DYNAMO Sub Surface data from the NOAA P-3

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1. Data Set Overview:

To sample the air-sea contrast and subsurface ocean structure over a larger area than can be samples by surface field assets, the NOAA P-3 deployed AXBTs and AXCTDs together with dropsondes.

Time period: 11 October – 13 December 2011.

Physical location: The AXBTs and AXCTDs were launched together with dropsondes. The sampling area is 14.5S – 1.2N, 69.8 – 81.0E.

2. Instrument Description

Instrument	Measurements
AXBT	Temperature, depth
AXCTD	temperature, salinity, depth

3. Data Collection and Processing

Data were provided by the PI in Matlab ".mat" format. Brandon Kerns converted the data in to NetCDF. CTD data were provided as separate files for each drop, and this convention was retained. Additional quality control was not performed.

4. Data Format

4.1. AXBT

```
dimensions:
        cast = 1 ;
        depth = 811 ;
variables:
        double cast(cast) ;
                cast:units = "degrees_latitude" ;
                cast:long_name = "Drop Latitude" ;
        double lat(cast) ;
                lat:units = "degrees_latitude" ;
                lat:long_name = "Drop Latitude" ;
        double lon(cast) ;
                lon:units = "degrees_longitude" ;
                lon:long_name = "Drop Longitude" ;
        double time(cast) ;
                time:units = "seconds since 1970-1-1 0:00:00 0:00" ;
                time:notes = "Time of drop." ;
        double z(depth, cast) ;
```

```
                z:units = "m" ;
                z:standard_name = "depth" ;
                z:long_name = "depth" ;
        double t(depth, cast) ;
                t:units = "degree_Celsius" ;
                t:standard_name = "sea_water_temperature" ;
                t:long_name = "Sea Water Temperature" ;

// global attributes:
                :Conventions = "CF-1.7" ;
                :title = "DYNAMO AXBT data for 2011-11-22T04:40:00: Dynamo Legacy
Collection" ;
                :institution = "Naval Postgraduate School (NPS)" ;
                :contact = "Qing Wang (qwang@nps.edu), Brandon Kerns (bkerns@uw.edu)"
;
                :PI = "Qing Wang (qwang@nps.edu)" ;
                :source = "AXBT" ;
                :history = "AXBT and AXCTD measurements were made on the NOAA WP-3D
aircraft during DYNAMO/LASP project between November 11 and December 13, 2011. QCd
data were posted online by Qing Wang in September 2013. Brandon Kerns obtained the
data from Qing Wang in January 2018 and converted from Matlab format to netcdf
format." ;
                :comment = "AXBTs were deployed from the NOAA P3 during DYNAMO. This
file contains a single profile from a single drop. Original file name:
201111220440XBT.mat. source = DYNAMO. platform = P3. z_equation = Standard.
classification = UNCLASSIFIED. distribution = UNLIMITED. poc = Qing Wang,
qwang@nps.edu." ;
                string :reference = "Alappattu, D. P., & Wang, Q. (2015). Correction
of depth bias in upper-ocean temperature and salinity profiling measurements from
airborne expendable probes. Journal of Atmospheric and Oceanic Technology, 32(2), 247–
255. https://doi.org/10.1175/JTECH-D-14-00114.1." ;
}
```

4.2. AXCTD

```
dimensions:
        cast = 1 ;
        depth = 452 ;
variables:
        double cast(cast) ;
                cast:units = "degrees_latitude" ;
                cast:long_name = "Drop Latitude" ;
        double lat(cast) ;
                lat:units = "degrees_latitude" ;
                lat:long_name = "Drop Latitude" ;
        double lon(cast) ;
                lon:units = "degrees_longitude" ;
                lon:long_name = "Drop Longitude" ;
        double time(cast) ;
                time:units = "seconds since 1970-1-1 0:00:00 0:00" ;
                time:notes = "Time of drop." ;
        double z(depth, cast) ;
                z:units = "m" ;
                z:standard_name = "depth" ;
                z:long_name = "depth" ;
        double t(depth, cast) ;
                t:units = "Celcius" ;
                t:standard_name = "sea_water_temperature" ;
                t:long_name = "Sea Water Temperature" ;
        double s(depth, cast) ;
                s:units = "PSU" ;
                s:standard_name = "sea_water_salinity" ;
                s:long_name = "Sea Water Salinity" ;
```

```
// global attributes:
                :Conventions = "CF-1.7" ;
                :title = "DYNAMO AXCTD data for 2011-11-22T05:41:00: Dynamo Legacy
Collection" ;
                :institution = "Naval Postgraduate School (NPS)" ;
                :contact = "Qing Wang (qwang@nps.edu), Brandon Kerns (bkerns@uw.edu)"
;
                :PI = "Qing Wang (qwang@nps.edu)" ;
                :source = "AXCTD" ;
                :history = "AXBT and AXCTD measurements were made on the NOAA WP-3D
aircraft during DYNAMO/LASP project between November 11 and December 13, 2011. QCd
data were posted online by Qing Wang in September 2013. Brandon Kerns obtained the
data from Qing Wang in January 2018 and converted from Matlab format to netcdf
format." ;
                :comment = "AXBTs were deployed from the NOAA P3 during DYNAMO. This
file contains a single profile from a single drop. Original file name:
201111220541CTD.mat. source = DYNAMO. platform = P3. z_equation = Standard.
classification = UNCLASSIFIED. distribution = UNLIMITED. poc = Qing Wang,
qwang@nps.edu. serial = [11063209]." ;
                string :reference = "Alappattu, D. P., & Wang, Q. (2015). Correction
of depth bias in upper-ocean temperature and salinity profiling measurements from
airborne expendable probes. Journal of Atmospheric and Oceanic Technology, 32(2), 247–
255. https://doi.org/10.1175/JTECH-D-14-00114.1." ;
}
```

5. Data Remarks

The data can be accessed using the myriad of software that is able to interact with NetCDF format files, including ncdump, ncview, Matlab, Python, IDL, and NCL.

Quality control has not been carried out beyond what was provided by the PI.

6. References

Alappattu, D. P., & Wang, Q. ,2015: Correction of depth bias in upper-ocean temperature and salinity profiling measurements from airborne expendable probes. Journal of Atmospheric and Oceanic Technology, 32(2), 247-255. https://doi.org/10.1175/JTECH-D-14-00114.1

Chen, S.S., B.W. Kerns, N. Guy, D.P. Jorgensen, J. Delanoë, N. Viltard, C.J. Zappa, F. Judt, C. Lee, and A. Savarin, 2016: Aircraft Observations of Dry Air, the ITCZ, Convective Cloud Systems, and Cold Pools in MJO during DYNAMO. Bull. Amer. Meteor. Soc., 97, 405–423, https://doi.org/10.1175/BAMS-D-13-00196.1