

OceanGliders Task Team for Polar Regions

General overview:

The goal of this Task Team is to globally coordinate glider operations in polar seas and to integrate regional observational efforts through best practices based on the unique requirements of polar regions. Glider operations in the Arctic and Antarctic bring unique challenges and risks due to extreme sea and wind conditions, as well as a potential lack of reliable access in case of malfunctions. Especially the navigation in ice-covered areas requires further adaptations such as a reliable acoustic underwater system. Perceiving the need for specific adaptations in polar seas, we have recently initiated contact with international scientists who share similar objectives in order to foster collaborative efforts. Through international coordination and collaboration, we aim to facilitate global convergence of the necessary preparations and practices. The development of relevant strategies for glider operations in ice-covered areas will enable exceptional high-resolution observations of key physical (temperature, salinity and currents), biogeochemical (nutrients, dissolved oxygen and pH) and biological parameters (phytoplankton, zooplankton), effectively improving our understanding of essential processes like dense water formation, ice-ocean interactions, ecosystem dynamics and the occurring changes in polar environments.

Moreover, close-range observations near ice shelves will provide unprecedented insight into oceanic heat transport and the corresponding ocean-driven basal melting and calving. The assessment of the relevant circulation and ice-ocean interactions is especially crucial in order to gain insight into the decreasing buttressing of ice shelves that surround polar ice sheets. These ice sheets drain into the surrounding ocean and terminate in the floating ice shelves that provide stability through buttressing. Sea ice has been found to contribute to this stability by buffering iceshelf frontal zones from destructive ocean swells and by supporting outer ice-shelf margins in the case of landfast ice. Considering in addition that relevant existing oceanographic observations are minimal, it is essential to take advantage of the capabilities of autonomous gliders. In the framework of global sea-level rise, the OceanGliders Task Team for Polar Regions will therefore aim particularly to enhance under-ice observations and to support process studies close to ice shelves.

Specific objectives and milestones

Theme 1) International collaboration and coordination among experts from various fields to maximize efficiency of glider operations in polar regions

Potential milestones:

- formation of a global network with regular meetings
- creation of a knowledge exchange platform
- development of a dedicated website (or addition to a relevant existing one)

Theme 2) Global convergence of the necessary preparations and practices based on the unique requirements of polar regions with special focus on under-ice navigation

Potential main milestones:

- project proposal for funding to set up and test a reliable underwater communication system for under-ice navigation
- facilitation of safer navigation in ice-covered areas with a reliable acoustic underwater unit
- publications (e.g., of successful case studies) and broad dissemination
- best practices / protocols etc. regarding operations, methodologies and data management in general

Theme 3) Integration of national or regional observational efforts / networks

Potential milestones:

- map and overview of existing glider operations through the created website (possible integration to DueSouth)
- database / data or metadata repository (possible integration SOOS)
- relevant capacity building activities (e.g., at international workshops & conferences)

Task Team Management and Roles

International Co-leads	team-wide coordination, task team's strategy and milestone affirmation
Scientific Steering Committee	scientific guidance, defining specific research objectives and evaluating progress
Communications	outreach efforts, online and social media presence
ECR Representative	advocate for ECRs, DEI and capacity development
Active Member	contribute to team tasks and support overall goals

International Co-leads will focus on team-wide coordination and milestone affirmation. The Scientific Steering Committee will provide scientific guidance and evaluate progress. The Communications Team will handle outreach efforts and online presence. The ECR Representatives will advocate for ECRs and DEI and potentially assist in administrative tasks. Active Members will participate in regular meetings and support overall goals.

Name	Scientific Field	Active Role	Location	Region of Interest	E-mail
Pierpaolo Falco	Physical Oceanography	Scientific Committee	Italy	Southern Ocean; Ross Sea	pierpaolo.falco@staff.univpm.it
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Jude van der Meer	General Oceanography	Member	Canada	NW Atlantic	jude.vandermeer@dal.ca
Adam Comeau	General Oceanography	Member	Canada	NW Atlantic	adam.comeau@dal.ca

Andy Thompson	Physical Oceanography	Member	USA	Southern Ocean; ACC; Bellinghousen/Amundsen	andrewt@caltech.edu
Meredith Meyer	Biogeochemical Oceanography	ECR Representative	USA (soon to be UK)	Southern Ocean; Ross Sea	mgmeyer9@email.unc.edu
Jasmin McInerney	Physical Oceanography	ECR Representative	New Zealand	Southern Ocean; Ross Sea	jasmin.mcinerney@niwa.co.nz
Craig Stevens	Physical Oceanography	Co-lead	New Zealand	Southern Ocean; Ross Sea	craig.stevens@niwa.co.nz
Esther Portela	Physical & BGC Oceanography	Member	France	Ross Sea (and in the near future tropical ocean, so not in the core of this group)	esther.portela_rodriguez@ird.fr
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Actions so far

- 1.) General Meeting on Wednesday, 22nd November 2023 at 14:00 UTC
- 2.) Determination of specific objectives and milestones
- 3.) Agreement of task team management roles and active memberships
- 4.) Creation of an internal depository with all relevant team documents, manuals and a communications platform including channels for organization and specific discussions on under-ice navigation, multi-glider operation, turbulence, data correction and quality control
- 5.) Internal meeting concerning upcoming milestones, potential synergies and proposal outline for designing the acoustic system for under-ice navigation
- 6.) Planning of the task team's participation in the upcoming International Underwater Glider Conference