

February 2026

FAIRSEAS Workshop Summary Report

The Future of Internationally Coordinated Air-Sea Interactions Research

EXECUTIVE SUMMARY

The 2026 FAIRSEAS workshop, held at The Lyell Centre, Heriot-Watt University, Edinburgh UK on February 21 2026, brought together SOLAS, OASIS, and CLIVAR to identify shared priorities for the next decade of air-sea interactions research. Participants emphasized that progress depends on stronger integration of physical, chemical, and biological observations, processes, and modelling efforts.

The community identified a need for a coordinated international strategy to better integrate observations, technology, data systems, modelling, and communication across the air-sea interactions community. This coordinated approach would advance understanding of air-sea interactions, improve our ability to understand, predict, and respond to environmental change, and support climate assessments, observing system planning, and evidence-based decision-making.

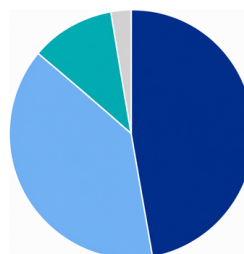
WORKSHOP PARTICIPANTS



59
in-person



26
early career



- Academia, 29 (49%)
- Gov, 22 (37%)
- Nonprofit, 7 (12%)
- Other, 1 (2%)



KEY POINTS

- Air-sea interactions regulate weather, climate, carbon cycling, and elemental exchange across the ocean-atmosphere interface.
- SOLAS, OASIS, and CLIVAR bring complementary strengths in biogeochemical processes, flux observations, emerging platforms, climate variability, and modelling.
- The community needs consistent flux terminology, especially for weather and climate extremes, to communicate effectively with policymakers, decision makers, and public audiences.
- OceanObs'29 is a strategic milestone for presenting a united, internationally coordinated agenda.

PRIORITY GAPS

- Insufficient observations of the air-sea transition zone, including heat, gases, and aerosols fluxes, and microbiology and primary production.
- Limited understanding of extremes, feedbacks, rare events, and small-scale processes such as bubbles, sea spray, waves, turbulence, and microlayer physics.
- Persistent mismatch between observational scales and model resolution.
- Under-sampled regions – the Southern Ocean, tropical Pacific, and polar regions; and under-sampled seasons – winter.
- Fragmented datasets, inconsistent metadata, and barriers to intercomparison.

RECOMMENDATIONS

- Shift from regional framing toward process- and regime-based science that can transfer across ocean basins.
- Develop minimum global observation standards while preserving flexibility for innovation and regional adaptation.
- Strengthen co-design between *in situ* observationalists, remote sensing operations, and modellers so observations diagnose model weaknesses, and models guide field priorities.
- Use machine learning and digital twins where high-resolution, co-located datasets can support validation and scenario testing.
- Expand industry partnerships, low climate impact observing practices, and engagement with maritime governance bodies.

STRATEGIC PRIORITIES (2026-2028)

- Establish a SOLAS-OASIS-CLIVAR coordination mechanism to reduce duplication and clarify shared priorities.
- Prepare OceanObs'29 outputs, such as white papers, strategy documents, gap assessments, community reviews, and priority-setting exercises.
- Focus early joint outputs on extremes, instrumentation, bulk formulae, and data inventories.
- Prioritize observations to be used with models and satellites.
- Create open, interoperable, FAIR-compliant data repositories and shared observational infrastructure to support coordinated assessments with models, remote sensing, and *in situ* observations.
- Build sustained early-career engagement and broaden participation in underrepresented regions through training, summer schools, workshops, and outreach.

ACTIONS ITEMS

DEADLINE

Define the scope, membership, and governance model for the coordination mechanism for global air-sea interactions.

November 2026

Draft a shared air-sea interactions OceanObs'29 roadmap with timelines, authorship, and review process.

November 2026

Inventory current air-sea interactions datasets, observing platforms, sensor protocols, and metadata practices.

November 2026

Identify air-sea interactions reference sites and calibration needs for cross-platform intercomparison.

January 2027

Develop consistent flux terminology for extremes and transition-zone processes.

January 2027

Map stakeholder audiences, including funders, policy makers, legal experts, industry, and public communicators.

April 2027

