



Una visione del futuro
Verso una programmazione pluriennale del PNRA
Workshop PNRA - 5-6 dicembre 2023
Teatro di Villa Torlonia



Climate Change Influences on Antarctic Ecosystems Contamination

Nicoletta

Ademollo

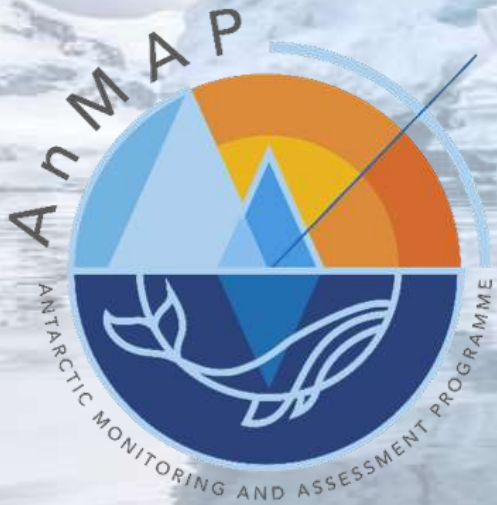
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RATIONALE

- Quantify and predict the impact of contamination and climate change in the Polar Regions.
- Mitigation of human influences in Antarctica is always identified as a priority for science.
- Global chemical production is increasing faster than chemical regulatory policies can.

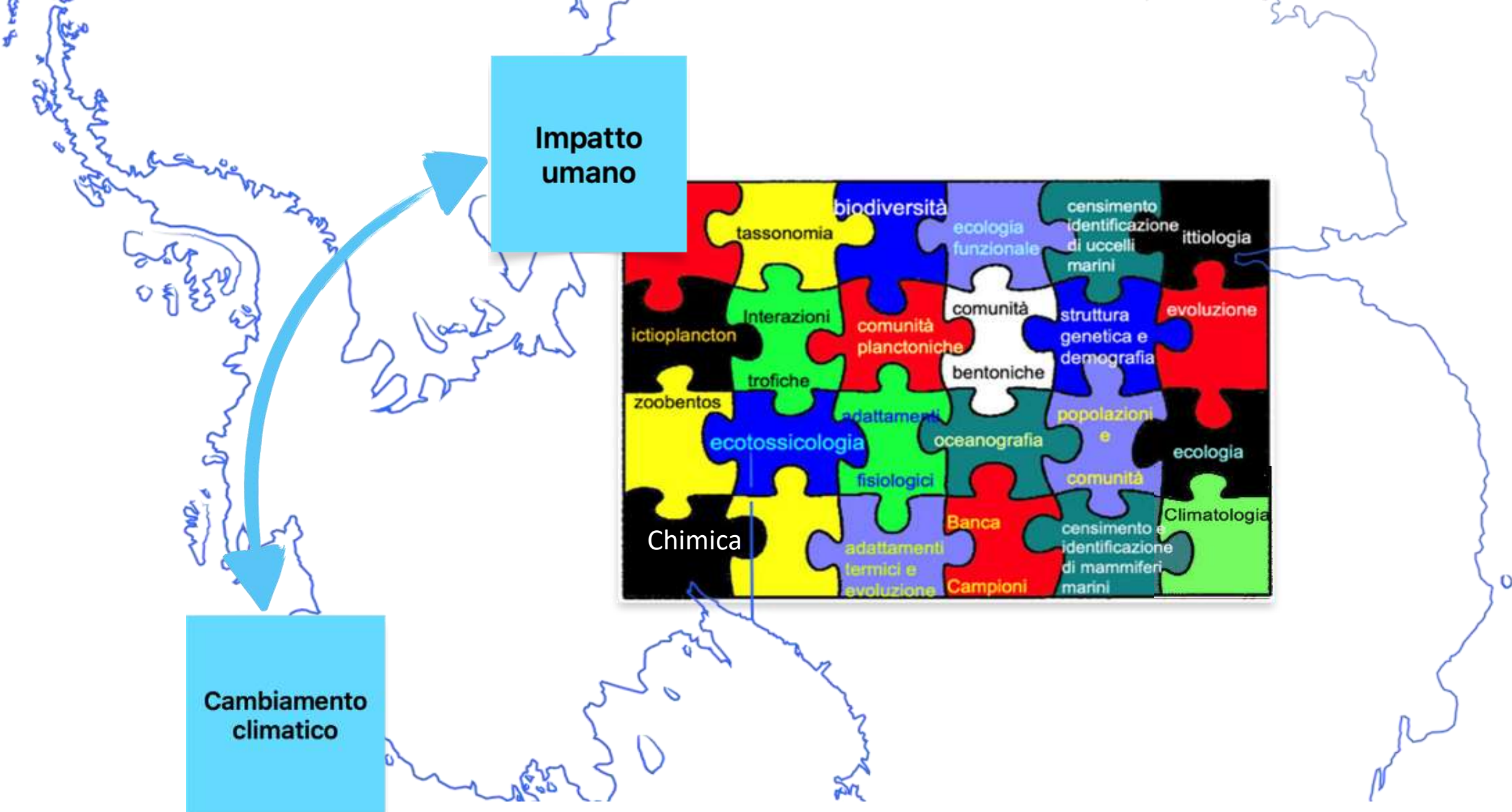


INPUT PATHWAYS OF PERSISTENT ORGANIC POLLUTANTS TO ANTARCTICA (IMPACT)

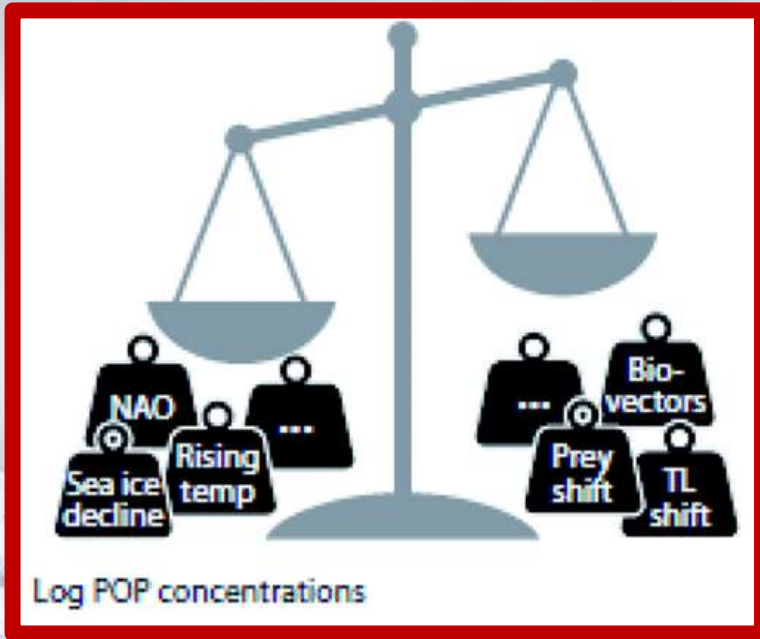
GAPS

- Regulated POPs and CEAnC in Antarctica.
- Remote Sources VS Local Sources
- How climate change will impact POP contamination in Antarctica?
- What is the resilience of Antarctic biota?

Interdisciplinarity...a puzzle to be built

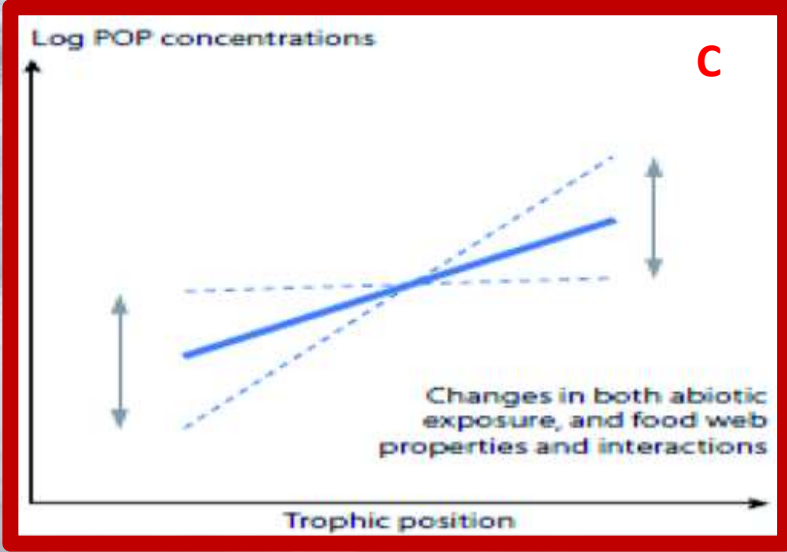
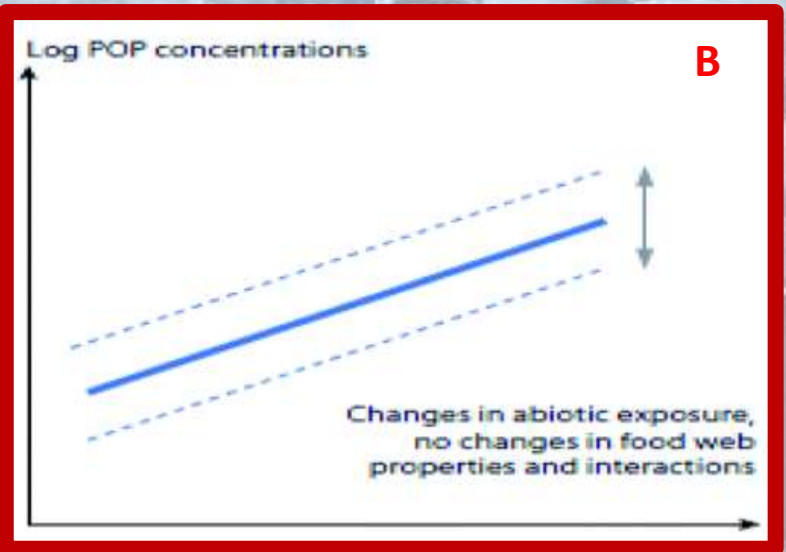
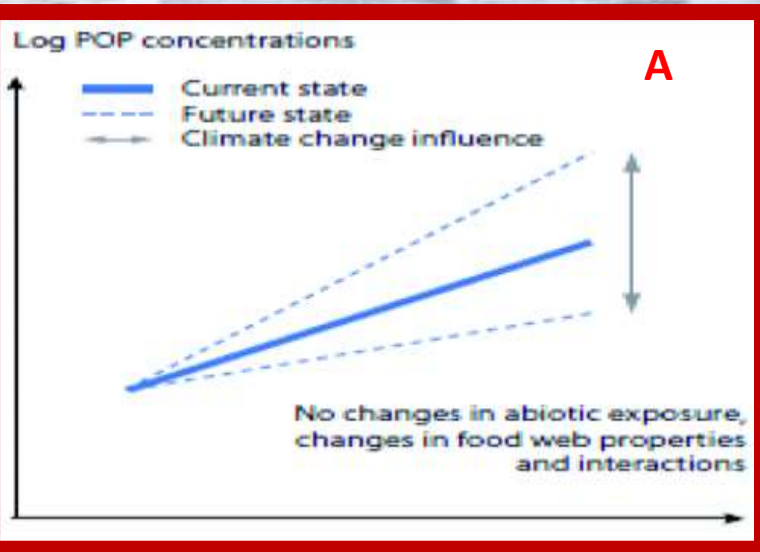


Bioaccumulation vs Climate Change Models

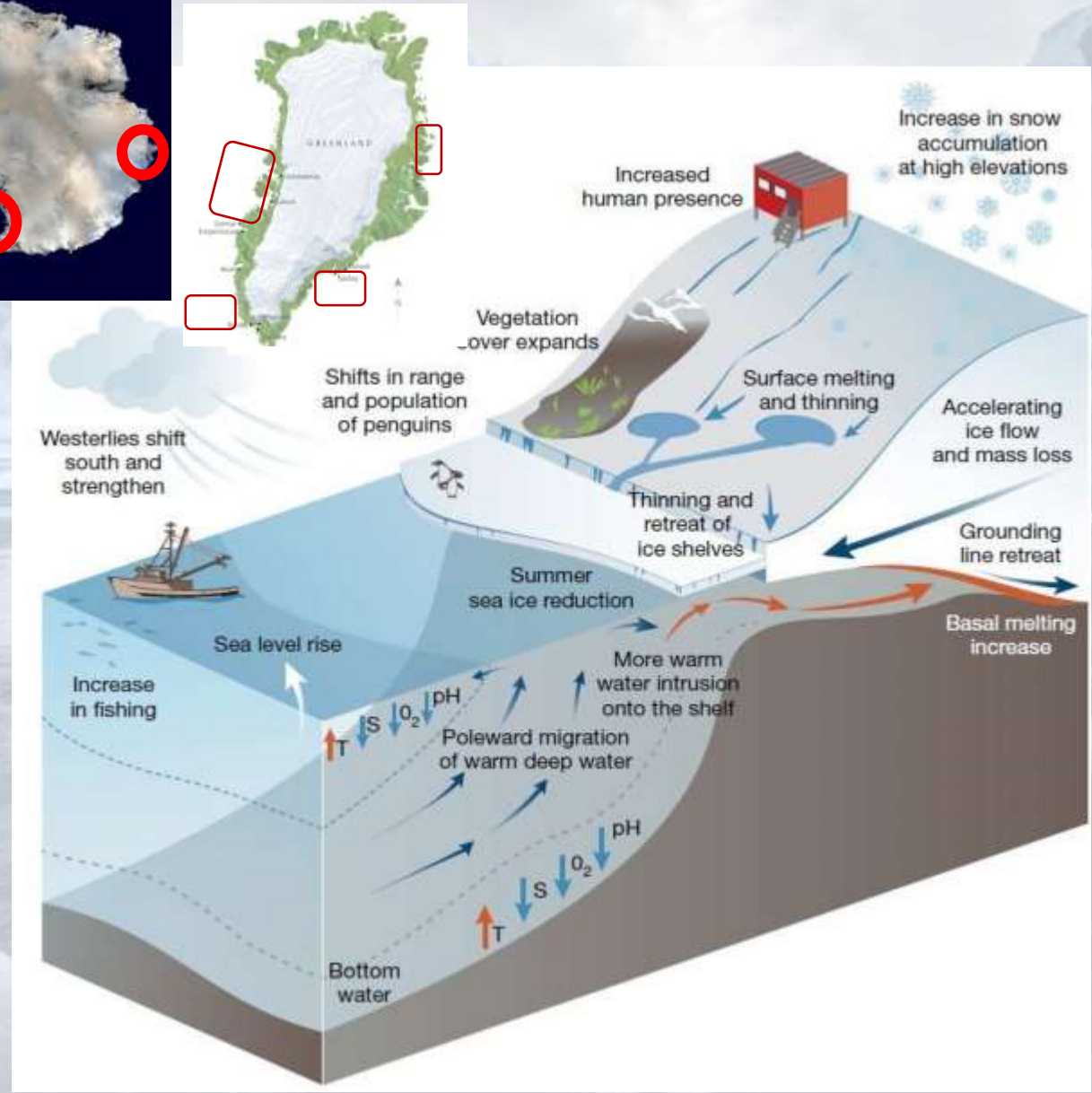


Conceptual models showing POP concentrations in relation to trophic level, in case climate change affects:

- the properties or interactions of the food web, (A)
- abiotic exposures, (B)
- both food web properties/interactions and abiotic exposures, (C)



Ongoing projects and collaborations



Transfer of contaminants from pelagic to benthic community

Biological transport (migratory vs resident)

Assessment of temporal trends and secondary emissions

Correlation between contaminant levels and transfer into the ecosystem and climatic and atmospheric parameters

Comparison of contaminant levels, profile and distribution in different sectors of the Antarctic coasts with different impacts

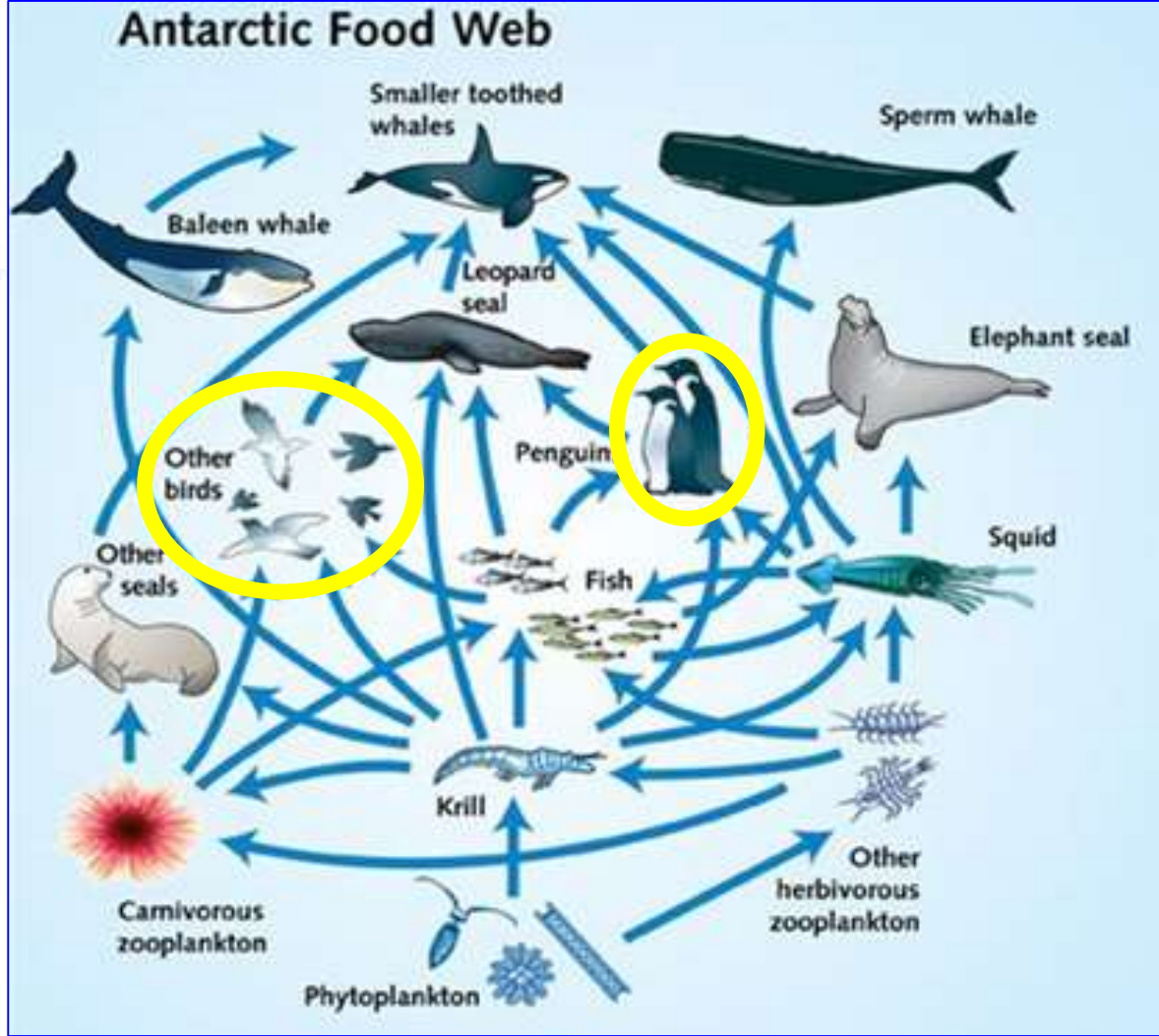
Standardization of sampling and analysis methods, which are essential for comparison in space and time (AnMAP and AMAP)

Some species studied: role in the food web and role as biovectors of contaminants

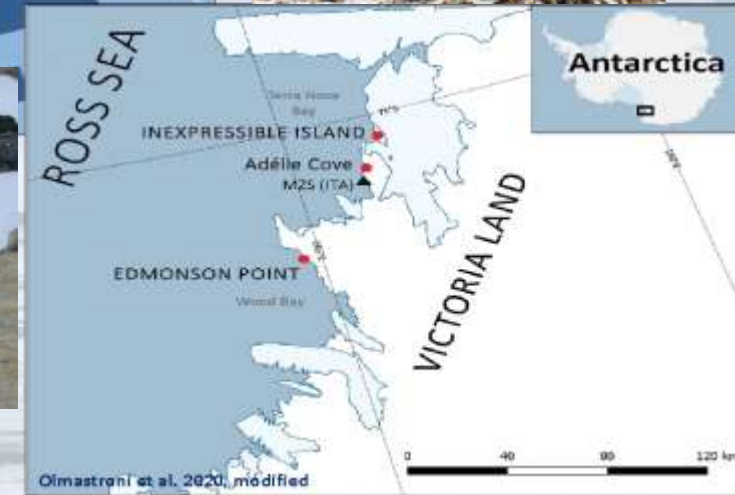
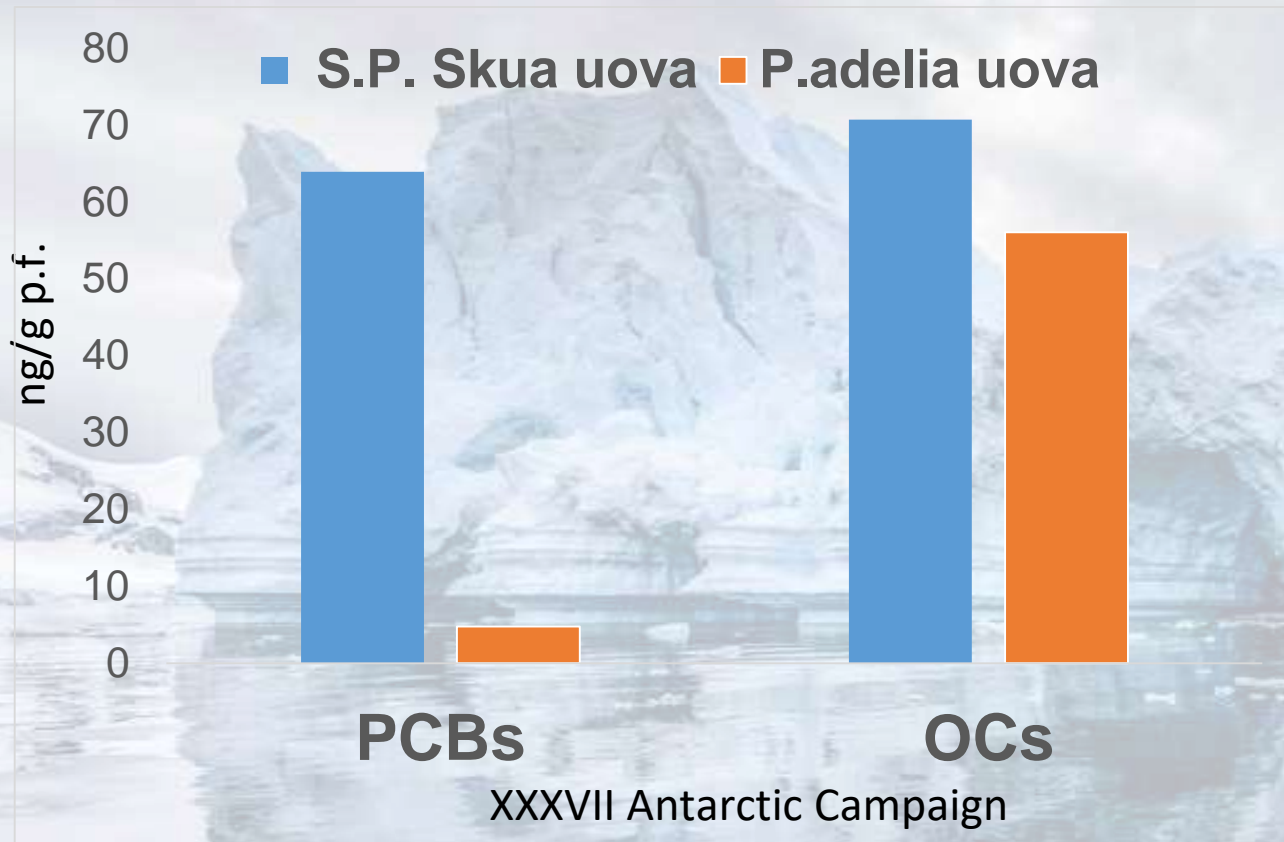
The **Adélie penguin** (*Pygoscelys adèliae*):
Sensitive indicator of Antarctic climate
environmental parameters regulate its presence



South Polar Skua (*Catharacta maccormicki*):
- reproduces close to prey (e.g. penguins, petrels)
- forms a long-term association with the same territory for reproduction and feeding.

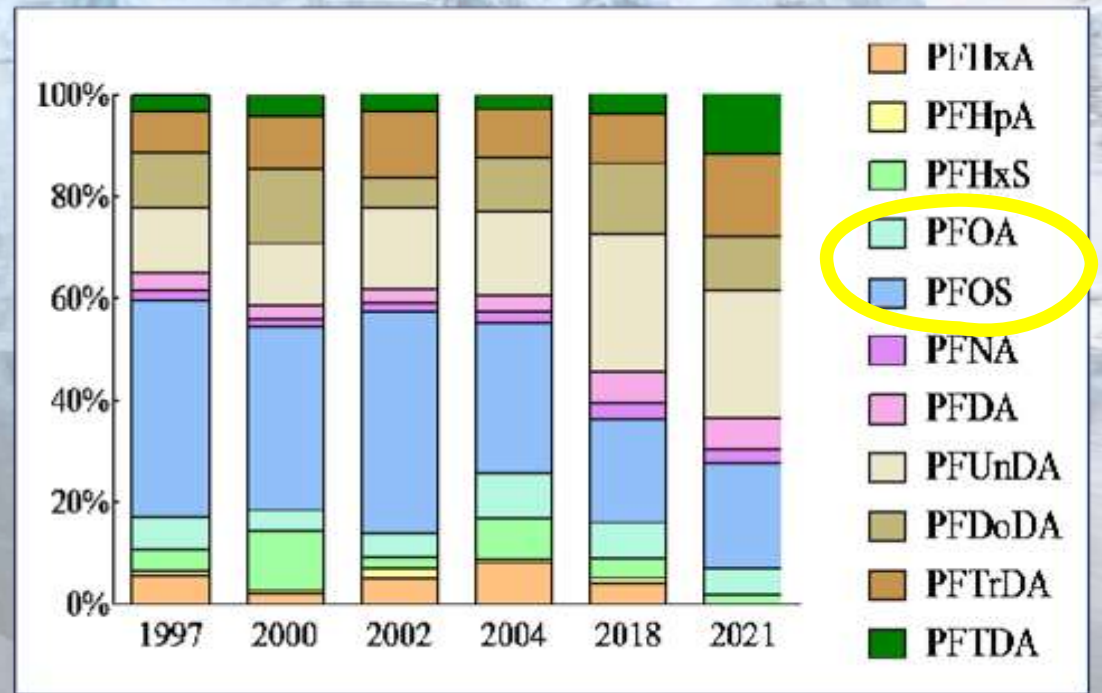
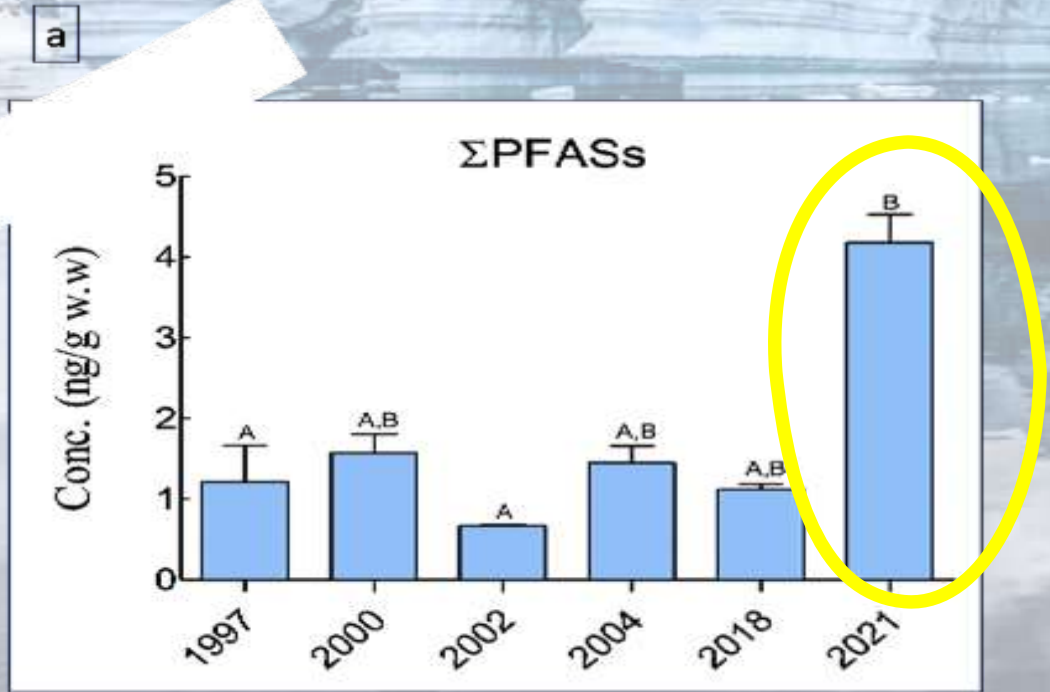
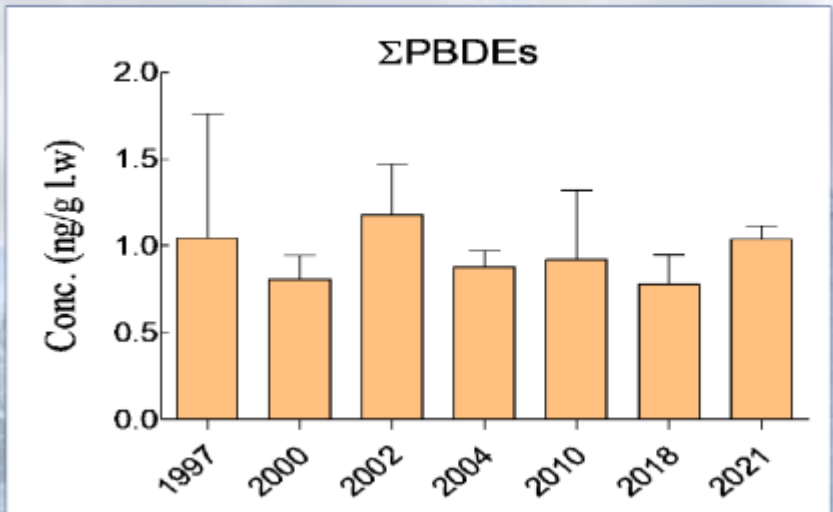


Biological transport: migratory vs resident

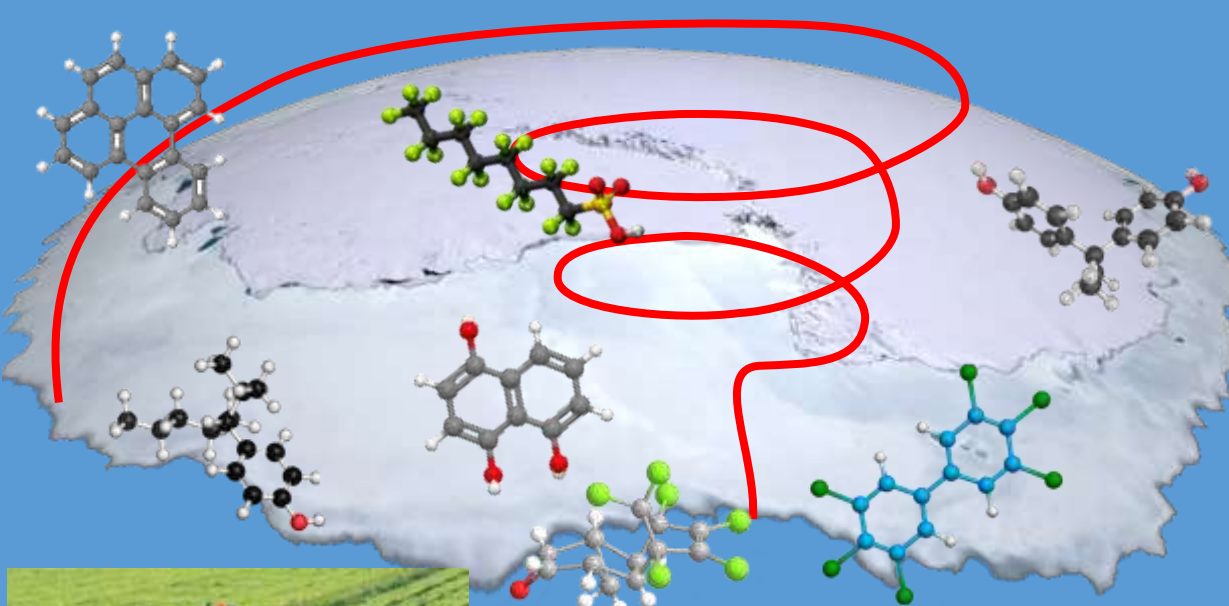


- ✓ Both migratory and resident species play a role in the localized concentration of some POPs in areas of enormous biological value and conservation of Antarctic ecosystems
- ✓ On a local scale, the contribution of the biovector to the transport of contaminants may exceed the abiotic transport, especially in receptor sites where migratory species congregate after a period of wide dispersal

Temporal Trend of Emerging POPs in Adélie Penguin Eggs (Ross Sea)

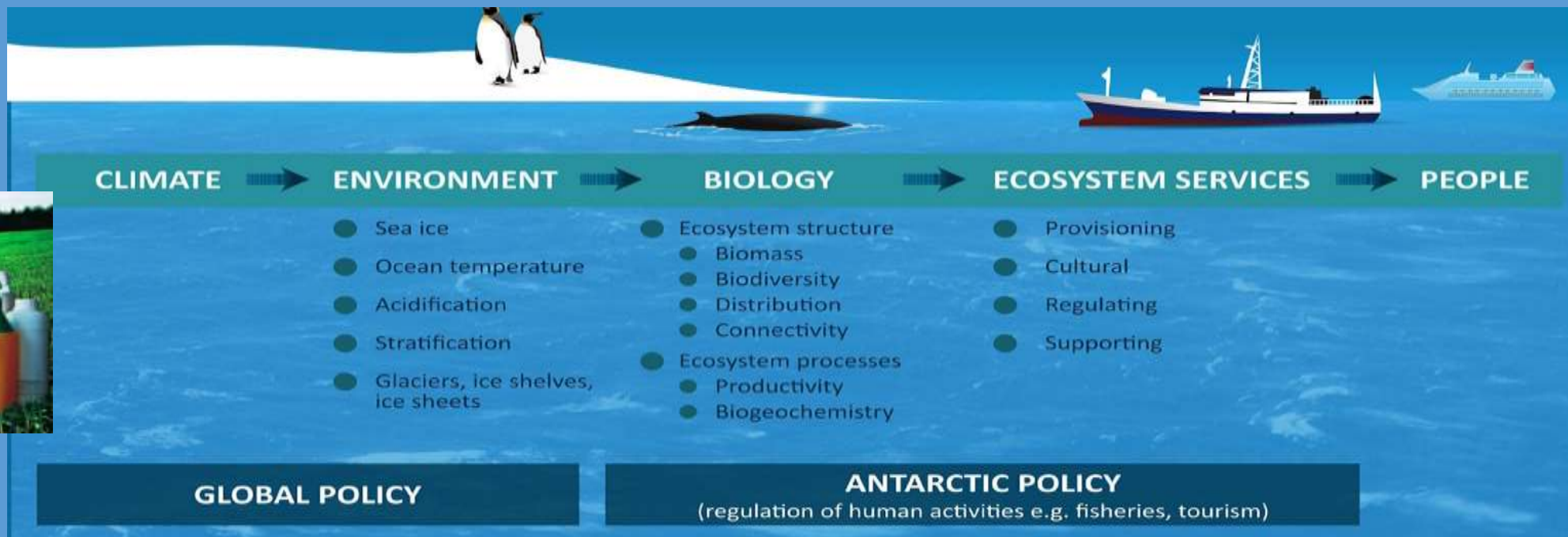


From today to the future...



Implement basic observations and indicators essential for ecosystems to understand:

- the current state,
- the impacts of climate change,
- the dynamics of the accumulation of chemicals and human activities on the environment,
- guide governance responses and establish appropriate policy urgency to take mitigation or adaptation measures





Grazie dell'attenzione!