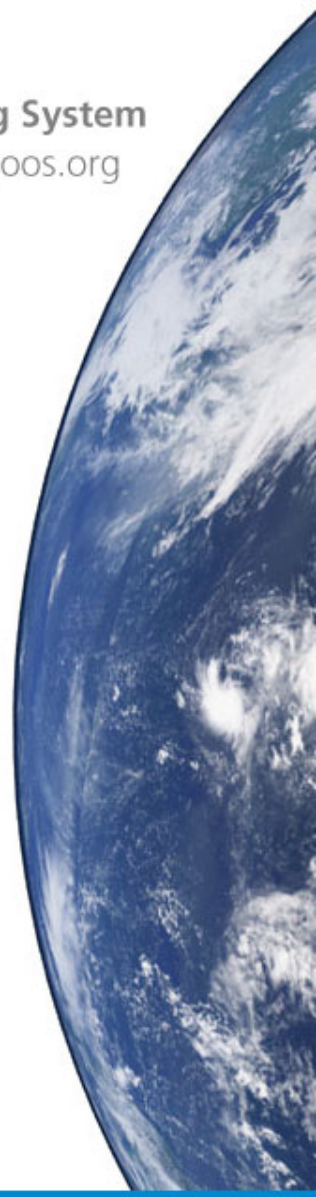
The Global Ocean Observing System
www.ioc-goos.org

A Framework for Ocean Observing

(at Local, Regional and Global Scales)

John Gunn
CEO, Australian Institute of Marine Science
Co-Chair IOC - GOOS Steering Committee



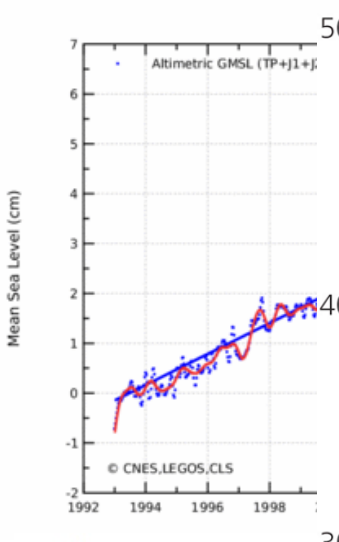
UNESCO IOC WMO UNEP ICSU

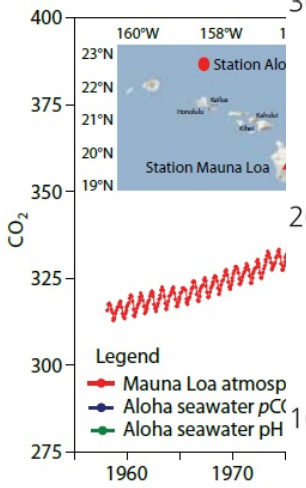
Why are Oceans Important?

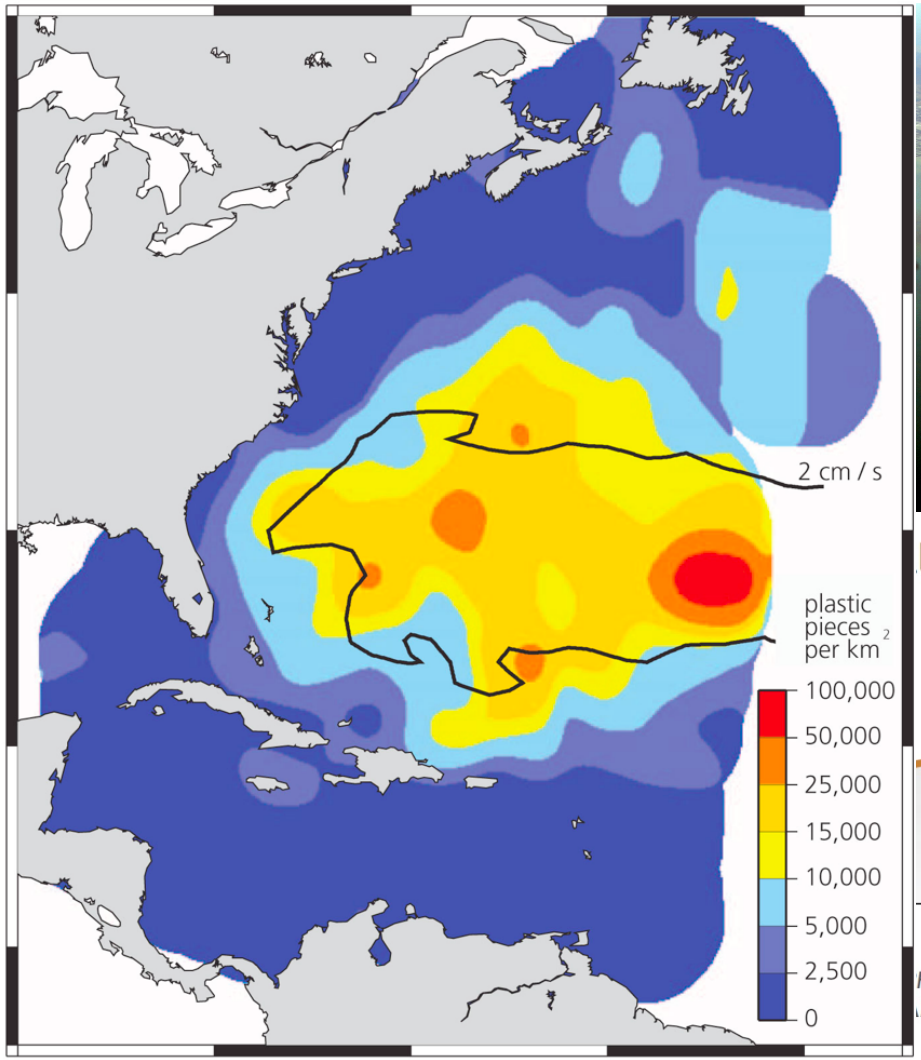
- Critical component of the Global Climate System
  - Global carbon and heat budgets
  - Hydrological, nitrogen and oxygen cycles
- Global “Blue Economy” = $ Trillions p.a. & Growing
- Energy and Food Security
- Ecosystem services and Social amenity
  - ~50% of global population lives on coastal plains.



Grand Challenges

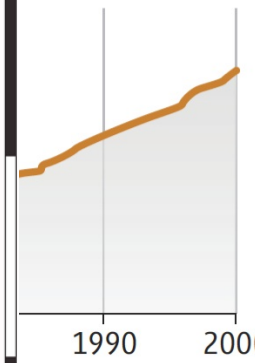




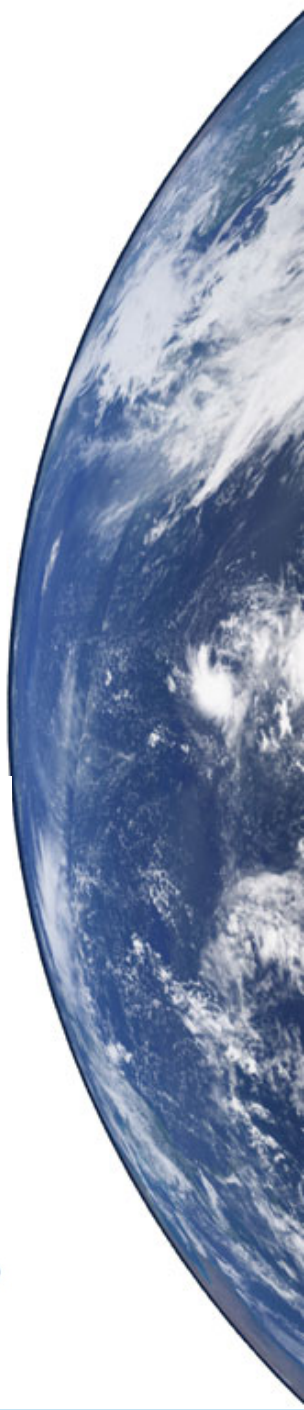




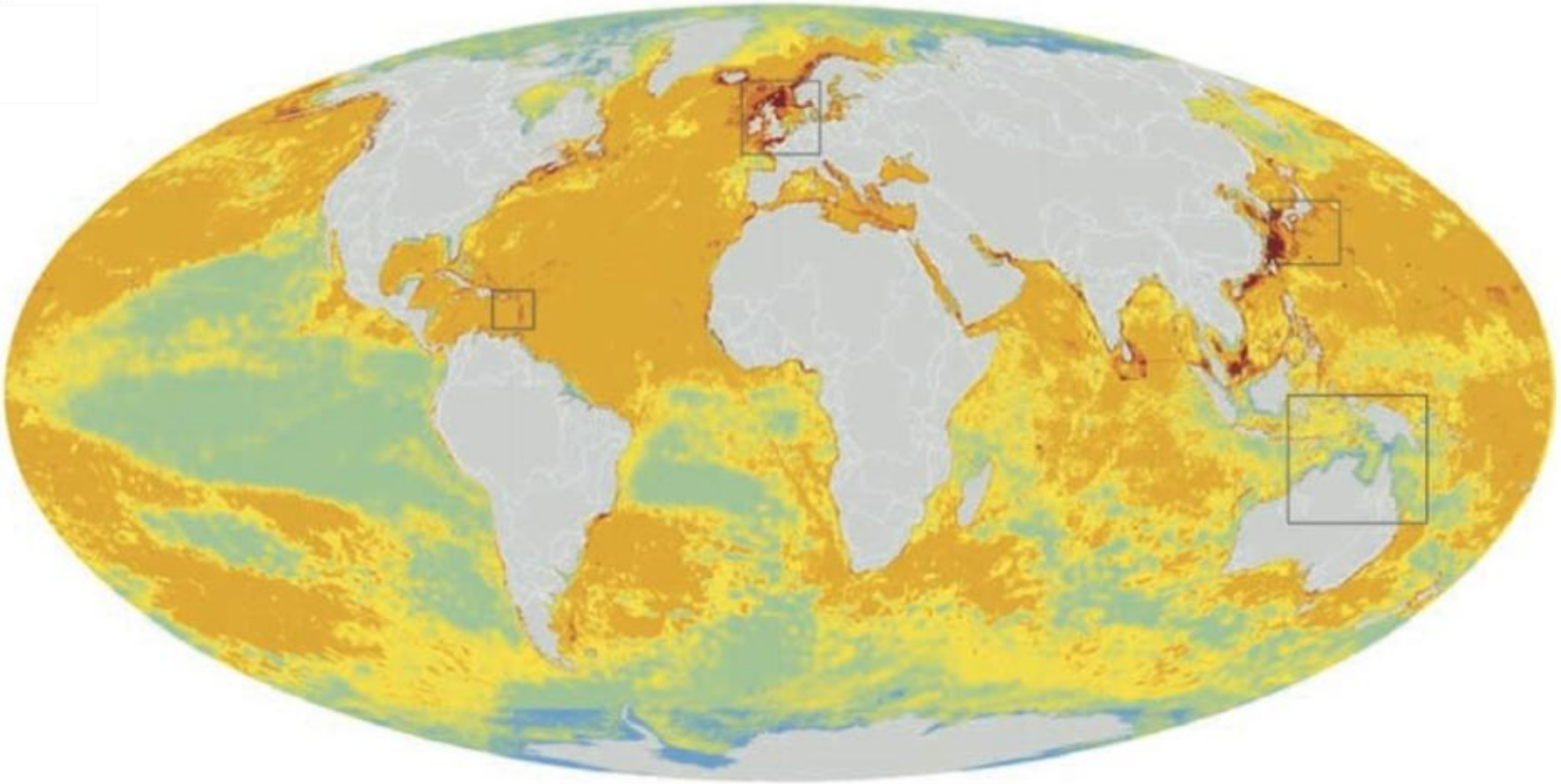
ly Exploited



HICAL TRANSACTIONS
L SOCIETY A **369** (2011)



The anthropocene : Cumulative impact



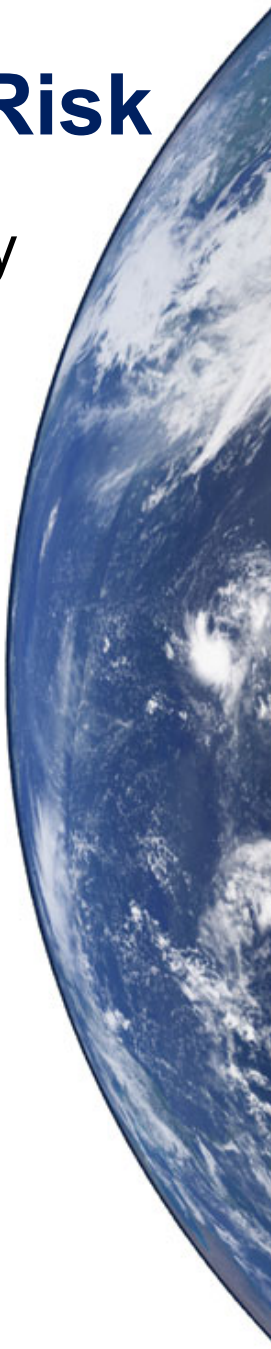
Halpern et al., Science, 2008

Meeting the Challenges : Managing the Risk

- Managing cumulative impacts & complex issues, at any scale, requires a robust, fit-for-purpose data/ evidence base.

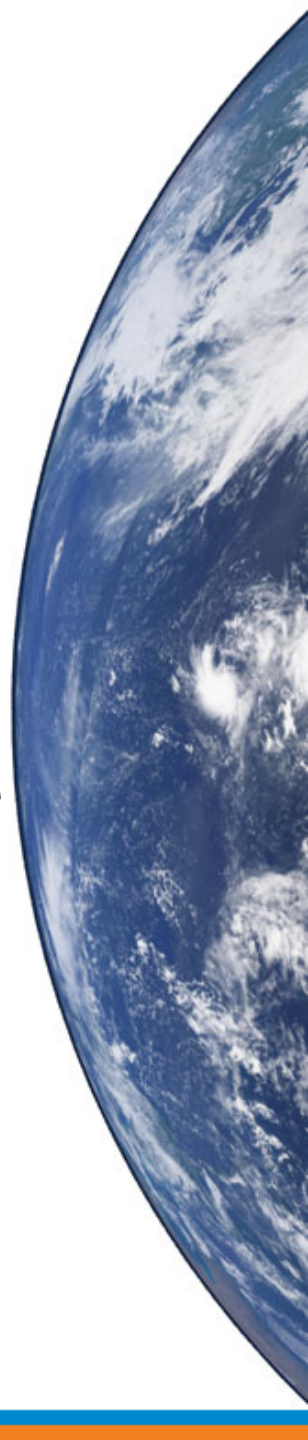
- For many high priority ocean challenges, the evidence base is grossly inadequate.

- 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.



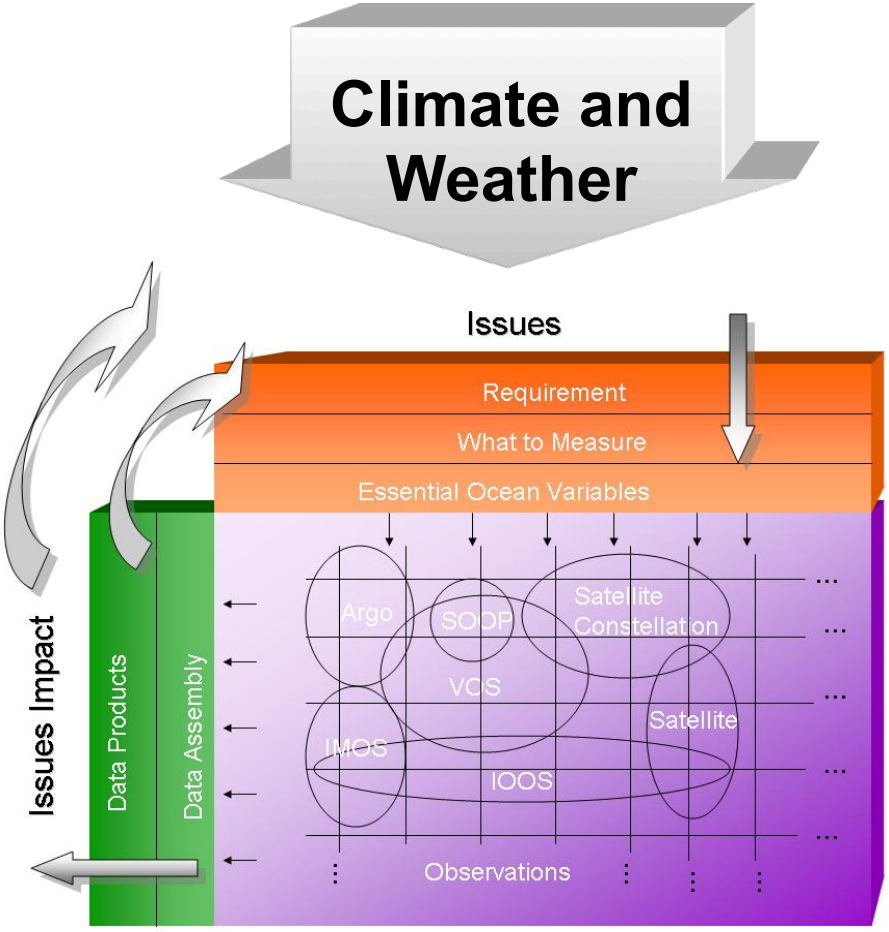
Framework Concepts

- 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 and 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.**



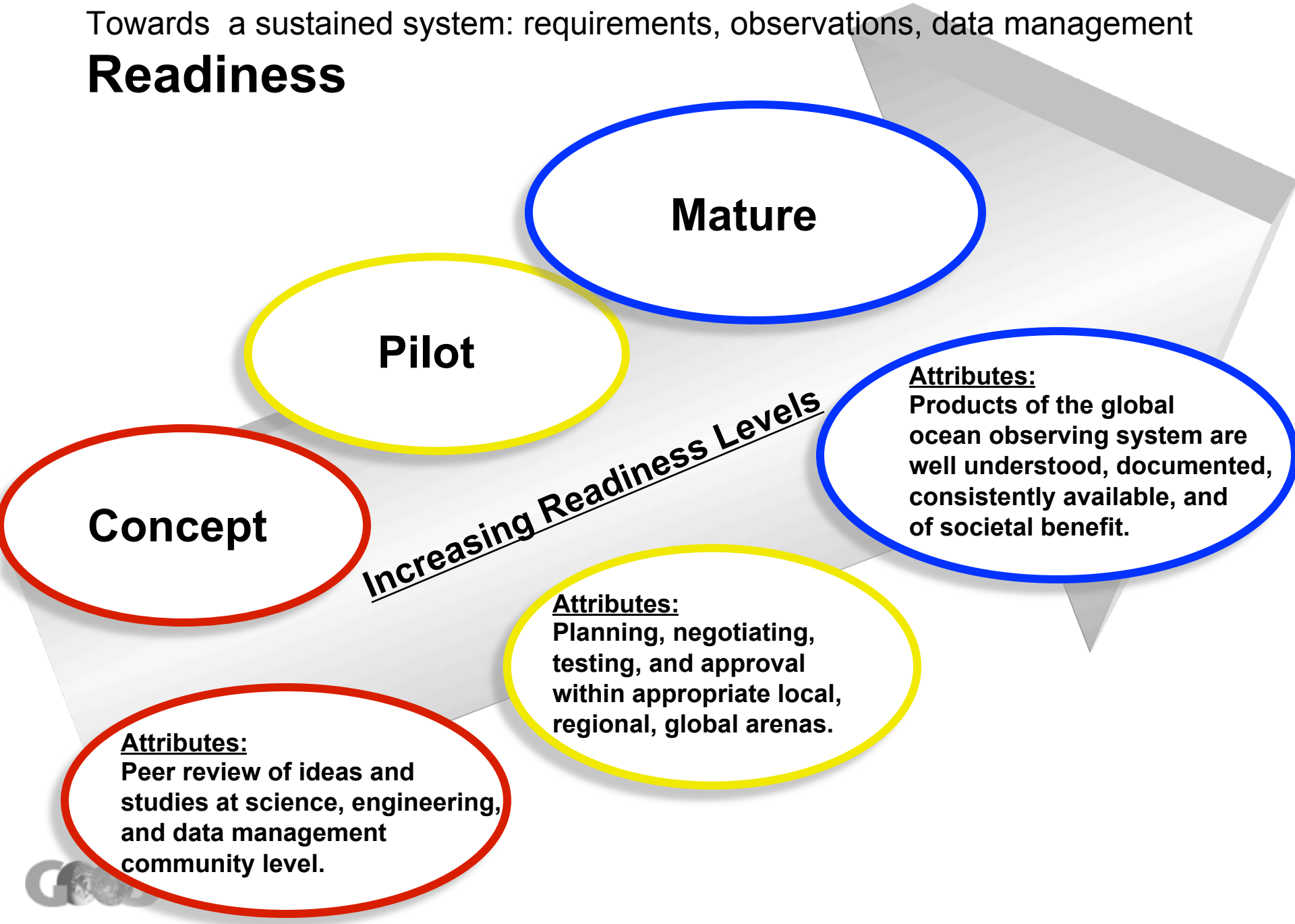
Best Practice : Global Ocean and Climate Observing System for Physics

- "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.

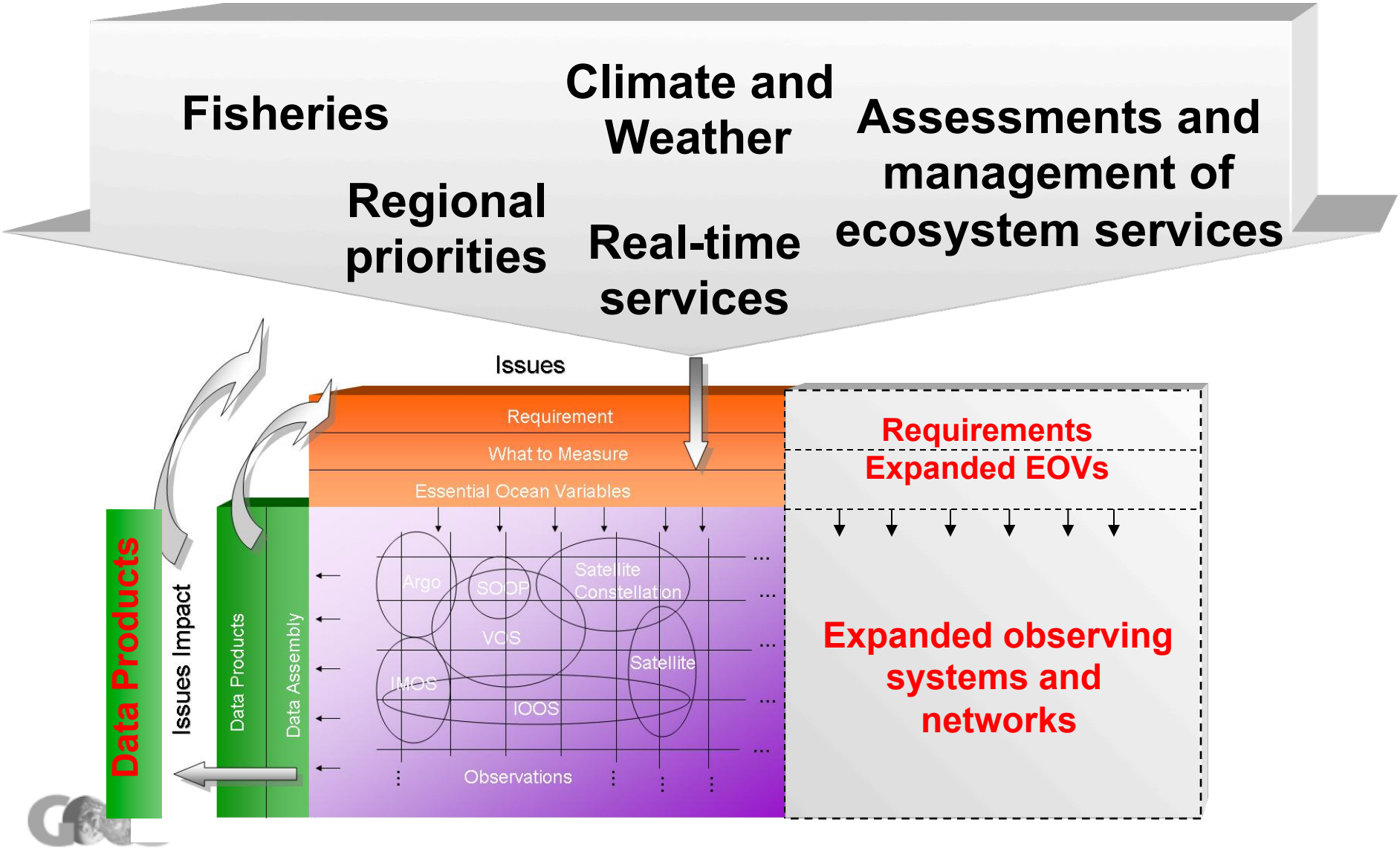


Towards a sustained system: requirements, observations, data management

Readiness

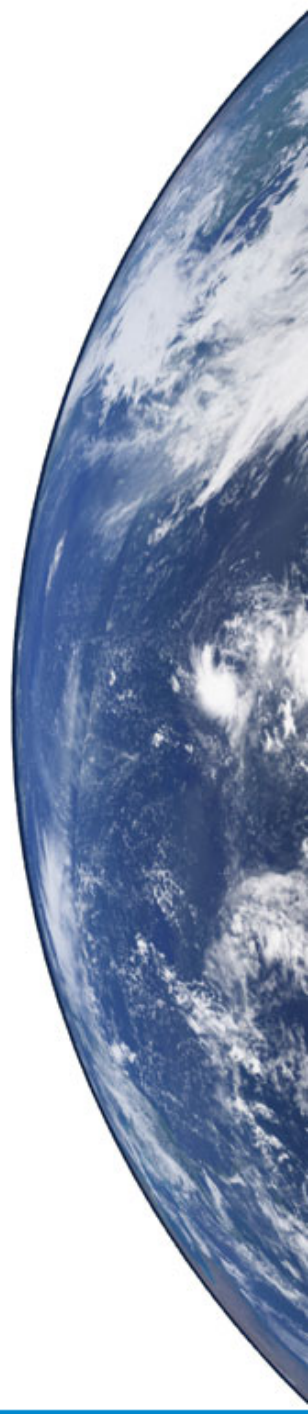


Extending Best Practice



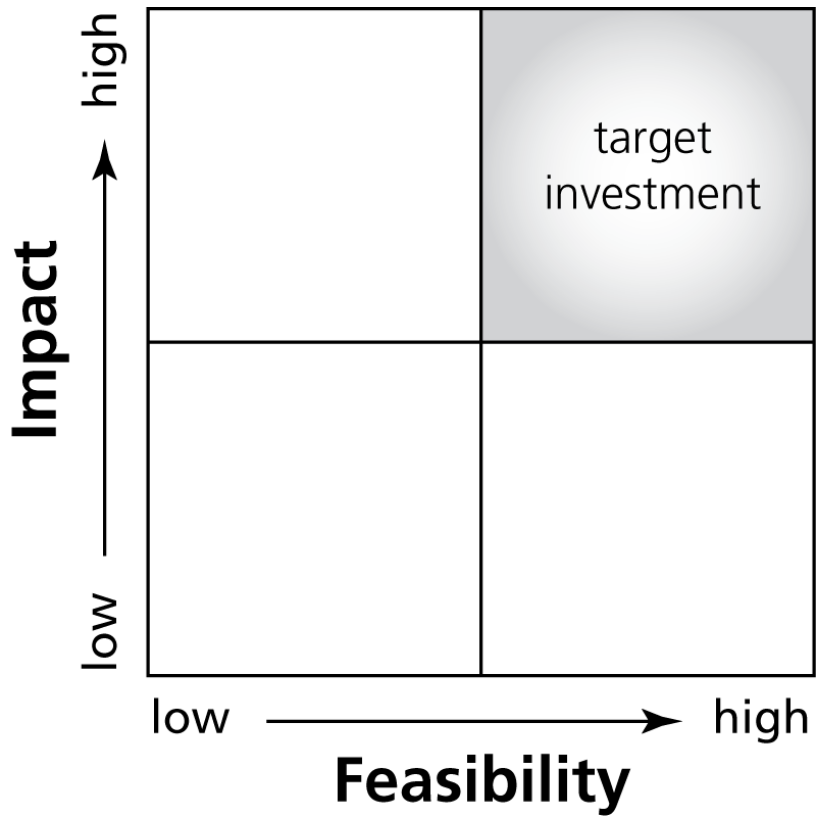
GOOS : Progress and Next Steps

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