

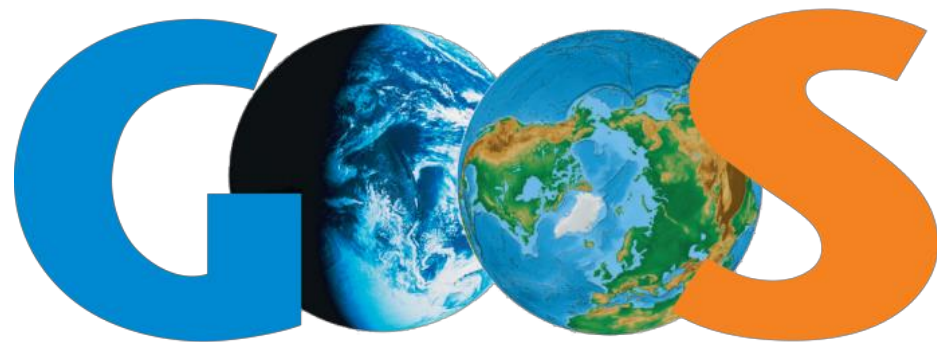
Integrative programs and NDSF



- Some integrative programs have recently or are in the process of sunsetting.
- New programs have emerged, some have or are developing their own deep submergence vehicles.
- What are the next programs that will make use of deep submergence vehicles?



Observations in the deep ocean to address the grand societal issues of climate change prediction and adaptation, ecosystem conservation, and sustainable management in the deep ocean.



The principal contribution of UNESCO to issues related to rising sea-levels is the Global Ocean Observing System, a collaborative international effort led by the Intergovernmental Oceanographic Commission (IOC).



DOSI seeks to integrate science, technology, policy, law and economics to advise on ecosystem-based management of resource use in the deep ocean and strategies to maintain the integrity of deep-ocean ecosystems.



Deep Ocean Observing Strategy

Terms of Reference

1. Build understanding on what is most important to observe.

Key science and societal questions and relevant variables; High priority processes and phenomena

2. Provide a hub for integration opportunities:

Coordinate existing deep observing activities across disciplines; create linkages among research, intergovernmental, industry, regulatory and funding agencies; foster multi-disciplinary observing at multi-use sites.

3. Coordinate observations to:

Utilize existing platforms for new or integrated sensors, document deep observing status, ID standards and best practices.

4. Develop deep observing requirements. (Identify deep EOVs gaps, emerging systems, add specs)

5. Build readiness in observing technology and techniques.

Promote new technology developments and assess their suitability, promote useability, facilitate transfer of technology to developing countries

6. Foster availability, discoverability, and usability of deep ocean data.

7. Create a common community science implementation guidance / plan for deep-ocean observing that advocates for deep observations



A Possible Integrated Pilot Study— Clarion Clipperton Zone (CCZ)?



- Address multiple DOOS goals related to human impacts in the deep-ocean from climate change and deep-sea mining

The Goal: Understand natural variations and trends in carbon cycling deep pelagic ecosystems, and benthic ecosystem functions, and to advance the agenda of the Tropical Ocean Observing System (TPOS).

WHAT: Long-term measurements at the benthic boundary layer and deep water column.

Contributions to TPOS: (a) estimate full-ocean-depth heat content anomalies (b) detect changes in temperature/salinity characteristics on interannual/decadal timescale (c) reduce the present 2000-m discontinuity in ocean observations for improvement of forecast model initialization and ocean data assimilation modeling.

Carbon Cycle: (1) evaluate carbon inventories (2) constrain natural variations and trends in the biological pump and (3) improve high-frequency EOVS observations at fixed-point reference stations.

Deep pelagic ecosystems: (1) elucidate variability over time, (2) address the consequences of changes in ecosystem structure due to OMZ intensification, thinning of the pelagic oxygenated zone, and ocean acidification.

Animal functions: (1) Determining how environmental conditions vary in abyssal ecosystems targeted for mining, and (2) explore how this variation influence biodiversity and function?



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**Volcanic Eruptions
and Their Repose,
Unrest,
Precursors,
and Timing**

Committee on Improving Understanding of Volcanic Eruptions

Committee on Seismology and Geodynamics

Board on Earth Sciences and Resources

Division on Earth and Life Studies

A Report of
The National Academies of
SCIENCES • ENGINEERING • MEDICINE

THE NATIONAL ACADEMIES PRESS
Washington, DC
www.nap.edu

Prepublication—Subject to Further Editorial Revision

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Monitoring of submarine volcanoes, repeat high-resolution bathymetric surveys with autonomous vehicles, sampling submarine deposits with human-occupied and remotely operated vehicles, and ocean drilling would expand our understanding of the history and nature of submarine volcanism.

Access to certain facilities, even if they're not necessarily dedicated solely to **SZ4D**, will be critical In the marine setting, the program will need ... access to surface vessels for instrument deployment, retrieval, and sea floor observation (including deep submergence, autonomous underwater vehicle [AUV] and/or remotely operated vehicle [ROV] access, **WP41**).