#162 Developing an Observing Air-Sea Interactions Strategy (OASIS)

July 2023 - June 2024

1. Brief summary with the main highlights (200-300 words)

In the last year of the WG162 OASIS, we finally had our first in-person meeting. This could not be realized since the start of our WG, due to the COVID pandemic. We combined this meeting with a community workshop with over 70 participants. This meeting was an overwhelming success and the participation was truly global, spanning a range of demographics. In addition, we published one paper and a commentary, and have several in preparation as follow-ups to our community workshop. During the reporting period, OASIS organized science sessions and town hall meetings at the Ocean Sciences Meeting (2024) and UN Ocean Decade Conference in Barcelona (co-organized with SOLAS). OASIS was invited for keynote talks, for example at Oceans 24 in Singapore and the NOAA NESDIS STAR OceanWatch Annual Conference. Two OASIS webinar series were highly attended: (1) Air-Sea Fluxes from Space, and (2) A Community of Practice for an Uncrewed Surface Vehicle network for GOOS. Both series are available on the OASIS YouTube channel. OASIS celebrated two major successes, namely that the air-sea interaction remote sensing project ODYSEA was selected for launch and that our emerging Uncrewed Surface Vehicle network for GOOS was selected for participation at the OCG meeting in May 2024. Finally, we accepted another application for an endorsed UN Ocean Decade Project under our OASIS UN Ocean Decade Program umbrella.

2. Activities since previous report to SCOR (e.g., virtual or in-person meetings, email discussions, special sessions). Limit 1000 words

- The SCOR Working Group (WG) #162 for Developing an Observing Air-Sea Interactions Strategy (OASIS) has held regular meetings and means of communication that can be summarised in 4 main categories over the past year. These have been telecons in the form of (1) bi-weekly SCOR WG #162 + OASIS Project Office (UCAR Center for Ocean Leadership) staff meetings (typically ~3-6 Working Group members and 2 project office members and a liaison from NOAA Office of International Activities attend these meetings);
- OASIS webinar series Air-Sea Flux from Space, held approximately weekly. See OASIS
- OASIS webinar series A Community of Practice for an Uncrewed Surface Vehicle Network for GOOS, held approximately quarterly. All webinars are on Youtube.
- OASIS sessions and townhalls at open conferences (e.g. UN Ocean Decade Conference Side Event and Ocean Sciences Meeting)
- approximately quarterly newsletters distributed to a broad mailing list of approx 180 people.

- The UN Ocean Decade has endorsed 1 UN Decade Projects under the auspices of the UN OASIS Decade Program, Sustained Data for a Changing Ocean.

- SCOR WG #162 and community members have presented OASIS activities and strategy at several meetings/programmes including: Solar and Longwave Radiation at the Ocean Surface -- an Observing Air-Sea Interaction Strategy (OASIS) at the Radiation and Climate Gordon Research Conference July 2023 (Meghan Cronin); OASIS at the Southern Ocean Observing System (SOOS) – Observational System Design (OSD) Capability Working Group Workshop August 2023 (Meghan Cronin); National Academy of Sciences (USA) briefing on OASIS October 2023 (Masha Edmonson); Roles of aircraft in the OASIS Vision at the UNOLS Scientific Committee for Oceanographic Aircraft Research (SCOAR) 2023 (Mark A. Bourassa); SCOR Working Group #162 for developing an Observing Air-Sea Interactions Strategy (OASIS) at the OceanSITES Virtual Meeting November 2023 (Jim Edson); 2 Keynote talks on OASIS in 2024 at Oceans 24 in Singapore and the NOAA NESDIS STAR OceanWatch Annual Conference (Meghan Cronin)

- OASIS Community YouTube Channel has 125 videos, 65 of which were added since July 2023 with over 3,500 views

3. Documents published since previous report to SCOR (e.g., peer-reviewed journal articles, reports, Web pages) and should be limited to publications that resulted directly from WG activities and which acknowledge SCOR support

Paper - Riihimaki LD, Cronin MF, Acharya R, Anderson N, Augustine JA, Balmes KA, Berk P, Bozzano R, Bucholtz A, Connell KJ, Cox CJ, di Sarra AG, Edson J, Fairall CW, Farrar JT, Grissom K, Guerra MT, Hormann V, Joseph KJ, Lanconelli C, Melin F, Meloni D, Ottaviani M, Pensieri S, Ramesh K, Rutan D, Samarinas N, Smith SR, Swart S, Tandon A, Thompson EJ, Venkatesan R, Verma RK, Vitale V, Watkins-Brandt KS, Weller RA, Zappa CJ and Zhang D (2024) Ocean surface radiation measurement best practices. Frontiers in Marine Science, 11:1359149. doi: 10.3389/fmars.2024.1359149

Commentary - Gutiérrez-Loza, L., Cronin, M. F., Marandino, C., Swart, S., Bourassa, M. A., du Plessis, M. D., ... & Venkatesan, R. (2024) The Need for a Community of Practice for Air-Sea Flux Observations. *Marine Technology Society Journal*, *58*(1-2), 20-25. DOI: https://doi.org/10.4031/MTSJ.58.1.3

Newsletters in Feb 2023 (not reported in last annual report), Sep 2023, and Feb 2024

New OASIS LinkedIn Site - started end Feb 2024, 39 followers

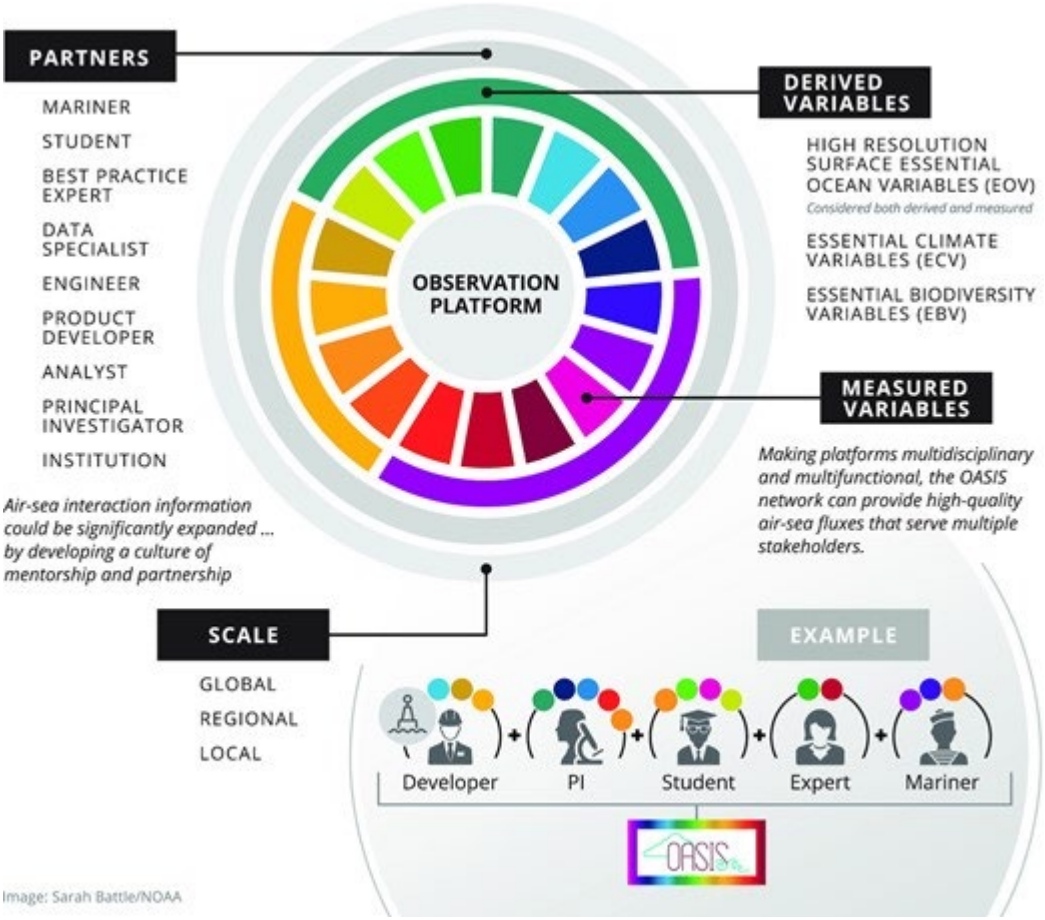
4. Progress toward achieving group's terms of reference. List each term of reference separately and describe progress on each one. Limit 1000 words

Here we list progress towards each of the OASIS TOR listed in the OASIS prospectus.

1. **Harmonize the recommendations from the OceanObs'19 CWPs into a unified Observing Air-Sea Interaction Strategy (OASIS)**

   This ToR has been completed through the efforts to synthesize the recommendations of >40 OceanObs19 Community White Papers. The summaries of these recommendations has been condensed in the OASIS paper by Cronin et al., 2023 (as reported in last Annual SCOR WG Report, 2023). Figure 1 from Cronin et al. (2023) in particular synthesizes 45 OO19 CWP into three grand ideas of OASIS and information for improving a Predicted, Safe, Clean, Healthy Ocean, and Productive Ocean.

2. Produce a capacity building strategy that enables developing nations (including least developed nations and island nations) to actively participate in and benefit from local-to- global air-sea interaction observations.



As outlined in Cronin et al. (2023, https://doi.org/10.1093/icesjms/fsac149) and shown in the figure above, the OASIS Theory of Change encompasses capacity strengthening globally, across stakeholder groups and career stage. We identified that the need to simultaneously measure multiple essential ocean variables should be considered a transformative opportunity to co-design a fit-for-purpose observing system. On-going focus is on

partnerships with Small Island Developing States (SIDS) that are seen as crucial communities to benefit from and support future air-sea related observations and networks.

Specific examples of engaging our Theory of Change are:

- An community paper in preparation, including OASIS co-chairs and WG members, on OASIS for SIDS
- Offering stakeholders access to code and toolboxes to compute fluxes on our website (https://airseaobs.org/fair-data). Here we highlight a recent publication of a flux toolbox that is featured on the OASIS website: https://git.noc.ac.uk/nocsurfaceprocesses/AirSeaFluxCode, related journal article: https://doi.org/10.3389/fmars.2022.1049168
- Regular Ocean Best Practices (OBPS) workshops - In 2023, we organized one on radiation and observing fluxes. In 2024, we will organize a new OBPS workshop on ocean skin temperature and its use in computing/measuring marine fluxes.
- Commentary publication on *The Need for a Community of Practice for Air-Sea Flux Observations.* This commentary outlines why communities of practice are valuable and especially what is required for the flux observation community of practice.
- In the last year, OASIS was able to raise funds to support ECRs to participate in workshops and to take on leadership roles in various activities. This includes providing a small honorarium to the ECRs actively engaged in leadership roles within OASIS.
- An idea that was discussed in New Orleans at our in-person meeting is the support of visiting scholarships. These scholarships would provide funding for scientists and technical staff to spend an extended period of time in Global South countries to provide training and to collaborate with local scientists on topics co-identified by both parties. OASIS is actively searching for the financial means to execute this idea.

3. Develop and assess network designs that optimize air-sea interaction observations

1) OASIS WG members participate in regional planning groups to design observational networks specific to their needs. Subsequent communication with OASIS aids in building a unified network across regions.

2) Ruth Patterson (ECR), leads the community of practice for Uncrewed Surface Vehicles (USV) -- An emerging network for GOOS and OCG. In 2024, she participated in GOO's 15th session of Observation Coordination Group (https://goosocean.org/event/3981) in Victoria, Canada. Through her participation, the USV COP received several tips for thoroughly engaging with GOOS and the community, which will ultimately lead to an optimized network design.

4. Develop a strategy for air-sea interaction process studies

OASIS has been promoting air-sea interaction process studies to encourage international engagement and interdisciplinary engagement. This most recent relevant examples include FUTURO (led by GEOMAR, https://www.geomar.de/en/futuro), TPEX (led by NOAA, https://cpo.noaa.gov/tropical-pacific-observing-system-tpos-equatorial-pacific-experiment-

tepex/), and WHIRLS (ERC Synergy Grant with PIs from GEOMAR, the University of Gothenburg, ENS Paris, and the University of Cape Town).

5. Develop a strategy for assessing interoperability of surface observing platforms.

OASIS has continued placing importance on this topic in the past year. Interoperability is an essential component of best, or recommended, practices. The radiation best practices paper has been published (see Section 2) as has the OASIS commentary on building a community of practice for flux observations. The work on uncrewed surface vehicles (USV) continues, including a paper in preparation. The steering group of the USV COP meets on a bi-monthly basis and has partcipation from the international community quarterly. Once per year, OASIS has a presence at the OBPS. In September 2024, OASIS will pick up the topic of ocean skin temperature at OBPS.

6. Build community and capacity for using, operating, and developing air-sea interaction observational platforms that allow collaborative partnerships

At the core, OASIS believes in the value of having multifunctional platforms that measure many co-located, co-incident variables. This lends itself towards working in collaborative partnerships. SCOR WG #162 actively works to build community (and partnerships) through its website (airseaobs.org) which has a "Get Involved" button that invites community to join the mailing list and indicate their main collaborative interests.

In 2024, OASIS co-organized a side event at the UN Ocean Decade Conference in Barcelona with SOLAS on Unifying Strategies to Develop Integrated Global Air-Sea Community Networks. The aim of this event was to build community related to common goals, and using established groups, in order to best address the needs of global stakeholders related to air-sea interactions.

5. WG activities planned for the coming year. Limit 500 words

The WG is now finished. We will continue to update and revise our original SCOR TOR to remain a valuable participant in the UN Ocean Decade landscape for the next 5-6 years. OASIS will periodically assess the air-sea interactions community's interest and requirements to plan our longer-term future actions.

6. Is the group having difficulties expected in achieving terms of reference or meeting original time schedule? If so, why, and what is being done to address the difficulties Limit 200 words

We have achieved our terms of reference, but this did take a bit longer than proposed (approximately 2 months). This was due to delays in meeting already attributed to the COVID pandemic.

7. Any special comments or requests to SCOR. Limit 100 words.

As we were limited in our mobility during the time of the SCOR WG, OASIS has a surplus of SCOR funding. We have requested to use the remaining funds in 2024 and 2025 through Ilka Peeken and received a response to revise our request. We are working on this currently.

Additional information can be submitted and may be posted at the SCOR Annual Meeting webpage at the discretion of the SCOR Executive Committee Reporter for the WG and the SCOR Secretariat.