Global Ocean Observing System

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GOOS Updates

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1. GOOS Reform & GRAs

Accenture Development Partnerships

Global Ocean Observing System

Mission, scope, structure

accenture

16 December 2025

This reform provides a framework for the future evolution of the Global Ocean Observing System (GOOS)

Why did we embark on this reform process?

- Member States have **binding commitments** under **international frameworks and conventions** (UNFCCC, CBD, BBNJ, etc.) requiring data and information for decision making dependent on a globally integrated ocean observing system
- Fulfilling these commitments requires more than infrastructure and data sharing – it requires **active involvement** in setting **priorities**, **governance**, and **investment** strategies
- Global Ocean Observing System (GOOS) is designed to help Member States meet these obligations through **active coordination of the global system of ocean observations**, but currently **faces challenges** like fragmented governance, unclear roles, weak national integration, and administrative burdens that limit its effectiveness
- Recognizing these challenges, IOC Member States have invited the IOC Executive Secretary in IOC Decision EC-57/4.1 and IOC Decision A-32/4.8.1 to **evolve GOOS governance and structure**, in consultation with the GOOS Steering Committee, representatives from Member States, and GOOS sponsors

What are the intended outcomes of GOOS reform?

- **Streamlined governance and reporting structure** with clarity on roles and responsibilities and enhanced accountability mechanisms
- **Elevated Member States' influence** in driving ocean observations agenda, ensuring priorities for ocean observations reflect both **suppliers** and **end-users needs**
- **Strengthened national coordination** by empowering National Focal Points (NFPs) and fostering inter-agency collaboration within countries
- **Improved efficiency and interoperability** in network coordination and data management
- **Fit-for-purpose structure** with capabilities that facilitate long-term resource mobilization

An updated and forward-focused mission statement outlines the essential role in delivering coordinated action and strategic outcomes for GOOS

Support stakeholders with implementation of effective observation systems

Support continuous improvement of ocean observing system to meet changing scientific, economic, ecological, environmental, and technological needs

Facilitate worldwide coordination and data sharing for a unified, comprehensive ocean monitoring, forecasting, and service value chain

Be receptive to the GOOS components, sponsors, Member States, suppliers, users, and the broader ocean observing enterprise

Build a robust and adaptable system that can withstand disruptions and deliver long-term, reliable data

To **enable** and **evolve** a **globally integrated**, **responsive**, and **resilient** ocean observing system for **thriving communities** and a **healthy ocean**

Ensure essential ocean data are ultimately transformed into actionable insights to support resilient societies and protect ecosystems – turning science into real-world impact while advancing the ocean economy, weather, and climate communities

Refined mission statement based on the GOOS reform project

GRA is one of the two outstanding decisions which are yet to be addressed

GOOS Regional Alliances (GRAs)

Key challenge	**GRAs are intended to bridge regional coordination and implementation, but their current structure lacks clarity and coherence** • There is significant variation in the structure and function of GRAs, leading to uneven levels of effectiveness • Interviews revealed confusion and uncertainty about their role and value, including language barriers that hinders collaboration
Options to investigate	• Consider the role and level of integration of GRAs with GOOS (see next slide) • Consider how to sharpen the unique contributions and role vis a vis GOOS in contrast to national system • Consider identifying potential maturity levels for GRAs

Key question: What is the future role, structure, function, governance of GRAs?

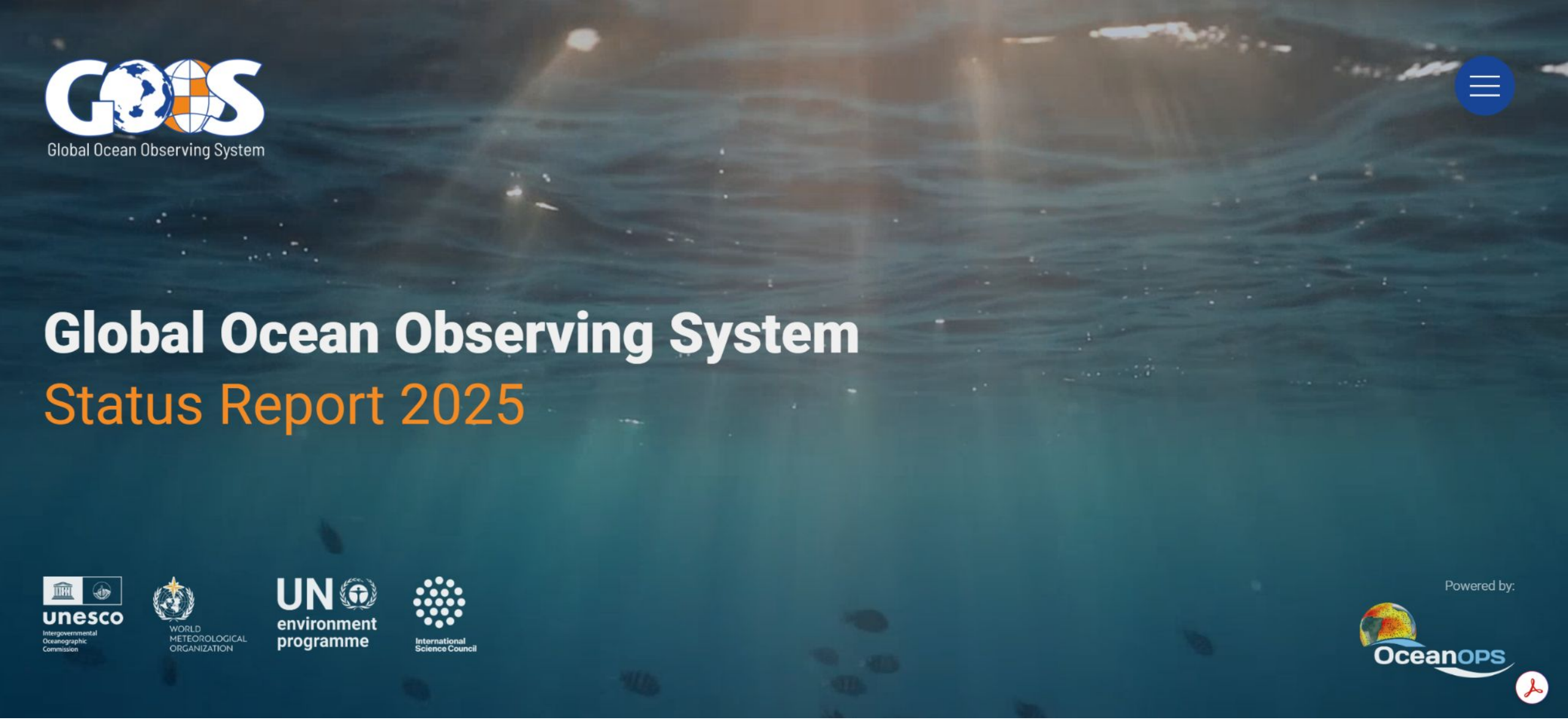
GRA role will be further investigated and discussed during the GRA Forum XII and GOOS SC-15 in March 2026

Degree of integration with GOOS

	Differentiate GRAs in GOOS structure	GRAs as self-governed, independent entities
Overview	• Renewed mandate and responsibilities to strengthen regional coordination of ocean observation • New and clearer process of engagement • Formalized accountability and reporting (e.g., OKRs) • Continued support from GOOS Secretariat • GRAs encouraged to be basin-aligned	• GRAs no longer a separate component of GOOS with no formalized mandate; with flexibility to set their own priorities • Regional autonomy in self-governance and decision-making • Voluntary alignment with GOOS principles rather than formal obligations • No direct support received from GOOS Secretariat
Governance	• GRA Council and GOOS Regional Forum	• Joint meeting between GRAs and NFPs for regional coordination
Pros	✔ Avoids disruption as builds on existing regional infrastructure and relationships ✔ Possibility to enhance regional coordination if mandates are clearly set and implemented ✔ Greater clarity and structure could improve performance and accountability	✔ Provides full autonomy and flexibility for GRAs to set regional priorities ✔ Encourages open dialogue and idea-sharing without formal obligations ✔ Streamlines GOOS structure ✔ Reduces dependency on GOOS Secretariat resources
Cons	✘ Demands change management to implement cohesively across GRAs ✘ Limits GRA flexibility and autonomy ✘ Requires ongoing GOOS Secretariat resources and capacity	✘ Weaker alignment with global GOOS objectives, with a risk of inconsistent standards and practices across GRAs ✘ GRAs may feel demotivated due to reduced formal authority, potentially limiting regional impact

Note: Other options considered included reconfiguring GRAs to basin-aligned, repositioning them under IOC sub-commissions with a stronger role for regional experts in the GOOS Steering Committee, or removing GRAs entirely (more detailes in Appendix slide 54,55)

2. GOOS Updates



GOOS Status Report 2025: https://www.ocean-ops.org/goosreport/#home

Achievement in 2024 -2025

- **Steady expansion of *in situ* observation** primarily driven by an increase in autonomous networks, offsetting the declines in other networks…
- Four emerging networks: SOCONET, SMART Cable, FVON, and SUN Fleet
- The Argo array has now surpassed 4,000 active floats, benefiting from technological innovation and improved instrument reliability, reached 55% of its OneArgo implementation target global
- Voluntary Observing Ships (VOS) achieved a record 4,5 million observations in 2024, supported by an increase in automation — but the number of ships involved is decreasing! **10,000 Ships for the Ocean initiative** launched - leveraging new public-private partnership!
- Availability and quality of real-time data and metadata have increased
- GOOS is also advancing the **integration of biological and ecosystem observations** into the global system.

Regional and Systemic Challenges in 2024-2025

- Limited resilience to **financial or geopolitical disruptions.**
  - Depends heavily on a few major contributors
  - Lacks sufficient redundancy to ensure long-term stability
- The **Southern Ocean remains the most under-sampled region** due to its remoteness and harsh conditions.
- The subcritical nature of GOOS also extends to the **supply and production chain**, including instrument manufacturers and service providers.

> **Faced with the fragility of the observing system and the constraints of decreasing budgets, we must innovate through stronger partnerships. This is why we are deepening our collaboration with the shipping industry — to harness the potential of these new partners and expand the automation and scale of ship-based observations.**
>
> **Mathieu Belbéoch**
> OceanOPS Manager

In situ observing networks by the numbers

3 stories demonstrate value of ocean observations

Climate

Is the ocean current system that shapes Europe's climate slowing down?

Ocean Health

First-of-its-kind seal data to guide Southern Ocean management and conservation

Operational Services

Towards better El Niño forecasts for fisheries and disaster preparedness

GOOS Steering Committee

Focus 2025-2027

I.**Core Coordination and Collaboration**

II. **Observation system design and development**
- A. Expert Panels
- B. Carbon and GHG Plan
- C. Biodiversity Plan
- D. EOV-led Ocean Indicators
- E. RRR and Evolving GBON

III. **Strengthening data integration and delivery**
- A. Observations Coordination
- B. IOC Data Architecture

IV. **System implementation**
- A. At national and regional level
  - 1. National Focal Points → **Task Team on NFP Implementation Guidelines**
  - 2. GOOS Regional Alliances
- B. And applications
  - 1. ETOOFS → **Task Team on ETOOFS**
  - 2. Engagement on applications, including forecasting
  - 3. Early Warning for All → **Task Team on GOOS engagement with EW4ALL**

V. **Outreach and Partners**
- A. Projects → **Task Team on GOOS Projects**
- B. Partners
- C. Communications

VI. **Reform**

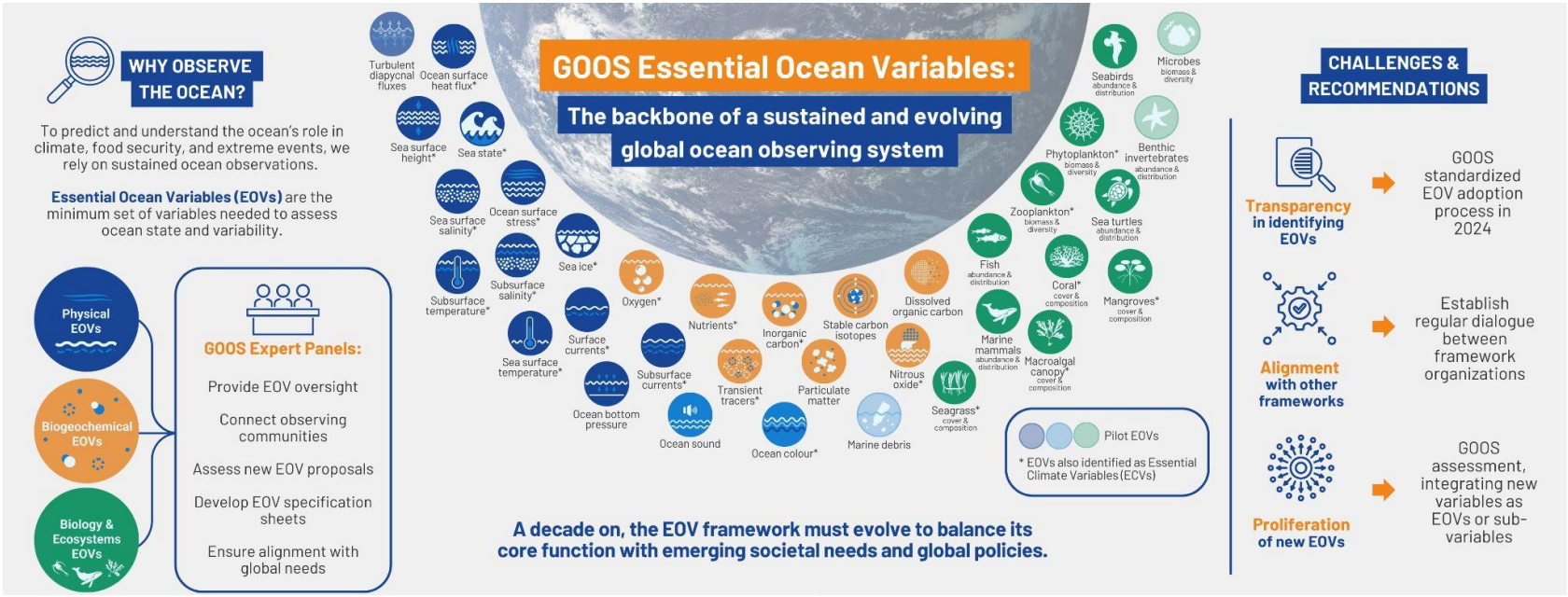
Evolve GOOS Governance

Activities are continuing as per the focus shown as well as 5 focused task teams

Essential Ocean Variables (EOVs)

- EOV Specification Sheets are being updated, with the support from 3 EU-funded projects:
  - BioGeoSea - Biogeochemistry EOVs (* Mini workshop with GRAs Today!)
  - ObsSea4Clim - Physics & Climate EOVs
  - BioEcoOcean - BioEco EOVs
- EOV paper published! - GOOS Essential Ocean Variables: the backbone of a sustained and evolving global ocean observing system, https://doi.org/10.3389/fmars.2026.1737002

- **It takes stock of more than 10 years of existence of the framework**
- **It consolidates the main concepts**
- **It establishes the governance**
- **It looks ahead**



GOOS Biodiversity Strategy & Implementation Plan

Goal:

To enable and evolve an integrated and fit-for-purpose framework for global ocean observing that meets national, regional and global needs for information on marine diversity, encompassing the diversity of marine life and the ecosystem it supports.

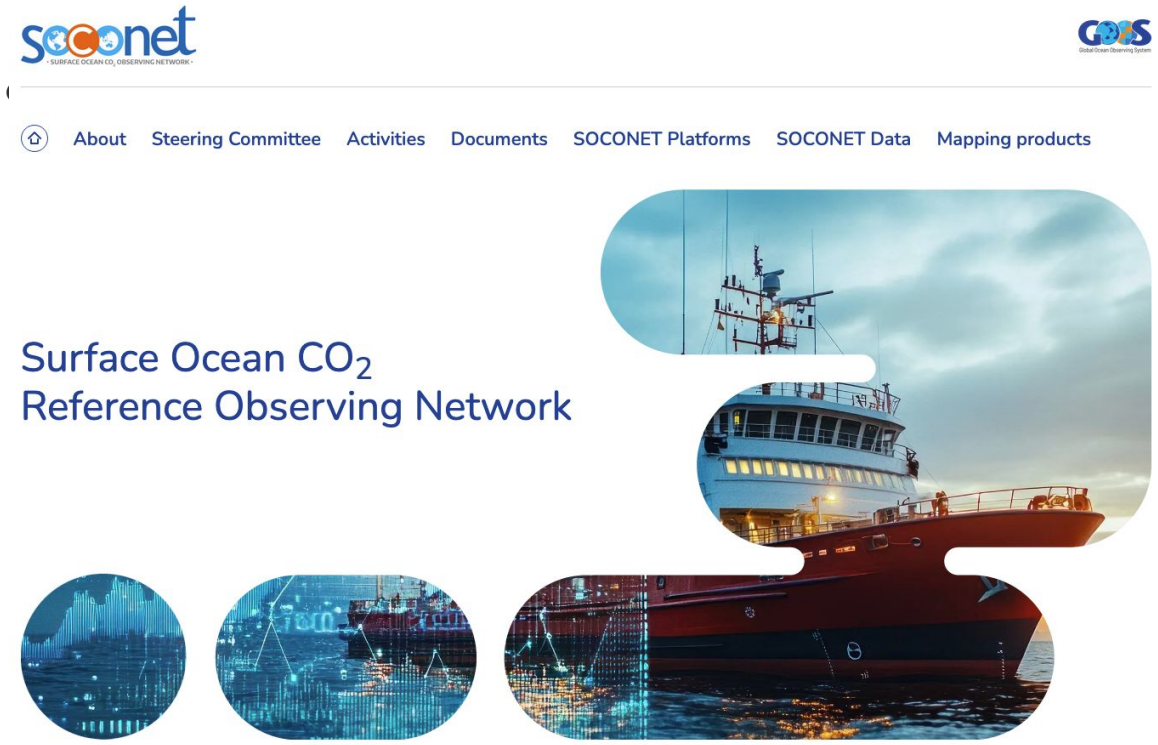
Main objectives:

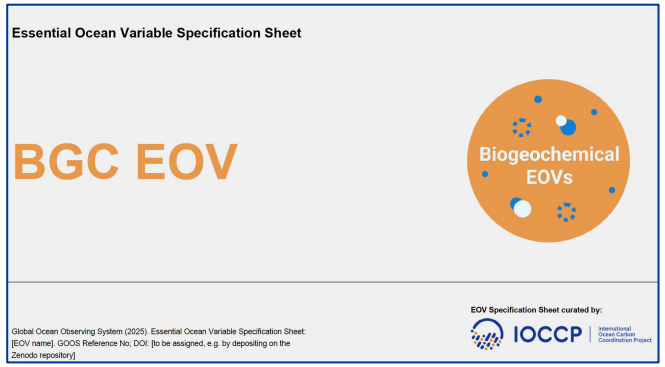
1. Mature the global ocean observing system for biology and ecosystems EOVs
2. Facilitate the use of marine biodiversity data in decision-making at all geographic scales
3. Strengthen capacity and expand global observing coverage
4. Drive innovation and promote the adoption of emerging technologies for ocean biodiversity monitoring

Progress:

- **GOOS Biodiversity Strategy** (high level) - final draft ready
- **Biodiversity Implementation Plan** to be developed in collaboration with OBIS, OCG and other partners.

GOOS Carbon & Greenhouse Gas Plan





Observing system design: Moving forward

Optimal Ocean Carbon Observing Design Workshop

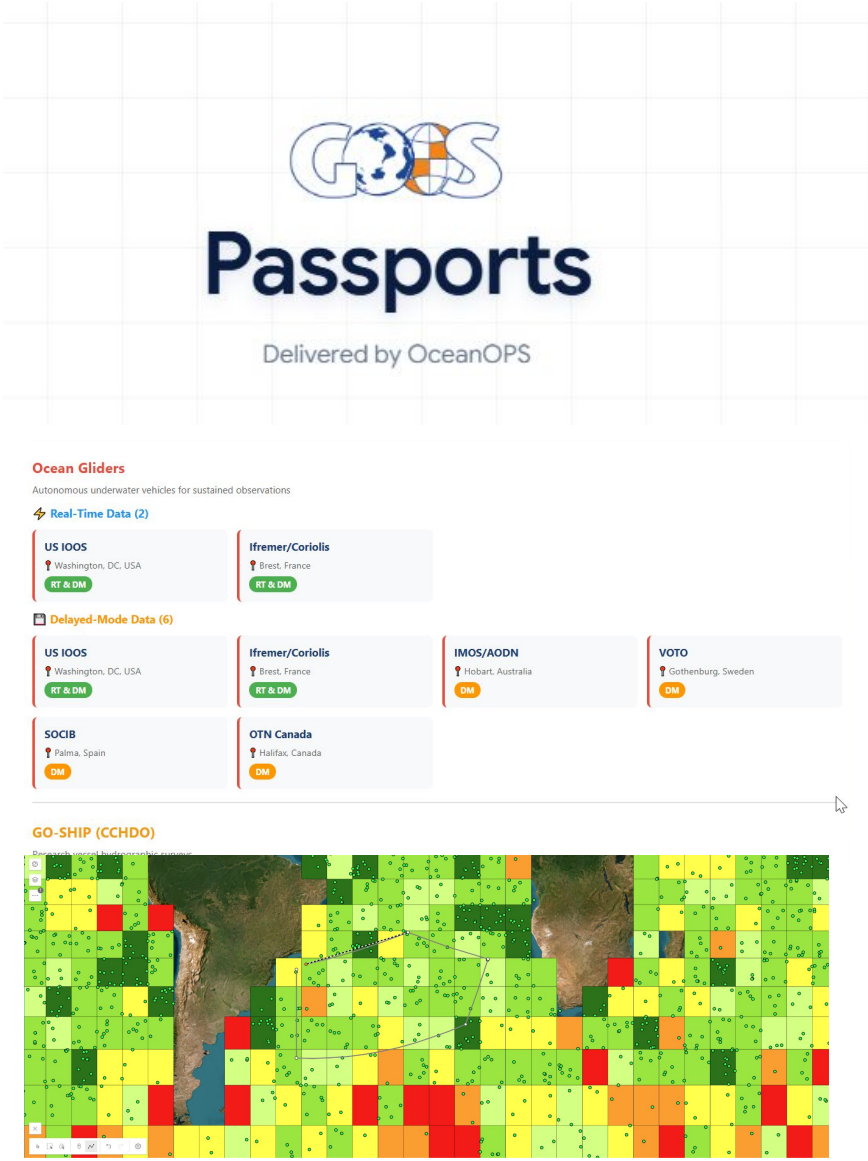
GOOS Updates - OCG

The Observations Coordination Group (OCG) works to efficiently operate, maintain, coordinate and integrate a comprehensive in-situ global ocean observing system.

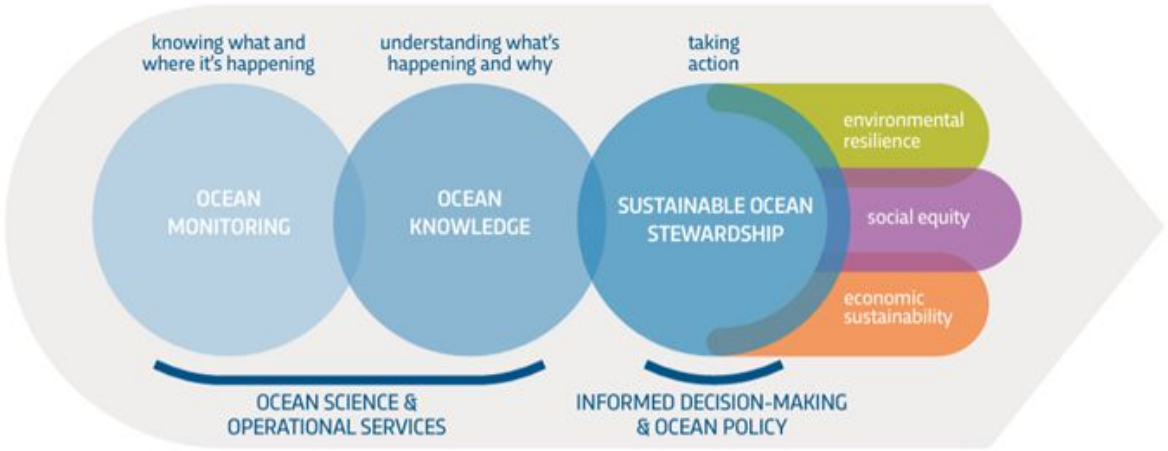
Building blocks for a digital GOOS…

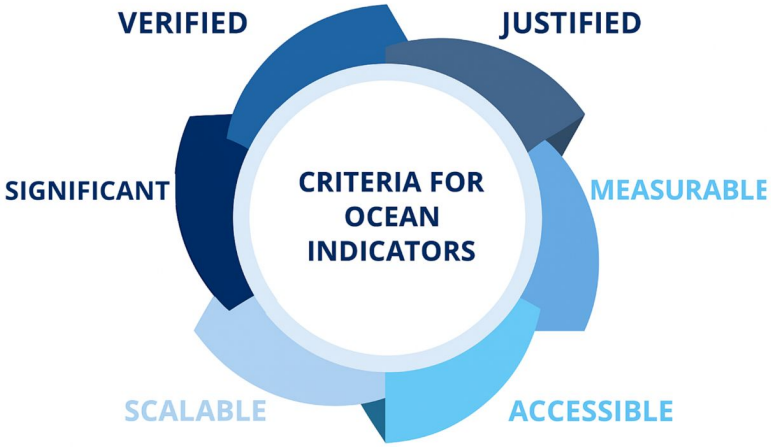
- **GOOS Passports -** Minimum metadata requirements agreed across GOOS networks - enable coordination, integration, visibility, contributor recognition, performance evaluation, long-term traceability of ocean observations and support user access and interoperability - **v important concept and building block for digital GOOS, working with BioEco Panel/OBIS for cross-GOOS implementation!**
- **Mapping of network data endpoints** next step for system analysis and data access - where we harvest the metadata and check system function and delivery
- **EOV Views -** e.g. density grid of observations with possibility to filter observations on multiple parameters, analysis the system around EOVs, enabled by the above…

https://www.ocean-ops.org/passports



Ocean Indicators





Ocean indicators are crucial for translating ocean science and data into practical metrics, guidance, and tools informing on the state and health of the ocean that can be directly applied by policymakers, practitioners, and the public.

9 pilot indicators for three general disciplines: physics and climate, biogeochemistry and biology & ecosystem

GOOS Communications Update

https://goosocean.org/goos-communications-toolkit/
! Passcode for access: gooscommunity

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  - Governance documents
  - Brand assets
  - Communications toolkit
- News
- Events
- Webinars

GOOS Communications Toolkit

This landing page provides the GOOS community with access to shared resources that support consistent, clear, and effective communication across our global system.

- GOOS Messaging Guide
- GOOS Brand Guidelines
- Logo Package
- GOOS Slide Deck and Template
- GOOS Ocean Observing Network Icons
- Essential Ocean Variable Icons and Graphics
- GOOS Virtual Background

Global Ocean Observing System

Thank you

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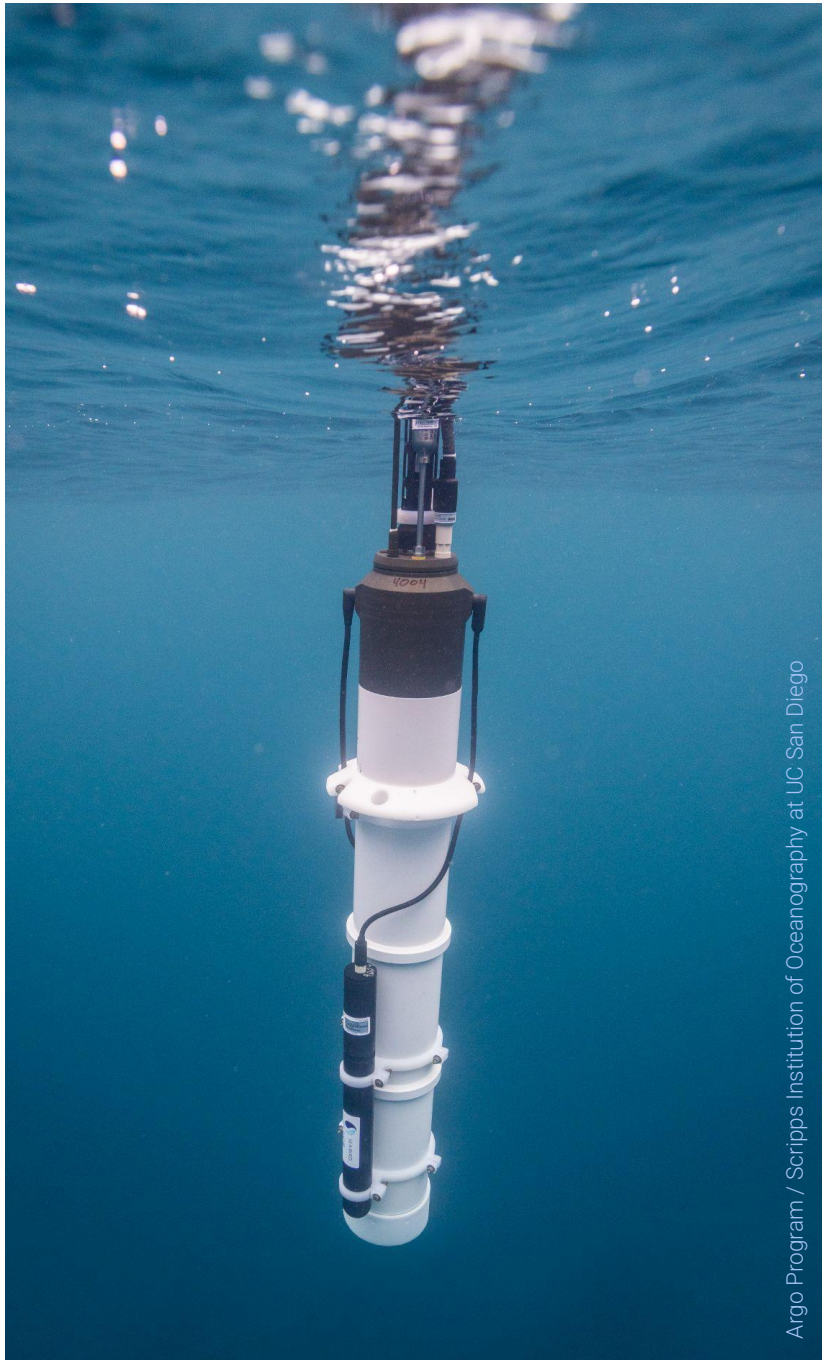

Argo Program / Scripps Institution of Oceanography at UC San Diego