 2.3  | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
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 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
------------------+---------------------------------------------
Rainfall(P)       | TK-1
```

```
==================================================================
=====
```

```
  Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
  Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
  RH(1.5m)    : Relative humidity at the 1.5m height (%)
  Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
  WD(14.0m) : Wind direction at the 14.0m height (deg.)
  Ws(14.0m)  : Wind speed at the 14.0m height (m/s)
  P(0.7m)     : Precipitation at the 0.7m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I", In the case of calculated by using
dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
  e = 6.112*exp((17.67*Td)/(Td + 243.5));
  q = (0.622 * e)/(p - (0.378 * e));
    where:
      e = vapor pressure in mb;
      Td = dew point in deg C;
      p = surface pressure in mb;
      q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
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Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Keelung_20030401_20030930.sfc.txt

CONTACT(S):

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================
            | Contact 1 | Contact 2
 --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
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            | Iowa State University | Chung-Li 32054,
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DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt |Measurement interval
         |decimal | decimal | (m) |
 -------------+--------+---------+------+---------------------------------
 Keelung     | 25.13 | 121.73 | 26.7 | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
    -------------------+----------------------------------------------
  Wind speed(WS)    | RM Young Model 05103
    -------------------+----------------------------------------------
  Rainfall(P)       | TK-1


================================================================
=====

  Ps(1.0m)     : Air pressure at the 1.0m height (hPa)
  Ts(1.8m)     : Air temperature at the 1.8m height (deg.C)
  RH(1.8m)    : Relative humidity at the 1.8m height (%)
  Td(1.8m)    :Dewpoint Temperature at the 1.8m height(deg.)
  WD(34.6m) : Wind direction at the 34.6m height (deg.)
  Ws(34.6m)  : Wind speed at the 34.6m height (m/s)
  P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

    Data are downloaded from the AWS monthly. Then, data are sent to CWB,
    where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

    And the two parameters indicated below were computed by using
    "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I", In the case of calculated by using
    dubious value fagged "D", the data flag was put "D".

    Specific Humidity were computed by using (Bolton 1980):
     $e = 6.112 \cdot \exp((17.67 \cdot Td)/(Td + 243.5))$;
     $q = (0.622 \cdot e)/(p - (0.378 \cdot e))$;
       where:
         e = vapor pressure in mb;
         Td = dew point in deg C;
         p = surface pressure in mb;
         q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Lanyu_20030401_20030930.sfc.txt

CONTACT(S):

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===============
            | Contact 1 | Contact 2
  --------------+------------------------------+----------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+------------------------------+----------------------------
      Address | Depertment of Geological and | Depertment of Atmospheric Sciences
            | Atmospheric Sciences | National Central University
            | Iowa State University | Chung-Li 32054,
            | 3010 Agronomy Hall | Taiwan
            | Ames, IA 50011, USA |
  --------------+------------------------------+----------------------------
      Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+------------------------------+----------------------------
      Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+------------------------------+----------------------------
      E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

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24 January 2005

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1.1 Introduction or abstract

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   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
  All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
        |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Lanyu      | 22.04  | 121.55  | 324  | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
------------------+--------------------------------------------
Wind speed(WS)   | RM Young Model 05103
------------------+--------------------------------------------
Rainfall(P)      | TK-1
```

```
==================================================================
=====
```

```
Ps(1.1m)     : Air pressure at the 1.1m height (hPa)
Ts(1.42m)    : Air temperature at the 1.42m height (deg.C)
RH(1.42m)    : Relative humidity at the 1.42m height (%)
Td(1.42m)    : Dewpoint Temperature at the 1.42m height(deg.)
WD(12.5m)    : Wind direction at the 12.5m height (deg.)
Ws(12.5m)    : Wind speed at the 12.5m height (m/s)
P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I", In the case of calculated by using
dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112 * \exp((17.67 * Td)/(Td + 243.5))$;
$q = (0.622 * e)/(p - (0.378 * e))$;
where:
e = vapor pressure in mb;
Td = dew point in deg C;
p = surface pressure in mb;
q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
$$U = -\sin(\text{direction}) * \text{wind\_speed};$$
$$V = -\cos(\text{direction}) * \text{wind\_speed};$$

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

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Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Pengchiayu_20030401_20030930.sfc.txt

CONTACT(S):

==
                | Contact 1 | Contact 2
  --------------+------------------------------+----------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+------------------------------+----------------------------
      Address | Depertment of Geological and | Depertment of Atmospheric Sciences
              | Atmospheric Sciences | National Central University
              | Iowa State University | Chung-Li 32054,
              | 3010 Agronomy Hall | Taiwan
              | Ames, IA 50011, USA |
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  --------------+------------------------------+----------------------------
      Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+------------------------------+----------------------------
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24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

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   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 -----------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Pengchiayu   | 25.63  | 122.07  | 99.0 | 1 hour
 -----------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:


```
======================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
  Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
  Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
  Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
  -------------------+-------------------------------------------
  Wind speed(WS)    | RM Young Model 05103
  -------------------+-------------------------------------------
  Rainfall(P)      | TK-1


=================================================================
=====

  Ps(0.8m)     : Air pressure at the 0.8m height (hPa)
  Ts(1.5m)     : Air temperature at the 1.5m height (deg.C)
  RH(1.5m)    : Relative humidity at the 1.5m height (%)
  Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
  WD(7.2m)   : Wind direction at the 7.2m height (deg.)
  Ws(7.2m)    : Wind speed at the 7.2m height (m/s)
  P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

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    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I", In the case of calculated by using
    dubious value fagged "D", the data flag was put "D".

   Specific Humidity were computed by using (Bolton 1980):
    e = 6.112*exp((17.67*Td)/(Td + 243.5));
    q = (0.622 * e)/(p - (0.378 * e));
      where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
$$U = -\sin(\text{direction}) * \text{wind\_speed};$$
$$V = -\cos(\text{direction}) * \text{wind\_speed};$$

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

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J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Penghu_20030401_20030930.sfc.txt

CONTACT(S):

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===============
       | Contact 1 | Contact 2
--------------+-----------------------------+----------------------------
  Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+-----------------------------+----------------------------
  Address | Depertment of Geological and | Depertment of Atmospheric Sciences
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        | Iowa State University | Chung-Li 32054,
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1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

The winter weather system that affects Taiwan and its vicinity is characterized by the
long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
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East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
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the causes of the long rainy season and formation of the Taiwan front and shallow
perturbation have not been disclosed, and possible impacts of cold surges on the
surface weather condition over Taiwan and on the global climate system have not been
well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
     All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ---------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Penghu      | 23.57  | 119.56  | 10.7 | 1 hour
 ---------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
==================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+----------------------------------------------
  Air pressure(Ps)  | Setra Model 270
 ------------------+----------------------------------------------
  Airtemperature(Ts)| MetOne T-200
 ------------------+----------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
 ------------------+----------------------------------------------
  Dewpoint Temp(Td) | Pt1000
 ------------------+----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+----------------------------------------------
Rainfall(P)       | TK-1


================================================================
=====
```

```
Ps(0.7m)    : Air pressure at the 0.7m height (hPa)
Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
RH(1.5m)    : Relative humidity at the 1.5m height (%)
Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
WD(14.6m)   : Wind direction at the 14.6m height (deg.)
Ws(14.6m)   : Wind speed at the 14.6m height (m/s)
P(0.5m)     : Precipitation at the 0.5m height (mm)
```


3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
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    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
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    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
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    dubious value fagged "D", the data flag was put "D".

   Specific Humidity were computed by using (Bolton 1980):
    $e = 6.112 \cdot \exp((17.67 \cdot Td)/(Td + 243.5))$;
    $q = (0.622 \cdot e)/(p - (0.378 \cdot e))$;
     where:
       e = vapor pressure in mb;
       Td = dew point in deg C;
       p = surface pressure in mb;
       q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
    U = -sin(direction) * wind_speed;
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For all parameters, the data has been visually checked, looking for
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thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

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Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Suao_20030401_20030930.sfc.txt

CONTACT(S):

==
| Contact 1 | Contact 2
--------------+-------------------------------+----------------------------
  Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+-------------------------------+----------------------------
  Address | Depertment of Geological and | Depertment of Atmospheric Sciences
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1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Suao        | 24.60  | 121.86  | 24.9 | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:


```
====================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
--------------------+-----------------------------------------
 Wind speed(WS)    | RM Young Model 05103
--------------------+-----------------------------------------
 Rainfall(P)       | TK-1
```

```
================================================================
=====
```

```
  Ps(0.7m)    : Air pressure at the 0.7m height (hPa)
  Ts(1.6m)    : Air temperature at the 1.6m height (deg.C)
  RH(1.6m)    : Relative humidity at the 1.6m height (%)
  Td(1.6m)    :Dewpoint Temperature at the 1.6m height(deg.)
  WD(34.0m)   : Wind direction at the 34.0m height (deg.)
  Ws(34.0m)   : Wind speed at the 34.0m height (m/s)
  P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
   http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
   also put the data flag "I", In the case of calculated by using
   dubious value fagged "D", the data flag was put "D".

   Specific Humidity were computed by using (Bolton 1980):
    e = 6.112*exp((17.67*Td)/(Td + 243.5));
    q = (0.622 * e)/(p - (0.378 * e));
      where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Taichung_20030401_20030930.sfc.txt

CONTACT(S):

==
===============
          | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
          | Atmospheric Sciences | National Central University
          | Iowa State University | Chung-Li 32054,
          | 3010 Agronomy Hall | Taiwan
          | Ames, IA 50011, USA |
  --------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
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DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ---------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Taichung    | 24.15  | 120.68  |  84  | 1 hour
 ---------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:


```
==================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+----------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+----------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+----------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+----------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+--------------------------------------------
 Wind speed(WS)    | RM Young Model 05103
-------------------+--------------------------------------------
 Rainfall(P)       | TK-1
```

```
================================================================
=====
```

 Ps(1.5m)   : Air pressure at the 1.5m height (hPa)
 Ts(1.5m)   : Air temperature at the 1.5m height (deg.C)
 RH(1.5m)   : Relative humidity at the 1.5m height (%)
 Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
 WD(17.2m) : Wind direction at the 17.2m height (deg.)
 Ws(17.2m) : Wind speed at the 17.2m height (m/s)
 P(0.5m)   : Precipitation at the 0.5m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

    Data are downloaded from the AWS monthly. Then, data are sent to CWB,
    where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

    And the two parameters indicated below were computed by using
    "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I", In the case of calculated by using
    dubious value fagged "D", the data flag was put "D".

    Specific Humidity were computed by using (Bolton 1980):
     e = 6.112*exp((17.67*Td)/(Td + 243.5));
     q = (0.622 * e)/(p - (0.378 * e));
       where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
   U = -sin(direction) * wind_speed;
   V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

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Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
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Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Tainan_20030401_20030930.sfc.txt

CONTACT(S):

===
                | Contact 1 | Contact 2
  --------------+------------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+------------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
             | 3010 Agronomy Hall | Taiwan
             | Ames, IA 50011, USA |
  --------------+------------------------------+----------------------------
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     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+------------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 -------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Tainan     | 23.00  | 120.20  | 13.8 | 1 hour
 -------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
==================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+-----------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+-----------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+-----------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+-----------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+-----------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
 Wind speed(WS)   | RM Young Model 05103
-------------------+---------------------------------------------
 Rainfall(P)      | TK-1


========================================================================
=====
```

   Ps(0.9m)   : Air pressure at the 0.9m height (hPa)
   Ts(1.5m)   : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)   : Relative humidity at the 1.5m height (%)
   Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
   WD(36.6m) : Wind direction at the 36.6m height (deg.)
   Ws(36.6m) : Wind speed at the 36.6m height (m/s)
   P(0.6m)   : Precipitation at the 0.6m height (mm)

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I", In the case of calculated by using
    dubious value fagged "D", the data flag was put "D".

   Specific Humidity were computed by using (Bolton 1980):
    $e = 6.112*\exp((17.67*Td)/(Td + 243.5))$;
    $q = (0.622 * e)/(p - (0.378 * e))$;
      where:
       e = vapor pressure in mb;
       Td = dew point in deg C;
       p = surface pressure in mb;
       q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
   U = -sin(direction) * wind_speed;
   V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

   No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

   Original data was collected and is provided by CWB of Taiwan, funded by
   Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Taipei_20030401_20030930.sfc.txt

CONTACT(S):

===

| Contact 1 | Contact 2
--------------+-----------------------------+----------------------------
Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+-----------------------------+----------------------------
Address | Depertment of Geological and | Depertment of Atmospheric Sciences
| Atmospheric Sciences | National Central University
| Iowa State University | Chung-Li 32054,
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E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

The winter weather system that affects Taiwan and its vicinity is characterized by the
long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
surges, cold fronts and shallow Taiwan perturbations within the context of the
East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
the causes of the long rainy season and formation of the Taiwan front and shallow
perturbation have not been disclosed, and possible impacts of cold surges on the
surface weather condition over Taiwan and on the global climate system have not been
well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
--------------------------------------------------------------------------
Station name |Latitude|Longitude| Alt  |Measurement interval
             |decimal | decimal | (m)  |
-------------+--------+---------+------+---------------------------------
Taipei       | 25.03  | 121.52  |  8   | 1 hour
--------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
=====================================================================
=====
Parameter/Variable |Source
Description        |
-------------------+--------------------------------------------
 Air pressure(Ps)  | Setra Model 270
-------------------+--------------------------------------------
 Airtemperature(Ts)| MetOne T-200
-------------------+--------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
-------------------+--------------------------------------------
 Dewpoint Temp(Td) | Pt1000
-------------------+--------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+-----------------------------------------------
  Wind speed(WS)    | RM Young Model 05103
-------------------+-----------------------------------------------
  Rainfall(P)       | TK-1


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=====

  Ps(1.3m)     : Air pressure at the 1.3m height (hPa)
  Ts(1.7m)     : Air temperature at the 1.7m height (deg.C)
  RH(1.7m)    : Relative humidity at the 1.7m height (%)
  Td(1.7m)    :Dewpoint Temperature at the 1.7m height(deg.)
  WD(34.9m) : Wind direction at the 34.9m height (deg.)
  Ws(34.9m)  : Wind speed at the 34.9m height (m/s)
  P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I", In the case of calculated by using
    dubious value fagged "D", the data flag was put "D".

   Specific Humidity were computed by using (Bolton 1980):
    $e = 6.112*\exp((17.67*Td)/(Td + 243.5))$;
    $q = (0.622 * e)/(p - (0.378 * e))$;
      where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
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Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
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Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
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Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Taitung_20030401_20030930.sfc.txt

CONTACT(S):

==
                | Contact 1 | Contact 2
 --------------+-----------------------------+----------------------------
    Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
 --------------+-----------------------------+----------------------------
    Address | Depertment of Geological and | Depertment of Atmospheric Sciences
           | Atmospheric Sciences | National Central University
           | Iowa State University | Chung-Li 32054,
           | 3010 Agronomy Hall | Taiwan
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    Fax.No. | +1-515-294-2619 | +1-886-3422-3283
 --------------+-----------------------------+----------------------------
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==

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

 The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
 All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Taitung     | 22.75  | 121.15  |  9   | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

 Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

 http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
=====================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+---------------------------------------------
  Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
  Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
  Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)       | TK-1
```

```
==============================================================
=====
```

```
   Ps(0.7m)     : Air pressure at the 0.7m height (hPa)
   Ts(1.5m)     : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)     : Relative humidity at the 1.5m height (%)
   Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
   WD(11.4m) : Wind direction at the 11.4m height (deg.)
   Ws(11.4m)  : Wind speed at the 11.4m height (m/s)
   P(0.9m)      : Precipitation at the 0.9m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
   Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
   Wind speed and direction are instantaneous values.
   Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
   http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
   also put the data flag "I", In the case of calculated by using
   dubious value fagged "D", the data flag was put "D".

   Specific Humidity were computed by using (Bolton 1980):
    e = 6.112*exp((17.67*Td)/(Td + 243.5));
    q = (0.622 * e)/(p - (0.378 * e));
      where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
U = -sin(direction) * wind_speed;
V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

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Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
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Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Tanshui_20030401_20030930.sfc.txt

CONTACT(S):

==
===============
          | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
          | Atmospheric Sciences | National Central University
          | Iowa State University | Chung-Li 32054,
          | 3010 Agronomy Hall | Taiwan
          | Ames, IA 50011, USA |
  --------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
===============

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

   The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 -------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
          |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Tanshui     | 25.17  | 121.43  |  19  | 1 hour
 -------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

   Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

   http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
  Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
  Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
  Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
  ------------------+-----------------------------------------
  Wind speed(WS)    | RM Young Model 05103
  ------------------+-----------------------------------------
  Rainfall(P)       | TK-1
```

===
=====

```
  Ps(1.0m)     : Air pressure at the 1.0m height (hPa)
  Ts(1.4m)     : Air temperature at the 1.4m height (deg.C)
  RH(1.4m)     : Relative humidity at the 1.4m height (%)
  Td(1.4m)     :Dewpoint Temperature at the 1.4m height(deg.)
  WD(12.2m)    : Wind direction at the 12.2m height (deg.)
  Ws(12.2m)    : Wind speed at the 12.2m height (m/s)
  P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I", In the case of calculated by using
dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112 \cdot \exp((17.67 \cdot Td)/(Td + 243.5))$;
$q = (0.622 \cdot e)/(p - (0.378 \cdot e))$;
  where:
    e = vapor pressure in mb;
    Td = dew point in deg C;
    p = surface pressure in mb;
    q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Tawu_20030401_20030930.sfc.txt

CONTACT(S):

==
================
          | Contact 1 | Contact 2
--------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
--------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
             | 3010 Agronomy Hall | Taiwan
             | Ames, IA 50011, USA |
--------------+-----------------------------+----------------------------
     Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
--------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
--------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
===============

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

  The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 --------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt |Measurement interval
        |decimal | decimal | (m)  |
 -------------+--------+---------+------+---------------------------------
 Tawu       | 22.36  | 120.90 | 8.1 | 1 hour
 --------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

  Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

  http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
===================================================================
=====
 Parameter/Variable |Source
 Description       |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)   | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)      | TK-1
```

==
=====

```
Ps(0.8m)     : Air pressure at the 0.8m height (hPa)
Ts(1.5m)     : Air temperature at the 1.5m height (deg.C)
RH(1.5m)    : Relative humidity at the 1.5m height (%)
Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
WD(12.7m) : Wind direction at the 12.7m height (deg.)
Ws(12.7m)  : Wind speed at the 12.7m height (m/s)
P(0.7m)      : Precipitation at the 0.7m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I", In the case of calculated by using
dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112*exp((17.67*Td)/(Td + 243.5));$
$q = (0.622 * e)/(p - (0.378 * e));$
  where:
    e = vapor pressure in mb;
    Td = dew point in deg C;
    p = surface pressure in mb;
    q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
 U = -sin(direction) * wind_speed;
 V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

   No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

   Original data was collected and is provided by CWB of Taiwan, funded by
   Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Tungchitao_20030401_20030930.sfc.txt

CONTACT(S):

===
             | Contact 1 | Contact 2
  --------------+------------------------------+----------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+------------------------------+----------------------------
      Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
             | 3010 Agronomy Hall | Taiwan
             | Ames, IA 50011, USA |
  --------------+------------------------------+----------------------------
      Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext. 65538
  --------------+------------------------------+----------------------------
      Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+------------------------------+----------------------------
      E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

  The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
  All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 -------------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Tungchitao   | 23.26  | 119.66  | 45.0 | 1 hour
 -------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

  Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

  http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
======================================================================
=====
 Parameter/Variable |Source
 Description        |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
Rainfall(P)       | TK-1
```

```
=================================================================
=====
```

```
Ps(0.9m)    : Air pressure at the 0.9m height (hPa)
Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
RH(1.5m)    : Relative humidity at the 1.5m height (%)
Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
WD(9.1m)   : Wind direction at the 9.1m height (deg.)
Ws(9.1m)    : Wind speed at the 9.1m height (m/s)
P(0.4m)     : Precipitation at the 0.4m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I", In the case of calculated by using
dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
$e = 6.112 * \exp((17.67 * Td)/(Td + 243.5));$
$q = (0.622 * e)/(p - (0.378 * e));$
where:
e = vapor pressure in mb;
Td = dew point in deg C;
p = surface pressure in mb;
q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Wuchi_20030401_20030930.sfc.txt

CONTACT(S):

===
                | Contact 1 | Contact 2
  --------------+------------------------------+----------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+------------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
             | Atmospheric Sciences | National Central University
             | Iowa State University | Chung-Li 32054,
             | 3010 Agronomy Hall | Taiwan
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  --------------+------------------------------+----------------------------
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  --------------+------------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===

DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

  The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
   All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
 ---------------------------------------------------------------------
 Station name |Latitude|Longitude| Alt  |Measurement interval
         |decimal | decimal | (m)  |
 -------------+--------+---------+------+----------------------------------
 Wuchi      | 24.26  | 120.52  |  7.2 | 1 hour
 ---------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

  Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

  http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
======================================================================
=====
 Parameter/Variable |Source
 Description      |
 ------------------+---------------------------------------------
 Air pressure(Ps)  | Setra Model 270
 ------------------+---------------------------------------------
 Airtemperature(Ts)| MetOne T-200
 ------------------+---------------------------------------------
 Rela. Humidity(RH)| MetOne DP-200B
 ------------------+---------------------------------------------
 Dewpoint Temp(Td) | Pt1000
 ------------------+---------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+---------------------------------------------
 Wind speed(WS)    | RM Young Model 05103
-------------------+---------------------------------------------
 Rainfall(P)       | TK-1
```

```
===============================================================
=====
```

```
 Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
 Ts(1.7m)    : Air temperature at the 1.7m height (deg.C)
 RH(1.7m)    : Relative humidity at the 1.7m height (%)
 Td(1.7m)    :Dewpoint Temperature at the 1.7m height(deg.)
 WD(33.2m)   : Wind direction at the 33.2m height (deg.)
 Ws(33.2m)   : Wind speed at the 33.2m height (m/s)
 P(0.4m)     : Precipitation at the 0.4m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB, where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature, Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
also put the data flag "I", In the case of calculated by using
dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
 $e = 6.112*exp((17.67*Td)/(Td + 243.5))$;
 $q = (0.622 * e)/(p - (0.378 * e))$;
   where:
     e = vapor pressure in mb;
     Td = dew point in deg C;
     p = surface pressure in mb;
     q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
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J. Climate, Vol. 14, No. 17, 3793-3797.

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Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Yushan_20030401_20030930.sfc.txt

CONTACT(S):

==
===============
           | Contact 1 | Contact 2
  --------------+-----------------------------+----------------------------
     Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  --------------+-----------------------------+----------------------------
     Address | Depertment of Geological and | Depertment of Atmospheric Sciences
           | Atmospheric Sciences | National Central University
           | Iowa State University | Chung-Li 32054,
           | 3010 Agronomy Hall | Taiwan
           | Ames, IA 50011, USA |
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  --------------+-----------------------------+----------------------------
     Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  --------------+-----------------------------+----------------------------
     E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
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DATE OF THIS DOCUMENT
24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

   The winter weather system that affects Taiwan and its vicinity is characterized by the
   long rainy season over northern-northeastern Taiwan and frequent occurrence of cold
   surges, cold fronts and shallow Taiwan perturbations within the context of the
   East-Asian winter monsoon circulation. Since the Winter Monsoon Experiment
(WMONEX),
   the causes of the long rainy season and formation of the Taiwan front and shallow
   perturbation have not been disclosed, and possible impacts of cold surges on the
   surface weather condition over Taiwan and on the global climate system have not been
   well explored. A mini-field experiment was designed and proposed to search for the
   resolutions of these long-standing problems.

1.2 Time period covered by the data

The Latter half CEOP EOP-3 time period (01 April 2003 to 30 September 2003).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
--------------------------------------------------------------------
Station name |Latitude|Longitude| Alt  |Measurement interval
        |decimal | decimal | (m)  |
-------------+--------+---------+------+---------------------------------
Yushan      | 23.49  | 120.95  | 3845 | 1 hour
--------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
=================================================================
=====
Parameter/Variable |Source
Description      |
------------------+--------------------------------------------
Air pressure(Ps)  | Setra Model 270
------------------+--------------------------------------------
Airtemperature(Ts)| MetOne T-200
------------------+--------------------------------------------
Rela. Humidity(RH)| MetOne DP-200B
------------------+--------------------------------------------
Dewpoint Temp(Td) | Pt1000
------------------+--------------------------------------------
@Wind direction(WD)| RM Young Model 05103
```

```
-------------------+----------------------------------------------
  Wind speed(WS)   | RM Young Model 05103
-------------------+----------------------------------------------
  Rainfall(P)      | TK-1
```

```
==============================================================
=====
```

```
  Ps(0.9m)    : Air pressure at the 0.9m height (hPa)
  Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
  RH(1.5m)   : Relative humidity at the 1.5m height (%)
  Td(1.5m)   :Dewpoint Temperature at the 1.5m height(deg.)
  WD(9.2m)  : Wind direction at the 9.2m height (deg.)
  Ws(9.2m)   : Wind speed at the 9.2m height (m/s)
  P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

 3.1 Description of data collection

   Data are downloaded from the AWS monthly. Then, data are sent to CWB,
   where they are processed.

 3.2 Description of derived parameters and processing techniques used
    Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
    Wind speed and direction are instantaneous values.
    Precipitation is accumulated on the previous minute.

   And the two parameters indicated below were computed by using
   "CEOP Derived Parameter Equations:
    http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
    also put the data flag "I", In the case of calculated by using
    dubious value fagged "D", the data flag was put "D".

    Specific Humidity were computed by using (Bolton 1980):
     e = 6.112*exp((17.67*Td)/(Td + 243.5));
     q = (0.622 * e)/(p - (0.378 * e));
       where:
         e = vapor pressure in mb;
         Td = dew point in deg C;
         p = surface pressure in mb;
         q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
 U = -sin(direction) * wind_speed;
 V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

7.0 REFERENCE REQUIREMENTS:

Original data was collected and is provided by CWB of Taiwan, funded by
Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus, Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:

A revisit of the tropical-midlatitude interaction in East Asia caused by cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

TITLE: CAMP_NSCSSJ_TMEX_Alishan_20031001_20041231.sfc.txt

CONTACT(S):

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======
                | Contact 1 | Contact 2
   --------------+-------------------------------
+----------------------------
        Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
   --------------+-------------------------------
+----------------------------
        Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
                | Atmospheric Sciences | National Central
University
                | Iowa State University | Chung-Li 32054,
                | 3010 Agronomy Hall | Taiwan
                | Ames, IA 50011, USA |
   --------------+-------------------------------
+----------------------------
        Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
   --------------+-------------------------------
+----------------------------
        Fax.No. | +1-515-294-2619 | +1-886-3422-3283
   --------------+-------------------------------
+----------------------------
        E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

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DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to
search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
  Station name |Latitude|Longitude| Alt |Measurement interval
               |decimal | decimal | (m) |
  -------------+--------+---------+------
+----------------------------------
  Alishan | 23.51 | 120.80 | 2413 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

  ==
  Parameter/Variable |Source
  Description |
  ------------------+--
   Air pressure(Ps) | Setra Model 270
  ------------------+--
   Airtemperature(Ts)| MetOne T-200
  ------------------+--
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+--
   Dewpoint Temp(Td) | Pt1000
  ------------------+--
 @Wind direction(WD)| RM Young Model 05103
  ------------------+--
   Wind speed(WS) | RM Young Model 05103
  ------------------+--

```
   Rainfall(P)        | TK-1
 ==================================================================

   Ps(2.5m)    : Air pressure at the 2.5m height (hPa)
   Ts(1.4m)    : Air temperature at the 1.4m height (deg.C)
   RH(1.4m)    : Relative humidity at the 1.4m height (%)
   Td(1.4m)     :Dewpoint Temperature at the 1.4m height(deg.)
   WD(15.1m)   : Wind direction at the 15.1m height (deg.)
   Ws(15.1m)   : Wind speed at the 15.1m height (m/s)
   P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

     Original data was collected and is provided by CWB of Taiwan, funded
by
     Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Alishan_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure

     No missing data.

Air Temperature
     No missing data.

Dew Point Temperature
     No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2003/10/08 08:00
     2003/10/09 12:00 - 2003/10/09 13:00 (2)
     2003/10/14 17:00
     2003/10/26 05:00
     2003/10/30 00:00
     2003/10/30 17:00
     2003/10/31 07:00
     2003/10/31 17:00
     2003/11/01 02:00
     2003/11/21 21:00
     2003/11/24 05:00
     2003/11/25 05:00
     2003/12/03 10:00 - 2003/12/03 11:00 (2)
     2003/12/06 08:00
     2003/12/16 11:00
     2003/12/16 23:00
     2003/12/22 00:00
     2003/12/28 01:00
     2003/12/30 07:00
     2003/12/31 07:00
     2004/01/03 04:00
     2004/01/03 08:00
     2004/01/05 04:00
     2004/01/05 08:00
     2004/01/07 07:00
     2004/01/09 05:00
     2004/01/12 04:00
     2004/01/15 07:00 - 2004/01/15 08:00 (2)
     2004/01/15 11:00
     2004/01/20 07:00
     2004/01/21 01:00
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     2004/01/23 08:00 - 2004/01/23 09:00 (2)
     2004/01/24 09:00
     2004/01/26 08:00
     2004/01/27 16:00
     2004/01/28 11:00
     2004/01/28 15:00 - 2004/01/28 16:00 (2)
     2004/01/31 08:00
     2004/02/02 17:00
     2004/02/05 23:00 - 2004/02/06 00:00 (2)
     2004/02/06 05:00
     2004/02/06 21:00
     2004/02/08 00:00
     2004/02/08 13:00
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2004/02/24 21:00
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2004/03/06 14:00
2004/03/12 03:00
2004/03/12 08:00
2004/03/13 19:00
2004/03/14 02:00
2004/03/20 08:00
2004/03/21 03:00
2004/03/25 21:00
2004/03/26 00:00
2004/04/01 04:00
2004/04/05 07:00
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        2004/11/17 08:00
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        2004/12/24 06:00
        2004/12/25 07:00 - 2004/12/25 08:00 (2)
        2004/12/28 11:00
        2004/12/30 02:00
        2004/12/31 00:00 - 2004/12/31 01:00 (2)

   V Wind Component
        2003/10/08 08:00
        2003/10/09 12:00 - 2003/10/09 13:00 (2)
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        2003/11/24 05:00
        2003/11/25 05:00
        2003/12/03 10:00 - 2003/12/03 11:00 (2)
        2003/12/06 08:00
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2004/01/31 08:00
2004/02/02 17:00
2004/02/05 23:00 - 2004/02/06 00:00 (2)
2004/02/06 05:00
2004/02/06 21:00
2004/02/08 00:00
2004/02/08 13:00
2004/02/13 08:00
2004/02/24 21:00
2004/02/25 08:00
2004/03/01 04:00 - 2004/03/01 05:00 (2)
2004/03/04 08:00
2004/03/05 01:00
2004/03/06 12:00
2004/03/06 14:00
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2004/12/28 11:00
2004/12/30 02:00
2004/12/31 00:00 - 2004/12/31 01:00 (2)
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```
Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Anpu_20031001_20041231.sfc.txt

CONTACT(S):

```
========================================================================
======
              | Contact 1                      | Contact 2
  -------------+-------------------------------
+----------------------------
       Name   | Tsing-Chang (Mike) Chen        | Ming-Cheng Yen
  -------------+-------------------------------
+----------------------------
       Address | Depertment of Geological and  | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences           | National Central
University
              | Iowa State University          | Chung-Li 32054,
              | 3010 Agronomy Hall             | Taiwan
              | Ames, IA 50011, USA            |
  -------------+-------------------------------
+----------------------------
       Tel.No. | +1-515-294-9874               | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+----------------------------
       Fax.No. | +1-515-294-2619               | +1-886-3422-3283
  -------------+-------------------------------
+----------------------------
       E-mail. | tmchen@iastate.edu            | tyenmc@atm.ncu.edu.tw

========================================================================
======
```

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform


```
----------------------------------------------------------------------
--
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------
+----------------------------------
  Anpu         | 25.18  | 121.52  |837.6 | 1 hour

----------------------------------------------------------------------
---
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  =====================================================================
  Parameter/Variable |Source
  Description        |
  -----------------+-----------------------------------------------
  Air pressure(Ps)  | Setra Model 270
  -----------------+-----------------------------------------------
  Airtemperature(Ts)| MetOne T-200
  -----------------+-----------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
  -----------------+-----------------------------------------------
  Dewpoint Temp(Td) | Pt1000
  -----------------+-----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  -----------------+-----------------------------------------------
  Wind speed(WS)    | RM Young Model 05103
  -----------------+-----------------------------------------------
```

```
   Rainfall(P)        | TK-1
  ====================================================================

    Ps(1.3m)    : Air pressure at the 1.3m height (hPa)
    Ts(1.8m)    : Air temperature at the 1.8m height (deg.C)
    RH(1.8m)    : Relative humidity at the 1.8m height (%)
    Td(1.8m)     :Dewpoint Temperature at the 1.8m height(deg.)
    WD(7.31m)   : Wind direction at the 7.31m height (deg.)
    Ws(7.31m)   : Wind speed at the 7.31m height (m/s)
    P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

       The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

       Original data was collected and is provided by CWB of Taiwan, funded
by
       Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Anpu_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
       No missing data.

Air Temperature
       No missing data.

Dew Point Temperature
       No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2003/10/01 22:00
     2003/10/02 06:00
     2003/10/02 10:00
     2003/10/03 23:00
     2003/10/07 14:00
     2003/10/07 18:00
     2003/10/08 16:00
     2003/10/08 22:00
     2003/10/09 01:00
     2003/10/10 01:00
     2003/10/10 03:00
     2003/10/13 12:00
     2003/10/14 02:00
     2003/10/14 23:00
     2003/10/15 08:00
     2003/10/15 16:00
     2003/10/16 05:00
     2003/10/16 09:00
     2003/10/16 12:00
     2003/10/16 14:00 - 2003/10/16 15:00 (2)
     2003/10/17 01:00
     2003/10/17 08:00
     2003/10/17 17:00
     2003/10/18 18:00
     2003/10/20 13:00
     2003/10/20 15:00
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     2003/10/21 15:00
     2003/10/21 17:00
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     2003/10/28 02:00 - 2003/10/28 03:00 (2)
     2003/10/28 07:00
     2003/10/30 06:00
     2003/11/09 13:00
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     2003/11/10 04:00
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     2003/11/10 18:00
     2003/11/10 22:00 - 2003/11/11 00:00 (3)
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     2003/11/12 20:00
     2003/11/16 07:00
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2003/11/27 00:00 - 2003/11/27 01:00 (2)
2003/11/27 03:00
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        2004/12/29 05:00

U Wind Component
        2003/10/01 22:00
        2003/10/02 06:00
        2003/10/02 10:00
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        2003/10/22 11:00
        2003/10/23 13:00
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        2003/10/28 02:00 - 2003/10/28 03:00 (2)
        2003/10/28 07:00
        2003/10/30 06:00
        2003/11/09 13:00
        2003/11/09 23:00 - 2003/11/10 01:00 (3)
        2003/11/10 04:00
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        2003/11/11 07:00 - 2003/11/11 08:00 (2)
        2003/11/12 20:00
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        2004/12/24 14:00
        2004/12/25 05:00
        2004/12/29 02:00 - 2004/12/29 03:00 (2)
        2004/12/29 05:00

Precipitation
        No missing data.

Snow Depth
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
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Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Chengkung_20031001_20041231.sfc.txt

CONTACT(S):

==
======
              | Contact 1 | Contact 2
  -------------+------------------------------
+----------------------------
       Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  -------------+------------------------------
+----------------------------
       Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences | National Central
University
              | Iowa State University | Chung-Li 32054,
              | 3010 Agronomy Hall | Taiwan
              | Ames, IA 50011, USA |
  -------------+------------------------------
+----------------------------
       Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
  -------------+------------------------------
+----------------------------
       Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  -------------+------------------------------
+----------------------------
       E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

----
--
  Station name |Latitude|Longitude| Alt |Measurement interval
               |decimal | decimal | (m) |
  -------------+--------+---------+------
+---------------------------------
  Chengkung | 23.10 | 121.37 | 33.5 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

  ==
  Parameter/Variable |Source
  Description |
  -----------------+--
   Air pressure(Ps) | Setra Model 270
  -----------------+--
   Airtemperature(Ts)| MetOne T-200
  -----------------+--
   Rela. Humidity(RH)| MetOne DP-200B
  -----------------+--
   Dewpoint Temp(Td) | Pt1000
  -----------------+--
 @Wind direction(WD)| RM Young Model 05103
  -----------------+--
   Wind speed(WS) | RM Young Model 05103
  -----------------+--

```
   Rainfall(P)        | TK-1
  ===================================================================

    Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
    Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
    RH(1.5m)    : Relative humidity at the 1.5m height (%)
    Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
    WD(12.8m)   : Wind direction at the 12.8m height (deg.)
    Ws(12.8m)   : Wind speed at the 12.8m height (m/s)
    P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Chengkung_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
    No missing data.

Specific Humidity
    No missing data.

Wind Speed
    No missing data.

Wind Direction
    2003/11/04 18:00
    2004/06/24 20:00
    2004/07/04 11:00
    2004/08/14 10:00
    2004/08/17 11:00
    2004/08/23 01:00
    2004/08/25 12:00 - 2004/08/25 13:00 (2)
    2004/08/25 19:00 - 2004/08/25 20:00 (2)
    2004/10/25 14:00

U Wind Component
    2003/11/04 18:00
    2004/06/24 20:00
    2004/07/04 11:00
    2004/08/14 10:00
    2004/08/17 11:00
    2004/08/23 01:00
    2004/08/25 12:00 - 2004/08/25 13:00 (2)
    2004/08/25 19:00 - 2004/08/25 20:00 (2)
    2004/10/25 14:00

V Wind Component
    2003/11/04 18:00
    2004/06/24 20:00
    2004/07/04 11:00
    2004/08/14 10:00
    2004/08/17 11:00
    2004/08/23 01:00
    2004/08/25 12:00 - 2004/08/25 13:00 (2)
    2004/08/25 19:00 - 2004/08/25 20:00 (2)
    2004/10/25 14:00

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

```
Outgoing Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Chiayi_20031001_20041231.sfc.txt

CONTACT(S):

===
======
                | Contact 1 | Contact 2
   -------------+-------------------------------
+-----------------------------
       Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
   -------------+-------------------------------
+-----------------------------
       Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
                | Atmospheric Sciences | National Central
University
                | Iowa State University | Chung-Li 32054,
                | 3010 Agronomy Hall | Taiwan
                | Ames, IA 50011, USA |
   -------------+-------------------------------
+-----------------------------
       Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
   -------------+-------------------------------
+-----------------------------
       Fax.No. | +1-515-294-2619 | +1-886-3422-3283
   -------------+-------------------------------
+-----------------------------
       E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform


```
-----------------------------------------------------------------------
--
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------
+--------------------------------
  Chiayi       | 23.50  | 120.42  | 26.9 | 1 hour

-----------------------------------------------------------------------
---
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ====================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+-----------------------------------------------
   Air pressure(Ps)  | Setra Model 270
  ------------------+-----------------------------------------------
   Airtemperature(Ts)| MetOne T-200
  ------------------+-----------------------------------------------
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+-----------------------------------------------
   Dewpoint Temp(Td) | Pt1000
  ------------------+-----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+-----------------------------------------------
   Wind speed(WS)    | RM Young Model 05103
  ------------------+-----------------------------------------------
```

```
   Rainfall(P)        | TK-1
  ===================================================================

     Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
     Ts(1.6m)    : Air temperature at the 1.6m height (deg.C)
     RH(1.6m)    : Relative humidity at the 1.6m height (%)
     Td(1.6m)    :Dewpoint Temperature at the 1.6m height(deg.)
     WD(14.5m)   : Wind direction at the 14.5m height (deg.)
     Ws(14.5m)   : Wind speed at the 14.5m height (m/s)
     P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

     Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
     where they are processed.

  3.2 Description of derived parameters and processing techniques used
     Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
     Wind speed and direction are instantaneous values.
     Precipitation is accumulated on the previous minute.

     And the two parameters indicated below were computed by using
     "CEOP Derived Parameter Equations:
      http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
      also put the data flag "I", In the case of calculated by using
      dubious value fagged "D", the data flag was put "D".

     Specific Humidity were computed by using (Bolton 1980):
       e = 6.112*exp((17.67*Td)/(Td + 243.5));
       q = (0.622 * e)/(p - (0.378 * e));
         where:
           e = vapor pressure in mb;
           Td = dew point in deg C;
           p = surface pressure in mb;
           q = specific humidity in kg/kg.

     U,V Components (4.6m) were computed by using (GEMPAK):
       U = -sin(direction) * wind_speed;
       V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
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8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Chiayi_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
    No missing data.

Specific Humidity
    No missing data.

Wind Speed
    No missing data.

Wind Direction
    2003/12/21 03:00
    2004/01/06 02:00
    2004/03/25 02:00

U Wind Component
    2003/12/21 03:00
    2004/01/06 02:00
    2004/03/25 02:00
    2004/06/30 03:00
    2004/07/21 09:00

V Wind Component
    2003/12/21 03:00
    2004/01/06 02:00
    2004/03/25 02:00
    2004/06/30 03:00
    2004/07/21 09:00

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Chutzehu_20031001_20041231.sfc.txt

CONTACT(S):

===
======
                 | Contact 1 | Contact 2
   --------------+--------------------------------
+----------------------------
       Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
   --------------+--------------------------------
+----------------------------
       Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
                 | Atmospheric Sciences | National Central
University
                 | Iowa State University | Chung-Li 32054,
                 | 3010 Agronomy Hall | Taiwan
                 | Ames, IA 50011, USA |
   --------------+--------------------------------
+----------------------------
       Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
   --------------+--------------------------------
+----------------------------
       Fax.No. | +1-515-294-2619 | +1-886-3422-3283
   --------------+--------------------------------
+----------------------------
       E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
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    long rainy season over northern-northeastern Taiwan and frequent
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    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform


```
----------------------------------------------------------------------------
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------+---------------------------------
  Chutzehu     | 25.16  | 121.54  | 607  | 1 hour

-------------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ======================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+-----------------------------------------------------
   Air pressure(Ps)  | Setra Model 270
  ------------------+-----------------------------------------------------
   Airtemperature(Ts)| MetOne T-200
  ------------------+-----------------------------------------------------
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+-----------------------------------------------------
   Dewpoint Temp(Td) | Pt1000
  ------------------+-----------------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+-----------------------------------------------------
   Wind speed(WS)    | RM Young Model 05103
  ------------------+-----------------------------------------------------
```

```
   Rainfall(P)        | TK-1
  ====================================================================

    Ps(0.5m)    : Air pressure at the 0.5m height (hPa)
    Ts(1.8m)    : Air temperature at the 1.8m height (deg.C)
    RH(1.8m)    : Relative humidity at the 1.8m height (%)
    Td(1.8m)     :Dewpoint Temperature at the 1.8m height(deg.)
    WD(11.03m) : Wind direction at the 11.03m height (deg.)
    Ws(11.03m) : Wind speed at the 11.03m height (m/s)
    P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
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values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

    The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
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8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Chutzehu_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2003/10/02 05:00
     2003/10/03 18:00
     2003/10/15 08:00
     2003/10/16 03:00
     2003/10/16 13:00
     2003/10/21 13:00
     2003/10/21 16:00
     2003/10/24 18:00 - 2003/10/24 19:00 (2)
     2003/11/01 02:00
     2003/11/02 17:00
     2003/11/14 01:00 - 2003/11/14 02:00 (2)
     2003/11/16 02:00
     2003/11/16 16:00
     2003/11/25 06:00
     2003/11/25 10:00
     2003/11/26 15:00
     2003/11/27 11:00
     2003/11/30 14:00
     2003/11/30 20:00 - 2003/11/30 21:00 (2)
     2003/12/03 05:00
     2003/12/07 03:00
     2003/12/09 23:00
     2003/12/20 12:00
     2003/12/20 21:00
     2003/12/22 22:00 - 2003/12/22 23:00 (2)
     2003/12/26 08:00
     2003/12/29 17:00
     2004/01/01 06:00
     2004/01/09 01:00
     2004/01/21 12:00
     2004/01/23 02:00
     2004/01/24 19:00
     2004/02/02 08:00
     2004/02/08 20:00
     2004/02/16 01:00
     2004/02/17 01:00
     2004/02/18 01:00
     2004/02/29 14:00
     2004/03/01 01:00
     2004/03/01 04:00
     2004/03/03 01:00
     2004/03/03 20:00
     2004/03/05 07:00
     2004/03/11 02:00
     2004/03/13 10:00
     2004/03/13 12:00
     2004/03/15 04:00
```

```
2004/03/15 10:00
2004/03/19 12:00
2004/03/24 17:00
2004/03/26 19:00
2004/03/31 21:00
2004/04/04 22:00
2004/04/09 06:00
2004/04/09 19:00
2004/04/23 17:00
2004/04/23 19:00
2004/04/27 02:00
2004/05/02 08:00
2004/05/05 01:00
2004/05/10 07:00
2004/05/18 16:00
2004/05/20 20:00
2004/05/21 08:00
2004/05/25 07:00
2004/06/02 14:00
2004/06/03 04:00
2004/06/03 08:00 - 2004/06/03 09:00 (2)
2004/06/03 11:00
2004/06/11 00:00
2004/06/11 15:00
2004/06/12 15:00 - 2004/06/12 17:00 (3)
2004/06/12 23:00
2004/06/20 15:00
2004/06/24 03:00
2004/06/27 11:00
2004/06/27 18:00
2004/06/28 02:00
2004/06/30 00:00
2004/06/30 05:00
2004/06/30 21:00
2004/07/01 09:00
2004/07/02 05:00
2004/07/12 09:00
2004/07/14 03:00
2004/07/14 14:00 - 2004/07/14 15:00 (2)
2004/07/14 17:00
2004/07/20 16:00
2004/07/21 00:00
2004/07/21 14:00
2004/07/23 06:00
2004/07/23 08:00
2004/07/30 06:00
2004/08/09 23:00
2004/08/11 14:00
2004/08/17 13:00
2004/08/19 08:00
2004/08/20 09:00
2004/08/22 23:00
2004/08/23 02:00
2004/08/23 06:00
2004/08/23 15:00
2004/08/23 18:00
2004/08/24 05:00
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2004/08/25 13:00
2004/08/26 22:00
2004/08/27 16:00
2004/09/04 09:00
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2004/09/05 08:00 - 2004/09/05 09:00 (2)
2004/09/08 14:00
2004/09/11 01:00
2004/09/19 07:00 - 2004/09/19 08:00 (2)
2004/09/23 19:00
2004/09/24 09:00
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2004/10/05 12:00
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2004/10/07 03:00
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2004/10/10 15:00
2004/10/13 01:00
2004/10/14 14:00
2004/10/18 09:00 - 2004/10/18 10:00 (2)
2004/10/19 20:00
2004/10/20 06:00
2004/10/23 21:00
2004/10/25 23:00
2004/10/26 10:00
2004/10/26 14:00
2004/10/26 16:00
2004/10/26 19:00
2004/10/31 16:00
2004/11/01 19:00
2004/11/15 19:00
2004/11/20 01:00
2004/12/04 12:00
2004/12/07 08:00
2004/12/07 18:00
2004/12/12 11:00
2004/12/12 22:00
2004/12/14 05:00
2004/12/15 03:00 - 2004/12/15 04:00 (2)
2004/12/16 14:00
2004/12/25 20:00
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```
     2004/12/26 13:00
     2004/12/27 01:00 - 2004/12/27 02:00 (2)


U Wind Component
     2003/10/02 05:00
     2003/10/03 18:00
     2003/10/15 08:00
     2003/10/16 03:00
     2003/10/16 13:00
     2003/10/21 13:00
     2003/10/21 16:00
     2003/10/24 18:00 - 2003/10/24 19:00 (2)
     2003/11/01 02:00
     2003/11/02 17:00
     2003/11/14 01:00 - 2003/11/14 02:00 (2)
     2003/11/16 02:00
     2003/11/16 16:00
     2003/11/25 06:00
     2003/11/25 10:00
     2003/11/26 15:00
     2003/11/27 11:00
     2003/11/30 14:00
     2003/11/30 20:00 - 2003/11/30 21:00 (2)
     2003/12/03 05:00
     2003/12/07 03:00
     2003/12/09 23:00
     2003/12/20 12:00
     2003/12/20 21:00
     2003/12/22 22:00 - 2003/12/22 23:00 (2)
     2003/12/26 08:00
     2003/12/29 17:00
     2004/01/01 06:00
     2004/01/09 01:00
     2004/01/21 12:00
     2004/01/23 02:00
     2004/01/24 19:00
     2004/02/02 08:00
     2004/02/08 20:00
     2004/02/16 01:00
     2004/02/17 01:00
     2004/02/18 01:00
     2004/02/29 14:00
     2004/03/01 01:00
     2004/03/01 04:00
     2004/03/03 01:00
     2004/03/03 20:00
     2004/03/05 07:00
     2004/03/11 02:00
     2004/03/13 10:00
     2004/03/13 12:00
     2004/03/15 04:00
     2004/03/15 10:00
     2004/03/19 12:00
     2004/03/24 17:00
     2004/03/26 19:00
     2004/03/31 21:00
     2004/04/04 22:00
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2004/04/09 06:00
2004/04/09 19:00
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2004/06/03 11:00
2004/06/11 00:00
2004/06/11 15:00
2004/06/12 15:00 - 2004/06/12 17:00 (3)
2004/06/12 23:00
2004/06/20 15:00
2004/06/24 03:00
2004/06/27 11:00
2004/06/27 18:00
2004/06/28 02:00
2004/06/30 00:00
2004/06/30 05:00
2004/06/30 21:00
2004/07/01 09:00
2004/07/02 05:00
2004/07/12 09:00
2004/07/14 03:00
2004/07/14 14:00 - 2004/07/14 15:00 (2)
2004/07/14 17:00
2004/07/20 16:00
2004/07/21 00:00
2004/07/21 14:00
2004/07/23 06:00
2004/07/23 08:00
2004/07/30 06:00
2004/08/09 23:00
2004/08/11 14:00
2004/08/17 13:00
2004/08/19 08:00
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2004/08/22 23:00
2004/08/23 02:00
2004/08/23 06:00
2004/08/23 15:00
2004/08/23 18:00
2004/08/24 05:00
2004/08/25 13:00
2004/08/26 22:00
2004/08/27 16:00
2004/09/04 09:00
2004/09/04 22:00
2004/09/05 08:00 - 2004/09/05 09:00 (2)
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2004/09/08 14:00
2004/09/11 01:00
2004/09/19 07:00 - 2004/09/19 08:00 (2)
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2004/09/25 05:00
2004/09/25 13:00
2004/09/26 04:00
2004/09/26 08:00
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2004/10/01 17:00
2004/10/02 04:00
2004/10/02 11:00
2004/10/02 22:00
2004/10/05 12:00
2004/10/06 02:00
2004/10/06 06:00 - 2004/10/06 07:00 (2)
2004/10/07 03:00
2004/10/07 19:00
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2004/10/26 10:00
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2004/10/31 16:00
2004/11/01 19:00
2004/11/15 19:00
2004/11/20 01:00
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2004/12/15 03:00 - 2004/12/15 04:00 (2)
2004/12/16 14:00
2004/12/25 20:00
2004/12/26 13:00
2004/12/27 01:00 - 2004/12/27 02:00 (2)

V Wind Component
2003/10/02 05:00
2003/10/03 18:00
```

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2003/10/15 08:00
2003/10/16 03:00
2003/10/16 13:00
2003/10/21 13:00
2003/10/21 16:00
2003/10/24 18:00 - 2003/10/24 19:00 (2)
2003/11/01 02:00
2003/11/02 17:00
2003/11/14 01:00 - 2003/11/14 02:00 (2)
2003/11/16 02:00
2003/11/16 16:00
2003/11/25 06:00
2003/11/25 10:00
2003/11/26 15:00
2003/11/27 11:00
2003/11/30 14:00
2003/11/30 20:00 - 2003/11/30 21:00 (2)
2003/12/03 05:00
2003/12/07 03:00
2003/12/09 23:00
2003/12/20 12:00
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2003/12/22 22:00 - 2003/12/22 23:00 (2)
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2004/02/02 08:00
2004/02/08 20:00
2004/02/16 01:00
2004/02/17 01:00
2004/02/18 01:00
2004/02/29 14:00
2004/03/01 01:00
2004/03/01 04:00
2004/03/03 01:00
2004/03/03 20:00
2004/03/05 07:00
2004/03/11 02:00
2004/03/13 10:00
2004/03/13 12:00
2004/03/15 04:00
2004/03/15 10:00
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2004/03/26 19:00
2004/03/31 21:00
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2004/04/23 17:00
2004/04/23 19:00
2004/04/27 02:00
2004/05/02 08:00
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2004/05/05 01:00
2004/05/10 07:00
2004/05/18 16:00
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2004/06/02 14:00
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2004/06/03 08:00 - 2004/06/03 09:00 (2)
2004/06/03 11:00
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2004/06/11 15:00
2004/06/12 15:00 - 2004/06/12 17:00 (3)
2004/06/12 23:00
2004/06/20 15:00
2004/06/24 03:00
2004/06/27 11:00
2004/06/27 18:00
2004/06/28 02:00
2004/06/30 00:00
2004/06/30 05:00
2004/06/30 21:00
2004/07/01 09:00
2004/07/02 05:00
2004/07/12 09:00
2004/07/14 03:00
2004/07/14 14:00 - 2004/07/14 15:00 (2)
2004/07/14 17:00
2004/07/20 16:00
2004/07/21 00:00
2004/07/21 14:00
2004/07/23 06:00
2004/07/23 08:00
2004/07/30 06:00
2004/08/09 23:00
2004/08/11 14:00
2004/08/17 13:00
2004/08/19 08:00
2004/08/20 09:00
2004/08/22 23:00
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2004/09/11 01:00
2004/09/19 07:00 - 2004/09/19 08:00 (2)
2004/09/23 19:00
2004/09/24 09:00
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    2004/09/24 22:00
    2004/09/25 05:00
    2004/09/25 13:00
    2004/09/26 04:00
    2004/09/26 08:00
    2004/09/26 19:00
    2004/09/27 03:00
    2004/09/27 13:00
    2004/10/01 17:00
    2004/10/02 04:00
    2004/10/02 11:00
    2004/10/02 22:00
    2004/10/05 12:00
    2004/10/06 02:00
    2004/10/06 06:00 - 2004/10/06 07:00 (2)
    2004/10/07 03:00
    2004/10/07 19:00
    2004/10/08 13:00
    2004/10/08 21:00
    2004/10/10 03:00
    2004/10/10 15:00
    2004/10/13 01:00
    2004/10/14 14:00
    2004/10/18 09:00 - 2004/10/18 10:00 (2)
    2004/10/19 20:00
    2004/10/20 06:00
    2004/10/23 21:00
    2004/10/25 23:00
    2004/10/26 10:00
    2004/10/26 14:00
    2004/10/26 16:00
    2004/10/26 19:00
    2004/10/31 16:00
    2004/11/01 19:00
    2004/11/15 19:00
    2004/11/20 01:00
    2004/12/04 12:00
    2004/12/07 08:00
    2004/12/07 18:00
    2004/12/12 11:00
    2004/12/12 22:00
    2004/12/14 05:00
    2004/12/15 03:00 - 2004/12/15 04:00 (2)
    2004/12/16 14:00
    2004/12/25 20:00
    2004/12/26 13:00
    2004/12/27 01:00 - 2004/12/27 02:00 (2)

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

```
Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Hengchun_20031001_20041231.sfc.txt

CONTACT(S):

```
============================================================================
======
               | Contact 1                      | Contact 2
   -------------+-------------------------------
+-----------------------------
       Name    | Tsing-Chang (Mike) Chen        | Ming-Cheng Yen
   -------------+-------------------------------
+-----------------------------
       Address | Depertment of Geological and   | Depertment of
Atmospheric Sciences
               | Atmospheric Sciences           | National Central
University
               | Iowa State University          | Chung-Li 32054,
               | 3010 Agronomy Hall             | Taiwan
               | Ames, IA 50011, USA            |
   -------------+-------------------------------
+-----------------------------
       Tel.No. | +1-515-294-9874                | +1-886-3422-7151 ext.
65538
   -------------+-------------------------------
+-----------------------------
       Fax.No. | +1-515-294-2619                | +1-886-3422-3283
   -------------+-------------------------------
+-----------------------------
       E-mail. | tmchen@iastate.edu             | tyenmc@atm.ncu.edu.tw

============================================================================
======
```

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform


```
----------------------------------------------------------------------
--
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------
+---------------------------------
  Hengchun     | 22.00  | 120.74  | 22.1 | 1 hour

----------------------------------------------------------------------
---
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ====================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+-----------------------------------------------
   Air pressure(Ps)  | Setra Model 270
  ------------------+-----------------------------------------------
   Airtemperature(Ts)| MetOne T-200
  ------------------+-----------------------------------------------
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+-----------------------------------------------
   Dewpoint Temp(Td) | Pt1000
  ------------------+-----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+-----------------------------------------------
   Wind speed(WS)    | RM Young Model 05103
  ------------------+-----------------------------------------------
```

```
   Rainfall(P)        | TK-1
  ====================================================================

    Ps(0.7m)    : Air pressure at the 0.7m height (hPa)
    Ts(1.8m)    : Air temperature at the 1.8m height (deg.C)
    RH(1.8m)    : Relative humidity at the 1.8m height (%)
    Td(1.8m)     :Dewpoint Temperature at the 1.8m height(deg.)
    WD(14.3m)   : Wind direction at the 14.3m height (deg.)
    Ws(14.3m)   : Wind speed at the 14.3m height (m/s)
    P(0.8m)     : Precipitation at the 0.8m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

    The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Hengchun_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2003/10/09 06:00
     2003/10/09 10:00
     2003/10/10 15:00
     2003/10/17 19:00
     2003/10/27 23:00
     2003/11/19 01:00
     2003/12/05 11:00
     2004/01/19 23:00
     2004/01/30 10:00
     2004/02/13 19:00
     2004/02/25 16:00 - 2004/02/25 17:00 (2)
     2004/02/27 15:00
     2004/03/03 05:00
     2004/03/04 16:00
     2004/03/14 05:00
     2004/03/25 01:00
     2004/03/26 09:00
     2004/04/02 18:00
     2004/04/25 16:00
     2004/05/06 06:00
     2004/05/21 21:00
     2004/08/10 17:00
     2004/08/11 12:00
     2004/09/29 01:00
     2004/11/04 21:00
     2004/11/04 23:00
     2004/11/11 23:00

U Wind Component
     2003/10/09 06:00
     2003/10/09 10:00
     2003/10/10 15:00
     2003/10/17 19:00
     2003/10/27 23:00
     2003/11/19 01:00
     2003/12/05 11:00
     2004/01/19 23:00
     2004/01/30 10:00
     2004/02/13 19:00
     2004/02/25 16:00 - 2004/02/25 17:00 (2)
     2004/02/27 15:00
     2004/03/03 05:00
     2004/03/04 16:00
     2004/03/14 05:00
     2004/03/25 01:00
     2004/03/26 09:00
     2004/04/02 18:00
```

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    2004/04/25 16:00
    2004/05/06 06:00
    2004/05/21 21:00
    2004/08/10 17:00
    2004/08/11 12:00
    2004/09/29 01:00
    2004/11/04 21:00
    2004/11/04 23:00
    2004/11/11 23:00

V Wind Component
    2003/10/09 06:00
    2003/10/09 10:00
    2003/10/10 15:00
    2003/10/17 19:00
    2003/10/27 23:00
    2003/11/19 01:00
    2003/12/05 11:00
    2004/01/19 23:00
    2004/01/30 10:00
    2004/02/13 19:00
    2004/02/25 16:00 - 2004/02/25 17:00 (2)
    2004/02/27 15:00
    2004/03/03 05:00
    2004/03/04 16:00
    2004/03/14 05:00
    2004/03/25 01:00
    2004/03/26 09:00
    2004/04/02 18:00
    2004/04/25 16:00
    2004/05/06 06:00
    2004/05/21 21:00
    2004/08/10 17:00
    2004/08/11 12:00
    2004/09/29 01:00
    2004/11/04 21:00
    2004/11/04 23:00
    2004/11/11 23:00

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

TITLE: CAMP_NSCSSJ_TMEX_Hsinchu_20031001_20041231.sfc.txt

CONTACT(S):

```
======================================================================
======
              | Contact 1                     | Contact 2
  -------------+-------------------------------
+----------------------------
      Name    | Tsing-Chang (Mike) Chen       | Ming-Cheng Yen
  -------------+-------------------------------
+----------------------------
      Address | Depertment of Geological and  | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences          | National Central
University
              | Iowa State University         | Chung-Li 32054,
              | 3010 Agronomy Hall            | Taiwan
              | Ames, IA 50011, USA           |
  -------------+-------------------------------
+----------------------------
      Tel.No. | +1-515-294-9874               | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+----------------------------
      Fax.No. | +1-515-294-2619               | +1-886-3422-3283
  -------------+-------------------------------
+----------------------------
      E-mail. | tmchen@iastate.edu            | tyenmc@atm.ncu.edu.tw

======================================================================
======
```

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to
search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
  Station name |Latitude|Longitude| Alt |Measurement interval
              |decimal | decimal | (m) |
  -------------+--------+---------+------
+---------------------------------
  Hsinchu | 24.83 | 121.01 | 26.9 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

  ==
  Parameter/Variable |Source
  Description |
  ------------------+---
   Air pressure(Ps) | Setra Model 270
  ------------------+---
   Airtemperature(Ts)| MetOne T-200
  ------------------+---
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+---
   Dewpoint Temp(Td) | Pt1000
  ------------------+---
 @Wind direction(WD)| RM Young Model 05103
  ------------------+---
   Wind speed(WS) | RM Young Model 05103
  ------------------+---

```
 Rainfall(P)        | TK-1
 ======================================================================

    Ps(2.0m)    : Air pressure at the 2.0m height (hPa)
    Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
    RH(1.5m)    : Relative humidity at the 1.5m height (%)
    Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
    WD(15.6m)   : Wind direction at the 15.6m height (deg.)
    Ws(15.6m)   : Wind speed at the 15.6m height (m/s)
    P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

   The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

   Original data was collected and is provided by CWB of Taiwan, funded
by
   Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Hsinchu_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

Relative Humidity
    No missing data.

Specific Humidity
    No missing data.

Wind Speed
    No missing data.

Wind Direction
    2004/05/26 01:00
    2004/07/09 02:00
    2004/12/03 04:00

U Wind Component
    2004/05/26 01:00
    2004/07/09 02:00
    2004/12/03 04:00

V Wind Component
    2004/05/26 01:00
    2004/07/09 02:00
    2004/12/03 04:00

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

TITLE: CAMP_NSCSSJ_TMEX_Hualien_20031001_20041231.sfc.txt

CONTACT(S):

```
======================================================================
======
                  | Contact 1                      | Contact 2
   --------------+-------------------------------
+-----------------------------
        Name     | Tsing-Chang (Mike) Chen        | Ming-Cheng Yen
   --------------+-------------------------------
+-----------------------------
        Address  | Depertment of Geological and   | Depertment of
Atmospheric Sciences
                  | Atmospheric Sciences           | National Central
University
                  | Iowa State University          | Chung-Li 32054,
                  | 3010 Agronomy Hall             | Taiwan
                  | Ames, IA 50011, USA            |
   --------------+-------------------------------
+-----------------------------
        Tel.No.  | +1-515-294-9874                | +1-886-3422-7151 ext.
65538
   --------------+-------------------------------
+-----------------------------
        Fax.No.  | +1-515-294-2619                | +1-886-3422-3283
   --------------+-------------------------------
+-----------------------------
        E-mail.  | tmchen@iastate.edu             | tyenmc@atm.ncu.edu.tw

======================================================================
======
```

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been
    well explored. A mini-field experiment was designed and proposed to
search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

```
------------------------------------------------------------------------
--
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------
+--------------------------------
  Hualien      | 23.98  | 121.60  | 16.1 | 1 hour

------------------------------------------------------------------------
---
```

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ====================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+-------------------------------------------------
   Air pressure(Ps)  | Setra Model 270
  ------------------+-------------------------------------------------
   Airtemperature(Ts)| MetOne T-200
  ------------------+-------------------------------------------------
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+-------------------------------------------------
   Dewpoint Temp(Td) | Pt1000
  ------------------+-------------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+-------------------------------------------------
   Wind speed(WS)    | RM Young Model 05103
  ------------------+-------------------------------------------------
   Rainfall(P)       | TK-1
  ====================================================================
```

```
      Ps(3.1m)    : Air pressure at the 3.1m height (hPa)
      Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
      RH(1.5m)    : Relative humidity at the 1.5m height (%)
      Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
      WD(12.0m)   : Wind direction at the 12.0m height (deg.)
      Ws(12.0m)   : Wind speed at the 12.0m height (m/s)
      P(0.4m)     : Precipitation at the 0.4m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

   No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

    The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Hualien_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

Relative Humidity
    No missing data.

```
Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2003/10/17 14:00
     2003/11/18 02:00
     2004/08/25 00:00
     2004/08/25 02:00
     2004/10/04 09:00
     2004/11/18 23:00
     2004/12/06 01:00
     2004/12/12 16:00

U Wind Component
     2003/10/17 14:00
     2003/11/18 02:00
     2004/08/25 00:00
     2004/08/25 02:00
     2004/10/04 09:00
     2004/11/18 23:00
     2004/12/06 01:00
     2004/12/12 16:00

V Wind Component
     2003/10/17 14:00
     2003/11/18 02:00
     2004/08/25 00:00
     2004/08/25 02:00
     2004/10/04 09:00
     2004/11/18 23:00
     2004/12/06 01:00
     2004/12/12 16:00

Precipitation
     No missing data.

Snow Depth
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

```
Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Ilan_20031001_20041231.sfc.txt

CONTACT(S):

===
======
              | Contact 1 | Contact 2
  -------------+-------------------------------
+-----------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  -------------+-------------------------------
+-----------------------------
      Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences | National Central
University
              | Iowa State University | Chung-Li 32054,
              | 3010 Agronomy Hall | Taiwan
              | Ames, IA 50011, USA |
  -------------+-------------------------------
+-----------------------------
      Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+-----------------------------
      Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  -------------+-------------------------------
+-----------------------------
      E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to
search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
  Station name |Latitude|Longitude| Alt |Measurement interval
              |decimal | decimal | (m) |
  -------------+--------+---------+------
+---------------------------------
  Ilan | 24.77 | 121.75 | 7.2 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

  ==
  Parameter/Variable |Source
  Description |
  ------------------+---
  Air pressure(Ps) | Setra Model 270
  ------------------+---
  Airtemperature(Ts)| MetOne T-200
  ------------------+---
  Rela. Humidity(RH)| MetOne DP-200B
  ------------------+---
  Dewpoint Temp(Td) | Pt1000
  ------------------+---
 @Wind direction(WD)| RM Young Model 05103
  ------------------+---
  Wind speed(WS) | RM Young Model 05103
  ------------------+---

```
   Rainfall(P)        | TK-1
  ====================================================================

     Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
     Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
     RH(1.5m)    : Relative humidity at the 1.5m height (%)
     Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
     WD(26.0m)   : Wind direction at the 26.0m height (deg.)
     Ws(26.0m)   : Wind speed at the 26.0m height (m/s)
     P(0.6m)     : Precipitation at the 0.6m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

       Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
       where they are processed.

  3.2 Description of derived parameters and processing techniques used
       Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
       Wind speed and direction are instantaneous values.
       Precipitation is accumulated on the previous minute.

       And the two parameters indicated below were computed by using
       "CEOP Derived Parameter Equations:
        http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
        also put the data flag "I", In the case of calculated by using
        dubious value fagged "D", the data flag was put "D".

       Specific Humidity were computed by using (Bolton 1980):
         e = 6.112*exp((17.67*Td)/(Td + 243.5));
         q = (0.622 * e)/(p - (0.378 * e));
           where:
             e = vapor pressure in mb;
             Td = dew point in deg C;
             p = surface pressure in mb;
             q = specific humidity in kg/kg.

       U,V Components (4.6m) were computed by using (GEMPAK):
         U = -sin(direction) * wind_speed;
         V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Ilan_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2003/11/12 23:00
     2003/11/13 02:00
     2003/11/15 11:00
     2003/11/29 19:00
     2003/12/03 11:00
     2003/12/07 03:00
     2003/12/20 04:00
     2004/01/01 04:00
     2004/01/29 23:00
     2004/03/15 08:00
     2004/04/01 13:00
     2004/05/01 01:00
     2004/05/05 06:00
     2004/06/21 14:00
     2004/07/03 18:00
     2004/08/14 16:00
     2004/10/15 03:00
     2004/10/24 06:00
     2004/11/21 21:00
     2004/11/28 04:00
     2004/12/29 04:00

U Wind Component
     2003/11/12 23:00
     2003/11/13 02:00
     2003/11/15 11:00
     2003/11/29 19:00
     2003/12/03 11:00
     2003/12/07 03:00
     2003/12/20 04:00
     2004/01/01 04:00
     2004/01/29 23:00
     2004/03/15 08:00
     2004/04/01 13:00
     2004/05/01 01:00
     2004/05/05 06:00
     2004/06/21 14:00
     2004/07/03 18:00
     2004/08/14 16:00
     2004/10/15 03:00
     2004/10/24 06:00
     2004/11/21 21:00
     2004/11/28 04:00
     2004/12/29 04:00

V Wind Component
     2003/11/12 23:00
```

```
        2003/11/13 02:00
        2003/11/15 11:00
        2003/11/29 19:00
        2003/12/03 11:00
        2003/12/07 03:00
        2003/12/20 04:00
        2004/01/01 04:00
        2004/01/29 23:00
        2004/03/15 08:00
        2004/04/01 13:00
        2004/05/01 01:00
        2004/05/05 06:00
        2004/06/21 14:00
        2004/07/03 18:00
        2004/08/14 16:00
        2004/10/15 03:00
        2004/10/24 06:00
        2004/11/21 21:00
        2004/11/28 04:00
        2004/12/29 04:00


Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Jiyuehtan_20031001_20041231.sfc.txt

CONTACT(S):

===
======
                | Contact 1 | Contact 2
  -------------+-------------------------------
+----------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  -------------+-------------------------------
+----------------------------
      Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences | National Central
University
              | Iowa State University | Chung-Li 32054,
              | 3010 Agronomy Hall | Taiwan
              | Ames, IA 50011, USA |
  -------------+-------------------------------
+----------------------------
      Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+----------------------------
      Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  -------------+-------------------------------
+----------------------------
      E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to
search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
   Station name |Latitude|Longitude| Alt |Measurement interval
               |decimal | decimal | (m) |
   -------------+--------+---------+------
+---------------------------------
   Jiyuehtan | 23.88 | 120.90 | 1015 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

   ==
   Parameter/Variable |Source
   Description |
   ------------------+--
    Air pressure(Ps) | Setra Model 270
   ------------------+--
    Airtemperature(Ts)| MetOne T-200
   ------------------+--
    Rela. Humidity(RH)| MetOne DP-200B
   ------------------+--
    Dewpoint Temp(Td) | Pt1000
   ------------------+--
  @Wind direction(WD)| RM Young Model 05103
   ------------------+--
    Wind speed(WS) | RM Young Model 05103
   ------------------+--

```
   Rainfall(P)       | TK-1
  ==================================================================

    Ps(0.8m)   : Air pressure at the 0.8m height (hPa)
    Ts(1.6m)   : Air temperature at the 1.6m height (deg.C)
    RH(1.6m)   : Relative humidity at the 1.6m height (%)
    Td(1.6m)    :Dewpoint Temperature at the 1.6m height(deg.)
    WD(8.0m)   : Wind direction at the 8.0m height (deg.)
    Ws(8.0m)   : Wind speed at the 8.0m height (m/s)
    P(0.5m)    : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

     Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
     where they are processed.

  3.2 Description of derived parameters and processing techniques used
     Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
     Wind speed and direction are instantaneous values.
     Precipitation is accumulated on the previous minute.

     And the two parameters indicated below were computed by using
     "CEOP Derived Parameter Equations:
     http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
     also put the data flag "I", In the case of calculated by using
     dubious value fagged "D", the data flag was put "D".

     Specific Humidity were computed by using (Bolton 1980):
      e = 6.112*exp((17.67*Td)/(Td + 243.5));
      q = (0.622 * e)/(p - (0.378 * e));
       where:
        e = vapor pressure in mb;
        Td = dew point in deg C;
        p = surface pressure in mb;
        q = specific humidity in kg/kg.

     U,V Components (4.6m) were computed by using (GEMPAK):
      U = -sin(direction) * wind_speed;
      V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Jiyuehtan_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
    No missing data.

Specific Humidity
    No missing data.

Wind Speed
    No missing data.

Wind Direction
    2003/10/04 17:00
    2003/10/26 05:00
    2003/11/13 01:00
    2003/11/28 23:00
    2004/02/07 15:00
    2004/02/17 02:00
    2004/03/03 02:00
    2004/03/04 02:00
    2004/04/18 02:00
    2004/04/18 05:00
    2004/04/18 15:00
    2004/05/06 00:00
    2004/05/09 00:00
    2004/06/17 19:00
    2004/06/21 23:00
    2004/06/22 17:00
    2004/06/30 03:00
    2004/07/01 17:00
    2004/07/07 00:00
    2004/07/27 11:00
    2004/07/29 20:00
    2004/08/12 02:00
    2004/09/27 03:00
    2004/10/01 23:00
    2004/10/04 01:00
    2004/10/24 03:00
    2004/11/06 06:00
    2004/11/17 16:00
    2004/12/02 20:00
    2004/12/03 00:00
    2004/12/15 03:00
    2004/12/23 03:00
    2004/12/31 02:00

U Wind Component
    2003/10/04 17:00
    2003/10/26 05:00
    2003/11/13 01:00
    2003/11/28 23:00
    2004/02/07 15:00
    2004/02/17 02:00
    2004/03/03 02:00
    2004/03/04 02:00
    2004/04/18 02:00
    2004/04/18 05:00
    2004/04/18 15:00
    2004/05/06 00:00
```

```
        2004/05/09 00:00
        2004/06/17 19:00
        2004/06/21 23:00
        2004/06/22 17:00
        2004/06/30 03:00
        2004/07/01 17:00
        2004/07/07 00:00
        2004/07/27 11:00
        2004/07/29 20:00
        2004/08/12 02:00
        2004/09/27 03:00
        2004/10/01 23:00
        2004/10/04 01:00
        2004/10/24 03:00
        2004/11/06 06:00
        2004/11/17 16:00
        2004/12/02 20:00
        2004/12/03 00:00
        2004/12/15 03:00
        2004/12/23 03:00
        2004/12/31 02:00

V Wind Component
        2003/10/04 17:00
        2003/10/26 05:00
        2003/11/13 01:00
        2003/11/28 23:00
        2004/02/07 15:00
        2004/02/17 02:00
        2004/03/03 02:00
        2004/03/04 02:00
        2004/04/18 02:00
        2004/04/18 05:00
        2004/04/18 15:00
        2004/05/06 00:00
        2004/05/09 00:00
        2004/06/17 19:00
        2004/06/21 23:00
        2004/06/22 17:00
        2004/06/30 03:00
        2004/07/01 17:00
        2004/07/07 00:00
        2004/07/27 11:00
        2004/07/29 20:00
        2004/08/12 02:00
        2004/09/27 03:00
        2004/10/01 23:00
        2004/10/04 01:00
        2004/10/24 03:00
        2004/11/06 06:00
        2004/11/17 16:00
        2004/12/02 20:00
        2004/12/03 00:00
        2004/12/15 03:00
        2004/12/23 03:00
        2004/12/31 02:00
```

```
Precipitation
     No missing data.

Snow Depth
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Kaohsiung_20031001_20041231.sfc.txt

CONTACT(S):

==
======
                   | Contact 1 | Contact 2
   --------------+-------------------------------
+-----------------------------
       Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
   --------------+-------------------------------
+-----------------------------
       Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
                 | Atmospheric Sciences | National Central
University
                 | Iowa State University | Chung-Li 32054,
                 | 3010 Agronomy Hall | Taiwan
                 | Ames, IA 50011, USA |
   --------------+-------------------------------
+-----------------------------
       Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
   --------------+-------------------------------
+-----------------------------
       Fax.No. | +1-515-294-2619 | +1-886-3422-3283
   --------------+-------------------------------
+-----------------------------
       E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
----------------------------------------------------------------------------
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------+----------------------------------
  Kaohsiung    | 22.57  | 120.31  | 2.3  | 1 hour

-------------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ======================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+---------------------------------------------------
  Air pressure(Ps)  | Setra Model 270
  ------------------+---------------------------------------------------
  Airtemperature(Ts)| MetOne T-200
  ------------------+---------------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
  ------------------+---------------------------------------------------
  Dewpoint Temp(Td) | Pt1000
  ------------------+---------------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+---------------------------------------------------
  Wind speed(WS)    | RM Young Model 05103
  ------------------+---------------------------------------------------
```

```
   Rainfall(P)        | TK-1
 =====================================================================

   Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
   Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)    : Relative humidity at the 1.5m height (%)
   Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
   WD(14.0m)   : Wind direction at the 14.0m height (deg.)
   Ws(14.0m)   : Wind speed at the 14.0m height (m/s)
   P(0.7m)     : Precipitation at the 0.7m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

     Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
     where they are processed.

  3.2 Description of derived parameters and processing techniques used
     Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
     Wind speed and direction are instantaneous values.
     Precipitation is accumulated on the previous minute.

     And the two parameters indicated below were computed by using
     "CEOP Derived Parameter Equations:
      http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
      also put the data flag "I", In the case of calculated by using
      dubious value fagged "D", the data flag was put "D".

     Specific Humidity were computed by using (Bolton 1980):
       e = 6.112*exp((17.67*Td)/(Td + 243.5));
       q = (0.622 * e)/(p - (0.378 * e));
         where:
           e = vapor pressure in mb;
           Td = dew point in deg C;
           p = surface pressure in mb;
           q = specific humidity in kg/kg.

     U,V Components (4.6m) were computed by using (GEMPAK):
       U = -sin(direction) * wind_speed;
       V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

        The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

        Original data was collected and is provided by CWB of Taiwan, funded
by
        Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Kaohsiung_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2004/01/20 05:00
     2004/06/02 23:00
     2004/06/14 19:00
     2004/09/13 18:00
     2004/10/30 14:00

U Wind Component
     2004/01/20 05:00
     2004/06/02 23:00
     2004/06/14 19:00
     2004/09/13 18:00
     2004/10/30 14:00

V Wind Component
     2004/01/20 05:00
     2004/06/02 23:00
     2004/06/14 19:00
     2004/09/13 18:00
     2004/10/30 14:00

Precipitation
     No missing data.

Snow Depth
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

TITLE: CAMP_NSCSSJ_TMEX_Keelung_20031001_20041231.sfc.txt

CONTACT(S):

```
========================================================================
======
              | Contact 1                    | Contact 2
  -------------+-------------------------------
+-----------------------------
      Name    | Tsing-Chang (Mike) Chen      | Ming-Cheng Yen
  -------------+-------------------------------
+-----------------------------
      Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences         | National Central
University
              | Iowa State University        | Chung-Li 32054,
              | 3010 Agronomy Hall           | Taiwan
              | Ames, IA 50011, USA          |
  -------------+-------------------------------
+-----------------------------
      Tel.No. | +1-515-294-9874              | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+-----------------------------
      Fax.No. | +1-515-294-2619              | +1-886-3422-3283
  -------------+-------------------------------
+-----------------------------
      E-mail. | tmchen@iastate.edu           | tyenmc@atm.ncu.edu.tw

========================================================================
======
```

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to
search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
  Station name |Latitude|Longitude| Alt |Measurement interval
              |decimal | decimal | (m) |
  -------------+--------+---------+------
+----------------------------------
  Keelung | 25.13 | 121.73 | 26.7 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

  ===
  Parameter/Variable |Source
  Description |
  -----------------+---
   Air pressure(Ps) | Setra Model 270
  -----------------+---
   Airtemperature(Ts)| MetOne T-200
  -----------------+---
   Rela. Humidity(RH)| MetOne DP-200B
  -----------------+---
   Dewpoint Temp(Td) | Pt1000
  -----------------+---
 @Wind direction(WD)| RM Young Model 05103
  -----------------+---
   Wind speed(WS) | RM Young Model 05103
  -----------------+---

```
   Rainfall(P)        | TK-1
  ====================================================================

   Ps(1.0m)    : Air pressure at the 1.0m height (hPa)
   Ts(1.8m)    : Air temperature at the 1.8m height (deg.C)
   RH(1.8m)    : Relative humidity at the 1.8m height (%)
   Td(1.8m)    :Dewpoint Temperature at the 1.8m height(deg.)
   WD(34.6m)   : Wind direction at the 34.6m height (deg.)
   Ws(34.6m)   : Wind speed at the 34.6m height (m/s)
   P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        $e = 6.112 * \exp((17.67 * Td)/(Td + 243.5))$;
        $q = (0.622 * e)/(p - (0.378 * e))$;
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        $U = -\sin(direction) * wind\_speed$;
        $V = -\cos(direction) * wind\_speed$;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

     Original data was collected and is provided by CWB of Taiwan, funded
by
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J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
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Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Keelung_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
    No missing data.

Specific Humidity
    No missing data.

Wind Speed
    No missing data.

Wind Direction
    2004/02/19 15:00
    2004/02/24 09:00
    2004/02/27 01:00
    2004/03/23 21:00
    2004/04/25 15:00
    2004/09/06 07:00
    2004/09/08 11:00
    2004/11/08 23:00 - 2004/11/09 00:00 (2)
    2004/11/17 04:00 - 2004/11/17 05:00 (2)

U Wind Component
    2004/02/19 15:00
    2004/02/24 09:00
    2004/02/27 01:00
    2004/03/23 21:00
    2004/04/25 15:00
    2004/09/06 07:00
    2004/09/08 11:00
    2004/11/08 23:00 - 2004/11/09 00:00 (2)
    2004/11/17 04:00 - 2004/11/17 05:00 (2)

V Wind Component
    2004/02/19 15:00
    2004/02/24 09:00
    2004/02/27 01:00
    2004/03/23 21:00
    2004/04/25 15:00
    2004/09/06 07:00
    2004/09/08 11:00
    2004/11/08 23:00 - 2004/11/09 00:00 (2)
    2004/11/17 04:00 - 2004/11/17 05:00 (2)

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

```
Outgoing Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Lanyu_20031001_20041231.sfc.txt

CONTACT(S):

```
======================================================================
======
              | Contact 1                    | Contact 2
  -------------+------------------------------
+-----------------------------
       Name   | Tsing-Chang (Mike) Chen      | Ming-Cheng Yen
  -------------+------------------------------
+-----------------------------
       Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences         | National Central
University
              | Iowa State University        | Chung-Li 32054,
              | 3010 Agronomy Hall           | Taiwan
              | Ames, IA 50011, USA          |
  -------------+------------------------------
+-----------------------------
       Tel.No. | +1-515-294-9874             | +1-886-3422-7151 ext.
65538
  -------------+------------------------------
+-----------------------------
       Fax.No. | +1-515-294-2619             | +1-886-3422-3283
  -------------+------------------------------
+-----------------------------
       E-mail. | tmchen@iastate.edu          | tyenmc@atm.ncu.edu.tw

======================================================================
======
```

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
----------------------------------------------------------------------------
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------+---------------------------------
  Lanyu        | 22.04  | 121.55  | 324  | 1 hour

-------------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ====================================================================
  Parameter/Variable |Source
  Description         |
  ------------------+-----------------------------------------------
   Air pressure(Ps)  | Setra Model 270
  ------------------+-----------------------------------------------
   Airtemperature(Ts)| MetOne T-200
  ------------------+-----------------------------------------------
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+-----------------------------------------------
   Dewpoint Temp(Td) | Pt1000
  ------------------+-----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+-----------------------------------------------
   Wind speed(WS)    | RM Young Model 05103
  ------------------+-----------------------------------------------
```

```
   Rainfall(P)        | TK-1
 ====================================================================

   Ps(1.1m)    : Air pressure at the 1.1m height (hPa)
   Ts(1.42m)   : Air temperature at the 1.42m height (deg.C)
   RH(1.42m)   : Relative humidity at the 1.42m height (%)
   Td(1.42m)    :Dewpoint Temperature at the 1.42m height(deg.)
   WD(12.5m)   : Wind direction at the 12.5m height (deg.)
   Ws(12.5m)   : Wind speed at the 12.5m height (m/s)
   P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
 http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
 also put the data flag "I", In the case of calculated by using
 dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
  e = 6.112*exp((17.67*Td)/(Td + 243.5));
  q = (0.622 * e)/(p - (0.378 * e));
    where:
      e = vapor pressure in mb;
      Td = dew point in deg C;
      p = surface pressure in mb;
      q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Lanyu_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2004/05/10 07:00
     2004/08/22 01:00

U Wind Component
     2004/05/10 07:00
     2004/08/22 01:00

V Wind Component
     2004/05/10 07:00
     2004/08/22 01:00

Precipitation
     No missing data.

Snow Depth
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Pengchiayu_20031001_20041231.sfc.txt

CONTACT(S):

===
======
                   | Contact 1 | Contact 2
   --------------+-------------------------------
+----------------------------
       Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
   --------------+-------------------------------
+----------------------------
       Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
                 | Atmospheric Sciences | National Central
University
                 | Iowa State University | Chung-Li 32054,
                 | 3010 Agronomy Hall | Taiwan
                 | Ames, IA 50011, USA |
   --------------+-------------------------------
+----------------------------
       Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
   --------------+-------------------------------
+----------------------------
       Fax.No. | +1-515-294-2619 | +1-886-3422-3283
   --------------+-------------------------------
+----------------------------
       E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
----------------------------------------------------------------------
--
  Station name |Latitude|Longitude| Alt  |Measurement interval
              |decimal | decimal | (m)  |
  -------------+--------+---------+------
+---------------------------------
  Pengchiayu   | 25.63  | 122.07  | 99.0 | 1 hour

-----------------------------------------------------------------------
---
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ====================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+----------------------------------------------
   Air pressure(Ps)  | Setra Model 270
  ------------------+----------------------------------------------
   Airtemperature(Ts)| MetOne T-200
  ------------------+----------------------------------------------
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+----------------------------------------------
   Dewpoint Temp(Td) | Pt1000
  ------------------+----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+----------------------------------------------
   Wind speed(WS)    | RM Young Model 05103
  ------------------+----------------------------------------------
```

```
   Rainfall(P)        | TK-1
  ===================================================================

    Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
    Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
    RH(1.5m)    : Relative humidity at the 1.5m height (%)
    Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
    WD(7.2m)    : Wind direction at the 7.2m height (deg.)
    Ws(7.2m)    : Wind speed at the 7.2m height (m/s)
    P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

     Original data was collected and is provided by CWB of Taiwan, funded
by
     Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Pengchiayu_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    2004/05/31 17:00 - 2004/06/06 16:00 (144)

Air Temperature
    2004/05/31 17:00 - 2004/06/06 16:00 (144)

Dew Point Temperature
    2004/05/31 17:00 - 2004/06/06 16:00 (144)

```
Relative Humidity
    2004/05/31 17:00 - 2004/06/06 16:00 (144)

Specific Humidity
    2004/05/31 17:00 - 2004/06/06 16:00 (144)

Wind Speed
    2004/05/31 17:00 - 2004/06/06 16:00 (144)

Wind Direction
    2004/05/31 17:00 - 2004/06/06 16:00 (144)

U Wind Component
    2004/05/31 17:00 - 2004/06/06 16:00 (144)

V Wind Component
    2004/05/31 17:00 - 2004/06/06 16:00 (144)

Precipitation
    2004/05/31 17:00 - 2004/06/06 16:00 (144)

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Penghu_20031001_20041231.sfc.txt

CONTACT(S):

===
======
              | Contact 1 | Contact 2
  -------------+-------------------------------
+------------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  -------------+-------------------------------
+------------------------------
      Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences | National Central
University
              | Iowa State University | Chung-Li 32054,
              | 3010 Agronomy Hall | Taiwan
              | Ames, IA 50011, USA |
  -------------+-------------------------------
+------------------------------
      Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+------------------------------
      Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  -------------+-------------------------------
+------------------------------
      E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to
search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
  Station name |Latitude|Longitude| Alt |Measurement interval
               |decimal | decimal | (m) |
  -------------+--------+---------+------
+---------------------------------
  Penghu | 23.57 | 119.56 | 10.7 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

  ===
  Parameter/Variable |Source
  Description |
  ------------------+--
   Air pressure(Ps) | Setra Model 270
  ------------------+--
   Airtemperature(Ts)| MetOne T-200
  ------------------+--
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+--
   Dewpoint Temp(Td) | Pt1000
  ------------------+--
 @Wind direction(WD)| RM Young Model 05103
  ------------------+--
   Wind speed(WS) | RM Young Model 05103
  ------------------+--

```
   Rainfall(P)        | TK-1
  ====================================================================

    Ps(0.7m)    : Air pressure at the 0.7m height (hPa)
    Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
    RH(1.5m)    : Relative humidity at the 1.5m height (%)
    Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
    WD(14.6m)   : Wind direction at the 14.6m height (deg.)
    Ws(14.6m)   : Wind speed at the 14.6m height (m/s)
    P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Penghu_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

Relative Humidity
    No missing data.

Specific Humidity
    No missing data.

Wind Speed
    No missing data.

Wind Direction
    No missing data.

U Wind Component
    No missing data.

V Wind Component
    No missing data.

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

TITLE: CAMP_NSCSSJ_TMEX_Suao_20031001_20041231.sfc.txt

CONTACT(S):

===
======
                 | Contact 1 | Contact 2
   --------------+-------------------------------
+----------------------------
       Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
   --------------+-------------------------------
+----------------------------
       Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
                 | Atmospheric Sciences | National Central
University
                 | Iowa State University | Chung-Li 32054,
                 | 3010 Agronomy Hall | Taiwan
                 | Ames, IA 50011, USA |
   --------------+-------------------------------
+----------------------------
       Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
   --------------+-------------------------------
+----------------------------
       Fax.No. | +1-515-294-2619 | +1-886-3422-3283
   --------------+-------------------------------
+----------------------------
       E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to
search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
  Station name |Latitude|Longitude| Alt |Measurement interval
               |decimal | decimal | (m) |
  -------------+--------+---------+------
+---------------------------------
  Suao | 24.60 | 121.86 | 24.9 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

  ==
  Parameter/Variable |Source
  Description |
  ------------------+---
  Air pressure(Ps) | Setra Model 270
  ------------------+---
  Airtemperature(Ts)| MetOne T-200
  ------------------+---
  Rela. Humidity(RH)| MetOne DP-200B
  ------------------+---
  Dewpoint Temp(Td) | Pt1000
  ------------------+---
 @Wind direction(WD)| RM Young Model 05103
  ------------------+---
  Wind speed(WS) | RM Young Model 05103
  ------------------+---

```
   Rainfall(P)        | TK-1
  ====================================================================

    Ps(0.7m)     : Air pressure at the 0.7m height (hPa)
    Ts(1.6m)     : Air temperature at the 1.6m height (deg.C)
    RH(1.6m)     : Relative humidity at the 1.6m height (%)
    Td(1.6m)      :Dewpoint Temperature at the 1.6m height(deg.)
    WD(34.0m)    : Wind direction at the 34.0m height (deg.)
    Ws(34.0m)    : Wind speed at the 34.0m height (m/s)
    P(0.5m)      : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Suao_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2003/10/03 04:00
     2003/10/03 15:00
     2003/10/07 07:00
     2003/10/10 00:00
     2003/10/13 09:00
     2003/10/25 02:00
     2003/11/04 08:00 - 2003/11/04 09:00 (2)
     2003/11/08 09:00
     2003/11/09 05:00
     2003/11/10 15:00
     2003/11/10 22:00
     2003/11/15 08:00
     2003/11/21 08:00
     2003/11/24 12:00
     2003/11/28 17:00
     2003/11/28 22:00
     2003/11/29 10:00
     2003/11/29 12:00
     2003/11/29 17:00
     2003/12/01 06:00
     2003/12/01 09:00
     2003/12/09 01:00
     2003/12/12 00:00
     2003/12/12 07:00
     2003/12/14 13:00
     2003/12/18 20:00 - 2003/12/18 21:00 (2)
     2003/12/31 01:00
     2004/01/13 04:00
     2004/01/20 19:00 - 2004/01/20 21:00 (3)
     2004/01/24 08:00
     2004/02/01 15:00
     2004/02/02 17:00
     2004/03/01 21:00 - 2004/03/01 22:00 (2)
     2004/03/02 17:00
     2004/03/03 08:00
     2004/03/16 15:00
     2004/03/31 14:00
     2004/03/31 23:00
     2004/04/01 16:00
     2004/04/14 18:00
     2004/05/02 15:00
     2004/05/12 09:00
     2004/05/12 12:00
     2004/05/18 17:00
     2004/06/03 11:00
     2004/06/19 20:00
     2004/06/20 16:00
```

```
    2004/06/29 00:00
    2004/07/18 13:00
    2004/07/19 20:00
    2004/07/27 18:00
    2004/07/30 09:00
    2004/08/31 22:00
    2004/09/01 11:00
    2004/09/04 23:00
    2004/09/10 12:00
    2004/09/24 06:00
    2004/09/27 06:00
    2004/10/08 06:00
    2004/10/12 02:00
    2004/10/18 12:00
    2004/10/31 11:00
    2004/11/12 02:00
    2004/11/18 10:00
    2004/11/22 00:00
    2004/11/30 10:00
    2004/12/03 21:00
    2004/12/04 07:00
    2004/12/05 08:00
    2004/12/14 08:00
    2004/12/19 10:00
    2004/12/21 01:00
    2004/12/28 07:00
    2004/12/28 15:00 - 2004/12/28 17:00 (3)
    2004/12/28 21:00
    2004/12/31 03:00

U Wind Component
    2003/10/03 04:00
    2003/10/03 15:00
    2003/10/07 07:00
    2003/10/10 00:00
    2003/10/13 09:00
    2003/10/25 02:00
    2003/11/04 08:00 - 2003/11/04 09:00 (2)
    2003/11/08 09:00
    2003/11/09 05:00
    2003/11/10 15:00
    2003/11/10 22:00
    2003/11/15 08:00
    2003/11/21 08:00
    2003/11/24 12:00
    2003/11/28 17:00
    2003/11/28 22:00
    2003/11/29 10:00
    2003/11/29 12:00
    2003/11/29 17:00
    2003/12/01 06:00
    2003/12/01 09:00
    2003/12/09 01:00
    2003/12/12 00:00
    2003/12/12 07:00
    2003/12/14 13:00
    2003/12/18 20:00 - 2003/12/18 21:00 (2)
```

```
        2003/12/31 01:00
        2004/01/13 04:00
        2004/01/20 19:00 - 2004/01/20 21:00 (3)
        2004/01/24 08:00
        2004/02/01 15:00
        2004/02/02 17:00
        2004/03/01 21:00 - 2004/03/01 22:00 (2)
        2004/03/02 17:00
        2004/03/03 08:00
        2004/03/16 15:00
        2004/03/31 14:00
        2004/03/31 23:00
        2004/04/01 16:00
        2004/04/14 18:00
        2004/05/02 15:00
        2004/05/12 09:00
        2004/05/12 12:00
        2004/05/18 17:00
        2004/06/03 11:00
        2004/06/19 20:00
        2004/06/20 16:00
        2004/06/29 00:00
        2004/07/18 13:00
        2004/07/19 20:00
        2004/07/27 18:00
        2004/07/30 09:00
        2004/08/31 22:00
        2004/09/01 11:00
        2004/09/04 23:00
        2004/09/10 12:00
        2004/09/24 06:00
        2004/09/27 06:00
        2004/10/08 06:00
        2004/10/12 02:00
        2004/10/18 12:00
        2004/10/31 11:00
        2004/11/12 02:00
        2004/11/18 10:00
        2004/11/22 00:00
        2004/11/30 10:00
        2004/12/03 21:00
        2004/12/04 07:00
        2004/12/05 08:00
        2004/12/14 08:00
        2004/12/19 10:00
        2004/12/21 01:00
        2004/12/28 07:00
        2004/12/28 15:00 - 2004/12/28 17:00 (3)
        2004/12/28 21:00
        2004/12/31 03:00

    V Wind Component
        2003/10/03 04:00
        2003/10/03 15:00
        2003/10/07 07:00
        2003/10/10 00:00
        2003/10/13 09:00
```

```
2003/10/25 02:00
2003/11/04 08:00 - 2003/11/04 09:00 (2)
2003/11/08 09:00
2003/11/09 05:00
2003/11/10 15:00
2003/11/10 22:00
2003/11/15 08:00
2003/11/21 08:00
2003/11/24 12:00
2003/11/28 17:00
2003/11/28 22:00
2003/11/29 10:00
2003/11/29 12:00
2003/11/29 17:00
2003/12/01 06:00
2003/12/01 09:00
2003/12/09 01:00
2003/12/12 00:00
2003/12/12 07:00
2003/12/14 13:00
2003/12/18 20:00 - 2003/12/18 21:00 (2)
2003/12/31 01:00
2004/01/13 04:00
2004/01/20 19:00 - 2004/01/20 21:00 (3)
2004/01/24 08:00
2004/02/01 15:00
2004/02/02 17:00
2004/03/01 21:00 - 2004/03/01 22:00 (2)
2004/03/02 17:00
2004/03/03 08:00
2004/03/16 15:00
2004/03/31 14:00
2004/03/31 23:00
2004/04/01 16:00
2004/04/14 18:00
2004/05/02 15:00
2004/05/12 09:00
2004/05/12 12:00
2004/05/18 17:00
2004/06/03 11:00
2004/06/19 20:00
2004/06/20 16:00
2004/06/29 00:00
2004/07/18 13:00
2004/07/19 20:00
2004/07/27 18:00
2004/07/30 09:00
2004/08/31 22:00
2004/09/01 11:00
2004/09/04 23:00
2004/09/10 12:00
2004/09/24 06:00
2004/09/27 06:00
2004/10/08 06:00
2004/10/12 02:00
2004/10/18 12:00
2004/10/31 11:00
```

```
        2004/11/12 02:00
        2004/11/18 10:00
        2004/11/22 00:00
        2004/11/30 10:00
        2004/12/03 21:00
        2004/12/04 07:00
        2004/12/05 08:00
        2004/12/14 08:00
        2004/12/19 10:00
        2004/12/21 01:00
        2004/12/28 07:00
        2004/12/28 15:00 - 2004/12/28 17:00 (3)
        2004/12/28 21:00
        2004/12/31 03:00

Precipitation
        No missing data.

Snow Depth
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Taichung_20031001_20041231.sfc.txt

CONTACT(S):

===
======
              | Contact 1 | Contact 2
  -------------+-------------------------------
+----------------------------
      Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  -------------+-------------------------------
+----------------------------
      Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences | National Central
University
              | Iowa State University | Chung-Li 32054,
              | 3010 Agronomy Hall | Taiwan
              | Ames, IA 50011, USA |
  -------------+-------------------------------
+----------------------------
      Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+----------------------------
      Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  -------------+-------------------------------
+----------------------------
      E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to
search for the
     resolutions of these long-standing problems.

1.2 Time period covered by the data

     The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
     All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
   Station name |Latitude|Longitude| Alt |Measurement interval
                |decimal | decimal | (m) |
   -------------+--------+---------+------
+---------------------------------
   Taichung | 24.15 | 120.68 | 84 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

     Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

     http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

   ==
   Parameter/Variable |Source
   Description |
   ------------------+---
    Air pressure(Ps) | Setra Model 270
   ------------------+---
    Airtemperature(Ts)| MetOne T-200
   ------------------+---
    Rela. Humidity(RH)| MetOne DP-200B
   ------------------+---
    Dewpoint Temp(Td) | Pt1000
   ------------------+---
  @Wind direction(WD)| RM Young Model 05103
   ------------------+---
    Wind speed(WS) | RM Young Model 05103
   ------------------+---

```
  Rainfall(P)       | TK-1
  ===================================================================

     Ps(1.5m)    : Air pressure at the 1.5m height (hPa)
     Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
     RH(1.5m)    : Relative humidity at the 1.5m height (%)
     Td(1.5m)    :Dewpoint Temperature at the 1.5m height(deg.)
     WD(17.2m)   : Wind direction at the 17.2m height (deg.)
     Ws(17.2m)   : Wind speed at the 17.2m height (m/s)
     P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
             e = vapor pressure in mb;
             Td = dew point in deg C;
             p = surface pressure in mb;
             q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

     Original data was collected and is provided by CWB of Taiwan, funded
by
     Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Taichung_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
     No missing data.

Air Temperature
     No missing data.

Dew Point Temperature
     No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2003/10/21 02:00
     2003/10/26 02:00
     2003/10/30 02:00
     2003/12/01 02:00
     2004/02/28 04:00
     2004/04/24 06:00
     2004/05/01 04:00
     2004/05/10 03:00
     2004/05/15 13:00
     2004/06/30 00:00
     2004/07/14 04:00
     2004/08/07 23:00
     2004/08/27 07:00
     2004/09/03 02:00
     2004/10/07 22:00
     2004/10/18 01:00
     2004/10/29 04:00
     2004/11/06 04:00
     2004/11/11 01:00
     2004/11/29 19:00
     2004/12/11 04:00
     2004/12/18 03:00
     2004/12/28 03:00

U Wind Component
     2003/10/21 02:00
     2003/10/26 02:00
     2003/10/30 02:00
     2003/12/01 02:00
     2004/02/28 04:00
     2004/04/24 06:00
     2004/05/01 04:00
     2004/05/10 03:00
     2004/05/15 13:00
     2004/06/30 00:00
     2004/07/14 04:00
     2004/08/07 23:00
     2004/08/27 07:00
     2004/09/03 02:00
     2004/10/07 22:00
     2004/10/18 01:00
     2004/10/29 04:00
     2004/11/06 04:00
     2004/11/11 01:00
     2004/11/29 19:00
     2004/12/11 04:00
     2004/12/18 03:00
```

```
        2004/12/28 03:00

V Wind Component
        2003/10/21 02:00
        2003/10/26 02:00
        2003/10/30 02:00
        2003/12/01 02:00
        2004/02/28 04:00
        2004/04/24 06:00
        2004/05/01 04:00
        2004/05/10 03:00
        2004/05/15 13:00
        2004/06/30 00:00
        2004/07/14 04:00
        2004/08/07 23:00
        2004/08/27 07:00
        2004/09/03 02:00
        2004/10/07 22:00
        2004/10/18 01:00
        2004/10/29 04:00
        2004/11/06 04:00
        2004/11/11 01:00
        2004/11/29 19:00
        2004/12/11 04:00
        2004/12/18 03:00
        2004/12/28 03:00

Precipitation
        No missing data.

Snow Depth
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
        2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Tainan_20031001_20041231.sfc.txt

CONTACT(S):

```
====================================================================
======
              | Contact 1                      | Contact 2
  -------------+-------------------------------
+----------------------------
       Name    | Tsing-Chang (Mike) Chen        | Ming-Cheng Yen
  -------------+-------------------------------
+----------------------------
       Address | Depertment of Geological and   | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences            | National Central
University
              | Iowa State University           | Chung-Li 32054,
              | 3010 Agronomy Hall              | Taiwan
              | Ames, IA 50011, USA             |
  -------------+-------------------------------
+----------------------------
       Tel.No. | +1-515-294-9874                 | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+----------------------------
       Fax.No. | +1-515-294-2619                 | +1-886-3422-3283
  -------------+-------------------------------
+----------------------------
       E-mail. | tmchen@iastate.edu              | tyenmc@atm.ncu.edu.tw

====================================================================
======
```

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform


```
----------------------------------------------------------------------------
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------+---------------------------------
  Tainan       | 23.00  | 120.20  | 13.8 | 1 hour

-------------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ====================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+-----------------------------------------------
  Air pressure(Ps)  | Setra Model 270
  ------------------+-----------------------------------------------
  Airtemperature(Ts)| MetOne T-200
  ------------------+-----------------------------------------------
  Rela. Humidity(RH)| MetOne DP-200B
  ------------------+-----------------------------------------------
  Dewpoint Temp(Td) | Pt1000
  ------------------+-----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+-----------------------------------------------
  Wind speed(WS)    | RM Young Model 05103
  ------------------+-----------------------------------------------
```

```
   Rainfall(P)       | TK-1
 ==================================================================

   Ps(0.9m)    : Air pressure at the 0.9m height (hPa)
   Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
   RH(1.5m)    : Relative humidity at the 1.5m height (%)
   Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
   WD(36.6m)   : Wind direction at the 36.6m height (deg.)
   Ws(36.6m)   : Wind speed at the 36.6m height (m/s)
   P(0.6m)     : Precipitation at the 0.6m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

3.1 Description of data collection

Data are downloaded from the AWS monthly. Then, data are sent to CWB,
where they are processed.

3.2 Description of derived parameters and processing techniques used
Air pressure, Air Temperature, relative humidity, Dewpoint Temperature,
Wind speed and direction are instantaneous values.
Precipitation is accumulated on the previous minute.

And the two parameters indicated below were computed by using
"CEOP Derived Parameter Equations:
 http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
 also put the data flag "I", In the case of calculated by using
 dubious value fagged "D", the data flag was put "D".

Specific Humidity were computed by using (Bolton 1980):
  e = 6.112*exp((17.67*Td)/(Td + 243.5));
  q = (0.622 * e)/(p - (0.378 * e));
    where:
      e = vapor pressure in mb;
      Td = dew point in deg C;
      p = surface pressure in mb;
      q = specific humidity in kg/kg.

U,V Components (4.6m) were computed by using (GEMPAK):
  U = -sin(direction) * wind_speed;
  V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Tainan_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    2004/12/06 02:00 - 2004/12/06 03:00 (2)

Air Temperature
    2004/12/06 02:00 - 2004/12/06 03:00 (2)

Dew Point Temperature
    2004/12/06 02:00 - 2004/12/06 03:00 (2)

```
Relative Humidity
    2004/12/06 02:00 - 2004/12/06 03:00 (2)


Specific Humidity
    2004/12/06 02:00 - 2004/12/06 03:00 (2)


Wind Speed
    2004/12/06 02:00 - 2004/12/06 03:00 (2)


Wind Direction
    2003/10/21 03:00
    2004/01/15 05:00
    2004/04/06 01:00
    2004/04/18 14:00
    2004/08/15 23:00
    2004/10/12 03:00
    2004/11/07 02:00
    2004/11/10 02:00
    2004/12/06 02:00 - 2004/12/06 03:00 (2)


U Wind Component
    2003/10/21 03:00
    2004/01/15 05:00
    2004/04/06 01:00
    2004/04/18 14:00
    2004/08/15 23:00
    2004/10/12 03:00
    2004/11/07 02:00
    2004/11/10 02:00
    2004/12/06 02:00 - 2004/12/06 03:00 (2)


V Wind Component
    2003/10/21 03:00
    2004/01/15 05:00
    2004/04/06 01:00
    2004/04/18 14:00
    2004/08/15 23:00
    2004/10/12 03:00
    2004/11/07 02:00
    2004/11/10 02:00
    2004/12/06 02:00 - 2004/12/06 03:00 (2)


Precipitation
    2004/12/06 02:00 - 2004/12/06 03:00 (2)


Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)


Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)


Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)


Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

```
Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Taipei_20031001_20041231.sfc.txt

CONTACT(S):

===
======
               | Contact 1 | Contact 2
  -------------+-------------------------------
+----------------------------
       Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  -------------+-------------------------------
+----------------------------
       Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
               | Atmospheric Sciences | National Central
University
               | Iowa State University | Chung-Li 32054,
               | 3010 Agronomy Hall | Taiwan
               | Ames, IA 50011, USA |
  -------------+-------------------------------
+----------------------------
       Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+----------------------------
       Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  -------------+-------------------------------
+----------------------------
       E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
----------------------------------------------------------------------
--
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------
+---------------------------------
  Taipei       | 25.03  | 121.52  | 8    | 1 hour

-----------------------------------------------------------------------
---
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ====================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+-------------------------------------------------
   Air pressure(Ps)  | Setra Model 270
  ------------------+-------------------------------------------------
   Airtemperature(Ts)| MetOne T-200
  ------------------+-------------------------------------------------
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+-------------------------------------------------
   Dewpoint Temp(Td) | Pt1000
  ------------------+-------------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+-------------------------------------------------
   Wind speed(WS)    | RM Young Model 05103
  ------------------+-------------------------------------------------
```

```
  Rainfall(P)        | TK-1
 ====================================================================

    Ps(1.3m)    : Air pressure at the 1.3m height (hPa)
    Ts(1.7m)    : Air temperature at the 1.7m height (deg.C)
    RH(1.7m)    : Relative humidity at the 1.7m height (%)
    Td(1.7m)     :Dewpoint Temperature at the 1.7m height(deg.)
    WD(34.9m)   : Wind direction at the 34.9m height (deg.)
    Ws(34.9m)   : Wind speed at the 34.9m height (m/s)
    P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Taipei_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2003/10/01 02:00
     2003/12/30 05:00
     2004/02/29 03:00
     2004/04/29 03:00
     2004/04/30 03:00
     2004/05/07 08:00
     2004/05/08 04:00
     2004/05/19 02:00
     2004/06/18 20:00
     2004/07/09 01:00
     2004/07/16 02:00
     2004/07/16 04:00
     2004/07/19 00:00
     2004/07/20 01:00
     2004/07/30 01:00
     2004/08/28 06:00
     2004/09/21 03:00
     2004/10/07 01:00
     2004/10/26 03:00
     2004/11/10 04:00
     2004/12/03 18:00

U Wind Component
     2003/10/01 02:00
     2003/12/30 05:00
     2004/02/29 03:00
     2004/04/29 03:00
     2004/04/30 03:00
     2004/05/07 08:00
     2004/05/08 04:00
     2004/05/19 02:00
     2004/06/18 20:00
     2004/07/09 01:00
     2004/07/16 02:00
     2004/07/16 04:00
     2004/07/19 00:00
     2004/07/20 01:00
     2004/07/30 01:00
     2004/08/28 06:00
     2004/09/21 03:00
     2004/10/07 01:00
     2004/10/26 03:00
     2004/11/10 04:00
     2004/12/03 18:00

V Wind Component
     2003/10/01 02:00
```

```
        2003/12/30 05:00
        2004/02/29 03:00
        2004/04/29 03:00
        2004/04/30 03:00
        2004/05/07 08:00
        2004/05/08 04:00
        2004/05/19 02:00
        2004/06/18 20:00
        2004/07/09 01:00
        2004/07/16 02:00
        2004/07/16 04:00
        2004/07/19 00:00
        2004/07/20 01:00
        2004/07/30 01:00
        2004/08/28 06:00
        2004/09/21 03:00
        2004/10/07 01:00
        2004/10/26 03:00
        2004/11/10 04:00
        2004/12/03 18:00

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Taitung_20031001_20041231.sfc.txt

CONTACT(S):

```
======================================================================
======
              | Contact 1                      | Contact 2
  -------------+-------------------------------
+----------------------------
       Name   | Tsing-Chang (Mike) Chen        | Ming-Cheng Yen
  -------------+-------------------------------
+----------------------------
       Address | Depertment of Geological and  | Depertment of
Atmospheric Sciences
              | Atmospheric Sciences           | National Central
University
              | Iowa State University          | Chung-Li 32054,
              | 3010 Agronomy Hall             | Taiwan
              | Ames, IA 50011, USA            |
  -------------+-------------------------------
+----------------------------
       Tel.No. | +1-515-294-9874               | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+----------------------------
       Fax.No. | +1-515-294-2619               | +1-886-3422-3283
  -------------+-------------------------------
+----------------------------
       E-mail. | tmchen@iastate.edu             | tyenmc@atm.ncu.edu.tw

======================================================================
======
```

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
----------------------------------------------------------------------------
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------+----------------------------------
  Taitung      | 22.75  | 121.15  |  9   | 1 hour
-------------------------------------------------------------------------------
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ======================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+---------------------------------------------------
   Air pressure(Ps)  | Setra Model 270
  ------------------+---------------------------------------------------
   Airtemperature(Ts)| MetOne T-200
  ------------------+---------------------------------------------------
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+---------------------------------------------------
   Dewpoint Temp(Td) | Pt1000
  ------------------+---------------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+---------------------------------------------------
   Wind speed(WS)    | RM Young Model 05103
  ------------------+---------------------------------------------------
```

```
   Rainfall(P)        | TK-1
 ====================================================================

    Ps(0.7m)    : Air pressure at the 0.7m height (hPa)
    Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
    RH(1.5m)    : Relative humidity at the 1.5m height (%)
    Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
    WD(11.4m)   : Wind direction at the 11.4m height (deg.)
    Ws(11.4m)   : Wind speed at the 11.4m height (m/s)
    P(0.9m)     : Precipitation at the 0.9m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

     Original data was collected and is provided by CWB of Taiwan, funded
by
     Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Taitung_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2004/06/21 00:00
     2004/07/11 00:00
     2004/11/01 01:00

U Wind Component
     2004/06/21 00:00
     2004/07/11 00:00
     2004/11/01 01:00

V Wind Component
     2004/06/21 00:00
     2004/07/11 00:00
     2004/11/01 01:00

Precipitation
     No missing data.

Snow Depth
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

TITLE: CAMP_NSCSSJ_TMEX_Tanshui_20031001_20041231.sfc.txt

CONTACT(S):

```
======================================================================
======
                | Contact 1                     | Contact 2
   -------------+-------------------------------
+-----------------------------
        Name    | Tsing-Chang (Mike) Chen       | Ming-Cheng Yen
   -------------+-------------------------------
+-----------------------------
        Address | Depertment of Geological and  | Depertment of
Atmospheric Sciences
                | Atmospheric Sciences          | National Central
University
                | Iowa State University         | Chung-Li 32054,
                | 3010 Agronomy Hall            | Taiwan
                | Ames, IA 50011, USA           |
   -------------+-------------------------------
+-----------------------------
        Tel.No. | +1-515-294-9874               | +1-886-3422-7151 ext.
65538
   -------------+-------------------------------
+-----------------------------
        Fax.No. | +1-515-294-2619               | +1-886-3422-3283
   -------------+-------------------------------
+-----------------------------
        E-mail. | tmchen@iastate.edu            | tyenmc@atm.ncu.edu.tw

======================================================================
======
```

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been
    well explored. A mini-field experiment was designed and proposed to
search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
  Station name |Latitude|Longitude| Alt |Measurement interval
               |decimal | decimal | (m) |
  -------------+--------+---------+------
+--------------------------------
  Tanshui | 25.17 | 121.43 | 19 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

  ==
  Parameter/Variable |Source
  Description |
  ------------------+--
   Air pressure(Ps) | Setra Model 270
  ------------------+--
   Airtemperature(Ts)| MetOne T-200
  ------------------+--
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+--
   Dewpoint Temp(Td) | Pt1000
  ------------------+--
 @Wind direction(WD)| RM Young Model 05103
  ------------------+--
   Wind speed(WS) | RM Young Model 05103
  ------------------+--
   Rainfall(P) | TK-1
  ==

```
   Ps(1.0m)    : Air pressure at the 1.0m height (hPa)
   Ts(1.4m)    : Air temperature at the 1.4m height (deg.C)
   RH(1.4m)    : Relative humidity at the 1.4m height (%)
   Td(1.4m)     :Dewpoint Temperature at the 1.4m height(deg.)
   WD(12.2m)   : Wind direction at the 12.2m height (deg.)
   Ws(12.2m)   : Wind speed at the 12.2m height (m/s)
   P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

   No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

     Original data was collected and is provided by CWB of Taiwan, funded
by
     Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Tanshui_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
     No missing data.

Air Temperature
     No missing data.

Dew Point Temperature
     No missing data.

Relative Humidity
     No missing data.

```
Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2004/09/08 14:00
     2004/09/10 07:00

U Wind Component
     2004/09/08 14:00
     2004/09/10 07:00

V Wind Component
     2004/09/08 14:00
     2004/09/10 07:00

Precipitation
     No missing data.

Snow Depth
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
     2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Tawu_20031001_20041231.sfc.txt

CONTACT(S):

```
============================================================================
======
               | Contact 1                     | Contact 2
   -------------+-------------------------------
+-----------------------------
       Name    | Tsing-Chang (Mike) Chen       | Ming-Cheng Yen
   -------------+-------------------------------
+-----------------------------
       Address | Depertment of Geological and  | Depertment of
Atmospheric Sciences
               | Atmospheric Sciences          | National Central
University
               | Iowa State University         | Chung-Li 32054,
               | 3010 Agronomy Hall            | Taiwan
               | Ames, IA 50011, USA           |
   -------------+-------------------------------
+-----------------------------
       Tel.No. | +1-515-294-9874               | +1-886-3422-7151 ext.
65538
   -------------+-------------------------------
+-----------------------------
       Fax.No. | +1-515-294-2619               | +1-886-3422-3283
   -------------+-------------------------------
+-----------------------------
       E-mail. | tmchen@iastate.edu            | tyenmc@atm.ncu.edu.tw

============================================================================
======
```

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
----------------------------------------------------------------------
--
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------
+----------------------------------
  Tawu         | 22.36  | 120.90  | 8.1  | 1 hour

----------------------------------------------------------------------
---
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ====================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+-----------------------------------------------
   Air pressure(Ps)  | Setra Model 270
  ------------------+-----------------------------------------------
   Airtemperature(Ts)| MetOne T-200
  ------------------+-----------------------------------------------
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+-----------------------------------------------
   Dewpoint Temp(Td) | Pt1000
  ------------------+-----------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+-----------------------------------------------
   Wind speed(WS)    | RM Young Model 05103
  ------------------+-----------------------------------------------
```

```
   Rainfall(P)        | TK-1
  ====================================================================

    Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
    Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
    RH(1.5m)    : Relative humidity at the 1.5m height (%)
    Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
    WD(12.7m)   : Wind direction at the 12.7m height (deg.)
    Ws(12.7m)   : Wind speed at the 12.7m height (m/s)
    P(0.7m)     : Precipitation at the 0.7m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

    For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

   The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

   Original data was collected and is provided by CWB of Taiwan, funded
by
   Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Tawu_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    2004/03/06 16:00 - 2004/03/08 05:00 (38)
    2004/03/08 07:00

Air Temperature
    No missing data.

Dew Point Temperature
    2003/11/18 08:00

```
     2003/11/18 10:00 - 2003/11/18 11:00 (2)
     2003/11/18 14:00 - 2003/11/18 20:00 (7)
     2003/11/18 22:00 - 2003/11/18 23:00 (2)
     2003/11/19 02:00
     2003/11/19 04:00 - 2003/11/19 05:00 (2)
     2003/11/19 07:00 - 2003/11/19 08:00 (2)
     2003/11/19 10:00 - 2003/11/19 11:00 (2)

Relative Humidity
     2003/11/18 08:00
     2003/11/18 10:00 - 2003/11/18 11:00 (2)
     2003/11/18 14:00 - 2003/11/18 20:00 (7)
     2003/11/18 22:00 - 2003/11/18 23:00 (2)
     2003/11/19 02:00
     2003/11/19 04:00 - 2003/11/19 05:00 (2)
     2003/11/19 07:00 - 2003/11/19 08:00 (2)
     2003/11/19 10:00 - 2003/11/19 11:00 (2)

Specific Humidity
     2003/11/18 08:00
     2003/11/18 10:00 - 2003/11/18 11:00 (2)
     2003/11/18 14:00 - 2003/11/18 20:00 (7)
     2003/11/18 22:00 - 2003/11/18 23:00 (2)
     2003/11/19 02:00
     2003/11/19 04:00 - 2003/11/19 05:00 (2)
     2003/11/19 07:00 - 2003/11/19 08:00 (2)
     2003/11/19 10:00 - 2003/11/19 11:00 (2)
     2004/03/06 16:00 - 2004/03/08 05:00 (38)
     2004/03/08 07:00

Wind Speed
     No missing data.

Wind Direction
     2003/10/11 07:00
     2003/10/11 11:00
     2003/11/01 22:00
     2003/12/21 20:00
     2003/12/22 14:00
     2003/12/24 19:00
     2003/12/30 14:00
     2004/01/01 16:00
     2004/01/04 23:00
     2004/01/17 21:00
     2004/02/11 18:00
     2004/02/18 21:00
     2004/03/03 08:00
     2004/03/04 15:00
     2004/03/09 15:00
     2004/03/17 14:00
     2004/03/19 16:00
     2004/04/05 12:00
     2004/04/05 20:00
     2004/04/05 22:00
     2004/04/06 00:00
     2004/04/10 13:00
     2004/04/10 19:00
```

```
     2004/04/13 23:00
     2004/04/18 20:00
     2004/04/29 21:00
     2004/05/31 21:00
     2004/06/01 19:00
     2004/06/03 18:00
     2004/06/13 13:00
     2004/06/14 05:00
     2004/06/14 23:00
     2004/06/16 23:00
     2004/07/05 13:00
     2004/07/06 14:00
     2004/07/16 02:00
     2004/07/27 14:00
     2004/07/28 12:00
     2004/08/01 15:00
     2004/08/01 23:00
     2004/08/07 21:00
     2004/08/09 23:00
     2004/08/10 09:00
     2004/08/16 15:00
     2004/08/16 17:00
     2004/08/20 17:00
     2004/08/23 14:00
     2004/08/23 18:00
     2004/08/24 19:00
     2004/08/28 00:00
     2004/09/05 13:00
     2004/09/07 19:00
     2004/09/08 16:00  -  2004/09/08 17:00 (2)
     2004/09/09 20:00
     2004/09/14 07:00
     2004/09/15 16:00
     2004/09/18 12:00
     2004/09/22 19:00
     2004/09/25 22:00
     2004/09/28 15:00
     2004/10/09 09:00
     2004/10/17 16:00
     2004/10/24 21:00
     2004/10/29 22:00
     2004/10/30 21:00
     2004/11/11 12:00
     2004/12/18 23:00
     2004/12/19 01:00

U Wind Component
     2003/10/11 07:00
     2003/10/11 11:00
     2003/11/01 22:00
     2003/12/21 20:00
     2003/12/22 14:00
     2003/12/24 19:00
     2003/12/30 14:00
     2004/01/01 16:00
     2004/01/04 23:00
     2004/01/17 21:00
```

```
2004/02/11 18:00
2004/02/18 21:00
2004/03/03 08:00
2004/03/04 15:00
2004/03/09 15:00
2004/03/17 14:00
2004/03/19 16:00
2004/04/05 12:00
2004/04/05 20:00
2004/04/05 22:00
2004/04/06 00:00
2004/04/10 13:00
2004/04/10 19:00
2004/04/13 23:00
2004/04/18 20:00
2004/04/29 21:00
2004/05/31 21:00
2004/06/01 19:00
2004/06/03 18:00
2004/06/13 13:00
2004/06/14 05:00
2004/06/14 23:00
2004/06/16 23:00
2004/07/05 13:00
2004/07/06 14:00
2004/07/16 02:00
2004/07/27 14:00
2004/07/28 12:00
2004/08/01 15:00
2004/08/01 23:00
2004/08/07 21:00
2004/08/09 23:00
2004/08/10 09:00
2004/08/16 15:00
2004/08/16 17:00
2004/08/20 17:00
2004/08/23 14:00
2004/08/23 18:00
2004/08/24 19:00
2004/08/28 00:00
2004/09/05 13:00
2004/09/07 19:00
2004/09/08 16:00 - 2004/09/08 17:00 (2)
2004/09/09 20:00
2004/09/14 07:00
2004/09/15 16:00
2004/09/18 12:00
2004/09/22 19:00
2004/09/25 22:00
2004/09/28 15:00
2004/10/09 09:00
2004/10/17 16:00
2004/10/24 21:00
2004/10/29 22:00
2004/10/30 21:00
2004/11/11 12:00
2004/12/18 23:00
```

```
        2004/12/19 01:00

V Wind Component
        2003/10/11 07:00
        2003/10/11 11:00
        2003/11/01 22:00
        2003/12/21 20:00
        2003/12/22 14:00
        2003/12/24 19:00
        2003/12/30 14:00
        2004/01/01 16:00
        2004/01/04 23:00
        2004/01/17 21:00
        2004/02/11 18:00
        2004/02/18 21:00
        2004/03/03 08:00
        2004/03/04 15:00
        2004/03/09 15:00
        2004/03/17 14:00
        2004/03/19 16:00
        2004/04/05 12:00
        2004/04/05 20:00
        2004/04/05 22:00
        2004/04/06 00:00
        2004/04/10 13:00
        2004/04/10 19:00
        2004/04/13 23:00
        2004/04/18 20:00
        2004/04/29 21:00
        2004/05/31 21:00
        2004/06/01 19:00
        2004/06/03 18:00
        2004/06/13 13:00
        2004/06/14 05:00
        2004/06/14 23:00
        2004/06/16 23:00
        2004/07/05 13:00
        2004/07/06 14:00
        2004/07/16 02:00
        2004/07/27 14:00
        2004/07/28 12:00
        2004/08/01 15:00
        2004/08/01 23:00
        2004/08/07 21:00
        2004/08/09 23:00
        2004/08/10 09:00
        2004/08/16 15:00
        2004/08/16 17:00
        2004/08/20 17:00
        2004/08/23 14:00
        2004/08/23 18:00
        2004/08/24 19:00
        2004/08/28 00:00
        2004/09/05 13:00
        2004/09/07 19:00
        2004/09/08 16:00 - 2004/09/08 17:00 (2)
        2004/09/09 20:00
```

```
       2004/09/14 07:00
       2004/09/15 16:00
       2004/09/18 12:00
       2004/09/22 19:00
       2004/09/25 22:00
       2004/09/28 15:00
       2004/10/09 09:00
       2004/10/17 16:00
       2004/10/24 21:00
       2004/10/29 22:00
       2004/10/30 21:00
       2004/11/11 12:00
       2004/12/18 23:00
       2004/12/19 01:00
```

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

TITLE: CAMP_NSCSSJ_TMEX_Tungchitao_20031001_20041231.sfc.txt

CONTACT(S):

==
======
                | Contact 1 | Contact 2
   -------------+-------------------------------
+------------------------------
       Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
   -------------+-------------------------------
+------------------------------
       Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
               | Atmospheric Sciences | National Central
University
               | Iowa State University | Chung-Li 32054,
               | 3010 Agronomy Hall | Taiwan
               | Ames, IA 50011, USA |
   -------------+-------------------------------
+------------------------------
       Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
   -------------+-------------------------------
+------------------------------
       Fax.No. | +1-515-294-2619 | +1-886-3422-3283
   -------------+-------------------------------
+------------------------------
       E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

==
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to search for the
resolutions of these long-standing problems.

1.2 Time period covered by the data

The Full CEOP EOP-4 time period (01 October 2003 to 31 December 2004).

1.3 Temporal characteristics of the data
All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or platform

```
----------------------------------------------------------------------
--
  Station name |Latitude|Longitude| Alt  |Measurement interval
               |decimal | decimal | (m)  |
  -------------+--------+---------+------
+---------------------------------
  Tungchitao   | 23.26  | 119.66  | 45.0 | 1 hour

----------------------------------------------------------------------
---
```

1.5 Data source if applicable (e.g. for operational data include agency)

Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

```
  ====================================================================
  Parameter/Variable |Source
  Description        |
  ------------------+-------------------------------------------------
   Air pressure(Ps)  | Setra Model 270
  ------------------+-------------------------------------------------
   Airtemperature(Ts)| MetOne T-200
  ------------------+-------------------------------------------------
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+-------------------------------------------------
   Dewpoint Temp(Td) | Pt1000
  ------------------+-------------------------------------------------
 @Wind direction(WD)| RM Young Model 05103
  ------------------+-------------------------------------------------
   Wind speed(WS)    | RM Young Model 05103
  ------------------+-------------------------------------------------
```

```
   Rainfall(P)       | TK-1
 ====================================================================

    Ps(0.9m)    : Air pressure at the 0.9m height (hPa)
    Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
    RH(1.5m)    : Relative humidity at the 1.5m height (%)
    Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
    WD(9.1m)    : Wind direction at the 9.1m height (deg.)
    Ws(9.1m)    : Wind speed at the 9.1m height (m/s)
    P(0.4m)     : Precipitation at the 0.4m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

   The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

   Original data was collected and is provided by CWB of Taiwan, funded
by
   Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Tungchitao_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     2004/05/13 11:00 - 2004/05/13 23:00 (13)
     2004/05/14 10:00 - 2004/05/14 23:00 (14)
     2004/05/15 10:00 - 2004/05/15 23:00 (14)
     2004/05/16 10:00 - 2004/05/16 23:00 (14)
     2004/05/17 10:00 - 2004/05/17 23:00 (14)
     2004/05/18 10:00 - 2004/05/18 23:00 (14)
     2004/07/02 17:00 - 2004/07/02 23:00 (7)
     2004/07/03 02:00
     2004/07/03 04:00 - 2004/07/03 05:00 (2)
     2004/07/03 07:00 - 2004/07/03 08:00 (2)
     2004/07/03 10:00 - 2004/07/03 23:00 (14)
     2004/07/04 02:00
     2004/07/04 04:00 - 2004/07/04 05:00 (2)
     2004/07/04 07:00 - 2004/07/04 08:00 (2)
     2004/07/04 10:00 - 2004/07/04 23:00 (14)
     2004/07/05 02:00
     2004/07/05 04:00 - 2004/07/05 05:00 (2)
     2004/07/05 07:00 - 2004/07/05 08:00 (2)
     2004/07/05 10:00 - 2004/07/05 23:00 (14)
     2004/07/06 02:00
     2004/07/06 04:00 - 2004/07/06 05:00 (2)
     2004/07/06 07:00 - 2004/07/06 08:00 (2)
     2004/07/06 10:00 - 2004/07/06 23:00 (14)
     2004/07/07 02:00
     2004/07/07 04:00 - 2004/07/07 05:00 (2)
     2004/07/07 07:00 - 2004/07/07 08:00 (2)
     2004/07/07 10:00 - 2004/07/07 23:00 (14)
     2004/07/08 02:00
     2004/07/08 04:00 - 2004/07/08 05:00 (2)
     2004/07/08 07:00 - 2004/07/08 08:00 (2)
     2004/07/08 10:00 - 2004/07/08 23:00 (14)
     2004/07/09 02:00
     2004/07/09 04:00 - 2004/07/09 05:00 (2)
     2004/07/09 07:00 - 2004/07/09 08:00 (2)
     2004/07/09 10:00 - 2004/07/09 23:00 (14)
     2004/07/10 02:00
     2004/07/10 04:00 - 2004/07/10 05:00 (2)
     2004/07/10 07:00 - 2004/07/10 08:00 (2)
     2004/07/10 10:00 - 2004/07/10 23:00 (14)
     2004/07/11 02:00
     2004/07/11 04:00 - 2004/07/11 05:00 (2)
     2004/07/11 07:00 - 2004/07/11 08:00 (2)
     2004/07/11 10:00 - 2004/07/11 23:00 (14)
     2004/07/12 02:00
     2004/07/12 04:00 - 2004/07/12 05:00 (2)
     2004/07/12 07:00 - 2004/07/12 08:00 (2)
     2004/07/12 10:00 - 2004/07/12 23:00 (14)
     2004/07/13 02:00
     2004/07/13 04:00 - 2004/07/13 05:00 (2)
     2004/07/13 07:00 - 2004/07/13 08:00 (2)
     2004/07/13 10:00

Wind Speed
```

No missing data.

Wind Direction
    No missing data.

U Wind Component
    No missing data.

V Wind Component
    No missing data.

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

TITLE: CAMP_NSCSSJ_TMEX_Wuchi_20031001_20041231.sfc.txt

CONTACT(S):

===
======
                | Contact 1 | Contact 2
   --------------+-------------------------------
+----------------------------
        Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
   --------------+-------------------------------
+----------------------------
        Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
                 | Atmospheric Sciences | National Central
University
                 | Iowa State University | Chung-Li 32054,
                 | 3010 Agronomy Hall | Taiwan
                 | Ames, IA 50011, USA |
   --------------+-------------------------------
+----------------------------
        Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
   --------------+-------------------------------
+----------------------------
        Fax.No. | +1-515-294-2619 | +1-886-3422-3283
   --------------+-------------------------------
+----------------------------
        E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to
search for the
     resolutions of these long-standing problems.

1.2 Time period covered by the data

     The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
     All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
   Station name |Latitude|Longitude| Alt |Measurement interval
                |decimal | decimal | (m) |
   -------------+--------+---------+------
+---------------------------------
   Wuchi | 24.26 | 120.52 | 7.2 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

     Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

     http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

   ==
   Parameter/Variable |Source
   Description |
   ------------------+---
    Air pressure(Ps) | Setra Model 270
   ------------------+---
    Airtemperature(Ts)| MetOne T-200
   ------------------+---
    Rela. Humidity(RH)| MetOne DP-200B
   ------------------+---
    Dewpoint Temp(Td) | Pt1000
   ------------------+---
  @Wind direction(WD)| RM Young Model 05103
   ------------------+---
    Wind speed(WS) | RM Young Model 05103
   ------------------+---

```
   Rainfall(P)       | TK-1
  ====================================================================

     Ps(0.8m)    : Air pressure at the 0.8m height (hPa)
     Ts(1.7m)    : Air temperature at the 1.7m height (deg.C)
     RH(1.7m)    : Relative humidity at the 1.7m height (%)
     Td(1.7m)     :Dewpoint Temperature at the 1.7m height(deg.)
     WD(33.2m)   : Wind direction at the 33.2m height (deg.)
     Ws(33.2m)   : Wind speed at the 33.2m height (m/s)
     P(0.4m)     : Precipitation at the 0.4m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

     The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

     Original data was collected and is provided by CWB of Taiwan, funded
by
     Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

Chen, Tsing-Chang, Ming-Cheng Yen, and Siegfried Schubert, 2001:
Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Wuchi_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
    No missing data.

Specific Humidity
    No missing data.

Wind Speed
    No missing data.

Wind Direction
    2003/11/14 19:00
    2004/01/26 02:00

U Wind Component
    2003/11/14 19:00
    2004/01/26 02:00

V Wind Component
    2003/11/14 19:00
    2004/01/26 02:00

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```

TITLE: CAMP_NSCSSJ_TMEX_Yushan_20031001_20041231.sfc.txt

CONTACT(S):

===
======
                | Contact 1 | Contact 2
  -------------+-------------------------------
+----------------------------
        Name | Tsing-Chang (Mike) Chen | Ming-Cheng Yen
  -------------+-------------------------------
+----------------------------
        Address | Depertment of Geological and | Depertment of
Atmospheric Sciences
                | Atmospheric Sciences | National Central
University
                | Iowa State University | Chung-Li 32054,
                | 3010 Agronomy Hall | Taiwan
                | Ames, IA 50011, USA |
  -------------+-------------------------------
+----------------------------
        Tel.No. | +1-515-294-9874 | +1-886-3422-7151 ext.
65538
  -------------+-------------------------------
+----------------------------
        Fax.No. | +1-515-294-2619 | +1-886-3422-3283
  -------------+-------------------------------
+----------------------------
        E-mail. | tmchen@iastate.edu | tyenmc@atm.ncu.edu.tw

===
======

DATE OF THIS DOCUMENT
09 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

    The winter weather system that affects Taiwan and its vicinity is
characterized by the
    long rainy season over northern-northeastern Taiwan and frequent
occurrence of cold
    surges, cold fronts and shallow Taiwan perturbations within the
context of the
    East-Asian winter monsoon circulation. Since the Winter Monsoon
Experiment (WMONEX),
    the causes of the long rainy season and formation of the Taiwan
front and shallow
    perturbation have not been disclosed, and possible impacts of cold
surges on the
    surface weather condition over Taiwan and on the global climate
system have not been

well explored. A mini-field experiment was designed and proposed to
search for the
    resolutions of these long-standing problems.

1.2 Time period covered by the data

    The Full CEOP EOP-4 time period (01 October 2003 to 31 December
2004).

1.3 Temporal characteristics of the data
    All parameters are recoded every 1 hour.

1.4 Physical location (including lat/lon/elev) of the measurement or
platform

--
  Station name |Latitude|Longitude| Alt |Measurement interval
               |decimal | decimal | (m) |
  -------------+--------+---------+------
+---------------------------------
  Yushan | 23.49 | 120.95 | 3845 | 1 hour

1.5 Data source if applicable (e.g. for operational data include agency)

    Original data provided by CWB (Central Weather Bureau) of Taiwan.

1.6 Any World Wide Web address references

    http://tmex.atm.ncu.edu.tw/

2.0 INSTRUMENTATION DESCRIPTION:

  ==
  Parameter/Variable |Source
  Description |
  ------------------+--
   Air pressure(Ps) | Setra Model 270
  ------------------+--
   Airtemperature(Ts)| MetOne T-200
  ------------------+--
   Rela. Humidity(RH)| MetOne DP-200B
  ------------------+--
   Dewpoint Temp(Td) | Pt1000
  ------------------+--
 @Wind direction(WD)| RM Young Model 05103
  ------------------+--
   Wind speed(WS) | RM Young Model 05103
  ------------------+--

```
   Rainfall(P)       | TK-1
  ====================================================================

    Ps(0.9m)    : Air pressure at the 0.9m height (hPa)
    Ts(1.5m)    : Air temperature at the 1.5m height (deg.C)
    RH(1.5m)    : Relative humidity at the 1.5m height (%)
    Td(1.5m)     :Dewpoint Temperature at the 1.5m height(deg.)
    WD(9.2m)    : Wind direction at the 9.2m height (deg.)
    Ws(9.2m)    : Wind speed at the 9.2m height (m/s)
    P(0.5m)     : Precipitation at the 0.5m height (mm)
```

3.0 DATA COLLECTION AND PROCESSING:

  3.1 Description of data collection

      Data are downloaded from the AWS monthly. Then, data are sent to
CWB,
      where they are processed.

  3.2 Description of derived parameters and processing techniques used
      Air pressure, Air Temperature, relative humidity, Dewpoint
Temperature,
      Wind speed and direction are instantaneous values.
      Precipitation is accumulated on the previous minute.

      And the two parameters indicated below were computed by using
      "CEOP Derived Parameter Equations:
       http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html" .
       also put the data flag "I", In the case of calculated by using
       dubious value fagged "D", the data flag was put "D".

      Specific Humidity were computed by using (Bolton 1980):
        e = 6.112*exp((17.67*Td)/(Td + 243.5));
        q = (0.622 * e)/(p - (0.378 * e));
          where:
            e = vapor pressure in mb;
            Td = dew point in deg C;
            p = surface pressure in mb;
            q = specific humidity in kg/kg.

      U,V Components (4.6m) were computed by using (GEMPAK):
        U = -sin(direction) * wind_speed;
        V = -cos(direction) * wind_speed;

4.0 QUALITY CONTROL PROCEDURES

   For all parameters, the data has been visually checked, looking for
extremely and unusual low/high values and/or periods with constant
values
thorough the CAMP Quality Control Web Interface.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS:

6.1 Missing data periods

    The missin data periods are listed in chapter 9.0

7.0 REFERENCE REQUIREMENTS:

    Original data was collected and is provided by CWB of Taiwan, funded
by
    Ministry of Transportation and Communications of Taiwan.

8.0 REFERENCES:

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Diurnal variation of pressure heights: A vertical phase shift.
J. Climate, Vol. 14, No. 17, 3793-3797.

Chen, Tsing-Chang, Ming-Cheng Yen, Wan-Ru Huang, and William A. Gallus,
Jr., 2002:
An East-Asian cold surge: Case study.
Mon. Wea. Rev., 130, 2271-2290.

Chen, Tsing-Chang, Shu-Yu Wang, Wan-Ru Huang, and Ming-Cheng Yen,, 2003:
Variation of the East Asian summer monsoon rainfall.
J. Climate, (in review).

Yen, Ming-Cheng, and Tsing-Chang Chen, 2000:
Seasonal variation of rainfall in Taiwan.
Inter. J. Climatol., 20, 803-809.

Yen, Ming-Cheng, and Tsing-Chang Chen, 2002:
A revisit of the tropical-midlatitude interaction in East Asia caused by
cold surges.
J. Meteor. Soc. Japan, 80, 1115-1128.

9.0 MISSING DATA PERIODS

File Name   : CAMP_NSCSSJ_TMEX_Yushan_20031001_20041231.sfc
Data Period : 2003/10/01 00:00 - 2004/12/31 23:00

Station Pressure
    No missing data.

Air Temperature
    No missing data.

Dew Point Temperature
    No missing data.

```
Relative Humidity
     No missing data.

Specific Humidity
     No missing data.

Wind Speed
     No missing data.

Wind Direction
     2003/10/06 06:00
     2003/10/07 01:00
     2003/10/14 03:00
     2003/10/16 01:00
     2003/10/17 03:00 - 2003/10/17 05:00 (3)
     2003/10/23 02:00 - 2003/10/23 04:00 (3)
     2003/10/25 03:00
     2003/11/03 02:00
     2003/11/30 01:00 - 2003/11/30 03:00 (3)
     2003/12/14 02:00
     2003/12/21 00:00 - 2003/12/21 02:00 (3)
     2004/02/27 00:00
     2004/03/16 04:00
     2004/05/24 07:00
     2004/05/29 02:00
     2004/05/29 05:00
     2004/06/15 01:00
     2004/06/15 03:00
     2004/06/15 08:00
     2004/06/16 02:00
     2004/06/18 07:00
     2004/07/12 02:00
     2004/08/11 03:00 - 2004/08/11 04:00 (2)
     2004/08/17 02:00 - 2004/08/17 03:00 (2)
     2004/08/22 02:00
     2004/08/22 08:00
     2004/08/31 08:00
     2004/09/03 19:00
     2004/09/04 13:00
     2004/09/20 23:00
     2004/09/23 23:00
     2004/09/26 00:00
     2004/09/26 07:00
     2004/09/26 14:00
     2004/09/28 00:00
     2004/10/07 00:00
     2004/10/12 02:00
     2004/10/15 07:00
     2004/10/16 00:00
     2004/10/16 03:00 - 2004/10/16 06:00 (4)
     2004/10/18 11:00
     2004/10/24 21:00

U Wind Component
     2003/10/06 06:00
     2003/10/07 01:00
     2003/10/14 03:00
```

```
    2003/10/16 01:00
    2003/10/17 03:00 - 2003/10/17 05:00 (3)
    2003/10/23 02:00 - 2003/10/23 04:00 (3)
    2003/10/25 03:00
    2003/11/03 02:00
    2003/11/30 01:00 - 2003/11/30 03:00 (3)
    2003/12/14 02:00
    2003/12/21 00:00 - 2003/12/21 02:00 (3)
    2004/02/27 00:00
    2004/03/16 04:00
    2004/05/24 07:00
    2004/05/29 02:00
    2004/05/29 05:00
    2004/06/15 01:00
    2004/06/15 03:00
    2004/06/15 08:00
    2004/06/16 02:00
    2004/06/18 07:00
    2004/07/12 02:00
    2004/08/11 03:00 - 2004/08/11 04:00 (2)
    2004/08/17 02:00 - 2004/08/17 03:00 (2)
    2004/08/22 02:00
    2004/08/22 08:00
    2004/08/31 08:00
    2004/09/03 19:00
    2004/09/04 13:00
    2004/09/20 23:00
    2004/09/23 23:00
    2004/09/26 00:00
    2004/09/26 07:00
    2004/09/26 14:00
    2004/09/28 00:00
    2004/10/07 00:00
    2004/10/12 02:00
    2004/10/15 07:00
    2004/10/16 00:00
    2004/10/16 03:00 - 2004/10/16 06:00 (4)
    2004/10/18 11:00
    2004/10/24 21:00

V Wind Component
    2003/10/06 06:00
    2003/10/07 01:00
    2003/10/14 03:00
    2003/10/16 01:00
    2003/10/17 03:00 - 2003/10/17 05:00 (3)
    2003/10/23 02:00 - 2003/10/23 04:00 (3)
    2003/10/25 03:00
    2003/11/03 02:00
    2003/11/30 01:00 - 2003/11/30 03:00 (3)
    2003/12/14 02:00
    2003/12/21 00:00 - 2003/12/21 02:00 (3)
    2004/02/27 00:00
    2004/03/16 04:00
    2004/05/24 07:00
    2004/05/29 02:00
    2004/05/29 05:00
```

```
    2004/06/15 01:00
    2004/06/15 03:00
    2004/06/15 08:00
    2004/06/16 02:00
    2004/06/18 07:00
    2004/07/12 02:00
    2004/08/11 03:00 - 2004/08/11 04:00 (2)
    2004/08/17 02:00 - 2004/08/17 03:00 (2)
    2004/08/22 02:00
    2004/08/22 08:00
    2004/08/31 08:00
    2004/09/03 19:00
    2004/09/04 13:00
    2004/09/20 23:00
    2004/09/23 23:00
    2004/09/26 00:00
    2004/09/26 07:00
    2004/09/26 14:00
    2004/09/28 00:00
    2004/10/07 00:00
    2004/10/12 02:00
    2004/10/15 07:00
    2004/10/16 00:00
    2004/10/16 03:00 - 2004/10/16 06:00 (4)
    2004/10/18 11:00
    2004/10/24 21:00

Precipitation
    No missing data.

Snow Depth
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Shortwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing Longwave
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Net Radiation
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Skin Temperature
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Incoming PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)

Outgoing PAR
    2003/10/01 00:00 - 2004/12/31 23:00 (ALL)
```