# WCRP-FPA2 Polar Challenge

**M. Rixen**
**and the Polar Challenge Committee**

**www.wcrp-climate.org/polarchallenge**

# The concept

A Prize money award to the first team completing a 2000 km continuous mission with an autonomous underwater vehicle (AUV) under the sea-ice

- Bonus demonstration 1 (optional):
  - regular observations of sea ice thickness or draft
- Bonus demonstration 2 (optional):
  - successful under-ice transmission of position and environmental data

# The context

The cryosphere:

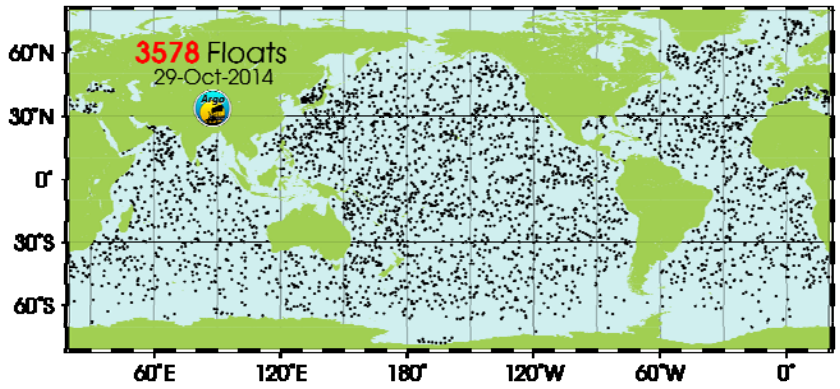
- plays a fundamental role in climate
- is directly impacted by climate change

Observations of the polar oceans:

- sparse
- risky
- expensive

# The vision and mission

- A new paradigm for long-term under-ice observations
- A cost-effective, autonomous and scalable ocean monitoring network for the Polar regions
- Analogy to ARGO but for sea-ice covered regions



# The long-term benefits for the public and private sector

- Energy
- Environment
- Safety
- Transport/shipping
- Insurance
- Climate research and services
- Weather forecasts
- …

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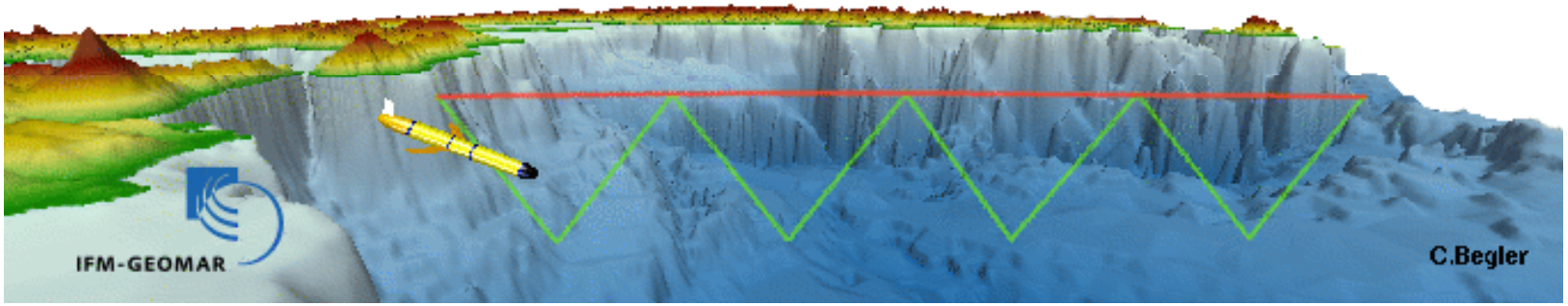
# AUV/Glider technology


**Typical observations:**

Temperature
Salinity
Currents
pH
Chlorophyll
etc




**… at a fraction of the cost of conventional (ship-based) observing systems**

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# The Challenge

- Ice-covered ocean regions:
  - AUV/glider range limitation
  - No GPS fix
  - No real-time data transmissions
- Innovations required:
  - Endurance
  - Positioning and navigation
  - Communications

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# The competition

- Draft guidelines available on-line, open for review
- When: 2016-2019 (with possible extension)
- Where: Arctic/Antarctic – under the sea-ice
- Process: application and review by Polar Challenge Committee, mission attempts, prize(s) claim, review by Judge Panel, award ceremony
- Competitors are responsible for mobilizing their own resources
- Announcement of Prize details: ASSW/AOS, Fairbanks, 15 March 2016

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# Would you like to help developing the Polar observing network of the future?

- would you like to compete for the Prize?
- would you like to become a co-sponsor of the Prize?

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**Compete for the Prize!**
**Become a co-sponsor!**
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JN 1691

Co-sponsors: WMO, Environment Canada, Environnement Canada, WWRP, esa, GCOS, GEO Group on Earth Observations, SCOR, UNESCO IOC

Endorsed by: IASC, SCAR

# POLAR CHALLENGE

## CONTEXT

**The cryosphere plays a fundamental role in the climate system. We need much better monitoring and prediction capabilities for the polar regions.**

## CHALLENGES AND OPPORTUNITIES

**Polar observations are expensive, risky and sparse. We can expand AUVs' endurance, navigation and communication capabilities to operate under the sea ice.**

## VISION

**A cost-effective, sustainable and autonomous polar ocean monitoring system to drive a new era for climate research and services.**

# THE POLAR CHALLENGE


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