Autonomous Ocean Flux Buoys (AOFB) on Meereisportal.de

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Photo: Tim Stanton, NPS

Description of autonomous platform

Autonomous Ocean Flux Buoys (AOFB) are designed to measure turbulent fluxes of heat, salt and momentum in the ocean mixed layer just below the sea ice. These instrument systems are custom designed and fabricated at the Naval Postgraduate School and Moss Landing Marine Laboratories (for more details see: NPS AOFB Program). Additionally, they measure vertical profiles of currents down to 80 m depth, local basal melt rates using an upward-looking acoustic altimeter, GPS position, water velocity, temperature and salinity 3 m below the sea ice surface.

Property name	Property value
Manufacturer	Tim Stanton, NPS and MLML, Monterey, CA, United States
Manufacturer name	AOFB
Data provider	NPS AOFB Program, Monterey, CA, United States
Weight	approx. 200 kg
Deployment type	Installation on sea ice floes at 3m depth, normally with a co-located Ice Tethered Profiler and Ice Mass Balance Buoy
Power supply	Li Chl primary batteries, solar power, wind power
Data transmission interval	12 hours

Parameters and accuracy

Parameter	Sensor
Water temperature (°C)	30 micro K resolution fast thermistor
eddy correlation fluxes at 3 m depth	Digital Acoustic Travel Time current sensor and fast T/C sensors
temperature, conductivity and salinity at 3 m depth	Precision thermistor and inductive conductivity cell
water velocity components every 2 m to 80 m depth	Teledyne RDI WHM300 ADCP
Position (from GPS)	

Data Processing

The data set has been processed and contains quality flags for different kinds for erroneous data. Flag values are the sum of individual error codes. The value of 0 refers to no error.

Quality flag, position: The geographic position is flagged +1 if the drift velocity, as derived from the GPS longitude and latitude, exceeds a threshold of 10 deg latitude or 50 deg longitude per time step; +2 if the position exceeds extreme values, such as longitude > 360 deg; +4 if the position is exactly 0.0.

How to cite

1. The reference for the (data portal of) Meereisportal.de is:

Grosfeld, K.; Treffeisen, R.; Asseng, J.; Bartsch, A.; Bräuer, B.; Fritzsch, B.; Gerdes, R.; Hendricks, S.; Hiller, W.; Heygster, G.; Krumpen, T.; Lemke, P.; Melsheimer, C.; Nicolaus, M.; Ricker, R. and Weigelt, M. (2016), Online sea-ice knowledge and data platform <www.meereisportal.de>, Polarforschung, Bremerhaven, Alfred Wegener Institute for Polar and Marine Research & German Society of Polar Research, 85 (2), 143-155, doi:10.2312/polfor.2016.011.

2. Please include the following phrase into the acknowledgment, substituting PARAMETER and DATE according to your usage:

Autonomous sea ice measurements (PARAMETER) from DATE to DATE were obtained from https://www.meereisportal.de (grant: REKLIM-2013-04).

3. Buoy data is archived at PANGAEA, a Data Publisher for Earth & Environmental Science, after the buoy has stopped sending data. Please refer to the buoys DOI.