

SOLAS International Project Office
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futureearth
Research. Innovation. Sustainability.



SOLAS Summary 2022-2023

Overview

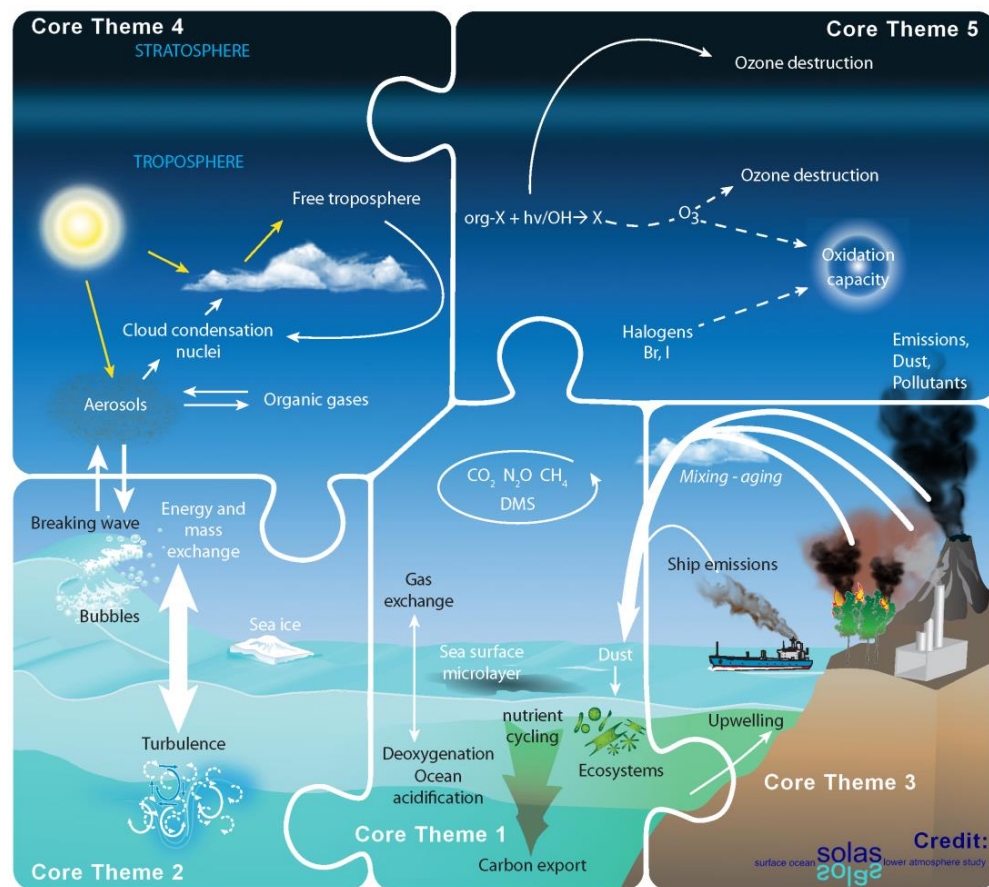
International organisation dedicated to quantitative understanding of the key biogeochemical-physical interactions and feedbacks between the ocean and atmosphere, and of how this coupled system affects and is affected by climate and global change.

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 oceans, Indian Ocean)
2. Climate intervention
3. Science and Society



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Governance

2023 -

IPO-China, MEL, Xiamen University, China

Executive Director: Li Li

Project Officer: Yan Yang



IPO-Ireland, University of Galway, Ireland

Project Officer: position to be announced

MSc research program on Ocean,

Atmosphere and Climate: to be restructured and led by Peter Croot



Changing Steering Committee

Co-Chairs until end of 2023

- Minhan Dai (M, China)
- Cecile Guieu (F, France)

Committee members rotating off:

- Katye Altieri (F, South Africa)
- Marcela Cornejo (F, Chile)
- Santiago Gassó (M, USA)
- Arne Körtzinger (M, Germany)
- Mohd Talib Latif (M, Malaysia)

Priorities for new members:

- Global South; Expertise in Climate Intervention, Science & Society, Themes 1, Upwelling Systems, Polar Oceans

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New activities and initiatives

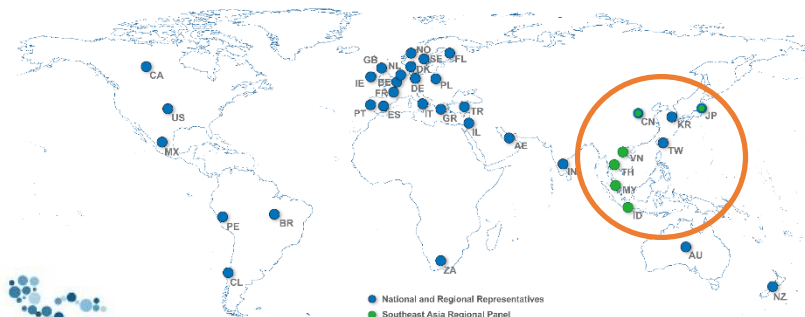
SOLAS Early Career Scientists committee

- Launched in January 2023
- Strong link with SSC/IPO
- Strategic and operational body to coordinate and champion ECS activities
- Leading SOLAS implementation activities, being part of designing SOLAS' future.



New Panels to promote ocean-atmosphere coupled research at the Regional Scale

- **Southeast Asia:** launched in March 2023
- **Latin America:** following the SOLAS Latin American Workshop, held online 26 May 2023



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New activities and initiatives

SOLAS 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, USA.
- UN Decade of Ocean Science Proposal: Aerosol Exchange with Marine Ecosystems



Eddy Covariance Initiative

- Eddy covariance (EC) air/sea gas flux best practice workshop, 28-30 March 2023, London, UK.
- Best practice for EC CO₂ flux system setup; results assessment of a data analysis intercomparison exercise; best practice for EC data analysis and uncertainty estimation; plan for an EC CO₂ flux intercomparison experiment in the field



Imperial College
London



SOLAS Modelling Initiative

- Recommendation of the SOLAS mid-term review conducted by SCOR and Future Earth
- Online workshop on Modelling surface ocean and lower atmosphere interactions in the Earth system, 24 July 2023
- A guide for the new Science Plan

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New activities and initiatives

SOLAS Postdoc Programme on Marine Carbon Dioxide Removal (mCDR)

- To advance understanding and model development of mCDR and contribute to robust Monitoring, Reporting, and Verification (MRV) protocols and consensus within the international scientific community
- Call for applications in August 2023, 4 experimental & modelling postdoc positions for three years within 2 projects.
- Project oversight group: GESAMP

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

- 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
- 12 SOLAS papers on-going publication



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Recent key event

9th SOLAS Summer School

- First time that the SOLAS Summer School took place in an African country
- 5-16 June 2023, Mindelo, Cabo Verde
- 66 young researchers from 25 countries
- 30 lecturers, practical demonstrators, and organisers
- Lectures, practicals, paralleled sessions, students' poster and oral presentation sessions, field trips to the Cape Verde Atmospheric Observatory



solas event report

Report 33 | September 2023

SOLAS Summer School 2023

5 – 16 June 2023
Mindelo, Cabo Verde

In this report

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Awardees research profiles

| | |
|---|----|
| Manon Berger, Geochemistry and biological feedbacks limit the potential of macroalgae carbon dioxide removal | 5 |
| Lucy Brown, Chemical controls on the uptake of ozone to the ocean | 8 |
| Genevieve Clow, Implementing a satellite simulator in an Earth system model to evaluate the impact of missing data on ocean chlorophyll observations | 10 |
| Louise Delaigle, Multidecadal change in natural carbon dynamics at the interface between the Atlantic and Southern Ocean | 13 |
| Yuanxu Dong, Temperature corrections increase global ocean CO ₂ uptake estimates by 35% | 16 |
| Agostino Niyonkuru Meroni, Fast thermal air-sea coupling: the instantaneous wind response and the role of environmental conditions | 18 |
| Uzoma C. Nworgu, Evaluating the South Atlantic Ocean dipole impacts on West African precipitation in Coupled Model Intercomparison Project phase 6 (CMIP6) model simulations | 20 |
| Daniel Tetah Quay, Seasonal variation and sources of particulate matter induced air-to-sea nutrient fluxes in the eastern tropical North Atlantic | 23 |
| Breanna Vanderploeg, A modelled sea spray generation function under tropical cyclone conditions and the effect of surfactants: A change in air-sea regime under major storms? | 25 |



厦门市海洋国际合作中心
XIAMEN MARINE INTERNATIONAL COOPERATION CENTER

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Upcoming events

- **SOLAS Seminar VII on Ice-nucleating particles linked to marine biogeochemistry**, online, 26 Oct 2023, 11:00-13:00UTC
- **Side event at WCRP Open Science Conference on Community engagement and feedback on the SOLAS science agenda**, Kigali, Rwanda, 23-27 Oct 2023
- **GOOD-OARS-CLAP-COPAS Summer School**, Coquimbo-La Serena, Chile, 6-12 Nov 2023 (co-sponsored event)
- **International Digital Twins of the Ocean Summit 2023**, Xiamen, China, 9-12 Nov 2023 (co-sponsored event)
- **Session at AGU 2023 on The Surface Ocean-Lower Atmosphere Study (SOLAS): 20-years of Progress and Developments in Ocean-Atmosphere science**, San Francisco, USA, 11-15 Dec 2023
- **Side event at UN Ocean Decade Conference**, 10-12 April 2024, Barcelona, Spain
- **SOLAS Science and Society Workshop**, Helsinki, Finland, 10-14 Jun 2024
- **SOLAS Open Science Conference**, Goa, India, 10-14 Nov 2024



SOLAS' future beyond 2025

Discussions on SOLAS' future beyond 2025

- September-October 2022, 23rd SOLAS SSC meeting, hybrid in Cape Town, South Africa
- December 2022, Follow-up meeting of the 23rd SSC meeting, online
- January 2023, SOLAS Town Hall at XMAS VI, hybrid in Xiamen, China
- April 2023, ECSC Scoping Workshop, online
- May 2023, 24th SOLAS SSC meeting, hybrid in Heraklion, Greece
- June 2023, Survey on SOLAS' future at 9th SOLAS Summer School

Timeline for the 3rd decadal SOLAS science plan

- **25-28 September 2023**, 1st draft framework at the SOLAS Scoping Workshop, hybrid in Xiamen, China
 - 17 in-person and 23 online participants: current/past SSC chairs/members, ECSC members, National/Regional Representatives, Implementation Team leaders/members, sponsors, sponsored projects, partners, SOLAS scientists from a wider community

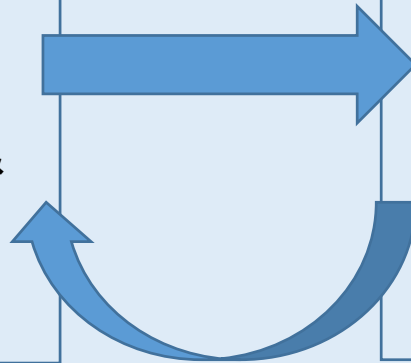


Tentative Title:

Surface Ocean-Lower Atmosphere Studies: from science to solutions → SOLAS 3

Discovery science

Basic system understanding,
observation, parameterization &
Earth System Models



Science for solutions

Evaluation of mitigation of
impacts, restoration and
adaptation. Policy
recommendations

T o o l s b o x



Community and skill development

Tentative Title:

Surface Ocean-Lower Atmosphere Studies: from science to solutions → SOLAS 3

Discovery science

1. Mean state of air-sea interactions (last 50 years)
2. Air-sea interactions under extreme events
3. Air-Sea interactions in the warming earth

Science for solutions

1. mCDR
2. Marine renewable winds energy
3. Shipping emissions
4. Radiative management
5. Clean-atmosphere future
6. Artificial upwelling?

Social Sciences

Community and skill development

1. Early career training and integration
2. Scientific interactions
3. Skill enhancement
4. Tool and resource accessibility
5. Scientific Advocacy
6. Policy Advocacy and outreach
7. Developp SOLAS Centres for Observation, Training and Solutions

➤ **End of November 2023:** 1st draft completed

➤ **December 2023:** comments by the Scoping Workshop participants

➤ **Late 2024:** science plan finalised with integration of community's input

➤ **2025:** transition period

Communication

Join the mailing list or follow us on twitter to stay apprised of the most current news on SOLAS, conferences, events, publications, and more.

<https://www.solas-int.org/news/join-the-mailing-list.html>

