Swedish Polar Research Secretariat

Promotes the conditions for and coordinates Swedish research and development in the polar regions

Head of Ship-based science Support, Åsa Lindgren

2023-02-17, FARO annual meeting, Vienna

SWEDISH POLAR
RESEARCH SECRETARIAT
POLARFORSKNINGSSEKRETARIATET

Abisko Scientific Research Station

68° 21‘N, 18° 49‘E

- 200 km north of the Arctic Circle
- The surroundings have a high variability
- Leading role in international climate and environmental research
- Environmental record that extends 100 years back and 3,000 scientific publications
- **WMO Centennial Station!**

SWEDISH POLAR RESEARCH SECRETARIAT
POLARFORSKNINGSSEKRETARIATET

Abisko Scientific Research Station
PHOTO **ANNA-KARIN LANDIN**

Icebreaker Oden

- One of the world‘s most powerful icebreakers
- Four engines, 24,500 hp
- Versatile scientific equipment; research containers, scientific laboratories, deep ocean winches
- Researchers are able to use the vessel based on their needs
- Has been used for marine geology, oceanography, ecological research and atmospheric research in the Arctic and Antarctica
- Owned by the Swedish Maritime Administration, expeditions are organised by us

SWEDISH POLAR RESEARCH SECRETARIAT
POLARFORSKNINGSSEKRETARIATET

Icebeaker Oden on the Arctic Ocean.
PHOTO **IDA KINNER**

The ARTofMELT expedition

(Atmospheric rivers and the onset of sea ice melt)

- warm air flows become more frequent, stronger, and longer-lasting in a warmer climate
- To assess the future climate more reliably – in the Arctic and globally – computer models are needed where both these air currents and the processes they set in motion are correctly described
- Sampling data both from I/B Oden and from Ice stations

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Efforts to reduce environmental impacts

- **Abisko Scientific Station; installing geothermal heating**
- **Electrical vehicles**
- **Reducing energy usage**

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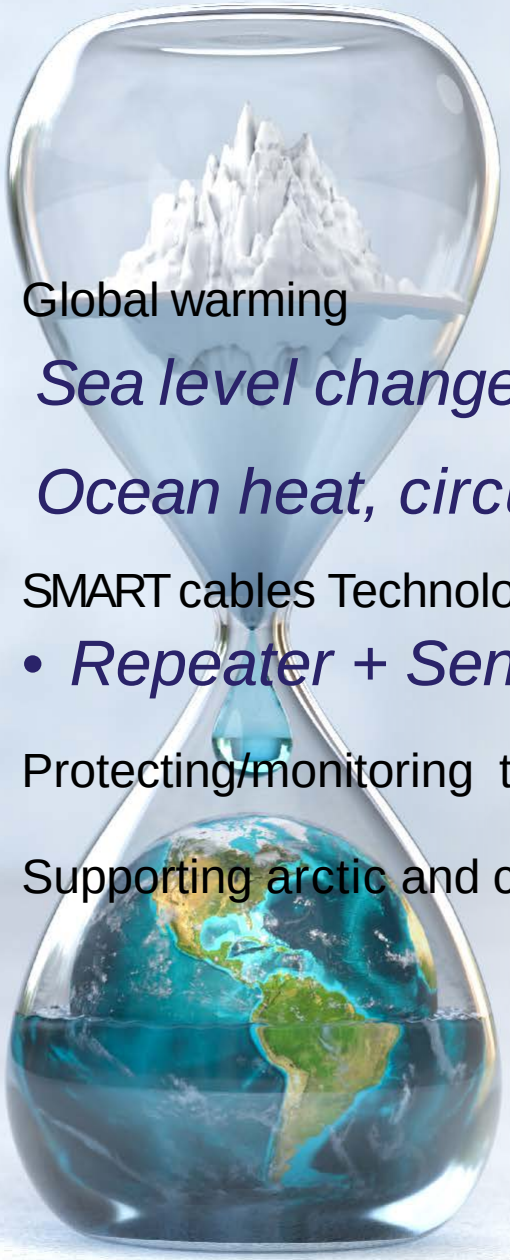
A new Swedish climate neutral research icebreaker for heavy ice conditions

POLAR-CONNECT

“Hybrid” Telecom and Research Infrastructure

Several phased systems proposed
All call for REN and SMART
2026?: NW passage route, Norway-Svalbard
2030?: run nearby North Pole, min latency



CLIMATE AND SMART CABLES

- Global warming
  - *Sea level change*
  - *Ocean heat, circulation*
- SMART cables Technologies
  - *Repeater + Sensors*
- Protecting/monitoring the cables themselves
- Supporting arctic and climate research

SMART Subsea Cables in the Arctic Science

- Bottom temperature, pressure, seismic acceleration, … hydrophone
- **Bottom temperature measure of deep heat content**
- Sea level change
- Horizontal pressure gradients give barotropic flow, ocean circulation
- Marine mammals, soundscapes
- High frequency sampling, no aliasing