

Theme 4: Improving knowledge and protection of the unique Antarctic life from land and ice into the deep-sea

Antarctica InSync Webinar

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British Antarctic Survey, Edinburgh University, AWI

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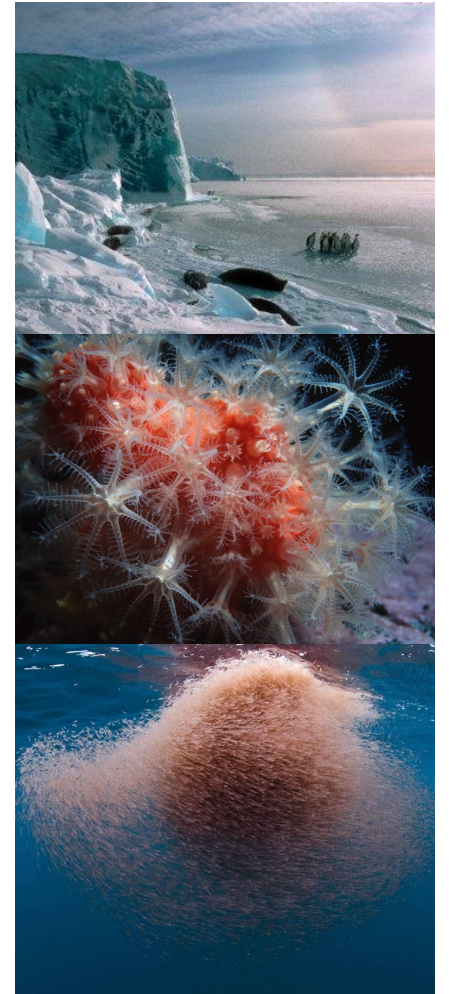


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Southern Ocean ecosystems are:

- Unique and highly productive
- Comprise resident and migrant species
- Adapted to cool thermally stable environment
- Occupy a range of habitats from the land to the deep ocean
- Under *threat* and need our *protection*



Credit Ali Massey & BAS



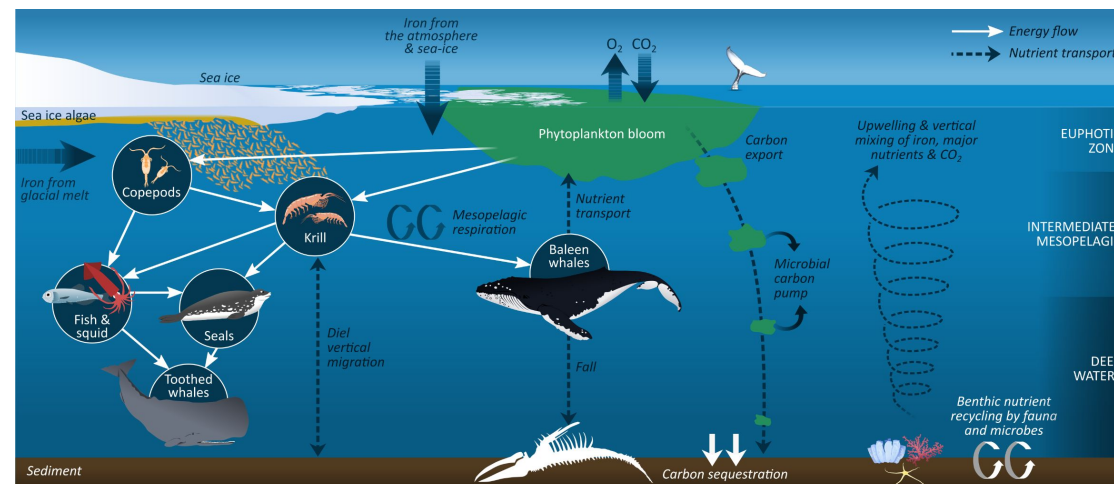
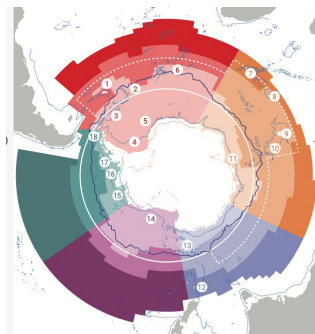
An extensive range of initiatives have been pivotal in advancing Southern Ocean ecosystem research including:





Recent assessment has shown these ecosystems are:

- Globally connected and provide important ecosystem services
 - e.g., biodiversity, fisheries, tourism, climate regulation, C and nutrient cycling
- Threatened by a range of global and local drivers
- Already changing
- Continued changes will have global consequences



Henley et al. 2020



Action is needed to protect them

- Effective local and regional **management and conservation policies** that account for change and foster ecosystem resilience
- Systematic **long-term measurements** of the state of habitats and biota (e.g., MEASO regions) to underpin assessments of change
- Robust **future projections** of change
- **Global action** to curb climate change and ocean acidification

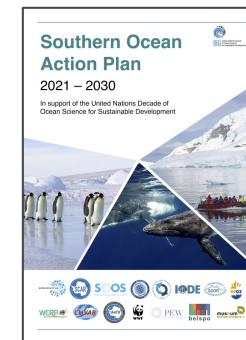


Requires international collaboration and coordination via initiatives like Antarctica InSync



Examples of key questions:

- How do past, ongoing, and future changes affect Antarctic ecosystems, i.e., the distribution, abundance, and life cycles of key species and communities?
- How resilient are key functional groups and species to climate change and increasing human pressures?
- What are the feedbacks (e.g., within food webs) caused by environmental shifts in terms of nutrient fluxes, carbon sequestration, and energy flow?
- What are the potential consequences of ecosystem shifts for the provision of ecosystem functions and services?
- How can marine protected areas help?





Antarctica InSync can help address big questions in Southern Ocean ecosystem research by:

- Establishing a **network of systematic long-term measurements** of the state of habitats (sea ice, coastal areas, deep ocean) and biota (phytoplankton, zooplankton, pelagic consumers, benthos) to assess change
- Identifying **mechanisms** involved and their resilience to external forcing
- Quantifying the **role of biology in carbon and nutrient cycles**
- Developing robust quantitative **future projections of ecosystems and implications for ecosystem services** (by providing the data to underpin ecosystem models and understand climate-ocean-ice interactions)
- **Standardising protocols** for observations

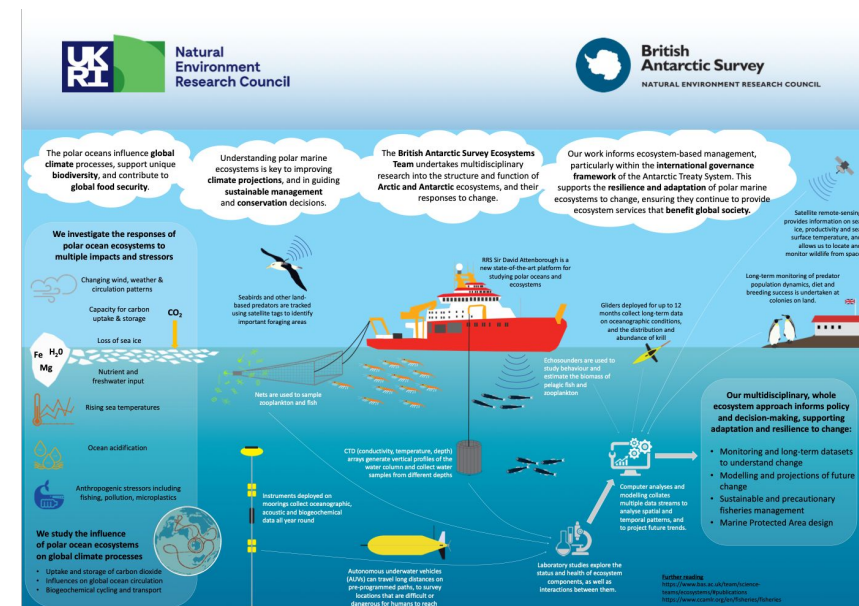
Particularly in the sea ice environment, during winter, and seasonal transitions



Next steps

- Southern Ocean and terrestrial ecosystem research communities to develop strategies to collaboratively design synchronous circumpolar surveys that can address key questions (building on previous and ongoing research and networks)
- Engage scientists from adjacent disciplines and other stakeholders
- Develop standardised protocols
- Make use of existing data
- Attract funding

Ensure all processes are inclusive



Thank you!

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2021 United Nations Decade
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