

Animal-borne instruments in the seasonal ice zone

Lars Boehme & MEOP consortium

OASIIS: Observing and Understanding the Ocean beneath Antarctic Sea Ice and Ice Shelves

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Sea Mammal Research Unit



Content

- What did we learn from MEOP?
- Best species for the sea ice zone
- Data management
- Animal Borne Instruments in GOOS





- Consortium to support IPY 2007-2008
- not funded directly, but brings together several national programmes relying on individual funding of its consortium members.
- to investigate the behaviour and well-being of marine animals.
- focuses on the provision of oceanographic data from animalborne instruments and acts as a bridge between the scientific teams deploying the tags and the front-end users.





- 10 nations were involved
- Very successful deployments in the Arctic and Antarctica on a range of species.
- One of the largest oceanographic data provider from the sea ice zone
- MEOP is still alive and MEOP data has produced **103** publications.









Complementary Data

In Situ Data - Observing

Example of 8,800+ CTD profiles from ABI (top) over winter 2014 from 14 seals.

ABI work best in conjunction with other observational strategies:

- Ships and moorings/ITPs can provide high resolution and accurate point measurements.
- Argo floats for open ocean
- ABI fill in time and space (background field) or work as 'adaptive samplers'









In Situ Data – Modelling I



ECCO global state estimate showed **significant improvements**, with cooler and fresher surface waters resulting in a sea ice distribution closer to satellite observations (Roquet et al. 2013).





In Situ Data – Modelling II

Under ice section in the UK Met Office's Global FOAM system with (top) and without (middle) ABI data.

- Some ocean fronts are more sharply defined and extent deeper, e.g. ACC Southern Boundary (SB).
- Effect of ABI data extends beyond ABI locations.

Carse et al. (2015)



Which seal species?

Elephant and Weddell seals are

- deep divers
- foraging on the shelf
- separating their horizontal movements
- both diving to the sea floor

Elephant seals seem to 'like' deeper waters, do not haul out, but disappear for a month in October for breeding.



Data Management



New developments

- More accurate and stable CTD sensors from different manufacturers.
- Other sensors (GPS, Accel., light, Fluorescence, O₂, pCO₂?)





Idlife Computers





Animal-Borne Instrument Task Team

- approved in May 2016
- Assist in the standardization best practices and protocols, calibration, delayed-mode quality control, meta data, data format, and delivery.
- **Promote the integration of animal-borne instruments** in ongoing and future European initiatives
- Ensure data availability (e.g. to Copernicus)
- Provide recommendations





MEOP data in EMODnet Physics







Foster links to other groups

• ATN (U.S. IOOS), IMOS, OTN, MEOP

 Data exchange standard for acoustic, archival and satellite tags (led by Xavier Hoenner, IMOS)

- GOOS Biology & Ecosystems
- JCOMM Observations Coordination Group
 - Invited to 8th session in Qingdao, China
 - creation of a formal global network to support GRAs
 - add ecosystem observations

WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology Observations Coordination Group

- Need to create a global network
- Provide data and expertise to GOOS Physics and GOOS Biology





OCG platform Steering team **Working Group:** ivironmenta orking Group cosystems Ø Biology data

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