

# Overview of GEO Ocean-related Activities

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# Overview

- Oceans and Society Blue Planet Initiative



- Marine Biodiversity Observation Network theme (GEOBON)



- Oceans and Islands AOGEOSS Task

# Blue Planet Initiative – Mission

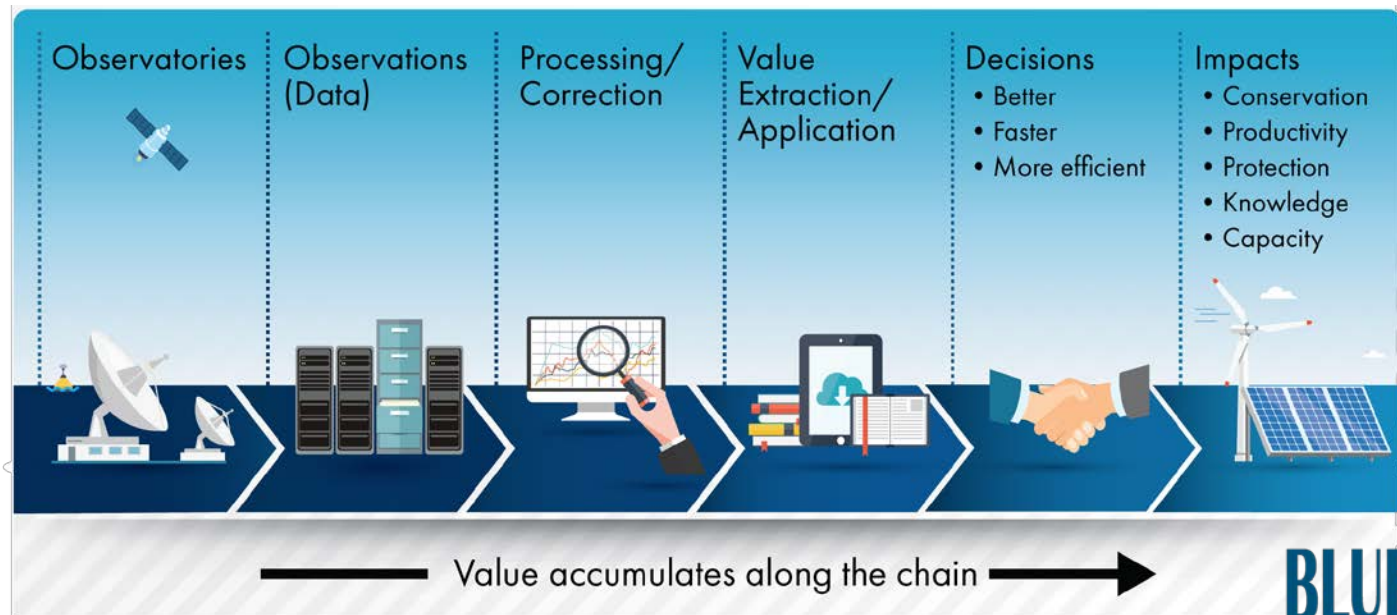
## Mission

- advance and exploit **synergies** among ocean and coastal observational programmes.
- increased **integration of and access to** in situ and remote sensing ocean observation data.
- improve **engagement** with a variety of **users** for enhancing the timeliness, quality and range of services.
- raise **awareness** of the societal benefits of ocean observations at the public and policy levels.



# Adding Value by Building on Existing Efforts

- Builds on existing programmes and coordinating mechanisms addressing ocean observations and their societal applications.
- Blue Planet adds value by:
  - Providing additional exposure and visibility to programmes
  - Identifying synergies between programmes,
  - Linking data to products to information to knowledge
  - Demonstrating societal benefits
  - link to relevant policies and policy frameworks.



# Blue Planet Initiative – Goal

- The overall goal of Blue Planet Initiative is to ensure the sustained development and use of ocean and coastal observations for the benefit of society



# Blue Planet Initiative – Objectives

- **Objective 1**: Increase integration of and access to in situ and remote sensing ocean observation data
- **Objective 2**: Conceptualize, promote and facilitate the development of end-to-end ocean information services
- **Objective 3**: Improve connections between producers and providers of ocean observation data, products and information and end users
- **Objective 4**: Increase societal support and build capacity for ocean observations



# Blue Planet Initiative – Themes

ENVIRONMENT

SOCIETY

ECONOMY



**Coastal Communities**



**Healthy Ecosystems & Food Security**



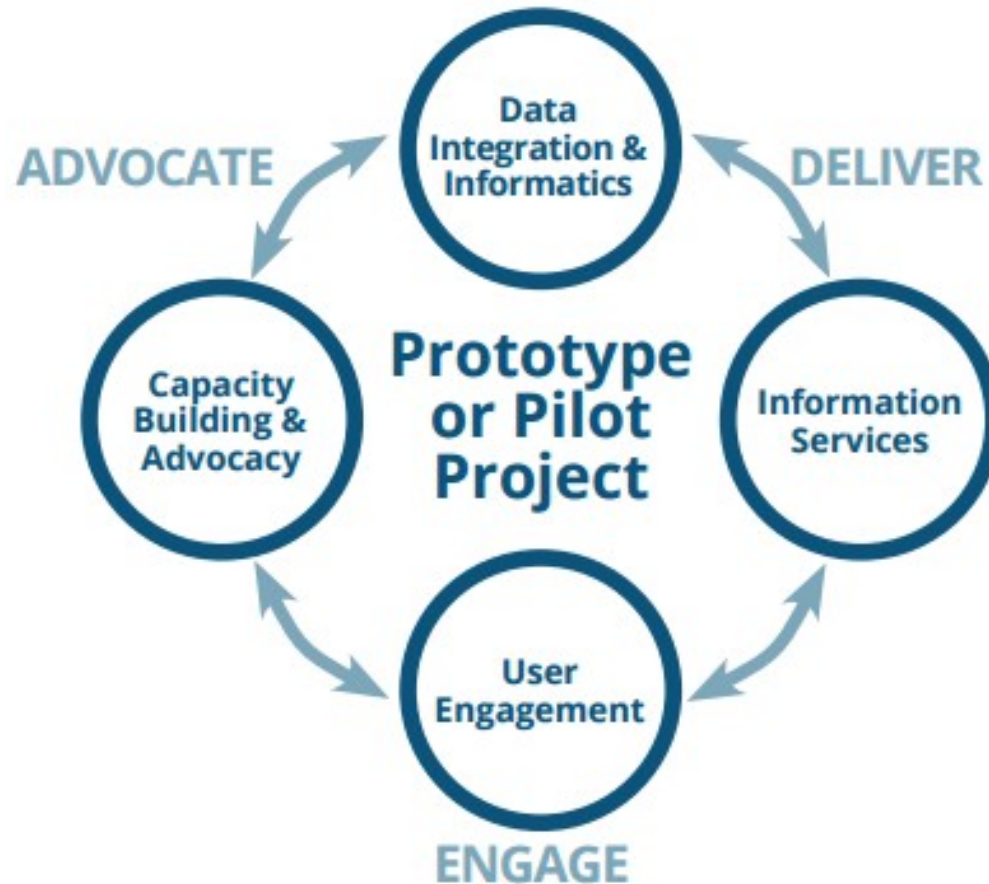
**The Blue Economy**



**Maritime Awareness**

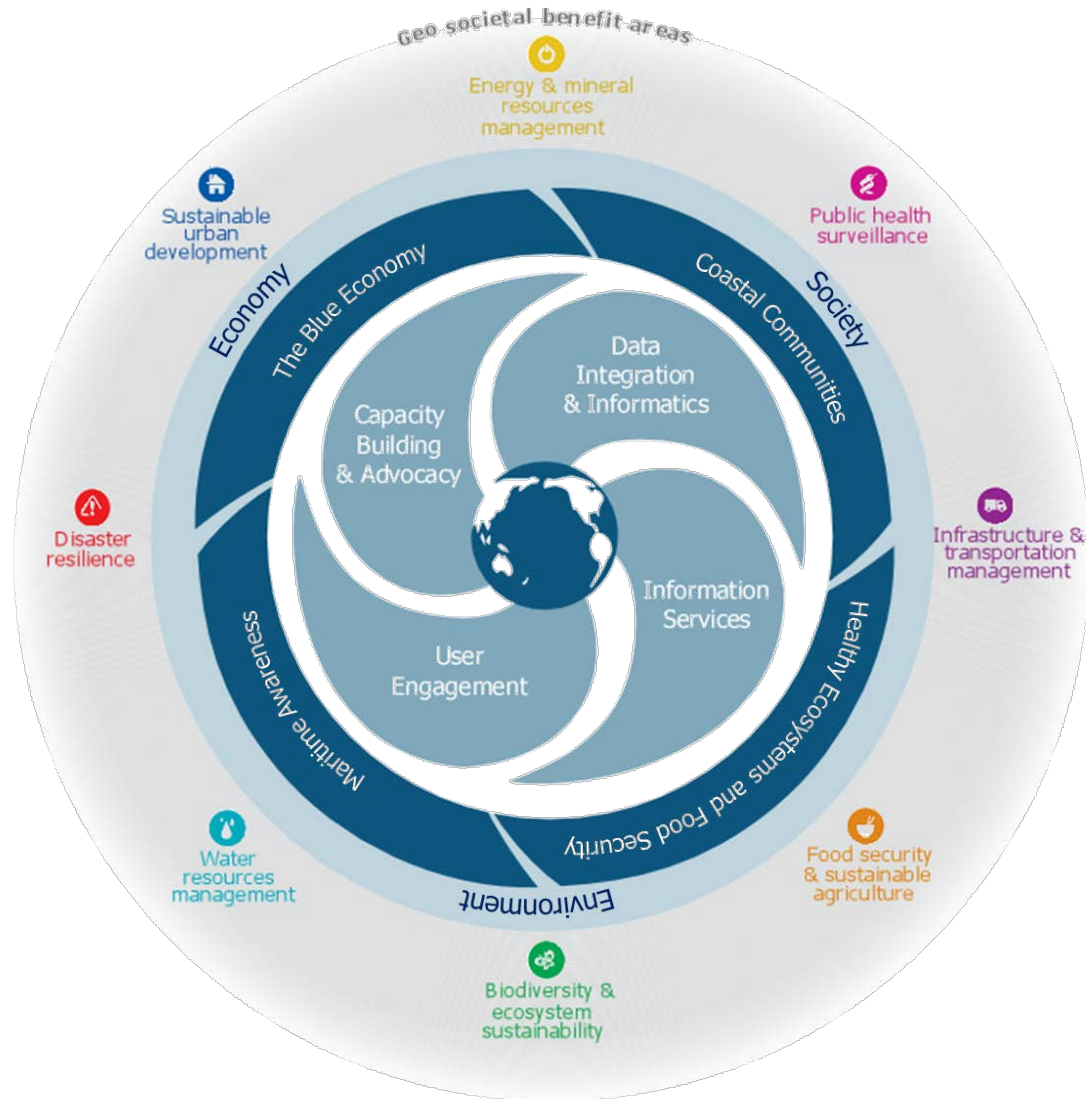
**Blue  
Planet  
Themes**

# Blue Planet Initiative – Projects

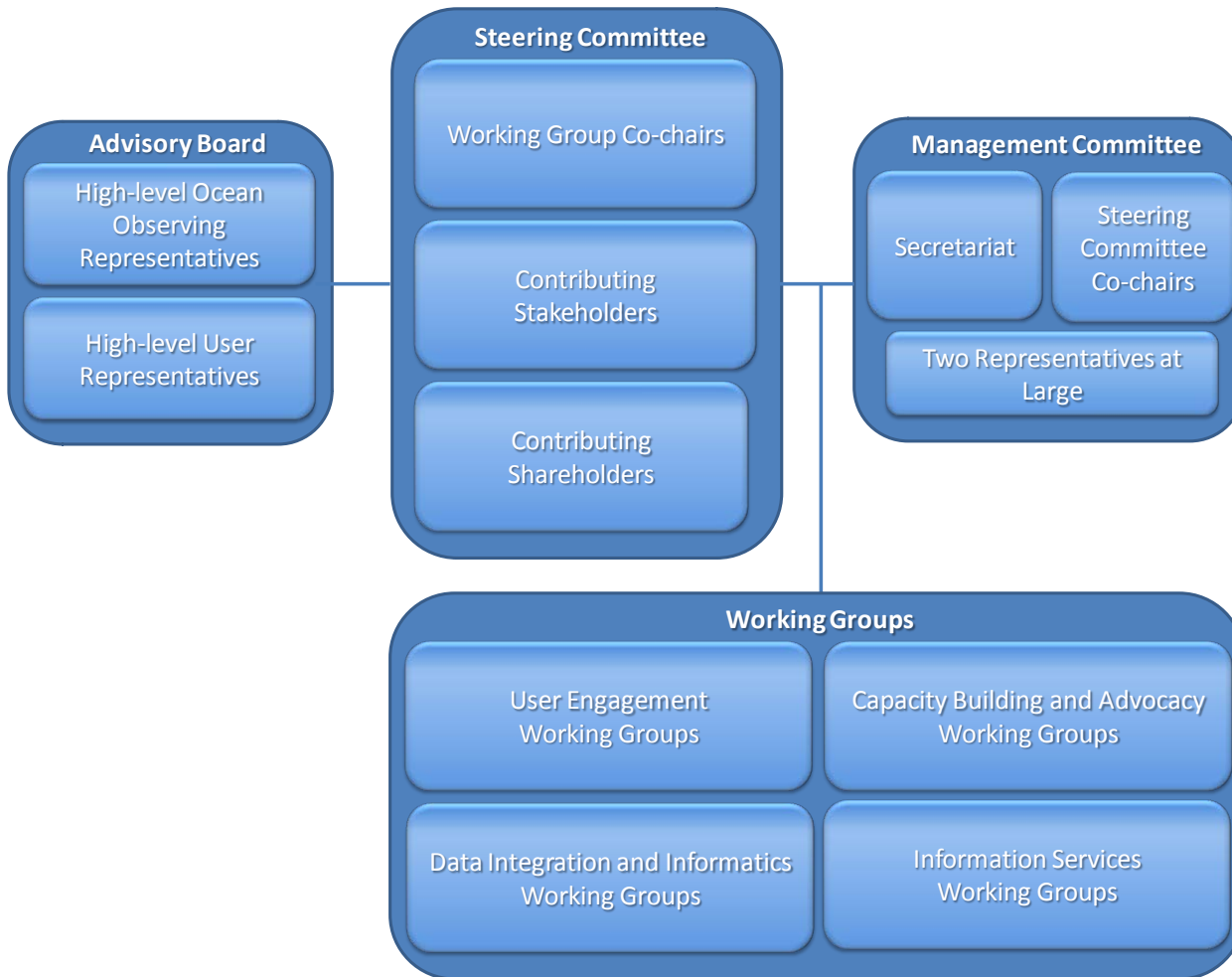




# Blue Planet Initiative – Components & Themes



# Blue Planet Initiative – Governance



## Call for Nominations

### *GEO Blue Planet:*

- Steering Committee
- Advisory Board

# Data Integration and Informatics Working Group

Jonathan Hodge (CSIRO)

[Jonathan.hodge@csiro.au](mailto:Jonathan.hodge@csiro.au)

## Outcomes

- Provide discoverable, integrated and accessible ocean observation data
- Provide a framework to enable comprehensive world ocean assessments
- Build on and add to GEOSS infrastructure

## Representation

- Ocean Data Interoperability Program (ODIP),
- Ocean Biogeographic Information System (OBIS),
- IOC/IODE,
- Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM),
- Committee on Earth Observation Satellites (CEOS).

## Activities

- Network existing regional and international efforts to improve data interoperability and access.
- Encourage and facilitate registration of databases within GEOSS Common Infrastructure.
- Coordinating various initiatives that are making available research cruise information to ensure that efforts are not being duplicated, and broaden the input to these efforts.
- Developing the Blue Planet website into an online resource for policy makers, scientists and the general public.
- Working with data providers to generate user friendly interfaces for services and products.

# Recent & Current Activities

## 2. Supporting SDG's- 14 life below water

- Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- UN Conference to support the implementation of SDG 14



## 3. 4M – Multi-purpose Marine Monitoring Mechanism

UNDP / CARIBE-GOOS proposal for Grenada and Barbados to:

- access expertise in capacity building and technical requirements for providing real-time information
- to promote evidence-based marine and fisheries policy programming and further strengthen the justification and accuracy in resource mobilization effort



**SUSTAINABLE DEVELOPMENT GOAL 13**

Take urgent action to combat climate change and its impacts\*



*Why are oceans relevant to you?*



**SUSTAINABLE DEVELOPMENT GOAL 15**

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss



**SUSTAINABLE DEVELOPMENT GOAL 6**

Ensure availability and sustainable management of water and sanitation for all



**SUSTAINABLE DEVELOPMENT GOAL 14**

Conserve and sustainably use the oceans, seas and marine resources for sustainable development



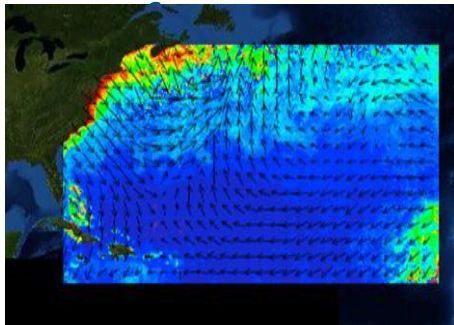
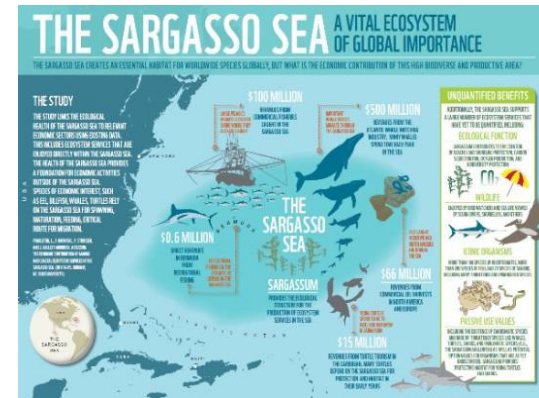
# Recent & Current Activities

## 4. COVERAGE:

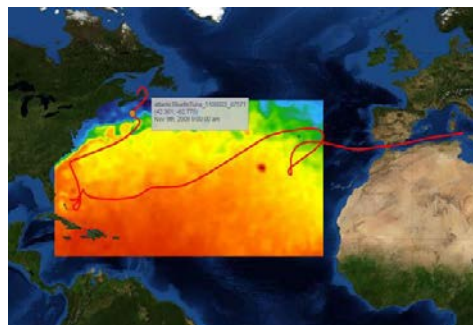
CEOS Ocean Variables Enabling Research and Applications for GEO

- assemble and present satellite and in situ ocean data in a compelling web-based format to demonstrate the value added of multivariate ocean data integration is support of science, applications, and public engagement.
- International collaboration via CEOS and GEO-Blue Planet for global extension based on a priority-set

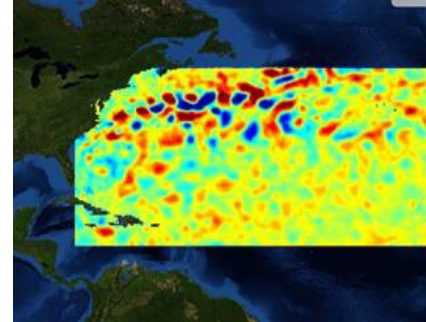
Use the Sargasso Sea as a regional pilot application



MODIS CHL-A +



Bluefin tuna archival tag track + Reynolds SST



AVISO Sea level anomaly



AIS Vessel Positions Heat map + Tracks

# Current Activities

## 1. Symposium Planning

### Desired outcomes

- Potential pilot and prototype projects for Blue Planet will be identified
- Associated observing system and technical needs will be identified
- Linkages and collaborations across disciplines and communities will be developed

<http://symposium.geoblueplanet.com/>



# Blue Planet Initiative – Contacts

## Blue Planet Steering Committee:

### Co Chairs

- Sophie Seeyeve PML) [ssve@pml.ac.uk](mailto:ssve@pml.ac.uk)
- Paul DiGiacomo (NOAA) [paul.digiacomo@noaa.gov](mailto:paul.digiacomo@noaa.gov)
- Andy Steven CSIRO) [andy.steven@csiro.au](mailto:andy.steven@csiro.au)

## Blue Planet Secretariat:

### Scientific Coordinator:

- Emily Smail (NOAA) [emily.smail@noaa.gov](mailto:emily.smail@noaa.gov)

### Technical Manager:

- Jonathan Hodge (CSIRO) [jonathan.hodge@csiro.au](mailto:jonathan.hodge@csiro.au)



[www.geoblueplanet.org](http://www.geoblueplanet.org)



[@GeoBluePlanet](https://twitter.com/GeoBluePlanet)

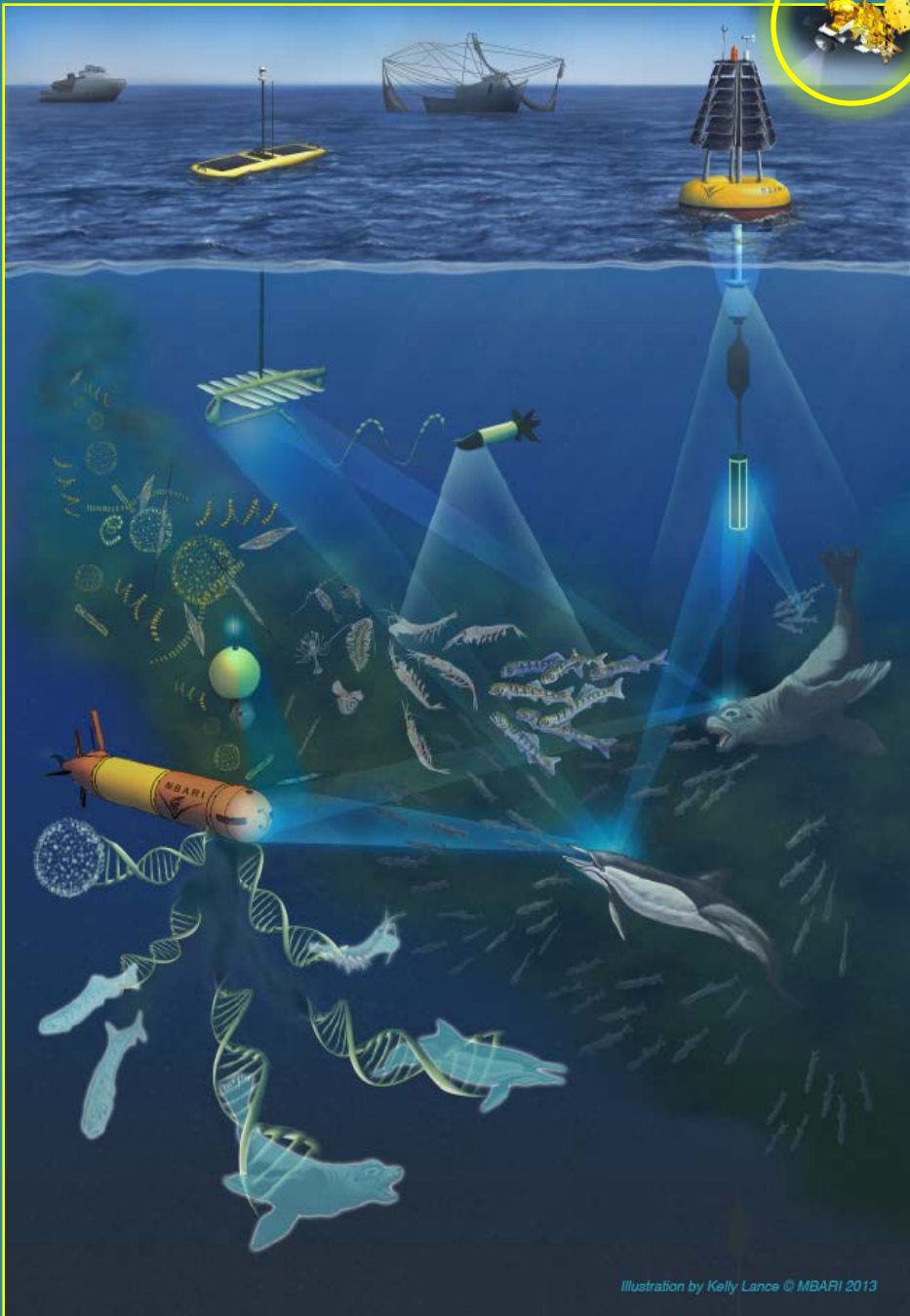


[info@geoblueplanet.com](mailto:info@geoblueplanet.com)

**BLUE PLANET**  
Oceans and Society







GEO BON

MBON

Marine Biodiversity  
Observation Network

**Biodiversity  
observations from  
microbes to whales**

Illustration courtesy of F. Chavez/K. Lance  
(Monterey Bay Research Institute/MBARI)

- ✓ Biodiversity means food for people
- ✓ It is our ethical responsibility to have healthy ecosystems and prevent species extinctions
- ✓ Biodiversity is key in ecosystem function & resilience, carbon & nutrient cycles, human health
- ✓ Research of environment (physics, chemistry) makes sense when put in the context of life on Earth

# Objectives

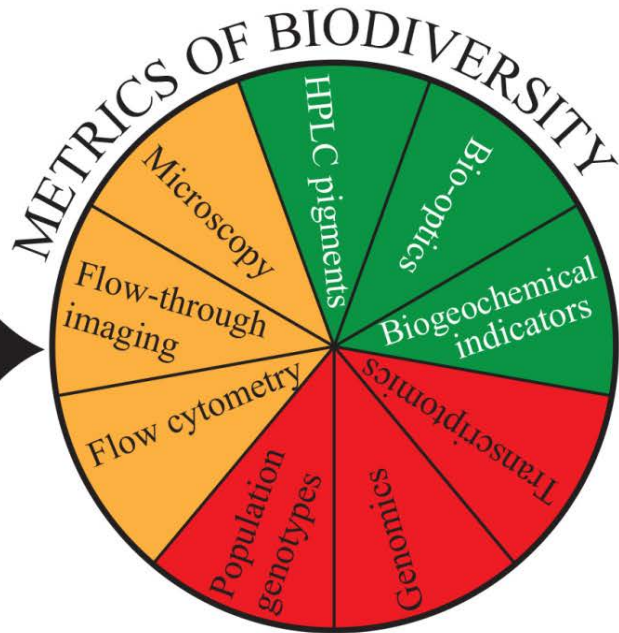
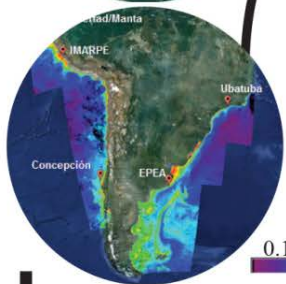
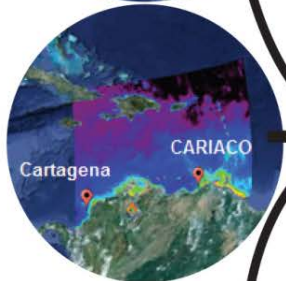
## Operational Objective:

- Develop a community of practice for the collection, curation, and analysis of marine biodiversity information
- Build on existing observing and data management infrastructure
- Inform government and intergovernmental policies and support Blue Planet
  - Convention on Biological Diversity (CBD/Aichi targets), the U.N. Sustainable Development Goals (especially SDG 14 on oceans), UN Law of the Sea (UNCLOS), Ramsar Convention on wetlands (corals, seagrasses, etc.), IPBES, national and regional needs, etc.

## Scientific Objective:

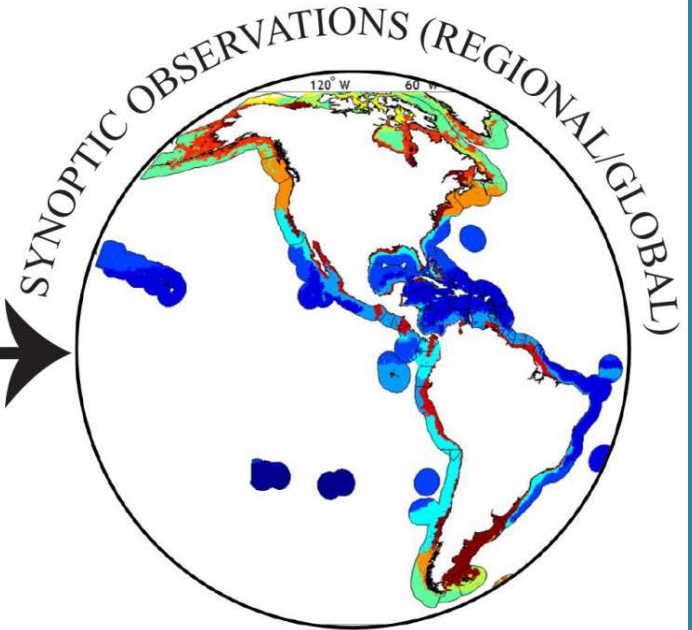
- Understand how and why life in the ocean is changing, how local changes relate to changes taking place over larger regions

## Time-Series



TAXONOMIC DIVERSITY  
GENOMIC DIVERSITY  
FUNCTIONAL DIVERSITY

## Seascapes



COLORS CORRESPOND TO DISTINCT SEASCAPES

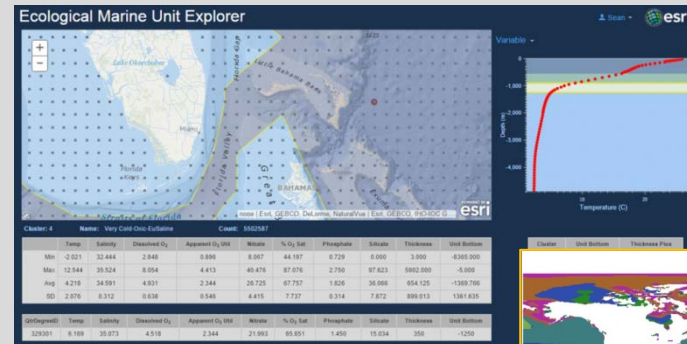
## INTEGRATION

Assessment of impacts of disturbances on coastal biomes

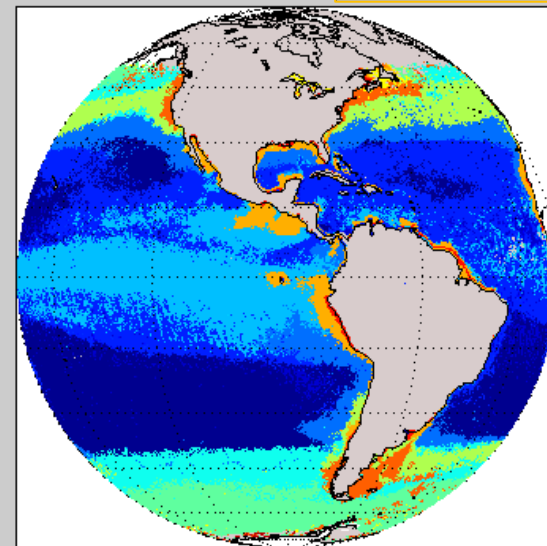
# Regional to Global Seascapes

In progress/Next steps:

- In situ validation
- Automate data flow between NASA, USF, WHOI, IOOS DMAC / Axiom
- Improving algorithms: Harmful Algal Blooms (HAB), carbonate system
- Expand high-resolution coverage:
  - Flower Garden Banks, AK-BON, Santa Barbara, other NMS
- Evaluate user metrics
- GEOBON and broader links:
  - Work with Roger Sayre (USGS) to link remote sensing Seascapes and Ecological Marine Units/EMU (USGS/esri)
  - Other partners/internationally



Month=1



Surface ocean  
EMU

Surface ocean  
Seascapes

# A Global Collaboration: OBIS + GOOS (IOC) and MBON

GEO BON/MBON – GOOS BioEco – OBIS partnership

Building a globally coherent, consistent and coordinated sustained global ocean observing system to assess the state of the ocean's biological resources and ecosystems

Requirements



- Focus on sustained observations
- Bring selected EOVs from pilot to mature
- Link with platforms and observing systems of GOOS and GRAs

Observations



- R&D focus
- Bring new EOVs from concept to pilot
- Assist with the establishment of national and regional BONs

Data & Products



- Open data sharing
- Data integration
- Data quality control
- Data harmonization
- Tools for data exploration, visualization and analysis

Products,  
Indicators,  
Assessments

e.g.: <http://iobis.org/2016/12/15/goosgeobonobis/>



## Marine Biodiversity Observation Network (MBON)



Working Group Co-Chairs:

Frank Muller-Karger      University of South Florida, USA

Mark Costello            University of Auckland, New Zealand

Isabel Souza Pinto      University of Porto, Portugal



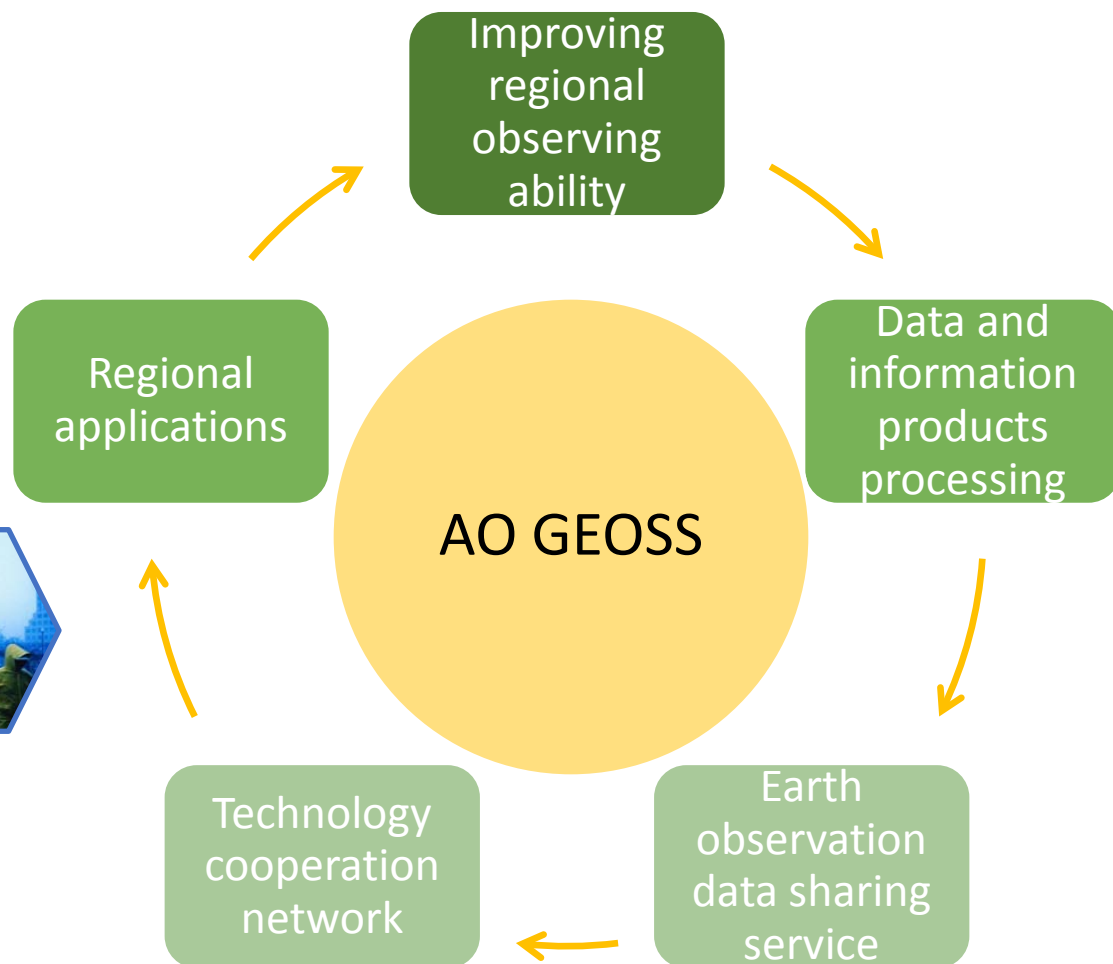
[www.geobon.org](http://www.geobon.org)

## Priority Areas

- ❑ Sustainable Agricultural
- ❑ Cross-regional disaster mitigation
- ❑ Ecology & environment



- ❑ Infrastructure monitoring
- ❑ Surveying and mapping
- ❑ Ocean remote sensing monitoring
- ❑ Water resources
- ❑ .....





# Ocean and Society

## GEOSS-AP Ocean Data Networking System

### Data site of Asia Pacific countries:

- |  |                  |  |   |                 |  |
|--|------------------|--|---|-----------------|--|
|  | <b>Japan</b>     | <ul style="list-style-type: none"><li>• NEAR-GOOS Regional Real Time Data Base</li><li>• NEAR-GOOS Regional Delayed Mode Data Base</li></ul>       |  | <b>India</b>    | <ul style="list-style-type: none"><li>• Indian National Centre for Ocean Information Services</li></ul>  |
|  | <b>Australia</b> | <ul style="list-style-type: none"><li>• Coastal Data Portal</li><li>• Coastal Research</li></ul>   |  | <b>Thailand</b> | <ul style="list-style-type: none"><li>• Central Database System and Data Standard for Marine and Coastal Resources</li></ul>                               |
|  | <b>China</b>     | <ul style="list-style-type: none"><li>• NEAR-GOOS Real Time Data Base</li><li>• China Delayed Mode Database for NEAR-GOOS</li></ul>                |  | <b>Vietnam</b>  | <ul style="list-style-type: none"><li>• Not yet have Data site. Inquire by E-mail.</li><li>• Vietnam's META-data is published in this web portal</li></ul> |
|  | <b>Korea</b>     | <ul style="list-style-type: none"><li>• Korea Real Time Database for NEAR-GOOS</li><li>• NEAR-GOOS Korea National Delayed Mode Data Base</li></ul> |   |                 |  |

### GEOSS-AP Ocean Data Networking System Web Portal:

Web data portal build via core framework(GYRE-System).

To encourage ocean research activities by searching the oceanographic data easily and speedily.

To give opportunities the countries which don't have the public data base site to disclose their meta information about their oceanographic data.



Extension of the current Ocean Data Networking, which will ensure national security and help efforts of individual observation projects for data exchanges through collaborative works. In particular, we seek possible extension to biogeochemical and ecosystem observation (e.g. ocean acidification)

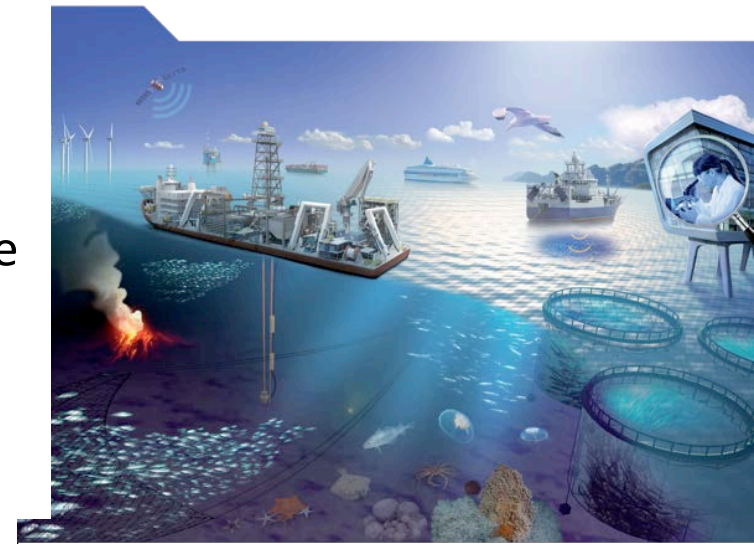
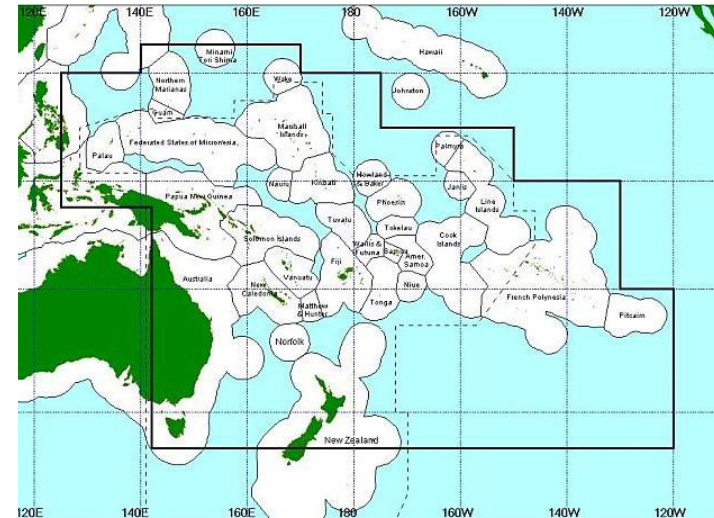
# T8 Oceans and Islands

## Goal

- To advance and exploit synergies among the many observational programmes devoted to island, coastal and ocean, to improve engagement with a variety of users for enhancing the timeliness, quality and range of services delivered;
- to raise awareness of the societal benefits of ocean observations at the public and policy levels
- Focus on coastal countries and small island states

## Tasks

- Identify and articulate user needs.
- Produce new marine and coastal observation network by supporting and linking partners.
- Improve the Coastal Applications of the Data Cube and Modelling the Hydrodynamics and Biogeochemistry of the ocean environment.
- Evaluate the sea level rise risk for the developing states in the western and eastern Pacific.



## Asia Oceania GEOSS

- Oceans and Islands Activity; pilots Sri Lanka and Fiji/Samoa
- **GEOBON**
  - Marine BON coordination
  - Global Ecological Marine Units

## International Partnership for Blue Carbon

- Mangrove and seagrass mapping

## Engagement with Other Programmes:

- AtlanTOS
- APEC Earth Marine Observations Workshop
- Future Earth Coasts

