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FURG

INSTITUTO DE OCEANOGRAFIA FURG

Laboratório de Ecologia do Ictioplâncton LEI - IO - FURG

Applying Ocean Sciences and Knowledge for Societal Benefit: Demands after Rio+20

Societal Benefit Demands Sustained Integrated Ocean Observations

We cannot manage what we do not measure

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- *Faced with challenges and needs for Ocean Sciences*

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Relevance of Ocean Sciences

- Demographics
  - ~ 40% of global population
  - 11 of the world's 15 largest cities
  - Population density predicted to > double by 2050
- Ecosystem Goods & Services
  - Valued at > $30 trillion (U.S. dollars) globally
  - Territorial waters & EEZs
    - Account for ~ 10% of the Earth's surface area, but
    - 30 – 40 % of goods & services
- Regulates Climate

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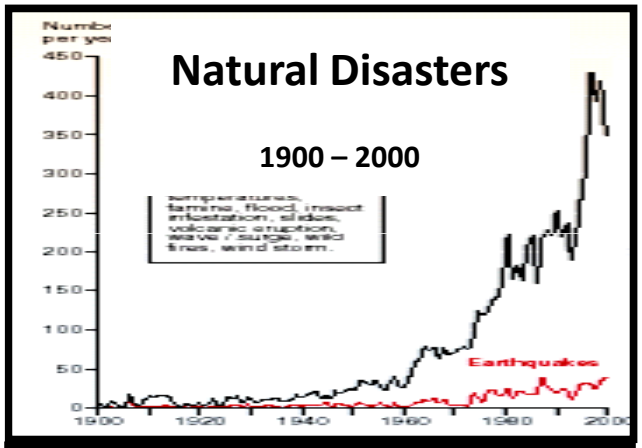
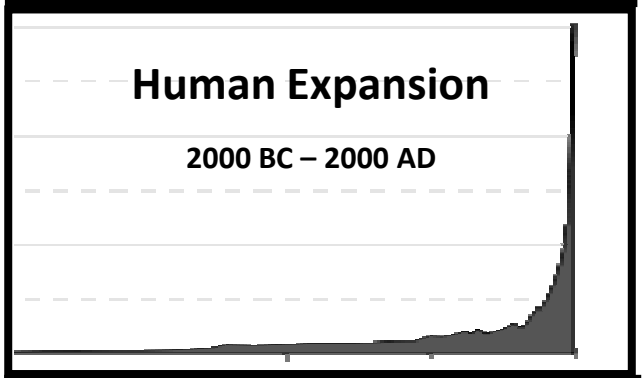
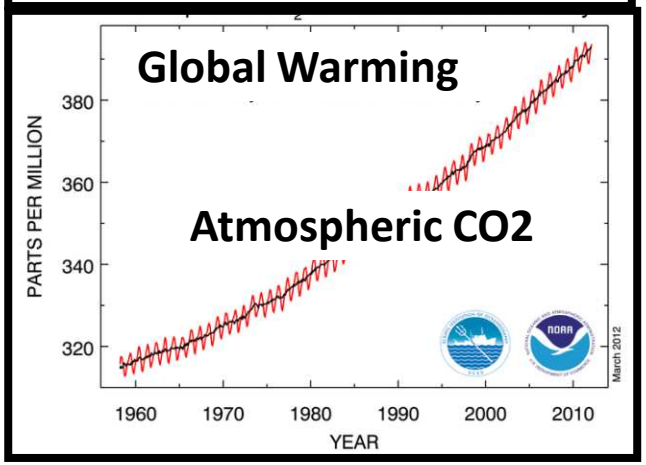
Coastal & Marine Ecosystems are CHANGING

Primary Drivers of Change







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Key Indicators of Pressures

Natural Disasters
Human Expansion
Global Warming

Drivers

Pressures

Sea level rise
Ocean acidification
Ocean warming
Extreme weather
Land – based inputs of pollutants
Industrialized fishing
Oil & gas extraction
Development of Renewable Energy
Basin scale migrations of large pelagic predators

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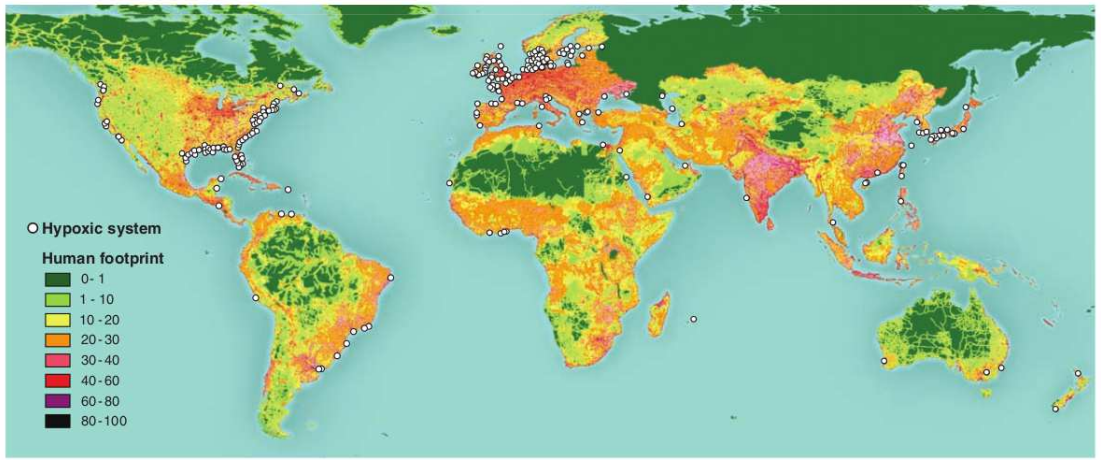
Key Indicators of States

Drivers

Pressures

States

Species diversity
Extent & conditions of essential habitats
Phytoplankton productivity
Number & size of “dead zones”
Distribution & abundance of toxic algal species
Distribution & abundance of enteric bacteria
Abundance & distribution of plankton indicators of ocean warming & acidification
Distribution, abundance & biomass of exploitable fish stocks
Abundance & migratory patterns of large pelagic predators



“dead zones”

Diaz e Rosenberg, 2008. Science

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Impacts of Changes Goods & Services

Drivers

Pressures

States

Impacts

- Resilience to Coastal Flooding & Erosion
- Food Security
- Uptake & Storage of Greenhouse Gases
- Water Quality
- Storage of Raw Materials
- Pharmaceuticals
- Tourism & Recreation
- Coastal infrastructure
- Aesthetic Value

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Drivers

Pressures

States

Impacts

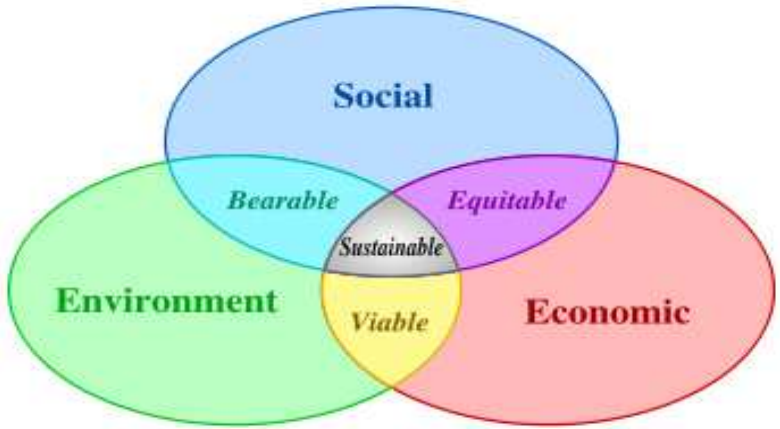
Responses

Traditional Response

Single Sector Planning & Management with Insufficient Regard for Interactions Among Sectors

Innovative Response

Call for Ecosystem – Based Approaches to Implementing Ocean Policies for Sustainable Development



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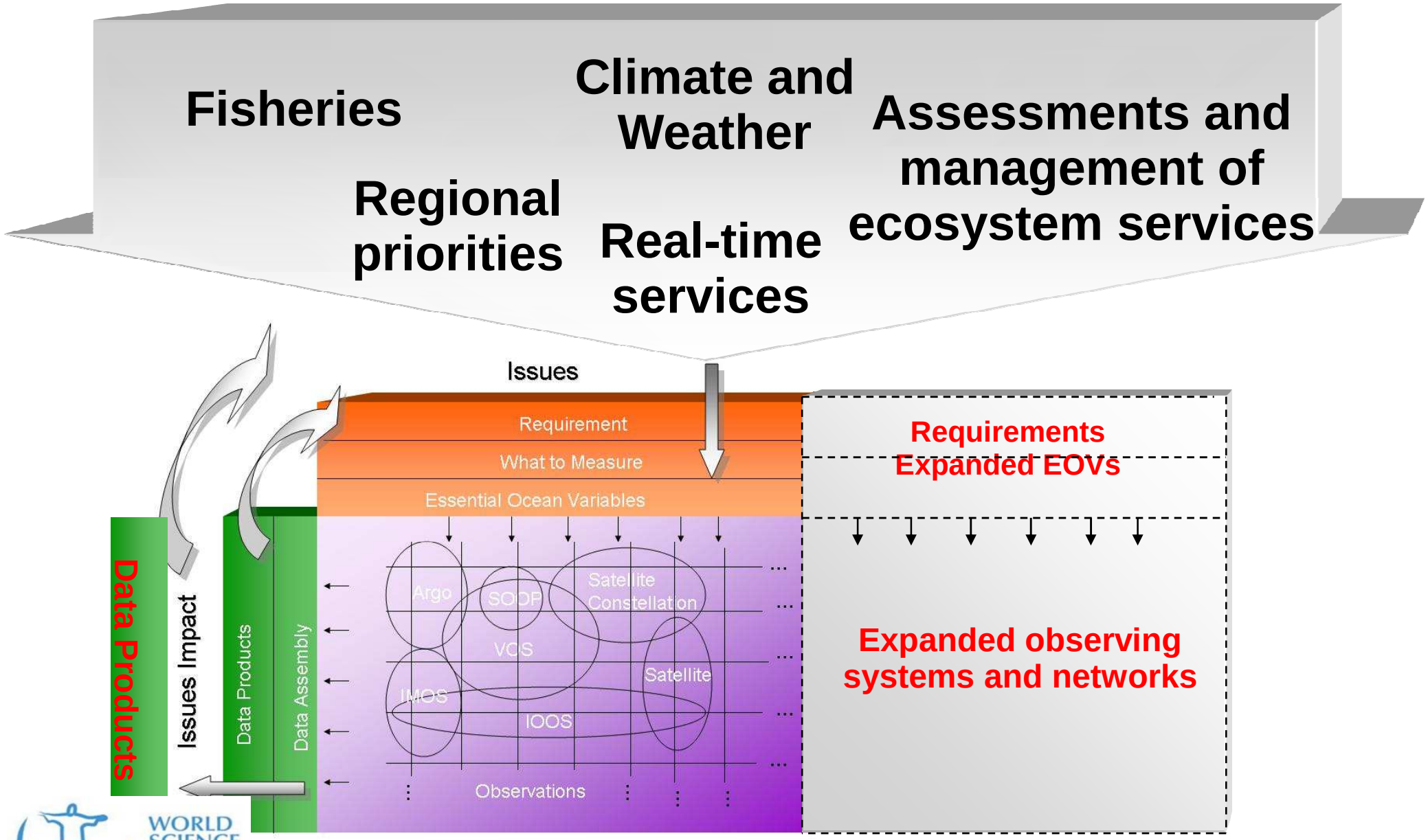
Societal drivers next decade

Framework for Ocean Observing (http://www.oceanobs09.net/foo/)



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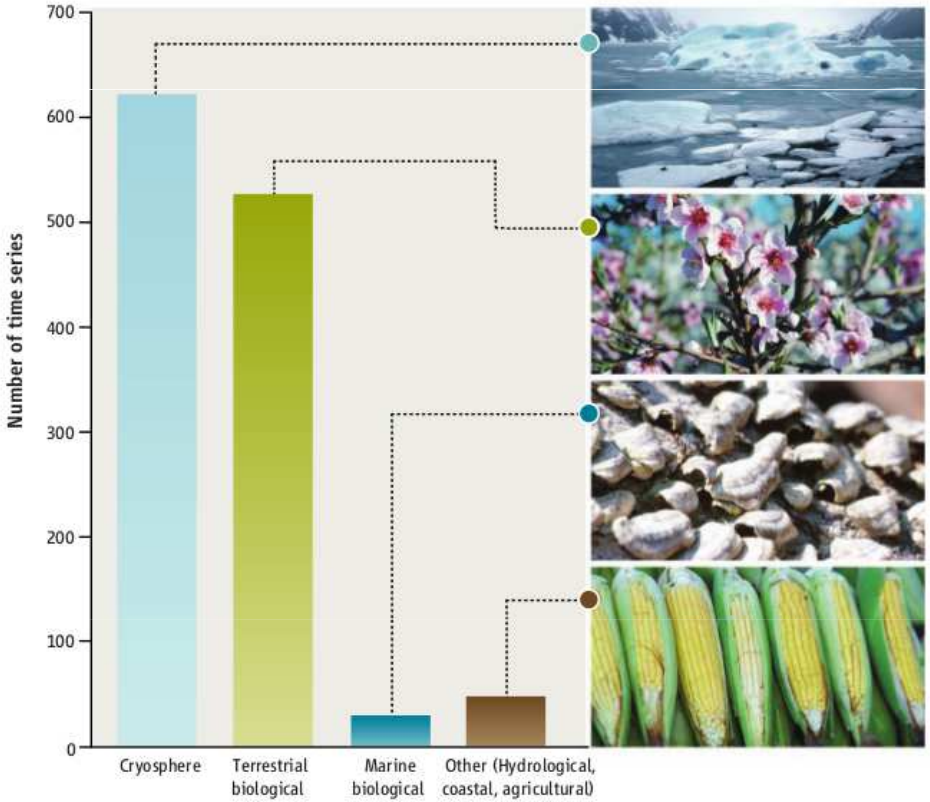
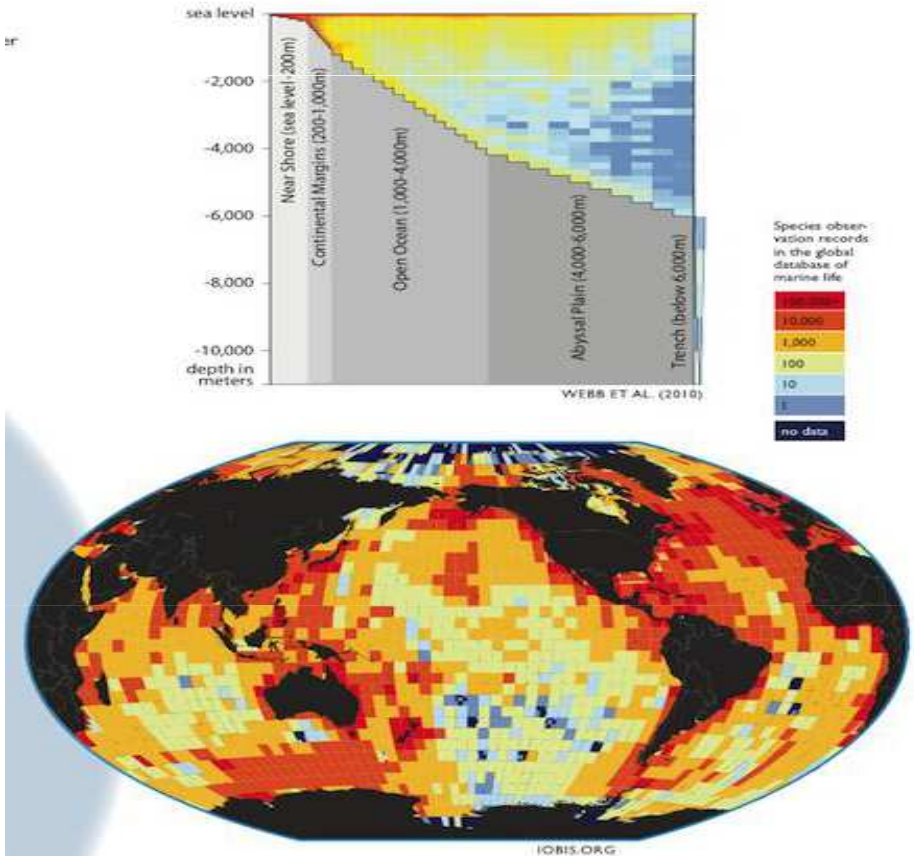
Sustained Observations & Modeling



Richardson e Poloczanska, 2008. Science.



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Sustained Integrated Observations & Modeling

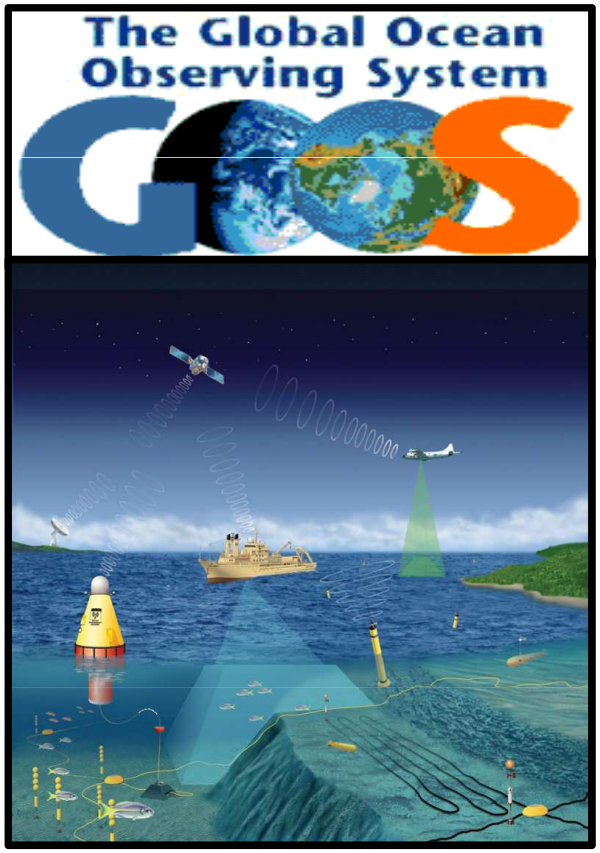
GOOS is primarily concerned with detecting and predicting the effects of climate change, natural hazards, & human expansion on the capacity of marine & estuarine ecosystems to provide goods & services.

Coastal GOOS

Human Expansion

IMPACTS

Marine Ecosystem Goods & Services



IMPACTS

Basin Scale GOOS

Climate Change
Natural Hazards
Marine Operations

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Applying Ocean Sciences and Knowledge for Societal Benefit: Demands after Rio+20

- The well-being of humankind is dependent on the health and function of the world ocean.

- Human expansion, global warming, and natural hazards are driving changes that jeopardize oceans.

- A sustainable “Blue-Green” economy and the ocean issues identified in the Rio+20 require the control and reversal of this degradation.

- To achieve this, a sustained global integrated ocean observation system is needed.

- Implementation of sustained integrated global ocean observations are a timely demand to support and maintain society benefits in our changing world.

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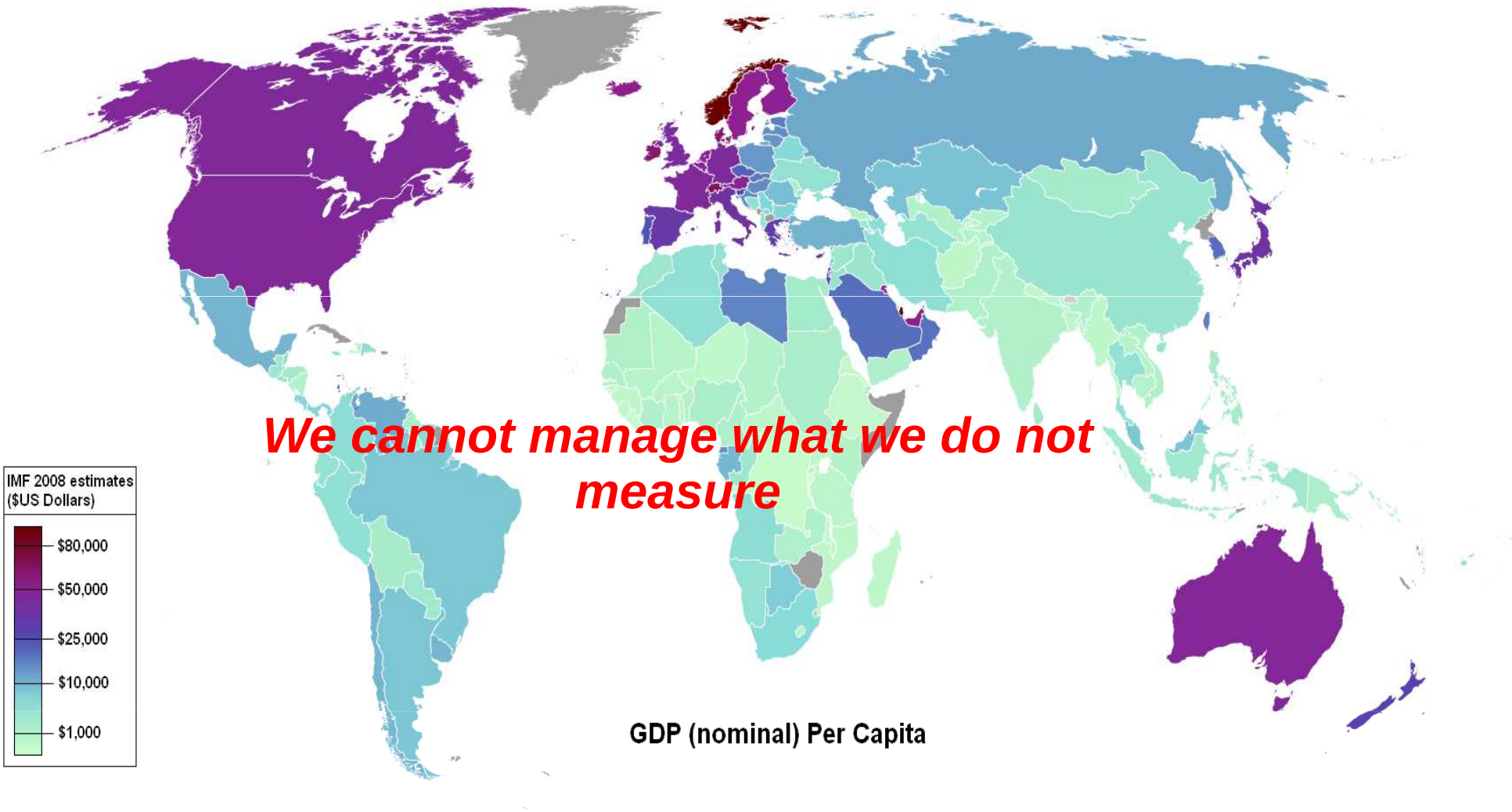

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Thank You!! ***Muito Obrigado!!***

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glynnAgnick.co.uk

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.