

The WCRP-FPA2 Polar Challenge: promoting a scalable, cost-effective and sustainable monitoring system for the polar oceans

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The World Climate Research Programme (WCRP) and the Prince Albert II of Monaco Foundation (FPA2) are promoting a Polar Challenge (www.wcrp-climate.org/polarchallenge) that will reward the first team to complete a 2000 km mission with an Autonomous Underwater Vehicle (AUV) under the Arctic or Antarctic sea-ice. Bonus awards will go to the team that can demonstrate that they have taken regular measurements of sea-ice thickness or draft and to those who successfully transmit their under-ice position and environmental data to operational networks.

In situ ocean observations in polar regions are inherently expensive, risky and sparse, even more so under the sea-ice. A new paradigm is required to complement remotely sensed Earth observations.

WCRP and FPA2 aim to promote technological innovation towards a future cost-effective, autonomous and scalable observing network for sea-ice covered regions based on a fleet of AUVs. The ultimate goal is to achieve what ARGO (www.argo.ucsd.edu/) has accomplished for the open ocean.

This initiative can have a tremendous impact in shaping future climate research in the polar regions. New collocated multidisciplinary data sets of sea-ice and under-ice properties at unprecedented temporal and spatial resolution far into unexplored territories could revolutionize our knowledge of climate change in those regions, for example, in the areas of heat fluxes and storage, fresh water exchanges, carbon sequestration and ocean acidification.

Ultimately, this proof of concept could be scaled up into a game-changing ocean monitoring network for the poles with wide-ranging benefits for climate research and services as well as for other sectors such as climate adaptation and mitigation policies, environmental protection, weather forecast, tourism, safety, security, transport, energy, biodiversity, fisheries and insurance.