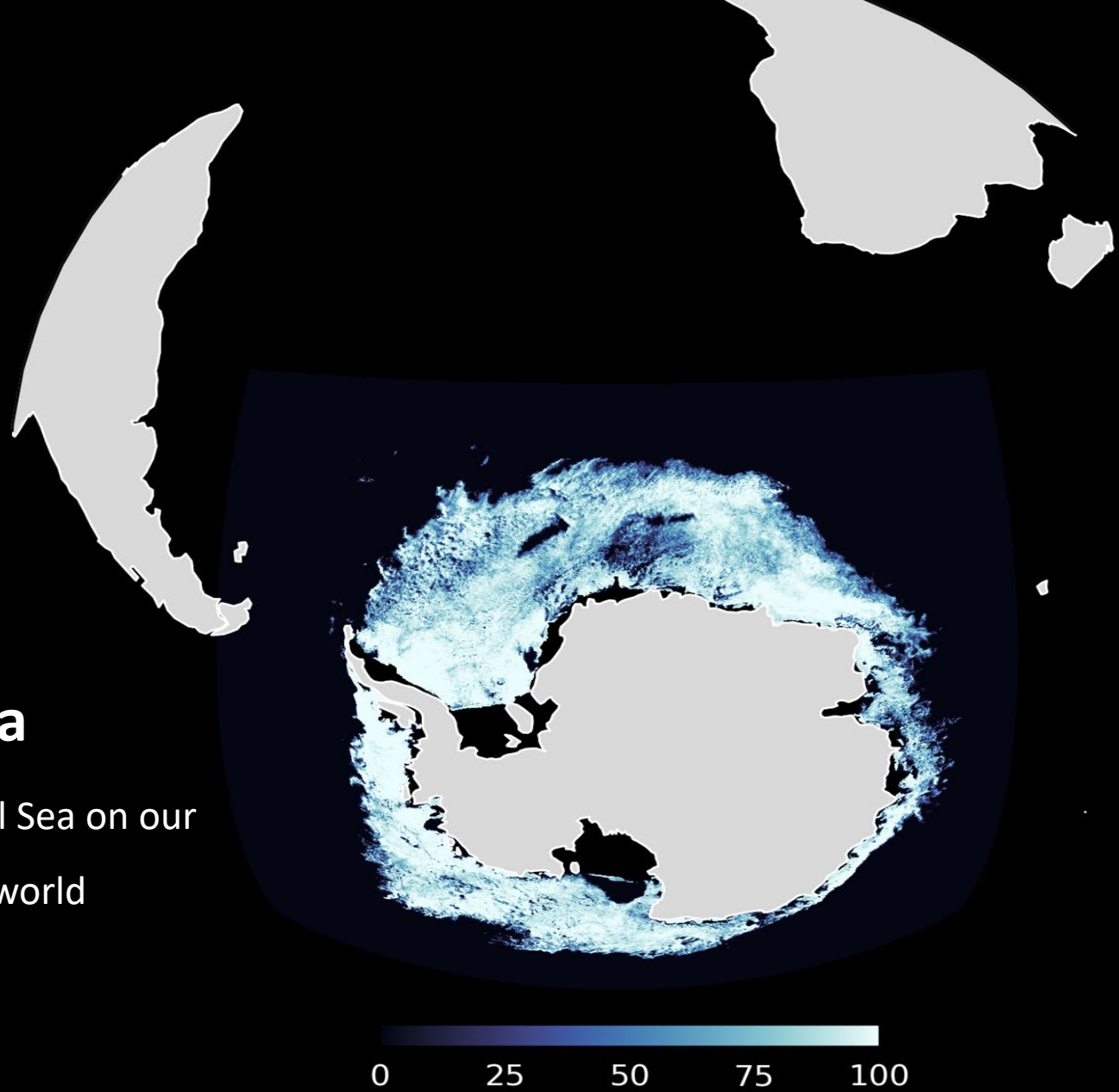


Pulse of the Weddell Sea

The functioning & significance of the Weddell Sea on our climate and ecosystems in a changing world



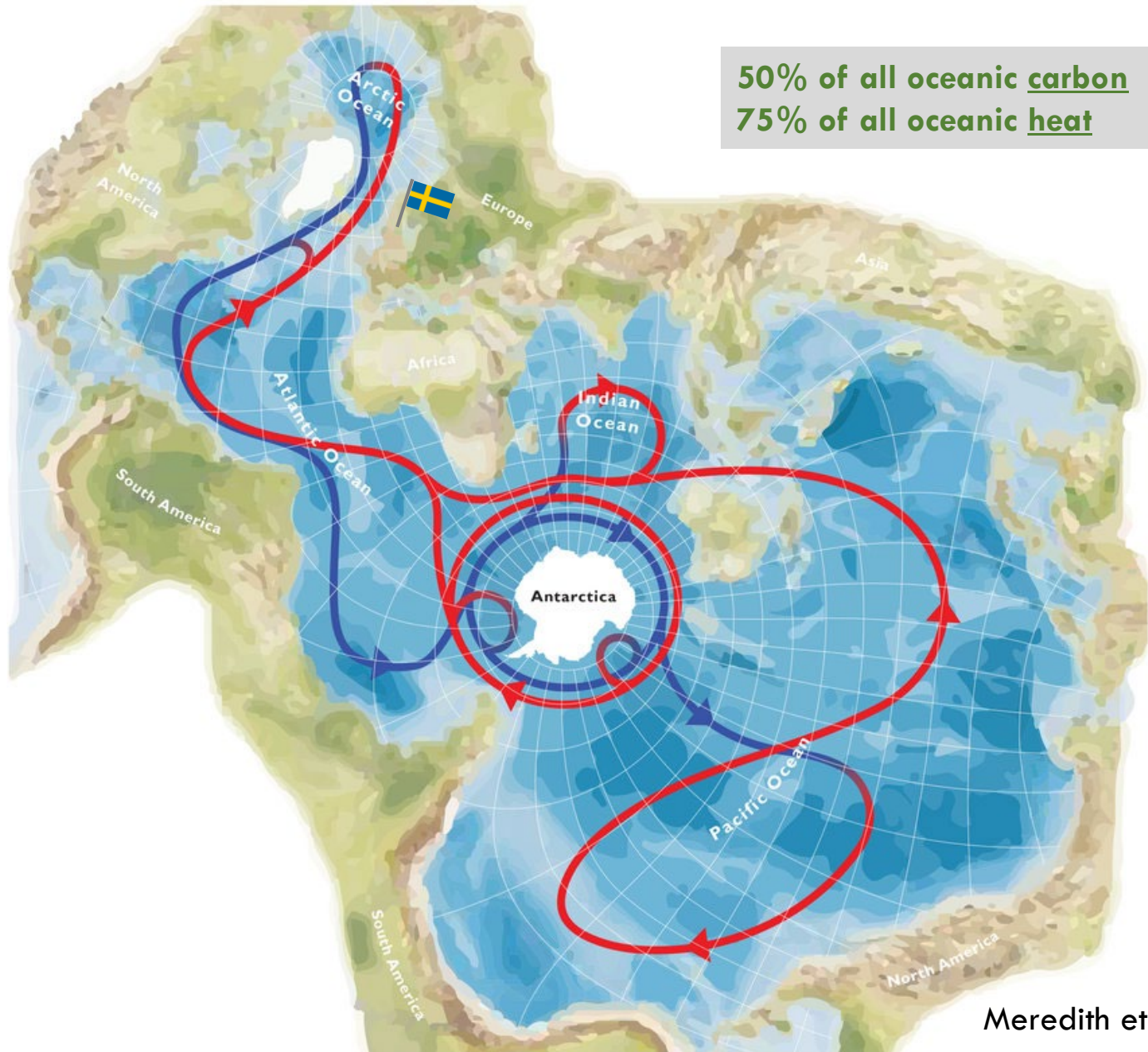
0 25 50 75 100

Sea ice concentration

DATA: AWI (www.meereisportal.de)

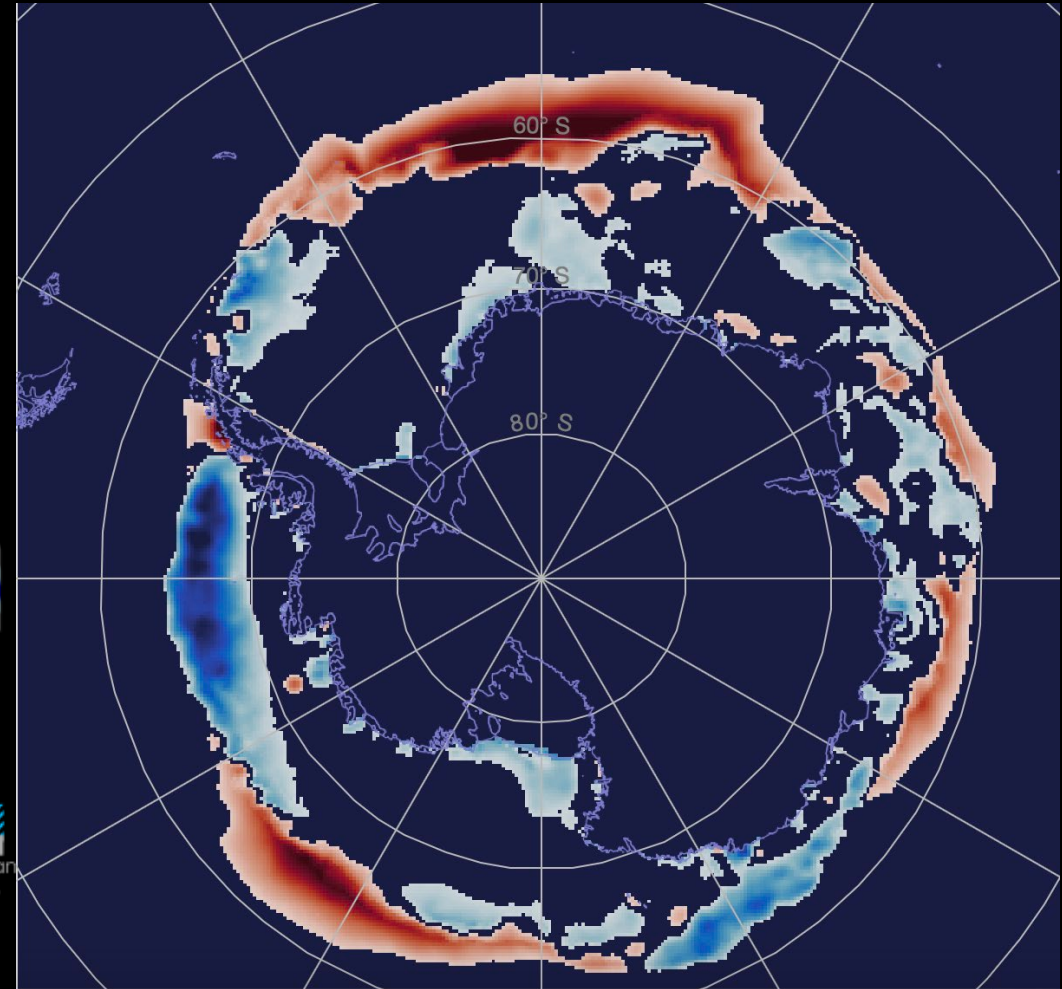
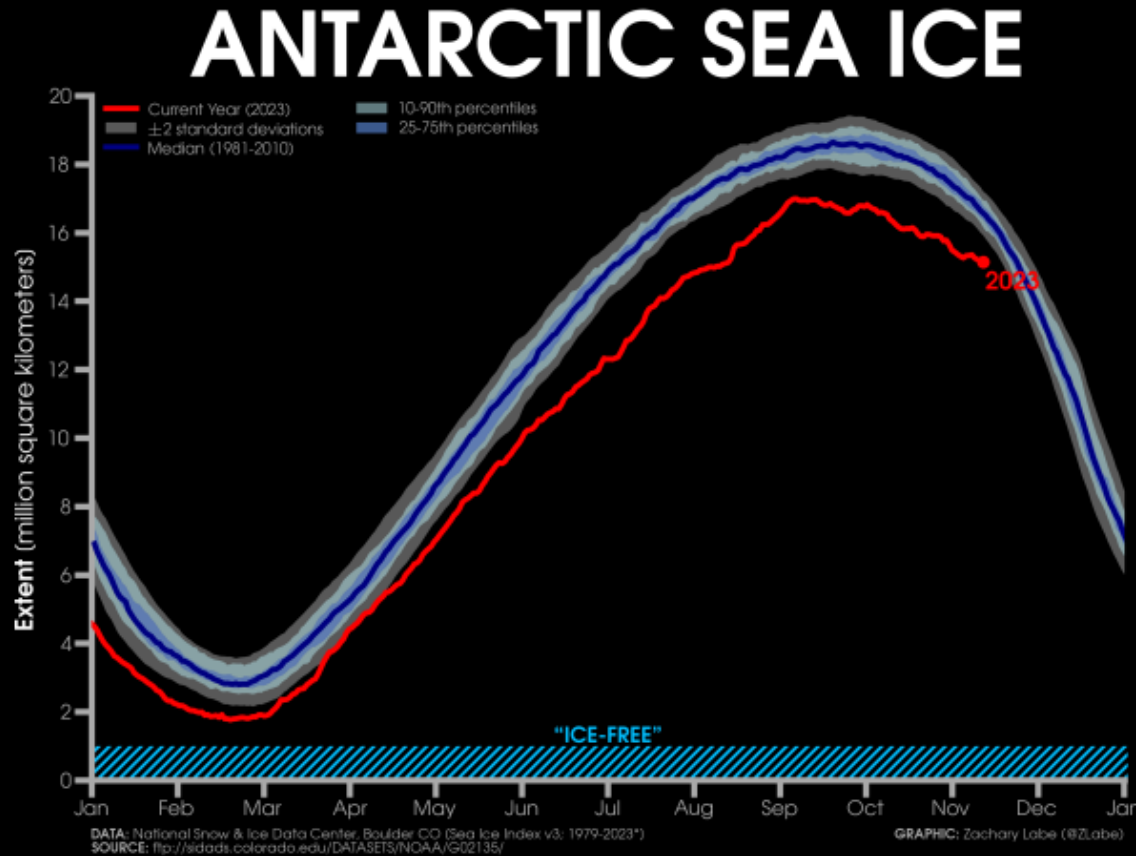
All oceans are connected

Spilhaus Projection, 1942



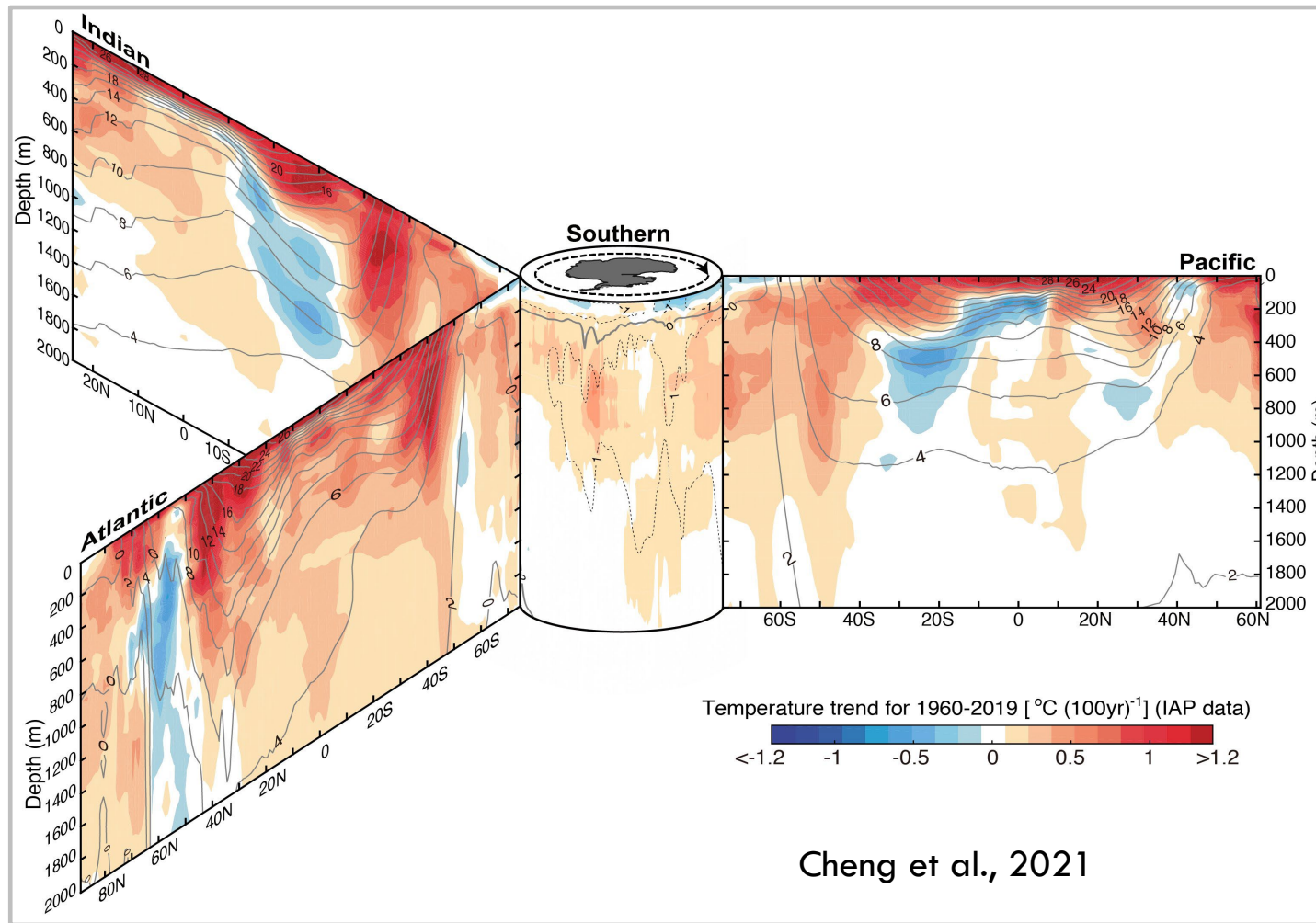
Meredith et al., 2019

Major Antarctic Sea Ice Loss



We have little understanding of the consequences for climate and ecosystems

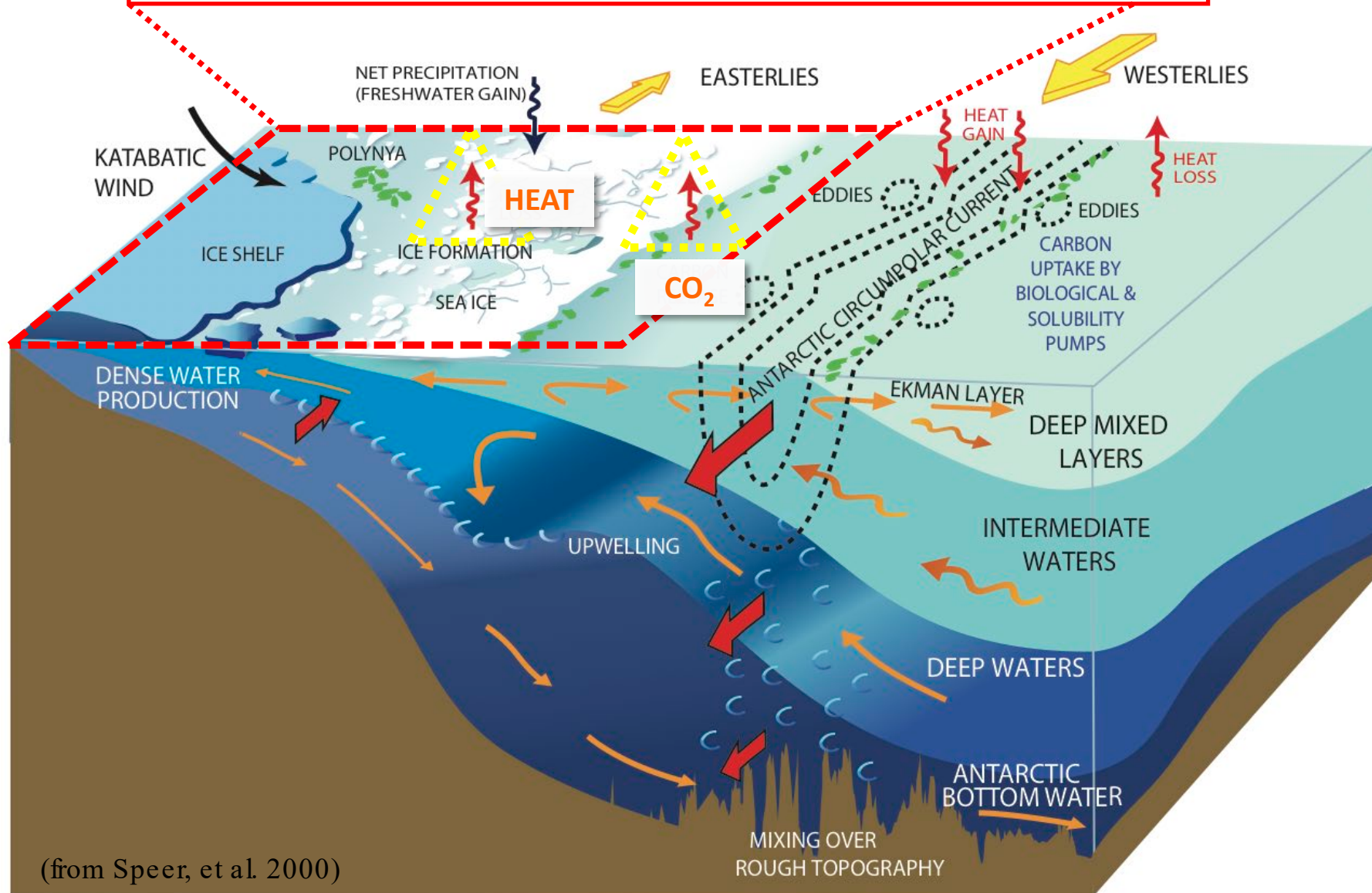
Southern Ocean is warming...



Big changes are going on there, with potentially dire consequences for us and our living earth.

A massive 'blind spot' in the global ocean observing system is a major impediment to better understanding of climate, biogeochemical cycles & sea level rise.

Extremely few observations for such a complex system!!

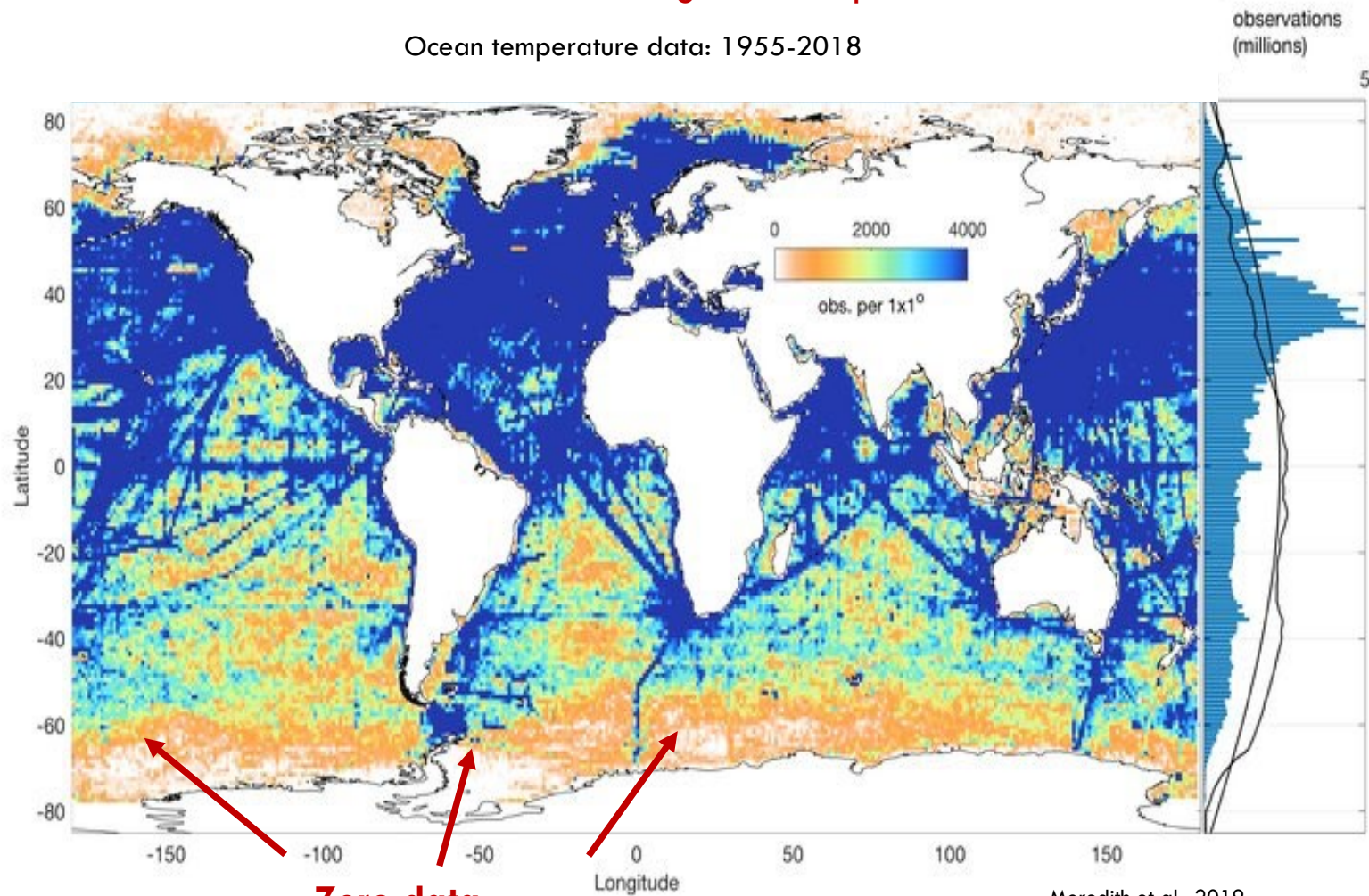


Big gaps in our knowledge

Our climate knowledge “blind spot”

Ocean temperature data: 1955-2018

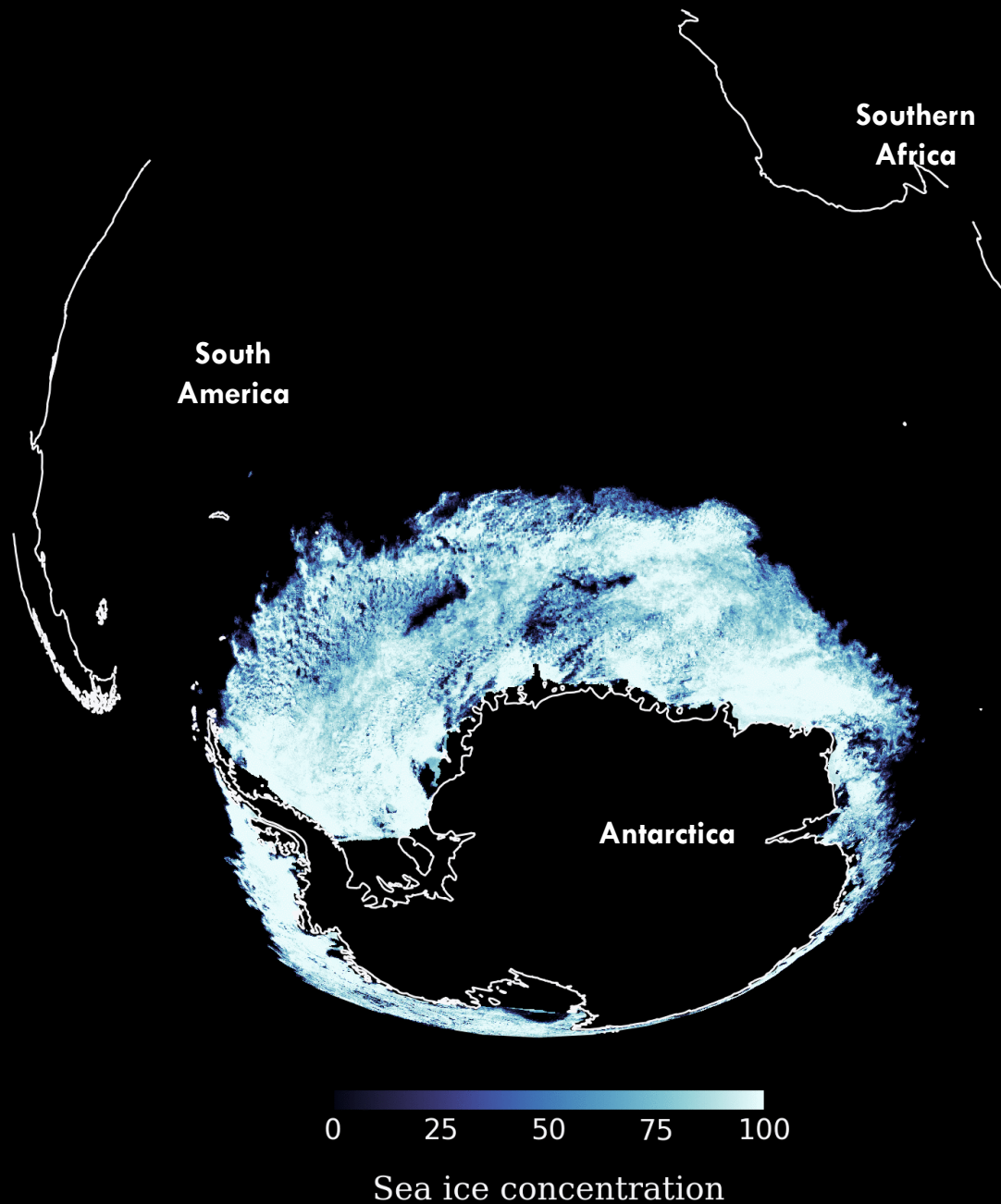
**Data
deserts
everywhere**



**Zero data
(sea ice regions)**

Meredith et al., 2019

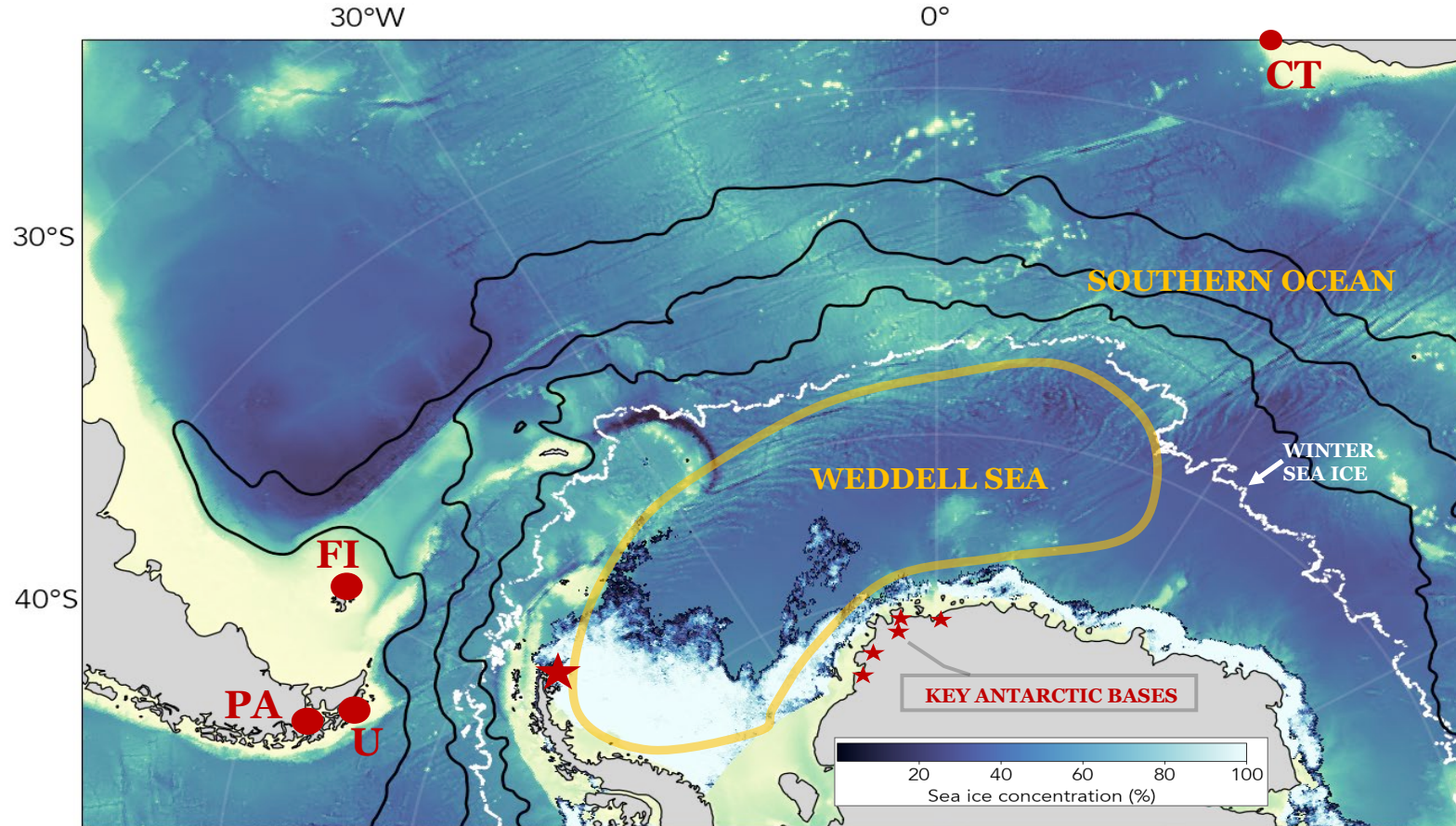
2018-11-23



Antarctic Sea Ice:

**Our 20 million km²
climate 'blind spot'**

Pulse of the Weddell Sea

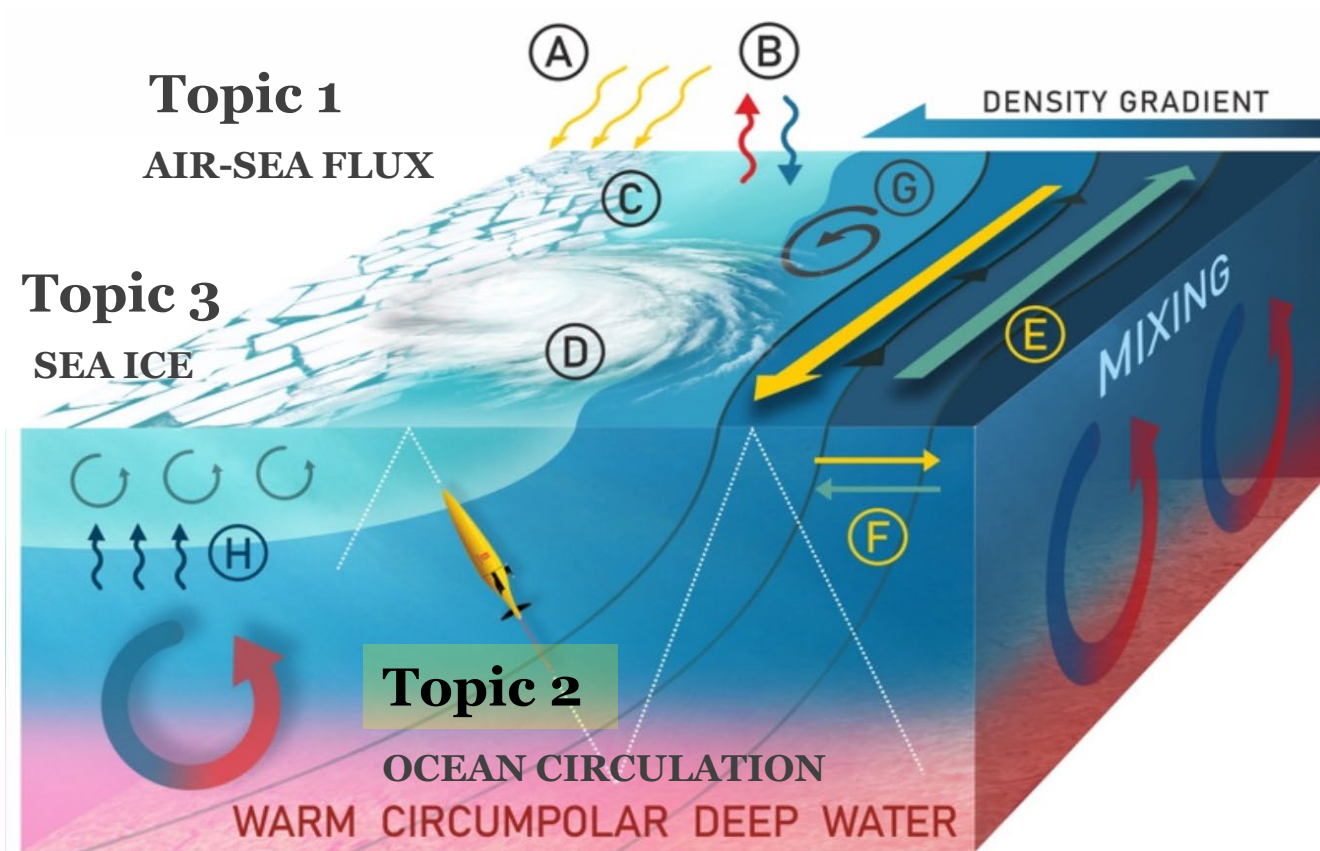


The Theme aims to address scientific challenges related to the Weddell Sea's role in climate and ecosystems, as well as Swedish heritage

*It aims to thrive from diverse spread of diciplines:
ocean, atmosphere, cryosphere <> primary production, BGC, various trophic levels of the ecosystem*

Physical environment:

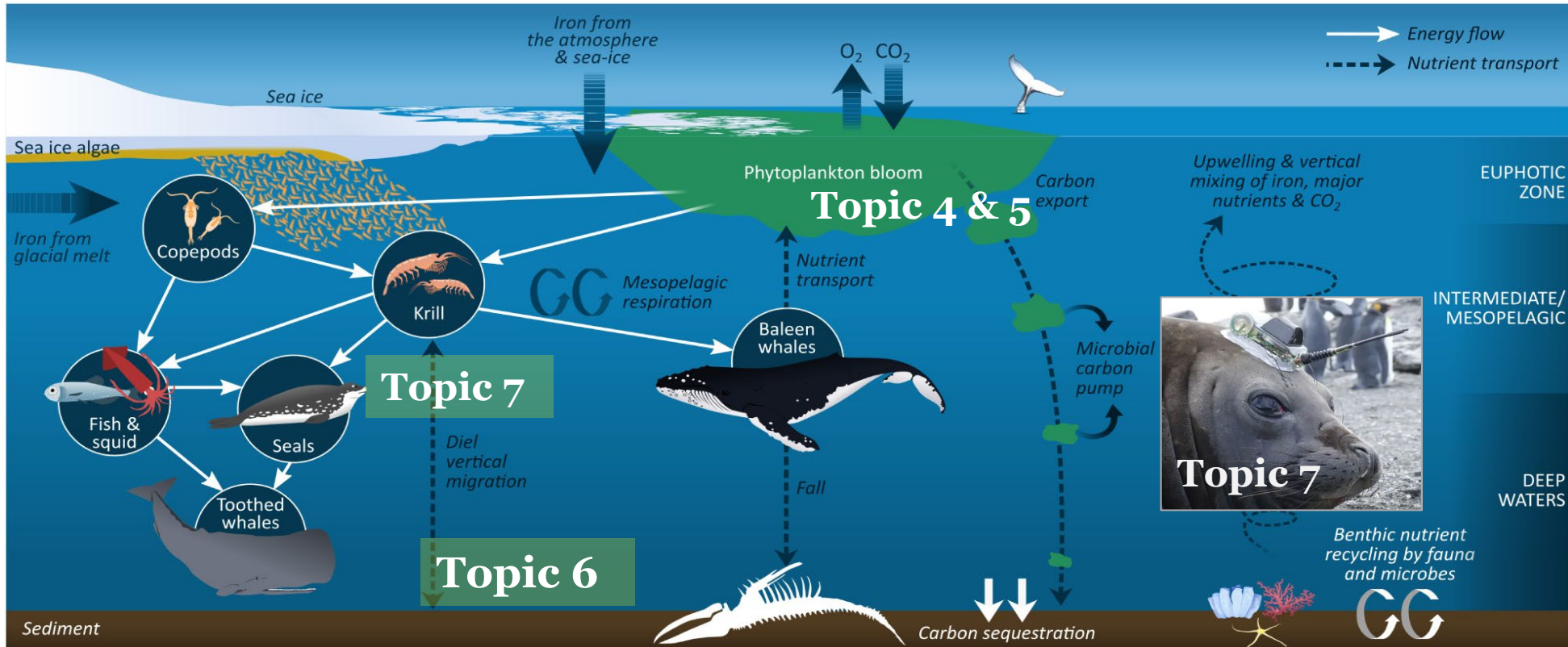
Air-ice-ocean fluxes; ocean circulation, sea ice dynamics



Tightly coupled to biology and ecosystem processes

Biogeochemistry and ecosystems

Primary production; microbiology; benthic fauna & diversity; marine mammals



Tightly coupled to the physical environment

Preserving our heritage

Shipwreck 'Antarctic' – Otto Nordensköld's expedition

Topic 8



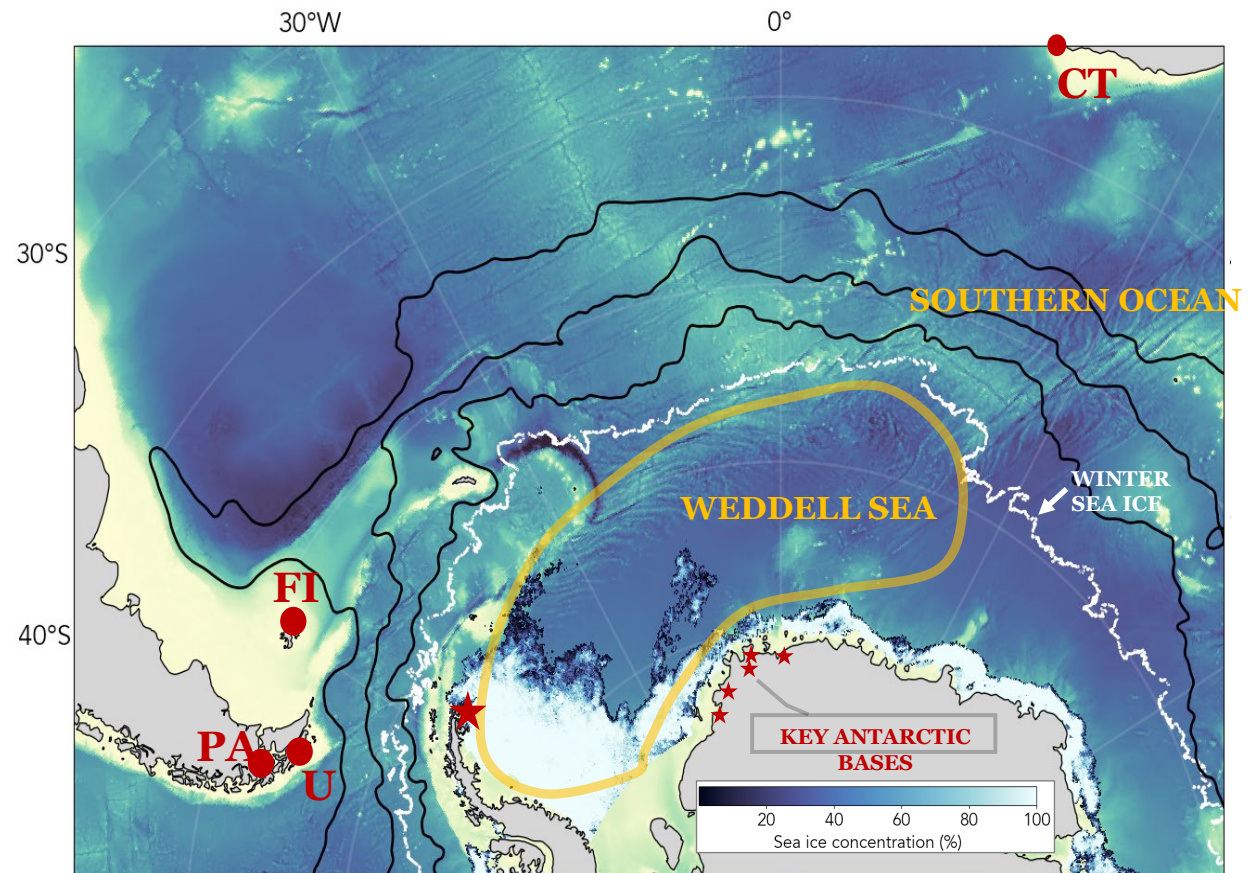
Primary Logistics

- **Icebreaker research vessel** (Oden class or similar)
- Basic instruments: CTD, sonars, meteorology, underway throughflow, corers, trawls
- Crane (onto ice, deployments)
- Wetlabs, technical labs
- ROV
- Towed CTD
- Working deck with container space aft (ROV/AUV) & fore (EC)
- Helicopter
- Work boat / Zodiac



Field sites

- **Flexible** – dynamics driven, except shipwreck
- **MIZ, sea ice edge**
- Open ocean (mostly underway)
- Deep / Bottom Waters
- Benthic environment
- Paulet Island – ‘*Antarctic*’



SOOS Science Themes



Understanding and Quantifying the State and Variability of....

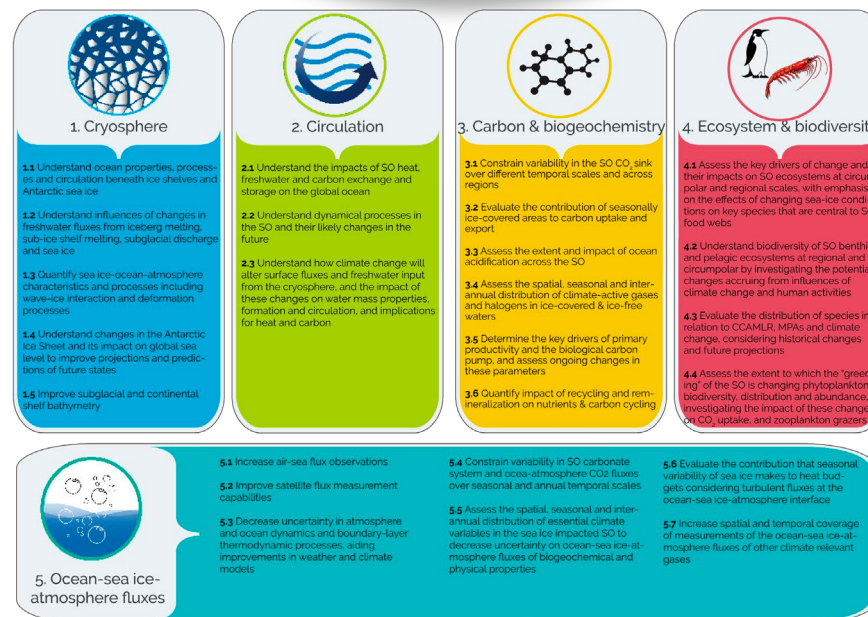
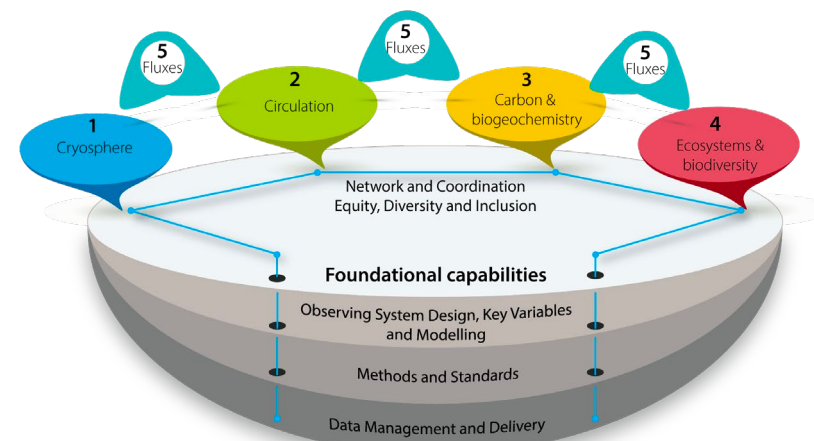
Theme 1: Southern Ocean Cryosphere (Topic 2, 3)

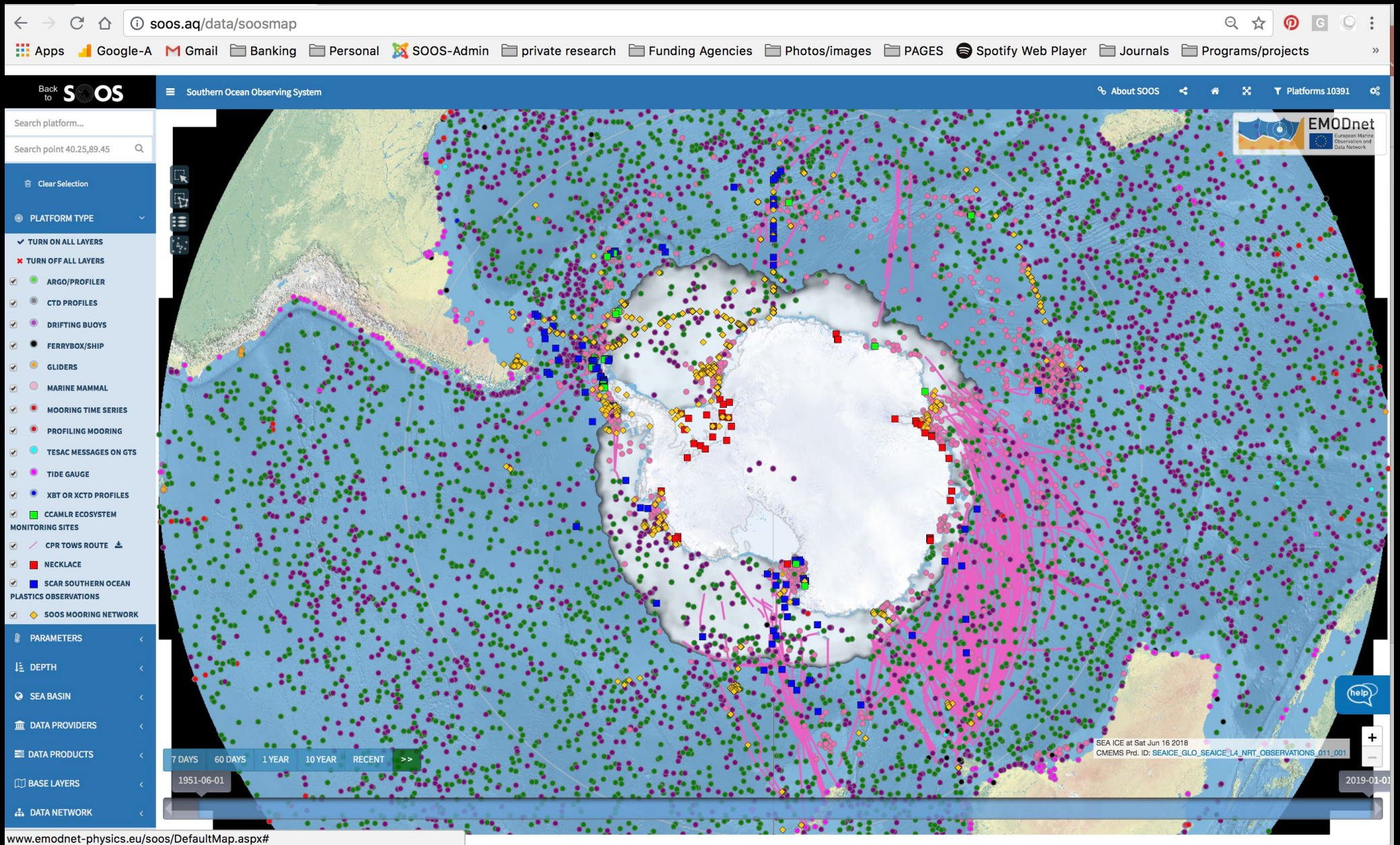
Theme 2: Southern Ocean Circulation (Topic 2)

Theme 3: Southern Ocean Carbon and Biogeochemical Cycles (Topic 1, 4, 5)

Theme 4: Southern Ocean Ecosystems and Biodiversity (Topic 4, 5, 6, 7)

Theme 5: Southern Ocean-Sea Ice-Atmosphere Fluxes (Topic 1)





SOOSmap

Development in collaboration
with EMODnet Physics

Antarctica InSync

International Science & Infrastructure for Synchronous Observations



Antarctica InSync is an Ocean Decade Action.

What is AA InSync? Circumpolar assessment of the connections between ice, ocean, climate, environment and life, including human pressures, and their solutions, such as marine protection.



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

What will AA InSync do? Reinforce scientific cooperation on issues related to polar regions, promote data and knowledge sharing and provide a roadmap for strengthening links between science, industry and decision-making.

Led by AWI

