

# Overview of GOOS and the FOO

## GOOS Secretariat

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*Distributed project office (IOC/UNESCO, WMO, IOPAN, U. Tas)*

*NOAA OOMD Workshop*



IOC



WMO



UNEP



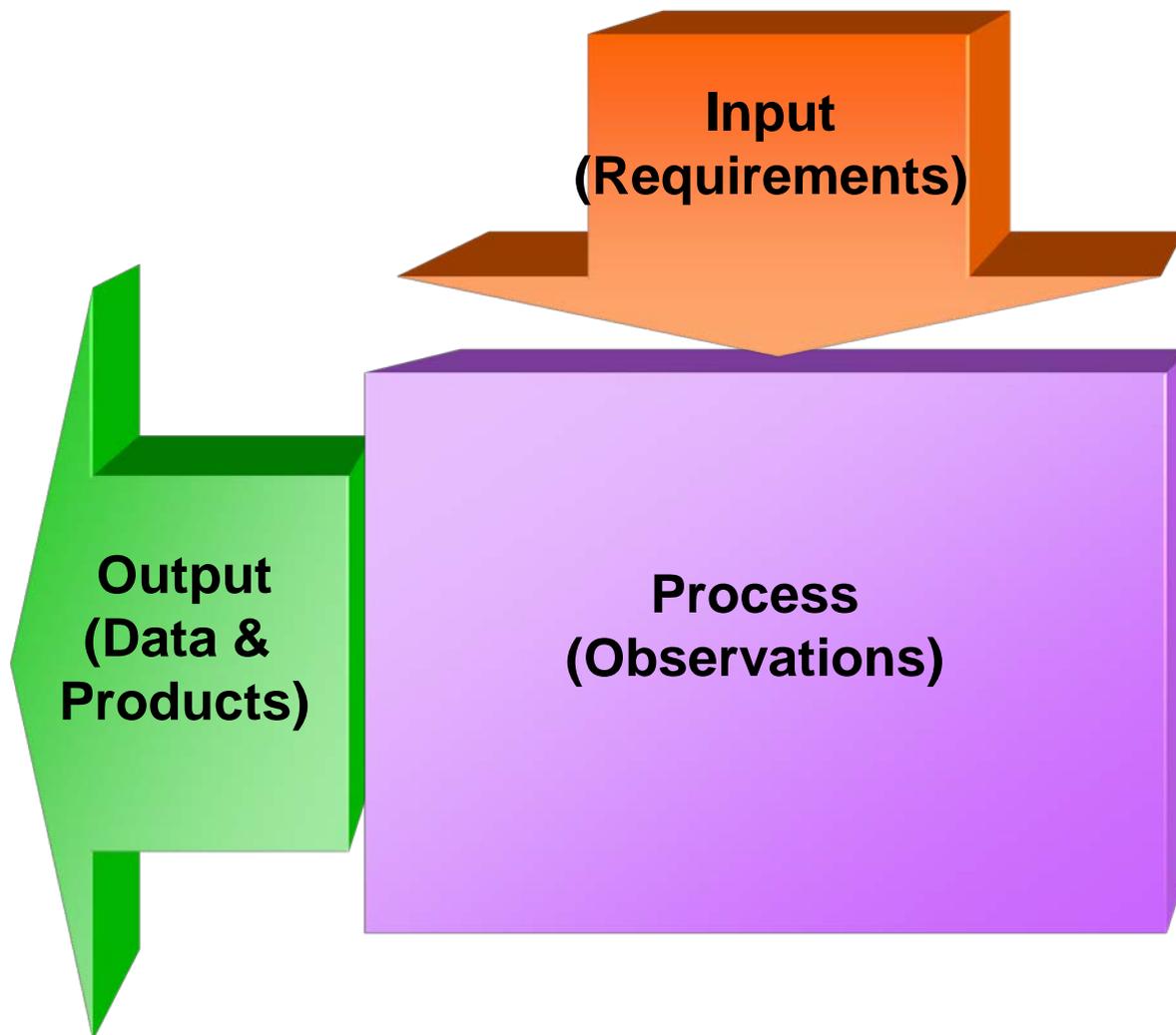
ICSU

# Ocean observations for societal benefit

## Climate, services, ocean health

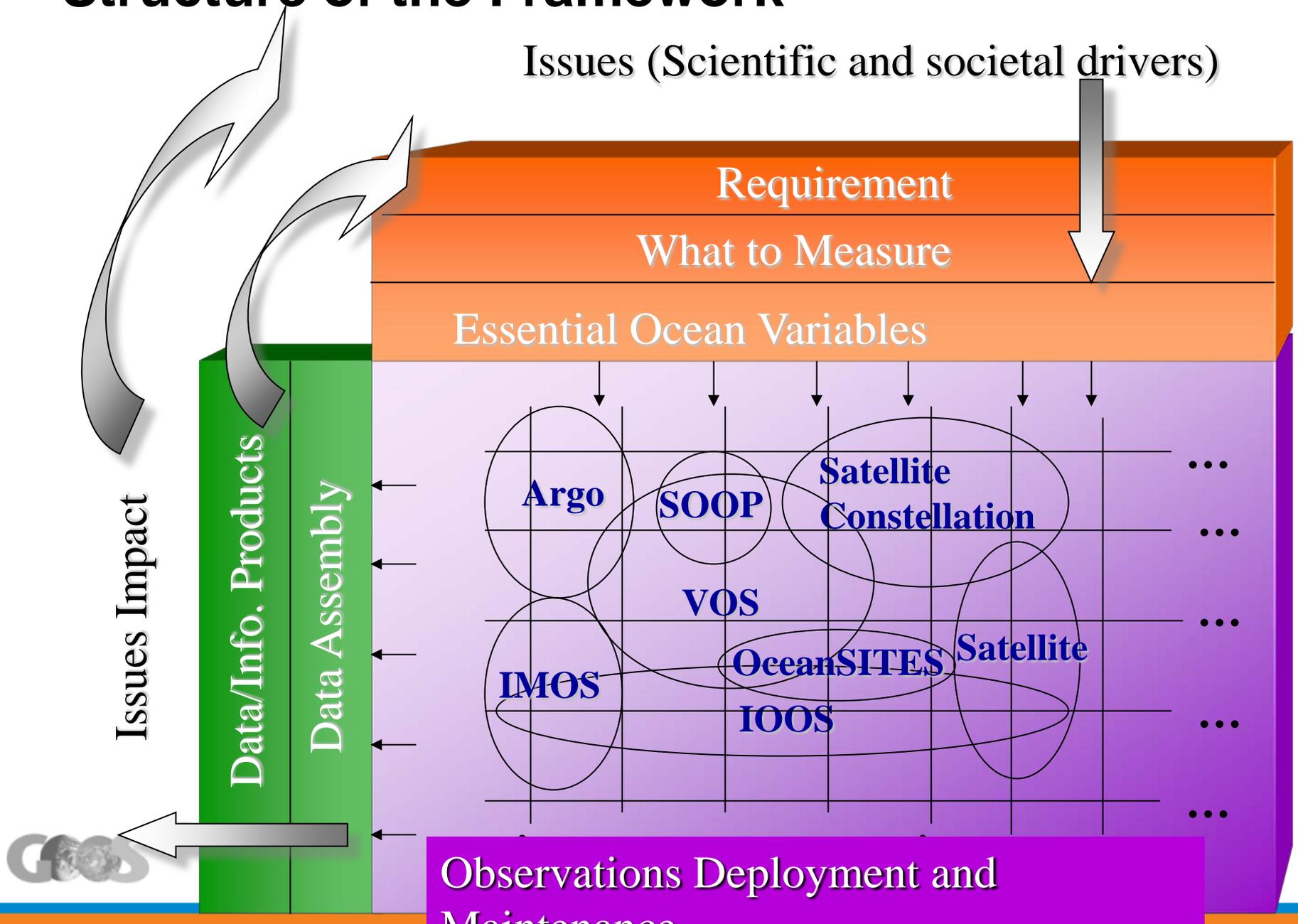


# A simple system



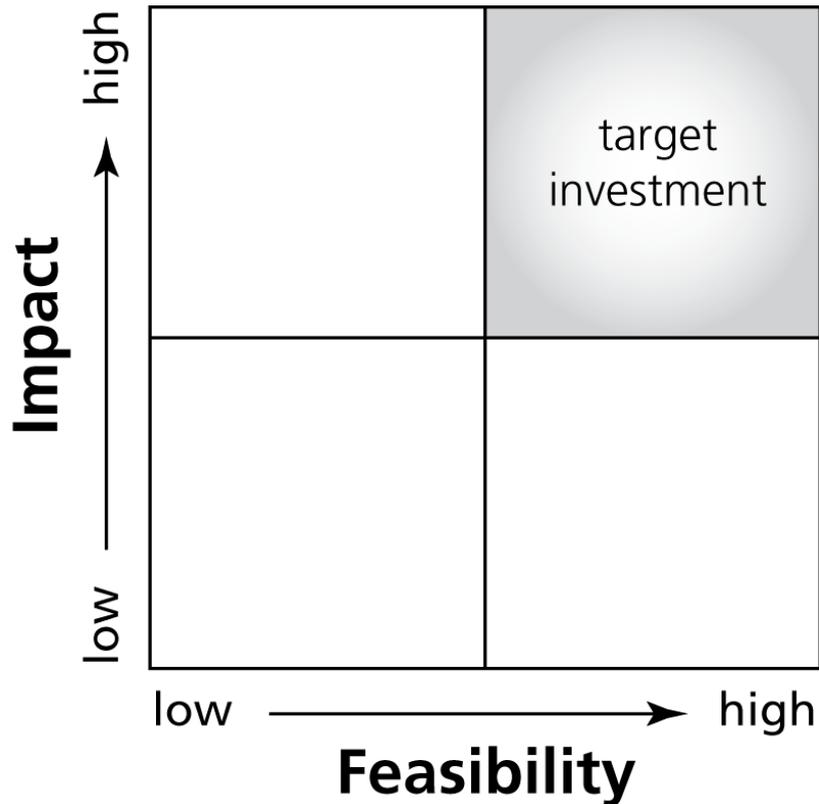
# Structure of the Framework

Issues (Scientific and societal drivers)



Driven by requirements, negotiated with feasibility

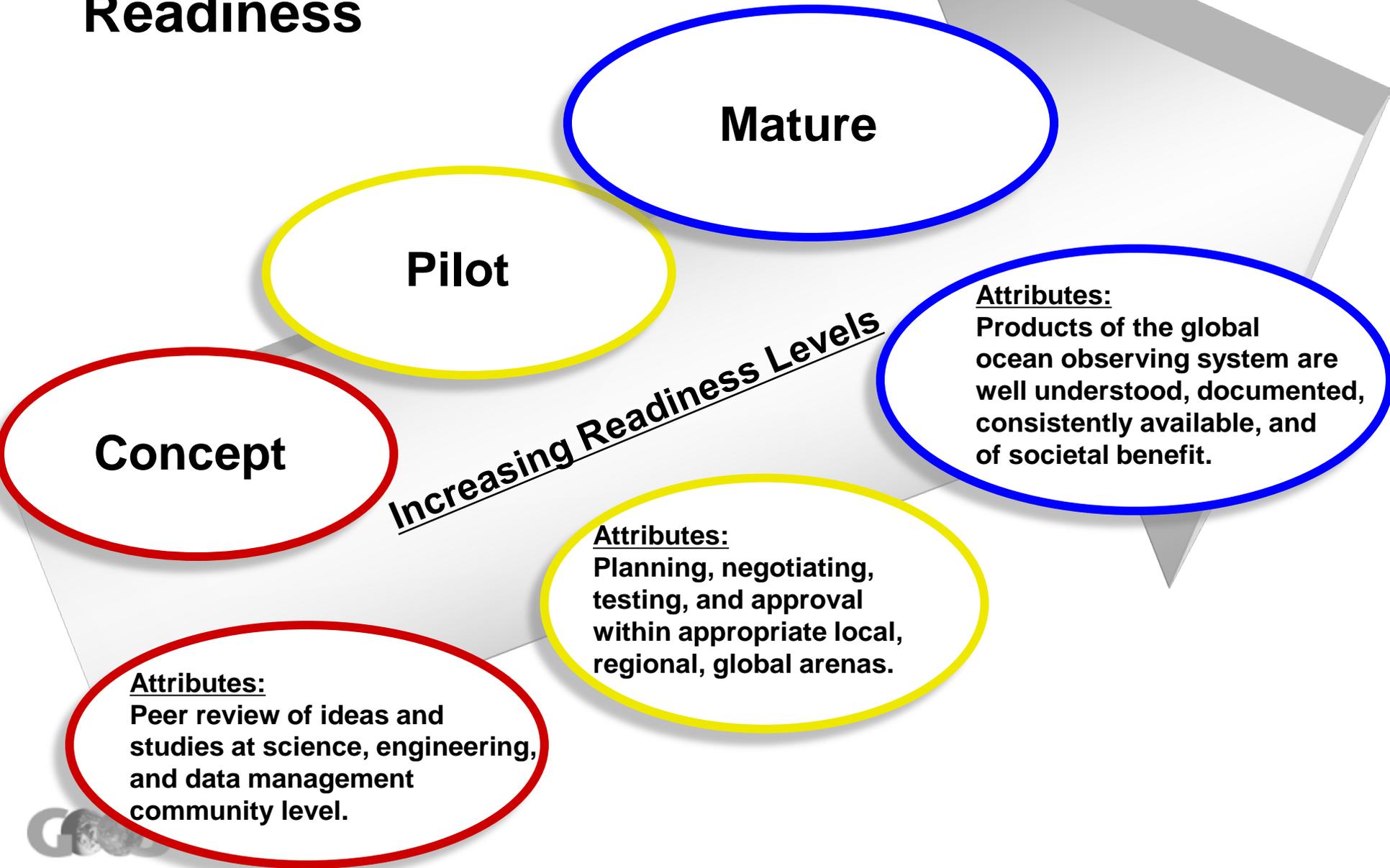
# Essential Ocean Variables



- **We cannot measure everything, nor do we need to**
- basis for including new elements of the system, for expressing requirements at a high level
- Driven by requirements, negotiated with feasibility
- Allows for innovation in the observing system over time

Towards sustained system: requirements, observations, data management

# Readiness





The Global Ocean Observing System



# Steering Committee

## Scientific Oversight

**Expert Panels**

**Physics**

GCOS • GOOS • WCRP



**Biogeochemistry**



**Biology and Ecosystems**



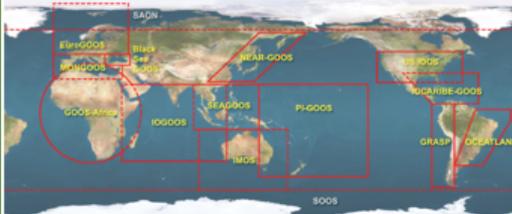
## Observation coordination

**Global observing networks and platforms**



**Regional and national organizations**

*GOOS Regional Alliances (GRAs)*



## Project development

**Improving through innovation and renovation**



**AtlantOS**




Global Ocean Acidification Observing Network

# EOVs and readiness level

**CONCEPT** **PILOT** **MATURE** \*also ECV [sometimes aggregated]

## Physics

- SST\*
- Subsurface temperature\*
- SSS\*
- Subsurface salinity\*
- Surface currents\*
- Subsurface currents\*
- Sea State\*
- Ocean surface stress\*
- Sea Ice\*
- Sea level\*
- Heat flux\*

## Biogeochemistry

- Oxygen\*
- Inorganic macro nutrients\*
- Carbonate system\*
- Transient tracers\*
- Suspended particulates
- Nitrous oxide\*
- Carbon isotope ( $^{13}\text{C}$ )
- Dissolved organic carbon
- Ocean colour\*

## Biology and Ecosystems

- Phytoplankton\* diversity and biomass
- Zooplankton\* diversity and biomass
- Fish abundance and distribution
- Turtle, bird and mammals abundance and distribution
- Live coral cover\*
- Seagrass cover\*
- Mangrove cover\*
- Macroalgal canopy cover\*

## Emerging:

- Microbe diversity and biomass
- Benthic invertebrate abundance and distribution



Specification sheets at: [goosocean.org/eov](http://goosocean.org/eov)

May 2016



IOC



WMO



UNEP



ICSU



GCOS



GOOS separation of responsibility for disciplines (ocean variables)

**Physics**      **Biogeochemistry**      **Biology**

**GOOS Application Areas**

**Climate**

(through **GCOS** for IPCC, UNFCCC, GFCS and national monitoring, mitigation, adaptation)



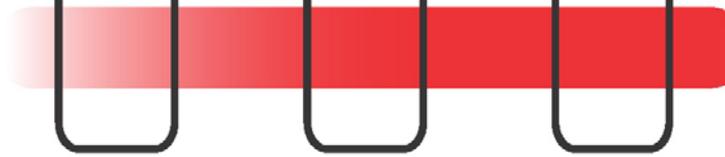
**Real-time Services**

(through JCOMM services, GODAE OV to specific benefit areas)



**Ocean Health**

(with GEO BON and others for IPBES, WOA, CBD, and national applications)



 Strength of disciplinary contribution to application area

GOOS separation of responsibility for disciplines (ocean variables)

**Physics**   **Biogeochemistry**   **Biology**

### GOOS Application Areas

#### Climate

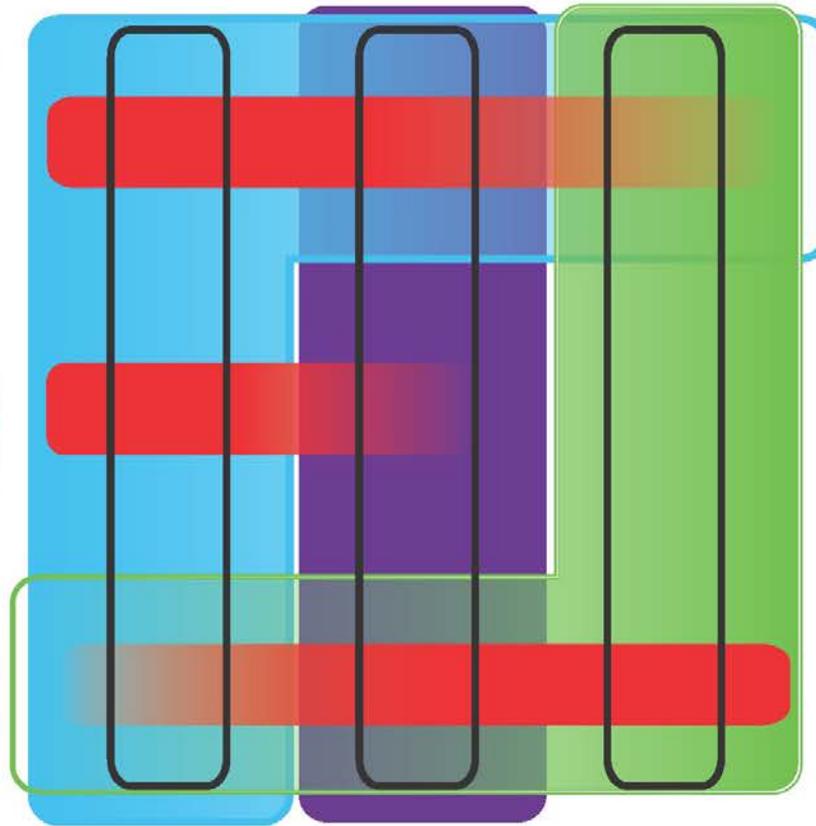
(through **GCOS** for IPCC, UNFCCC, GFCS and national monitoring, mitigation, adaptation)

#### Real-time Services

(through JCOMM services, GODAE OV to specific benefit areas)

#### Ocean Health

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Strength of disciplinary contribution to application area

#### GCOS-GOOS-WCRP

OOPC: Panel for Physics variables, and Climate Theme Lead  
RT Services Theme Lead.  
Ocean Health Theme Support

GOOS **Biogeochemistry**: Panel for Biogeochemical Variables and Climate Theme Support  
Ocean Health Theme Support

GOOS **Biology**: Panel for Biology Variables, and Ocean Health Theme Lead  
Climate Theme Support

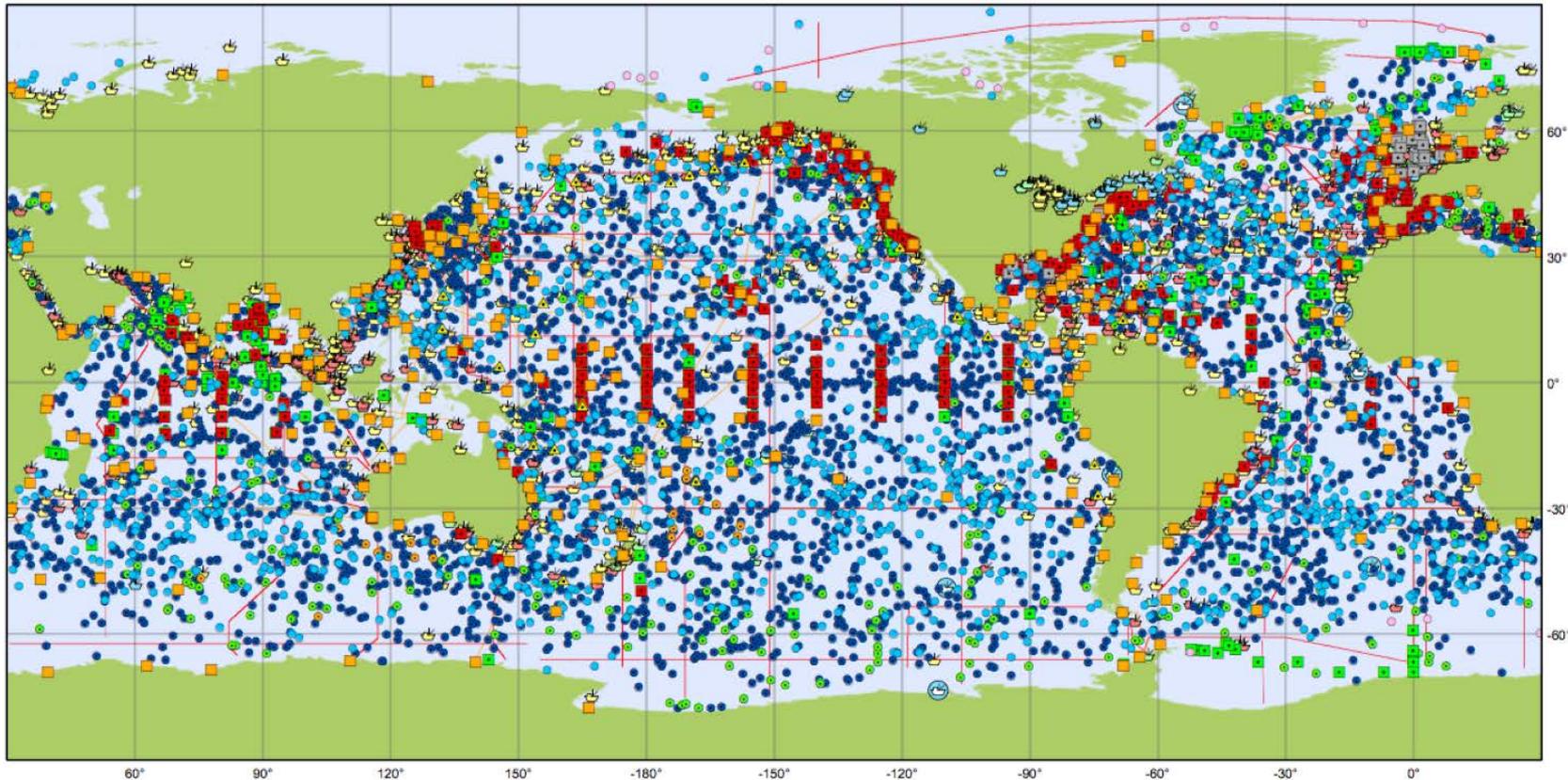


# OOPC Focus

- **Assess, review and prioritize requirements for EOVs and ECVs**
- Work with JCOMM OCG and regional bodies to **coordinate observing networks**
- **Review** the status of and **requirements for data and information management**
- Develop a **process for ongoing evaluation** of the observing system
- **Liaison and advocacy** for agreed plans
- Report to sponsors

**OOPC work plan (2013-2018).**





### Main in-situ Elements of the Global Ocean Observing System

February 2017

#### Argo

- Argo (3999)
- Deep-Argo (26)
- BGC-Argo (301)

#### DBCP

- Surface Drifters (1401)
- Fixed Platforms (103)
- Ice Buoys (22)
- Moored Buoys (376)
- ▲ Tsunameter (32)

#### OceanSITES

- Platforms (331)

#### GO-SHIP

- GO-SHIP (61)

#### GLOSS

- Tide Gauges (252)

#### SOT

- VOSclim-Automated (107)
- VOSclim-Manned (358)
- VOS-Automated (152)
- VOS-Manned (1056)

- ASAP Radiosondes (21)
- SOOP XBTs (37)



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# JCOMM OCG Focus

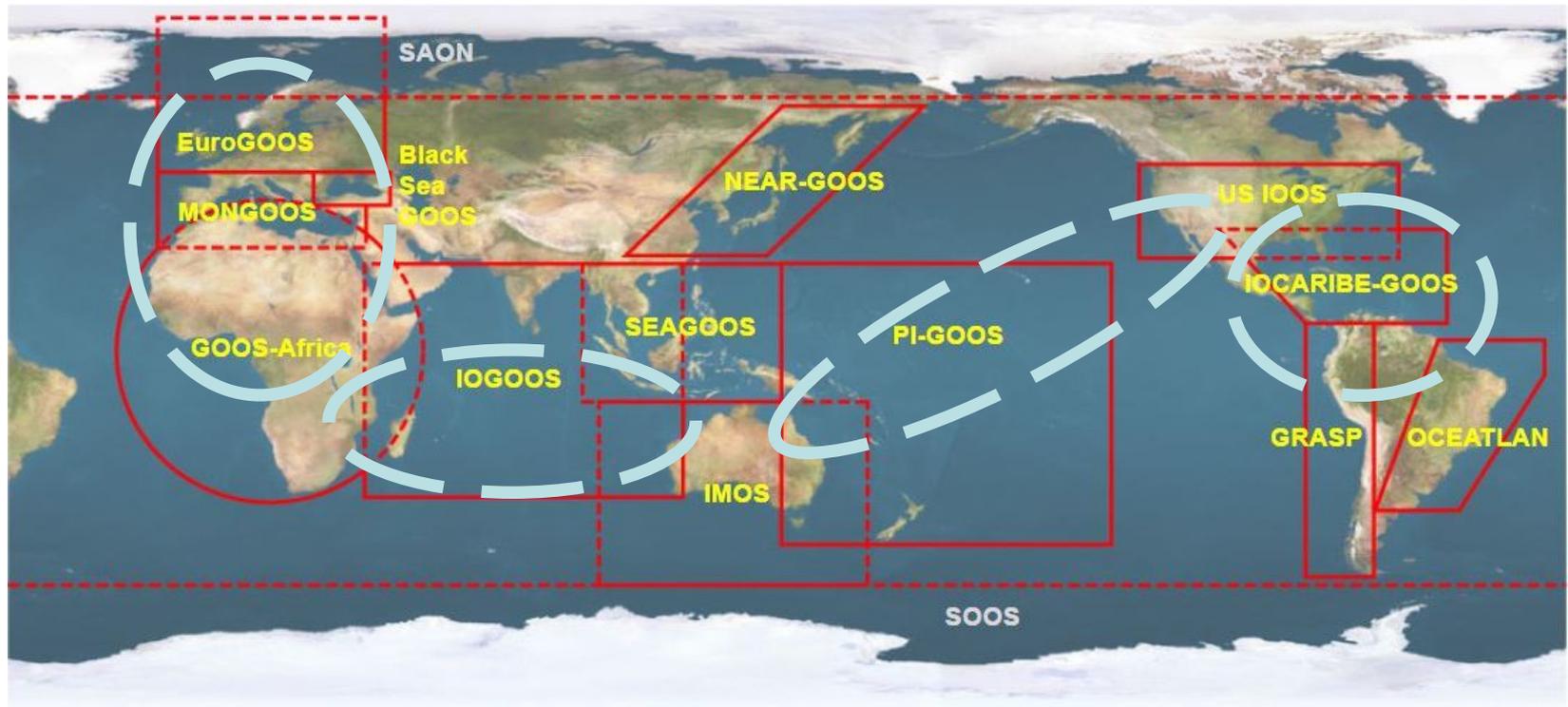
- Focus on technical coordination across the networks to improve observing system delivery, capitalising on synergies in areas of
  - Responding to **requirements**
  - **Implementation** (deployment/servicing logistics, ship resources, new technologies)
  - **Metrics** (implementation, delivery, performance, risk).
  - **Standards and Best Practices**
  - **Data Management and integration.**

**JCOMM OCG work plan (2015-2020 )**



# GRAs want to be part of growing GOOS

- more realistic for sub-groups of GRAs to work together on pilot projects





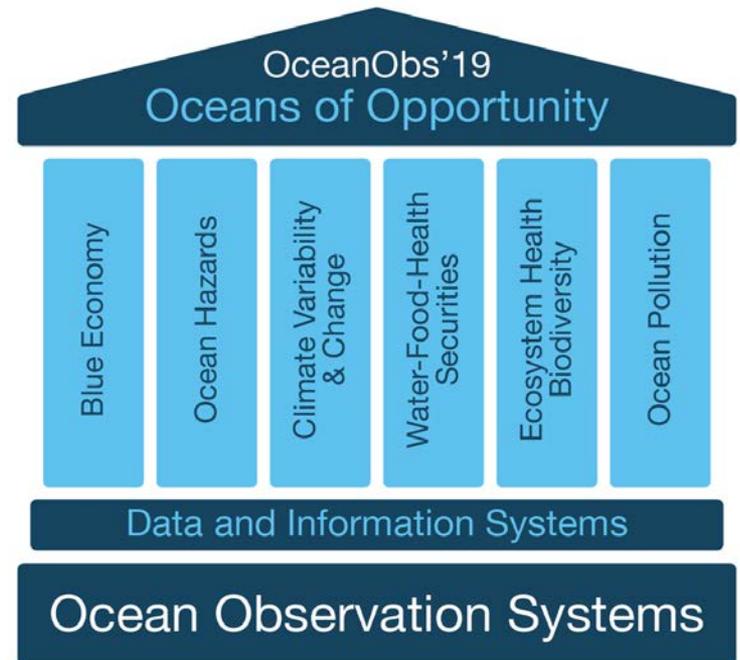
# Bringing new networks into GOOS

Highest Readiness Level	Requirements	Observations	Data & Information
<b>Mature</b>	Measurement validated through peer review, implemented at regional and/or global scales and capable of being sustained.	Following validation of observation via peer review of specifications and documentation, system is in place globally and indefinitely.	Validation of data policy via routinely available and relevant information products.
<b>Pilot</b>	Measurement and sampling strategy verified at sea. Autonomous deployment in an operational environment.	Establishment of international governance mechanism, international commitments, and sustaining components. Maintenance and servicing logistics negotiated.	Data management Practices determined and tested for quality and accuracy throughout the system. Creation of draft data policy.
<b>Concept</b>	Need for information identified and characteristics determined. Feasibility study of measurement strategy and technology.	The system is articulated, capability is documented and tested. Proof of concept validated by a basin scale feasibility test.	Data model is articulated, expert review of interoperability strategy. Verification of model with actual observational unit.
Lowest Readiness Level			

# OceanObs'19

16-20 Sept 2019, Honolulu ,  
*oceanobs19.net*

- Envisioning ~1200 participants
- Focus on connecting observers with end user community
- What does OceanGliders want to showcase in 2019?
- Contact:  
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[khill@wmo.int](mailto:khill@wmo.int)





*Thank you*