DEEP OCEAN OBSERVING STRATEGY

www.deepoceanobserving.org
Deep Ocean Observing Strategy (DOOS) is ...

... a project within GOOS, that envisions a globally integrated network of systems that observe the deep ocean effectively in support of science, policy, and planning for sustainable oceans.

What is Deep?

• Focus on ocean depths below main thermocline (> 2000 m)

• Processes & mechanisms below the photic zone (> 200 m) that influence deeper depths
2011: “From Space to the Deep Seafloor” Workshop Conducted

2013-2016: DOOS Consultative Draft Distributed and Posted for Review

2016: DOOS Scoping Workshop Conducted (51 attendees from 9 countries)

2017: Project Plan and Engagement Plan Completed

2019: DOOS Science and Implementation Guide Released

2014: Adopted as a GOOS Project (GOOS SC-3)

2016: Deep-Ocean Observing Inventory Launched (Ongoing)

2017: First DOOS Steering Committee Meeting Convened

2018: Community Communications Conducted (Townhall, Obs ‘19 White Paper)

2020 and Beyond: Implementation of Deep Ocean initiatives based on Ocean Obs ‘19 outcomes
Overarching Science Questions

1. **Understand global deep and bottom water formation rates**, their variability, and the time scales of their global property changes while **assessing global heat, salt, and freshwater budget dynamics**;

2. Document **deep ocean tracer transport and ventilation processes** and assess their impact on ocean biogeochemical processes, both on the seafloor and in the water column; and

3. **Understand marine deep-sea biodiversity and ecosystem services** in light of human-induced and natural changes.

4. Responses to climate change, including **nature-based and any proposed geoengineering technologies**, require firm scientific **grounding** in terms of feasibility & impacts on the deep ocean.
The time for deep ocean observing is now!

• **THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT**
  - Understanding and predicting climate change
  - Sustainable Management of the Deep Ocean and the Blue Economy
  - Biodiversity Conservation

• **GLOBAL ASSESSMENTS**
  - IPCC 2019 Special Report on Ocean and Cryosphere in a Changing Climate
  - IPBES Global Assessment Report on Biodiversity and Ecosystem Services
  - World Ocean Assessment II – focus on a changing ocean

• **US FEDERAL MANDATES**
  - Presidential Memo on Mapping, Exploring, and Characterizing the ocean (Nov. 2019)
  - US White House OST Policy - data repositories used to locate, manage, share, use data (Jan 2020)
Inventory of Sustained Observing in the Deep Ocean
DOOS Azores Demonstration Project:
(iAtlantic collaborators – Telmo Morato, Ana Colaco, Marina Carreiro –Silva
Plus NOAA OER, Karen Stocks, Steve Diggs, Patrick Heimbach, L. Levin, A. McCurdy, F. Janssen

• **The concept.** Demonstrate the feasibility of integrated and coordinated deep-ocean observing in its broadest sense, including exploration, observation, monitoring, experimentation, and modeling.

• measurement of essential ocean variables (EOVs)

• tie together existing but separate programs and communities

• test new technologies

• demonstrate the benefit of deep ocean knowledge for policy, management, conservation and the private sector.

Image courtesy of T. Morato
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