

Interagency Ocean Observation Committee (IOOC) Biology- Integrating Core to Essential Variables (Bio-ICE) Task Team

Scope of Work

July, 7 2020

Goals and activities of the task team

The goal of this IOOC task team is to advance the integration of biological observations from local, regional and federal sources using best practices to inform national needs and ultimately feed seamlessly into the Global Ocean Observing System, as appropriate. To accomplish this goal the task team will focus on marine mammals and corals, to:

1. Reconcile the IOOS core biological variables with GOOS Essential Ocean Variables (EOVs) and the Group on Earth Observations' Essential Biodiversity Variables (EBVs), identifying where there are clear synergies in terms of spatial and temporal observing requirements and existing observation infrastructure and delivery including best practices/standards.
2. Identify and improve pathways for data flow for observations of these variables from both the Regional Associations and Federal sources into IOOS. Focus will be on identifying and implementing best practices surrounding standardized data collection and delivery adhering to the [FAIR¹](#), and [CARE²](#) data principles, as appropriate.

Background and rationale

Several sessions at the Ocean Observations '19 conference produced recommendations related to biological observations. There are seven key recommendations from the conference that this task team seeks to contribute to (Appendix 1).

To ensure the goal of the task team can be achieved within its time frame, efforts will focus on corals and marine mammals, which have complementary essential variables. We have selected these sets of variables because of their importance to multiple stakeholders, as well as offering opportunities to tie-in to several critical U.S. priorities in ocean science. While the team will focus on these two sets of variables, we acknowledge that there are activities looking at other essential variables that could be synergistic with our efforts, such as SCOR Working Group 158: Coordinated Global Research Assessment of Seagrass System (C-GRASS). We will monitor and engage with such groups should the joint undertaking benefit the task team.

¹ Findable, Accessible, Interoperable, Reusable (<https://www.go-fair.org/fair-principles/>)

² Collective Benefit, Authority to Control, Responsibility, Ethics (<https://www.gida-global.org/care>)

As mentioned, both of these sets of variables are of interest to a range of local, regional, tribal and federal stakeholders, and they are directly responsive under two of the goals of the Sub-Committee for Ocean Science and Technology's (SOST's) Decadal Vision for Ocean Science³. Specifically, under Goal one "Understand the Ocean in the Earth System," the acoustic datasets used to assess occurrence, distribution, abundance, phenology, and density of marine mammals, as well as the satellite data sets and/or towed-diver/video surveys used to evaluate spatial coverage and potentially species composition of corals, are relevant to the Harness Big Data section. Additionally, both of these variables are of interest under Goal two "Promote Economic Prosperity." Preserving coral reefs has both ecological benefit (biodiversity maintenance) and economic benefit (provision of critical habitat to larval and juvenile stages of some commercially harvested species and tourism). Coral reefs may provide goods and services worth \$375 billion each year, an impressive figure for an environment that covers less than 1 percent of the Earth's surface⁴. For marine mammals, the ecological benefit to nutrient turnover^{5,6} supports healthy fish stocks, which has a direct connection to commercial fisheries, and whale-watching/tourism provides a substantial economic benefit. A recent study put the value of the average great whale, based on its various activities, at more than \$2 million, and easily over \$1 trillion for the current stock of great whales⁷.

The activities proposed by the task team for both corals and marine mammals fall clearly under seven of the eight topic areas (and arguably under all eight topic areas) of the recent Ocean Summit on Technology and Partnerships⁸. Both of the selected sets of variables are also relevant to the Presidential Memorandum⁹ on "Ocean Mapping of the United States Exclusive Economic Zone and the Shoreline and nearshore of Alaska." Improving our knowledge and the information available on coral species composition, coverage and location responds directly to mapping the seafloor. While the methods used to map the seafloor may impact marine mammals so understanding their occurrence, distribution and abundance is critical to minimizing impacts during the mapping efforts.

³ SOST (2018) "Science and Technology for America's Oceans: A Decadal Vision."

<https://www.whitehouse.gov/wp-content/uploads/2018/11/Science-and-Technology-for-Americas-Oceans-A-Decadal-Vision.pdf>

⁴ Costanza, R., R. d'Arge, R. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R.V. Oneill, J. Paruelo, R.G. Raskin, P. Sutton, M. van den Belt et al. 1997. "The value of the world's ecosystem services and natural capital." *Nature* 387, 253–260. <https://doi.org/10.1038/387253a0>

⁵ Roman, J., and J.J. McCarthy. 2010. "The Whale Pump: Marine Mammals Enhance Primary Productivity in a Coastal Basin." *PLoS ONE* 5 (10): e13255. <https://doi.org/10.1371/journal.pone.0013255>

⁶ Roman, J., J.A. Estes, L. Morissette, C. Smith, D. Costa, J.J McCarthy, J. Nation, S. Nicol, A. Pershing, and V. Smetacek. 2014. "Whales as Marine Ecosystem Engineers." *Frontiers in Ecology and the Environment* 12 (7): 377–85. <https://doi.org/10.1890/130220>

⁷ Chami, R., S. Oztoşun, T. Cosimano, and C. Fullenkamp. 2019. "Nature's Solution to Climate Change." *Finance and Development* 56(4).

<https://www.imf.org/external/pubs/ft/fandd/2019/12/pdf/natures-solution-to-climate-change-chami.pdf>

⁸ Ocean Summit on Technology and Partnerships

<https://www.whitehouse.gov/wp-content/uploads/2019/11/Ocean-ST-Summit-Readout-Final.pdf>

⁹ Presidential Memorandum on "Ocean Mapping of the United States Exclusive Economic Zone and the Shoreline and nearshore of Alaska."

<https://www.whitehouse.gov/presidential-actions/memorandum-ocean-mapping-united-states-exclusive-economic-zone-shoreline-nearshore-alaska/>

Anticipated Impact and Deliverables

The task team will leverage existing infrastructure and information to improve the integration of fit-for-purpose marine mammal and coral observations from local, regional and federal sources using standardized best practices. This will inform national needs, feed seamlessly into the Global Ocean Observing System, and provide a roadmap for IOOS to improve delivery of its other core biological variables consistent with national and global requirements. Deliverables include but may not be limited to:

1. Summary of the synergies between core and essential variables for marine mammals and corals in terms of spatial and temporal observing requirements and existing observation infrastructure and delivery.
2. Identification/development and publication of best practices to deliver fit-for-purpose observations and information for these variables, and submission of existing or new materials to the IOC Ocean Best Practices Repository¹⁰.
3. Evaluation report on how well the variables are being implemented (observation to information delivery to meet requirements) as the task team sunsets.

Timeline and responsibilities

The task team is proposed for the period June 2020 – January 2022. Activities will focus initially around examination of relationships between core and essential (biodiversity and ocean) variables for corals and marine mammals. Identification of common requirements will be prioritized to ascertain best practices and map data pathways/life cycles. The task team will engage with other existing groups with interest in corals and marine mammals including, but not limited to, the IOOS Association and the NOPP Biodiversity Interagency Working Group. One or a series of working meetings will be held to engage with the broader community in discussions and adoption of best practices, and agreement to share data so that ultimately observations and information from these variables will be increased in IOOS (from both regional and federal sources). Timing and location of the working meeting(s) will depend on ongoing activities.

Resources Required

Staff and Facilities: IOOC staff with the assistance of the Consortium for Ocean Leadership (COL) will provide basic logistical support to facilitate meetings, workshops, and conference calls. In addition, we request support from COL to help organize and host the working group meeting(s), as well as IOOC Exec Sec time to support and coordinate the team.

Budget: Initial request of up to \$50,000 to host, arrange logistics, and provide invitational travel for expert participants to working meeting(s) in late 2021.

¹⁰ Ocean Best Practices Repository. <https://www.oceanbestpractices.org/repository/>

Membership/Representation

The task team shall consist of a minimum of three representatives from at least three of the interested IOOC member agencies and will operate with the approval/oversight of the IOOC.

Within the Team, there will be two sub-groups which will focus on each of the variables identified. Each subgroup will have a Chair who will be responsible for ensuring the sub-group is achieving their tasks/deliverables. Two task team Co-Chairs will oversee the progress of the sub-groups, reconcile the activities, and ensure team deliverables are on time. The team Co-Chairs will also be responsible for keeping in close contact with the sub-group Chairs and assist when needed. All officially recognized task team members can vote. Non-voting participants may be invited to help achieve specific task team objectives. (See list of members below).

Approval Process/Reporting

The IOOC will be the final approval authority for the scope of work and products for this task team.

- The IOOC Co-Chairs will initially review the final scope of work and proposed products and approve them for review by the IOOC.
- During the time the task team is active, any questions and issues that cannot be resolved by internal consensus will be presented to the IOOC for resolution.
- The task team will provide written or verbal updates at IOOC meetings and as needed to the IOOC Co-Chairs.

Frequency

The frequency of meetings will be as agreed by the group to achieve the activities in a timely manner.

Sunset Date

Task team will remain constituted until January 31, 2022, unless disbanded sooner or extended.

A review of the Scope of Work will be undertaken after the first six months initially, and then extended as agreed to upon review thereafter, to ensure continuing relevance to IOOC goals.

Members *(In-Progress)*

General Membership
Gabrielle Canonico (Team Co-Chair) – NOAA
Laura Lorenzoni (Team Co-Chair)– NASA
Brian Melzian – EPA

Sub-Groups

Corals	Marine Mammals
Jennifer Koss (Chair) – NOAA	Sam Simmons (Chair)
Erica Towle – NOAA	Mike Weise – ONR

Appendix 1: Ocean Obs '19 Key Recommendations this task team will directly address

Ecosystem Health and Biodiversity session:

- Integrate biological observations into the global observing system as an integral and necessary component of ocean ecosystem science and understanding.
- Advance decadal plans for a fully encompassing global ocean observing system that integrates biology, biodiversity, physical and biogeochemical observations.
- Implement available technologies for biological observing now, maximizing access to biological data and information to quantify, explain, and forecast biodiversity changes.

Integrating Ocean Observations sessions 1 and 3:

- 1c) Make sure we're measuring the same, important EOVs in comparable ways across geographic scales to inform societal, management and scientific needs.
- 3a) Ensure that observing networks contributing to the global ocean observing system provide updated metadata on progress towards full maturity under the FOO, as well as their data to the relevant open and FAIR regional and global databases
- 3b) Report progress towards the desired global ocean observing system through biennial reporting to the United Nations using EOVs as a reporting framework
- 3c) Increase regional & global coordination throughout the next decade, focusing on partnerships & improved communication; observational capacity including improved data sharing; an expanded funding base for sustained observations.