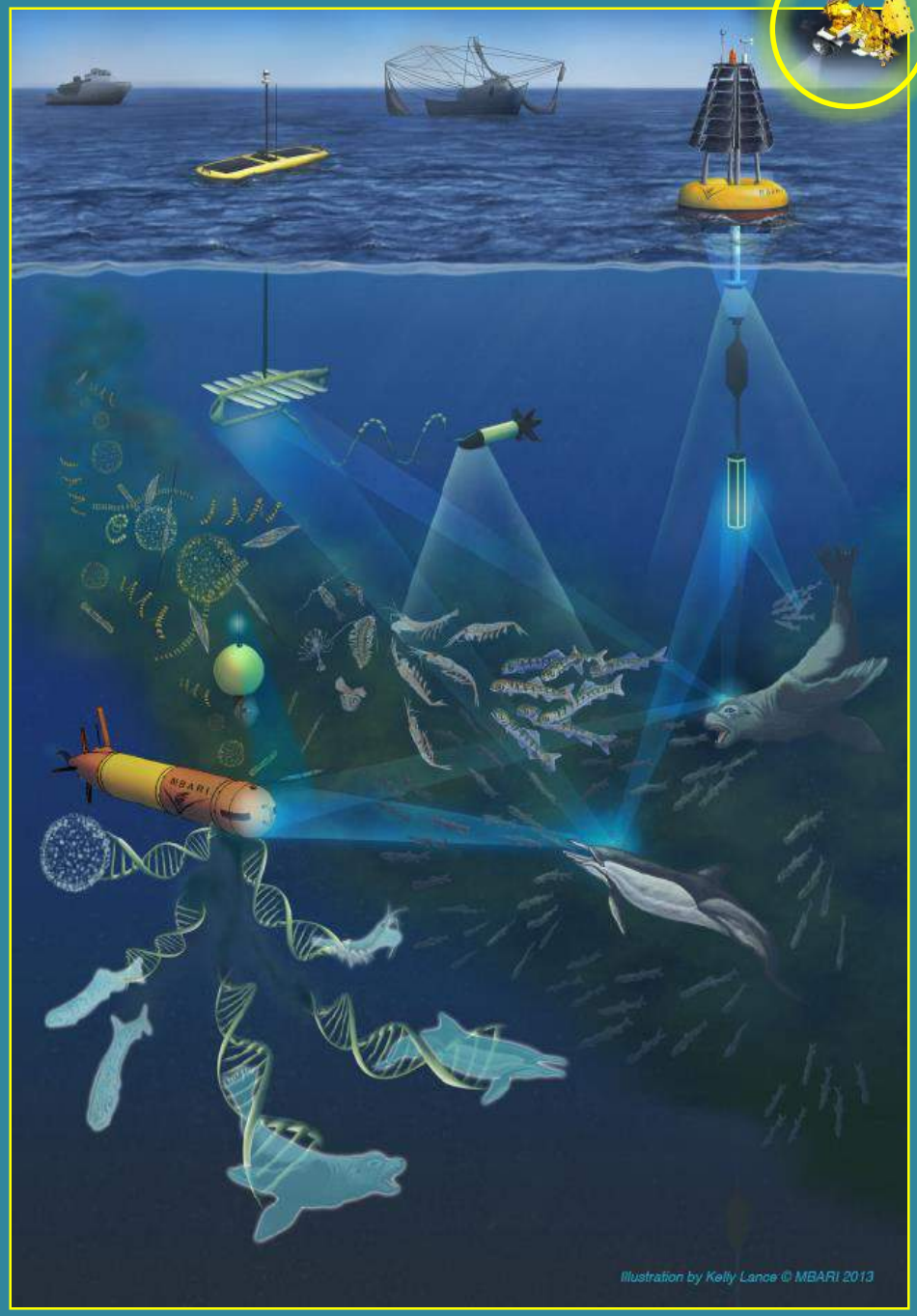
Linkages to the Intergovernmental Oceanographic Commission, Ocean Obs 19 and the UN Decade of Ocean Science for Sustainable Development (2021-2030)



GEO BON

MBON

Marine Biodiversity Observation Network

A global partnership for the systematic study of life in the sea

…from microbes to whales

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

MBON
Marine Biodiversity Observation Network

UN environment WCMC

To understand local change in a regional context, MBON:

- Promotes a global **Community of Practice** for the observation of marine biodiversity
  - **Best practices** for marine biodiversity observation
  - IOC/IODE Ocean Best Practices repository (field, lab, metadata)
- Supports **monitoring efforts** in country or region
- Promotes **open-access databases** (e.g. Ocean Biogeographic Information System/OBIS)
- Promotes integration of biological observations with regional observing (e.g. Global Ocean Obs. System)
- Promotes capacity building

The NOPP Sanctuaries MBON Pilot:
Primary Goals of Cooperative Agreement

- Export the MBON concept globally

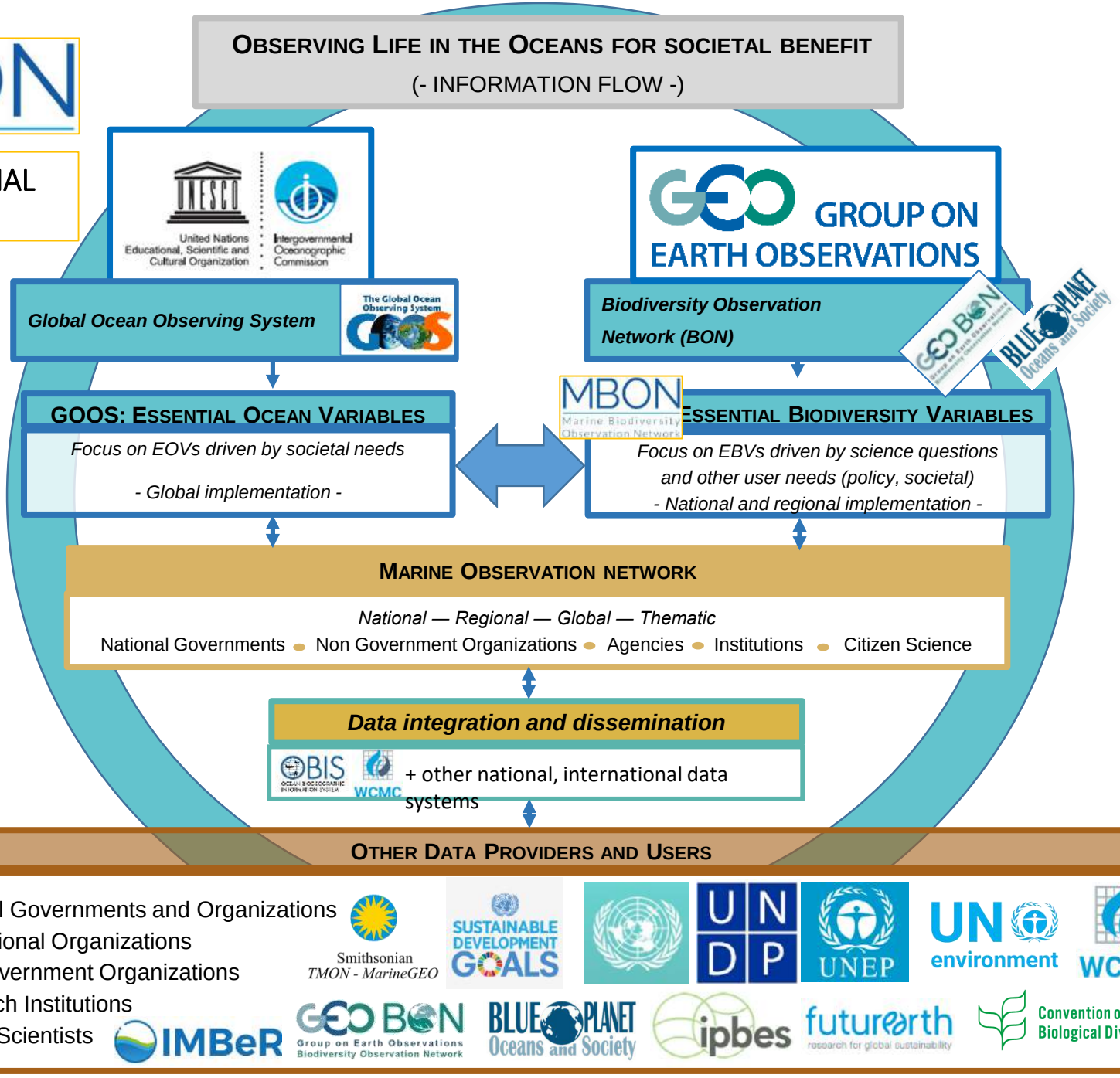
Our Approach:

Networking networking networking

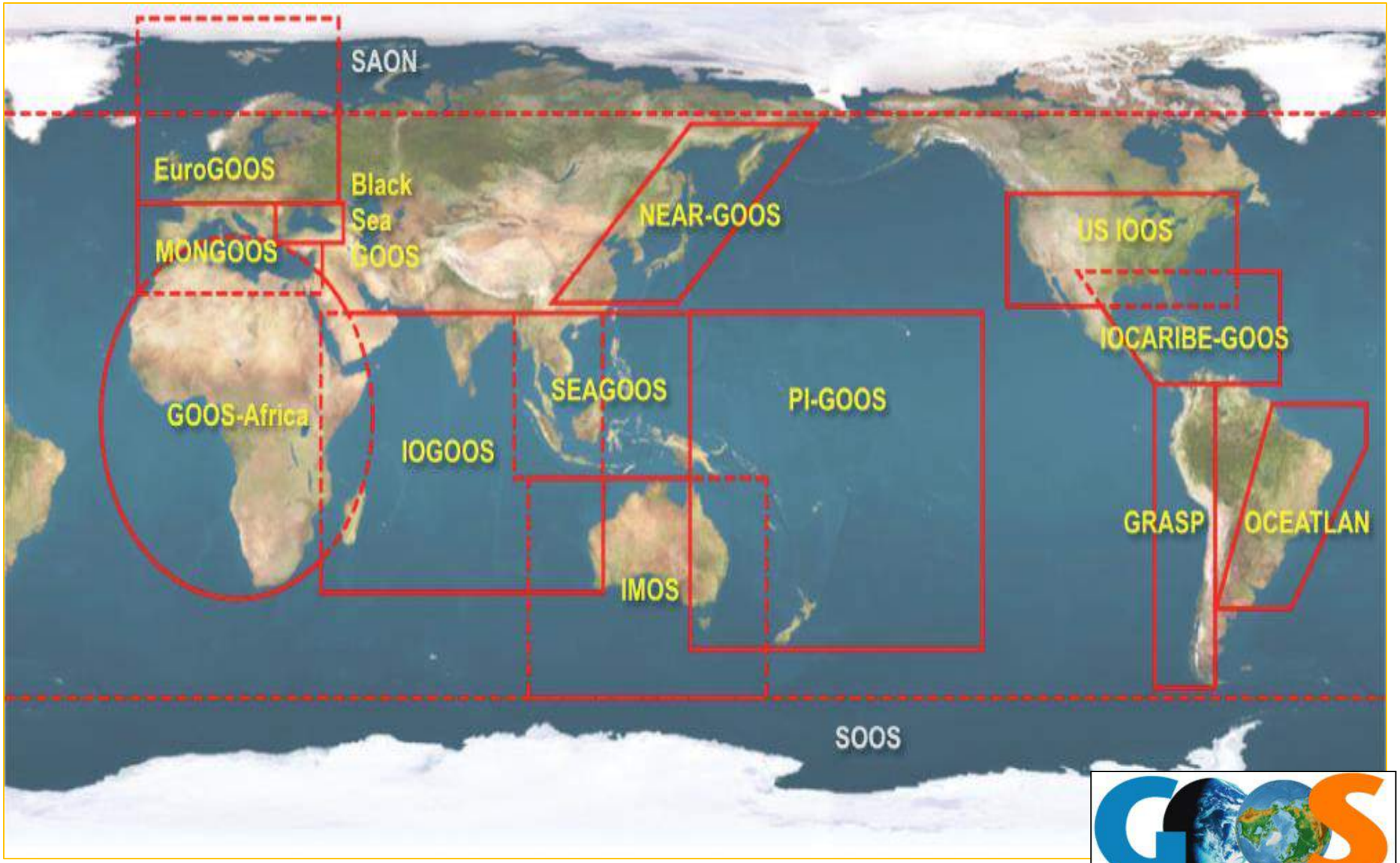
Respecting/enhancing identity of observer groups and stakeholders

MBON

INTERNATIONAL LINKAGES



15 GOOS Regional Alliances



DEEP OCEAN OBSERVING STRATEGY

www.deepoceanobserving.org

An international, community-based group focused on developing a roadmap that will lead to an improved understanding of the state of the deep ocean with respect to baseline conditions, response to climate variability and response to human disturbance.

GOOS
The Global Ocean Observing System

DOSI
DEEP-OCEAN STEWARDSHIP INITIATIVE

Smithsonian MarineGEO Partnership

Our infrastructure is people

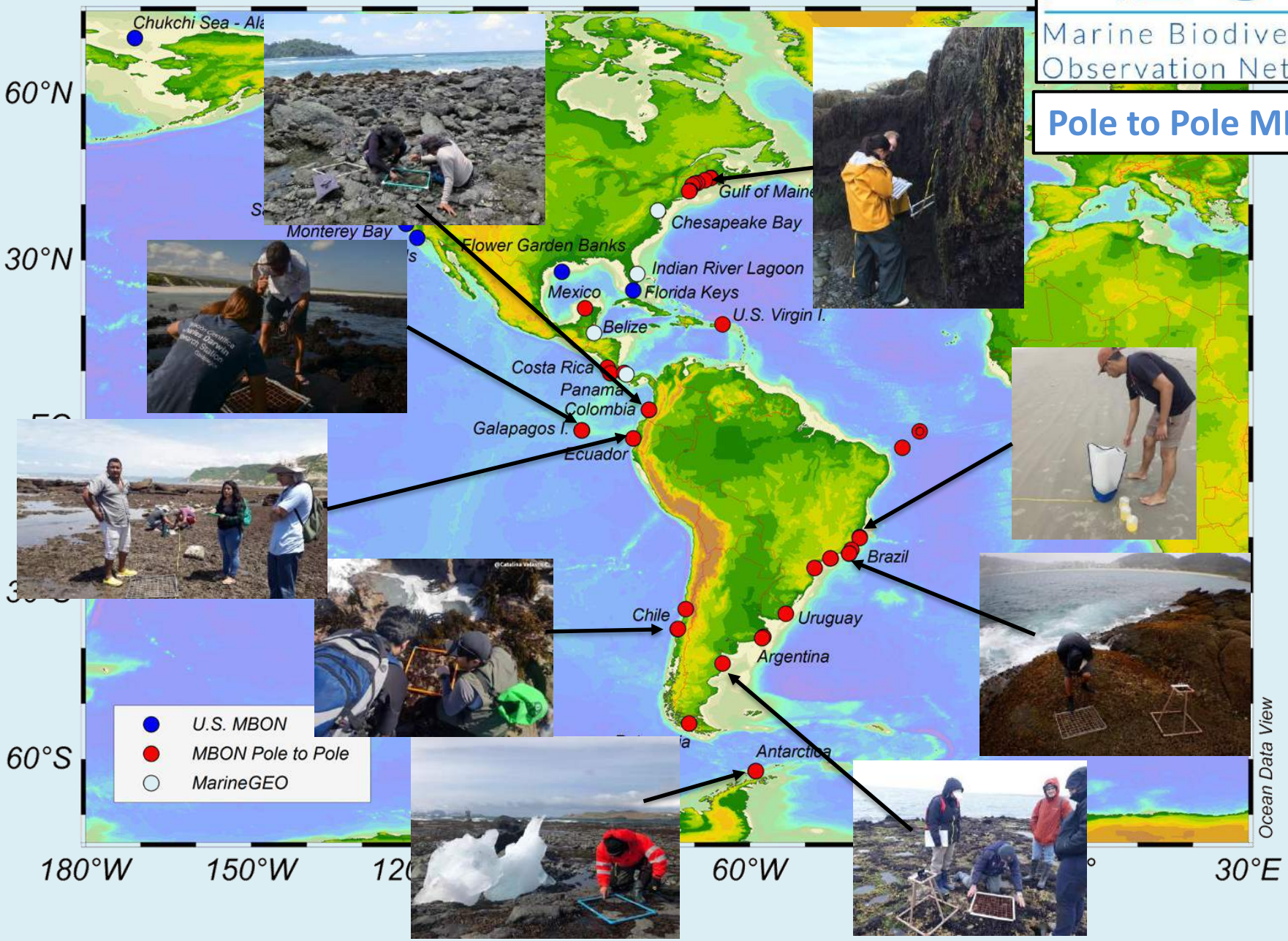
MarineGEO
THE TENNENBAUM
MARINE OBSERVATORIES NETWORK
Smithsonian Institution

- **Vital signs**:
  coastal seabed focus
  diversity time series
- **Diagnostic tests**:
  Coordinated exp'ts
- **Capacity building**

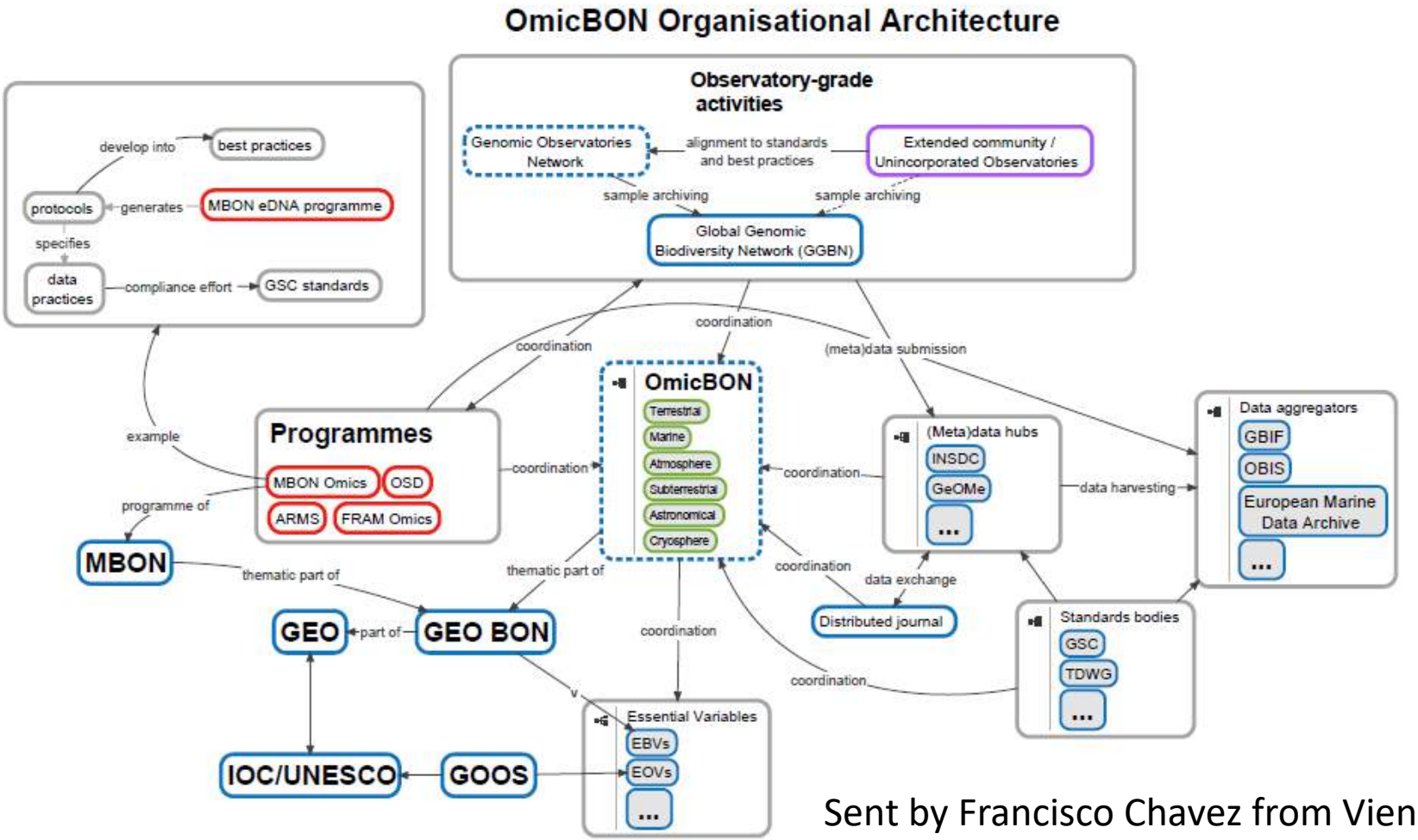
Capacity Building – Field sampling

MBON
Marine Biodiversity Observation Network

Pole to Pole MBON



MBON and the Genomics Standard Consortium



Sent by Francisco Chavez from Vienna
24 May 2019

Honolulu, Hawaii

MBON
Marine Biodiversity Observation Network

The Global Ocean Observing System
GOOS

BLUE PLANET
Oceans and Society

Substantial MBON involvement

In partnership with

NSF OceanObs RCN:

- ***Intellectual sponsor***
- ***Program Committee***
- Participation:
  - Speakers and panelists
  - Breakout sessions
- **Post OO19 activities** planned
  - AGU fall Meeting
  - Ocean Sci. Meeting

http://www.oceanobs19.net/

Conference Objectives

IMPROVE OCEAN OBSERVATION

(advocacy, funding, best practices, etc.)

Information: how do we meet future user needs? And how can we better communicate among observing systems to deliver products for users that follow usability and other best practices across the globe?

Innovation: how can we spur innovation in observing technologies, products, and user services?

Integration: how can we balance user and operator needs, capabilities, and knowledge worldwide? And how can we improve sharing and access of capabilities internationally? How can different actors from academia, the public and private sector work together.

Governance: how can we improve ocean observing governance at the global and basin scale? How can we register commitments and deliver against agreed objectives?

UN Decade of Ocean Science for Sustainable Development (2021-2030)

Martin Visbeck
GEOMAR und Kiel University

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

On 5 December 2017, the UN General Assembly proclaimed the Decade of Ocean Science for Sustainable Development (2021-2030).

Resolution A/72/L.18 calls upon the IOC to prepare an Implementation Plan for the Decade in consultation with:

- Member States;
- UN partners;
- Institutional partners;
- Other relevant stakeholders.

And to report to the UN Secretary-General about the implementation of the Decade.

Resolution A/72/L.18 also invites UN-Oceans to collaborate with IOC.

SUSTAINABLE DEVELOPMENT GOALS

2030 AGENDA

UN Decade of Ocean Science forSustainable Development (2021-2030)

Biological Diversity/Aîchi Biodiversity targets (CBD)

Law of the Sea (UNCLOS + BBNJ + UNFSA)

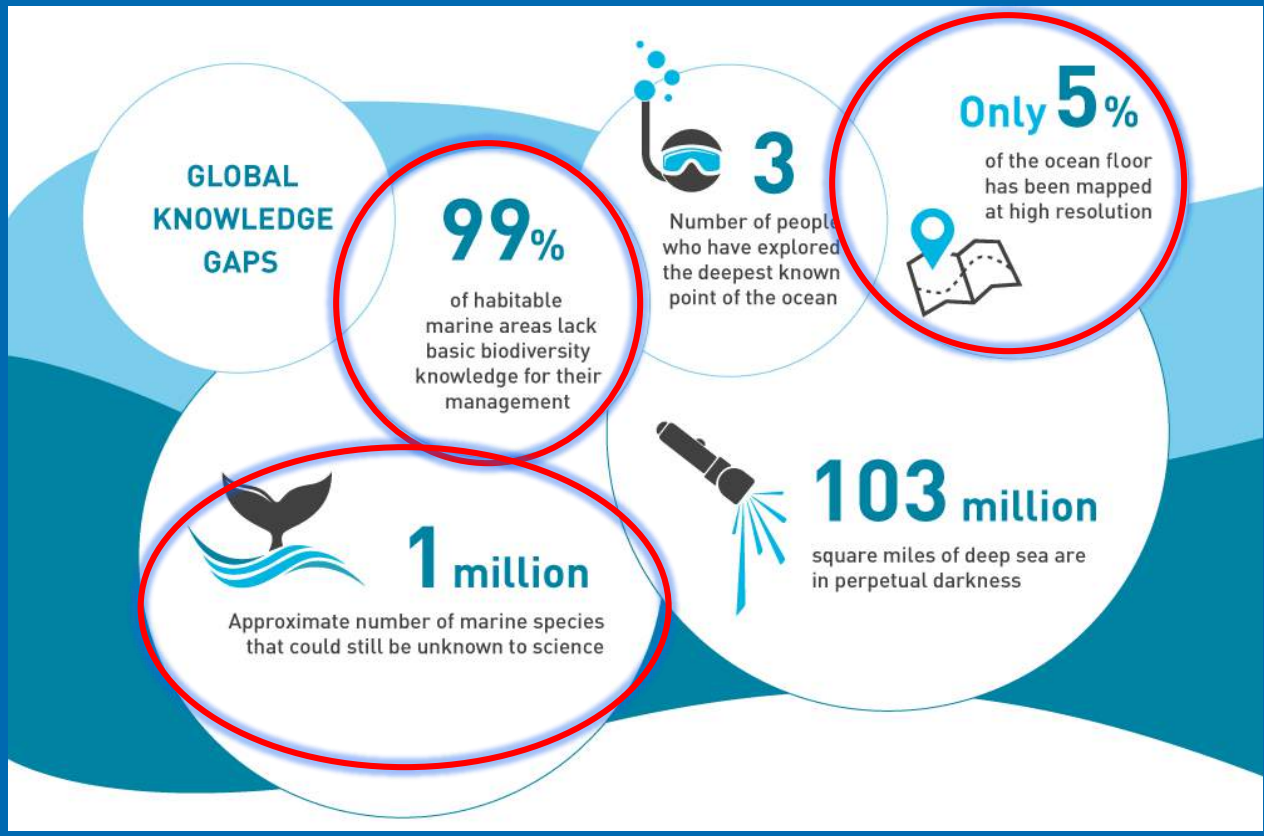
SIDS Action (SAMOA Pathway)

Disaster Risk Reduction SENDAI Framework

Climate Change/Paris Agreement (UNFCCC)

A global framework that will ensure Ocean Science can help governments and societies achieve the major goals of our generation

A global collective research and investment framework to close the knowledge gaps



Research & Development Priority Areas

Map the entire ocean floor and processes

Bolster ocean observation systems in all basins

Conduct an inventory of ecosystems and their functioning

Develop a data and information portal

Establish an integrated multi-hazard warning system

New integrated models for ocean prediction

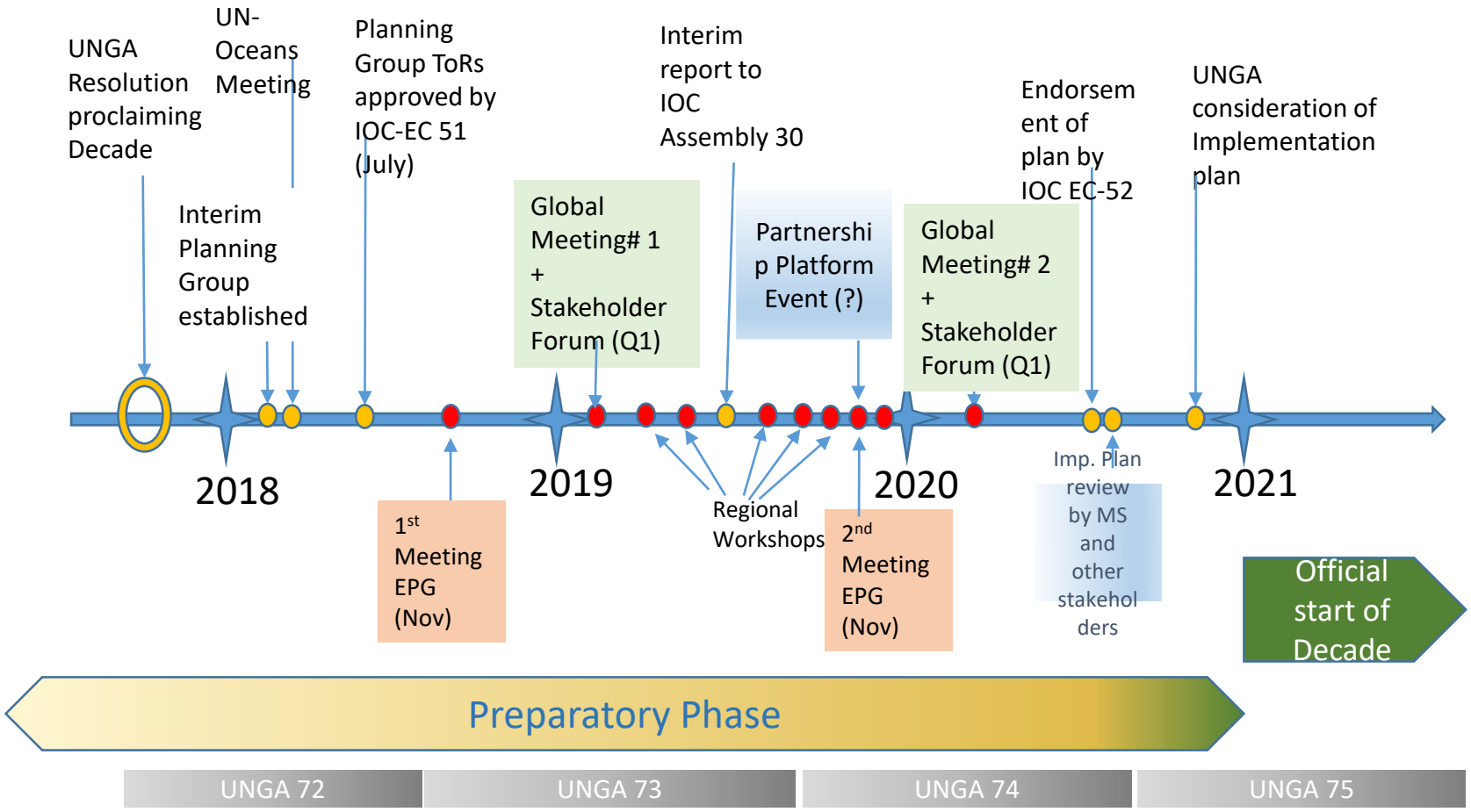
Strengthen capacities and accelerate technology transfer and ocean literacy

Preparatory Phase: 2018-2020

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

2021 2030 United Nations Decade of Ocean Science for Sustainable Development



Preparing for the Decade: Next Steps

















Executive Planning Group

serves as an advisory body to the IOC governing bodies

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

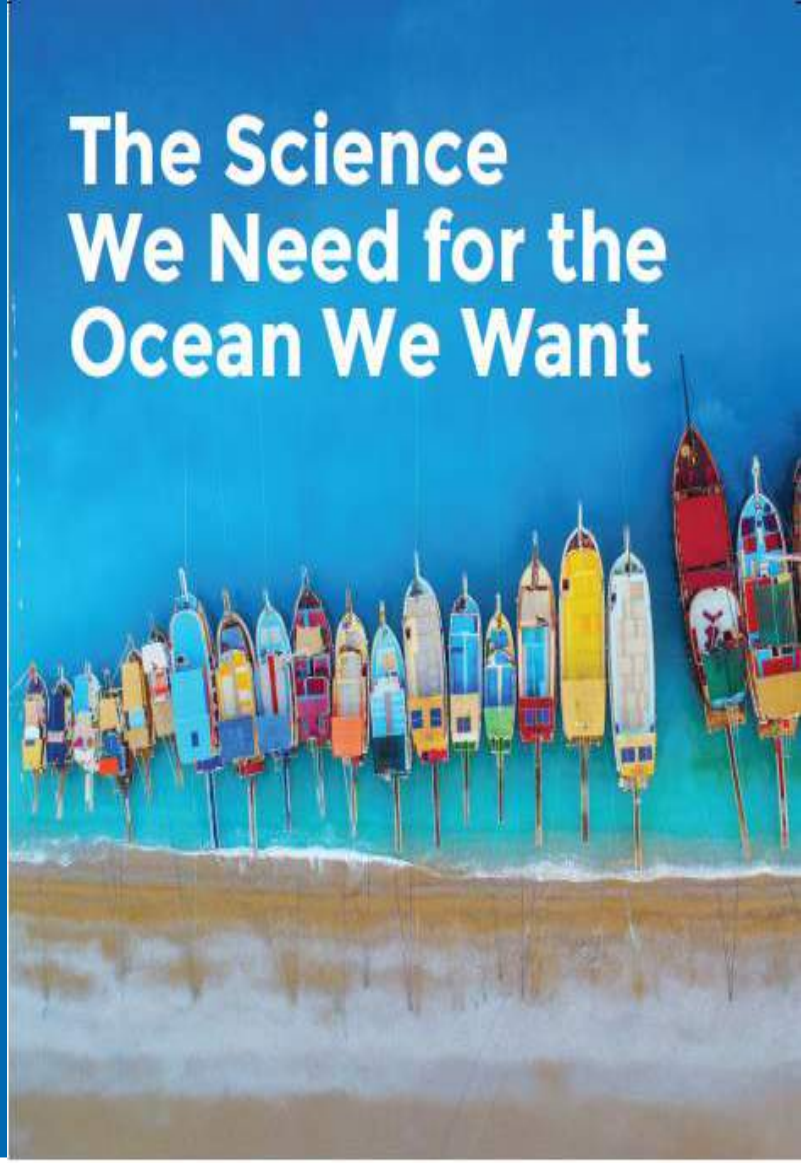
Get in touch

Write to:
oceandecade@unesco.org

Follow all Decade news:
http://oceandecade.org

Social media:

IocUnesco IocUnesco ioc_unesco



United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

The United Nations Decade of Ocean Science for Sustainable Development (2021-2030)

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

MBON

Marine Biodiversity Observation Network

…we can
…do this now!

https://mbon.ioos.us/

Contacts: (GEO BON / MBON co-chairs)

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-Isabel Sousa Pinto (ispinto@ciimar.up.pt)
-Mark Costello (m.costello@auckland.ac.nz)

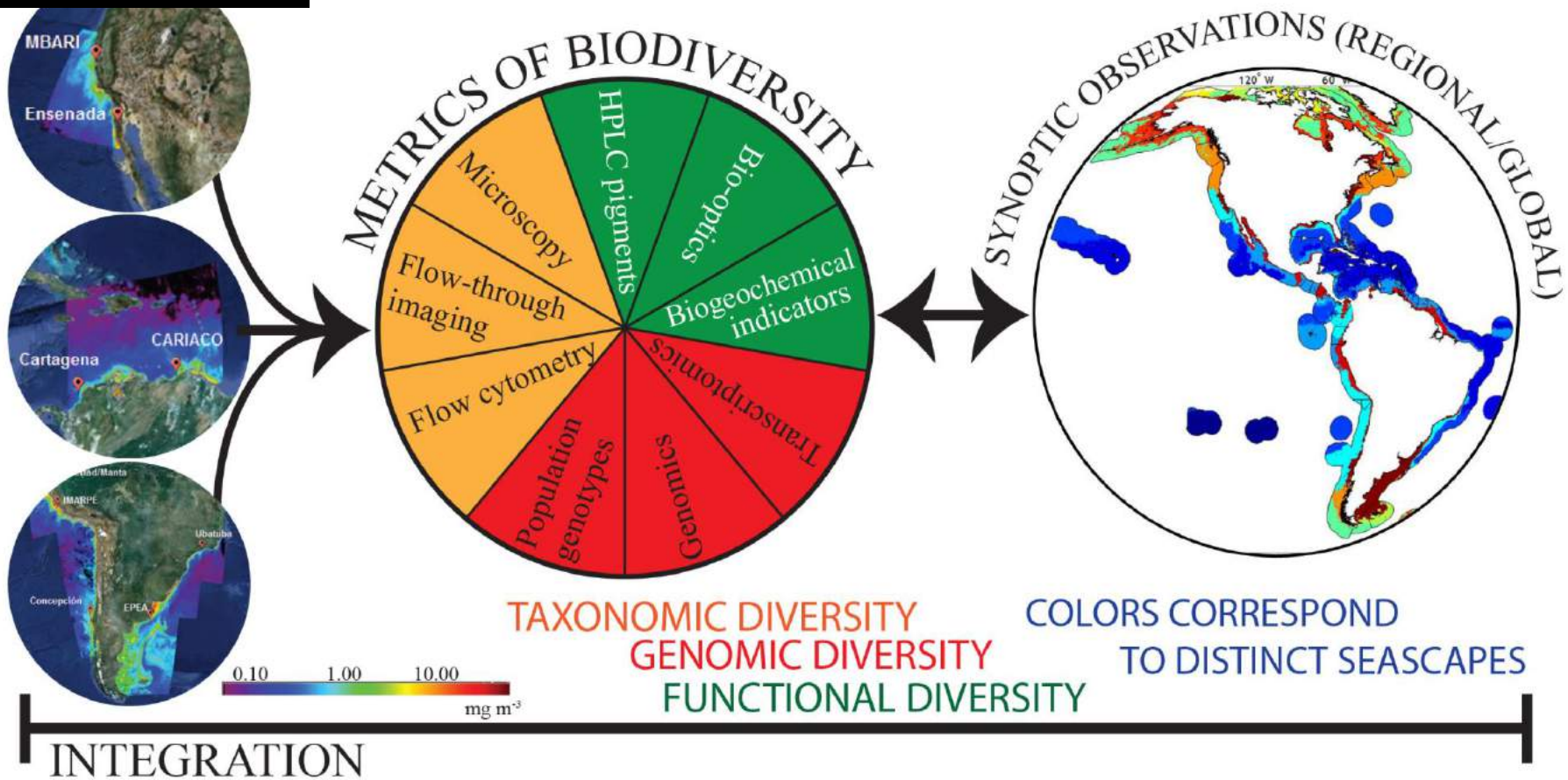
BACKUP

MBON

STRATEGIES

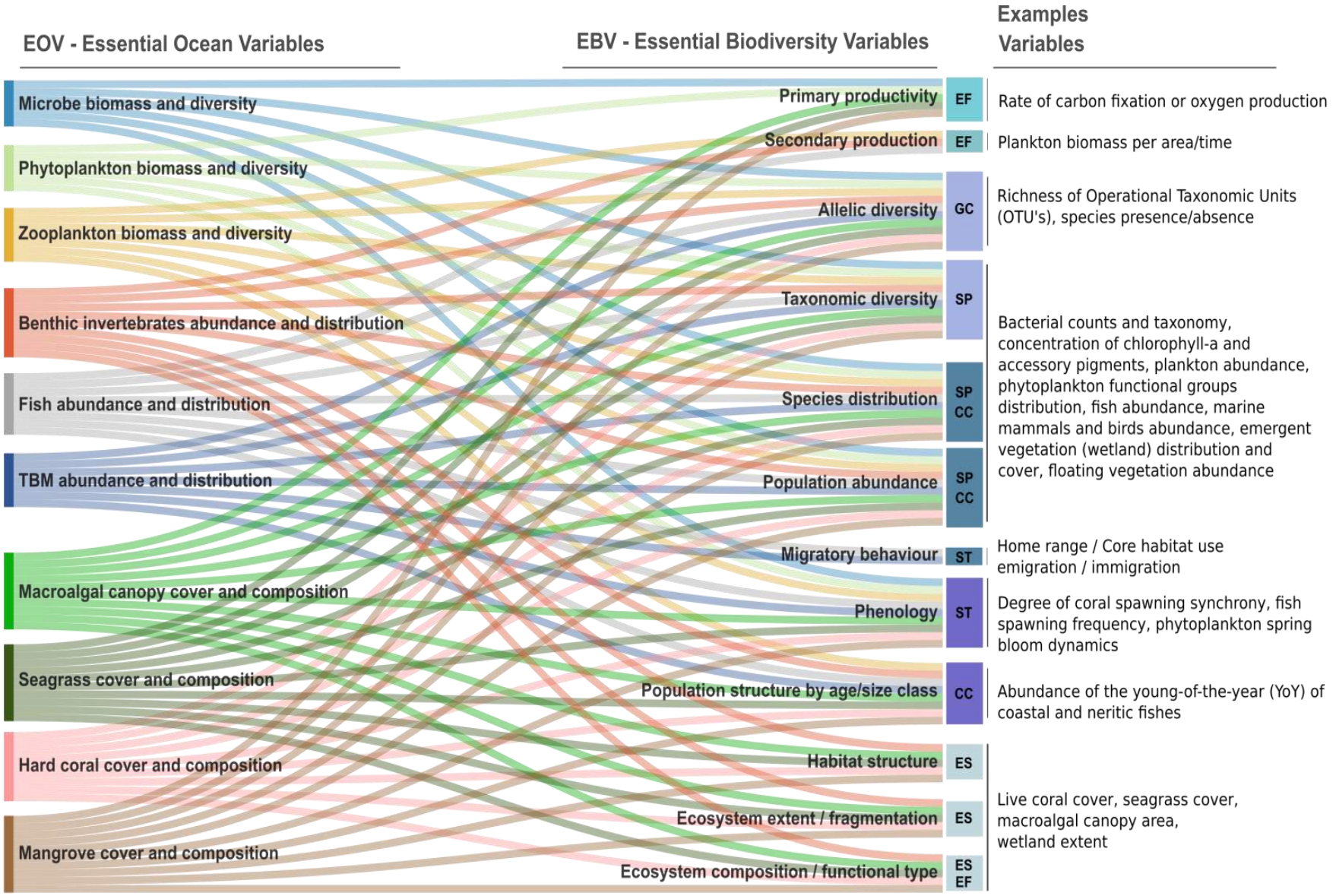
Time-Series

Seascapes



F.E. Muller-Karger, M. Kavanaugh, E. Montes, W.M. Balch, M. Breitbart, F.P. Chavez, S.C. Doney, E.M. Johns, R.M. Letelier, M.W. Lomas, H.M. Sosik, A.E. White. A framework for a Marine Biodiversity Observation Network within changing continental shelf seascapes. In press. Oceanography. September 2014.

EBV and EOV are Complementary



Ongoing/Developing Collaborations:

OBIS-GOOS-MBON

NSF OceanObs Network RCN

Animal Telemetry Network (ATN)

Ocean Acidification Network

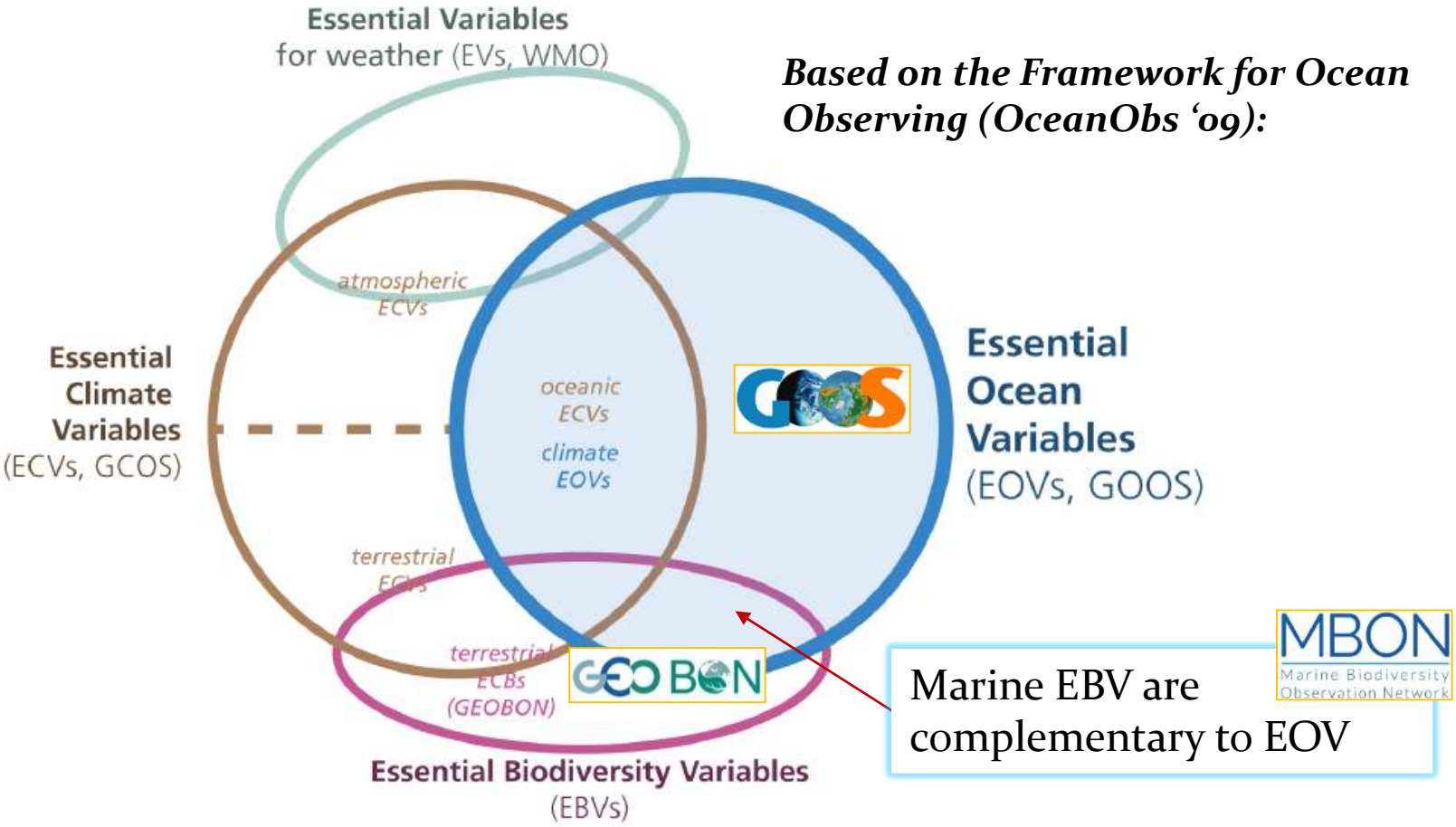
Other IOOS RA's

MarineGEO (Tennenbaum)

...

OBIS-GOOS-MBON Partnership: Belgium, Dec 2016

Linking Essential Biodiversity Variables (EBVs) and Essential Ocean Variables (EOVs)



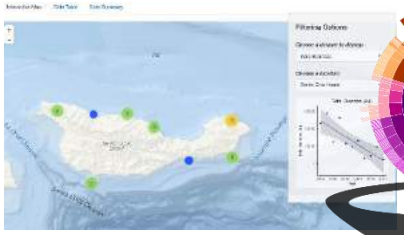
Based on the Framework for Ocean Observing (OceanObs '09):

EOVs are central to GOOS strategic planning and implementation
EBVs are central to GEO BON strategic planning and implementation

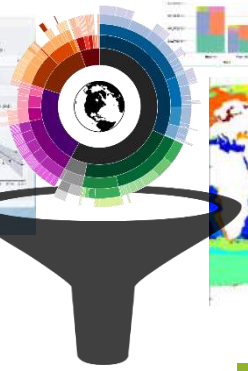
BLUE PLANET Oceans and Society

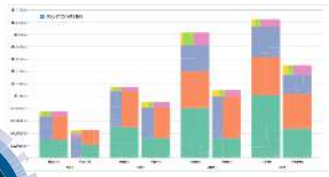
MBON Marine Biodiversity Observation Network

Mapping tools

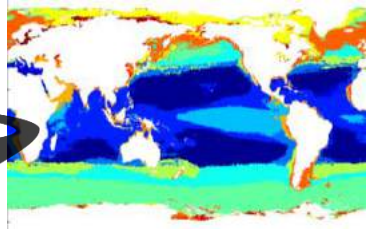


Taxa





Time series



Satellite seascapes

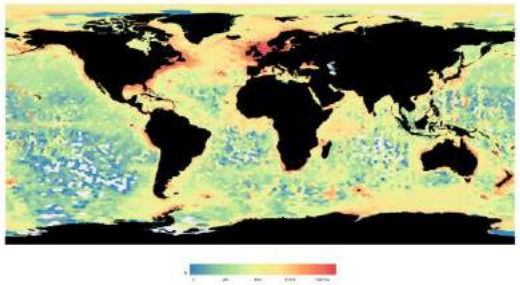
GOOS + GEO

14 LIFE BELOW WATER

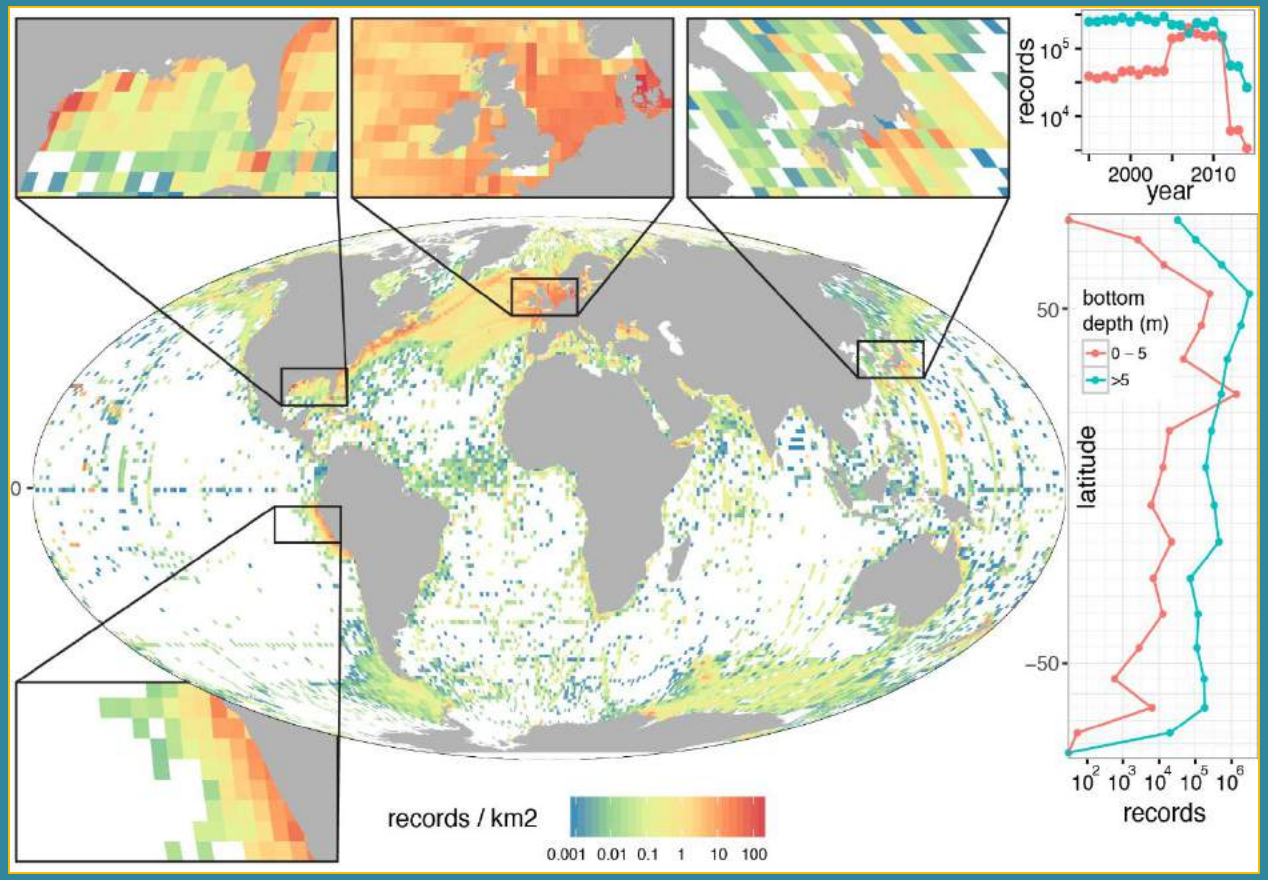
SUSTAINABLE DEVELOPMENT GOALS

The state of marine biodiversity monitoring

OBIS
OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM



OBIS: 47 million records (water column to benthos)



Data needed to satisfy 'Drivers'

<u>Near-surface</u> taxonomic records (<20 m)

→Many areas have no records

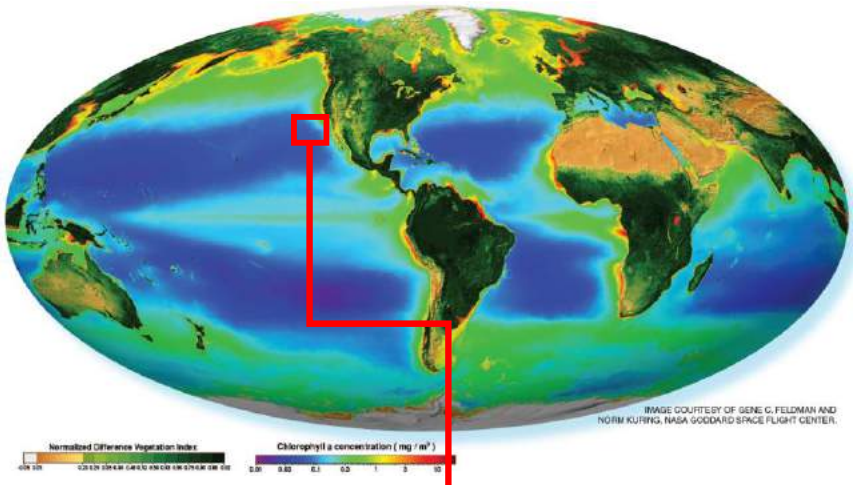
→Less records in last 10 years:
lag in reporting data to OBIS

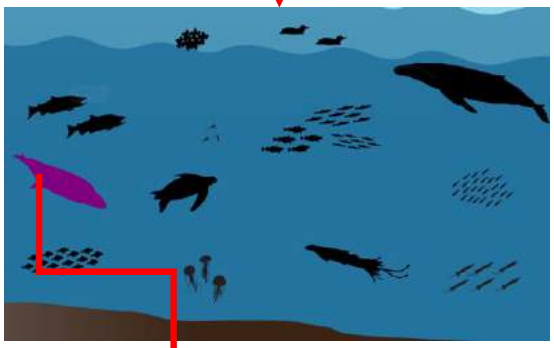
MBON

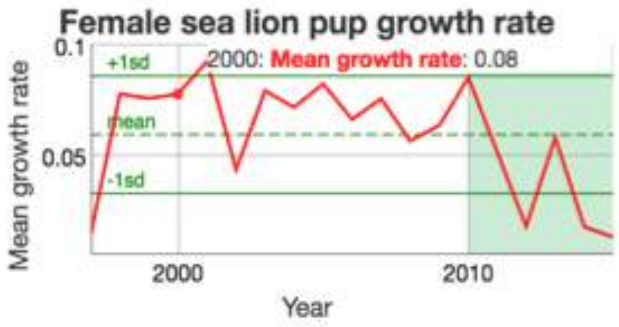
Societal Relevance

NCEAS Global Marine Ecosystems layers:

Beach
Coral Reefs
Deep Hard Bottom
Deep Soft Benthic
Deep Waters
Hard Shelf
Hard Slope
Intertidal Mud
Kelp
Mangroves
Rocky Intertidal
Rocky Reef
Salt Marsh
Seagrass
Seamounts
Soft Shelf
Soft Slope
Sub-tidal Soft Bottom
Surface Waters
Suspension-Feeder Reef







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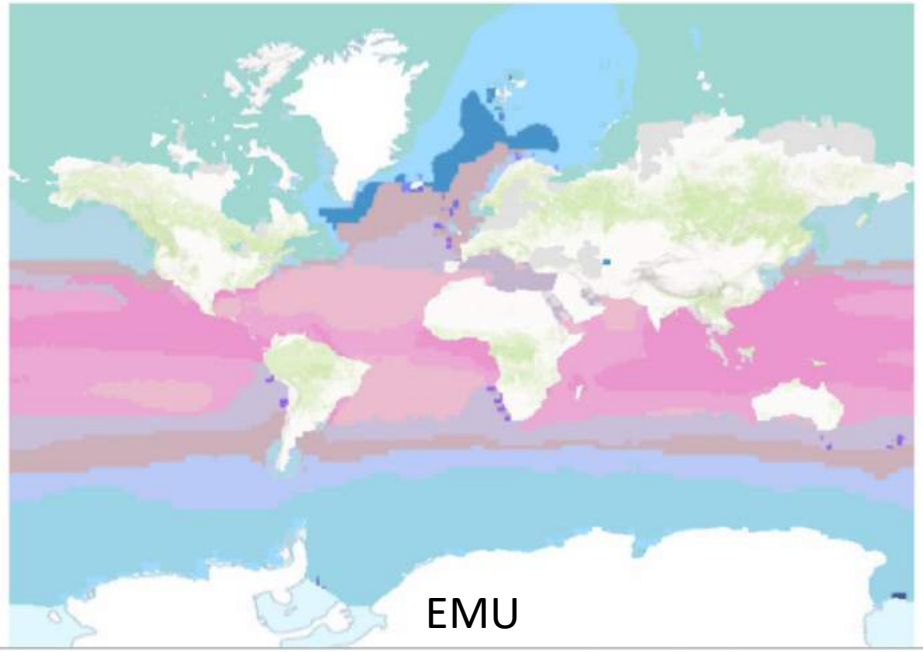
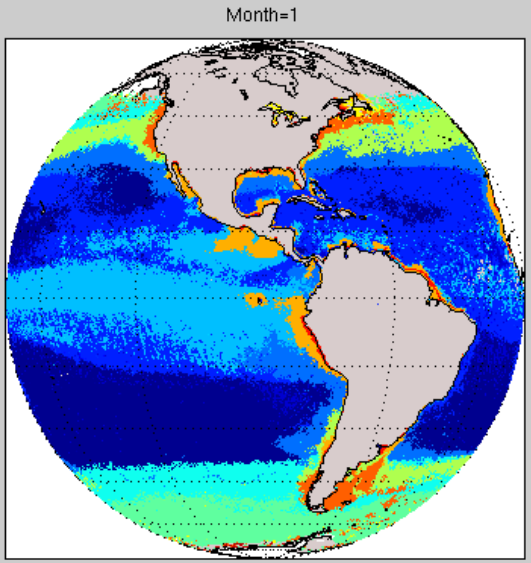
GEO Activity: Collaboration with USGS and ESRI
Ecological Marine Units (EMU) and Seascape comparisons



EMU



Seascapes

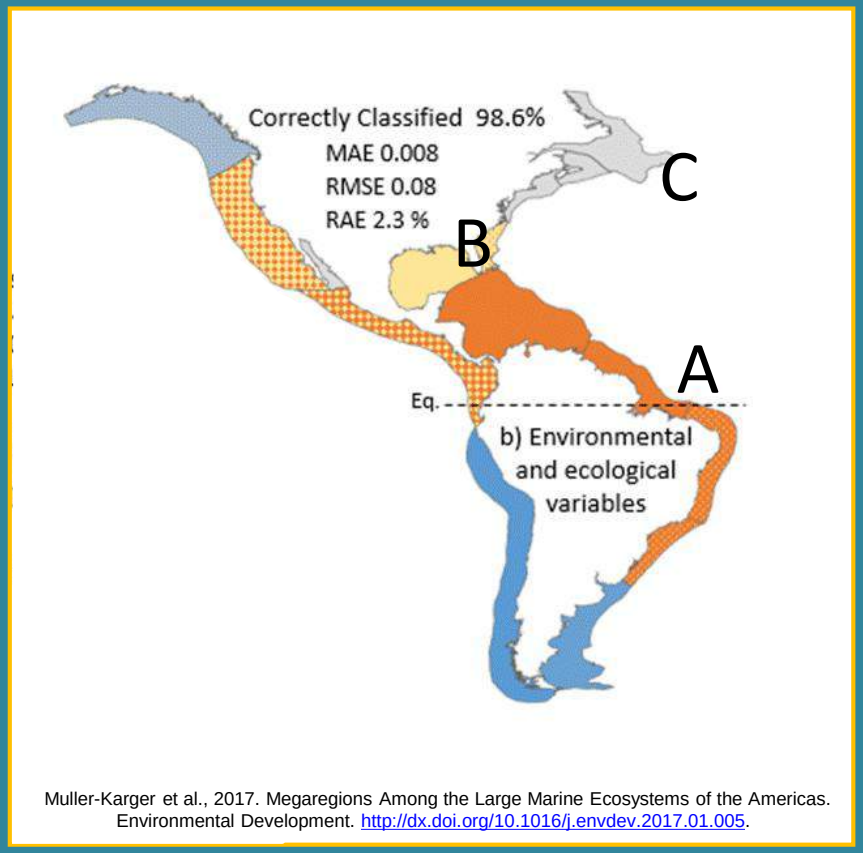
1) Surface EMUs classified from interpolated NOAA WOA data
2) Seascape classified from satellite derived SST, chl-a, NFLH, PAR

Example: diversity of fisheries and satellite seascapes (SST, CHL, productivity) in Large Marine Ecosystems (LME)

Results:

Three megaregions (A, B, C)

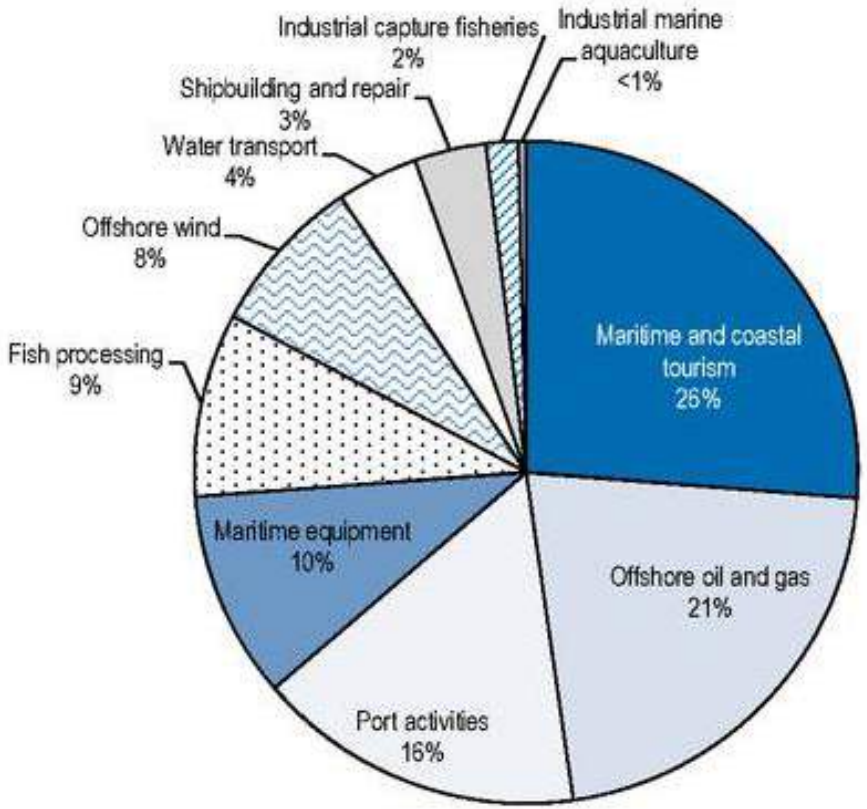
Between 1982 and 2010, *seven LMEs diversified their fisheries*



Muller-Karger et al., 2017. Megaregions Among the Large Marine Ecosystems of the Americas. Environmental Development. http://dx.doi.org/10.1016/j.envdev.2017.01.005.

OECD 2016
The Ocean Economy in 2030
DOI:10.1787/9789264251724-en

Figure 1.6. **Value added of the ocean economy in 2030 in the business-as-usual scenario**

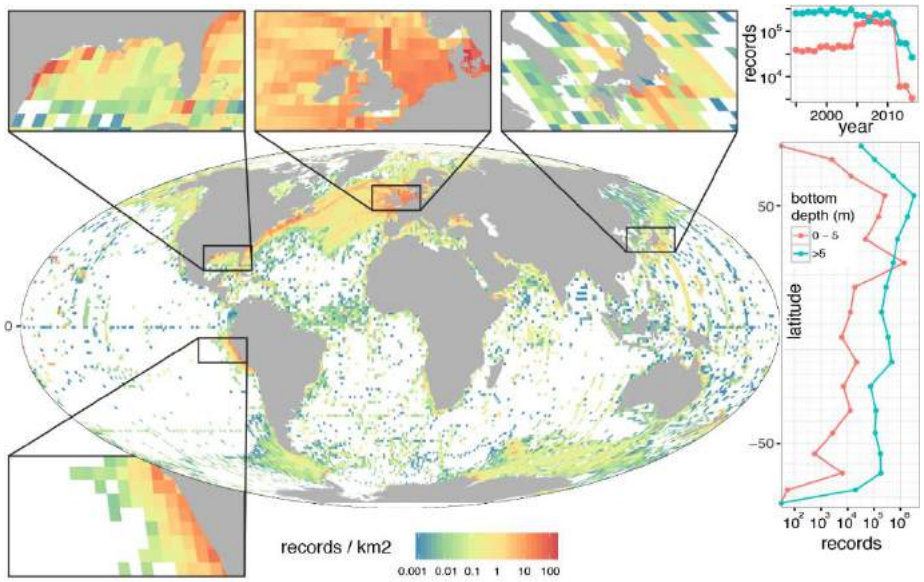


Ocean Economy value:
>US $3 trillion in 2030

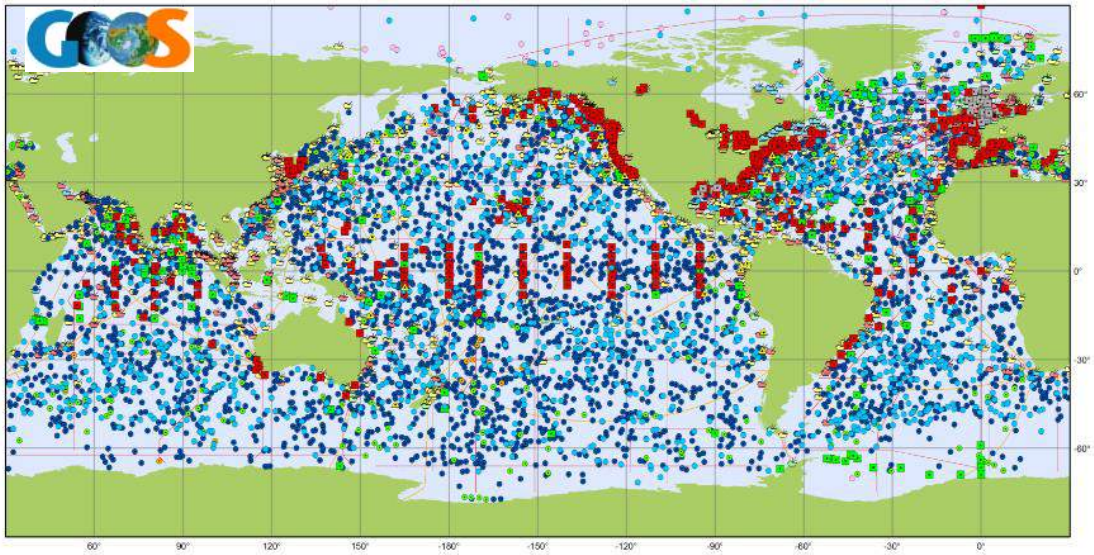
StatLink http://dx.doi.org/10.1787/888933334632

Note: Artisanal fisheries are not included in this overview.

Source: Authors' calculations based on OECD STAN, UNIDO INDSTAT, UNSD; Lloyd's Register (2014; 2013); World Bank (2013); IEA (2014).



Present to Future



MBON

Marine Biodiversity Observation Network

<u>GOAL</u>:

Increase observations of marine life building on GOOS, OBIS, and other networks:

- MarineGEO/Tennenbaum
- UNEP WCMC
- Americas (AmeriGEOSS)
- EuBON
- AsiaPacific
- Coral/GCRMN
- Africa
- CAFF (Arctic)
- National programs
- etc.

Essential Biodiversity Variables (EBV)

Biodiversity:

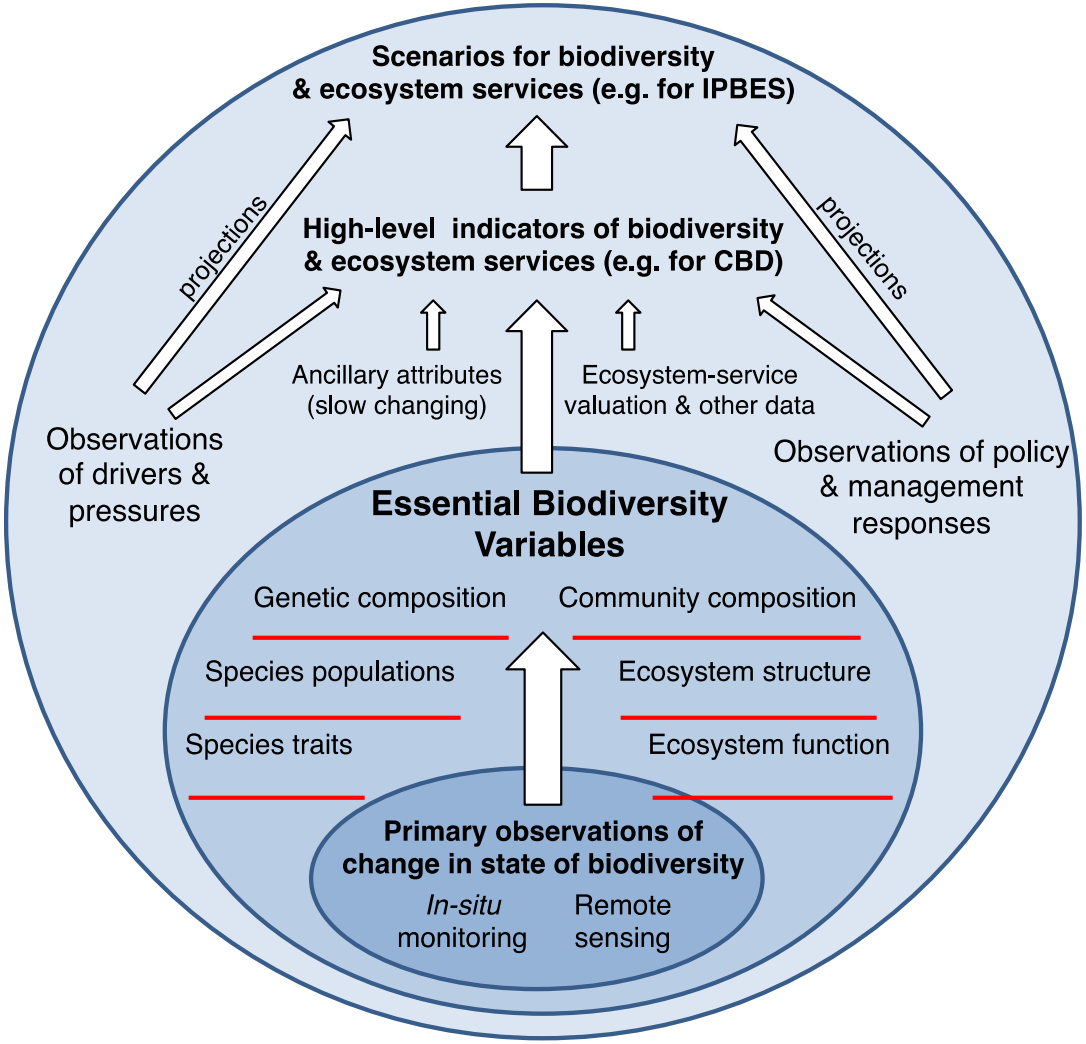
the variety of life and habitats

-number of species,

-abundance, biomass, distribution

-interactions

-variability of habitat



Pereira, H. M., et al. 2013. Essential Biodiversity Variables. Science. Vol. 339. 277-278.

Global Ocean Observing System (GOOS) Essential Ocean Variables (EOVs)

PHYSICS	BIOGEOCHEMISTRY	BIOLOGY AND ECOSYSTEMS
Sea state	Oxygen	Phytoplankton biomass and diversity
Ocean surface stress	Nutrients	Zooplankton biomass and diversity
Sea ice	Inorganic carbon	Fish abundance and distribution
Sea surface height	Transient tracers	Marine turtles, birds, mammals abundance and distribution
Sea surface temperature	Particulate matter	Hard coral cover and composition
Subsurface temperature	Nitrous oxide	Seagrass cover
Surface currents	Stable carbon isotopes	Macroalgal canopy cover
Subsurface currents	Dissolved organic carbon	Mangrove cover
Sea surface salinity	Ocean colour *(Spec Sheet under development)*	Microbe biomass and diversity (*emerging)
Subsurface salinity		Benthic invertebrate abundance and distribution (*emerging)
Ocean surface heat flux		