

ANTARCTICA INSYNC

International Science &
Infrastructure for
Synchronous Observation

An internationally coordinated, circumpolar,
and year-round mission

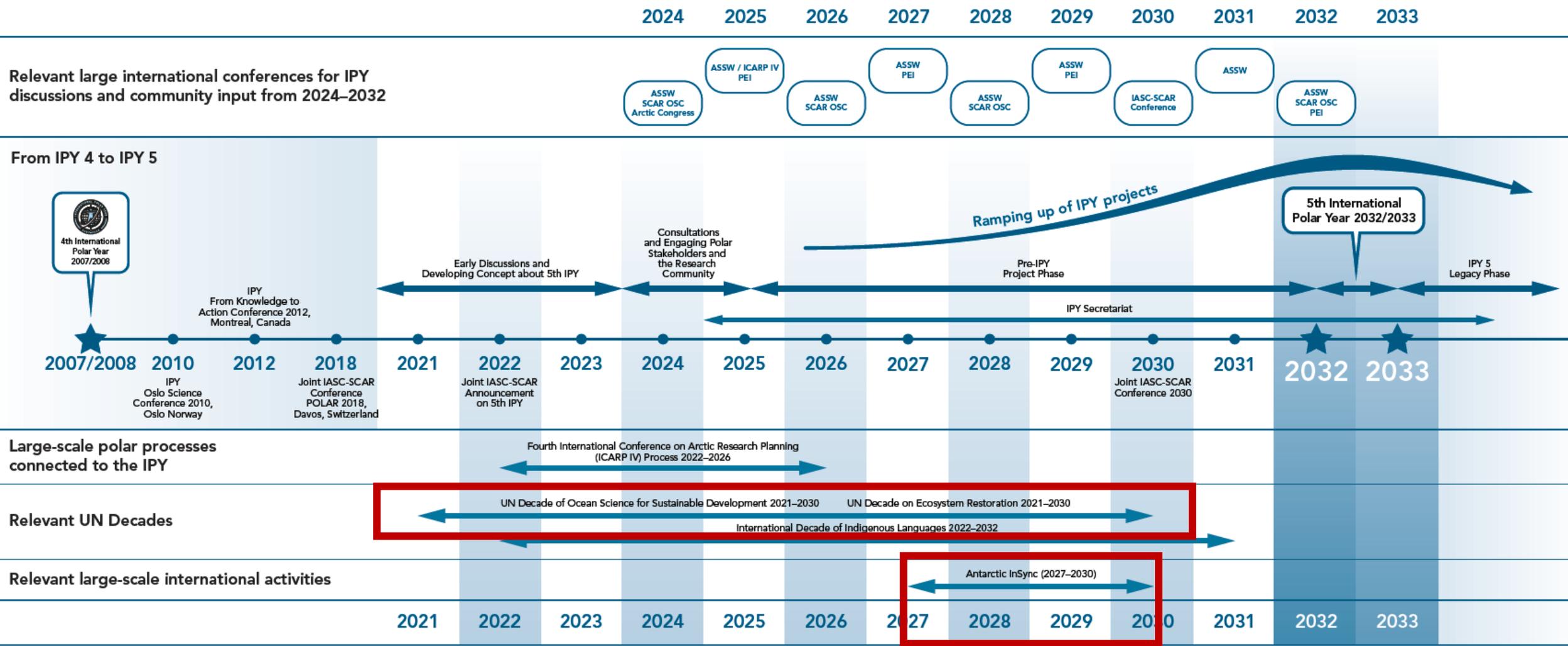
2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development





Long-term perspective

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

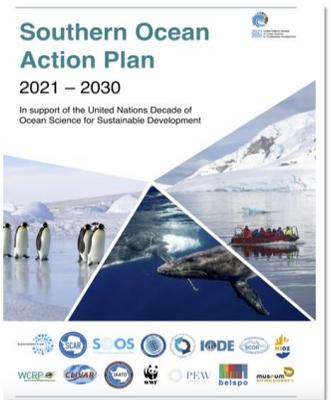


Background: Identifying the need for the program

UN Decade of the Ocean



Southern Ocean Action Plan



SCAR



SCAR Horizon Scan

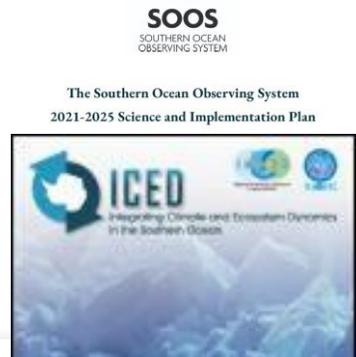
1st SCAR Antarctic and Southern Ocean Science Horizon Scan



SOOS / ICED



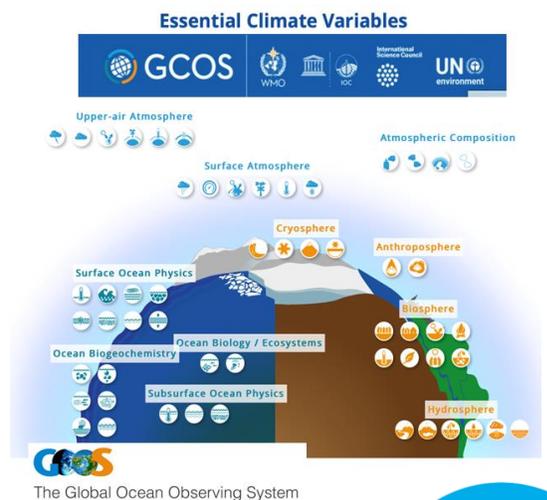
Science and Implementation Plans



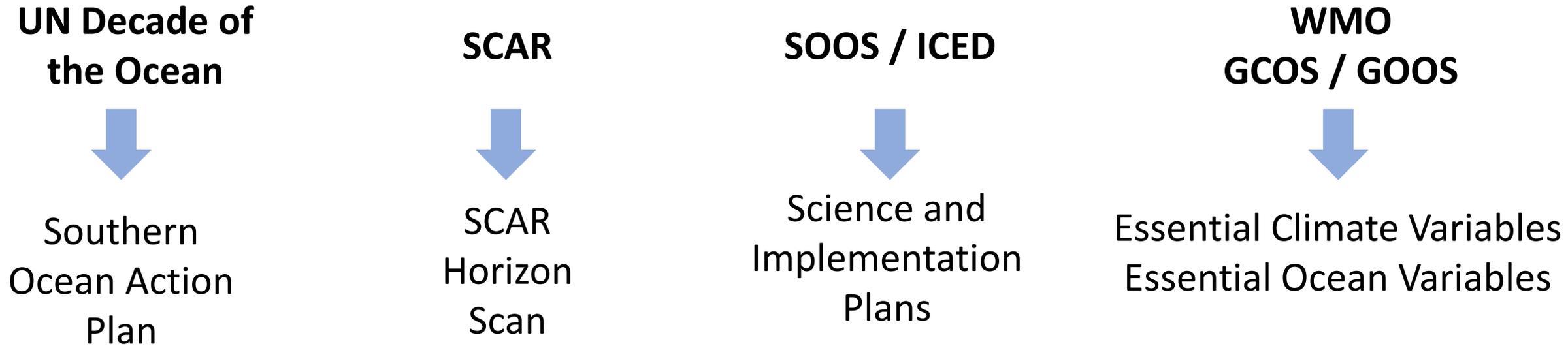
WMO GCOS / GOOS



**Essential Climate Variables
Essential Ocean Variables**



Background: Identifying the need for the program



- Year-round & circumpolar observations, in particular in the seasonal ice-covered Southern Ocean
- 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
- International coordination



A unique opportunity for the community

SCAR



Southern Ocean UN Decade
Collaborative Centre (DCC)



ATCM

Information paper by Germany, Australia,
France, Italy, Norway, UK, USA, ...

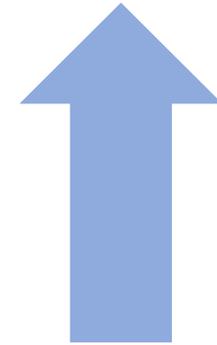


Antarctica InSync
Program



Coordination &
Infrastructure

Science,
planning,
fieldwork



**Expert / Action / Working
Groups, Communities**

SOOS, ICED, ASPeCt, SORP,
BEPSII, SKEG, RINGS, SIPN
South, etc.

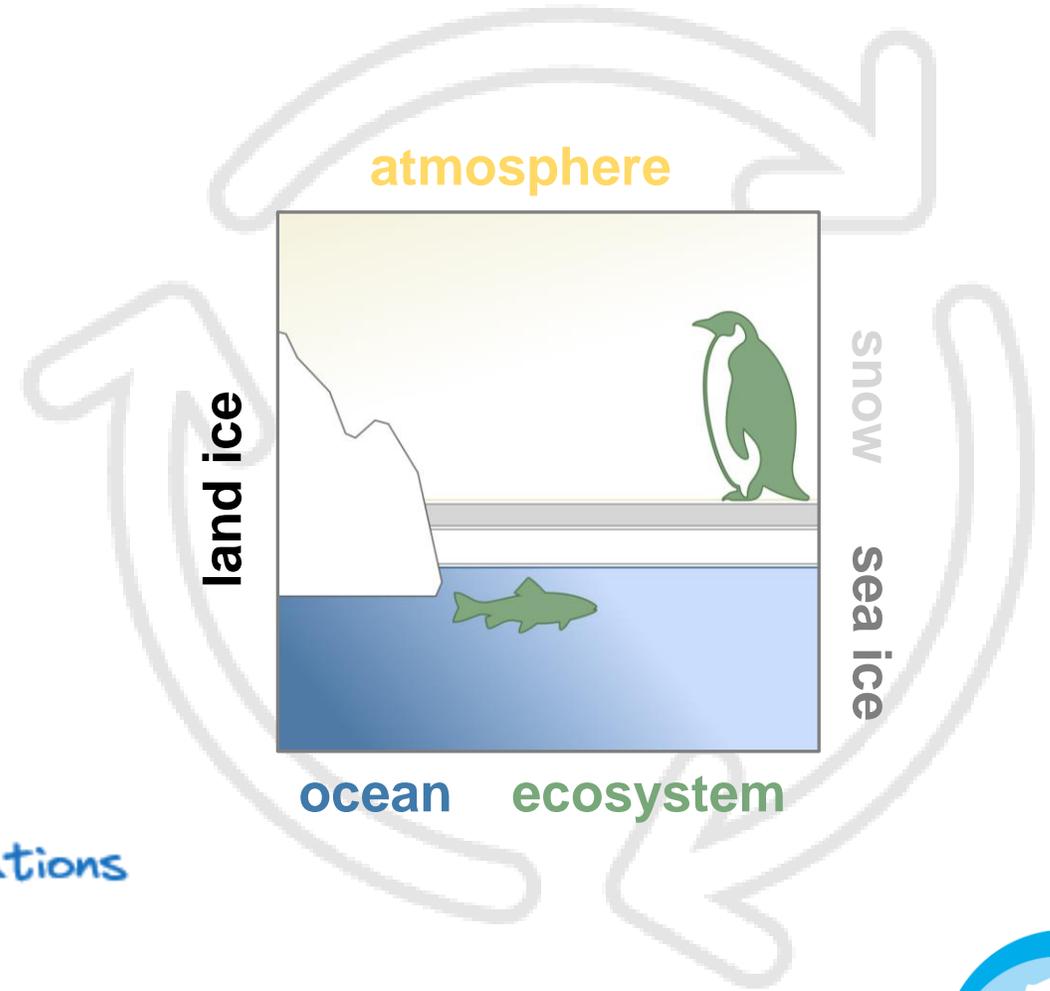
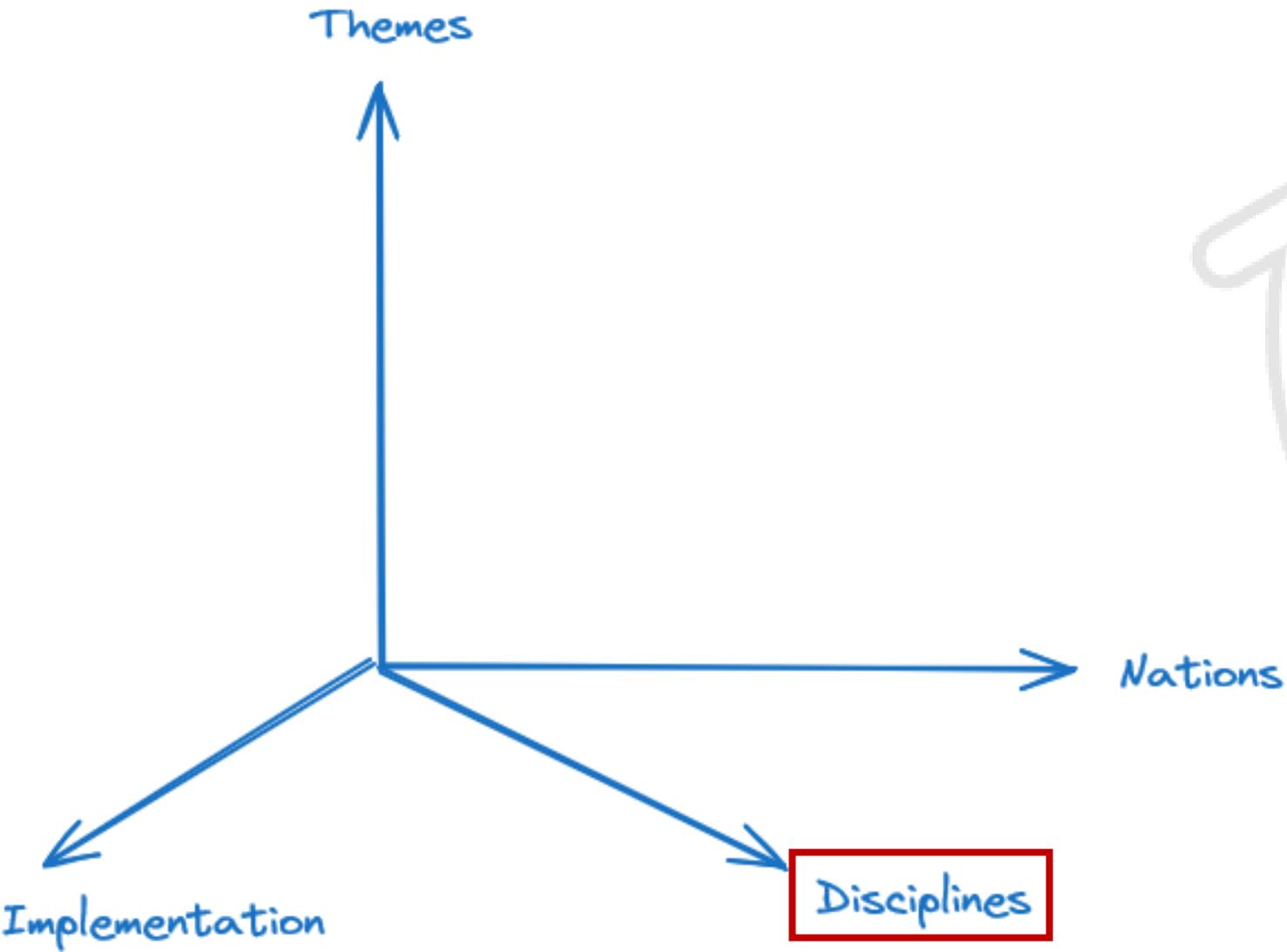


Anticipated time-line for Antarctica InSync

2022	EOI submission to UN Decade program and SCAR
2023	Presentations at ATCM, COMNAP, SCAR, SOOS etc.
2023	Approved as a UN Ocean Decade program
2023-2024	Communication, workshops & identification of science priorities
2025	ESA workshops for each research theme
2025	Writing of science implementation plan by working groups
2025-2026	Proposal writing, planning & preparatory phase
2027-2029	Fieldwork & implementation phase
2029-2030	Completion and reporting phase



Structure of Antarctica InSync



Scientific Vision of Antarctica InSync

Themes

Andrew Meijers (BAS)
Marcel du Plessis (GU)



Southern Ocean heat, freshwater, and carbon budgets and their response to climate change

Nadine Johnston (BAS)



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



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



Rapid sea ice decline and its interdisciplinary consequences

Petra Heil (AAD/UTAS)



Melting ice shelves and coastal impacts

Tore Hattermann (NPI)

Nations

Implementation

Disciplines



Thank you!

info@antarctica-insync.org

stefanie.arndt@awi.de

alexander.haumann@awi.de

<https://www.antarctica-insync.org>



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development

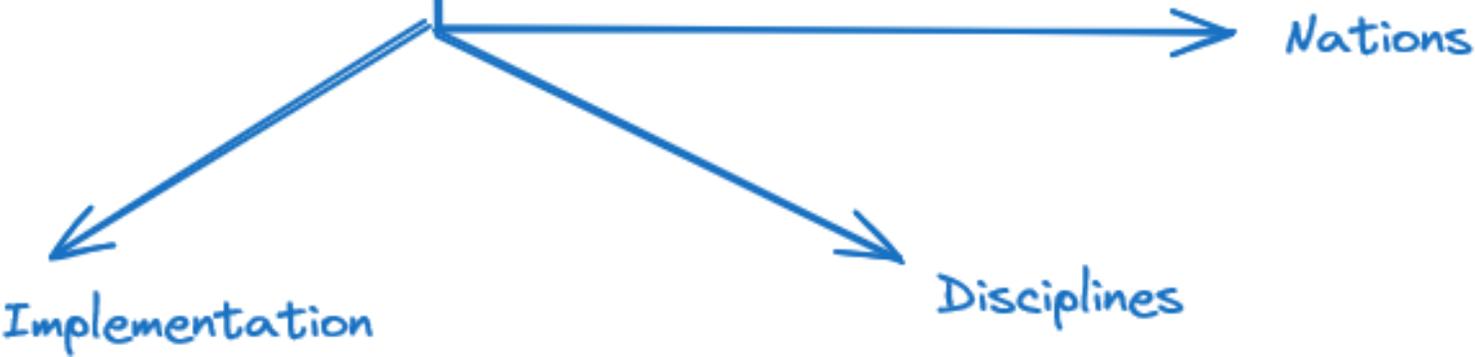


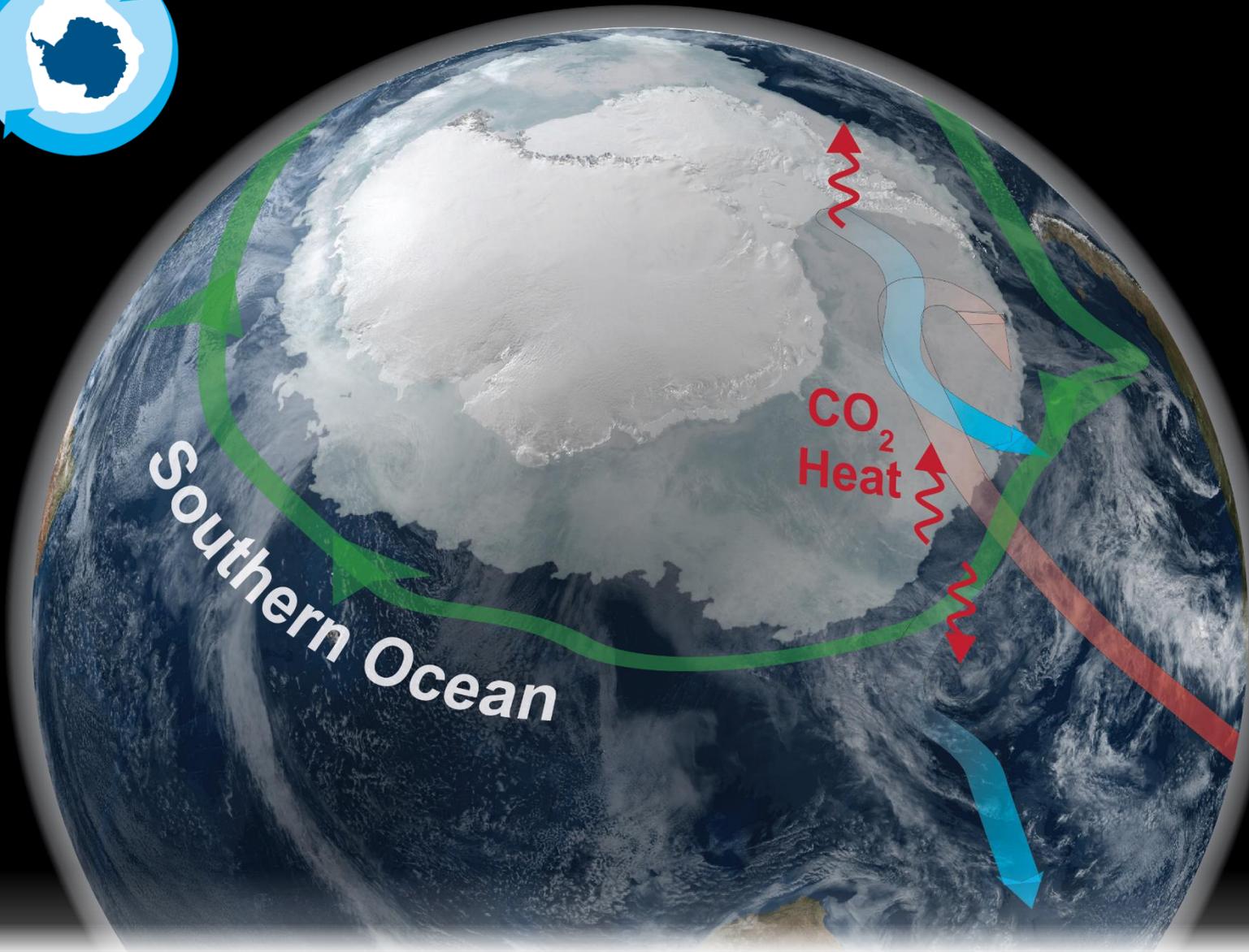
ANTARCTICA
INSYNC

Structure of Antarctica InSync

Themes

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





Returns up to 80% of all deep water to surface

Releases heat and CO₂ to the atmosphere

Subducts large amounts of anthropogenic CO₂ (13%) and heat (68%)
→ Slowing-down global warming

Loses heat around the continent and melts ice shelves
→ Contributing to sea-level rise

Hosts the largest seasonal events on Earth (sea ice), which has been changing abruptly

Is home to one of the most unique ecosystems on Earth, sensitive to environmental changes

→ If we want to understand future local and global climate change and its impact on the ecosystem, we have to understand the Southern Ocean heat, freshwater and carbon budgets!



Antarctic Treaty

1959

→ Regulates international relations on a political/diplomatic level



COMNAP

Council of Managers
of National Antarctic Programs

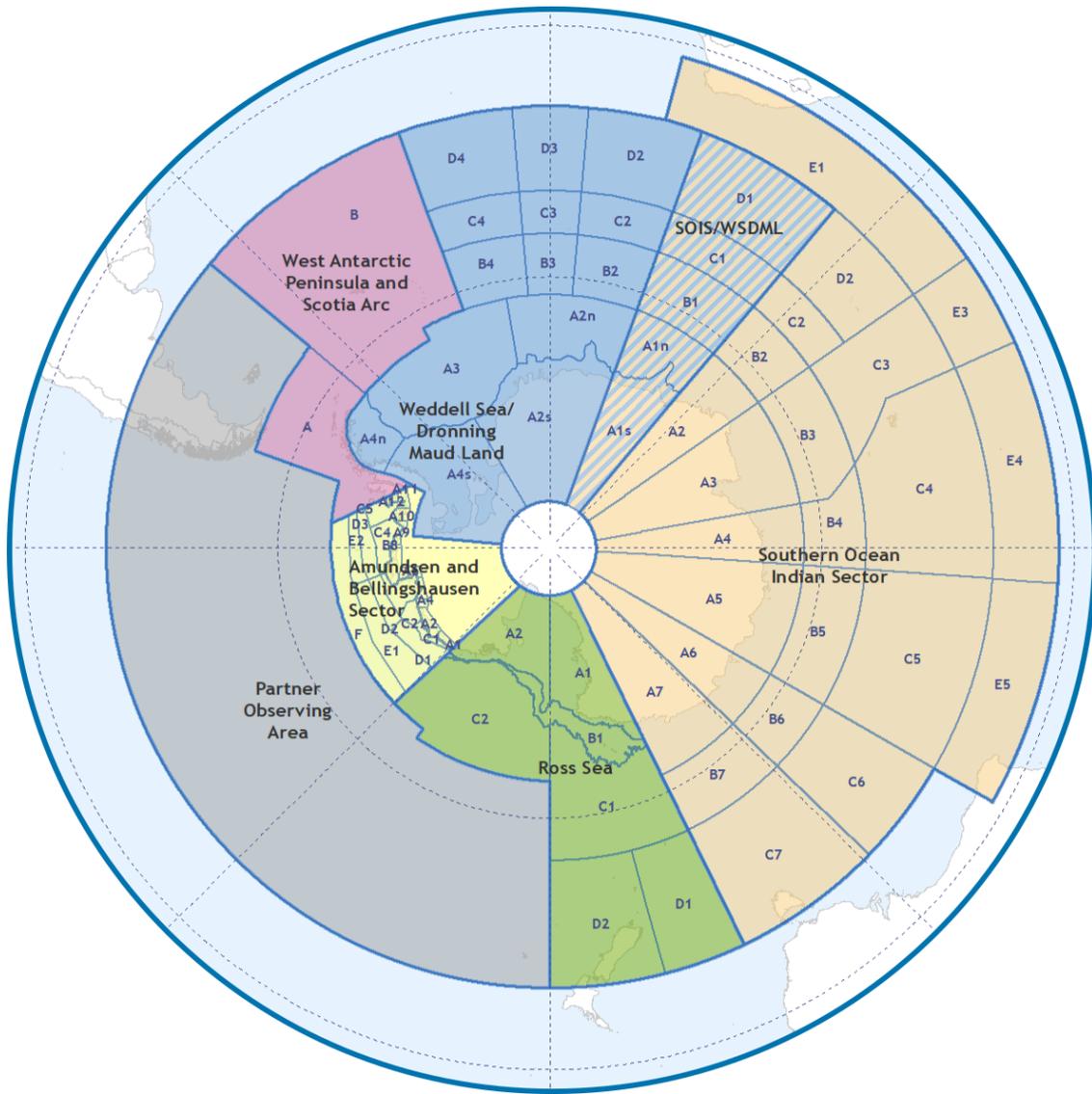
1988

→ Coordinates national programs, infrastructure, operations, safety, environmental management & protection

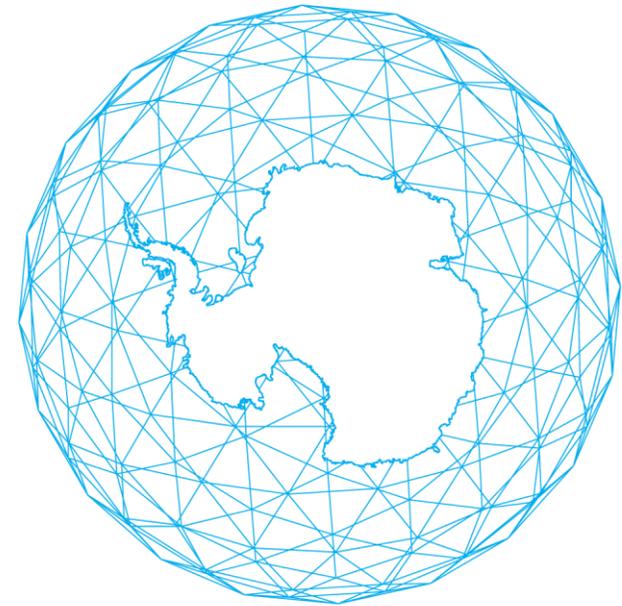


1958

→ Initiates, develops and coordinates international scientific research



→ Strong regional focus by different countries



SOOS

SOUTHERN OCEAN
OBSERVING SYSTEM

2011

→ Aims to sustain, integrate, and coordinate observations across disciplines and countries