

SOLAS International Project Office
State Key Laboratory of Marine Environmental Science, Xiamen University, China
www.solas-int.org
solas@xmu.edu.cn



futureearth
Research. Innovation. Sustainability.



SOLAS Overview

Scientific structure

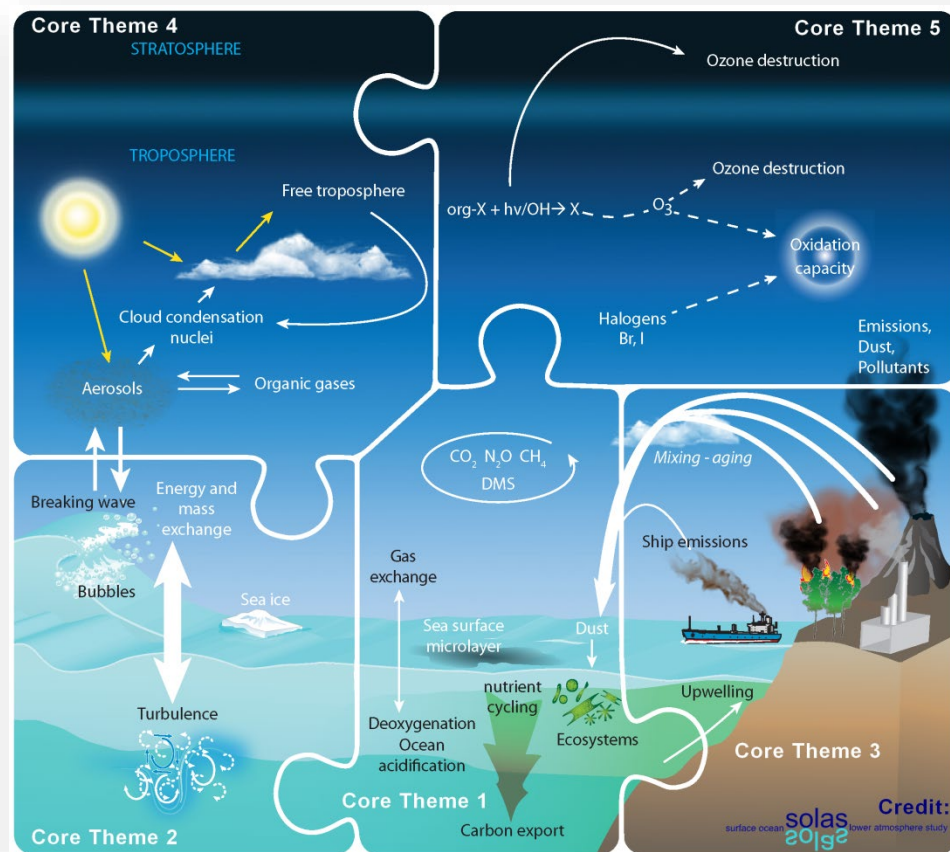
Core Themes:

1. Greenhouse gases and the oceans
2. Air-sea interface and fluxes of mass and energy
3. Atmospheric deposition and ocean biogeochemistry
4. Interconnections between aerosols, clouds, and marine ecosystems
5. Ocean biogeochemical controls on atmospheric chemistry

Cross-Cutting Themes:

1. Integrated topics (e.g., upwelling systems, Polar & Indian Oceans)
2. Climate Intervention
3. Science and Society

SOLAS 2015-2025



SOLAS Overview

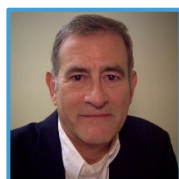
Governance

Scientific Steering Committee: 19 members from 16 countries

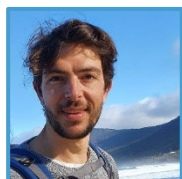
International Project Office: hosted by the State Key Laboratory of Marine Environmental Science, China



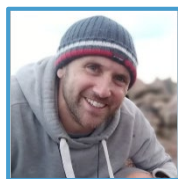
Christa Marandino
Co-Chair
Germany



Bill Miller
Co-Chair
USA



Lennart Bach
Australia



Tom Bell
UK



Minhan Dai
Ex-officio
China



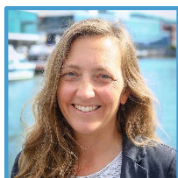
Cécile Guieu
Ex-officio
France



Ellycia Harrould-Kolieb
Australia



Maria Kanakidou
Exec. Committee
Greece



Karin Kvale
New Zealand



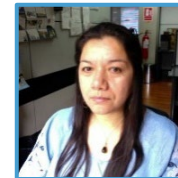
Zouhair Lachkar
United Arab
Emirates



Joan Llort
Spain



Anoop Mahajan
Exec. Committee
India



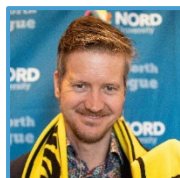
Ivonne Montes
Peru



Daiki Nomura
Japan



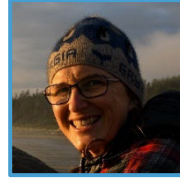
Jurgita Ovadnevaite
Exec. Committee
Ireland



Andreas Raspotnik
Norway



Arvind Singh
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Nadja Steiner
Exec. Committee
Canada



Lisan Yu
WCRP Representative
USA



Li Li
Executive Director
China



Yan Yang
Project Officer
China

SOLAS Overview

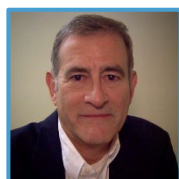
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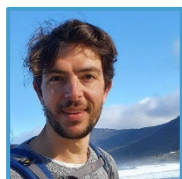
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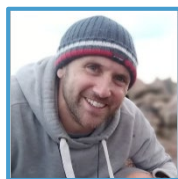
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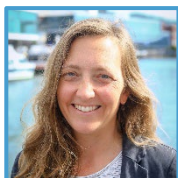
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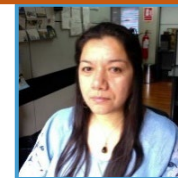
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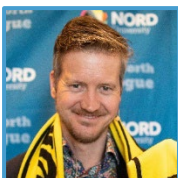
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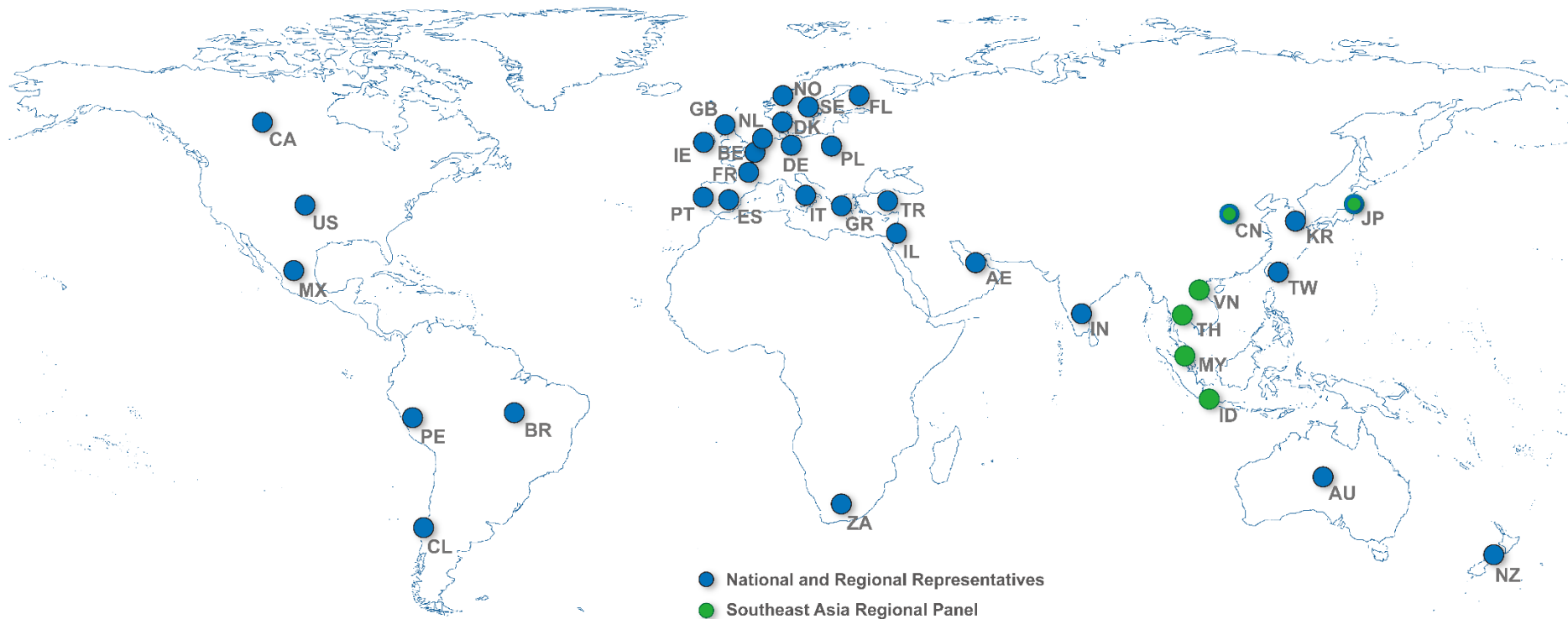


Yan Yang
Project Officer
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SOLAS Overview

Global network

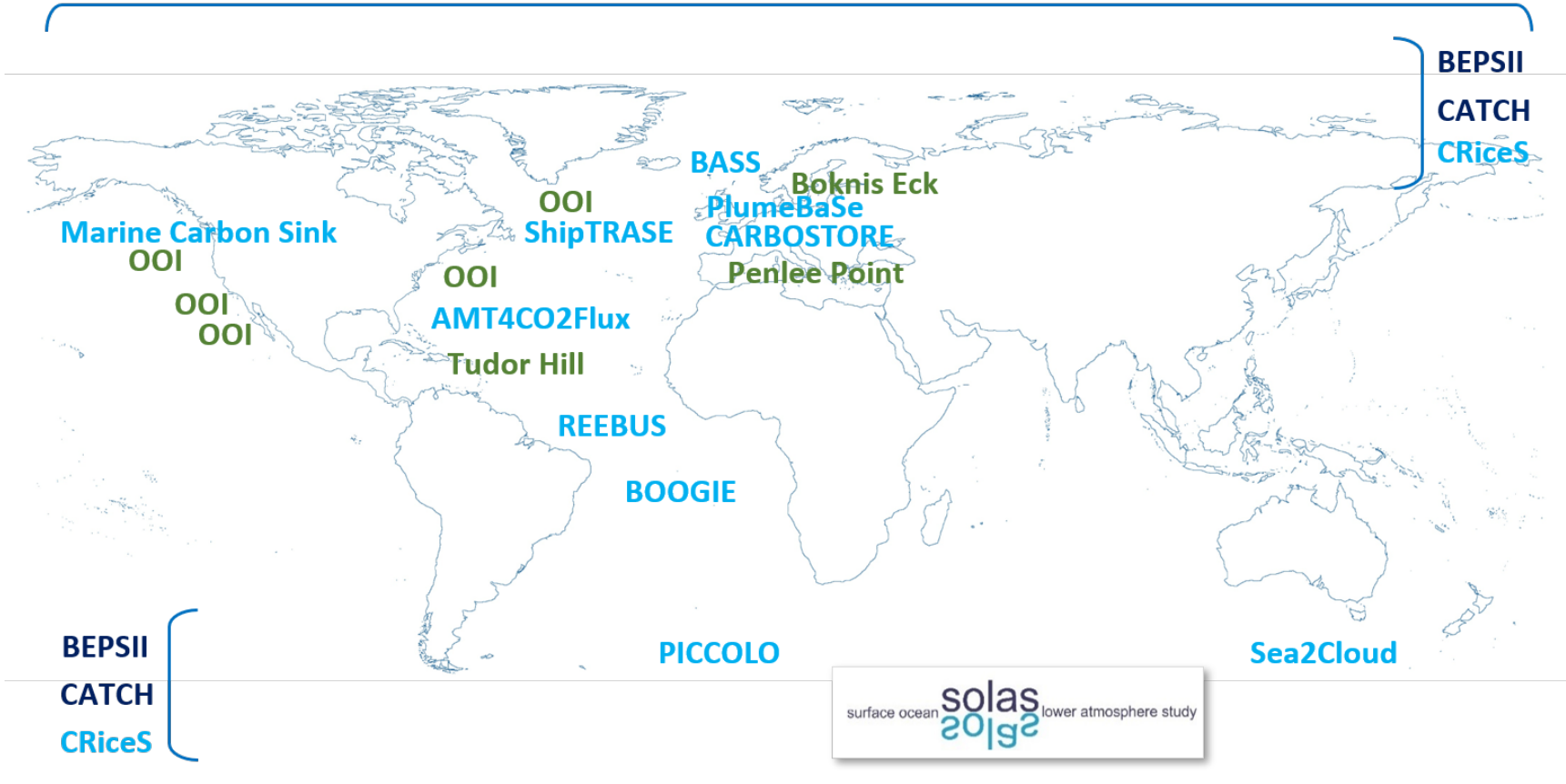
Research networks in 33 countries and regions coordinated by 36 Representatives and 1 Regional Panel



SOLAS Overview

Activities

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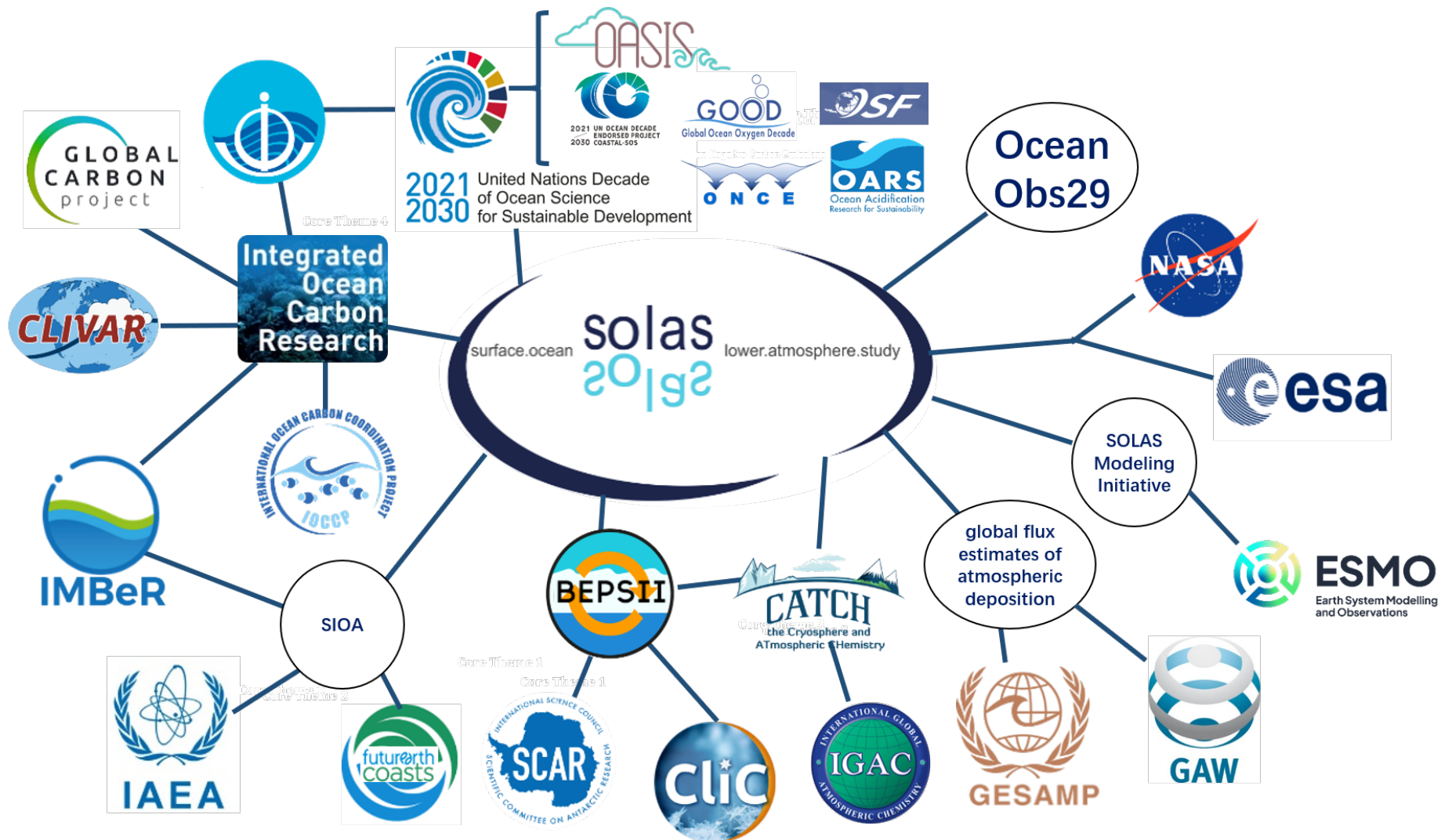
Sponsored Projects

Endorsed Projects

Endorsed Time Series Stations

SOLAS Overview

Collaborations



SOLAS Summary 2023-2024

New activities and initiatives

Early Career Scientists Committee

- ⚙ Launched in January 2023
- ⚙ ToR update and member rotation in 2024
- ⚙ Strategic and operational body to coordinate and champion ECS activities
- ⚙ Leading SOLAS implementation activities, being part of designing SOLAS' future.

SOLAS Mentorship Programme

- ⚙ Survey at SOLAS Summer School 2023
- ⚙ Discussion at SOLAS Open Science Conference 2024
- ⚙ To be launched at SOLAS Summer School 2026
- ⚙ Led by SOLAS Early Career Scientist Committee

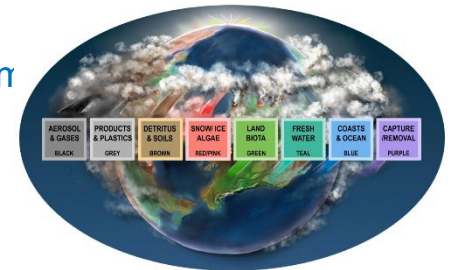


SOLAS Summary 2023-2024

New activities and initiatives

Fire Initiative

- ☀ COP27 UN Climate Change Conference Side Event: Fire risk increase, a challenge for Earth system and societies, 6–18 Nov 2022
- ☀ Fire science Learning Across the Earth system (FLARE) Workshop, 18-21 Sep 2023, Bermuda.
- ☀ White paper published on The Fire science Learning Across the Earth System (FLARE) Working Group (2024). Igniting progress: Results from the FLARE workshop and 3 challenges for the future of transdisciplinary fire science.



Climate Intervention Initiative

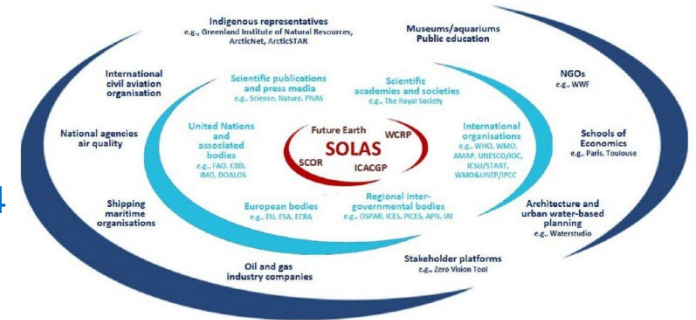
- ☀ Global network of SOLAS marine Carbon Dioxide Removal (mCDR) Nodes being established to develop standards for mCDR initiatives especially concerning Monitoring, Reporting, and Verification (MRV).
- ☀ Two projects under SOLAS postdoc programme: “Constraining the additionality problem for Ocean Alkalinity Enhancement” and “Investigating the additionality effect of Ocean Alkalinity Enhancement on air-sea fluxes in Halifax Harbour and the Scotian Shelf”
- ☀ Involvement in the IPCC Scoping Meeting for an IPCC Methodology Report on the Carbon Dioxide Removal Technologies and Carbon Capture Utilization and Storage.

SOLAS Summary 2023-2024

New activities and initiatives

SOLAS Science & Society Initiative

- ☀ Phase 1 since 2016: workshop series and publications on
 - Ocean carbon
 - Ship emissions
 - Air-sea interaction, policy, and stewardship
- ☀ Phase 2 since 2024: 2-day workshop alongside the OSC 2024
 - Nature-based marine solutions to climate change
 - Harmful algae blooms
 - Marine plastic

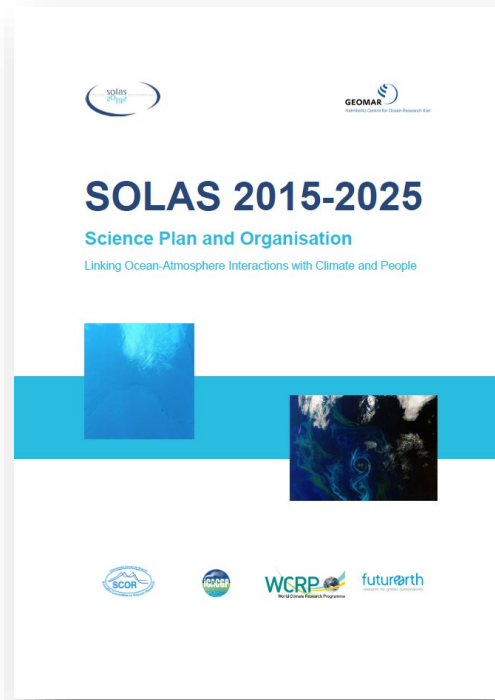
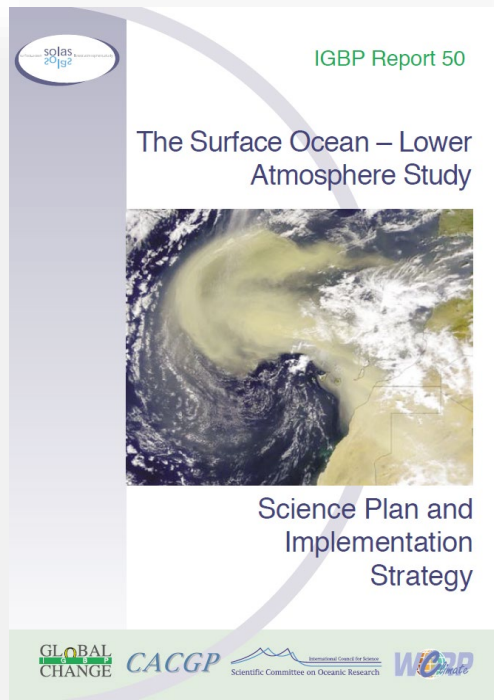


Special Feature “*Boundary Shift: The Air-Sea Interface in a Changing Climate*” in “*Elementa: Science of the Anthropocene*”

- ☀ 12 papers on SOLAS Core Themes, Cross-cutting/integrated topics
- ☀ To assess the current state of air-sea exchange science, highlight critical future research directions, and identify emerging opportunities for new collaborations, technologies, and discoveries



SOLAS' future beyond 2025

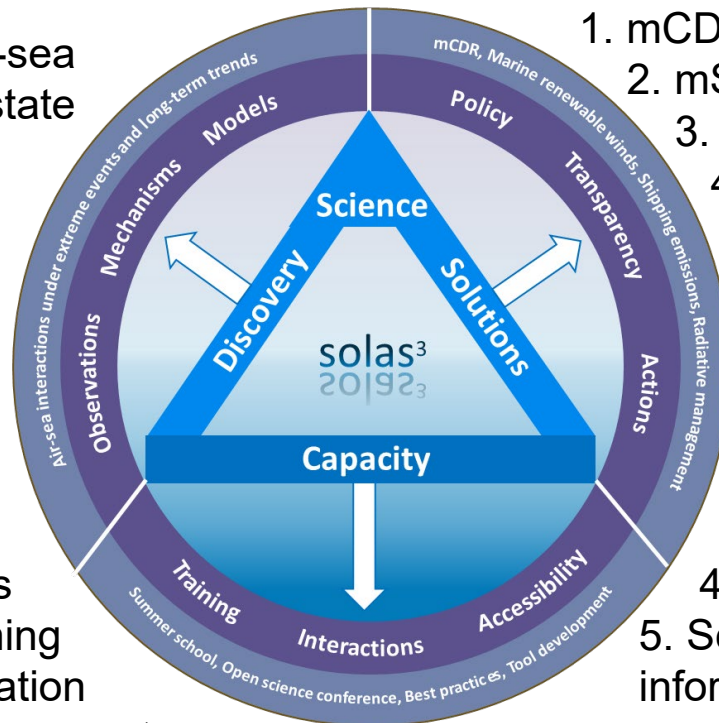


SOLAS 2026-2035

SOLAS 3.0

Surface Ocean-Lower Atmosphere Studies: from science to solutions

1. Characterization of air-sea interactions' mean state
2. Extreme events in the SOLAS domain



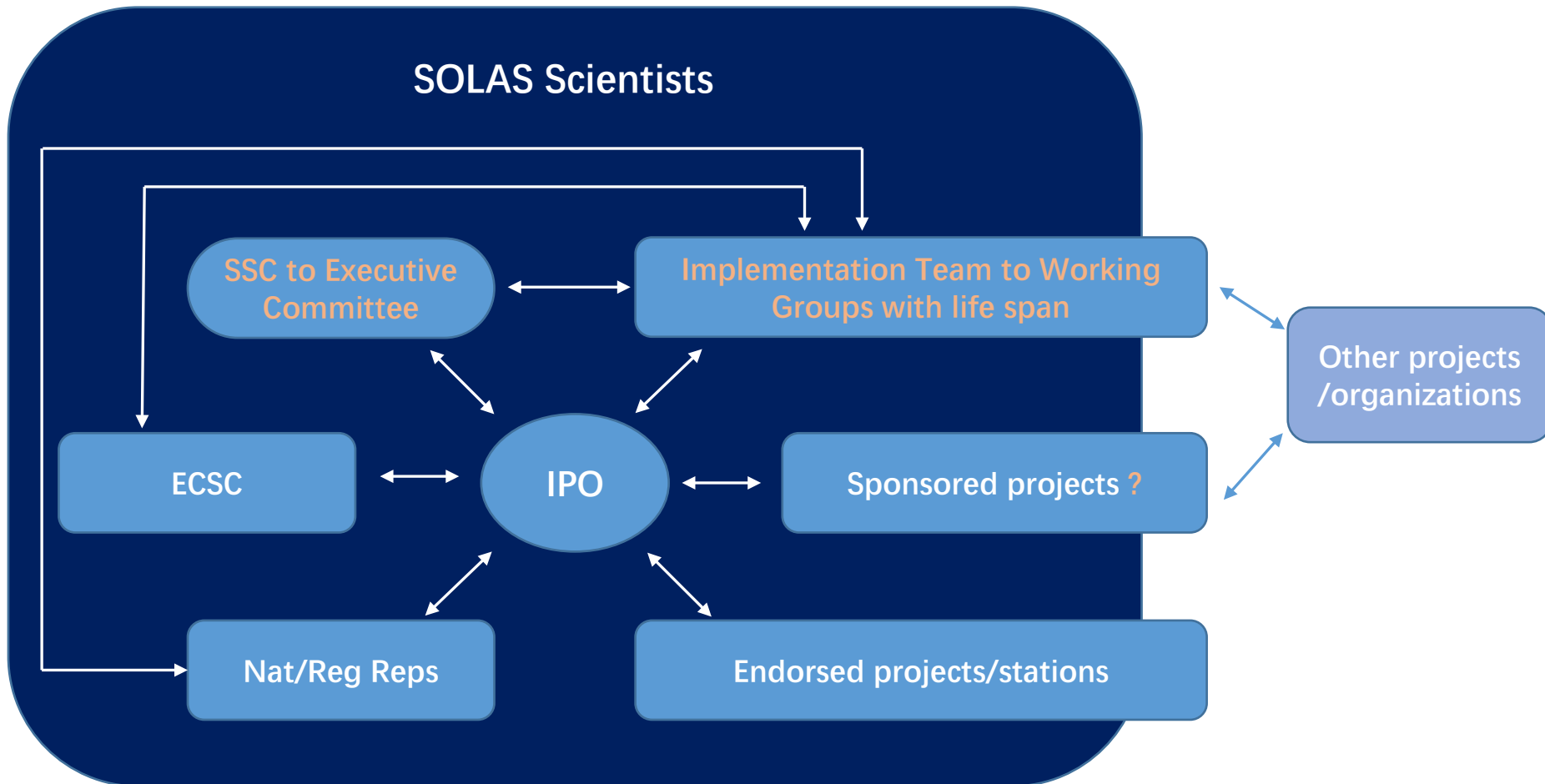
1. mCDR
2. mSRM
3. Solutions for restoration
4. Blue economy
5. International governance and coordination of ocean solutions

1. Scientific interactions
2. Early career training and integration
3. Skill enhancement

4. Tool and resource accessibility
5. Science advocacy, policy information and outreach

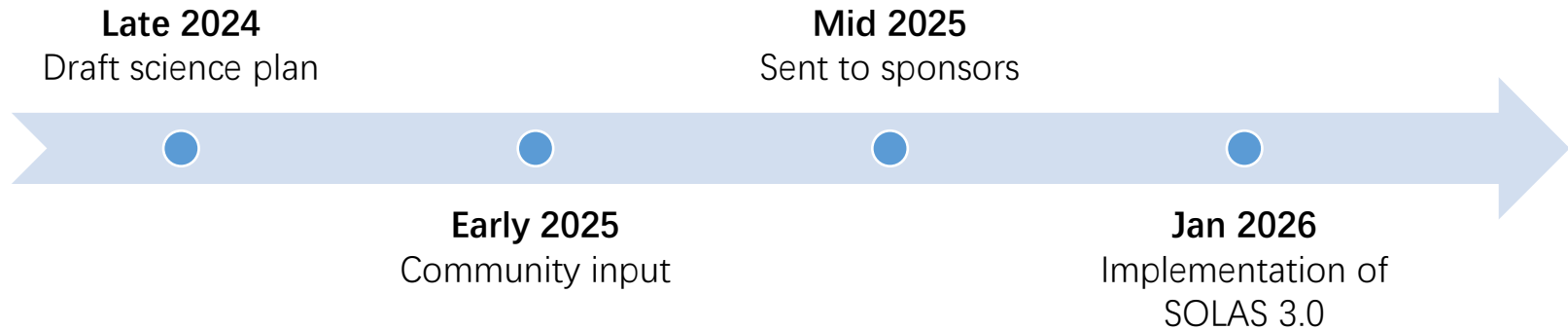
SOLAS 2026-2035

SOLAS 3.0 Organisational structure



SOLAS 2026-2035

SOLAS 3.0 timeline



Incomplete author list

Bach Lennart	Guieu Cecile	Llort Joan	Raspotnik Andreas
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Comeau Steve	Kanakidou Maria	Miller William	Steiner Nadja
Dai Minhan	Kurusu Minako	Mongwe Precious	Stuut Jan-Berend
Dinasquet Julie	Kvale Karin	Montes Ivonne	Tham Yee Jun
Dong Yuanxu	Lachkar Zouhair	Nomura Daiki	Tinel Liselotte
Garcon Veronique	Latif Mohd Talib	Oliveira Raquel	van Doorn Erik
Gassó Santiago	Leyba Ines	Ovadnevaite Jurgita	Wallace Doug
Guerreiro Catarina	Li Li	Perron Morgane	Yu Lisan

Upcoming events

- **9th SOLAS Open Science Conference**
 - 10-14 Nov 2024, Goa, India
 - Plenary sessions on SOLAS Core Themes and Cross-cutting Themes
 - Discussion sessions on SOLAS-related topics to further collaborations and research
 - Dedicated events for SOLAS 3.0, ECRs and Indian Community
- **Chemical, Biogeochemical, and Physical Drivers of the Coupled Polar Atmosphere and Climate: An International Polar Year 2032-33 Planning Workshop**
 - Online and in Aussois, France, 17-22 Nov 2024
- **IGAC-SOLAS session at XMAS 2025 on Chemistry and physics at surface ocean and lower atmosphere**
 - Xiamen, China, 14-17 Jan 2025
- **GESAMP WG38-GAW/WMO-SOLAS joint workshop on Research priorities for improving global flux estimates of atmospheric deposition to the ocean**
 - Heraklion, Greece, 7-10 Apr, 2025
- **SOLAS session at EGU2025 on Air-sea Chemical Fluxes: Impacts on Biogeochemistry and Climate**
 - Online and in Vienna, Austria, 27 Apr-2 May, 2025
- **SPARSE Workshop: Sea-surface microPlastic fRom Space**
 - Siena, Italy, 2025
 - Supported by Future Earth-ESA joint programme
- **10th SOLAS Summer School**
 - CEPENE, Tamandaré, Brazil, 22 Feb-14 Mar, 2026

