



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development



Workshop Report

Air-Sea Observations for a Safe Ocean
a satellite event for the UN Decade of Ocean Science for Sustainable Development - Safe
Ocean Laboratory
April 7, 2022

**SCOR Working Group #162 for developing an Observing Air-Sea Interactions Strategy
(OASIS)**

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Overview

The “Air-Sea Observations for a Safe Ocean” satellite event to the UN Decade Safe Ocean Laboratory was held on April 7, 2022 at 0000 CEST with a total number of 39 participants. The 2-hour virtual workshop, also referred to on the Observing Air-Sea Interactions Strategy (OASIS) website as “OASIS for a Safe Ocean” (<https://airseaobs.org/oasis-for-a-safe-ocean>), included a 30-minute poster/social session in the interactive Gather.Town platform (Figure 1). Overall, the event was interactive and productive, fostering constructive discussions about the OASIS strategy. With a focus on Small Island Developing States (SIDS), three of the four speakers and one moderator were from island states. Overall, the group was diverse and demonstrated the strong interest of the global air-sea interactions community to promote a Safe Ocean, particularly for SIDS. Participants included many Early Career Ocean Professionals (ECOP), representing the stake they have in the future, and had active women participation.

This workshop was part of a series of UN Ocean Decade laboratory satellite events organized by OASIS to gather recommendations from stakeholder groups to co-design the local, regional, and global air-sea interactions observations. Previous UN Ocean Decade laboratory satellite events organized by OASIS include the “Air-sea Observations for a Predicted Ocean” event held in September 2021 (Cronin et al. 2021; <https://airseaobs.org/oasis-for-a-predicted-ocean>) and “Air-sea Observations for a Clean Ocean” in November 2021 (Marandino et al. 2022; see <https://airseaobs.org/oasis-for-a-clean-ocean>).

The Safe Ocean satellite event commenced with a welcome speech by Meghan Cronin describing the scope of OASIS (Cronin et al. 2022) and the goals for the workshop, and was followed by four sessions:

1) Small Island Developing States’, regional, and global early warning system needs for a Safe Ocean.

Moderator: R. Venkatesan

Speaker: Evan Jones, describing typhoon climatologies from his recently published paper Jones et al. (2021).

Speaker: Marcus “Landon” Aydelett, describing marine forecast needs for island states

2) Techniques in observing for a safe ocean,

Moderator: Jerome Aucun

Speaker: Sebastien Boulay, describing Sofar Ocean, Inc. low-cost, easily deployed moored and drifting buoy solutions for monitoring winds, waves, barometric pressure and other surface variables in remote locations.

3) Observing air-sea interactions strategies for a Safe Ocean.

Moderator: Meghan Cronin

Speaker: Patricia Chardón-Maldonado, describing the Caribbean Integrated Ocean Observing System (CARICOOS), which may act as a model for other island nations.

4) Posters and networking in Gather.Town

The speaker and moderators represented ECOPs, Stakeholders, and Senior Scientists. Since the pre-recorded talks were short, open group discussion was maximized in each session. All talks are available for viewing on the OASIS YouTube channel: https://www.youtube.com/playlist?list=PL7IEVqN7cilzevgD-la8q01FYmWQhiY_p

The final overview and take home messages are summarized below. Appendix 1 shows Session summaries. Appendix 2 lists the posters that were displayed in the Gather.Town poster room. Appendix 3 shows logistical information about using Gather.Town shared with participants prior to the event. Lastly, Appendix 4 describes the Consortium for Ocean Leadership's Participant Code of Conduct & Anti-Harassment Policy, which has been adopted by OASIS. Appendix 5 provides a list of participants.

While there were numerous recommendations listed below, the Safe Ocean participants had broad support for the "Three Big Asks" for OASIS (Cronin et al. 2022):

- 1) A globally distributed in situ air-sea interaction observing network
- 2) A constellation of optimized satellites
- 3) Improved models and understanding of air-sea interaction processes.

Likewise, there was broad support for the OASIS community building and advocacy for SIDS and global coasts. Participants were urged to continue the dialogue for co-designing the OASIS and to get involved in OASIS theme teams through the airseaobs.org/get-involved website.

Take away messages for the OASIS for a Safe Ocean

The following points highlight recommendations on the role of OASIS for a Safe Ocean, which can be summarized to: *Gather, Synthesize, Share, Act and Promote.*

1. Higher resolution satellite data, with good coverage is critical for forecasting natural disasters such as tropical cyclones. Islands often have complicated spatial variability that are missing in coarse resolution products. Improving and advocating for denser and higher quality observations of tropical cyclones and cells is critical. Observations should be viewed holistically, as multiple different sensors, platforms, satellites, etc. provide a more comprehensive forecast and/or understanding of the ocean-atmosphere state.

2. Better understanding and observations of ocean current systems is critical for a safe ocean. High resolution surface currents observed from space could be a game changer for safe navigation in island states that depend upon maritime commerce and transportation
3. Improved forecasts of climate phenomena, e.g., ENSO, MJO, IOD is extremely important for long-term planning and understanding/forecasting convective systems and for managing water resources. Need accurate information of fluxes between ocean and atmosphere for use in coupled model simulations and hindcasting. Error forecasts are reduced through data assimilation and increased observations over time.
4. Local in situ observations in different regimes (e.g. northside, southside, east, west) are needed for validation of models, particularly for sleeper waves (swell and King tides) that can lead to inundation and for tsunami warning systems. Tracking thresholds should be evaluated for resolving systems in models. Need for a buoy to validate various meteorological parameters, to measure ocean heat content, salinity stratification etc.
5. In situ observing platforms need to be small and easy to handle in order to be operated by locals in under-resourced areas and regions with challenges such as how to communicate operate, and benefit from systems in regions without internet connectivity in remote islands. Also the platforms should rely upon Indigenous communication tools/methods.
6. The value of the observations could be increased by sharing information with other regions in the Area of Responsibility. Advocating for getting observations disseminated to the public for easy access to information is needed. There was a request for any high temporal resolution barometric pressure observations that might contribute to the analysis of the shock wave from the Hunga Tonga-Hunga Ha'apai volcano eruption off the coast of Tonga on January 15, 2022.
7. Networking & Expansion of OASIS Community was very productive. For an efficient reach of warning information to island communities there should be more exchange among the observational agencies and industry for developing cost effective technology for data dissemination and communication with Island communities

Acknowledgement

We thank the Consortium for Ocean Leadership for their support with coordinating this event. We acknowledge funding provided by national committees of the Scientific Committee on Oceanic Research (SCOR) and from a grant to SCOR from the U.S. National Science Foundation (OCE-1840868) to support SCOR Working Group #162 (OASIS) activities. This is PMEL contribution number 5380.

Bibliography

Cronin, M. F., C. Marandino, S. Schwartz, M. Chory, P. Browne, A. Subramanian, W. Joubert, B. Arbic, M. Bourassa, M. du Plessis, S. Swart, U. Schuster, C. Gentemann, R. Sun, J. Reeves Eyre, V. Hormann, O. Alves, F. February, P. Mongwe, S. Zippel, V. Menezes, D. Blair, A.-L. Deppenmeier, P. Martin, J. Palter, R. Venkatesen, A. Gray, C. A. Clayson, J. D. Shutler (2021): Workshop Report for the Observing Air-Sea Interactions Strategy (OASIS) for a Predicted Ocean,

a satellite event for the UN Decade of Ocean Science for Sustainable Development - Predicted Ocean Laboratory, held virtually on September 16-17, 2021. doi: 10.3289/SCOR_WG_162_2021

Cronin, M. F., Swart, S., Marandino, C. A., Anderson, C., Browne, P., Chen, S., Joubert, W. R., et al., (2022): Developing an Observing Air–Sea Interactions Strategy (OASIS) for the global ocean, *ICES J. of Mar. Sci.*, fsac149, <https://doi.org/10.1093/icesjms/fsac149>

Jones, E., Wing, A. A., and Parfitt, R. (2021): A Global Perspective of Tropical Cyclone Precipitation in Reanalyses, *J. Clim.* 34, 8461-8480. <https://doi.org/10.1175/JCLI-D-20-0892.1>.

Marandino, C., M. F. Cronin, M. Chory, N. Maximenko, C. Anderson, M.A. Ballesteros, D. Booge, L. C. da Cunha, S. Gasso, J. Gier, V. Hormann, M. Jones, L. Ladah, L.Li, C. Maes, N. Mahowald, E. Nyadjro, M. Perrone, R. K. Quarcoo, A. Rutgersson, M. Ya, (2022): Workshop Report for the Observing Air-Sea Interactions Strategy (OASIS) for a Clean Ocean, a satellite event for the UN Decade of Ocean Science for Sustainable Development - Clean Ocean Laboratory, held virtually on November 18–19, 2021. doi: 10.3289/SCPR_WG_162_2022_1.

Appendix 1 Session Summaries

All pre-recorded videos can be found on the OASIS youtube channel at: https://www.youtube.com/playlist?list=PL7IEVqN7cilzevgD-Ia8q01FYmWQhiY_p

Venkat and Meghan gave a brief introduction about the OASIS and this Satellite event. The main goal of OASIS is to increase availability of information to help promote UN Ocean Decade goals for a predicted, clean, safe, healthy and productive ocean. Attendees were urged to get involved in OASIS theme teams and join the OASIS community. A Safe Ocean requires preparedness, awareness, and education to ensure human safety from severe events, particularly for island nations, which requires expanded observations and bridging the gap in forecasting and monitoring.

Session 1: “Island Nations to Regional to Global needs for Early warning systems”

Session Moderator: R Venkatesan India

Session Presenters: Evan Jones, FSU, USA;

Marcus Landon Aydllett, Guam Weather Forecast Office

The need for high resolution satellite data with good coverage for forecasting natural disasters such as tropical cyclones was discussed. Importance of quality in-situ from observations being fed into forecast and reanalysis models as well as proper representation of processes in the models for accurate parameterization are also highlighted. The SIDS solely depends upon rain as there are no groundwater sources. The panelists opined that improved forecasts of climate phenomena, e.g., ENSO, MJO, IOD is extremely important for long-term planning and understanding/forecasting convective systems and for managing water resources. Also, Sea level rise and surf events due to ENSO variations lead to flooding and inundation that affects coastlines

and agriculture. The importance of traditional knowledge of air-sea interaction be incorporated into the ocean observation systems were also discussed. Island Area of Responsibility can include many islands across a vast area (e.g., Guam WFO): showed some examples of tools that are used to study typhoons and tropical cyclones, or TCs. These include weather stations, buoys in the ocean, planes that fly into developing or maturing hurricanes, dropsondes that measure atmospheric conditions as they are dropped from those planes, satellites such as the recently-launched GOES-T satellite, and forecast models as well. Models are not only used for forecasting into the near-future, but also for looking into the past to look at climatologies. A reanalysis gives a homogenous, dynamically-consistent view of past weather that has occurred around the globe. To give a short summary, she looked at the climatological annual precipitation that can be attributed to TCs in eight different reanalysis datasets and compared the results. The results give important insight since TC rainfall often represents the extremes in rainfall in many regions and can cause those devastating impacts. Forecasts and representation of TCs in models continues to improve, but the representation of rainfall from TCs still varies widely across models, and this is true both in reanalyses and in operational forecast models. All this is to say that the choice of model used matters, whether the application is for forecasting or research, and it is really important to continue to advocate for further development of both observations and models themselves.

Session 2: “Techniques”

Moderator: Jerome Aucan, SPC, New Caledonia

Presenter: Sebastien Boulay, consultant, New Zealand

During the session new cost-effective technologies that may be appropriate for SIDS was discussed. The advantages of SOFAR spotter buoy for ocean observation is discussed. Also the need for building expertise among the local communities to maintain and repair the platforms and sustain in-situ data collection was discussed. Indo-Pacific Fish Aggregate Devices (FAD) system consists of floats that can deploy at large depths and absorb waves in deep water (idea came out of the fisheries department given existing observing structure, and FADs are deployed by fishermen in the community). It is suggested that New Caledonia needs 2+ moorings (active and spare) so that spare can be implemented for additional observing points to feed forecasting models; importance of observing flexibilities for short-term conditions. High resolution satellite measurements of winds and surface currents are needed to improve the forecasts. The Spotter buoy can be installed as a traditional anchored coastal buoy or as an open ocean drifter. Using the sensor platform with smart Mooring, this buoy can have power and communication to underwater sensors and allow their data to be accessible in real-time. The sensor data can be used for real-time operations, quick decisions and warnings. For example, a bottom mounted pressure sensor can be installed to get real-time water level monitoring for storm surge, tide, or infragravity wave studies and to notify coastal communities during inundation events. This was the approach taken by the United States Geological Service who installed a few Spotter buoys with pressure sensors to monitor water levels and improve their coastal inundation forecasts. This system allows them to deploy a large number of stations and have, at the same location, easy access to wave and storm surge data. This is particularly important during the hurricane season as traditional tide gauges are usually installed in ports, where it is already too late to notify coastal

communities. It's obviously much needed for their day to day life, to use the ocean safely, but also to start collecting important baseline data for climate adaptation studies.

Session 3: "Strategies"

Moderator: Meghan Cronin, NOAA PMEL, USA

Presenter: Patricia Chardón-Maldonado, CARICOOS, Puerto Rico

The OASIS Strategy needs to have ability to sample larger Areas of Responsibility by deploying more sensors upstream and around even smaller islands: It is convinced that SIDS are highly vulnerable to cyclones, coastal storm surges, waves, winds, etc. Puerto Rico and Virgin islands face devastating consequences from severe weather events. The importance of resolving island-scale phenomenon within coupled model forecasts was also discussed. The panelists also opined that for an efficient reach of warning information to island communities there should be more exchange among the observational agencies and industry for developing cost effective technology for data dissemination and communication with Island communities. It is also important to educate local communities about technology and highlighting safety and non-interference concerns with deployed platforms and sensors. SOFAR is deploying global fleet of open ocean sensors, with >800 drifting Spotter buoys reporting spectral wave, wind and barometric pressure data every hour. Data sts can be seen here: <https://weather.sofaroccean.com/>. These sensors captured the recent event here <https://www.sofaroccean.com/posts/spotter-network-captures-big-waves-during-tc-cody-shock-waves-during-the-hunga-tonga-eruption>

Appendix 2: List of Posters

After the three sessions concluded, participants had the opportunity to view posters, wander through Gather.Town, and socialize with friends and colleagues. The list of posters can be found in Appendix 2.

Participants were asked to register in advance of the event, which led to 72 registered participants. There were numerous back-to-back (and sometimes overlapping) satellite events during the Safe Ocean Laboratory. There were about 45 participants in the GoToMeeting. All registered attendees were link and invited to visit the poster room and Gather.Town at their leisure, so presumably some that registered for the event but were unable to attend the GoToMeeting talks participated in the poster viewing. All registered attendees were also sent the YouTube links to the talks after the session for their viewing.

Many of the posters shown were created for OceanObs19. The list of posters below are grouped by their locations in the Gather.Town Poster Room (Figure 3).

Row 1 (from the bottom of the room up) Posters listed left to right

Cronin et al. - Air-Sea Fluxes with a focus on Heat and Momentum

Subramanian et al. - Impact of ocean observation systems on ocean analyses and subseasonal forecasts

Addey et al. - Seasonal and latitudinal dynamics of carbon sink across the western boundary current and its recirculation regions

Coronado-Alvarez et al. - Seasonal and latitudinal dynamics of carbon sink across the western boundary current and its recirculation regions

Row 2

Posters listed left to right

Gommenginger et al. - SEASTAR: Observing Ocean Submesoscale Dynamics and Small-Scale Atmosphere-Ocean Processes in Coastal, Shelf and Polar Seas

Vinogradova-Shiffer & McCurdy - Advancing Ocean Science through Open Science and Software on the Cloud

Vinogradova-Shiffer & McCurdy - Improved Value of the Observing System through Integrated Satellite and in situ Design

Wineteer et al.: Ocean Shot: Satellite measurements of winds and currents through Ka-Band doppler scatterometry

Appendix 3: Pre-meeting instruction for the OASIS Gather.Town provided to registered participants

The link to OASIS Gather.Town is not included below.

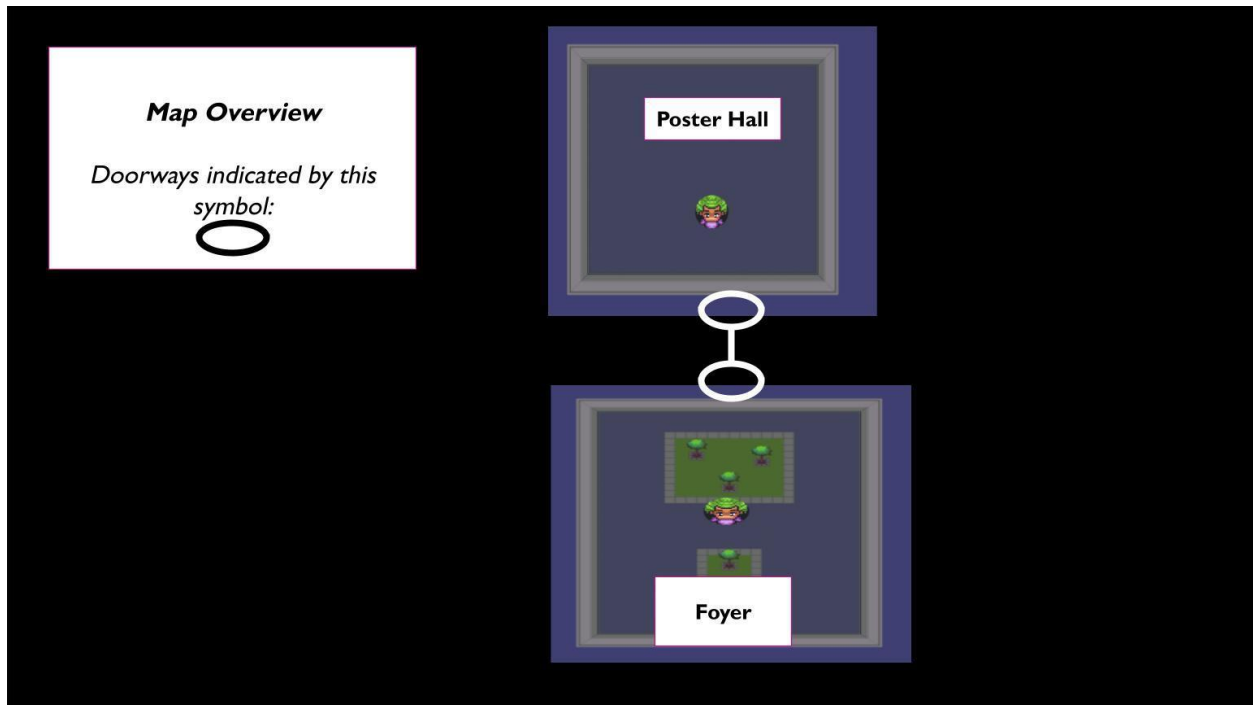


Figure 1. Map of OASIS Gather.Town.

Gather.Town 101 – Tips & Tricks for the event:

- When you first log in to Gather.Town, it may present you with a mini tutorial before entering the OASIS for a Safe Ocean space.

Navigation:

- To navigate your character throughout the different event spaces, use your arrow keys.
- Hold the “G” key on your keyboard to move through people and silence nearby conversations/video chats.

Private Spaces:

- There are private spaces throughout the different rooms, typically indicated by a different floor color. Upon entering one, you will also see a message on your screen that reads, “You have entered a private space.”
- All conversations outside this space cannot be heard by those within the space. Conversations within this space cannot be heard outside of it.

Interactive Objects:

- See Slide 4 for a comprehensive list of the objects you can find throughout the event.
- To interact with an object, press the “X” key on your keyboard.

Chat:

- Please keep an eye on the chat, as announcements will be made here. Also see the “pinned” notes by the tack symbol on the left side of your screen
- When in a private space or Theme Room, use the “Nearby” option (or direct message an individual).

- Using the “Everyone” option sends a chat to all participants, even those in a different room.

Help Desk:

- If you are having any trouble, visit our Help Desk (white desk) in the Main Room. We will be ready to answer your questions!

Interactive Objects

In each room, you will find different objects to interact with by pressing the “X” key on your keyboard. Here’s a comprehensive list of the for each area:

Foyer Room:

- Bulletins with the link to the zoom session
- Sign outside the poster room.
- Help document on the Help Desk (white desk).

Poster Room:

- Safe Ocean posters
- Bulletin, to the right of the door, and at the back left of the room that links to a document where you can leave comments and questions about the posters. This document also tells you where in the room you can find each poster.

The official Gather.Town session is from 1:30-2:00 am CEST 7 April 2022. However, the room will be open all day! Feel free to pop in at your convenience to view posters and meet colleagues and friends. We look forward to seeing you there!

Code of Conduct

By entering our Gather.Town space, you agree to our Virtual Event Code of Conduct.

[Click here to read the Code of Conduct](#)

Appendix 4. Participant Code of Conduct & Anti-Harassment Policy

The Consortium for Ocean Leadership [for Virtual Events] policy is publicly available through the OASIS website at: https://airseaobs.org/wp-content/uploads/2021/09/COL-Code-of-Conduct-Anti-Harassment_Virtual_OASIS.pdf

Guiding Principles and Code of Conduct

As a community organization, the Consortium for Ocean Leadership (COL) regularly organizes and hosts events, including meetings, workshops, conferences, trainings, and educational events, with members from multiple sectors within the ocean science, technology, education, and related communities and stakeholders. The core values of COL form the foundation on which we perform work and conduct ourselves and define how we interact with each other.

Our core values are:

Respect for each other, and for all cultures and backgrounds:

We embrace each other's differences so that we may enrich the well-being of everyone. We value different experiences, backgrounds, and perspectives that bring forward creative and innovative

solutions. We value a safe environment in which to offer multiple, and at times conflicting, opinions that drive toward common goals. We particularly value the diversity across the organization, and the contributions each person and organizational component makes to the success of us all. We are a growing and evolving organization; we value change.

Honesty, integrity, and candor:

We seek the truth and speak it directly.

Credibility:

We strive to be a trusted source of unbiased and science-based advice and information: science and technology are the ground upon which we stand.

Professionalism:

Demonstration of exemplary qualities in all aspects of personal presentation and conduct; we establish and adhere to high standards.

We believe we can accomplish the most by working together.

The participants of this meeting were chosen for the experience and perspectives they bring to the discussion; therefore, every voice is important to reaching our goal of building an Observing Air-Sea Interactions Strategy (OASIS) for a Predicted Ocean.

To those ends, in this meeting, we invite all staff and participants to abide the following code of conduct:

- ***Respect for each other, and for all cultures and backgrounds:***
 - Value a diversity of views and opinions and seek out perspectives other than those already represented.
 - Seek to understand, learn, and build rather than to be right.
 - Assume that you have relative privileges and both explicit and implicit biases. Know that others may or may not have had similar opportunities, experiences, and background as you. Recognize that their contributions are equally valuable. For those from dominant identity groups, refrain from contributions that prioritize dominant experiences over those who have been marginalized.
- ***Honesty, integrity, and candor/ Credibility***
 - Speak to your knowledge and experience when it is not represented in the group discussion. ○ Avoid sharing sensitive personal information about yourself or another individual, whether or not an attendee of this event.
 - Honor confidentiality. do not share the specifics of others experiences or information without permission.
 - Speak only for yourself. Avoid contributing to assumptions or generalizations about groups, and do not ask individuals to speak for their (perceived) group.
- ***Professionalism***
 - Leave space for others to engage and express comments and ideas if you have spoken recently, by speaking if you have not, and by letting people finish their thoughts before adding new ones.
 - Affirm the person, critique the ideas. Provide feedback constructively and with the intent for mutual growth, and welcome feedback and constructive dissent.
 - Be solution- and goal-oriented
 - Contribute what has not yet been said, rather than repeating or re-affirming what has.
 - Though we will be discussing topics that may involve high personal

meaning and impact, refrain sharing potentially triggering information in the group and instead utilize the support resources offered.

Etiquette for virtual communication

- If you would not say something to someone's face, refrain from writing/saying it virtually.
- Know that use of strong language, capital letters, and exclamation marks can be easily misinterpreted online as unwelcome yelling or aggressive behavior.
- Remember that tone does not carry via text. People might not realize you are joking or being sarcastic.

Supporting one another

If you notice someone in distress, privately ask if they would like support or assistance. If yes, offer support, direct them to the workshop's support resources, and/or ask if they would like you to contact a COL staff member.

Reporting incidents

Notification of an issue or concern should be done by contacting a COL staff person by phone, email, or private chat message in Gather.Town.

COL staff members responsible for this meeting:

Maggie Chory, Program Associate
Email: mchory@oceanleadership.org

Masha Edmondson, Program Associate
Email: medmonds@oceanleadership.org

Cassie Wilson, Program Associate
Email: cwilson@oceanleadership.org

Other COL reporting points of contact:
Jasmine Hill, Meetings and Travel Specialist
Email: jhill@oceanleadership.org

Anti-Harassment Policy **Policy on Harassment**

COL is dedicated to providing a harassment-free and inclusive event experience for everyone regardless of gender identity and expression, sexual orientation, disabilities, physical appearance, race, nationality, age, religion, or any other protected category. COL will not tolerate unlawful harassment or behavior that creates an intimidating, hostile, or offensive environment at any of the events it organizes or co-organizes in any location throughout the world. All event participants are required to abide by this Code of Conduct, which is adapted from the American Geophysical Union and complies with the new directive from the National Science Foundation.

Sexual harassment is a specific kind of unlawful harassment and includes sexual advances, requests for sexual favors, unwelcome or offensive touching, and other verbal, visual or physical conduct of a sexual nature that has the purpose or effect of creating a hostile work environment. Harassment can include, but is not limited to, comments, cartoons, "jokes," e-mail messages, computer images, physical conduct (including gestures), horseplay, stereotyping, and unwelcome touching.

Unacceptable Behavior includes, but is not limited to:

- Harassment, intimidation, or discrimination in any form.
- Physical or verbal abuse by anyone to anyone, including but not limited to a participant, speaker, guest, staff member, volunteer, sponsor, etc.
- Sexual attention or advances.
- Personal attacks directed at other participants, speakers, guests, members, staff, etc.
- Alarming, intimidating, threatening, or hostile comments or conduct.
- Nudity and/or displaying sexual images.
- Threatening or stalking anyone, including a participant.
- Other conduct which could reasonably be considered inappropriate in a professional setting.

Anyone requested to stop unacceptable behavior is expected to comply by ceasing the behavior immediately, regardless of

o Whether they agree the behavior is a policy violation

o Whether the request comes from the target of the behavior, a bystander/witness, a member of the COL staff, or another person in charge of the meeting.

Consequences for policy violations may include but are not limited to:

- COL staff (or their designee) or security may take any action deemed necessary and appropriate, including immediate removal from the event without warning or, when applicable, refund (to include travel reimbursement).
- COL reserves the right to prohibit attendance at any future event.
- Notification of an infraction to the offender's home institution