The Global Ocean Observing System
www.goosocean.org

The Global Ocean Observing System for Marine Life

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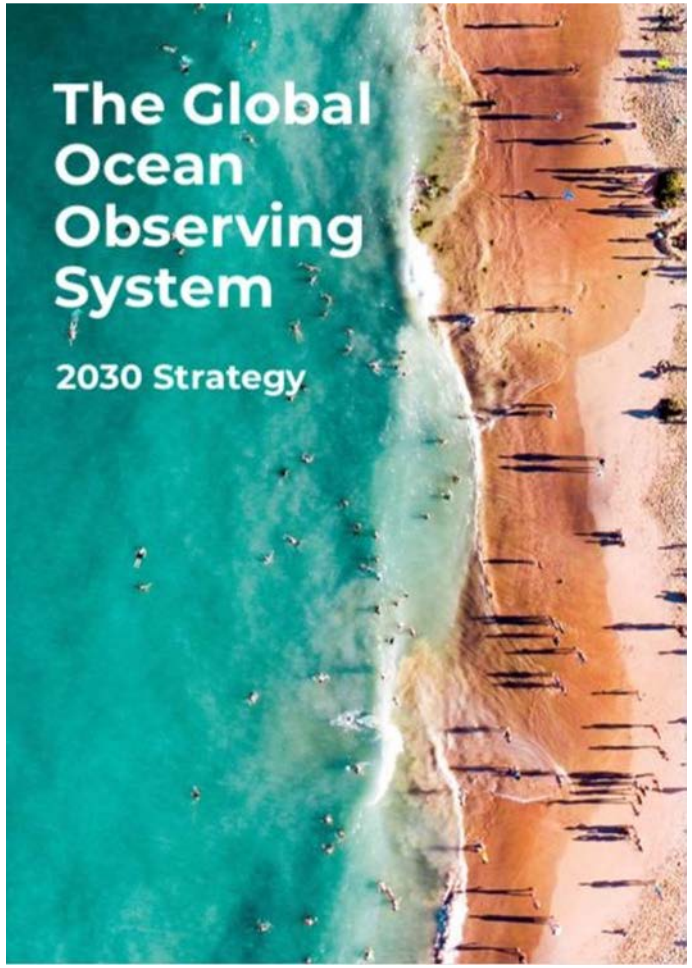
Biology and the Global Ocean Observing System

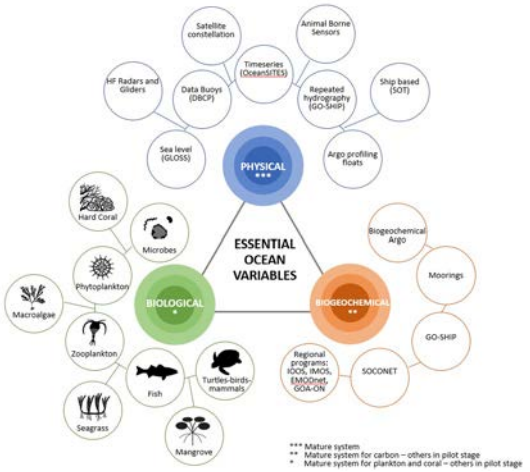
VISION: Develop a truly global ocean observing system that delivers the essential information needed for sustainable development, safety, wellbeing and prosperity.

Recognizes need to integrate biology and ecosystem observations across observation systems for delivery into:

- ocean forecasting
- ocean predictions
- ocean assessments
- global agreements
- whole of system management



What to observe



Specification sheets

Key variables

Secondary variables

Phenomena

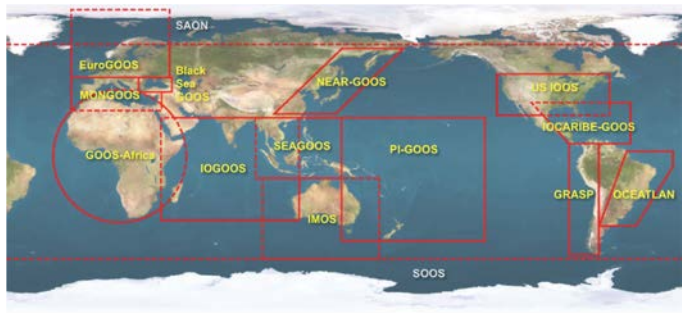
How to observe

Ocean best practices

Connecting/ sharing observations

OBIS
OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM

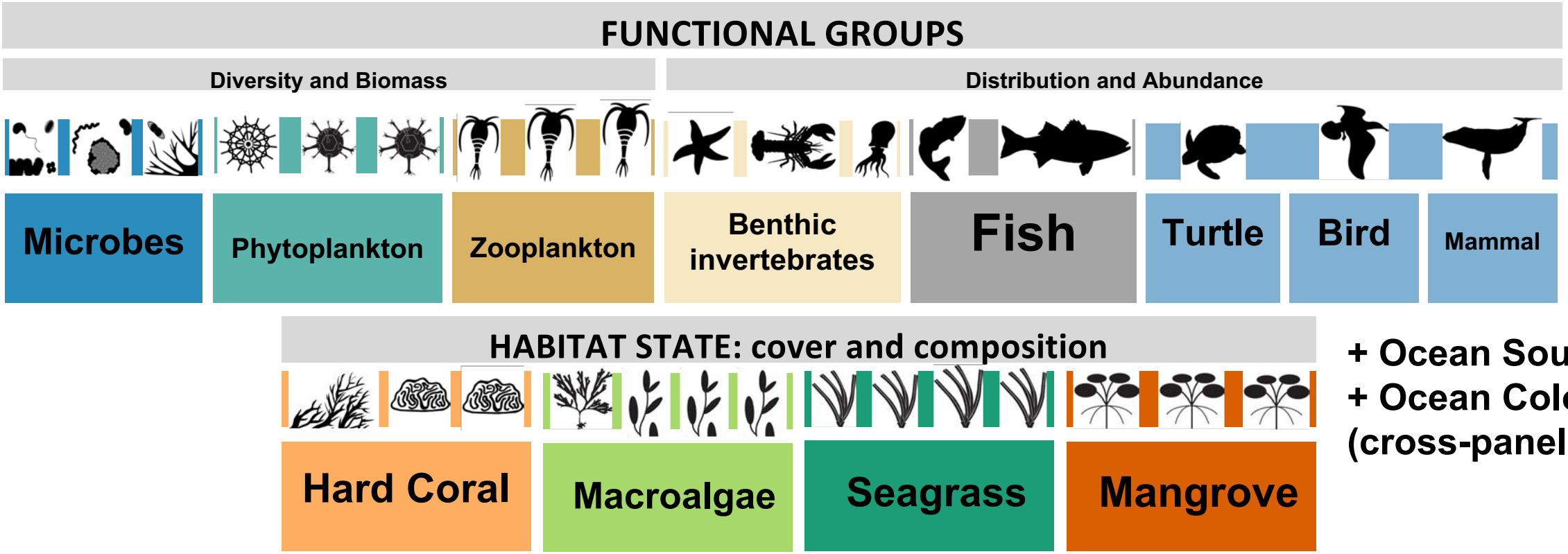
Regional alliance of observation systems



Ocean data/ information products

Biology and Ecosystem Essential Ocean Variables (EOVs)

Focus: defining and supporting data collection, development of ocean practices, building connected networks, increasing availability



Work of the Panel: PEGASuS

Key findings

Identified 203 active, long-term (≥5 years old), programs that systematically sampled ≥1 of the BioEco EOVs.

- 7% of the ocean surface had an active monitoring program
  - Programs sampling seagrass, mangroves, hard corals and macroalgae existed in 6% of the global coastal zone
- 53% contributed data into a repository, aggregator, or other data serving tool
- 66% had publicly accessible data; 34% restricted data access
- 95% used SOPs, yet only 10% shared SOPs
- 67% conducted capacity development/tech transfer

Sattherthwaite et al. (2021) Frontiers in Marine Science 8:737416

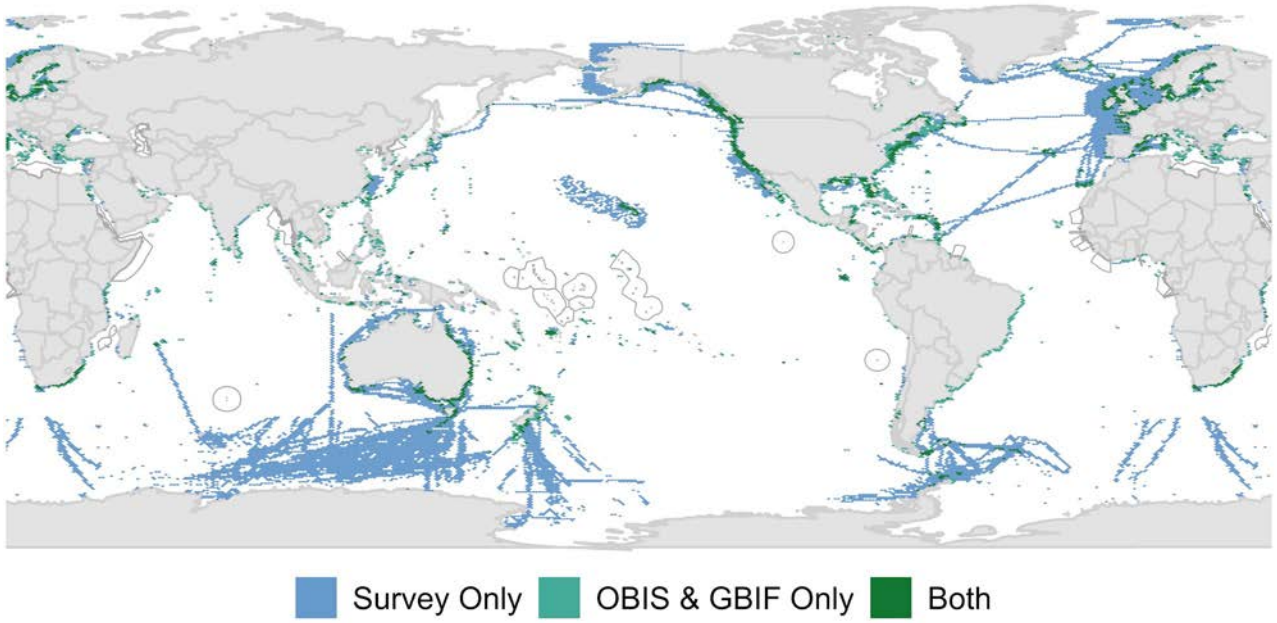


Figure 1: Spatial coverage of known active, long-term biological observations globally

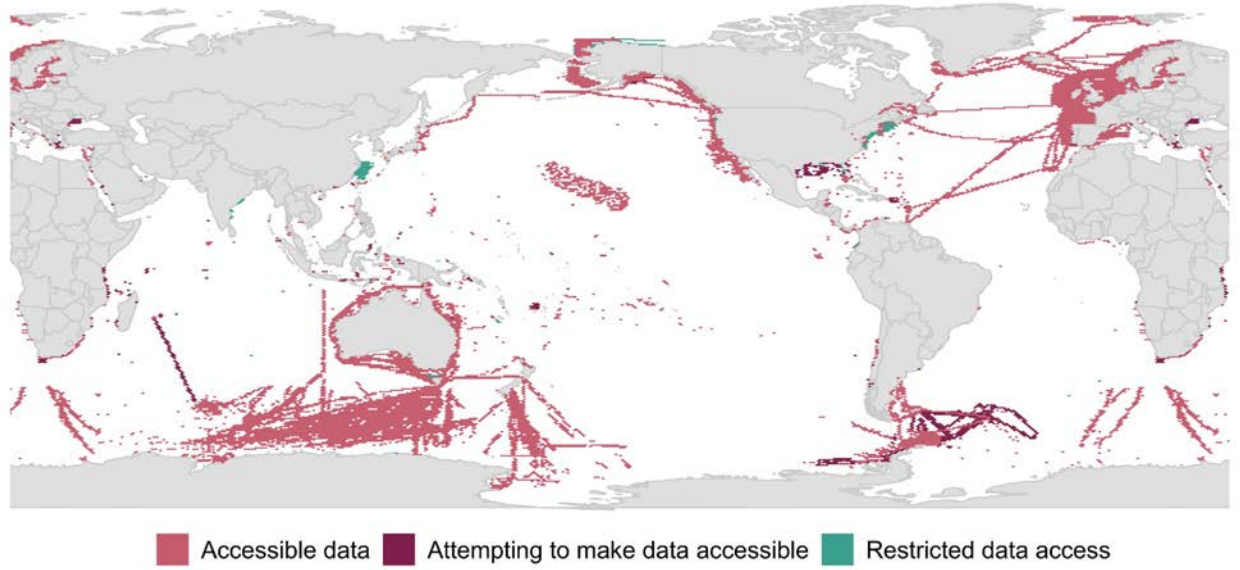
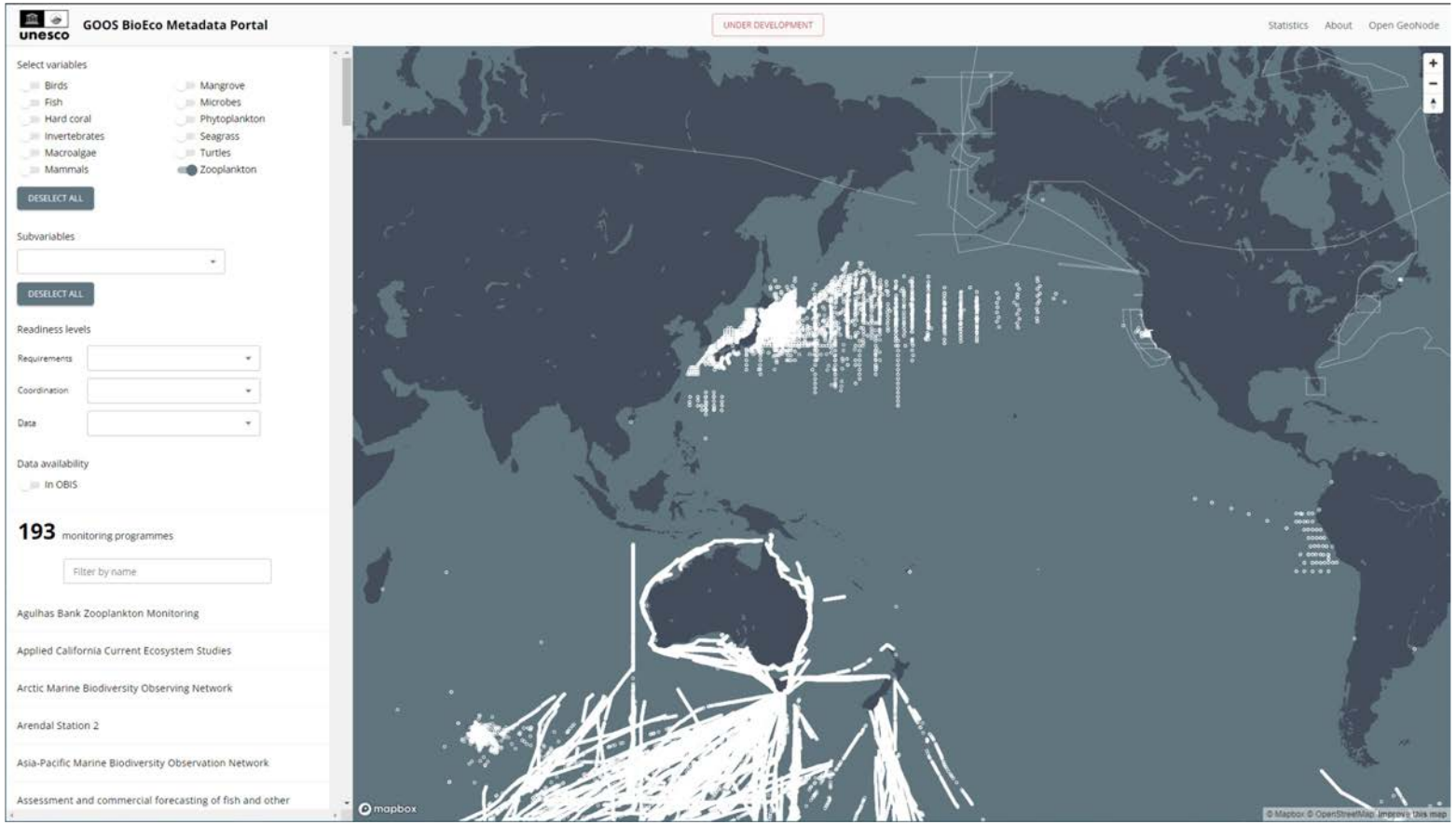


Figure 2: Accessibility of data for the various programs identified

GOOS BioEco Portal: https://bioeco.goosocean.org/

- Provides open access metadata and information on global ocean observations and monitoring programs involving biological and ecosystem EOVs
- Aims to provide insight into the current and historical state and trends of ocean observation
- Currently holds metadata of **579** globally distributed active monitoring programs
- Integration of EOV sub-variables and EBVs is in development
- Data/ metadata is extractable for story-telling purposes regarding the state of global ocean observation



The key 'biodiversity' questions for science and society

What **changes** are occurring?

What are the **impacts** of these changes?

Is **recovery** from these changes possible?

SUSTAINABLE DEVELOPMENT GOALS

14 LIFE BELOW WATER

HIGH LEVEL PANEL for A SUSTAINABLE OCEAN ECONOMY

GLOBAL BIODIVERSITY FRAMEWORK

UNFCCC

OCEANS & LAW OF THE SEA UNITED NATIONS

Biology and Ecosystems Panel

OBIS OCEAN BIODIVERSITY INFORMATION SYSTEM

MBON Marine Biodiversity Observation Network

OBON OCEAN BIOMOLECULAR OBSERVING NETWORK

Ocean Observing Co-design · GOOS Integration · CoastPredict · Observing Together

Marine Life 2030

CHALLENGES

Safe ▪ Sustainable & Productive ▪ Transparent & Accessible ▪ Clean ▪ Healthy & Resilient ▪ Predicted

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

OCEAN

Programmes/projects involving BioEco Panel members and the IPO

Pegasus/ Future Earth

Designing the observi
system for the world's
ocean – from microbe
whales

frontiers in Marine Science

Establishing the Foundation for the Global Observing System for Marine Life

Regional Coordination

- **Needs and requirements – observations, data, infrastructure, interoperability**
- **Capabilities, gaps and needs**
- **Impact and delivery – scientific, societal, policy**

GOOS Regional Alliance

G7 FSOI

EU Horizon projects:
Eurosea, MarcoBolo
BioEcoOcean

SCOR

Ocean Decade

rammes
030

150
Ocean Practices for the Decade

Ocean Predict
DITTO

?

Strategic Alliances

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 selected to mature
- Link with platforms and observing systems of GOOS and GRAs

OBSERVATIONS

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

DATA & PRODUCTS

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

PRODUCTS, INDICATORS, ASSESSMENTS

http://iobis.org/2015/12/15/goosgeobonobis/

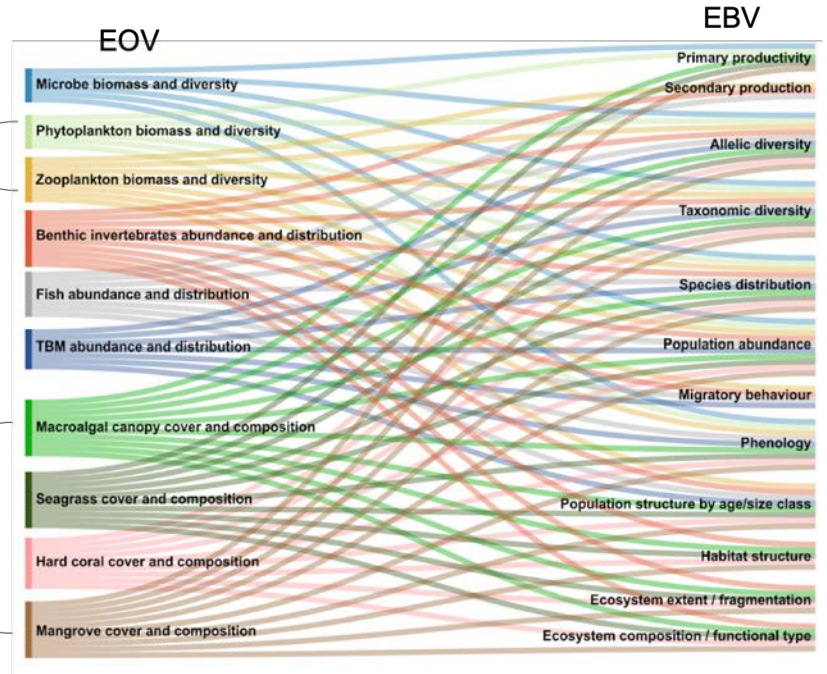
2021 2030 United Nations Decade of Ocean Science for Sustainable Development

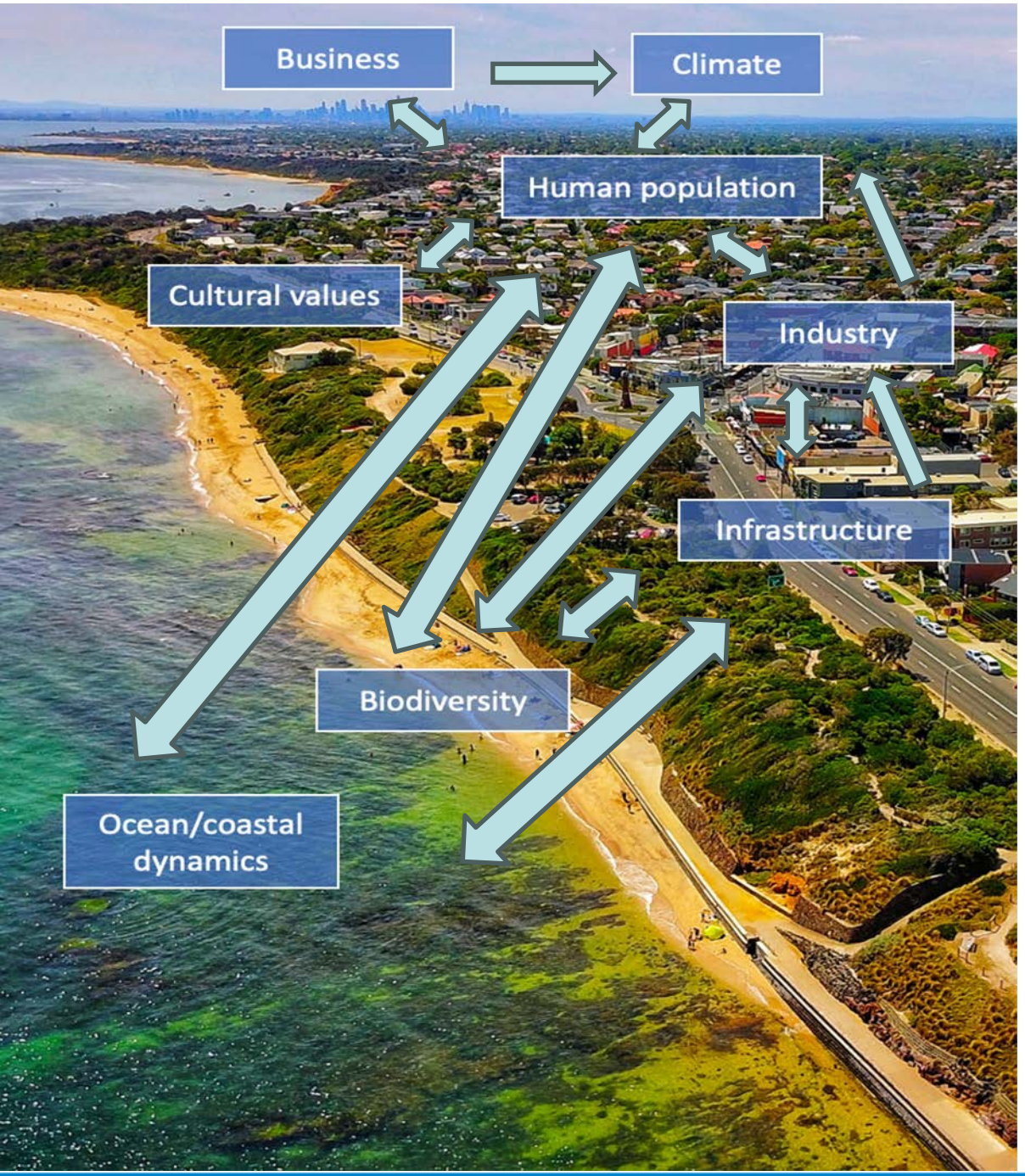
ACCELERATE transfer of marine technology, training and education

Connecting/ sharing observations

OBIS OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM

GBIF Global Biodiversity Information Facility





If we are to achieve useful predictions of the ocean we need to think about the whole of the system

What can we do together?

OceanPredict strategic objectives

Building the ocean prediction capacity of the future

- **moving beyond statistical correlations with physical variables to end to end integrated modelling**
- **developing integrated forecasting products**

Strengthening engagement with the international ocean science community

- **moving from “uptake” to “integrate”: co-design and co-development of modelling and forecasting products with observing systems to include marine life**

Co-design and co-develop ocean prediction and ocean observing systems

- **working with national agencies to move towards observation systems that fully support whole of system integrated modelling of the ocean**

Increasing Ocean prediction societal impact

- **expanding the concept of multidisciplinarity to include biology (beyond ocean colour)**

What can we do together?

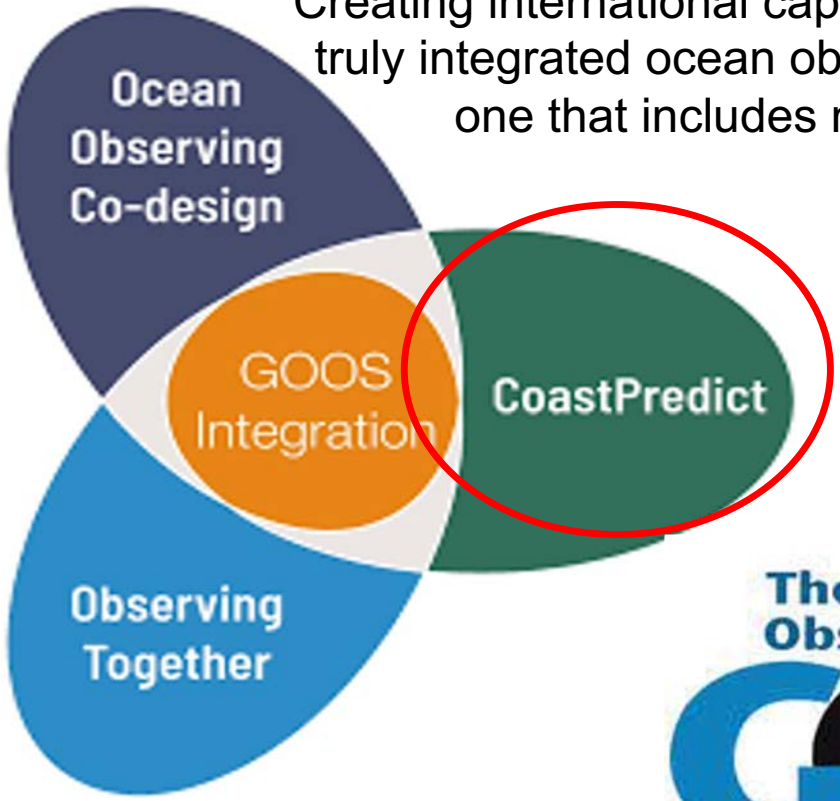
OceanPredict and the UN Decade of Ocean Science for Sustainable Development

Interoperability and accessibility of data and data products

Leveraging deployments to expand biological observations

Expansion of forecasting products to include biology

Creating international capacity to develop a truly integrated ocean observing system - one that includes marine life

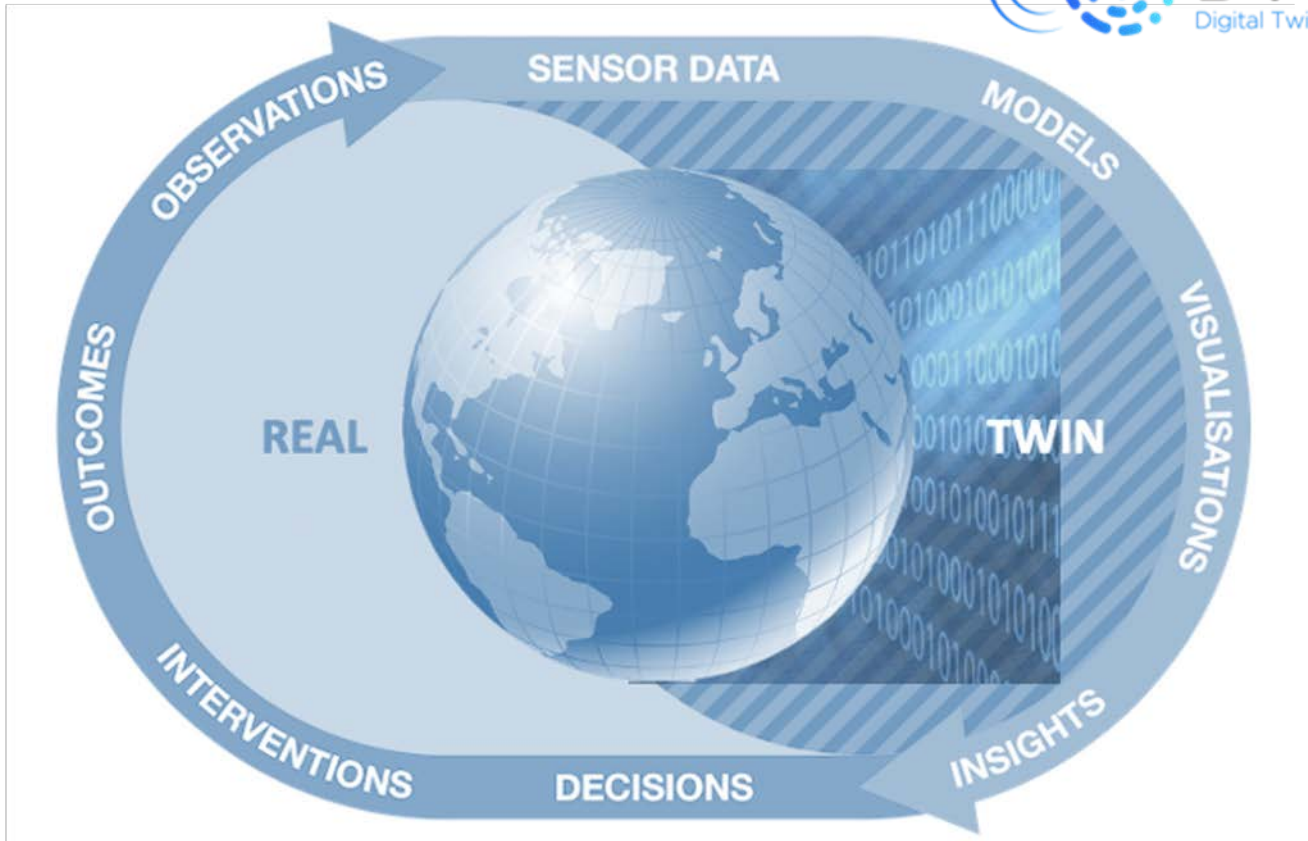


Connecting ocean observers with the communities they serve to improve accessibility to observations

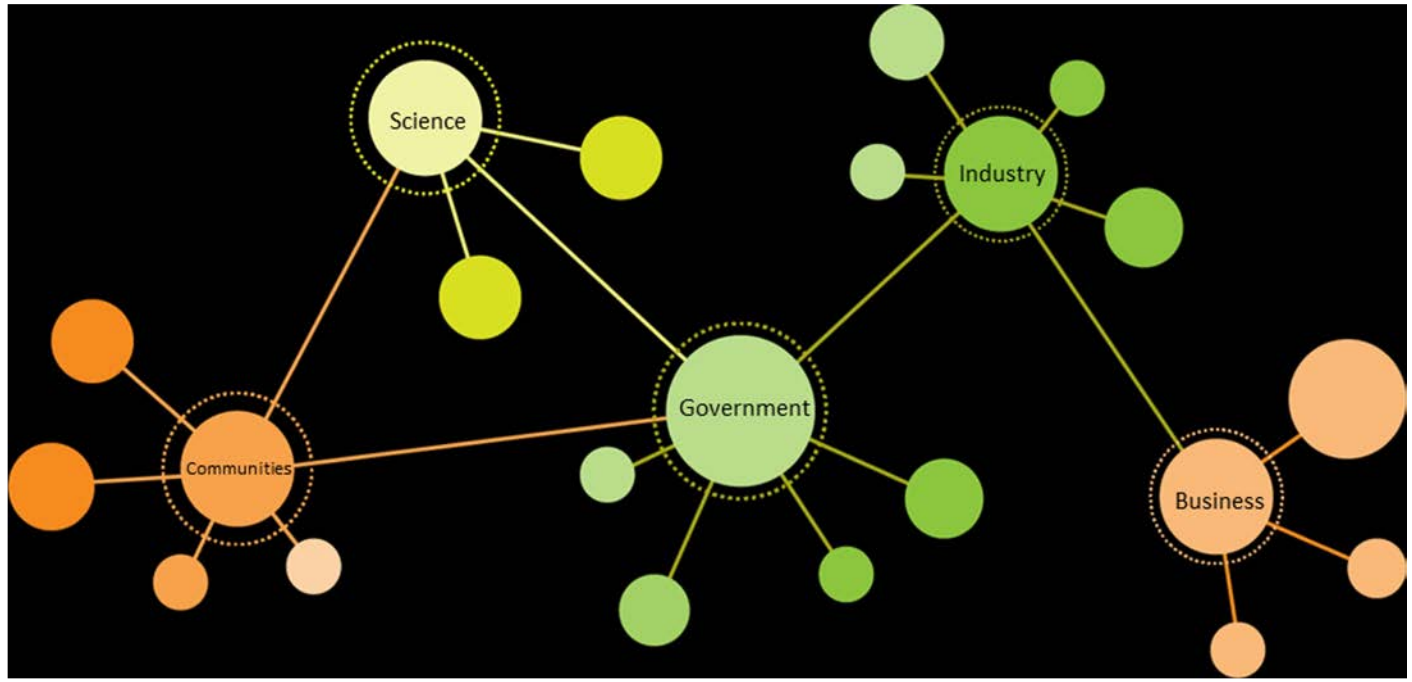
What can we do together?

OceanPredict and the UN Decade of Ocean Science for Sustainable Development

DITTO
Digital Twins of the Ocean



Thankyou!



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Biology and Ecosystems Panel

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