

TITLE: CAMP_Mongolia_DRS_20021001_20030331.sfc.txt

CONTACT(S):

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DATE OF THIS DOCUMENT

03 March 2004

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

To develop and verify algorithms for satellite remote sensing of soil moisture by microwave radiometers "AMSR" and "AMSR-E", soil moisture conditions and related meteorological/hydrological factors are being monitored by automatic stations spread in the Mongolian Plateau, where high quality data are expected to be obtained because of relatively uniform ground-surface-conditions.

Intensive moving observations synchronized with satellite passing carried out after launching ADEOS-II and AQUA.

We also conduct fundamental studies focused on the time-space variation of water and energy budgets in the subjected region, to confirm reliability of ground observation results and satellite remote sensing products.

This project is implemented under the framework of JAXA-JRA "Ground Truth for Evaluation of Soil Moisture and Geophysical/Vegetation parameters Related to Ground Surface Conditions with AMSR and GLI in the Mongolian Plateau" (PI : Prof. I. Kaihotsu, Hiroshima Univ.) and is partnership with Institute of Meteorology and Hydrology, Ministry of Nature and Environment, Mongolia.

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

```
-----  
Station name | Lat.(deg.) | Long. (deg.) | Alt.(m) |Measurement interval|  
-----+-----+-----+-----+-----  
DRS         | 46.12'31.2"| 106.42'53.0"| 1297   | 30 minutes  
-----
```

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

These data are obtained under the framework of JAXA-JRA "Ground Truth for Evaluation of Soil Moisture and Geophysical/Vegetation parameters Related to Ground Surface Conditions with AMSR and GLI in the Mongolian Plateau" (PI : Prof. I. Kaihotsu, Hiroshima Univ.) and is partnership with Institute of Meteorology and Hydrology, Ministry of Nature and Environment, Mongolia.

1.5 Any World Wide Web address references

<http://home.hiroshima-u.ac.jp/~ampex/hm/index-e.htm>

2.0 INSTRUMENTATION DESCRIPTION:

Table : AWS Type of Data.

```
=====
```

Parameter/Variable	Range	Units	Source
Wind speed(WS)	1.0 - 60	m/s	WIND-MONITOR 05103-4 (Young)
Wind direction(WD)	0 - 355	deg	WIND-MONITOR 05103-4 (Young)
Humidity(AH)	0 - 100	%	50Y(VAISALA)
Airtemperature(AT)	-40 - 60	degC	Pt1000
Air pressure(AP)	600-1060	hPa	ANALOG BAROMETER PTB101 (Campbell; VAISALA)
Soil surface temp.	55-99.9	degC	4000.4G (EVEREST)

```
-----
```

Rn(net radiation)	0.25 - 60	microm	NET RADIOMETER Q7(REBS)
Rainfall(P)	0.2	mm	RAIN COLLECTOR II(Davis)

3.0 DATA COLLECTION AND PROCESSING:

Wind speed, Wind direction, Relative humidity, Temperature, Air Pressure, Soil surface temperature and radiation are averaged over the previous 30 minutes. Precipitation is accumulated on the previous 30 minutes. The instruments height of each sensor are as follows ;

Parameter/Variable	Instruments height above ground
Wind speed(WS)	2.4 m
Wind direction(WD)	2.4 m
Humidity(AH)	1.5 m
Airtemperature(AT)	1.5 m
Air pressure(AP)	1.0 m
Soil surface temp.	0 m
Rn(net radiation)	1.4 m
Rainfall(P)	1.0 m

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.

The quality control flags follow the CEOP data flag definition document.

5.0 GAP FILLING PROCEDURES

Filled in gap by the Missing value "-999.99".

6.0 DATA REMARKS:

The net radiation data values are low from about 19 January 2003 to about 2 March 2003. Although the values of measurement is apparently small, the change in decrease is seen to be smooth and natural. Then we put [D] flags for these periods.

7.0 REFERENCE REQUIREMENTS:

Original data were collected and provided within the framework of JAXA-JRA "Ground Truth for Evaluation of Soil Moisture and Geophysical/Vegetation parameters Related to Ground Surface Conditions with AMSR and GLI in the Mongolian Plateau" (PI : Prof. I. Kaihotsu, Hiroshima Univ.). This JRA has been actually carrying out as an international cooperational project with Institute of Meteorology and Hydrology of National Agency for Meteorology, hydrology and Environment Monitoring of Mongolia.

8.0 REFERENCES:

Kaihotsu, I., Yamanaka, T., Oyunbaatar D., Ganbold, T., Davaa, G., and Koike, T., 2003: Long-term Monitoring by Water Cycle Stations in the Central Part of the Mongolian Plateau. Proceed. 1st Inter. Conf. APHW, 1, 117-120.

T. Koike, Y. Nakamura, I. Kaihotsu, G. Davaa, N. Matsuura, 2003: AMSR-E Soil Moisture Product validated at the CEOP Mongolia Reference Site. CEOP Newsletter, No.4, P5.

TITLE: CAMP_Mongolia_DRS_20030401_20030930.sfc.txt

CONTACT(S):

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          | Sougoukagaku-bu, Hiroshima University  
          | 1-7-1 Higashi-hiroshima,Hiroshima,739-8521, Japan  
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E-mail.   | kaihotu@hiroshima-u.ac.jp  
-----
```

DATE OF THIS DOCUMENT

24 January 2005

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

To develop and verify algorithms for satellite remotesensing of soil moisture by microwave radiometers "AMSR" and "AMSR-E", soil moisture conditions and related meteorological/hydrological factors are being monitored by automatic stations spread in the Mongolian Plateau, where high quality data are expected to be obtained because of relatively uniform ground-surface-conditions. Intensive moving observations synchronized with satellite passing carried out after launching ADEOS-II and AQUA. We also conduct fundamental studies focused on the time-space variation of water and energy budgets in the subjected region, to confirm reliability of ground observation results and satellite remotesensing products. This project is implemented under the framework of JAXA-JRA "Ground Truth for Evaluation of Soil Moisture and Geophysical/Vegetation parameters Related to Ground Surface Conditions with AMSR and GLI in the Mongolian Plateau" (PI : Prof. I. Kaihotsu, Hiroshima Univ.) and is partnership with Institute of

Meteorology and Hydrology, Ministry of Nature and Environment, Mongolia.

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

```
-----  
--  
Station name | Lat.(deg.) | Long. (deg.) | Alt.(m) | Measurement  
interval|  
-----+-----+-----+-----  
+-----  
DRS          | 46.12'31.2'' | 106.42'53.0'' | 1297    | 30 minutes  
-----  
-
```

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

These data are obtained under the framework of JAXA-JRA "Ground Truth for Evaluation of Soil Moisture and Geophysical/Vegetation parameters Related to Ground Surface Conditions with AMSR and GLI in the Mongolian Plateau" (PI : Prof. I. Kaihotsu, Hiroshima Univ.) and is partnership with Institute of Meteorology and Hydrology, Ministry of Nature and Environment, Mongolia.

1.5 Any World Wide Web address references

<http://home.hiroshima-u.ac.jp/~ampex/hm/index-e.htm>

2.0 INSTRUMENTATION DESCRIPTION:

Table : AWS Type of Data.

Parameter/Variable Description	Range	Units	Source
Wind speed(W.S)	1.0 - 60	m/s	WIND-MONITOR 05103-4 (Young)
Wind direction(WD)	0 - 355	deg	WIND-MONITOR 05103-4 (Young)
Humidity(AH)	0 - 100	%	50Y(VAISALA)
Air temperature(AT)	-40 - 60	degC	Pt1000
Air pressure(AP)	600-1060	hPa	ANALOG BAROMETER PTB101 (Campbell; VAISALA)

Soil surface temp.	55-99.9	degC	4000.4G (EVEREST)
Rn(net radiation)	0.25 - 60	microm	NET RADIOMETER Q7(REBS)
Rainfall(P)	0.2	mm	RAIN COLLECTOR II(Davis)

3.0 DATA COLLECTION AND PROCESSING:

Wind speed, Wind direction, Relative humidity, Temperature, Air Pressure,
 Soil surface temperature and radiation are averaged over the previous 30 minutes. Precipitation is accumulated on the previous 30 minutes. The instruments height of each sensor are as follows ;

Parameter/Variable	Instruments height above ground
Wind speed(WS)	2.4 m
Wind direction(WD)	2.4 m
Humidity(AH)	1.5 m
Airtemperature(AT)	1.5 m
Air pressure(AP)	1.0 m
Soil surface temp.	0 m
Rn(net radiation)	1.4 m
Rainfall(P)	1.0 m

And the three 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".

Dew Point Temperature were computed by using (Bolton 1980):

$$\begin{aligned}
 es &= 6.112 * \exp((17.67 * T)/(T + 243.5)); \\
 e &= es * (RH/100.0); \\
 Td &= \log(e/6.112)*243.5/(17.67-\log(e/6.112));
 \end{aligned}$$

where:

- T = temperature in deg C;
- es = saturation vapor pressure in mb;
- e = vapor pressure in mb;
- RH = Relative Humidity in percent;
- Td = dew point in deg C

Specific Humidity were computed by using (Bolton 1980):

$$\begin{aligned}
 e &= 6.112*\exp((17.67*Td)/(Td + 243.5)); \\
 q &= (0.622 * e)/(p - (0.378 * e));
 \end{aligned}$$

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.

The quality control flags follow the CEOP data flag definition document.

5.0 GAP FILLING PROCEDURES

N/A

6.0 DATA REMARKS:

6.1 Missing data periods

Air_Pressure 2003/06/18 04:00:00 - 2003/09/30 23:30:00

7.0 REFERENCE REQUIREMENTS:

Original data were collected and provided within the framework of JAXA-JRA "Ground Truth for Evaluation of Soil Moisture and Geophysical/Vegetation parameters Related to Ground Surface Conditions with AMSR and GLI in the Mongolian Plateau" (PI : Prof. I. Kaihotsu, Hiroshima Univ.). This JRA has been actually carrying out as an international cooperational project with Institute of Meteorology and Hydrology of National Agency for Meteorology, hydrology and Environment Monitoring of Mongolia.

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Kaihotsu, I., Yamanaka, T., Oyunbaatar D., Ganbold, T., Davaa, G., and Koike, T., 2003: Long-term Monitoring by Water Cycle Stations in the Central Part of the Mongolian Plateau. Proceed. 1st Inter. Conf. APHW, 1, 117-120.

T. Koike, Y. Nakamura, I. Kaihotsu, G. Davaa, N. Matsuura, 2003: AMSR-E Soil Moisture Product validated at the CEOP Mongolia Reference Site. CEOP Newsletter, No.4, P5.

TITLE: CAMP_Mongolia_DRS_20031001_20040331.sfc.txt

CONTACT(S):

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E-mail. | kaihotu@hiroshima-u.ac.jp

DATE OF THIS DOCUMENT

05 June 2006

1.0 DATA SET OVERVIEW:

1.1 Introduction or abstract

To develop and verify algorithms for satellite remote sensing of soil moisture by microwave radiometers "AMSR" and "AMSR-E", soil moisture conditions and related meteorological/hydrological factors are being monitored by automatic stations spread in the Mongolian Plateau, where high quality data are expected to be obtained because of relatively uniform ground-surface-conditions.

Intensive moving observations synchronized with satellite passing carried out after launching ADEOS-II and AQUA.

We also conduct fundamental studies focused on the time-space variation of water and energy budgets in the subjected region, to confirm reliability of ground observation results and satellite remote sensing products.

This project is implemented under the framework of JAXA-JRA "Ground Truth for Evaluation of Soil Moisture and Geophysical/Vegetation parameters Related to Ground Surface Conditions with AMSR and GLI in the Mongolian Plateau" (PI : Prof. I. Kaihotsu, Hiroshima Univ.) and is partnership with Institute of Meteorology and Hydrology, Ministry of Nature and Environment, Mongolia.

1.2 Time period covered by the data

The First half CEOP EOP-4 time period (01 October 2003 to 31 March 2004).

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

```
-----  
Station name | Lat.(deg.) | Long. (deg.) | Alt.(m) |Measurement interval|  
-----+-----+-----+-----+-----  
DRS          | 46.12'31.2"| 106.42'53.0"| 1297  | 30 minutes  
-----
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1.4 Data source if applicable (e.g. for operational data include agency)

These data are obtained under the framework of JAXA-JRA "Ground Truth for Evaluation of Soil Moisture and Geophysical/Vegetation parameters Related to Ground Surface Conditions with AMSR and GLI in the Mongolian Plateau" (PI : Prof. I. Kaihotsu, Hiroshima Univ.) and is partnership with Institute of Meteorology and Hydrology, Ministry of Nature and Environment, Mongolia.

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Table : AWS Type of Data.

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Airtemperature(AT)	-40 - 60	degC	Pt1000
Air pressure(AP)	600-1060	hPa	ANALOG BAROMETER PTB101 (Campbell; VAISALA)
Soil surface temp.	55-99.9	degC	4000.4G (EVEREST)

```
=====
```

```

-----+-----+-----+-----
Rn(net radiation) |0.25 - 60| microm | NET RADIOMETER Q7(REBS)
-----+-----+-----+-----
Rainfall(P)      | 0.2   | mm   | RAIN COLLECTOR II(Davis)
-----+-----+-----+-----

```

3.0 DATA COLLECTION AND PROCESSING:

Wind speed, Wind direction, Relative humidity, Temperature, Air Pressure, Soil surface temperature and radiation are averaged over the previous 30 minutes. Precipitation is accumulated on the previous 30 minutes. The instruments height of each sensor are as follows ;

```

=====
=====
Parameter/Variable | Instruments height above ground
-----+-----
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-----+-----
Wind direction(WD)| 2.4 m
-----+-----
Humidity(AH)       | 1.5 m
-----+-----
Airtemperature(AT)| 1.5 m
-----+-----
Air pressure(AP)   | 1.0 m
-----+-----
Soil surface temp.| 0 m
-----+-----
Rn(net radiation) | 1.4 m
-----+-----
Rainfall(P)        | 1.0 m
-----
=====
=====

```

And the three 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".

Dew Point Temperature were computed by using (Bolton 1980):

$$es = 6.112 * \exp((17.67 * T)/(T + 243.5));$$

$e = e_s * (RH/100.0);$
 $Td = \log(e/6.112)*243.5/(17.67-\log(e/6.112));$

where:

T = temperature in deg C;
es = saturation vapor pressure in mb;
e = vapor pressure in mb;
RH = Relative Humidity in percent;
Td = dew point in deg C

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.

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5.0 GAP FILLING PROCEDURES

N/A

6.0 DATA REMARKS:

7.0 REFERENCE REQUIREMENTS:

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T. Koike, Y. Nakamura, I. Kaihotsu, G. Davaa, N. Matsuura, 2003: AMSR-E Soil Moisture Product validated at the CEOP Mongolia Reference Site. CEOP Newsletter, No.4, P5.

9.0 Missing Data Periods:

File Name : CAMP_Mongolia_DRS_20031001_20040331.sfc
Data Period : 2003/10/01 00:00 - 2004/03/31 23:30

Station Pressure
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Air Temperature
No missing data.

Dew Point Temperature
No missing data.

Relative Humidity
No missing data.

Specific Humidity
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

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 - 2004/03/31 23:30 (ALL)

Incoming Shortwave
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Outgoing Shortwave
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Incoming Longwave
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Outgoing Longwave
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Net Radiation
No missing data.

Skin Temperature
No missing data.

Incoming PAR
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

Outgoing PAR
2003/10/01 00:00 - 2004/03/31 23:30 (ALL)

TITLE: CAMP_Mongolia_DRS_20040401_20041231.sfc.txt

CONTACT(S):

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DATE OF THIS DOCUMENT

30 June 2006

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1.2 Time period covered by the data

The Second half CEOP EOP-4 time period (01 April 2004 to 31 December 2004).

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

```
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Station name | Lat.(deg.) | Long. (deg.) | Alt.(m) |Measurement interval|  
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DRS          | 46.12'31.2"| 106.42'53.0"| 1297  | 30 minutes  
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```

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Wind direction(WD)| 2.4 m
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Humidity(AH)       | 1.5 m
-----+-----
Airtemperature(AT)| 1.5 m
-----+-----
Air pressure(AP)   | 1.0 m
-----+-----
Soil surface temp.| 0 m
-----+-----
Rn(net radiation) | 1.4 m
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Rainfall(P)        | 1.0 m
-----+-----
=====
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And the three 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".

Dew Point Temperature were computed by using (Bolton 1980):

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$e = e_s * (RH/100.0);$
 $Td = \log(e/6.112)*243.5/(17.67-\log(e/6.112));$

where:

T = temperature in deg C;
es = saturation vapor pressure in mb;
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RH = Relative Humidity in percent;
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$e = 6.112*\exp((17.67*Td)/(Td + 243.5));$

$q = (0.622 * e)/(p - (0.378 * e));$

where:

e = vapor pressure in mb;
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4.0 QUALITY CONTROL PROCEDURES

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5.0 GAP FILLING PROCEDURES

N/A

6.0 DATA REMARKS:

7.0 REFERENCE REQUIREMENTS:

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9.0 Missing Data Periods:

File Name : CAMP_Mongolia_DRS_20040401_20041231.sfc
Data Period : 2004/04/01 00:00 - 2004/12/31 23:30

Station Pressure

2004/04/01 00:00 - 2004/12/31 23:30 (ALL)

Air Temperature

2004/10/01 03:30

Dew Point Temperature

2004/10/01 03:30

Relative Humidity

2004/10/01 03:30

Specific Humidity

2004/04/01 00:00 - 2004/12/31 23:30 (ALL)

Wind Speed

2004/10/01 03:30

Wind Direction

2004/10/01 03:30

U Wind Component
2004/10/01 03:30

V Wind Component
2004/10/01 03:30

Precipitation
2004/10/01 03:30

Snow Depth
2004/04/01 00:00 - 2004/12/31 23:30 (ALL)

Incoming Shortwave
2004/04/01 00:00 - 2004/12/31 23:30 (ALL)

Outgoing Shortwave
2004/04/01 00:00 - 2004/12/31 23:30 (ALL)

Incoming Longwave
2004/04/01 00:00 - 2004/12/31 23:30 (ALL)

Outgoing Longwave
2004/04/01 00:00 - 2004/12/31 23:30 (ALL)

Net Radiation
2004/10/01 03:30

Skin Temperature
2004/10/01 03:30

Incoming PAR
2004/04/01 00:00 - 2004/12/31 23:30 (ALL)

Outgoing PAR
2004/04/01 00:00 - 2004/12/31 23:30 (ALL)