



SOUTHERN OCEAN OBSERVING SYSTEM

ANNUAL REPORT 2023

THE SOUTHERN OCEAN IN A  
CHANGING WORLD

[www.soos.aq](http://www.soos.aq)



# WELCOME NOTE FROM THE EO

This report showcases SOOS' key achievements and progress in 2023, an incredibly productive and successful year. The highlight of the year was the inaugural SOOS Symposium held in August 2023 in Hobart, Australia. We would like to extend our gratitude to all those involved in the SOOS Symposium for making this such a successful event. The Symposium brought together 300 people from 25 countries across all continents to discuss all parts of the ocean observations pathway.

In addition to the SOOS Symposium, SOOS co-convened the 4th International Ross Sea Symposium in July 2023 in Naples, Italy. Rejuvenated after the last Ross Sea Symposium was run in the early 2000s, the Symposium was attended by over 100 scientists from 11 nations who discussed recent advances in Ross Sea research.

SOOS was also very active in policy forums during 2023. As an observer at the CCAMLR, SOOS presented information to the commission on how its tools can assist with conservation monitoring and ecosystem-based management. SOOS was also well represented at COP28 in Dubai, leading and contributing to multiple events in the Cryosphere Pavilion. These events highlighted the threat of climate change to Antarctic and Southern Ocean ecosystems and discussed what the 2023 record low levels of sea ice tell us about Antarctica's future.

In 2023, SOOS continued to provide the Southern Ocean chapter to the BAMS State of the Climate Report and released a publication on the catastrophic breeding failure of emperor penguins. In 2022, irregularities were observed in sea surface temperature, salinity, heat transfer between the atmosphere and ocean as well as marine productivity and oxygen levels. Additionally, the early break up of sea ice in the Bellingshausen Sea region resulted in the total breeding failure of four out of five breeding sites in the region.

Looking ahead to 2024, SOOS will continue its efforts in linking to policy, maintain a strong presence at the SCAR Open Science Conference, coordinate a special issue in Elementa, and be actively involved in the planning for the 2032-33 International Polar Year. An overarching priority for SOOS in 2024 will be securing funding to ensure a stable and sustainable future for SOOS.



*A Hancock*

Dr Alyce Hancock  
Executive Officer

# FACTS AND STATS OF 2023

## SOOS Community Engagement

**4**  
NEWSLETTERS

**119**  
LEADERSHIP  
TEAM MEMBERS

**4**  
PUBLICATIONS

**23**  
MEETINGS &  
WORKSHOPS

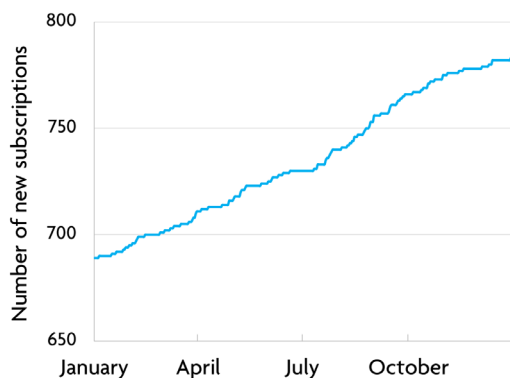
**27**  
PRESENTATIONS

**16**  
EARLY CAREER  
LEADERSHIP

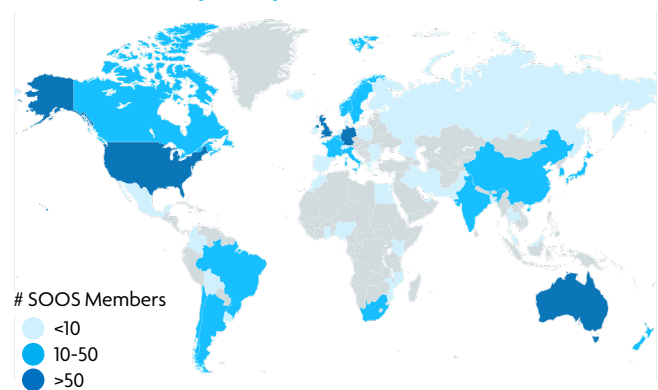
**4**  
REPORTS

**8**  
ENDORSED  
PROJECTS

## SOOS Membership Growth



## Membership Map



## SOOS Outreach

**1993**  
FOLLOWERS  
+301 IN 2023

**2981**  
FOLLOWERS  
+147 IN 2023

**112**  
SUBSCRIBERS  
+25 IN 2023

**145**  
FOLLOWERS  
NEW IN 2023

**177K**  
IMPRESSIONS

**201**  
POSTS

**9.5K**  
REACH

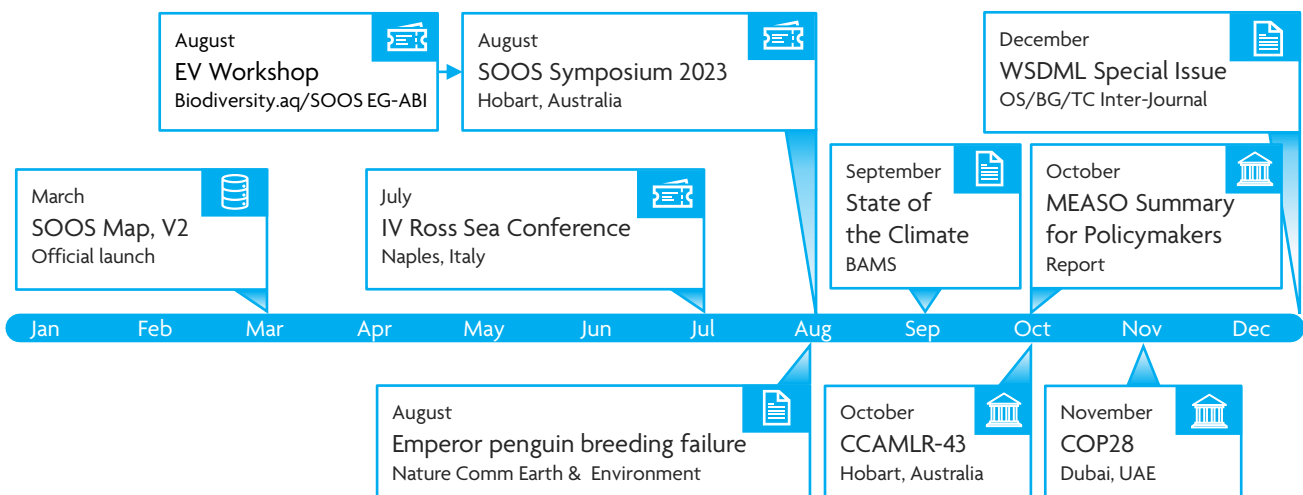
**168**  
POSTS

**3007**  
VIEWS

**11**  
UPLOADS

**7.2 K**  
PAGE VISITORS  
SINCE JUNE 2023 (GA4)

## Timeline of Major SOOS Outputs





## REGIONAL WORKING GROUPS (RWG)

### Weddell Sea/Dronning Maud Land (WSDML)

155 members from 89 institutions and 27 countries

- Coordinated a special issue in Copernicus
- Convened a joint parallel session with ABS at the SOOS Symposium and an open lunch meeting
- Presented on SOOS at an international meeting

### West Antarctic Peninsula and Scotia Arc (WAPSA)

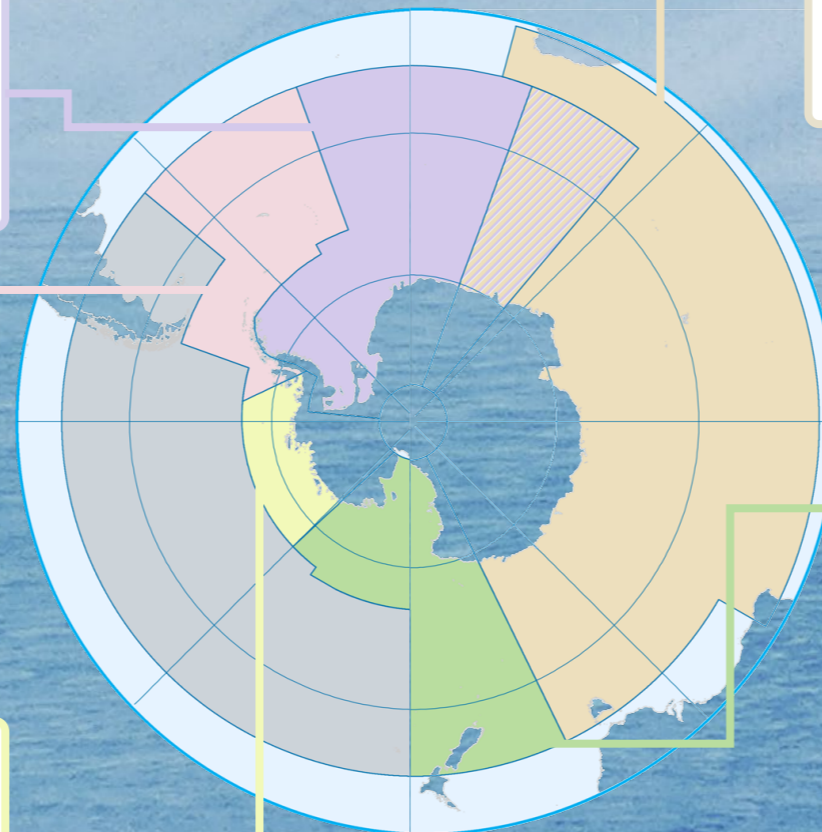
133 members from 83 institutions and 30 countries

- Convened a parallel session at the SOOS Symposium and an open lunch meeting
- Recruited a new APECS Representative and are seeking new leadership team members to commence in 2024

### Amundsen and Bellingshausen Sector (ABS)

120 members from 78 institutions and 24 countries

- Released an ABS newsletter
- Convened a joint parallel session with WSDML at the SOOS Symposium
- Recruited a new APECS Representative and are seeking new leadership team members to commence in 2024



### Southern Ocean Indian Sector (SOIS RWG)

133 members from 85 institutions and 23 countries

- Released 2 SOIS newsletters
- Convened an open lunch meeting at the SOOS Symposium
- Presented on SOOS at 2 international meetings
- Recruited a new APECS Representative

### Ross Sea RWG

118 members from 79 institutions and 25 countries

- Convened the 4<sup>th</sup> International Ross Sea Symposium in Naples in July which was attended by 100 people
- Coordinating a special issue in Deep Sea Research II
- Convened a parallel session at the SOOS Symposium and an open lunch meeting
- Convened a parallel session at IUGG
- Presented on SOOS at 2 international meetings
- Commenced online Ross Sea presentation sessions in late 2023 to be run bi-monthly in 2024
- Recruited a new APECS Representative and are seeking new leadership team members to commence in 2024

## CAPABILITY WORKING GROUPS (CWG)

### Censusing Animal Pop. from Space (CAPS)

52 members from 39 institutions and 23 countries

- Publication = "Record low 2022 Antarctic sea ice led to catastrophic breeding failure of emperor penguins" (Fretwell *et al.*, 2023)
- Open lunch meeting at the SOOS Symposium

### Observing System Design (OSD)

141 members from 96 institutions and 30 countries

- Held a side-workshop at the SOOS Symposium
- Convened 5 OSD webinars
- Recruited a new APECS Representative

### Southern Ocean Fluxes (SOFLUX)

174 members from 95 institutions and 29 countries  
Endorsed UN Ocean Decade Action

- Convened a parallel session at the SOOS Symposium and an open lunch meeting
- Convened 4 SOFLUX webinars
- Released 8 SOFLUX newsletters
- Presented on SOOS at an international meeting
- Recruited a new APECS Representative and Co-Chair

## TASK TEAMS

### Polar Technology Task Team

- Co-convened a side-workshop with OSD
- Convened a plenary and parallel session at the SOOS Symposium

### eEOV Task Team

- Delivered the Marine Ecosystem Assessment of the Southern Ocean (MEASO) Summary to Policy Makers together with the larger MEASO team
- Completed in 2023

## OTHER SOOS GROUPS

### Equity, Diversity and Inclusion (EDI) Group

- Developed and implemented a Code of Conduct for the SOOS Symposium
- Conducted a pilot hybrid offering at the SOOS Symposium

### Ocean Acidification Regional Hub

- *Ocean Acidification Regional Hub for the Southern Ocean* is being developed in collaboration with the Global Ocean Acidification Observing Network (GOA-ON)

# BROKERING DATA



**>50,000**  
DATASETS



**14,543**  
KRILLBASE SAMPLES



**766**  
CONTINUOUS PLANKTON  
RECORDER TRANSECTS



**380**  
DNA BARCODING OF  
MARINE ZOOPLANKTON



**34,937**  
CTD CASTS



**3,630**  
PENGUIN COLONY COUNTS



**1,636**  
MARINE MAMMALS (MEOP)



**114**  
SCAR PLASTICS SAMPLING



**814**  
SOOS MOORING  
NETWORK



**50**  
DATA LAYERS



**234**  
SCAR ICEBERG  
DATABASE



**1,980**  
ARGO

**SOOSmap** unites globally curated datasets from decades of Southern Ocean observing.

In 2023, the SOOSmap, Version2, has been further developed and officially launched, including improved and new:

- Interface and filtering features
- Data federation and metadata presentation
- Data download features
- Management of *in situ*, remote sensing and model output on the same interface
- [SOOSmap tutorial](#) on SOOS YouTube channel.

Developed, maintained and hosted by:



**24 Nations Represented in**

**355 Ship Expeditions**



**52**  
SCIENCE/NAP



**41**  
FISHERIES



**262**  
TOURIST

**22 Other Expeditions**



**21**  
FLIGHTS



**1**  
TRAVERSE

**DueSouth** enables sharing of plans for upcoming cruises, expeditions and more.

Next to promoting DueSouth (hosted in Polardex) at events in 2023, other key achievements include:

- Explored data updates and adding additional data sources with new and existing partners, such as COMNAP
- Contributed to the Polar Observing Assets Working Group on logistics metadata standards
- Implemented an automated email updates system

Maintained and hosted by: As part of:



## SOOS Metadata Portal

3839 page views, 356 visitors per year

- The number of datasets increased to 9,258 in 2023 (from 7,629 in 2022)
- New International Directory Network (IDN) homepage offers direct access to tools.
- NASA's CMR provides HTML views of metadata, indexed by Google Dataset Search for better data access.

Developed, maintained and hosted by:



## Data Management Sub-Committee

22 members from 17 institutions and 13 countries

- Convened a plenary session, parallel workshops, a data helpdesk, and a data surgery at the SOOS Symposium
- Convened a hybrid DMSC meeting in August and an online meeting in March
- Presented on SOOS at 4 international meetings
- Contributed to the SOOSmap, V2, launch



# SOOS PARTNERSHIPS & COLLABORATIONS



**Antarctic bioDiVersity dAta iNfrastruCture (ADVANCE)**, a new project which will create a Virtual Research Infrastructure (VRI) for Antarctic & Southern Ocean biodiversity data, held the joint "Biodiversity.aq/SOOS EG-ABI Essential Variables Workshop" in August 2023.



**UN Ocean Decade Southern Ocean Task Force** was approved as the "UN Decade Collaborative Centre for the Southern Ocean Region" in 2023, hosted by SCAR. SOOS entered a new collaboration with the newly endorsed UN Decade Action "Antarctica InSync".



**Marine Ecosystem Assessment for the Southern Ocean (MEASO)** published a summary of scientific findings to educate global policymakers in 2023 co-authored and supported by SOOS. Key findings including translations are available via the SOOS website.

**CLIVAR/CliC/SCAR Southern Ocean Regional Panel (SORP)** SSC *ex-officio* position held by SOOS, which in 2023 co-authored section: "6g. Southern Ocean" in BAMS's "State of the Climate" & has been co-editing a SORP CLIVAR Exchanges Special Issue on National Antarctic Programs.

## HIGHLIGHT OF THE YEAR



### SOOS Symposium 2023 "Southern Ocean in a Changing World"

14 – 18 August | Hobart, Australia  
10 - 20 August with side-meetings and workshops

The Southern Ocean Observing System (SOOS) held its inaugural SOOS Symposium in 2023, which included plenary presentations, parallel sessions and workshops covering a wide spectrum of Southern Ocean research. In light of the escalating climate crisis, a community statement calling for an urgent expansion of Southern Ocean observations was released, which had been translated into 12 languages.

**Closing Statement:** "The Southern Ocean is a critical component of the global climate system. The Southern Ocean controls to a large extent the uptake of human generated heat and carbon into the ocean. Yet, we are currently observing critical changes in the Southern Ocean that are seen in the record low levels of sea-ice extent, record high temperatures and dramatic shifts in penguin populations, among other striking changes. The chronic lack of observations for the Southern Ocean challenges our ability to detect and assess the consequences of change. As such, it is more pressing than ever to have a sustained and coordinated Southern Ocean observing system to provide an understanding of current conditions, inform predictions of future states, and support policies and regulations for the benefit of society."



**300**  
attendees  
25 countries  
133 institutes  
31 % early careers



**40**  
media features  
in Australia, Europe,  
New Zealand, North  
& South America

**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 2023

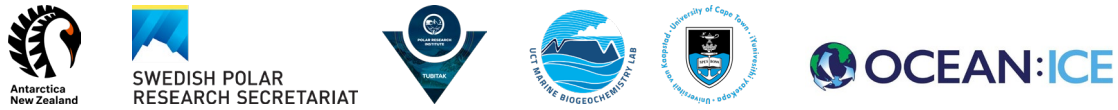


SOOS IPO host



Joining in 2024

### SOOS International Sponsorship in 2023



### Service Providers in 2023



### SOOS Executive Committee (ExCom) in 2023



From left to right:  
**Eileen Hofmann**, (Co-Chair),  
**Sian Henley** (Co-Chair),  
**Sebastien Moreau** (Vice Chair),  
**Irene Schloss** (Vice Chair)

### SOOS IPO Team



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

