

International Science & Infrastructure for Synchronous Observation (Antarctica InSync)



Antje Boetius
Alfred Wegener Institute Helmholtz Center
for Polar and Marine research

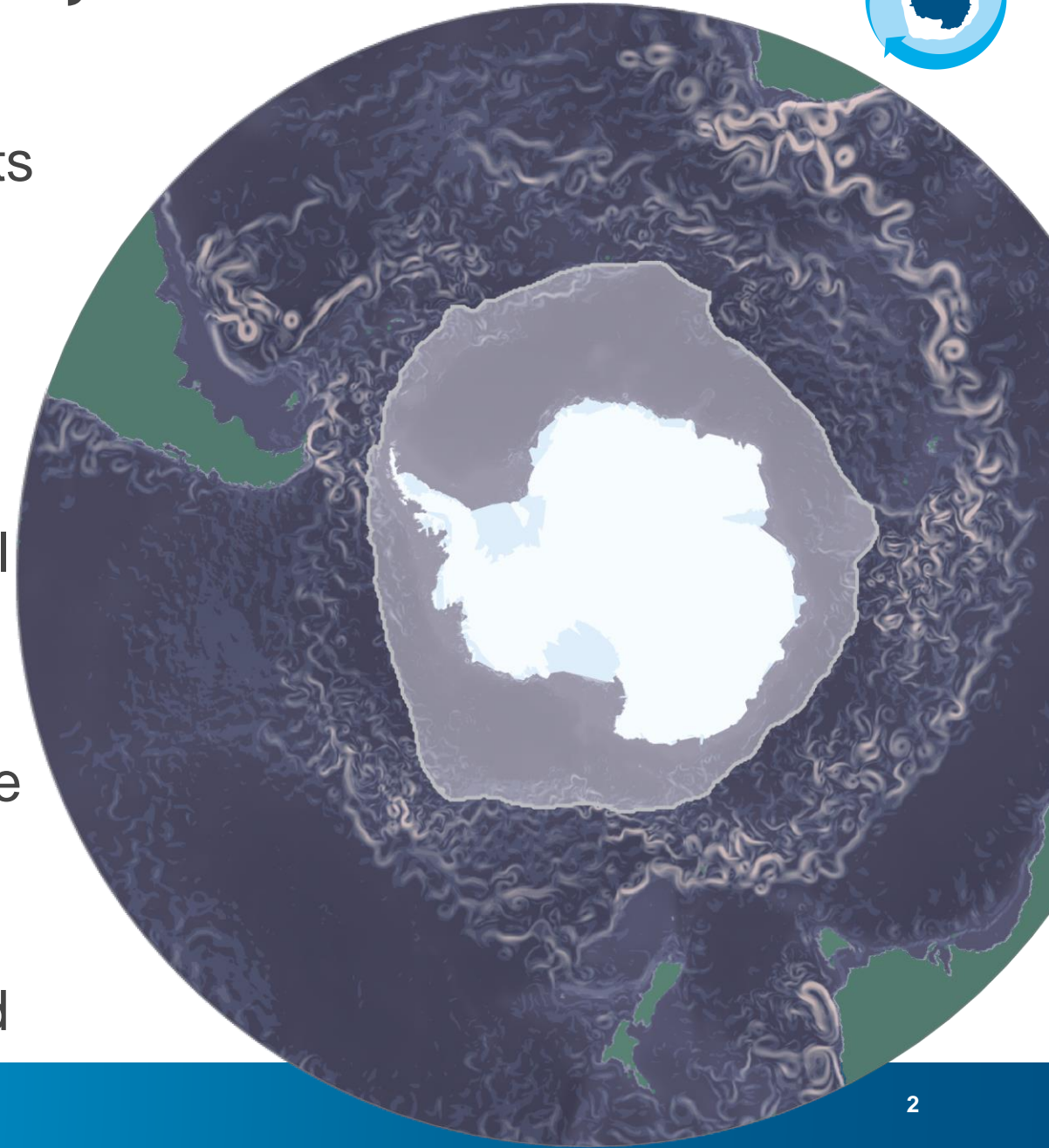
ANTARCTICA
INSYNC

03.09. September EU Polar

A vision for a mission: PanAntarctic Synchronous Science



- Southern Ocean and Antarctica heat, freshwater, carbon and other element budgets and their response to climate change
- Rapid sea ice decline and its causes and consequences
- Melting ice shelves and ice sheets and their connections to coastal ocean and continental margin zones
- Improving knowledge and protection of the unique Antarctic life from land and ice into the deep-sea
- Detecting and abating anthropogenic footprints in atmosphere, ice, ocean and land



ATCM & COMNAP & CCAMLR & SCAR 2023: Proposing UN Decade Program Antarctica InSync



- Method: Coordinated, synchronous observations
Support: ATCM & COMNAP & CCAMLR
- **Alignment with and contribution to SCAR DCC**
- 2024-2026 Preparation phase
- 2027-2030 Field and analysis phase
- New: Provi2032/2033 **Create a stepping stone for the International Polar Year**

- Establishment of coordination office at AWI
International cooperation unit
- E-Mail info@antarctica-insync.org
- Website www.antarctica-insync.org



From the One Planet-Polar Summit: Paris Forum for Peace - November 2023 to preparing for a UN Decade for the Cryosphere



UNESCO general secretary

Audrey Azoulay announced Antarctica Insync as key contribution to the UN Decade for Ocean

Handover of the declaration to 30 heads of state

<https://oneplanetsummit.fr/en/events-16/one-planet-polar-summit-284>



G7 Science and Technology Ministers' Meeting Communiqué

(Bologna and Forlì, July 9-11, 2024)

*Since then: many more international statements that international collaboration in observation and in improving prediction is key. e.g. G7; G20
New: UN Decade of Actions for Cryospheric Sciences 2025-2034*

Antarctica INSYNC time plan

2022	EOI submission to UN Decade program and SCAR
2023	Presentations at ATCM, COMNAP, SCAR, SOOS etc
2024-2026	Preparatory Phase
2027-2029	Implementation Phase / Fieldwork
2029-2030	Completion and Reporting Phase



ANTARCTICA INSYNC

International Partnership
for Science and Society



Combining international activities – “better together”



Science / Policy / Society

Infrastructure



URGENT MESSAGES FROM THE SOUTH: ANTARCTIC AND SOUTHERN OCEAN SCIENCE AND POLICY

Strategic Plan 2023 - 2028

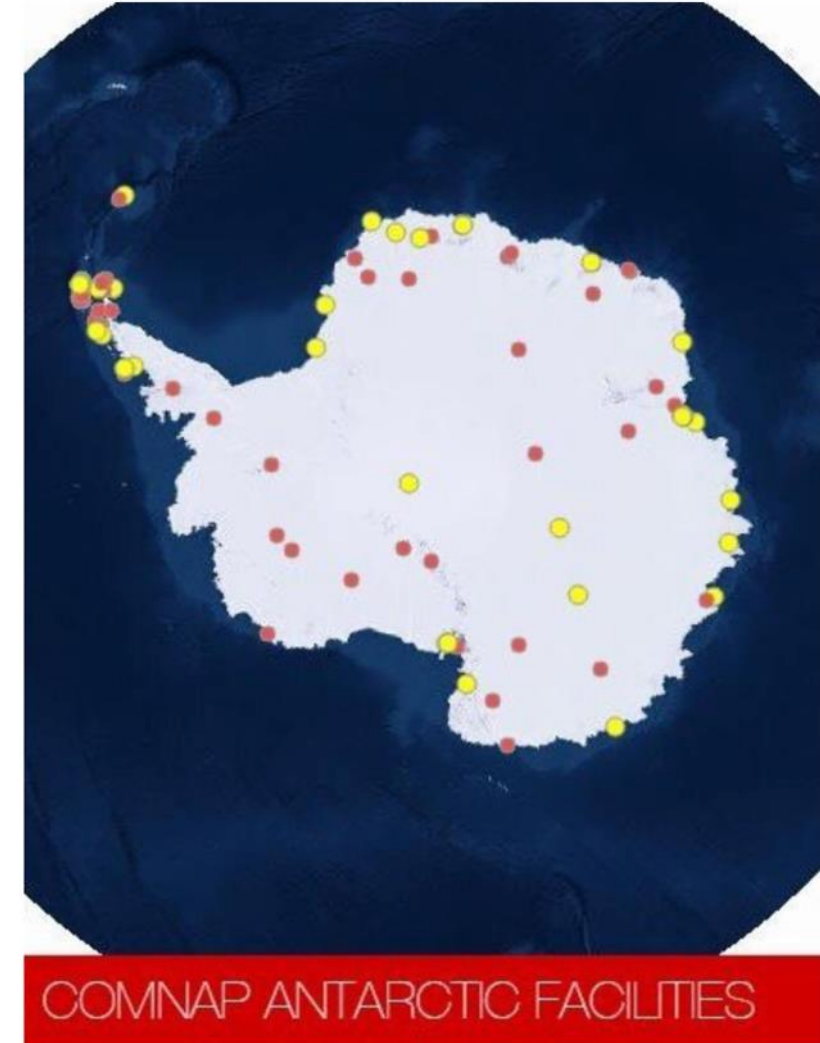
SCAR will focus on seven main objectives over the next five years:

- i.** Promote SCAR's leadership in science by strengthening and expanding high-quality, collaborative, visionary and societally relevant research through international partnerships while addressing urgent global priorities including climate change and biodiversity.
- ii.** Provide independent scientific advice to the Antarctic Treaty System (ATS) and other international bodies in response to science and knowledge needs identified by policymakers.
- iii.** Encourage and facilitate unrestricted and free access to Antarctic research data and samples in support of all the above objectives.
- iv.** Enhance and expand research capacity in SCAR's member countries, recruit new members, and encourage the support of research that addresses the above imperatives.
- v.** Increase public awareness and understanding of Antarctic issues and the essential roles Antarctica and the Southern Ocean play in the Earth's climate systems.
- vi.** Ensure equality, diversity, and inclusion (EDI) principles are applied to all of SCAR's activities and actions, including SCAR's management, structure, and the realization of its missions and vision.
- vii.** Reduce the carbon footprint of all SCAR activities.

Southern Ocean Action Plan

2021 – 2030

In support of the United Nations Decade of Ocean Science for Sustainable Development





Partnership in Antarctica InSync .. International Steering Board of Sci & Infra Directors

[AAD Rhonda.Bartley@aad.gov.au](mailto:Rhonda.Bartley@aad.gov.au)

[AntarcticaNZ J.Hendrikx@antarcticanz.govt.nz](mailto:J.Hendrikx@antarcticanz.govt.nz)

[AWI antje.boetius@awi.de](mailto:antje.boetius@awi.de)

[BAS janefr@bas.ac.uk](mailto:janefr@bas.ac.uk)

[BAI dragomir.mateev@gmail.com](mailto:dragomir.mateev@gmail.com)

[CCMAR acanario@ualg.pt](mailto:acanario@ualg.pt)

[C. Pol. Espanol antonio.quesada@ciencia.gob.es](mailto:antonio.quesada@ciencia.gob.es)

[CPC jefferson.simoes@ufrgs.br](mailto:jefferson.simoes@ufrgs.br)

[Czech Ant. Res. Prog. Daniel.Nyvlt@sci.muni.cz](mailto:Daniel.Nyvlt@sci.muni.cz)

[IAA qum@mrecic.gov.ar](mailto:qum@mrecic.gov.ar)

[INACH alopez@inach.cl](mailto:alopez@inach.cl)

[İTÜ PolReC burcu.ozsoy@tubitak.gov.tr](mailto:burcu.ozsoy@tubitak.gov.tr)

[IPEV Yan.Ropert-Coudert@ipev.fr](mailto:Yan.Ropert-Coudert@ipev.fr)

[ISP barbante@unive.it](mailto:barbante@unive.it)

[KOPRI hcshin@kopri.re.kr](mailto:hcshin@kopri.re.kr)

[NCPOR meloth@ncpor.res.in](mailto:meloth@ncpor.res.in)

[NIPR nogi@nipr.ac.jp](mailto:nogi@nipr.ac.jp)

[NPI camilla.brekke@npolar.no](mailto:camilla.brekke@npolar.no)

[NSF jcallen@nsf.gov](mailto:jcallen@nsf.gov)

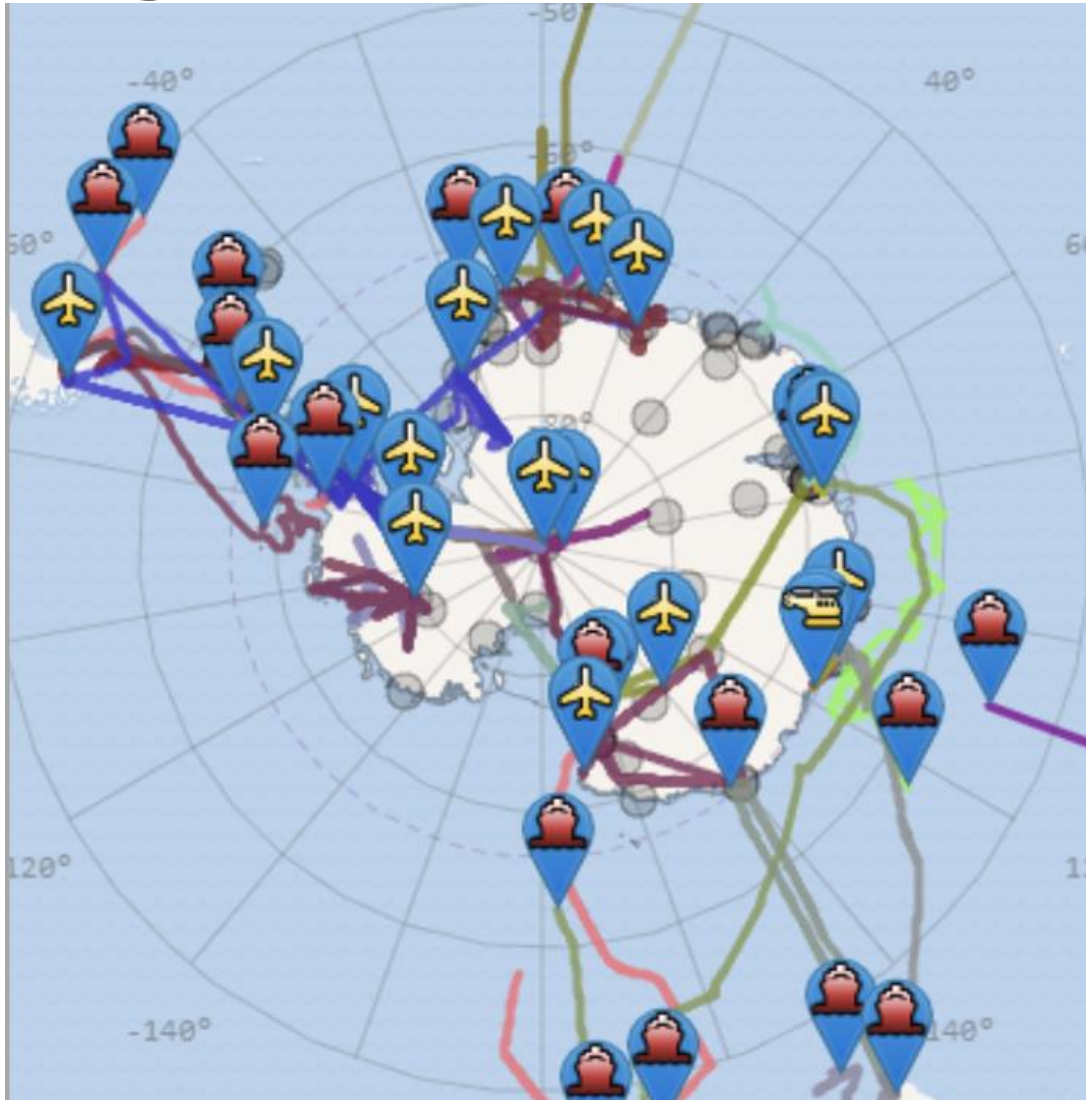
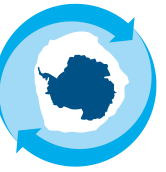
[PFS Katarina.gardfeldt@polar.se](mailto:Katarina.gardfeldt@polar.se)

[SPI daniele.rod@swisspolar.ch](mailto:daniele.rod@swisspolar.ch)

[SAEON jc.hermes@saeon.nrf.ac.za](mailto:jc.hermes@saeon.nrf.ac.za)

[UAI/PNA gerardo.prato@mrree.gub.uy](mailto:gerardo.prato@mrree.gub.uy)

Key Task : Scheduling of platforms via National programs and COMNAP



- Ships
- Planes / helicopters
- Traverse
- Stations
- Autonomous deployments
- Remote sensing missions

- Other partner platforms

Council of Managers of National Antarctic Programs (COMNAP) Assets app

New: POLARIN- style facilitation POLAR Research Infrastructure Network

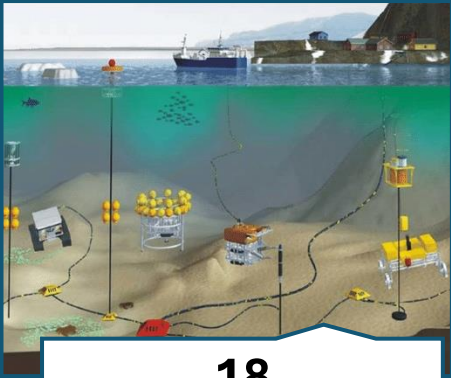
Access integration to **64** research infrastructures and their services
in **both poles.**



38
Research stations



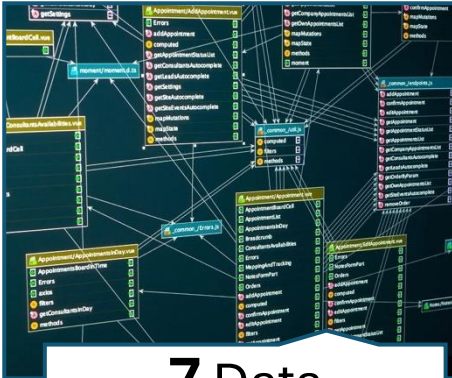
12
Polar vessels



18
Observatories



4 Ice and sediment
core repositories



7 Data
infrastructures

Consortium

16 European countries
6 non-European countries
50 consortium members

Coordinator



Duration

01.03.2024 – 30.02.2029

Funding

€14,588,114

Grant Agreement No.

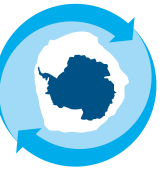
101130949

Project coordinator

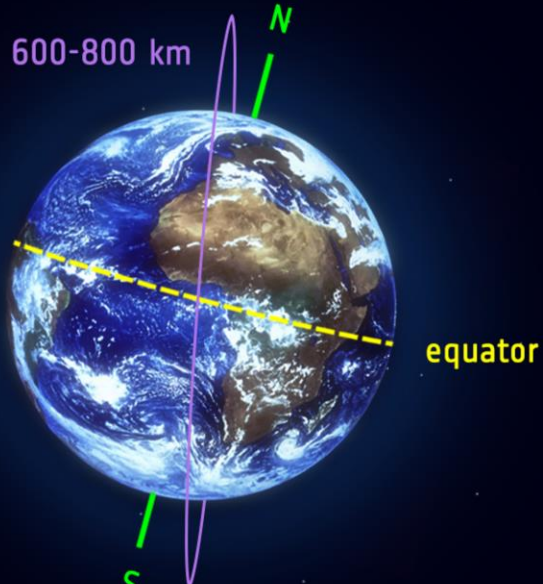
Nicole Biebow (AWI)



Bringing in new Partners & Platforms e.g. Satellites & Sailors



SSO





ANTARCTICA INSYNC

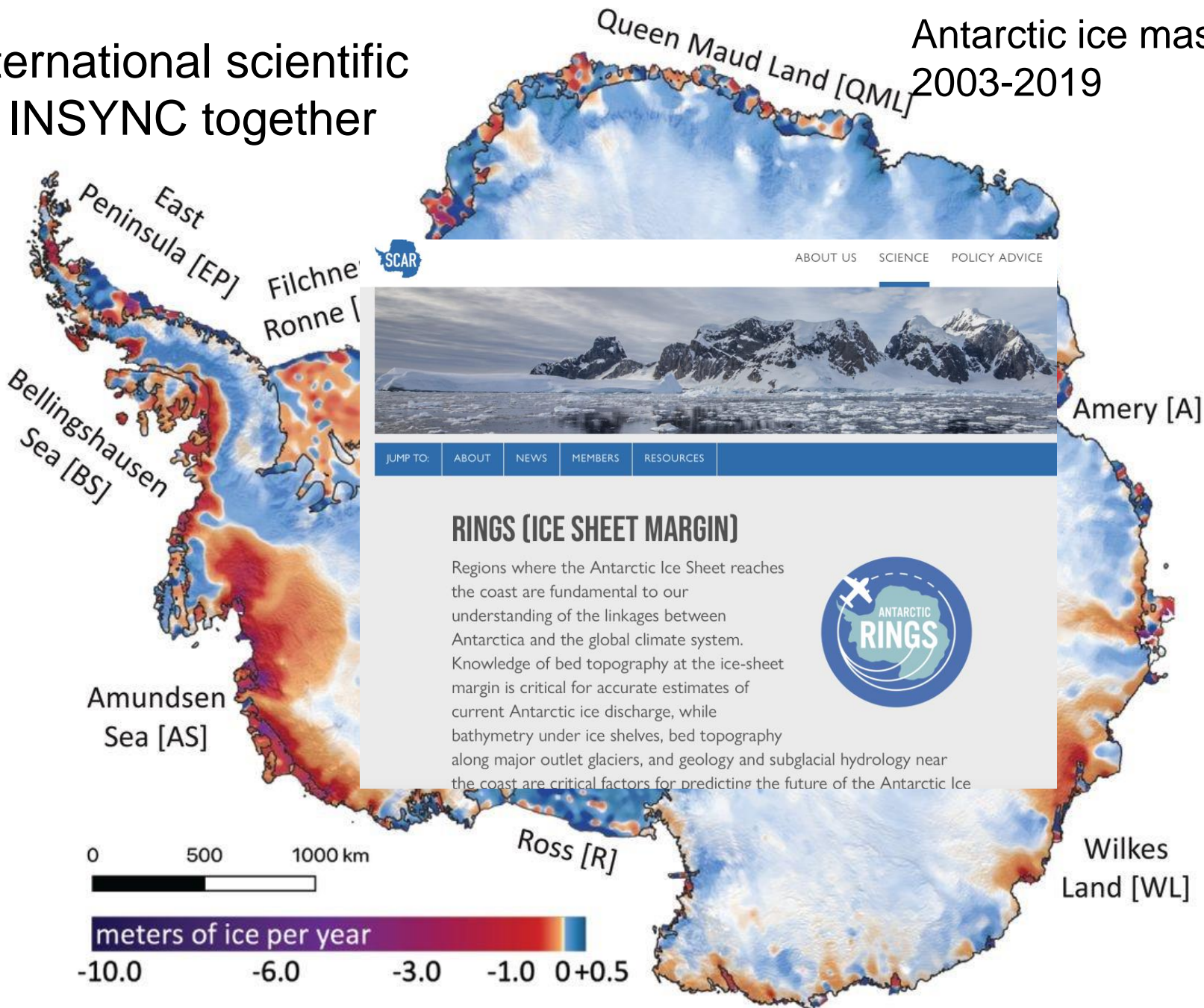
International Scientific Working Groups



Examples: Involving international scientific working groups to plan INSYNC together

Antarctic ice mass loss 2003-2019

How will changes in surface melt over the ice shelves and ice sheet evolve, and what will be the impact of these changes?

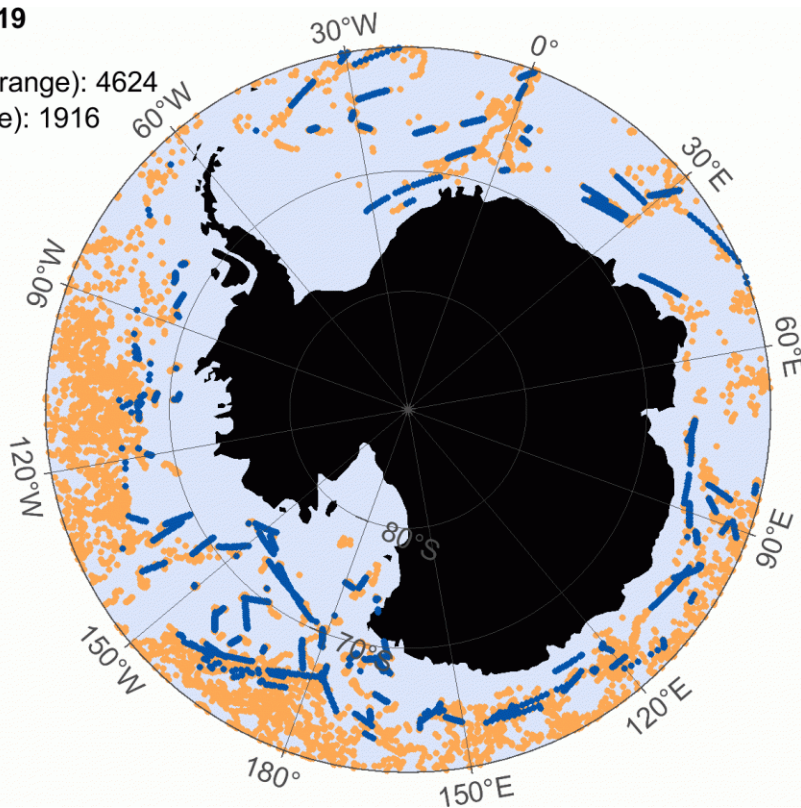


Smith et al. 2020

Polar ARGO + BGC / Southern Ocean Carbon and Climate Observations and Modeling (SOCCOM)

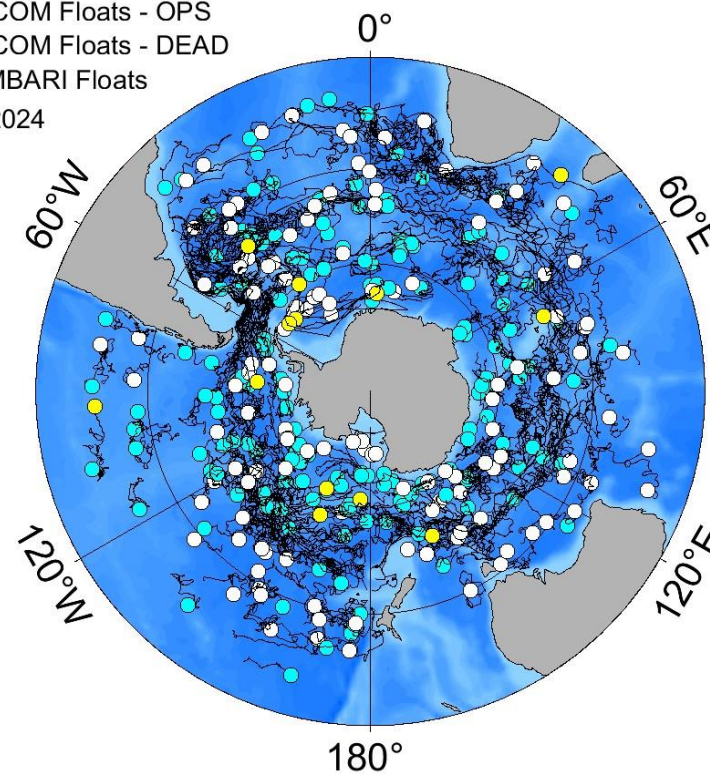
Profiles in 2019

Open water (orange): 4624
Under Ice (blue): 1916



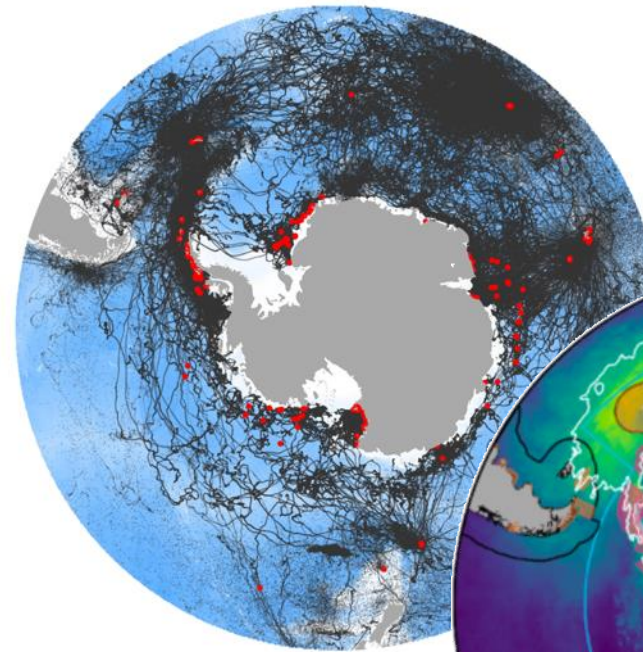
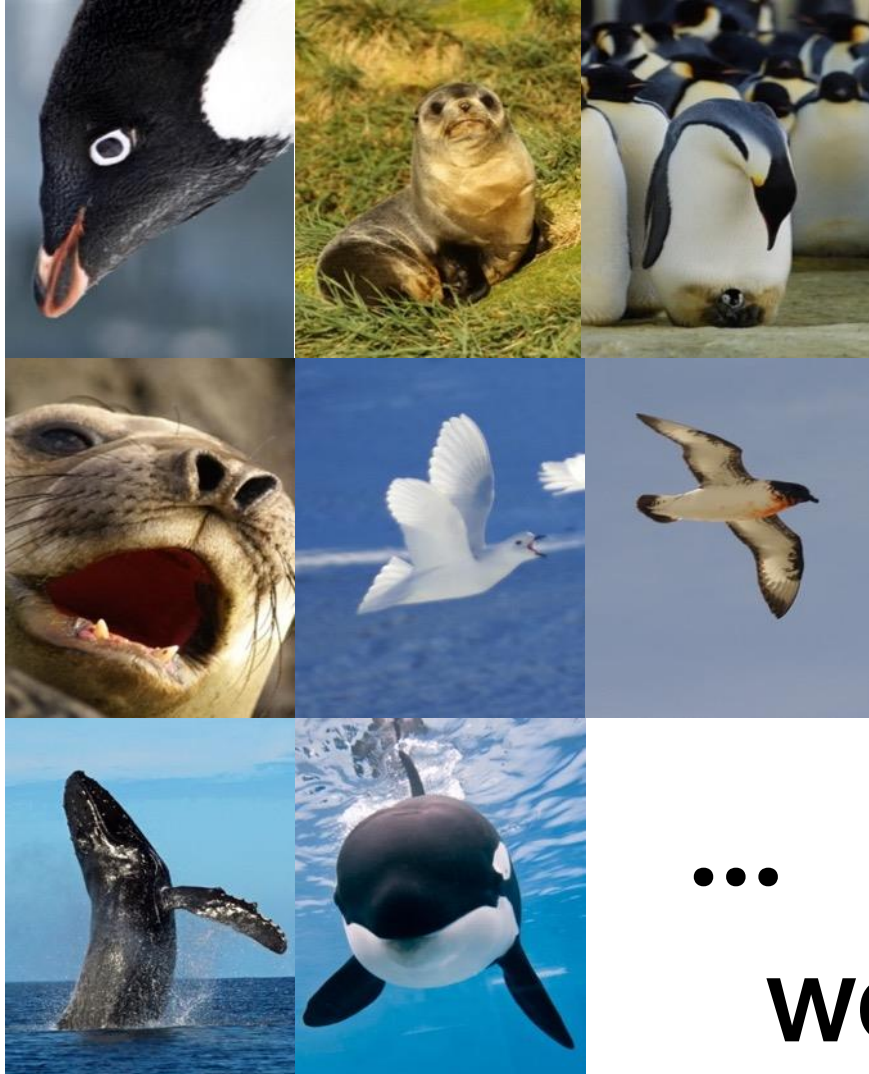
<https://argo.ucsd.edu/expansion/polar-argo/>

○ SOCCOM Floats - OPS
● SOCCOM Floats - DEAD
● UW/MBARI Floats
15-Aug-2024

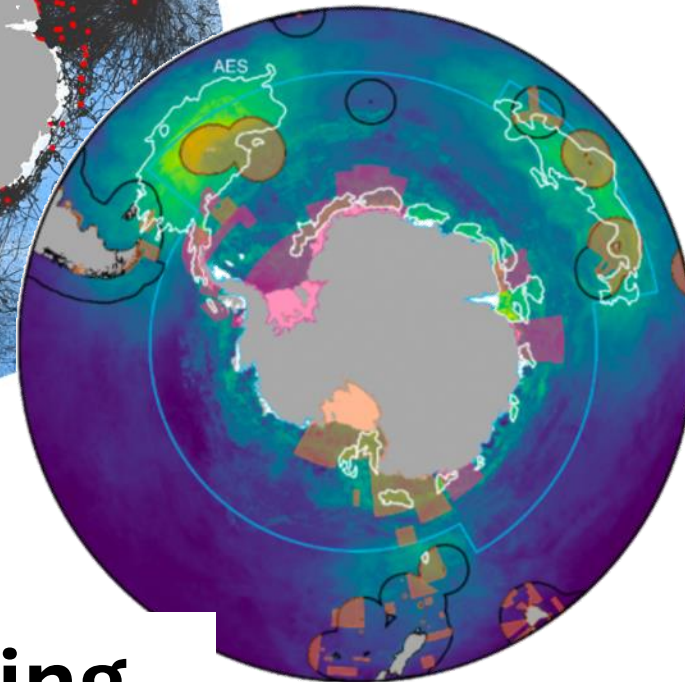


SOCCOM has an array size of about 150 ice-capable biogeochemical profiling floats throughout the Southern Ocean and 30 more floats per year will be deployed until 2024

Examples: Involving international scientific working groups to plan INSYNC together



Retrospective Analysis of Antarctic Tracking Data

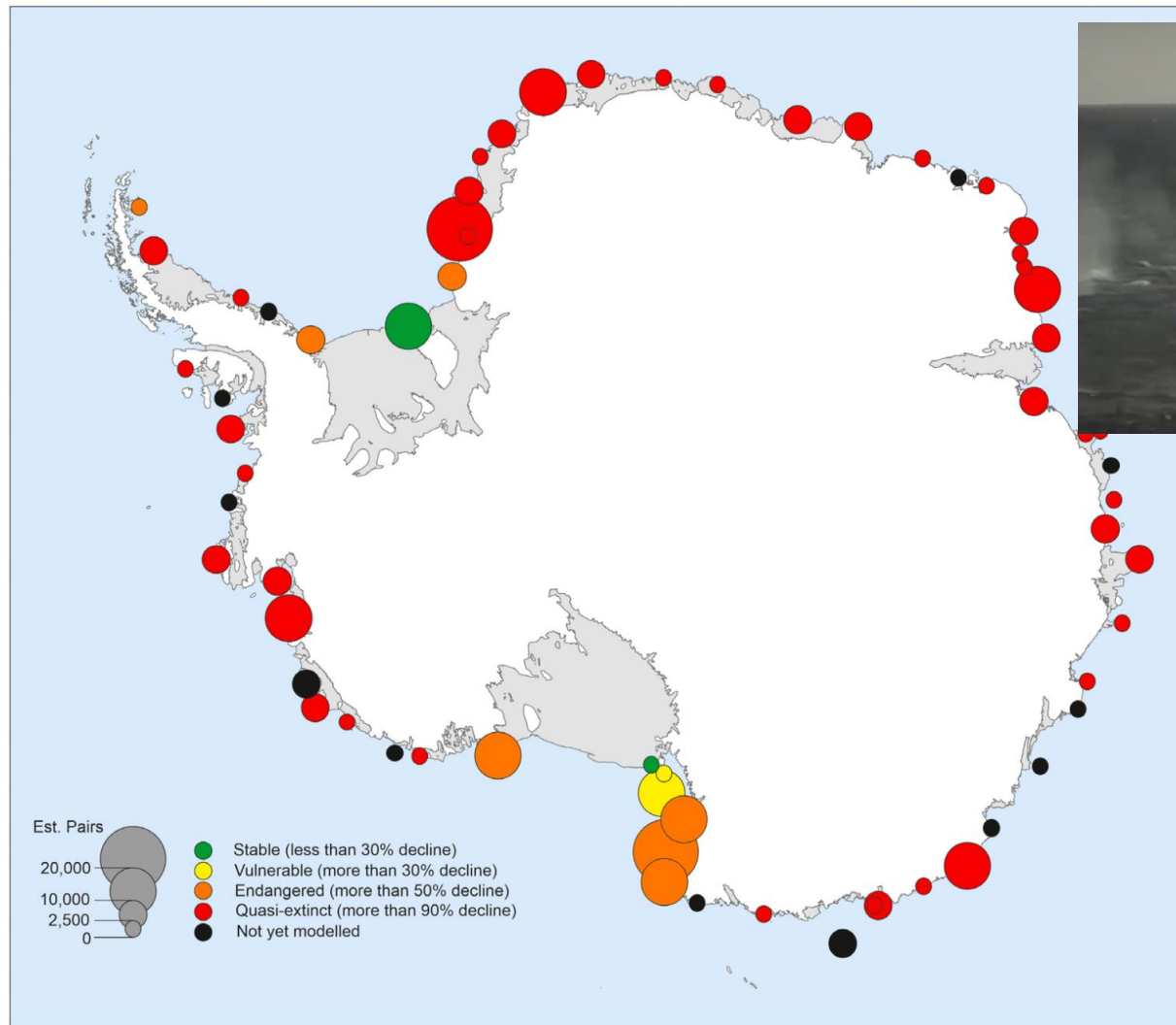


...

WG - Bio-logging

Hindell et al. 2020 Nature

Biodiversity information by remote sensing



Remote Sensing in Ecology and Conservation.

Examples: Involving international scientific working groups to plan INSYNC together



Southern Ocean Genomics- Macro to micro scale diversity



10 YEARS. 10 CHALLENGES. 1 OCEAN.

A Science Mission for Antarctica and the Southern Ocean in 2027-2030 as a contribution to the UN Ocean Decade

2024-2026 preparatory phase >>> 2027-2030 field phase

Antarctica InSync proposes a joint, multidisciplinary science program in Antarctica and the Southern Ocean, inspired by the success of initiatives like the MOSAiC Expedition. This program aims to unite national Antarctic programs in synchronous observation, addressing key knowledge gaps and contributing to the goals of the UN Ocean Decade.

[LEARN MORE](#)



Understand and beat marine pollution



Protect and restore ecosystems and biodiversity



Unlock ocean-based solutions to climate change



Expand the Global Ocean Observing System



Create a digital representation of the ocean



Change humanity's relationship with the ocean





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.