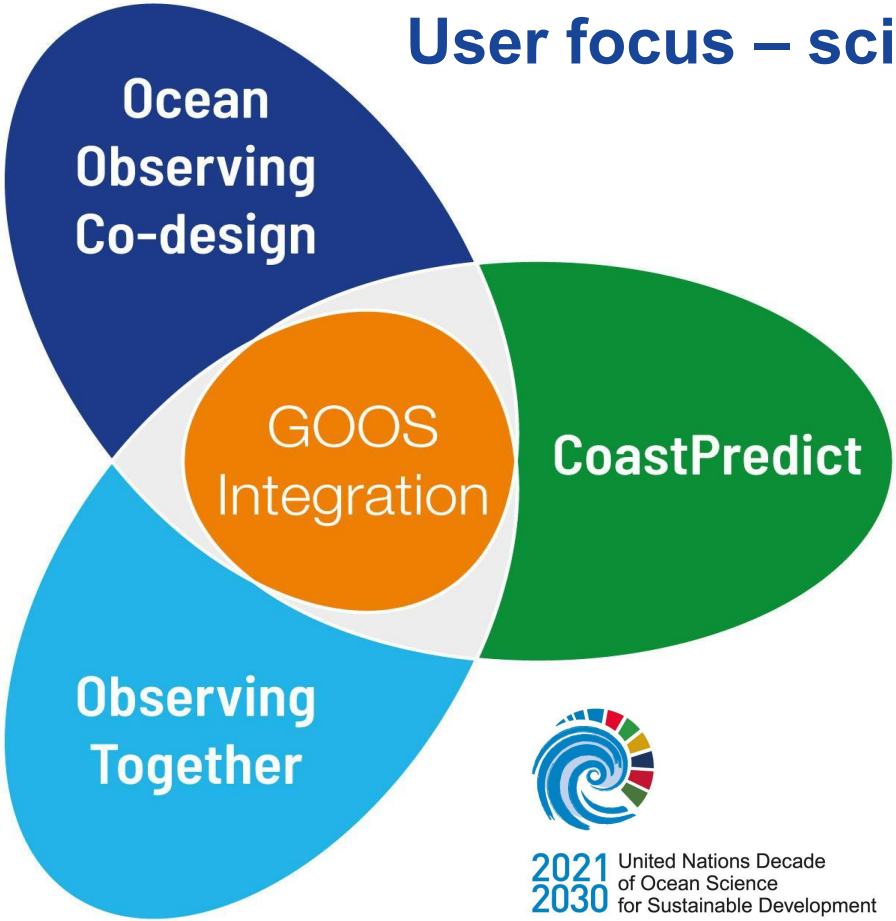
The Global Ocean Observing System

Session 6b: System implementation and applications

Ann-Christine Zinkann, Emma Heslop, Cristina Mino, Nadia Pinardi, Mairead O'Donovan

14th GOOS Steering Committee meeting (SC-14) | 19-21 February 2025 | Paris, France

User focus – science to operational services



- Revolutionise **global coastal ocean observing and forecasting**, supporting coastal communities for risk and adaptation
- Transform our ocean observing system so that it is **co-designed with users and responds to their needs**

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

Teams

Ocean Observing Co-Design

by The Global Ocean Observing System

David Legler, Co-chair | NOAA
Bernadette Sloyan, Co-chair | CSIRO
Emma Heslop, GOOS IOC/UNESCO
Ann-Christine Zinkann, ECOP Connection, Boundary Current co-chair | NOAA
Andrea McCurdy | Satellite connections, COL / NASA
Jun She | Modelling connections, Danish Meteorological Institute
Cristina Miño, Exemplars support Officer | UNESCO

Global team from 19 countries, 28 institutions, global organisational connections *— community of practice for co-design*

CoastPredict

with The Global Ocean Observing System

Nadia Pinardi, Chair | University of Bologna
Villy Kourafalou, Co-chair | University of Miami
Joaquín Tintoré, Co-chair | SOCIB-IMEDEA(CSIC-UIB)
Emma Heslop, Board | GOOS IOC/UNESCO
Giovanni Coppini, GlobalCoast Co-chair | CMCC
Aletta Yñiguez, GlobalCoast Co-chair | University of the Philippines
Mairéad O'Donovan, CoastPredict Secretariat | CMCC
Areeba Moiz, CoastPredict Secretariat | CMCC

326 institutions engaged globally*, new network for coastal implementation-GlobalCoast*

Ocean Observing Co-Design

Co-design - a continuous process, a collaborative and iterative effort involving users, observing system implementers, data managers, modelling/assessment, and service providers to enhance the existing ocean observing systems

High level objectives

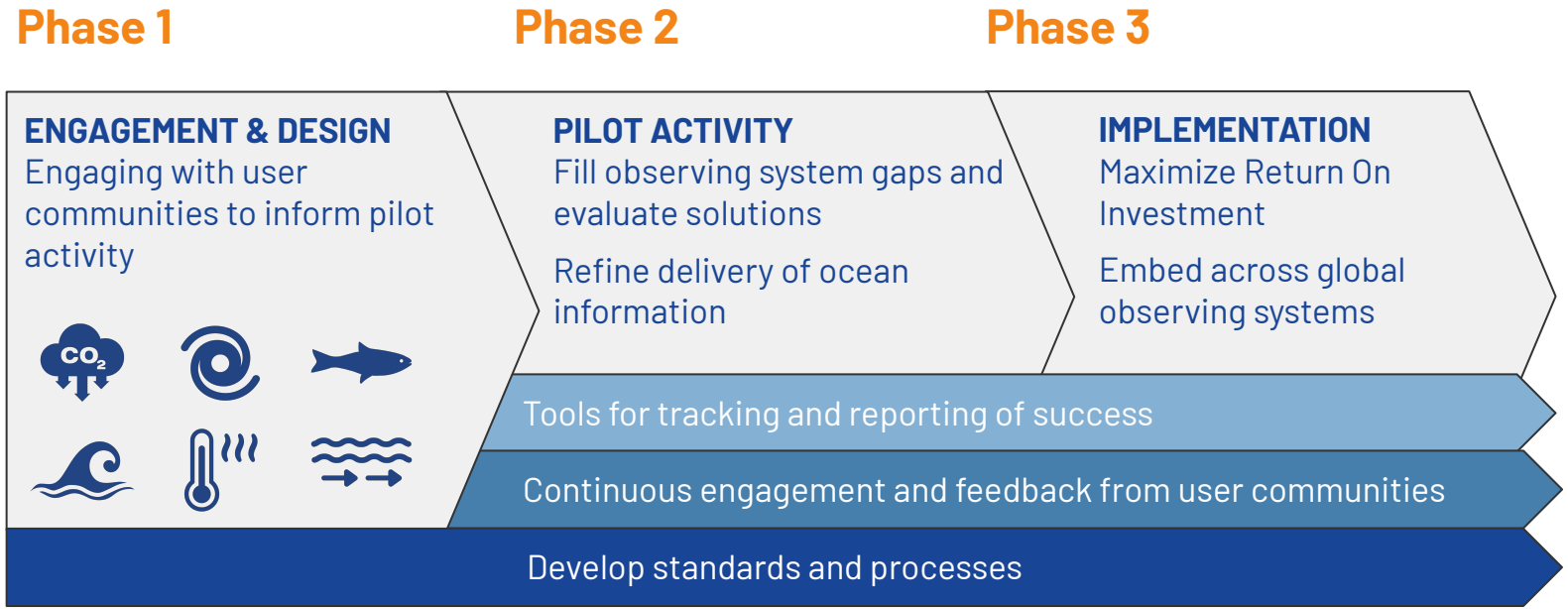
1. Integrate observing and modelling to support a sustainable ocean and society in ways that are measurably better

2. Make ocean observing and information appreciably more impactful through transformative co-design with the modelling community and key user stakeholders

3. Establish the international capacity and modular infrastructure to co-design and regularly evaluate the observing system

4. Entrain new observing and information technology across all elements of the Programme.

Programme Implementation Phases



Exemplar Explainer Document

Co-Design Process - what we have learnt

- Programme is **enhancing existing systems** - not replacing
- The **phases and co-design concepts are working**, enabling new focused collaborations, positive response through engagement with users/stakeholders - some Exemplars entering phase 2: pilot implementation and OSE/OSSE
- **Exemplars maturing at different speeds** - factors include is services exist and community complexity
- Alignment of funding/projects + some new + DCC support
- Interplay between co-design processes and RRR
- Stakeholder engagement highly desirable - but still not being funded
- Exemplars found Co-Design Programme under GOOS enabled:
    - **Credibility and recognition**
    - **Connections - WMO, GOOS, experts, organisations**
    - **Bridge science and societal impact**
    - **Engage with non-intergovernmental institutions and potential funders**
    - **~~Balance coordination / implementation (i.e. aligning high-level planning with on-ground needs)~~**

Recent advances Programme

- Submission of the **AccelNet proposal** to build international co-design capacity.
- **Expansion of the team** with a new Co-Chair, an Expert in modelling and a Support Officer
- Collaborating with **GOOS Panels** (BGC, OOPC) focusing on the user needs.
- Securing support from the **DCC OCC**.
- Launching a mentorship initiative with the Decade **Strategic Communications Group**.

Exemplars

Strengthened collaboration with WMO and regional forecasting centers to integrate ocean data into forecasting systems.

Hosting of the Agulhas current Workshop, to design observing systems and engage regional users.

Integrated into the GOOS Carbon Plan and established partnerships for a Horizon Europe funding proposal.

Leadership transition and revitalizing its Steering Committee

Plans for pilots and new technology

Next steps: Co-Design, 2025

- **Governance:** Establish clear structure, reporting protocols, and advisory group to increase advocacy.
- **Exemplar Implementation:** Planning to identify opportunities for support and specific funding gaps, stakeholder engagement, and sharing of best practices.
- **Visibility & Communication:** Website update, outreach with GOOS & WMO and beyond (industry, etc).
- **Funding:** Identify opportunities (industry, climate adaptation, philanthropy) & submit proposals.
- **Community Development:** Organize a Co-Design meeting & document best practices.

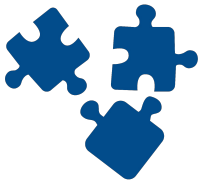
CoastPredict

CoastPredict Programme aims to develop solutions for coastal resilience

Technically, it will provide decision-makers and coastal managers with ***integrated observing and predicting systems for managing risk in the short-term and planning for risk mitigation and adaptation in the longer-term*** *context of climate change.*

Drivers & opportunities

Fragmentation of knowledge & efforts



Establish international network for Global Coastal Ocean innovation and solutions

Large data gaps: coastal zone & Global South

Equitable access, resources & knowledge sharing, shared services development

Technology gaps

Coastal & urban models for the future
Accessible observing technologies
Delivery of services & big data

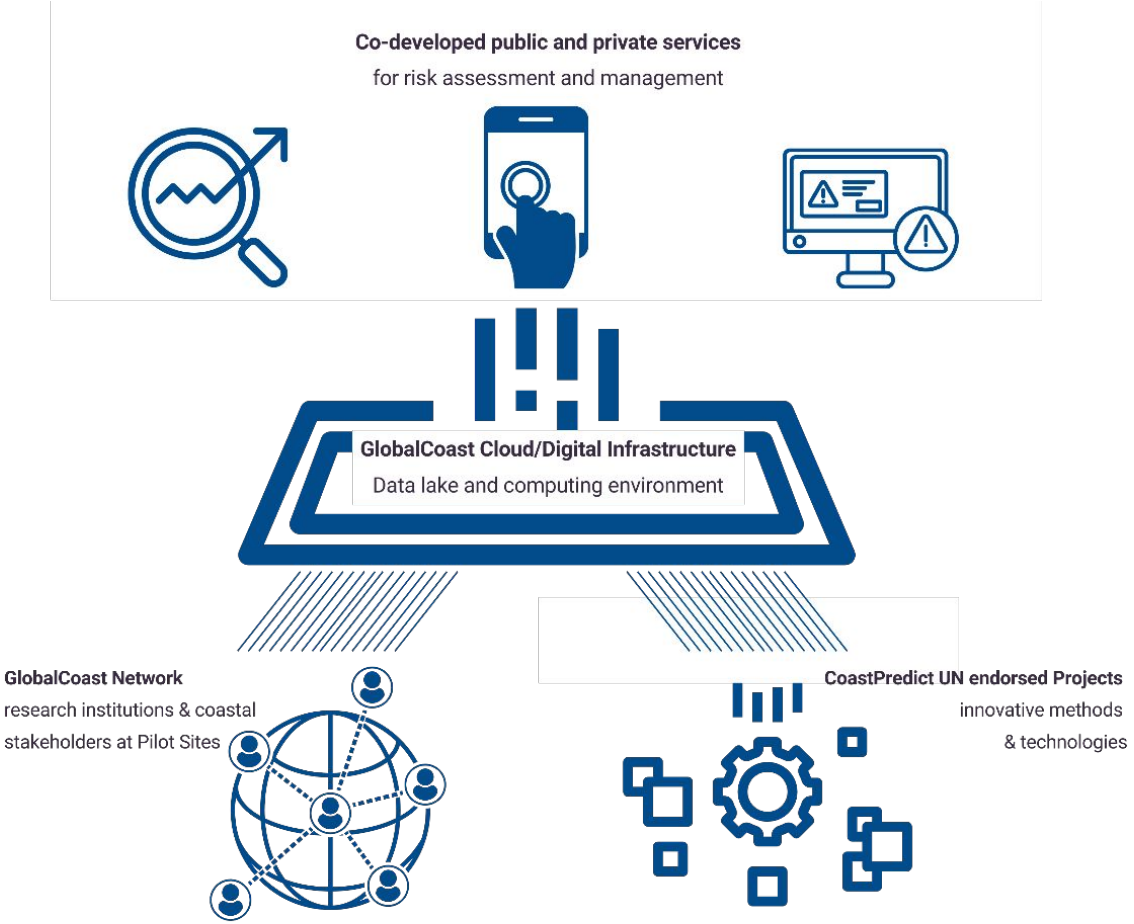
Services don't exist & trust in solutions is low

Involve coastal managers & communities
Demonstrate services
Public & private

GlobalCoast Framework

Create globally replicable solutions, standards, and applications that enhance coastal resilience for both natural and built environments

- harness opportunities
- overcome barriers
- connect the work globally
- enable public-private collaboration
- replicable solutions
- engage cloud technology to support services

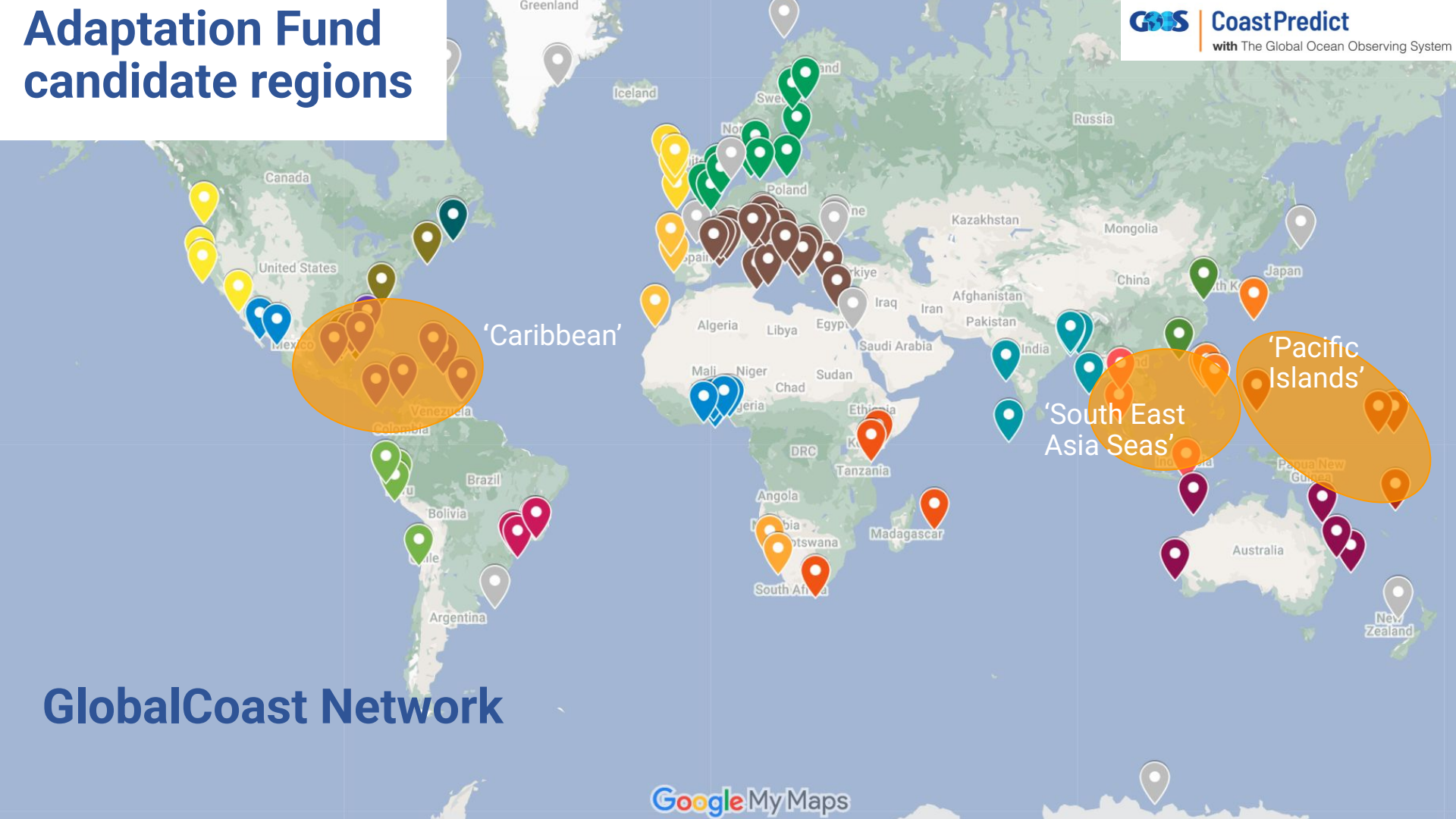


CoastPredict
with The Global Ocean Observing System

GlobalCoast Network

130 Pilot Sites
66 countries

Adaptation Fund candidate regions



GlobalCoast Network

Recent advances: CoastPredict

GlobalCoast Network:

- MoU: 26 signatories to date (as of 13 February 2025)
- First Network Assembly Lecce, Italy 5-6 February 2025 -> election of GlobalCoast Network co-chairs Giovanni Coppini, CMCC & Aletta Yñiguez, University of the Philippines, & approval of CMCC as host of secretariat
- Network and MoU establish principles of collaboration among Pilot Sites globally incl. exchange of information & requirements
- May serve as a coastal collaborative component for GOOS

Fundraising:

- Regional project proposals are being developed for Adaptation Fund
- Other funding opportunities anticipated e.g. upcoming HORIZON calls

GlobalCoast Cloud:

- Prototype in development with EGI Foundation (European Grid Infrastructure)

Evolution of governance structure

- Governance structure updated (accepted by an Extraordinary Assembly, 4.11.2024) to include & formalise GlobalCoast Network

Public-private partnership

- Flagship accelerator project with Fugro in discussion - a first in GOOS context - will demonstrate services and GlobalCoast public-private services delivery using advanced model output, new & existing open data sources

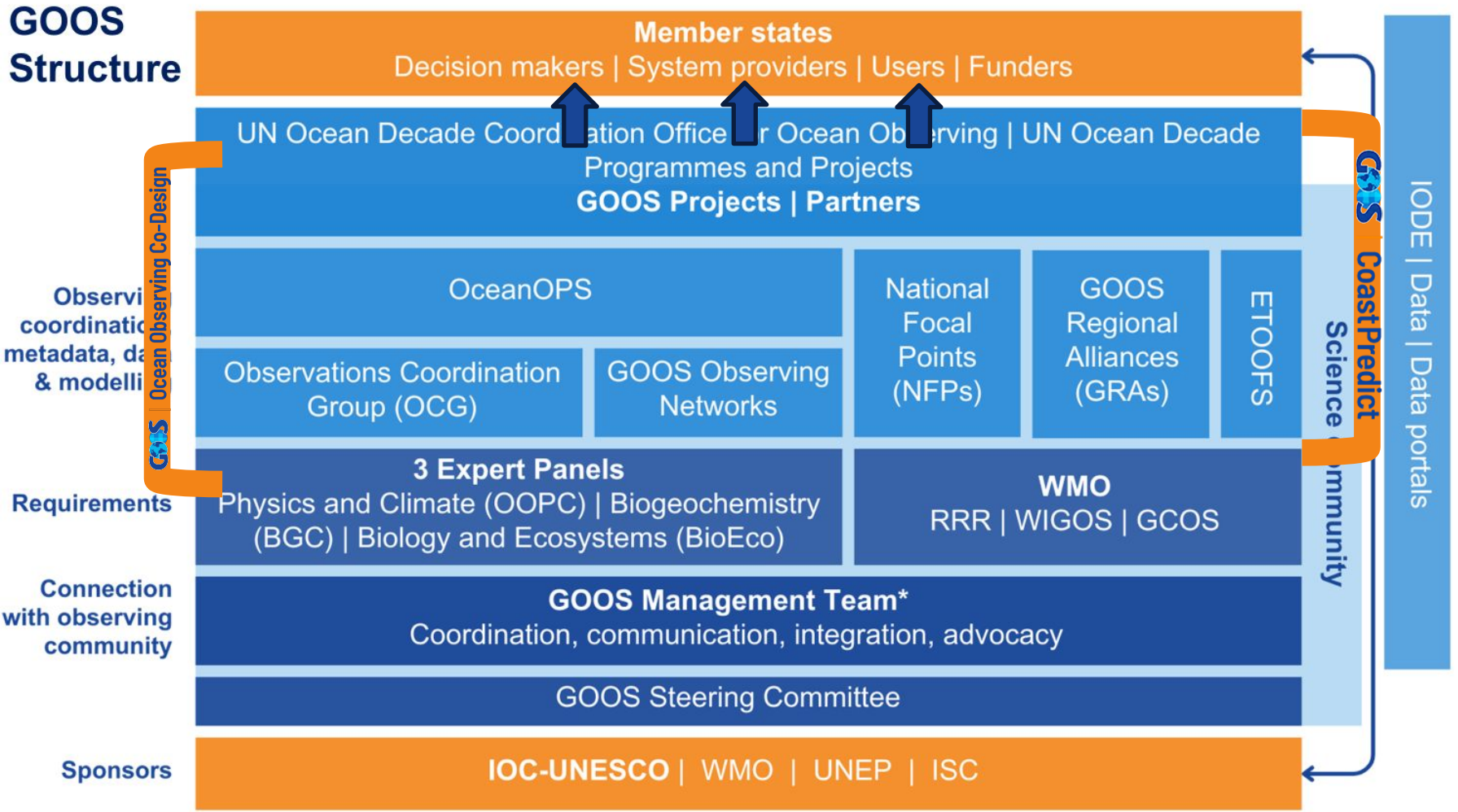
Next steps: CoastPredict, 2025

- Establishment of two GlobalCoast Working Groups:
  - **WG 1- MetOcean WG to support GlobalCoast collaboration with MetOffices**
  - **WG 2 - Best practices for user engagement**
- **Preparation and delivery of 3 proposals to Adaptation Fund** -UNESCO-IOC as Multilateral Implementing Entity, IOC Sub-commissions and SPC as executing entities
- First COMPASS Training Course in the Philippines (Coastal Observing and Modeling for Prediction and Assessment to Support resilient Systems) under the DCC-CR
- **Regional Cloud Infrastructure prototype** demonstration with EGI Foundation
- **Start of Flagship accelerator project demonstration with Fugro** private partnership (2025)
- Reopening of GlobalCoast survey to expand network of Pilot Sites (Sept. 2025)
- Preparation of CoastPredict ECOP Project for UN Ocean Decade endorsement

Next steps: CoastPredict, 2026- 2027

- Implementation at GlobalCoast Pilot Sites as part of regional projects
- Proposal of further regional projects for funding
- Flagship accelerator project demonstration with Fugro private partnership
- CoastPredict and GlobalCoast Network Assemblies (annually)

GOOS Structure



* GOOS Management Team HQ based at IOC secretariat, Paris

Existing issues

GOOS | Ocean Observing Co-Design
GOOS | CoastPredict

- Clarify pathways for interaction between parts of GOOS and the Programmes
- Learning from best practices, process development, ideasonmissing structure
- NSF Funding - approval is now delayed and this is risk for planned Co-Design Workshop - cross connection with modelling, best practices, co-design community building - other sources / combined sourcers?
- Decade not really been forthcoming in support

Considerations for the SC

Ocean Observing Co-Design
CoastPredict

- **Recommend connection with GRAs and NFPs in pilot areas**, integration of effort - this is happening, but a little ad hoc. **Connection to GRAs** to be developed maintaining considerations of the Global Coastal Ocean aspects
- **Communication** on progress important

- **Set up to transform GOOS** - developed now over 2.5 years - new processes, structures, practices - **how are we going to take advantage of this?**
- Suggest that SC takes time to later in 2025 (online session), include/interview for GOOS 2.0. Ask Programmes:
  - **to report on progress against objectives**
  - **Ask 3-5 key questions: what learnt? What means for GOOS? Suggestions for the future to transform GOOS? What want the programmes to leaves a legacy?**

The Global Ocean Observing System

Thank you

goosocean.org

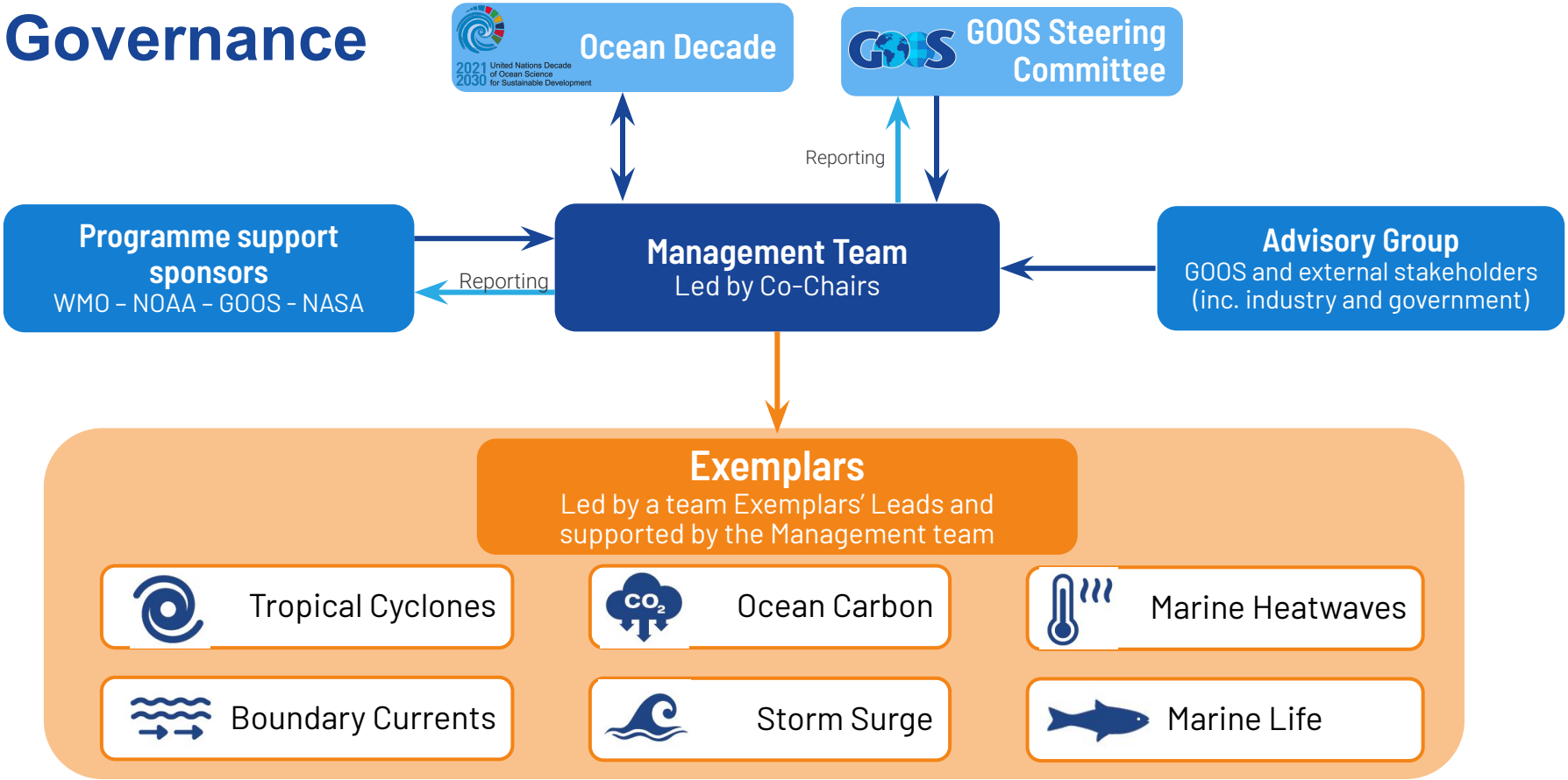
unesco
Intergovernmental Oceanographic Commission

WORLD METEOROLOGICAL ORGANIZATION

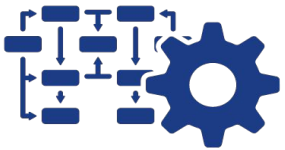
UN environment programme

International Science Council

Governance


Ocean Decade
2021 2030 United Nations Decade of Ocean Science for Sustainable Development
GOOS Steering Committee
Reporting
Programme support sponsors
WMO – NOAA – GOOS - NASA
Reporting
Management Team
Led by Co-Chairs
Advisory Group
GOOS and external stakeholders (inc. industry and government)
Exemplars
Led by a team Exemplars' Leads and supported by the Management team
Tropical Cyclones
Ocean Carbon
Marine Heatwaves
Boundary Currents
Storm Surge
Marine Life

OUTCOMES



Link along **value chain and users**

Observing **design** for user need area

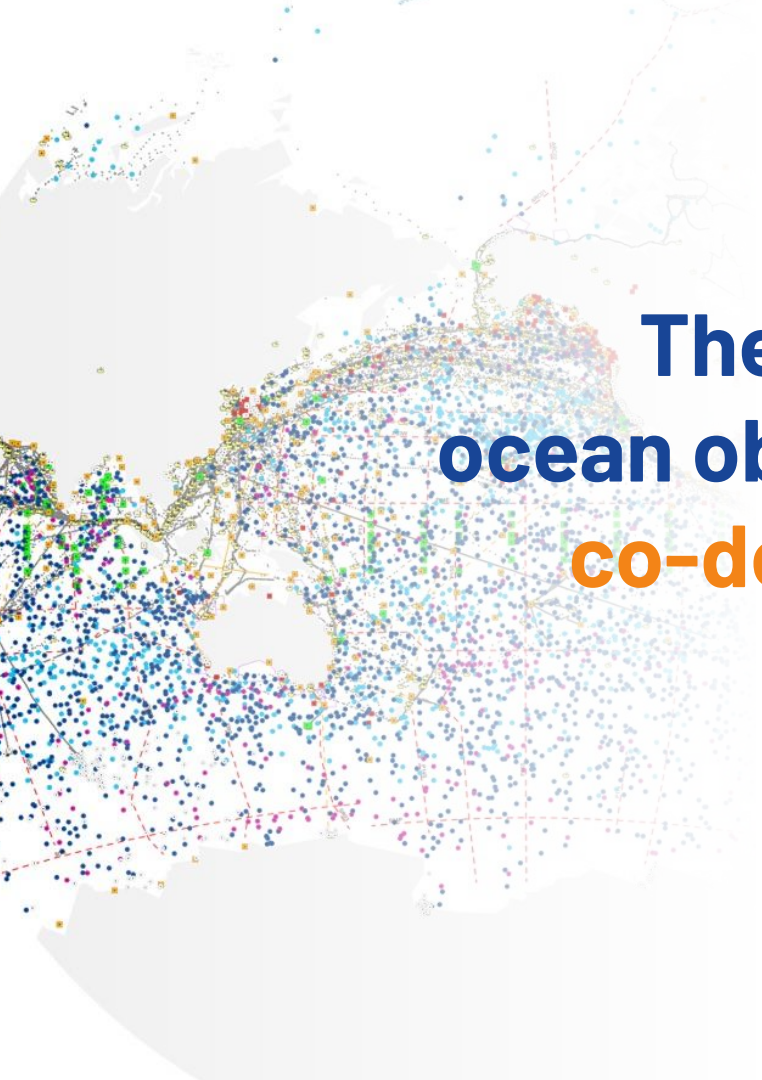
Economic value assessment

Blueprint for services if they don't exist

Tracking of implementation against need

Ocean Observing Co-Design

by The Global Ocean Observing System



The Programme will evolve the ocean observing system so that it is co-designed with end-users and responds to their needs

326 engaged institutions (Steering Committee & Pilot Sites) including

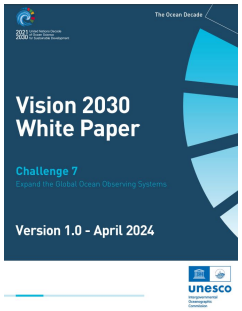
ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

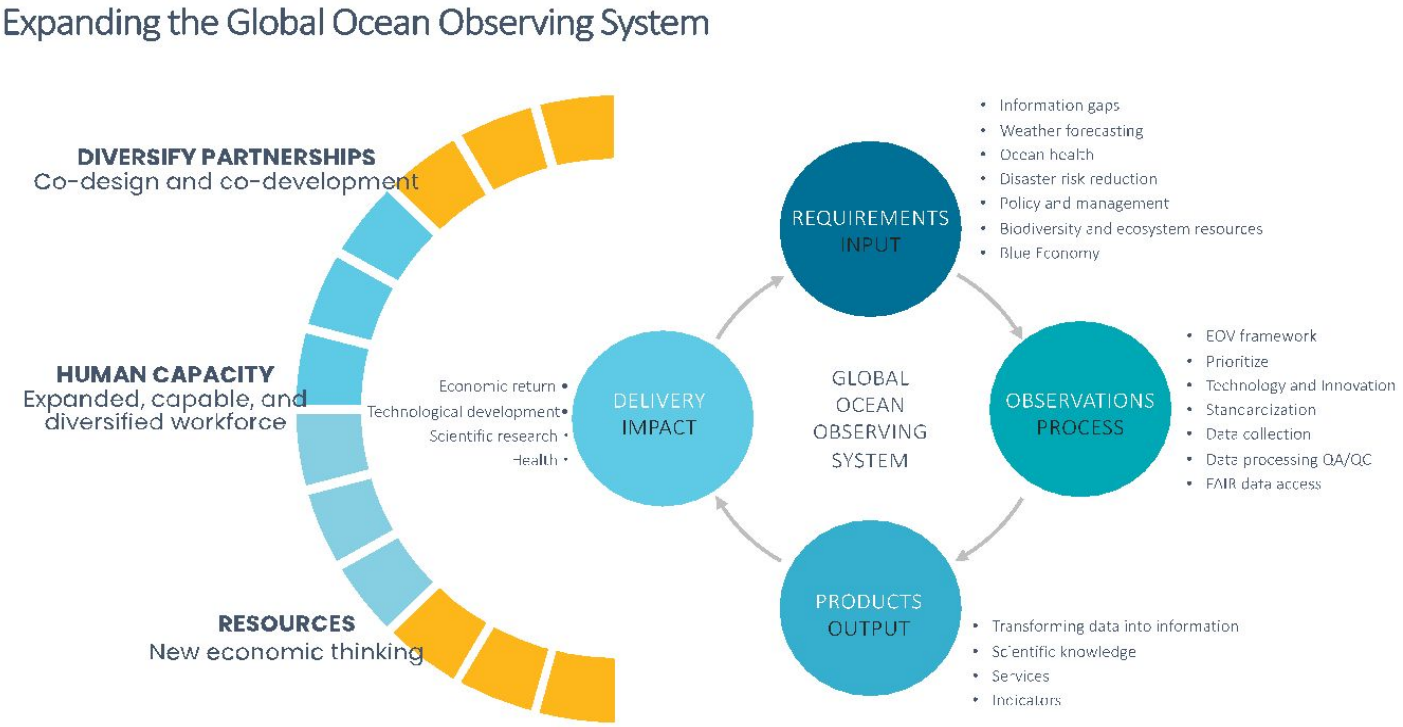
MIAMI

Vision 2030 White Paper

Ocean Decade Coordination Office

Ocean Observing





https://oceanexpert.org/document/33599