Floats in the Seasonal ice zone

Co-ordinator: Ifremer
Institut Français de Recherche pour l'Exploitation de la Mer - France
Potential for a task team has discussed at AST-15

Colleagues have been approached and are willing to work on a task team pending an decision of AST

Marcel Babin (Baffin Bay)
Olaf Boebel (Southern Ocean)
Ilona Goszczko (Nordic Seas+ north of Fram Strait)
Katrin Latarius (Nordic Seas)
Edouard Leymarie (Baffin Bay)
Esmee van Wijjk (SOOS contact)
Breck Owens (Ice Tethered floats)
John Toole (Ice Tethered floats)*
Need to be realised from national plans and EU contributions

39 active floats in the Nordic Seas:
10 in the boundary currents (x) and 29 in the 4 deep basins,

red — Greenland Sea (11 floats)
blue — Icelandic Plateau (6 floats)
yellow — Lofoten Basin (4 floats)
green — Norwegian Basin (8 floats)

Boundary currents floats: parking depth of 500 m, profiling depth of 2000 m, working cycle of 3 days, lifetime 2 years.
Deep basin floats, parking depth of 1000 m, profiling depth of 2000 m, working cycle of 10 days, lifetime 3 years.
Two floats with biogeochemical sensors (oxygen+bio) per basin except for the Lofoten Basin (3-4) floats
No EuroArgo targets for deployment have been defined, because mature technology is missing. But national and international activities exist and are carried out as pilot projects.

The ITP program is an international effort with International Polar Year contributions from EU, AWI, IPEV, Ocean University China, Shirshov Inst. of Oceanogr., ASBO and TEA-COSI, U.S. Office of Naval Research, Yale University and WHOI.

Sampling in the Arctic has started for the Baffin Bay. France as part of NAOS Project (http://www.naos-equipex.fr/) has a pilot experiment for biogeochemical floats in the Arctic (Bay of Bafin) (cooperation with Canada - UMI Takuvik) (20 floats in 2015-2016) (PI : M. Babin).
High latitudes: Monitoring the Arctic (multiyear ice) with floats

**FRAM**
FRontiers In
Arctic Marine Monitoring

**PPP/YOPP**
Polar Prediction Project
Year of Polar Prediction

Helmholtz Association ‘Strategic Investment‘: August 2014 – July 2019, Sustained continuation planned on AWI funds

Sustained multidisciplinary, year-round surface to seafloor observations in the changing Arctic to address variability and trends in phys. conditions and ecosystem response.

WMO effort to promote cooperative international research enabling development of improved weather and environmental prediction services for the polar regions, on time scales from hourly to seasonal
High latitudes: Monitoring the Arctic (multiyear ice) with floats

- Modular benthic observatory
- FRAM
- Benthic crawler
- Zooplankton imaging system
- Seafloor imaging system
- Free-falling landers
- Profiling mooring
- AUV
- Gliders
- Autonomous water sampler
- Standard sediment Trap
Statement of the FRAM coordination:

“FRAM provides the infrastructure framework to integrate different observatory techniques, platforms and multi-sensor technologies to achieve a wide range of spatial and temporal scales of synchronous observations.

In this regard, integration of floats and under ice platforms is of key interest to FRAM.

FRAM will be able to provide personnel for analyses of float data from the Arctic Ocean.”
PPP aim: improve information/service available for shipping, economy, stakeholders, local communities

Why? Arctic opening and related environmental changes
High latitudes: Monitoring the Arctic (multiyear ice) with floats

Preparation Phase
2013 to mid-2017

Community engagement
Align with other planned activities
Develop implementation plan
Preparatory research
Summer school Workshops
Liaise with funders

Intensive observing periods
Dedicated model experiments
Research into use & value of forecasts
Intensive verification effort
Summer school

Consolidation Phase mid-2019 to 2022

Data denial experiments
Model developments
Dedicated reanalyses
Operational implementation
YOPP publications
YOPP conference

YOPP summit in Geneva: 13.-15.07.2015
Statement of the PPP/YOPP chair and office:
"For the period of intense observations during the Year of Polar Prediction it would be highly valuable to have an increased sampling not only in atmosphere and sea ice, but also in the ocean.

An extension of Argo float measurements into the polar oceans would thus be an important contribution to the overall success of the Year of Polar Prediction."
Deployments in the southern ocean have to consider ice protection and underwater tracking. Shown are surface positions Dec 2012 – June 2013 with circles indicating RAFOS sound source moorings maintained at AWI
EuroArgo interests for deployment:

Extension of Argo beyond 60°S into the seasonal ice zone at the nominal core Argo design density: 320 active floats in the Southern Ocean

Strong European research interest in the Weddell Gyre, RAFOS array already installed -> focus on Weddell Gyre

Requires 81 floats to be active in the Weddell Gyre at any given time

Accounting for an increased failure rate of floats of 20% -> 25 deployments per year

Maintainance of rafos sound sources needs to be funded