

The Global Ocean Observing System
www.ioc-goos.org

A Framework for Ocean Observing

(at Local, Regional and Global Scales)

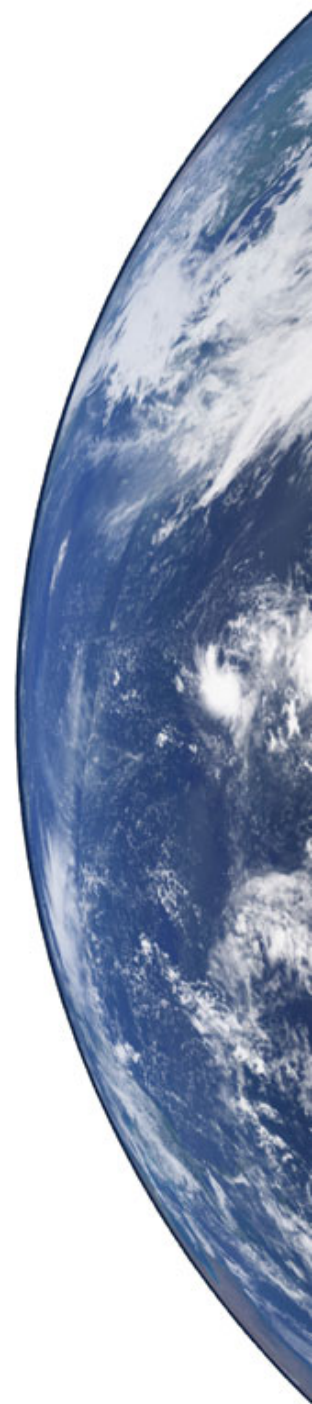
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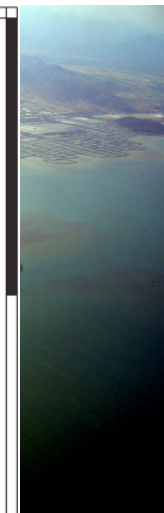
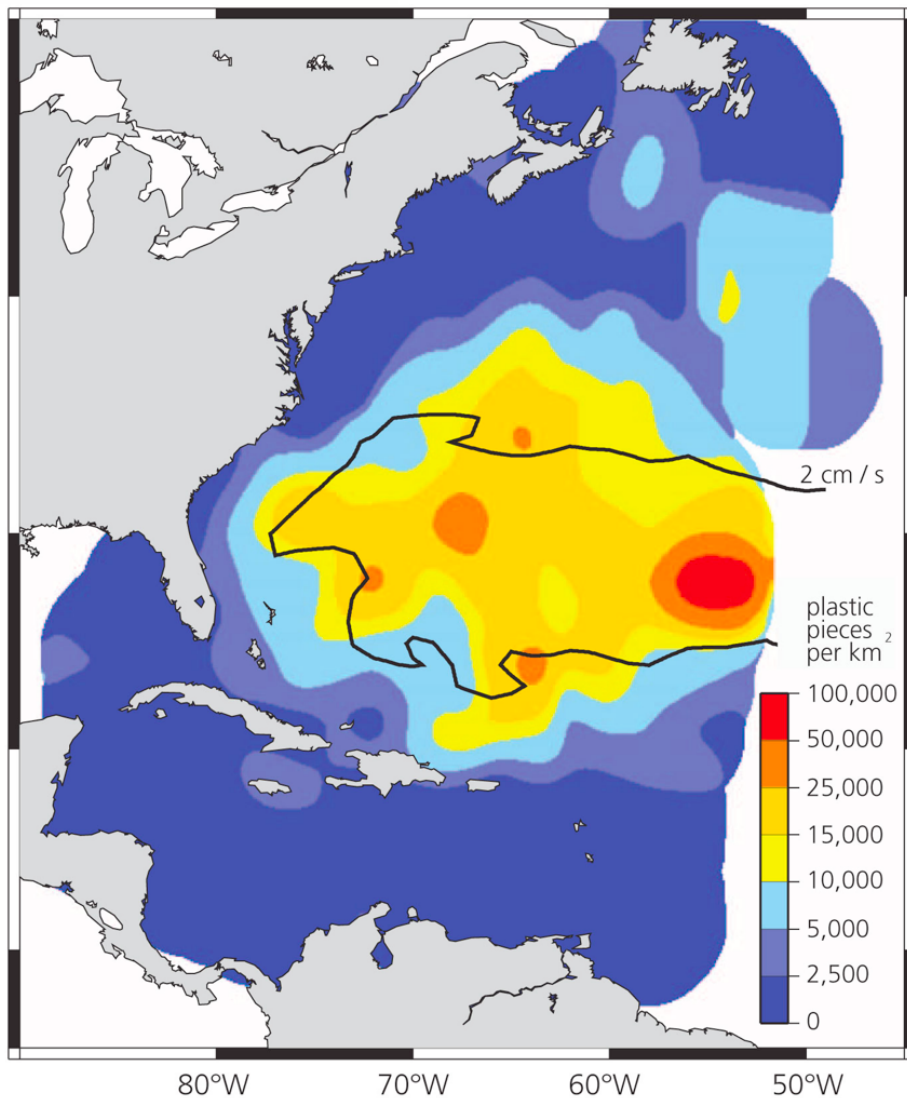
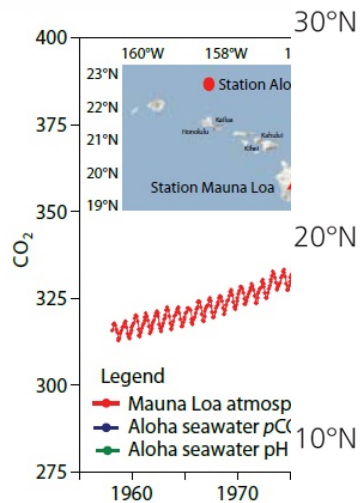
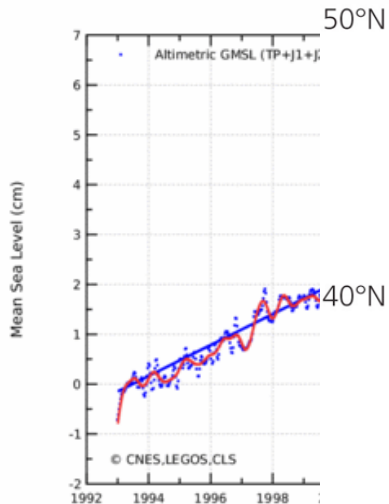


Why are Oceans Important?

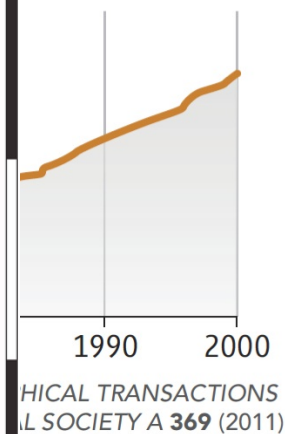
- Critical component of the Global Climate System
 - Global carbon and heat budgets
 - Hydrological, nitrogen and oxygen cycles
- Global “Blue Economy” = \$ Trillions p.a. & Growing
- Energy and Food Security
- Ecosystem services and Social amenity
 - ~50% of global population lives on coastal plains.



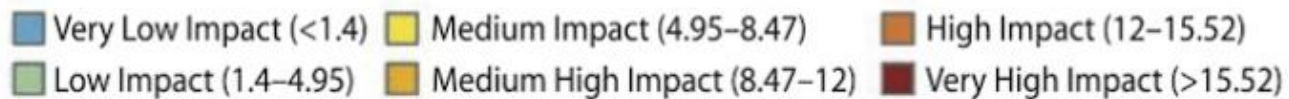
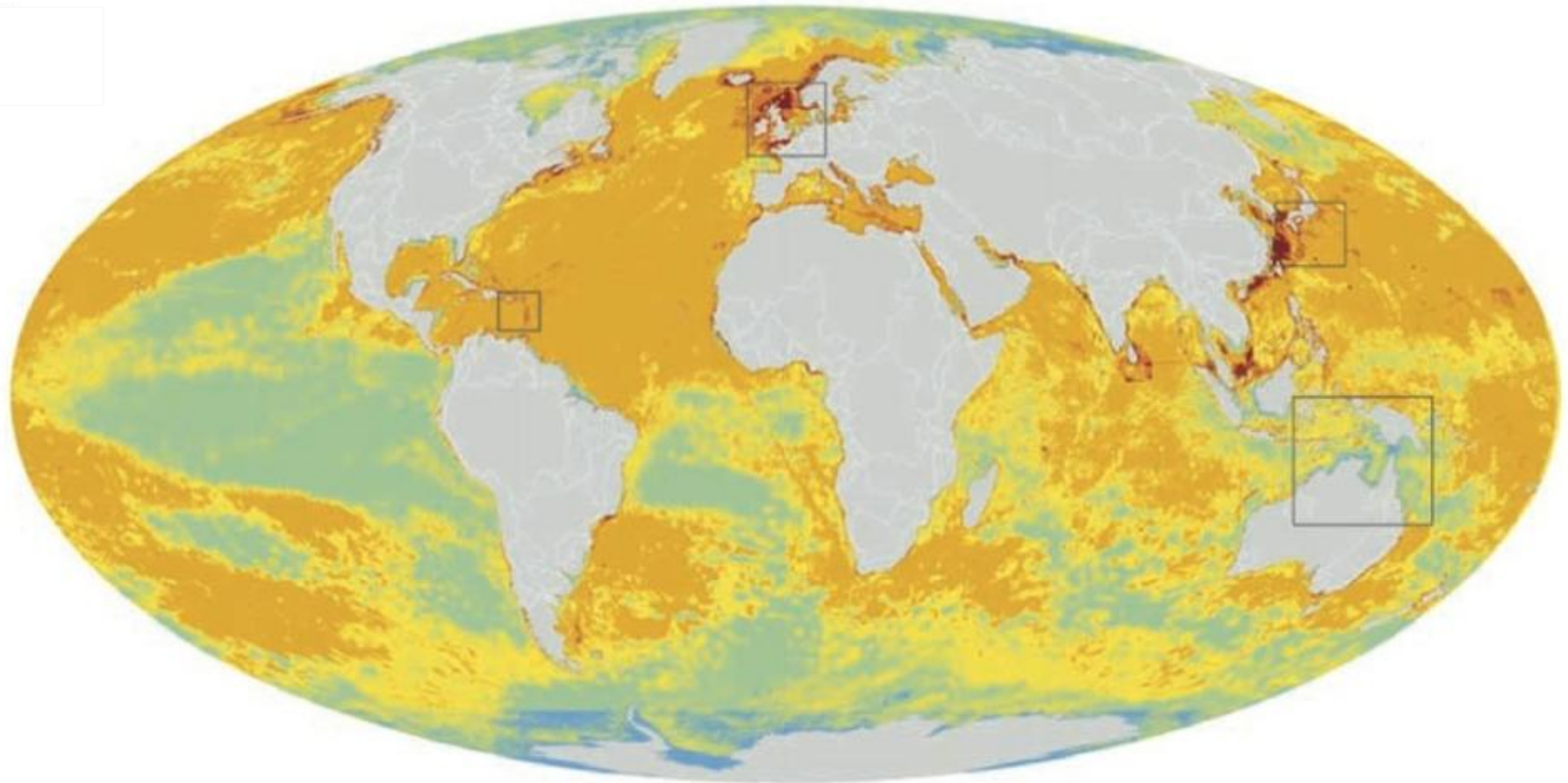
Grand Challenges



ly Exploited

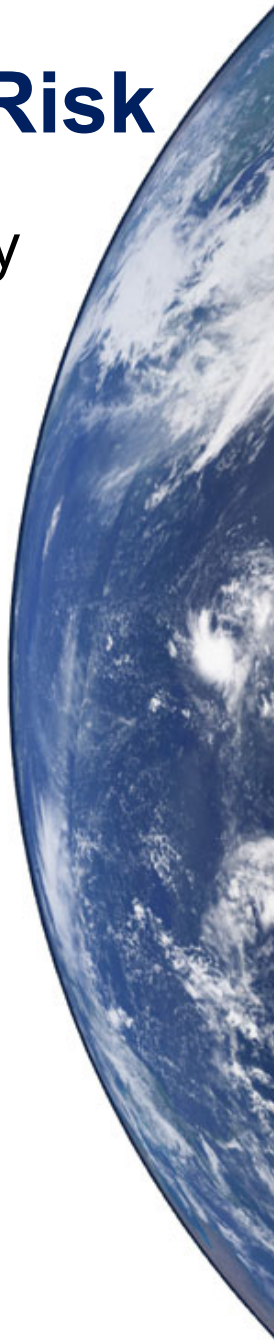


The anthropocene : Cumulative impact



Meeting the Challenges : Managing the Risk

- Managing cumulative impacts & complex issues, at any scale, requires a robust, fit-for-purpose data/ evidence base.
- For many high priority ocean challenges, the evidence base is grossly inadequate.
- In 2009, the international ocean science community called for **a framework for planning and moving forward with an enhanced global sustained ocean observing system over the next decade**, integrating new physical, biogeochemical, biological observations while sustaining present observations.



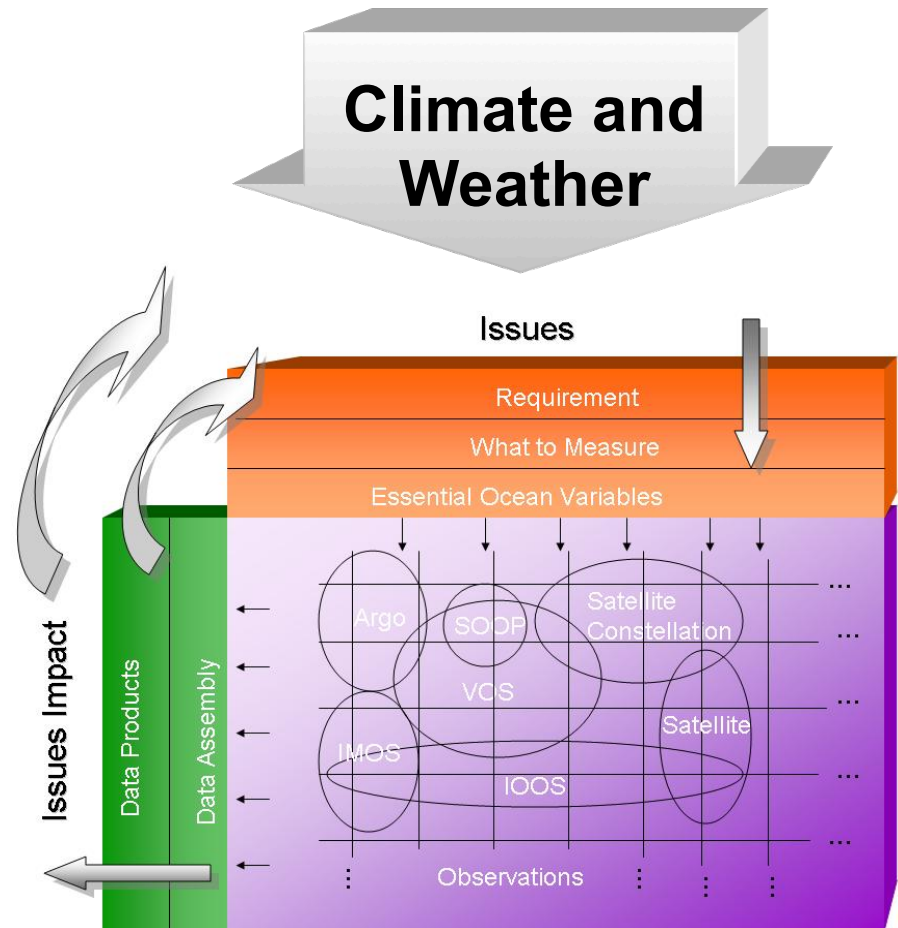
Framework Concepts

- Take lessons learned from successes of existing observing efforts – **best practices**
- **Guide** observing community as a whole to sustain and expand the capabilities of the ocean observing system
- Deliver an observing system that is **fit-for-purpose**
- Promote **collaborative alignment** of independent groups, communities and networks, **building on existing structures** as much as possible
- **Think and plan globally, invest and implement locally/regionally.**



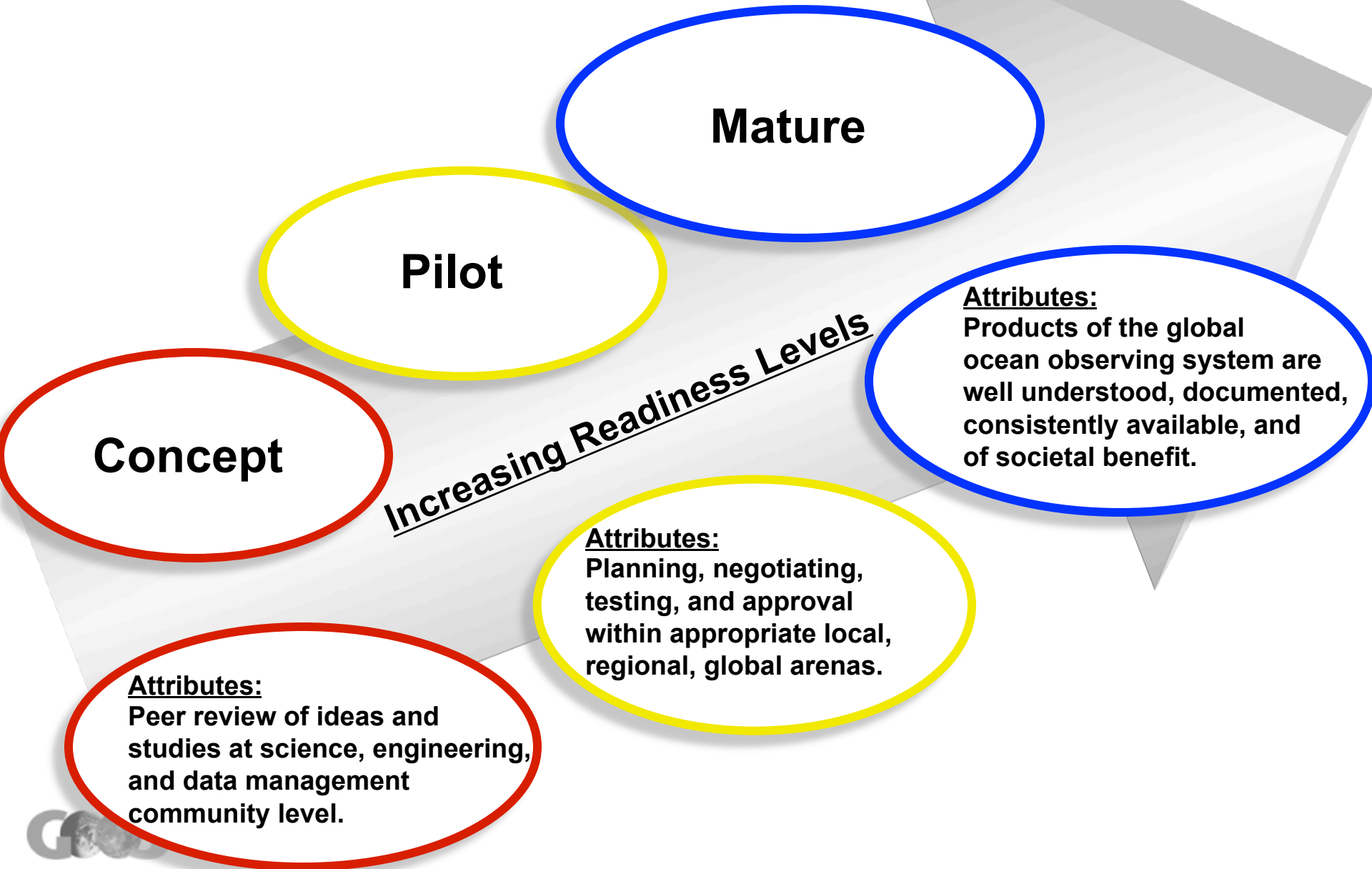
Best Practice : Global Ocean and Climate Observing System for Physics

- “Requirements” set by UNFCCC/WMO.
- Agreement on “Essential Ocean/Climate Variables”
- Communities formed to innovate, organize, implement components of an observing system.
- Data shared, standardized, QA/QC.
- Regular reviews, and reporting through IPCC process.



Towards a sustained system: requirements, observations, data management

Readiness



Extending Best Practice

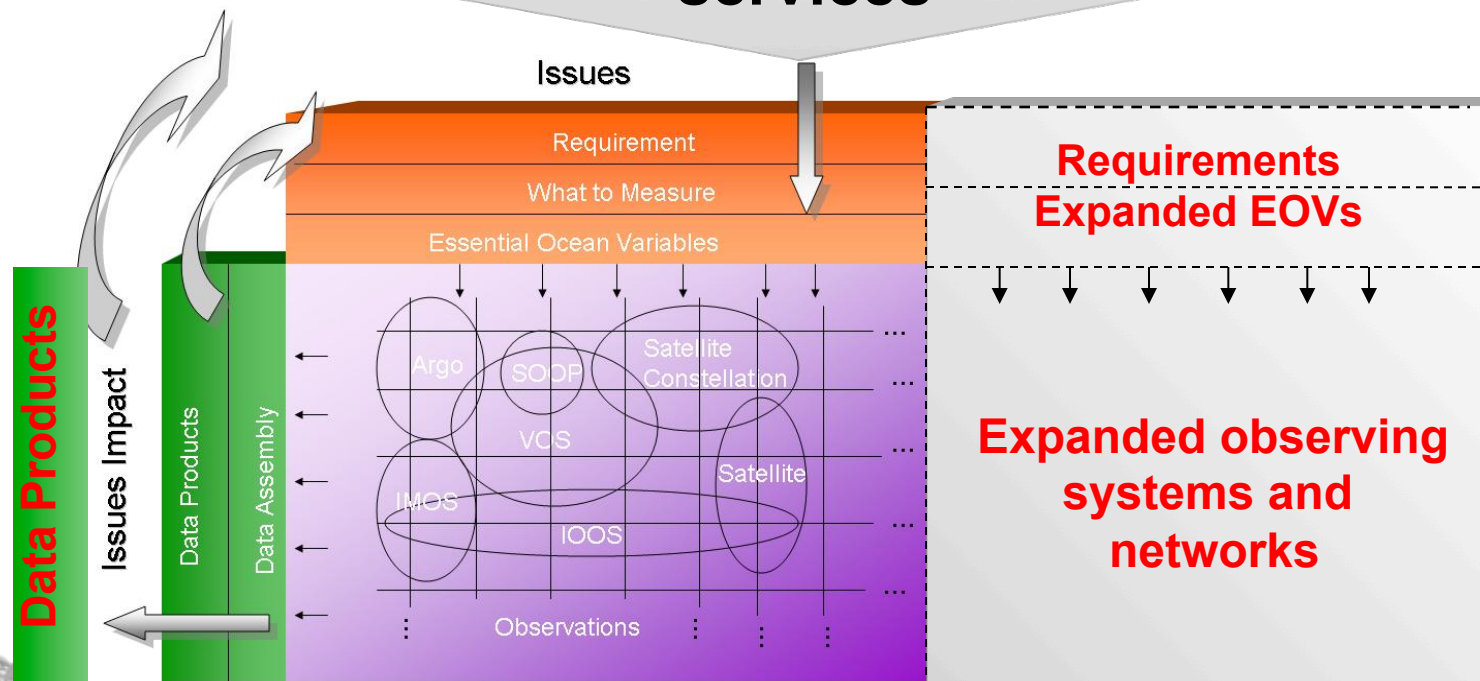
Fisheries

**Climate and
Weather**

**Assessments and
management of
ecosystem services**

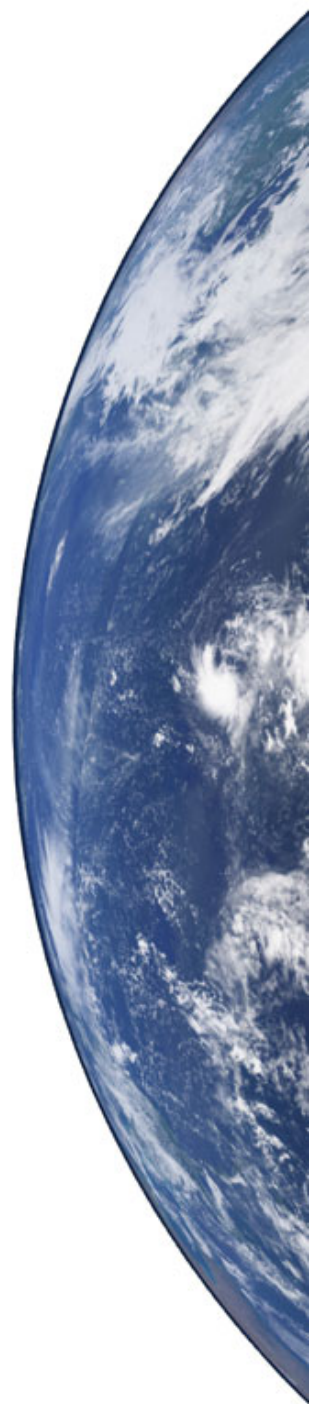
**Regional
priorities**

**Real-time
services**



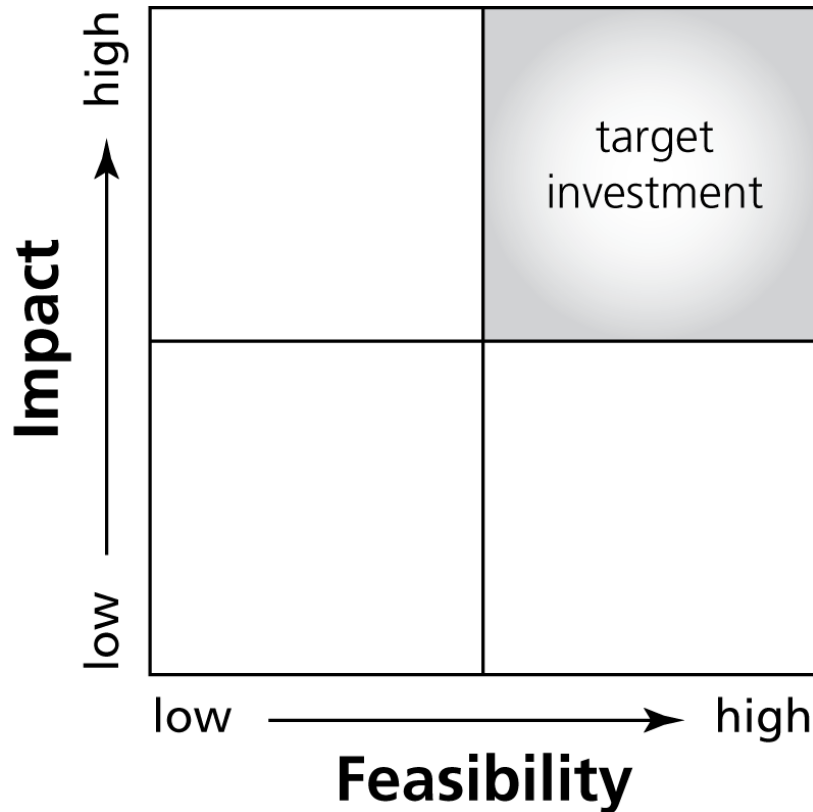
GOOS : Progress and Next Steps

- Three Panels formed to guide implementation (Physics, Biology, Biogeochemistry), working closely with other international and regional initiatives.
- Challenge in identifying “Essential Ocean Variables”
- Science “Push” V Requirement (Societal) “Pull”
- Technology/Infrastructure definitely “the” answer, but also a challenge
- Constant challenge to ensure the not easy herding biologists!



Essential Ocean Variables

Driven by requirements, negotiated with feasibility



- **We cannot measure everything, nor do we need to**
- Including new elements of the system is driven by requirements, negotiated with feasibility
- Allows for innovation in the observing system over time

Lessons from Australia's

IMOS Integrated Marine Observing System

- **Ocean Change, Climate Variability, Extremes**
 - Temperature, salinity, carbon, *El-Nino/La Nina*, IOD, SAM
- **Major Boundary Currents**
 - EAC, Leeuwin, ITF
- **Continental Shelf Processes**
 - Eddies, Upwellings, Acidification/pH
- **Ecosystem Responses**
 - Productivity, abundance, distribution, Pelagic, benthic





Thank you!



GLOBAL OCEAN OBSERVING SYSTEM

The oceans are the basis of the life support system. GOOS measures ocean warming and provides an opportunity for the human system to respond.

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