Geophysical Institute – University of Bergen, Norway

http://www.uib.no/en/gfi

Organization contact

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Areas of contribution

Polar atmospheric processes

Oceanic processes

Modelling and forecasting

Polar-lower latitude linkages

Education

Observations

Sea ice processes

Data archiving

Outreach

Summary

The Geophysical Institute (GFI, www.uib.no/gfi/) at the University of Bergen (UiB) is an internationally acknowledged contributor to the development of marine and polar research and weather forecasting methods as well as in research training. It has a permanent staff of 44 professors/associated prof., technicians and administrators, and 52 postdocs and PhD candidates. The research strategy rests upon use of own cutting-edge measurement techniques developed in collaboration with technology partners that combine theoretical studies and modeling in meteorology, climate dynamics, physical and chemical oceanography. As an integral part of the
Bjernes Center for Climate Research (BCCR - www.bjerknes.uib.no) the GFI played a major role in the development of the Norwegian Earth System Model (NorESM), and climate prediction system (NorCPS). GFI coordinates The Norwegian Atlantic Current Observatory (NACO) a national large-scale infrastructure funded by the Research Council of Norway, the Norwegian node of the European Research Infrastructure ICOS (Integrated Carbon Observation System), and leads the ICOS Ocean Thematic Centre OTC. GFI represents UIB at ESF (European Science Foundation) Marine Board and the Norwegian UNESCO Commission. GFI scientists are also active in international scientific committees and working groups of large international research programmes such as the International Geosphere-Biosphere Programme (IGBP), including the Joint Global Ocean Flux Study (JGOFS), the Surface Ocean-Lower Atmosphere Study (SOLAS), and the Integrated Marine Biosphere Research (IMBeR), as well as the World Climate Research Programme's project Climate and Ocean: Variability, Predictability and Change (CLIVAR) and the Scientific Committee on Oceanic Research (SCOR/IOC).

Description

Research activities and strategies of the GFI are perfectly in line with the main mission of YOPP, and in particular with the objectives detailed below:

- improve the polar observing system to provide good coverage of high-quality observations in a cost effective manner;
- gather additional observations through field programmes aimed at improving understanding of polar key processes.

A number of research project financed through the Norwegian Research Council and the EU-H2020 programme, among others, provide new and additional observations of the Arctic. These include the EU projects INTAROS investigating the challenges of an integrated Arctic observing system, ICOS, the project ISOBAR focusing on stable boundary layer processes, the project PROVOLO in which water-mass transformations in the Norwegian Sea will be studied, the project SNOWPACE aiming to analyze the impact of water evaporating in the marginal ice zone for precipitation in Norway, and several others. GFI will encourage all on-going and planned research projects at GFI that fall within the YOPP objectives to get endorsed with YOPP.

- develop improved representation of polar key processes in uncoupled and coupled models used for prediction, including those which are a particular hindrance to high-quality prediction for the polar regions, such as stable boundary layer representation, surface exchange, and steep orography;
- explore the predictability of sea ice on time scales from days to a season;
- improve understanding of linkages between polar regions and lower latitudes and assess skill of models representing these;
- provide training opportunities to generate a sound knowledge base on polar prediction related issues.

Several research projects, mentioned above, and internally financed positions access new research avenues in this direction. A suite of research models are being applied and developed to study the interaction between sea-ice and atmosphere, the development of polar mesocyclones, and the interaction between high-latitude and low-latitude changes. Past and ongoing research has a strong relation to atmosphere-ice-ocean interaction at high latitudes, and YOPP will give further emphasis to these activities.
The Bjerknes Centre for Climate Research and the Polar Network in Bergen, among others, will be utilized to spread information received by YOPP to relevant scientists at GFI and to the larger polar research community in Bergen.

MSc and PhD students at GFI will obtain opportunities to take part in field activities (research cruises, field measurements) and training schools, such as the upcoming Polar Prediction school. In collaboration with UNIS, exchange of students at the MSc level will be encouraged particularly during the YOPP core phase. Through our national research training school CHESS (Research school on changing climates - in the coupled earth system) relevant training courses will be offered. GFI also offers to become a host for Marie Curie fellows from YOPP partners.

Key project deliverables

- Scientific publications on relevant activities and research projects;
- Datasets (observations, model simulation) during the YOPP period;
- Outreach to the public through presentations, news articles, interviews;
- Candidates (PhD, MSc, BSc) with a relevant training and background;
- Contribution to education in the Arctic through lecturers at UNIS (University Centre in Svalbard) and the CHESS national research school.

Data management

Data will be archived using established data centres depending on the scientific field and existing formal obligations. The Bjerknes Climate Data Centre, hosted by the Geophysical Institute at the University of Bergen, has data archival agreements with several data centres. Chemical oceanographic data relevant to YOPP will be made available via the data publisher PANGAEA or the European Research Infrastructure Integrated Carbon Observation System (ICOS). Relevant historical physical oceanographic data will be made available via PANGAEA or the Norwegian Marine Data Centre. Historical data for certain fields can only be made available in a limited form due to funding limitations. Only public data will be shared and intellectual property rights will be respected. Part of the data that will be generated during the Year of Polar Prediction will be made available via GTS but at this point it is challenging to estimate the amount of data to be provided to YOPP via GTS due to internal and external factors. At this stage it is not possible to make certain data available since data is not or just partly provided by the platform via the GTS due to funding limitations.

Is data provided to WMO Global Telecommunication System

Yes
Real-time provision

Certain meteorological and oceanographic data will be shared with the consortium in real-time but access could be limited due to funding restrictions.