



SOUTHERN OCEAN OBSERVING SYSTEM

ANNUAL REPORT 2024

WAVES OF PROGRESS



www.SOOS.aq

WELCOME FROM THE CO-CHAIRS

Welcome to SOOS's Annual Report for 2024! This report showcases SOOS' key achievements and progress in 2024, a busy and productive year across all of SOOS. A key focus in 2024 was enhancing the SOOS data portal, [SOOSmap](#). This included developing additional features, improving user experience and adding new datasets to strengthen SOOSmap's capabilities for the future. A new joint regional hub between SOOS and the Global Ocean Acidification Observing Network focusing on ocean acidification and its impacts in the Southern Ocean was also launched.

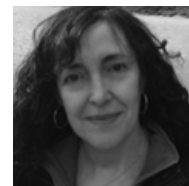
2024 saw the publication of six SOOS-led papers, including a 6-year assessment of impacts on emperor penguins under low sea-ice conditions, and two special issues focused on the Ross Sea and the Weddell Sea. SOOS continued its annual contribution to the BAMS State of the Climate Report, with this year's article highlighting the rapid changes occurring in the Southern Ocean. These include substantial warming and continued low sea-ice extent, both of which will impact the critical role of the Southern Ocean in regulating global climate.

SOOS was also very active in policy forums during 2024. As an observer at the *Antarctic Treaty Consultative Meeting (ATCM)* and *Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)*, SOOS presented information to the meetings on the status of the observing system, and continues to work with the ATCM on its intersessional work on the *development of an international framework for environmental monitoring*. SOOS was also well represented at the *UN Climate Change conference COP29*, contributing to multiple events in the Cryosphere and Ocean Pavilions. These events continued to highlight the threat of climate change to the Southern Ocean and the impacts of these changes on the human population.

Looking ahead to 2025, the last year of SOOS' current Science and Implementation Plan, SOOS will update its Science Plan and develop a new Implementation Plan for 2026-2030. SOOS will continue its efforts in linking Southern Ocean science to global and regional policy, including a strong presence at the UN Ocean Conference, the Intergovernmental Oceanographic Commission, CCAMLR and COP30. It will also publish a special feature in *Elementa* building on the SOOS Symposium in 2023, remain actively involved in Antarctica InSync and contribute to planning for the 2032-33 International Polar Year. An overarching priority for SOOS in 2025 will be securing funding to ensure a stable and sustainable future for SOOS, as a key facilitator in the international Southern Ocean community.



Sian Henley
Sian Henley
SOOS Co-Chair



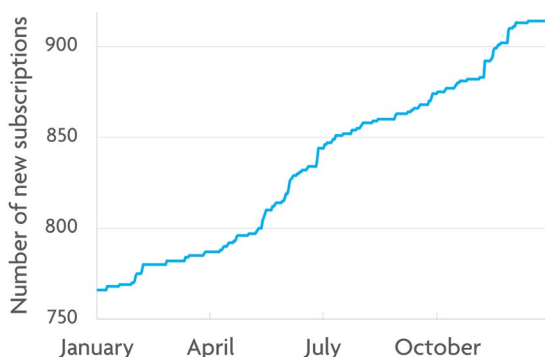
Irene Schloss
Irene Schloss
SOOS Co-Chair

FACTS AND STATS OF 2024

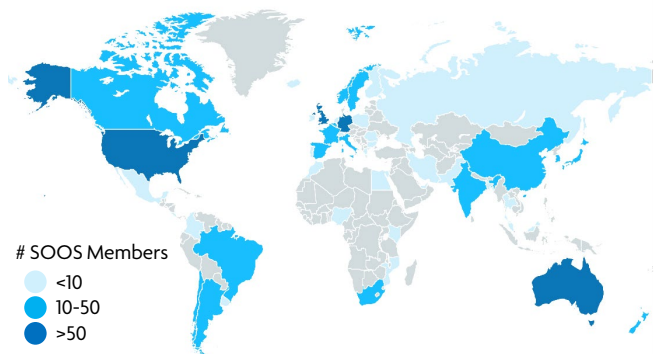
SOOS Community Engagement



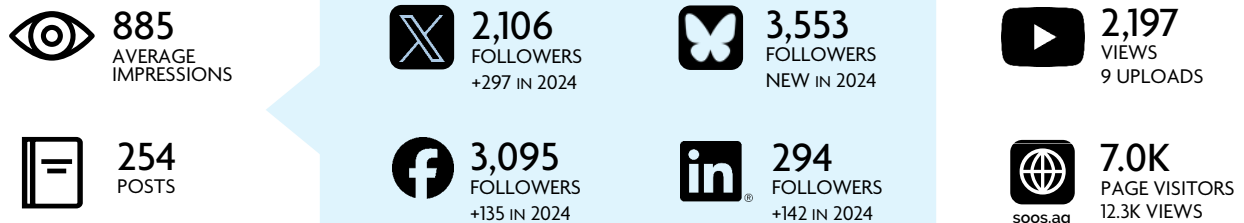
SOOS Membership Growth



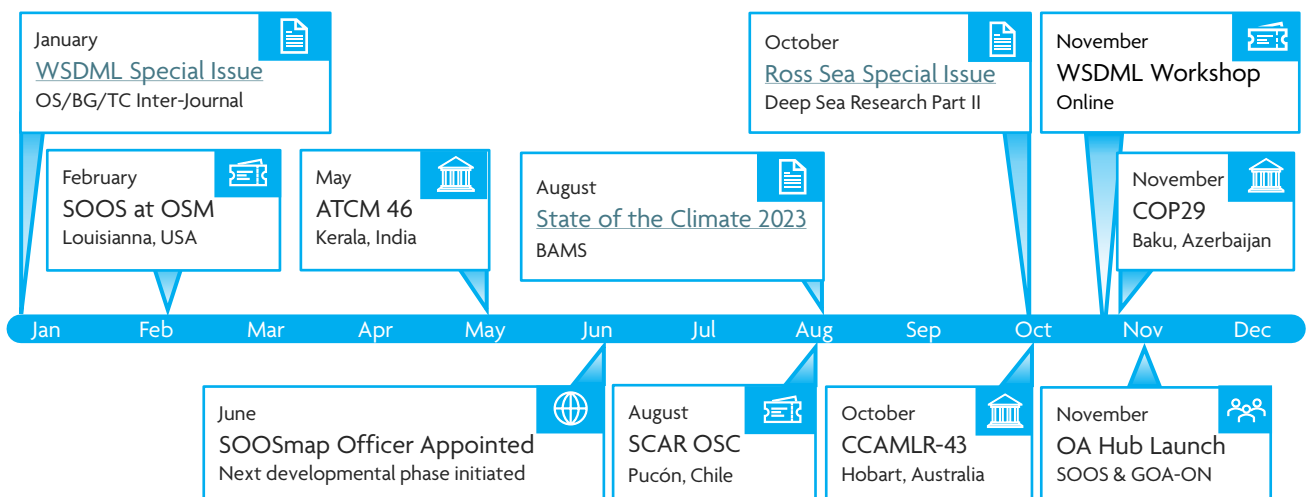
Membership Map



SOOS Outreach



Timeline of Major SOOS Outputs



BROKERING DATA



52 Million
OBSERVATIONS



>14,500
KRILLBASE SAMPLES



>149,100
CONTINUOUS PLANKTON
RECORDER MEASUREMENTS



>669,200
DNA BARCODES



>584,600
CTD MEASUREMENTS



>4,600
PENGUIN SPECIES
OCCURRENCE RECORDS



1.7 Million
MARINE MAMMAL
OBSERVATIONS



>699,900
ARGO MEASUREMENTS



63
DATA LAYERS



814
SOOS MOORING
NETWORK



>26,600
SCAR ICEBERG
OBSERVATIONS



114
SCAR PLASTICS
SAMPLINGS

SOOSmap (soosmap.aq) unites globally curated datasets from decades of Southern Ocean observing.

In 2024, SOOSmap Version 2 saw significant advancements, including:

- A designated Project Officer driving the next development phase
- Improvements to data visualisation and access
- Addition of 6 new datasets (1 EMBL sequencing dataset, 3 OCEAN:ICE Argo datasets, 2 SO-CHIC Glider datasets)
- Metadata cleaning

Developed, maintained and hosted by:



26 Nations Represented in

>700 Ship Expeditions



64
SCIENCE/NAP



86
FISHERIES



>550
TOURIST

34 Other Expeditions



32
FLIGHTS



2
TRAVERSE

DueSouth (polarDEX.org/due-south) enables sharing of plans for upcoming cruises, expeditions and more.

DueSouth is hosted by the European Polar Board's polar infrastructure and logistics platform, PolarDEX. Key achievements in 2024 include:

- Continued updates of data from existing partners, COMNAP, IAATO and CCAMLR, and exploration of new data updates and sources
- Enhanced portal functionality as well as improved information available via PolarDEX

Maintained and hosted by: As part of:



SOOS Metadata Portal

1,662 page views, 267 visitors, 9,093 datasets

- Implemented a "tour" of the portal
- Bulk download of granule data through a web browser extensions is now available as well as analysis-in-place for individual granules through a Jupyter Notebook
- Access is now available to the International Directory Network

Developed, maintained and hosted by:



Data Management Sub-Committee

22 members from 17 institutions and 13 countries

- DMSC virtual meeting and joint DMSC/Scientific Steering Committee virtual meeting
- Development of a publication on SOOSmap (ten Hoopen et al., in review)
- Development and release of a '[Guidelines to Early Career Researchers for Data Discovery](#)'
- Presentation on SOOSmap and DueSouth at SCAR OSC, Ocean Decade Workshop and IMDIS.

REGIONAL WORKING GROUPS (RWG)

Weddell Sea/Dronning Maud Land (WSDML)

200 members from 111 institutions and 32 countries

- Coordinated and published a special issue in [Copernicus](#)
- Convened a 3-day WSDML online workshop
- Convened a WSDML webinar
- Released a WSDML newsletter
- Recruited a new APECS Representative and 3 new leadership team members
- Active involvement in Antarctica InSync development

West Antarctic Peninsula and Scotia Arc (WAPSA)

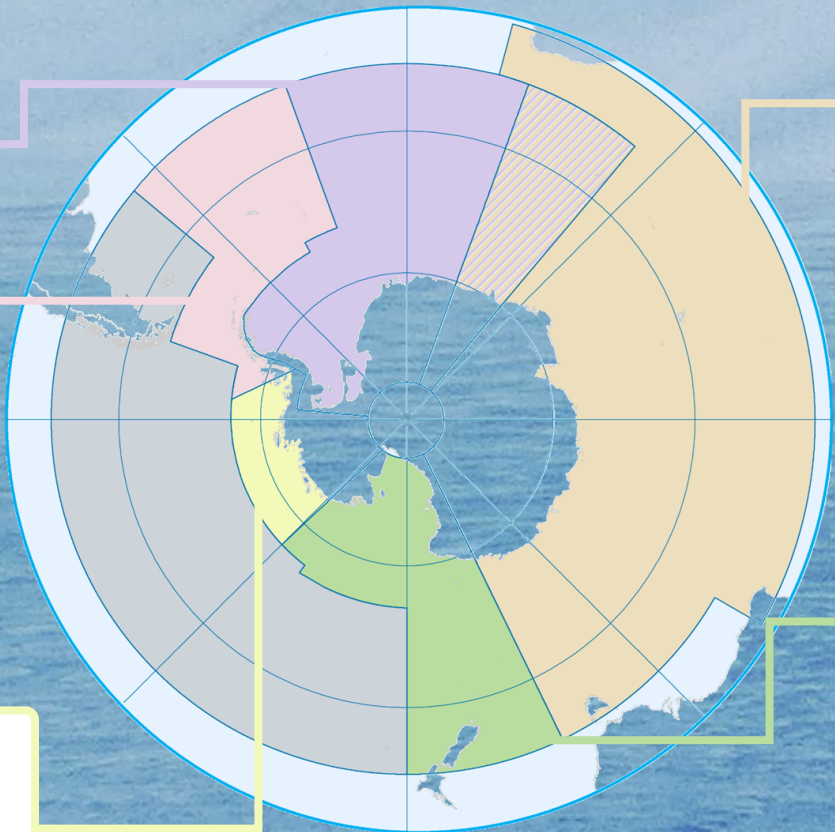
151 members from 94 institutions and 34 countries

- Co-convened a session at the SCAR Open Science Conference
- Recruited a new Co-Chair, new APECS Representative and 4 new leadership team members

Amundsen and Bellingshausen Sector (ABS)

138 members from 90 institutions and 28 countries

- Published 2 OCEAN:ICE publications of relevance to SOOS
- Recruited a new APECS Representative and 3 new leadership team members



Southern Ocean Indian Sector (SOIS RWG)

152 members from 96 institutions and 28 countries

- Convened 2 SOIS webinars
- Released 3 SOIS newsletters
- Convened a session at the SOLAS Open Science Conference
- Developed a publication on the status of ocean observations in the SOIS region (Halfter et al., in review)
- Recruited a new leadership team member

Ross Sea RWG

156 members from 100 institutions and 31 countries

- Coordinated and published a special issue in [Deep Sea Research II](#)
- Continued an online [Ross Sea bi-monthly meeting series](#)
- Collaborative New Zealand/Italy joint campaign to the Ross Sea
- Recruited a new Co-Chair, a new APECS Representative and 3 new leadership team members
- Engagement and endorsement of the newly funded [Ross Sea Research Coordination Network \(RCN\)](#)

CAPABILITY WORKING GROUPS (CWG)

Censusing Animal Pop. from Space (CAPS)

62 members from 42 institutions and 24 countries

- 4 CAPS publications ([Attard et al., 2024](#); [Fretwell, 2024](#); [LaRue et al., 2024](#); [Wethington et al., 2024](#))
- CAPS open meeting at SCAR OSC
- Exhibition and presentations on CAPS at 2 other meetings
- 5 new projects funded to contribute to CAPS
- Recruited a new APECS Representative
- Working to coordinate Antarctica InSync projects

Southern Ocean Fluxes (SOFLUX)

205 members from 113 institutions and 34 countries
Endorsed UN Ocean Decade Action

- Convened 8 [SOFLUX webinars](#)
- Released 4 SOFLUX newsletters
- SOFLUX open meeting at Ocean Sciences
- Publication on observing system requirements of air-sea fluxes in the SO ([Prend et al., 2025](#))
- Working to propose Antarctica InSync projects

Observing System Design (OSD)

163 members from 107 institutions and 35 countries

- Presentations on OSD at AGU

OTHER SOOS GROUPS

Southern Ocean – Ocean Acidification Regional Hub (SO-OA)

31 members from 26 institutions and 15 countries
Joint hub between SOOS and the GOA-ON

- A SOOS/Global Ocean Acidification Observing Network (GOA-ON) Ocean Acidification Regional Hub for the Southern Ocean was launched in November 2024
- Hub launch workshop held as part of the OA Week and the Australian Antarctic Research Conference
- Recruitment of inaugural hub leadership team members and APECS Representative in early 2025
- Presentation at COP29

Polar Technology Task Team

42 members from 27 institutions and 17 countries

Equity, Diversity and Inclusion (EDI) Group

Released a report on EDI at the SOOS Symposium 2023

SOOS PARTNERSHIPS & COLLABORATIONS



Antarctic bioDiVersity dAta iNfrastruCture (ADVANCE), a project which will create a Virtual Research Infrastructure (VRI) for biodiversity data, released a report on "[Designing Southern Ocean E\(B\)V workflows, from data collection to data products](#)"



UN Decade Collaborative Centre for the Southern Ocean Region held a workshop at the SCAR Open Science Conference in Chile as well as 2 side-events highlighting the Southern Ocean at the UN Decade Conference in Barcelona. SOOS continues collaboration with the UN Decade Action "[Antarctica InSync](#)" as official partner of the program.



International Polar Year (IPY) 5 is being planned for 2022-33 with SOOS being a core member of the IPY5 Planning Group. In 2025, a [website](#) for IPY5 and [updated concept note](#) was released.

SORP

CLIVAR/CLIC/SCAR Southern Ocean Regional Panel (SORP) SSC *ex-officio* position held by SOOS, which in 2024 included the release of a CLIVAR Exchanges Special Issue on "[Advances in Emerging Antarctic Programs](#)" and co-authorship of the [BAMS State of the Climate Report 2023](#).

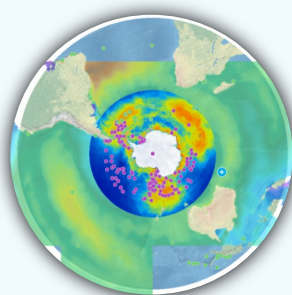


Polar Data Discovery and Enhancement Research Working Group (POLDER) continued to convene [bi-monthly hackathons](#), commenced planning for the Polar Data Forum VI (Hobart, 2025) and finalised a report on mapping the polar data ecosystem.

HIGHLIGHT OF THE YEAR

Advancing SOOSmap: The Next Phase

In 2024, significant advancements were made to the SOOS data portal, [SOOSmap](#), enhancing its capabilities for the future. Full data cards now feature updated links to Source Data, Original Metadata and DOI for seamless access. All datasets include either official citations from the source or suggested citations for user reference. The [tutorial](#) is more prominently accessible ensuring users can quickly navigate and understand key features. Additional improvements include:



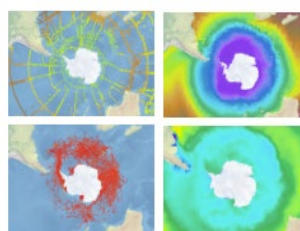
New datasets added, with more in progress.
Improved layering enables datasets to now be layered together, regardless data of type.



Improved data cards now feature adjustable opacity and top layer labelling for better visibility.



Launch of a [public GitHub repository](#) to provide resources, code, and a platform for issue reporting and new dataset suggestions.



Development of a [SOOSmap GeoNetwork](#) Catalogue to provide a centralised, standards-compliant platform for (meta-)data management.



ABOUT | The Southern Ocean Observing System (SOOS) is a joint initiative of the Scientific Committee on Antarctic Research (SCAR) and the Scientific Committee on Oceanic Research (SCOR). SOOS was launched in 2011 with the mission to facilitate the sustained collection and delivery of essential observations of Southern Ocean systems to all international stakeholders, through design, advocacy, and implementation of cost-effective observing and data delivery systems.

SOOS Governing Bodies



SOOS International Project Office (IPO) Sponsorship Collaboration in 2024



SOOS IPO host



SOOS International Sponsorship in 2024



Service Providers in 2024

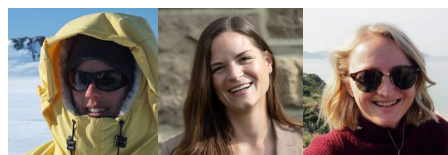


SOOS Executive Committee (EXCOM) in 2024



From left to right:
Sian Henley (Co-Chair),
Irene Schloss (Co-Chair),
Wolfgang Rack (Vice Chair),
Andrew Meijers (Vice Chair)

SOOS IPO Team



From left to right:
Alyce Hancock (Executive Officer)
Julia Bach (Science & Comms Officer),
Michaela Miller (Data Officer)