

ANTARCTICA INSYNC

**International Science &
Infrastructure for
Synchronous Observation**

An internationally coordinated, circumpolar,
and year-round mission

**2021
2030** United Nations Decade
of Ocean Science
for Sustainable Development



Internationally coordinated observing system to tackle key Antarctic & Southern Ocean challenges

- Year-round & circumpolar observations, in particular in the seasonal ice-covered Southern Ocean & Antarctica
- Observing network: integration of ship-based, autonomous, and remote sensing
- Multidisciplinary observations
- Integration with modelling efforts
- Unified measurements in terms of variables, protocols, meta-data, data publishing





ANTARCTICA INSYNC

International Partnership
for Science and Society



Antarctica InSync international partnership

26 countries and growing



Instituto Antártico
Argentino - **Argentina**



Australian Antarctic Division
- **Australia**



Belgien Science Policy
- **Belgium**



Brazilian Antarctic Program
(PROANTAR) - **Brazil**



Bulgarian Antarctic Institute
- **Bulgaria**



Chilean Antarctic Institute
- **Chile**



Czech Antarctic Research
Programme - **Czech Republic**



French Polar Institute
Paul-Émile Victor - **France**



Alfred Wegener Institute Helmholtz
Centre for Polar and Marine
Research - **Germany**



National Centre for Polar
and Ocean Research -
India



Institute of Polar
Sciences - **Italy**



National Institute of Polar
Research - **Japan**



Antarctica New Zealand –
New Zealand



Norwegian Polar Institute
- **Norway**



Polish Polar Consortium
- **Poland**

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Portuguese Polar Program - **Portugal**



Korea Polar Research Institute – **Republic of Korea**



South Africa Environmental Observation Network – **South Africa**



Spanish Polar Committee - **Spain**



Swedish Polar Research Secretariat - **Sweden**



Swiss Polar Institute - **Switzerland**



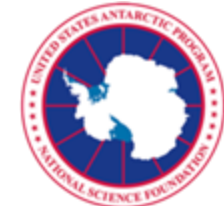
The Netherlands Polar Programme (NPP) - **The Netherlands**



British Antarctic Survey - **UK**



Uruguayan Antarctic Institute - **Uruguay**



U.S. National Science Foundation - **USA**



Dirección de Asuntos Antárticos – Ministerio de Relaciones Exteriores del **Perú**

Partnerships



European Space Agency for remote sensing efforts
(Contact: Martin Wearing)



The proposal was accepted and **Antarctica InSync** is endorsed by **COMNAP** as a support program



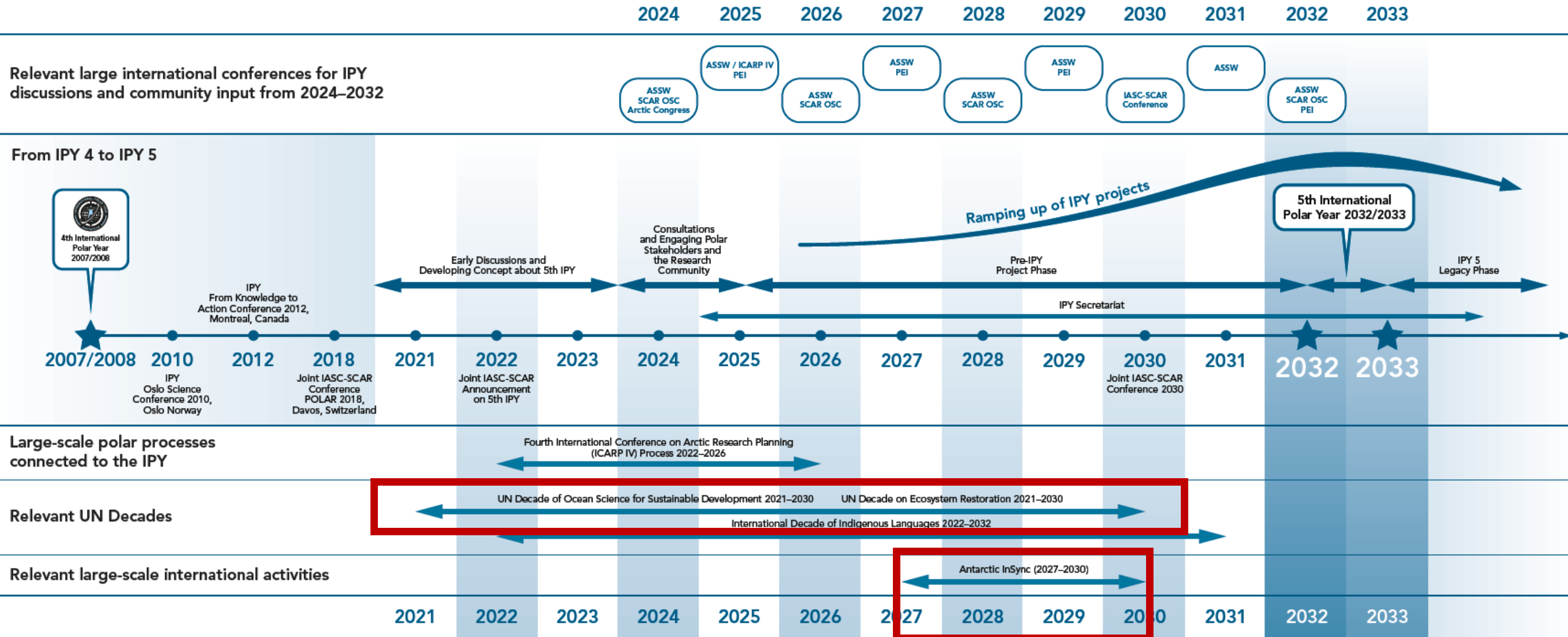
SOOS
SOUTHERN OCEAN
OBSERVING SYSTEM

SOOS is an official Antarctica InSync partner. SOOS & SCAR are forming an internationally distributed Data Task Team for **Antarctica InSync**, supported by national centers (Contact: Michaela Miller; data@soos.aq).



Proposal for a Antarctica InSync Action Group submitted.
Support through the SCAR Equity, Diversity, and Inclusion (EDI) working group (Contact: Inga Beck).

Long-term perspective Towards the 5th International Polar Year (IPY) 2032-33



Antarctica InSync | Timeline



1st SCAR
Antarctic and Southern Ocean Science
Horizon Scan



2025:
Forming of International Working Groups
Development of Science Plan
Expedition and Project Proposals

2023

2027

2030

2032

2033

Preparatory phase

Synchronous
scientific observation

Synthesis
and reporting

5th
IPY



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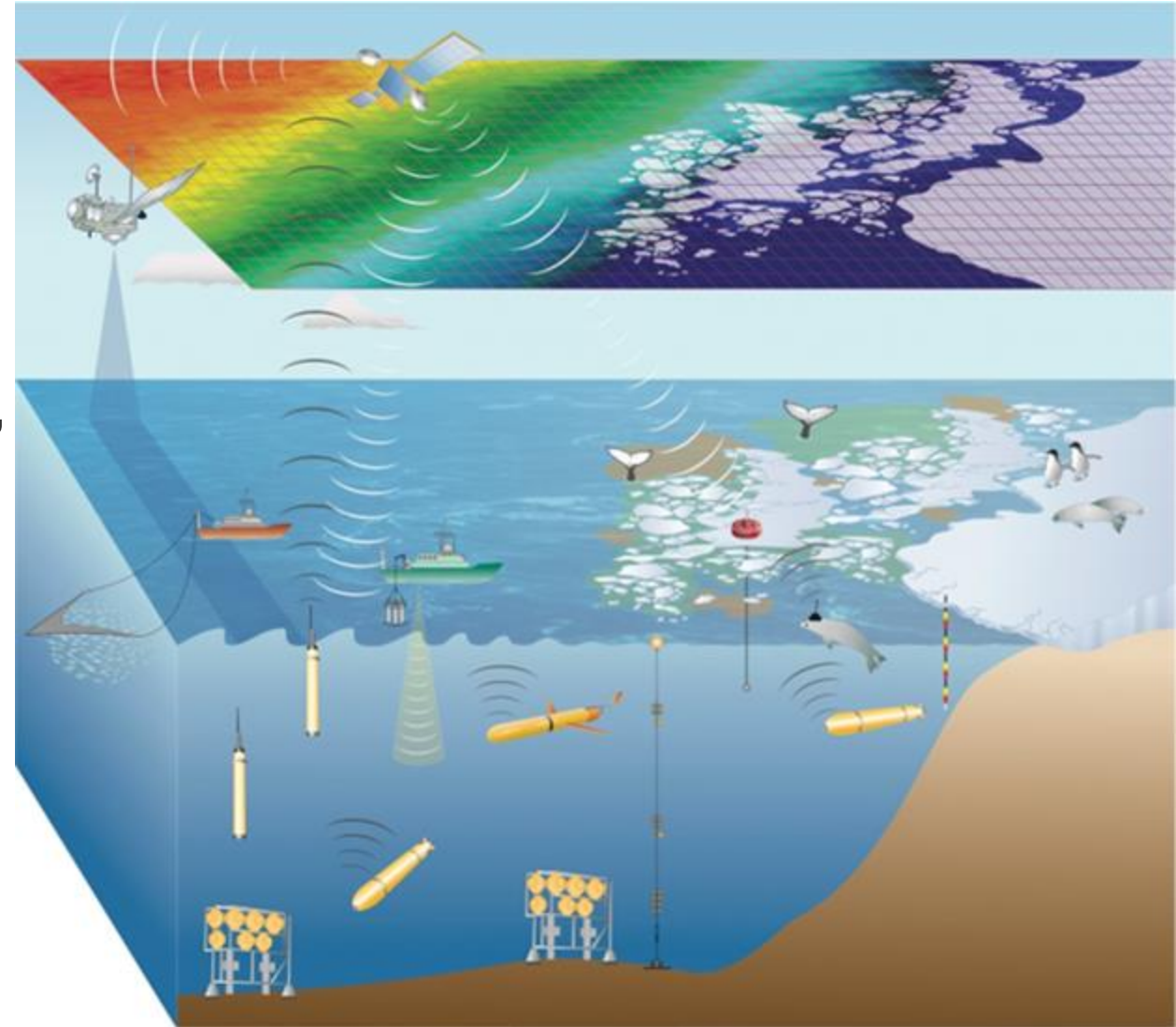
Infrastructure



Cyber-infrastructure & Observing Network



- Research Vessels
- Sailing Vessels
- Ships of Opportunity
- Research Stations
- Autonomous platforms (Argo, Glider, Drones, etc.)
- Instrumented Marine Mammals
- Moorings
- Buoys / Drifters / Ice-tethered platforms
- Airplanes
- Satellites

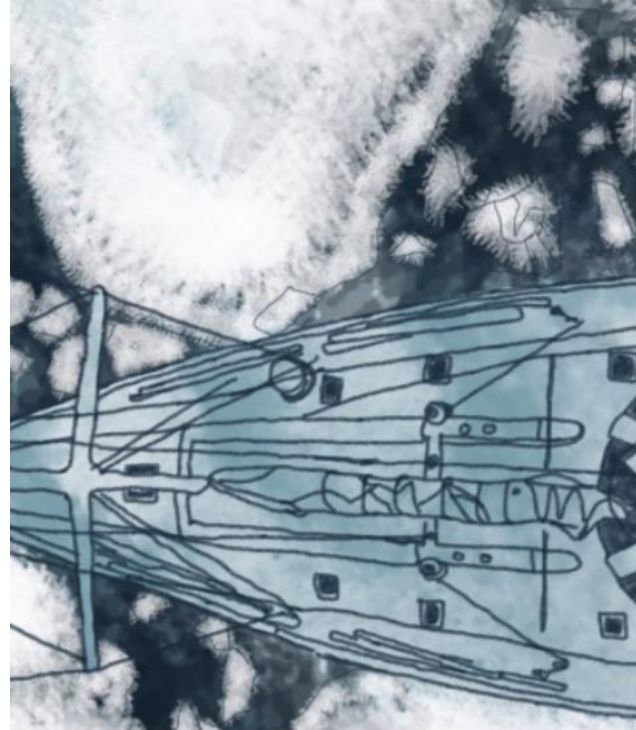


Bringing in new Partners & Platforms

sailing & space science & philanthropy



- Tara Foundation
- Team Malizia/ Vendee globe
- REV Ocean
- Schmidt Ocean



RV Polarstern during Antarctica InSync (2027-2029)



6 expedition legs

- Fall 2027 | KrillBiss, Antarctic Peninsula
- Summer 2027/28 | HAFOS + Neumayer supply
- Fall 2028 | tbd
- Winter 2028 | tbd
- Spring 2028 | tbd
- Summer 2028/29 | tbd

→ shared infrastructure





ANTARCTICA INSYNC

International Scientific Working Groups



Organization of the Science Community



Themes

- Provide scientific framework
- Overarching major challenges
- Interdisciplinary approach

Research Areas

- Sea ice / Ocean / Atmosphere / Biology / Ice Sheet / Seafloor / etc.

National Committees

- Organization of national interests
- Information flow
- Balanced representation of research areas

Working Groups

- Existing / newly formed interest international group
- Contributing to the themes



Steering committee
 Coordination
 Logistics/Coord.
 International coop.
 Science commun.
 Data management
 EDI

Maarten Boersma
 Diego Filun
 Julia Regnery
 Nicole Biebow
 Roland Koch
 Janine Felden (AWI)
 Inga Beck (SCAR/LMU)

Ocean

Alexander Haumann (AWI/LMU)
 Hermann Bange (GEOMAR)

Sea ice

Stefanie Arndt (AWI/UHH)
 Gunnar Spreen (University of Bremen)

Biology

Helena Herr (UHH)
 Bettina Meyer (AWI)

Atmosphere

Markus Rex (AWI)
 Andreas Macke (TROPOS)

Land/Ice sheet

Olaf Eisen (AWI)
 Alexandra Zuhr (University of Tübingen)

Palaeo climate

Frank Lamy (AWI)

Anthropogenic footpr.

Ralf Ebinghaus (Hereon)

APECS representative

Lena Nicola (PIK)

Modelling

Torge Martin (GEOMAR) & Martin Werner (AWI)

National Committee Germany



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Scientific vision of Antarctica InSync



Southern Ocean and Antarctic heat, freshwater, carbon and other elements cycles and their response to climate change



Rapid sea ice decline and its interdisciplinary consequences



Melting ice sheets and ice shelves and coastal impacts



Improving knowledge and protection of the unique Antarctic life: from land to ocean and into the deep sea



Anthropogenic signatures in Antarctica: the race against pollution and other pressures

New themes

- Aerosol-cloud interactions and radiative feedbacks
- Under development:
Climate variability: from extremes, to weather, long-term variability, and global teleconnections

How to contribute & get involved?

International Science teams – Actions to the program



- Register on the Antarctica InSync website (<https://www.antarctica-insync.org>) and follow updates
- Bring forward contributions to “Infrastructure”
- Get in touch with funding agencies and write proposals
- Collect Ideas of working groups and shape them to science plans with some leaders in the field and some representatives of the “next generation”
- Propose to standing working groups, discuss, shape, write a short plan
- Bring plans forward to international steering committee for feedback
- Submit contributing Actions to the UN Ocean Decade



Antarctica InSync

Antarctica International Science & Infrastructure for Synchronous Observation

Antarctica InSync is a global effort to synchronize research across Antarctica and the Southern Ocean, connecting ice, ocean, climate, and life to protect this vital region.