Theme 5: Anthropogenic signatures in Antarctica: The race against pollution and other pressures

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ANTARCTICA INSYNC

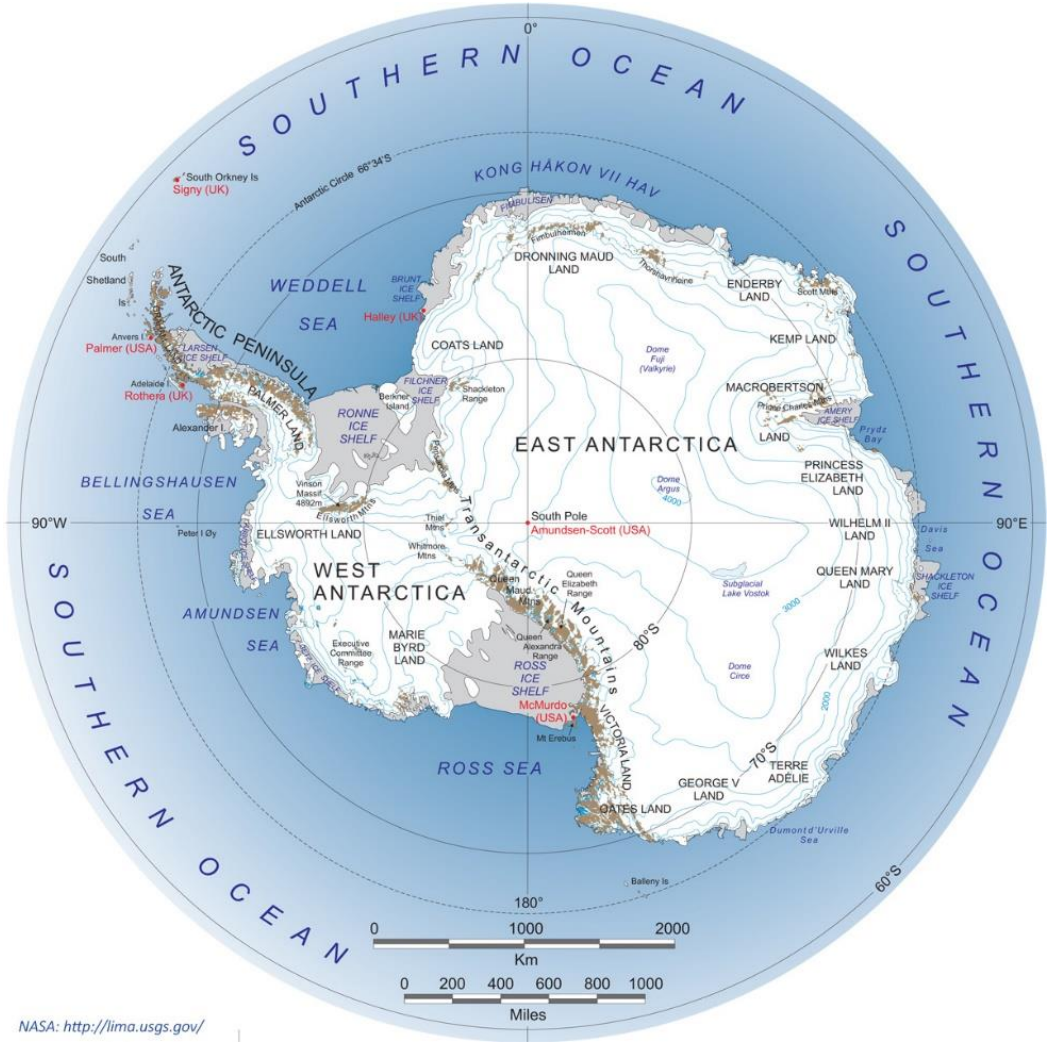
unesco Intergovernmental Oceanographic Commission

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

COMNAP Council of Managers of National Antarctic Programs

SCAR

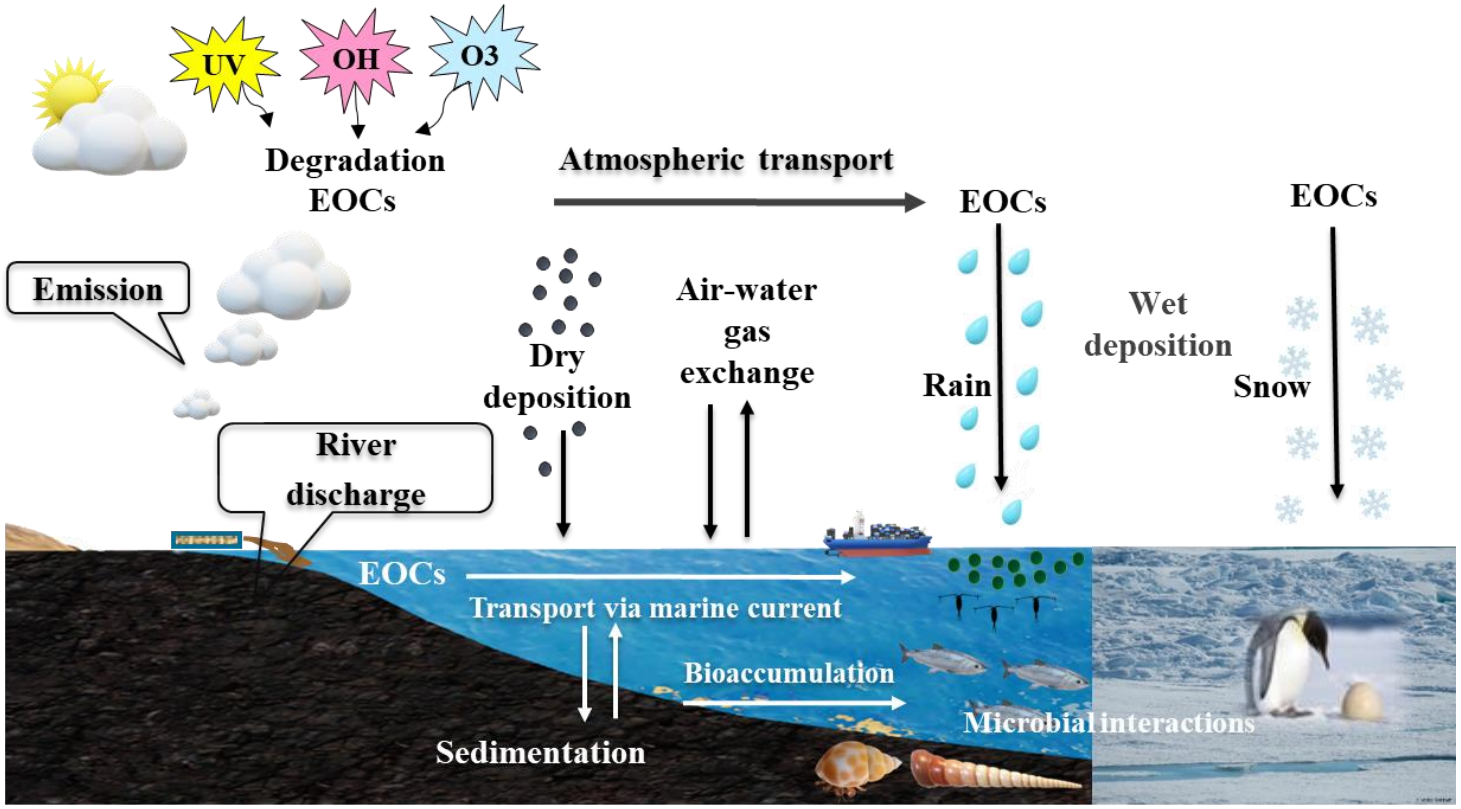
Human Impacts on Antarctica and Threats to the Environment



The main threats facing Antarctica:

- **Rapid industrialization** accelerates climate change in polar regions, driving rising sea temperatures, ice melt, and ocean acidification
- **Man-made chemicals** can reach Antarctica both through long-range atmospheric transport and marine transport, and discharged from the local sources
- **The growing influx of tourist** risks disrupting Antarctica's pristine ecosystems and disturbing sensitive wildlife populations in their natural habitats
- **Increasing shipping traffic** elevates underwater noise pollution, disrupting deep-water marine species and their acoustic environments in Antarctic waters
- **Expanding human activities** in Antarctica threatens native biodiversity and increases the risk of invasive species introduction

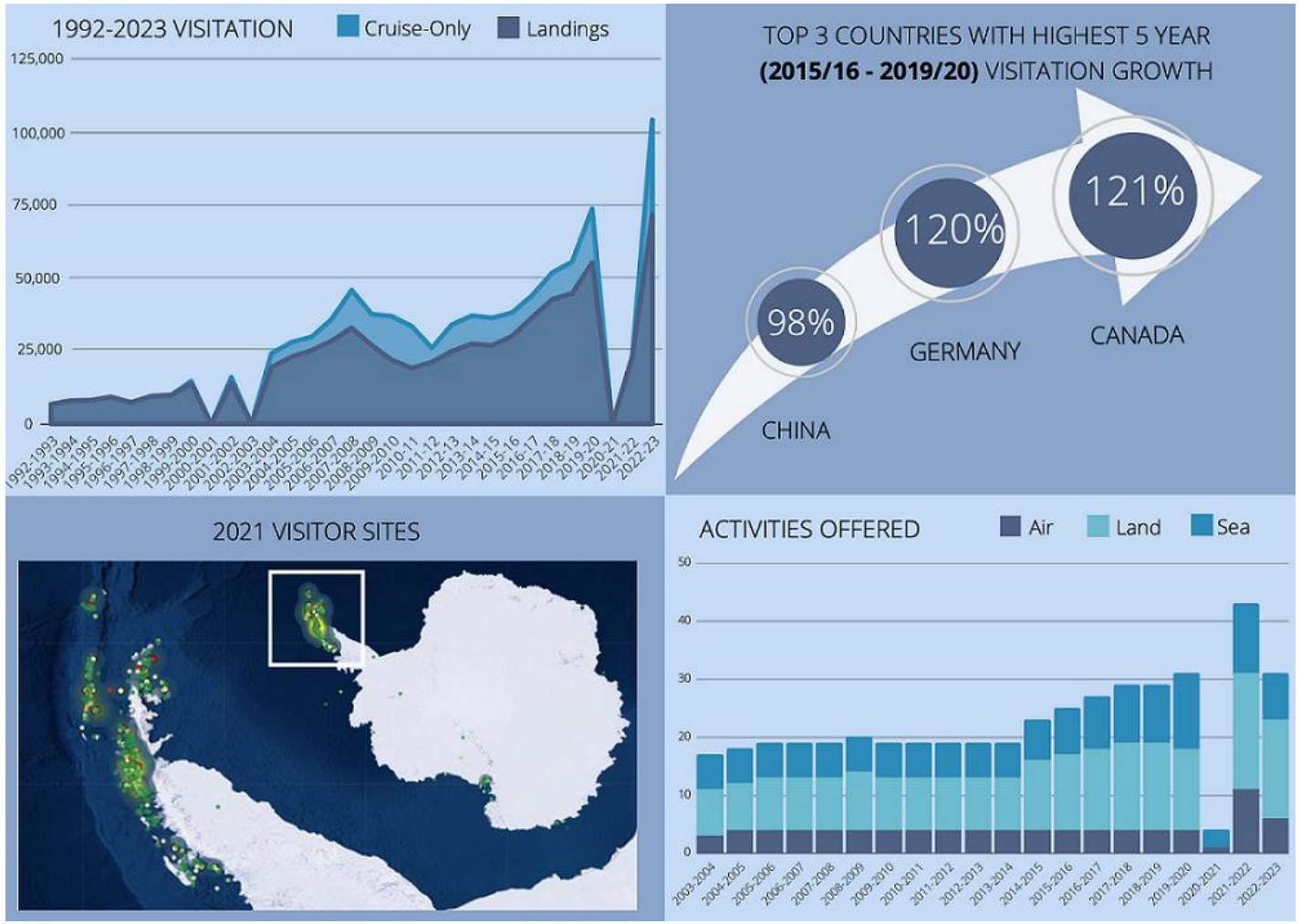
Chemical pollution in Antarctica
Long-range environmental transport (LRET)and biogeochemical cycling



Research objective

- **Chemical pollution:** Persistent organic pollutants (POPs) & Emerging contaminants, e.g. PFAS, PPCP, microplastics and related chemicals
- **LRET** with air and oceanic currents from source areas to Polar Regions
- **Interaction** between different environment matrices
- **Reemission** from glacier ice and snow melting
- **Bioaccumulation** in fish, birds and marine mammals

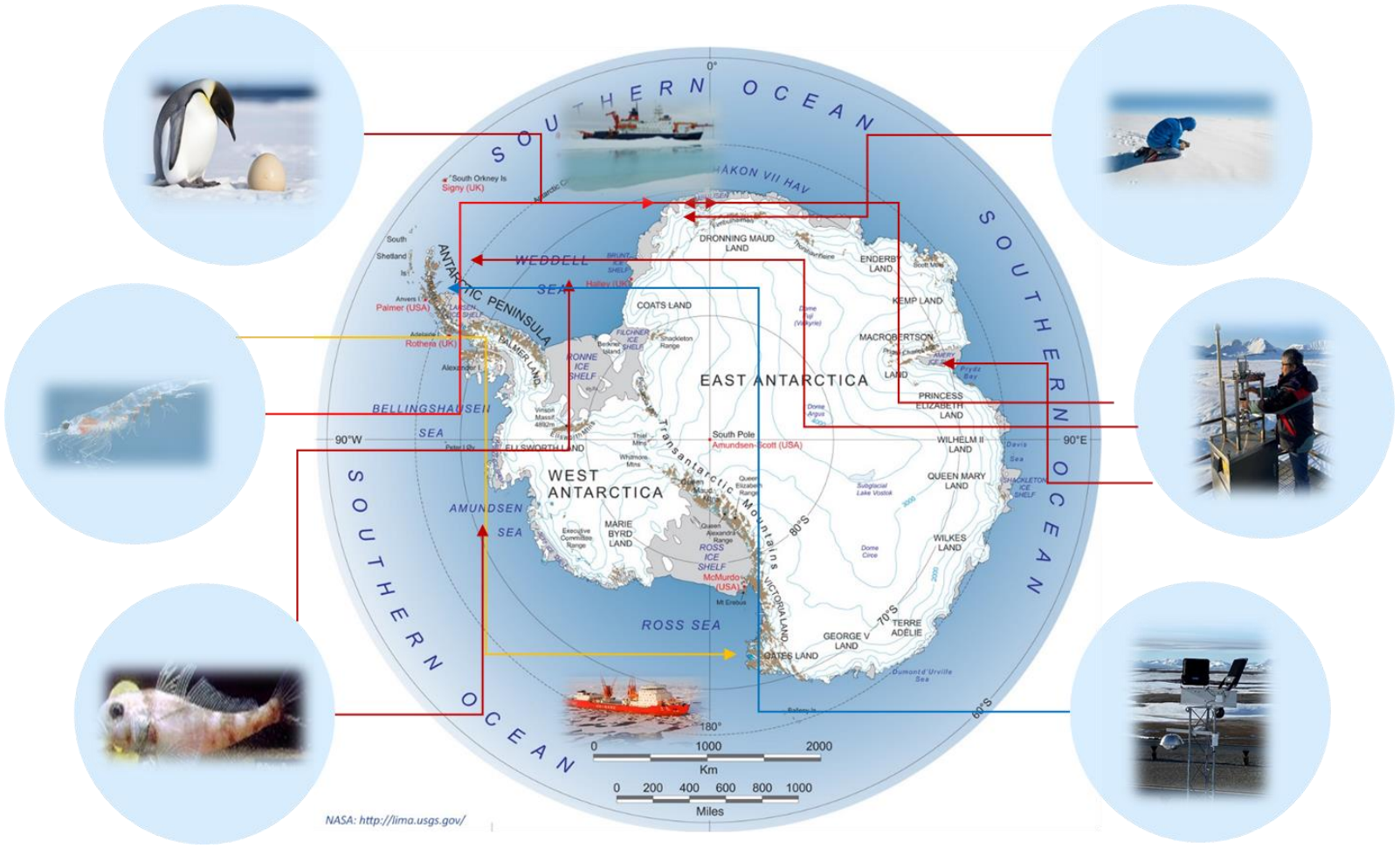
Tourism in Antarctica: new challenges of the Antarctic environment



- Antarctic tourism focuses on the Peninsula regions, amplifying environmental impacts
- Evaluate the discharge of chemical pollution in Antarctica by rising tourist
- Observe potential ecological impacts
- Develop effective management among policymakers, tour operators, and scientists to protect Antarctica's species

Source of the Figure. https://iucn.org/sites/default/files/2023-06/iucn-issues-brief_impacts-of-tourism-in-antarctica_3.pdf (IUCN, 2023)

Research activities at the Antarctic bases and onboard research vessels



- High-volume active Air sampling and Passive air sampling
- Surface snow and ice core sampling
- Fish, krill and Penguin egg collection
- Seawater and sediment sampling

Working groups of Antarctica InSync Theme V

WG 1
Systematic Monitoring of Chemical Pollution and management

W2
UndG erwater noise monitoring and mitigation

WG 3
Tourism impact assessment and management

WG 4
Biosecurity and invasive species prevention

The overarching goal is to develop an integrated monitoring concept for human impact research in Antarctica.

Below is a link and alternatively a QR code.

link: Antarctica InSync: Theme V – Anthropogenic signatures in Antarctica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Thank you, and welcome to join us!