Polar Challenge: Creating an AUV for under Sea-ice Exploration

The World Ocean Council (WOC) is working to foster private-sector participation in the Polar Challenge – a competition to develop an autonomous underwater vehicle (AUV) capable of a 2,000km mission under the sea-ice in the Arctic or Antarctic, with a prize of CHF500,000 for the winner.

The World Climate Research Programme (WCRP) and Prince Albert II of Monaco Foundation hope the competition will stimulate innovation towards a cost-effective, autonomous and scalable observing network for ice-covered ocean regions.

According to WCRP senior scientist Michel Rixen, the reliability of long-term climate change outlooks in polar regions is severely limited by the scarcity and cost of observations of the sea-ice and below. New generation AUVs such as underwater gliders provide a potential cost-effective option for scaling up observing networks for the Polar regions.

WOC CEO, Paul Holthus, noted that the use of AUVs and other intensive data collection technology can be cost-effectively augmented by harnessing the use of commercial vessels for data collection as they operate in polar waters, and we are working to advance this through the WOC 'Smart Ocean-Smart Industries' programme.

Currently AUVs are primarily used in ice-free zones, where they can surface to get a GPS fix and transmit data, e.g. temperature, salinity, chlorophyll and acidity. But under the sea-ice, the operating range, positioning and data transmission are a major challenge. Progress on power systems, navigation and communication create the potential to expand the scope of AUVs to under sea-ice operations. The Polar Challenge advances WCRP research priorities in polar oceans and will contribute to the World Meteorological Organization (WMO) polar initiatives that benefit the wider community (weather, ocean, environment, safety, transport, energy, tourism, etc.).

The WCRP invites contributions from all relevant stakeholders and provides more details, including competition rules and registration.

The Polar Challenge was announced last week at the Arctic Observing Summit (AOS), in Fairbanks, Alaska, USA. WOC co-organised the private sector theme sessions of the Arctic Observing Summit, which addressed industry experience in, and needs for, Arctic observations and data, and culminated in a workshop on fostering data collection and sharing by industry.

The AOS brought together 450 delegates from 30 countries - representing industry, science, indigenous peoples, government agencies, and NGOs. The AOS 2016 Conference Statement outlines seven major recommendations for developing a pathway towards an internationally supported, pan-Arctic observing system.