Future GEF-STAP Directions on Supporting Ocean Adaptation Efforts

CBD COP-10 Ecosystems and climate change pavilion

Oceans and coastal adaptation: emerging issues

GEF Scientific and Technical Advisory Panel Presentation
26 October 2010

UNITED NATIONS UNIVERSITY
UNU-INWEH

Scientific and Technical Advisory Panel

The Scientific and Technical Advisory Panel, administered by UNEP, advises the Global Environment Facility

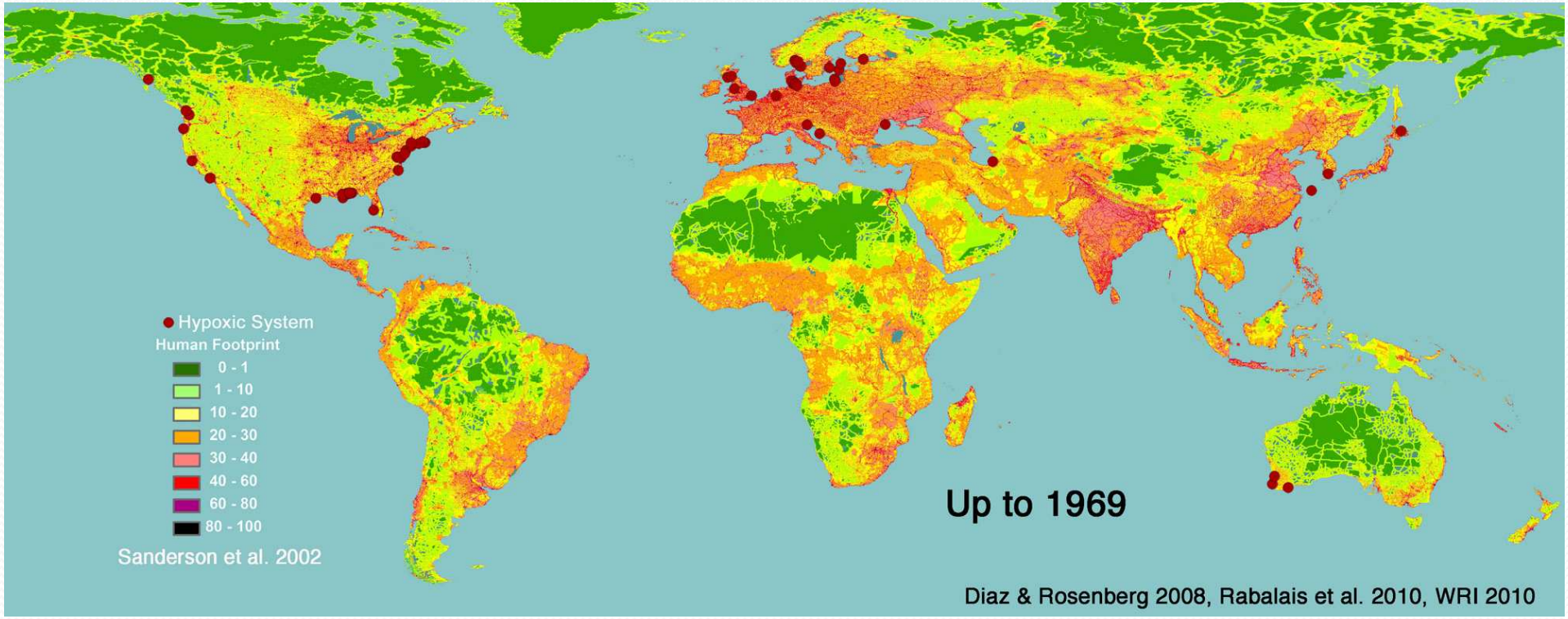
gef

UNEP

Coastal Hypoxia and Nutrient Reduction

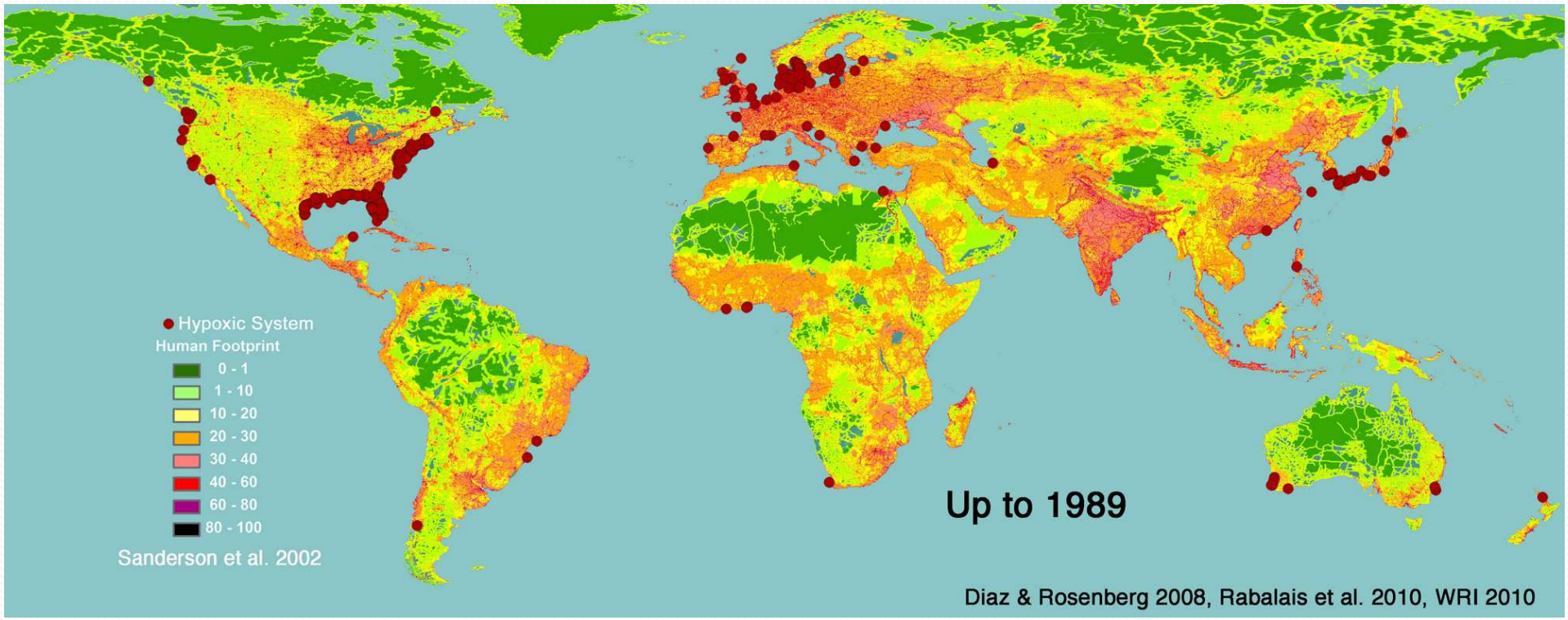
Coastal hypoxia

- Number of cases **doubled** every 10 years starting in 1960s.
- Up to 1969 there were **60** cases reported.



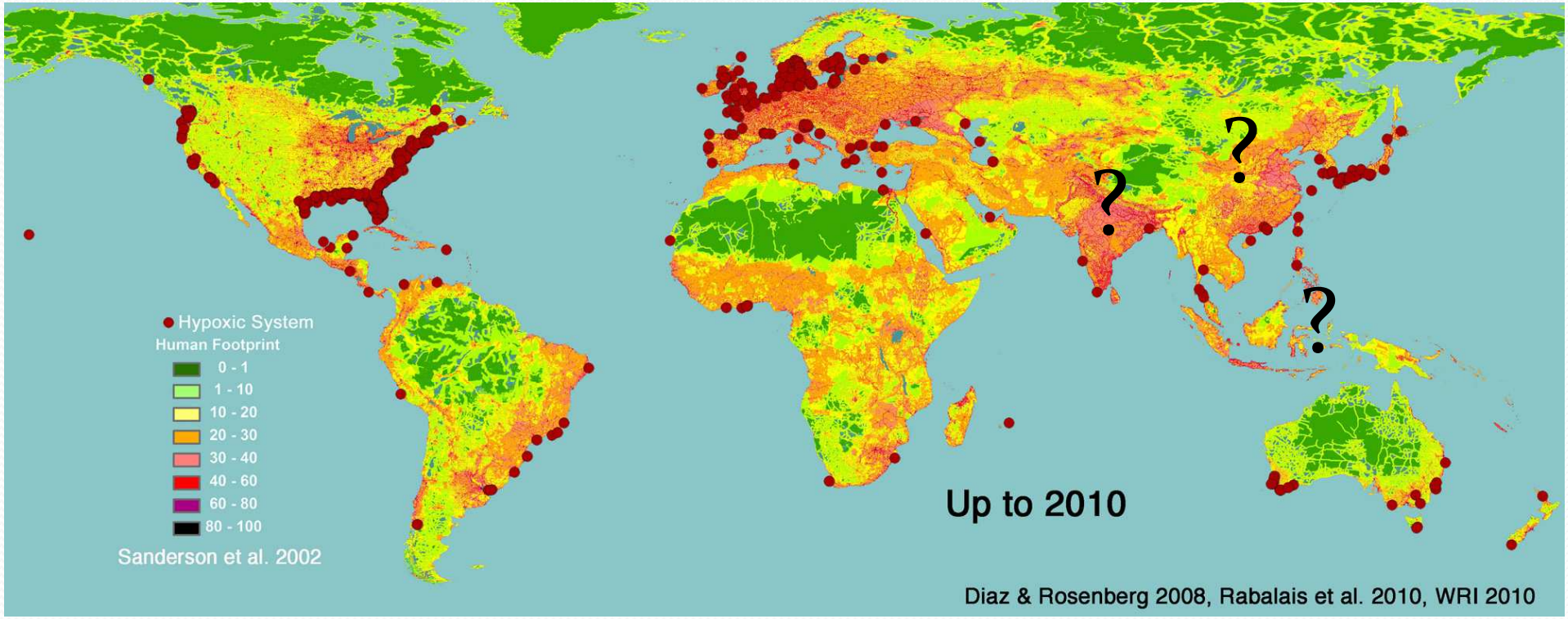
Coastal hypoxia

- 1980s had explosive increase in the number of hypoxic systems.
- Number of cases was **275** by 1989.



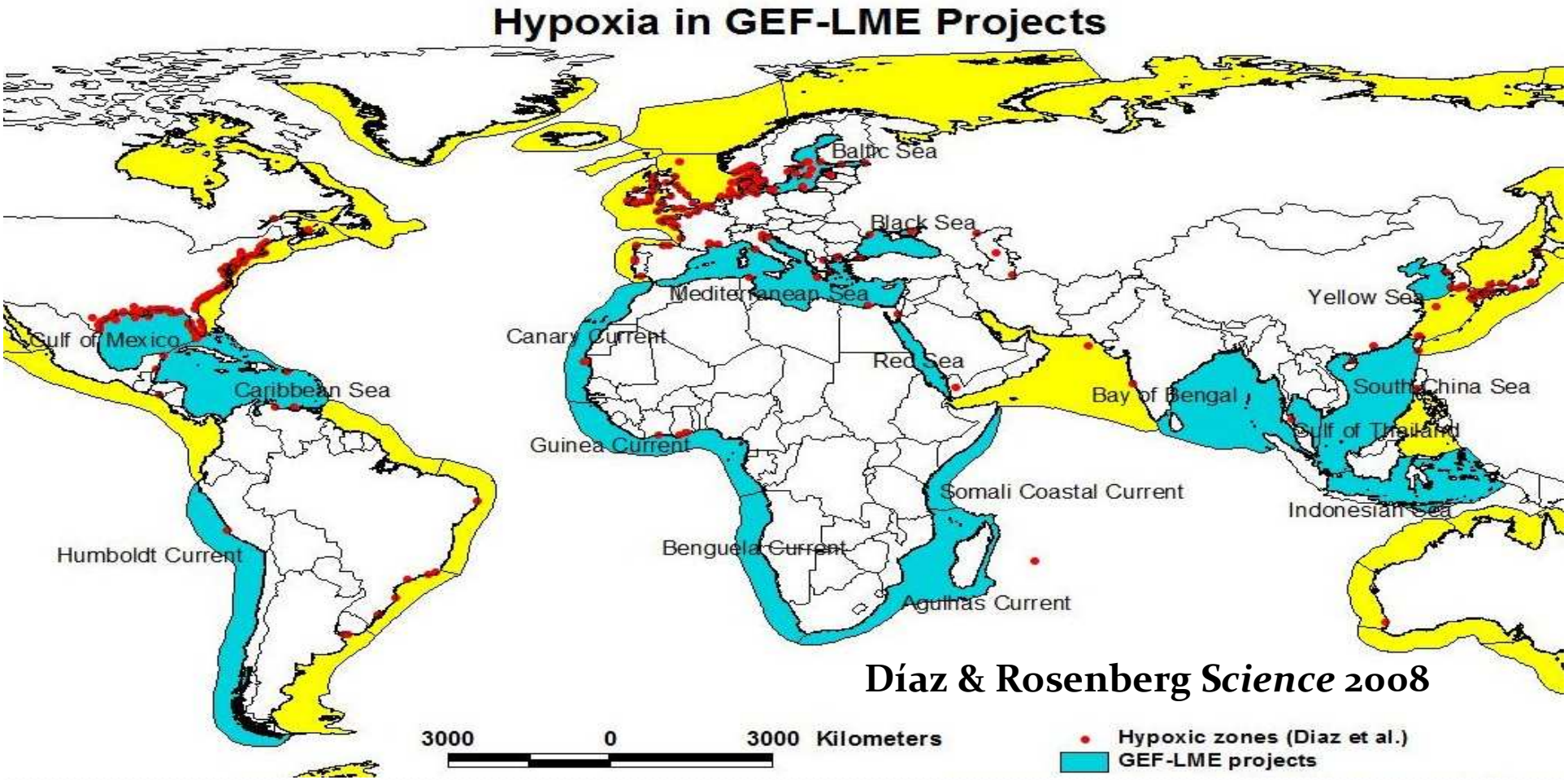
Coastal hypoxia

- By 1990s most estuarine and marine systems close to population centers had reports of hypoxia or anoxia.
- Number of cases is now **>500**.



Coastal hypoxia and GEF

- **Large Marine Ecosystem** projects cover many present and potential hypoxia cases
- In 2009, GEF's Scientific and Technical Advisory Panel (STAP) initiated **expert consultations.**



Key questions from GEF partners

- **National governments:** What can we do about **dead zones** and **fish kills**?
- **GEF Programs:** How is hypoxia related to **global nutrient cycle disruption**? What is "**good practice**" in reducing nutrients to prevent hypoxia?
- **UNEP***:* How can GPA's **Global Nutrient Management Program** accelerate coastal nutrient reduction?
- **FAO***:* How does hypoxia relate to **agriculture, aquaculture, fisheries & water programs**?
- **UNIDO***:* How can the **Green Industries Initiative** help nutrient reduction?
- **NGOs***:* Should hypoxia and nutrient reduction be **higher** on our agenda?
- **Researchers**: How can science help reduce hypoxia in the face of accelerating global environment and **climate change**?

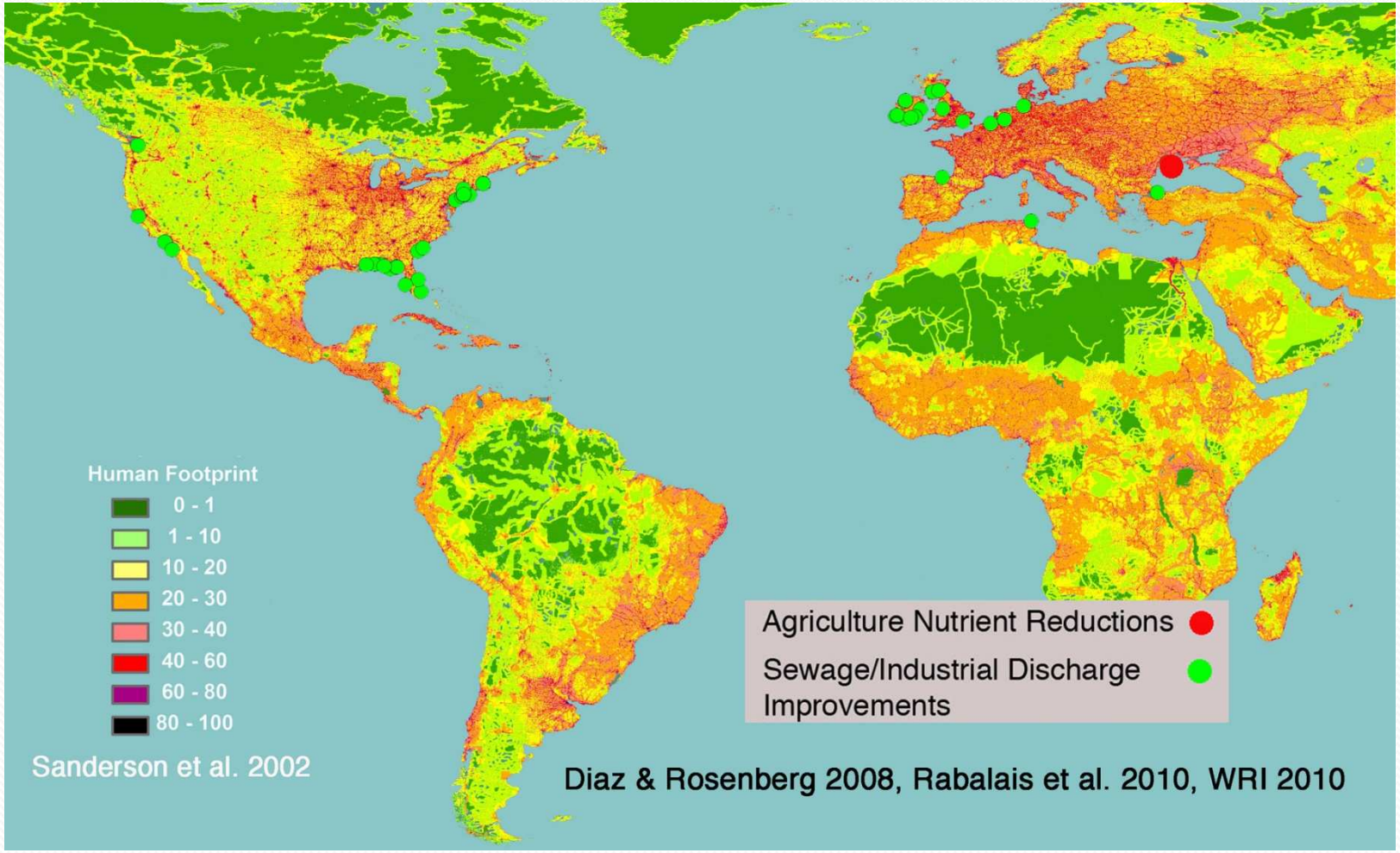
Solving coastal hypoxia

- **Prevention and long-term remediation can be achieved by reducing excess nutrients entering the sea from the land and atmosphere (especially N and P).**

- **Nutrient reduction requires:**
  - **Knowledge of local environmental conditions**
  - **Diagnosis of main nutrient sources**
  - **Integrated, cross-sectoral land & sea management.**

Reducing nutrients to treat hypoxia

Science-based evidence shows hypoxia can be prevented or remediated by reducing nutrient pollution.



Reducing nutrients to treat hypoxia

Nutrient pollution can only be reduced via **integrated** and **multi-sectoral** actions at appropriate scales.

Land-based enterprises must control excess nutrient output:

- **GEF has co-funded + $120 million USD in nutrient control projects.**
- **New ecosystem approaches highlight integrated solutions.**

Large coastal areas can be broken down into smaller sub-systems:

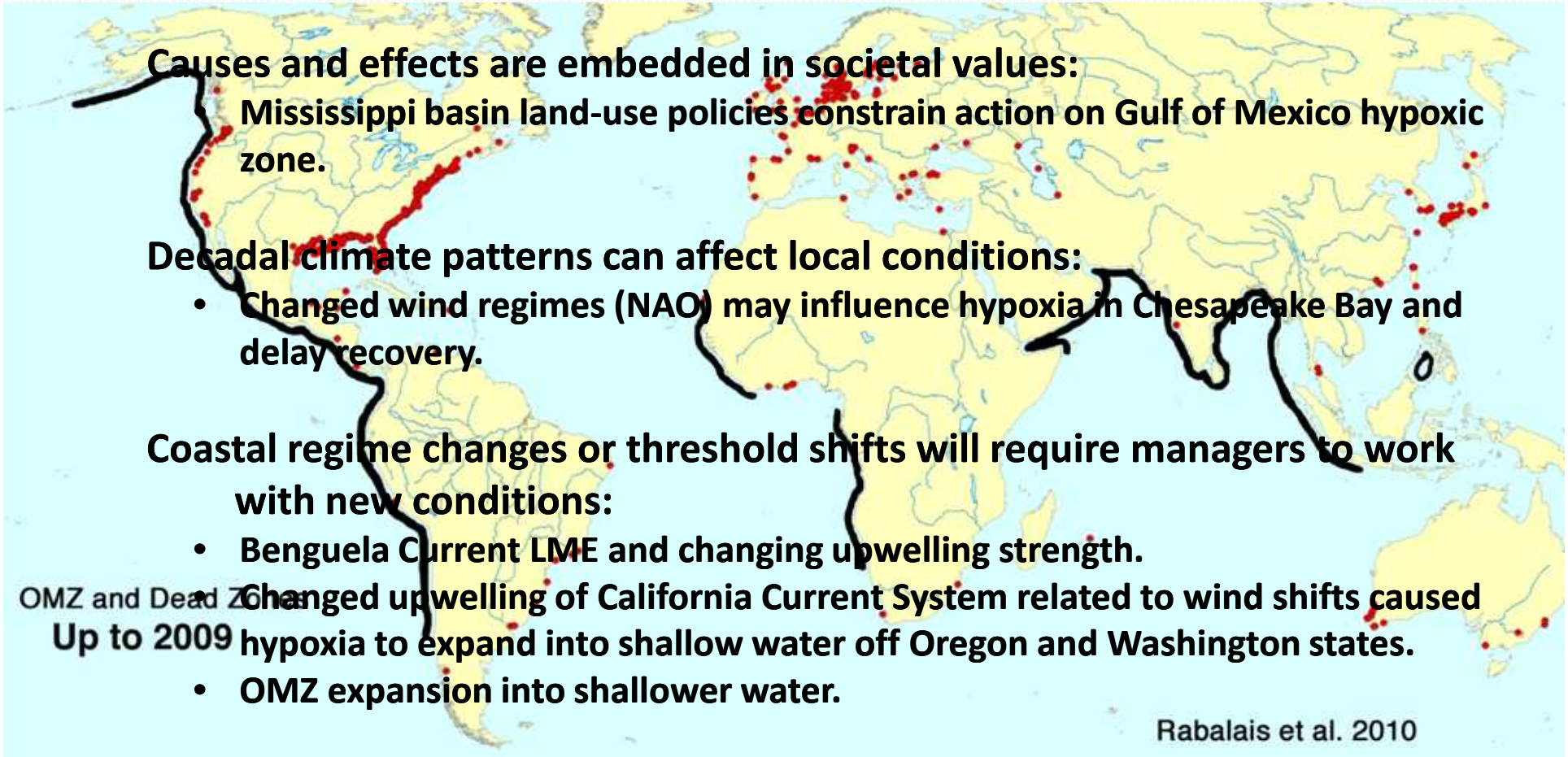
- **Smaller, shallower & brackish waters are easier to manage**
  - **e.g. Mersey Estuary (UK) or Hudson River (USA).**
- **Community-linked systems more likely to find a full range of feasible fixes.**

Prevention, diagnosis, monitoring & best practices tools available:

- **STAP is developing a resource guide to GEF, UNEP, FAO & PEMSEA tools.**
- **Outreach to society and new multi-sectoral partnerships needed.**

Reducing nutrients to treat hypoxia

Not all forms of hypoxia can be readily controlled but **case-specific knowledge** can clarify solutions.



Causes and effects are embedded in societal values:

- **Mississippi basin land-use policies constrain action on Gulf of Mexico hypoxic zone.**

Decadal climate patterns can affect local conditions:

- **Changed wind regimes (NAO) may influence hypoxia in Chesapeake Bay and delay recovery.**

Coastal regime changes or threshold shifts will require managers to work with new conditions:

- **Benguela Current LME and changing upwelling strength.**
- **Changed upwelling of California Current System related to wind shifts caused hypoxia to expand into shallow water off Oregon and Washington states.**
- **OMZ expansion into shallower water.**

Rabalais et al. 2010

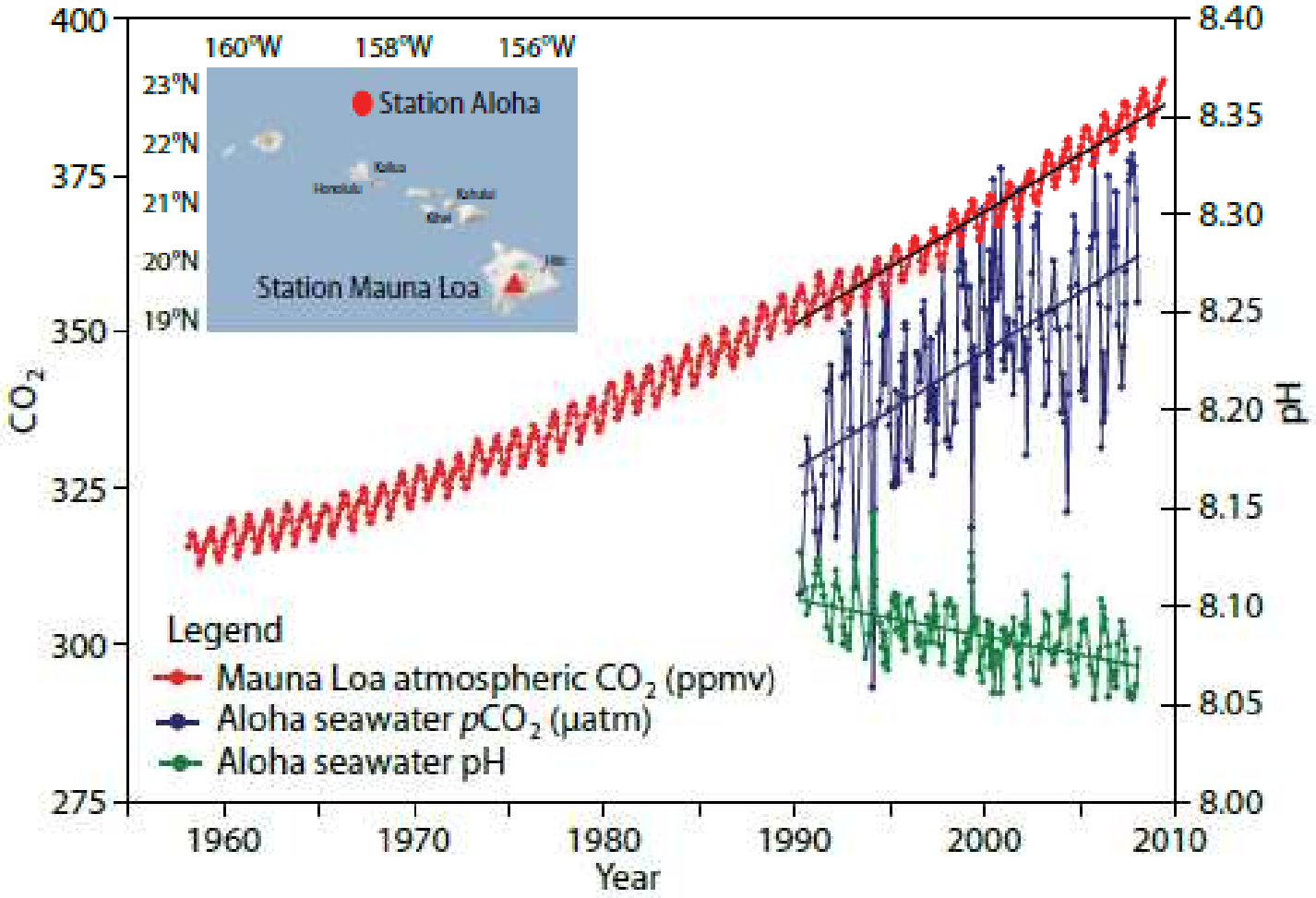
GEF-STAP Timeline & next steps

- **End of January 2011**
  - **STAP advisory document published & disseminated.**
  - **Web advisory toolkit including guide to management resources, science review, analysis of GEF LMEs and hypoxia.**
- **Mid-2011**
  - **Expansion of advisory toolkit for GEF partners, including indicators, diagnosis and monitoring guides.**
- **Under development:**
  - **Communication strategy to reach out to new partners.**
  - **Linkages with GPA's Global Nutrient Management Project.**
  - **Possible GEF Targeted research (TR)**
  - **Follow-on STAP Project: Global Foundations for Reducing Nutrient Enrichment and Oxygen Depletion from Land-Based Pollution, in Support of Global Nutrient Cycle.**
- **Official STAP site: http://www.unep.org/stap/**

PRODUCT TYPE	CONTENTS
SYNOPSES	**•Advice for decision makers (4 pp)** **•*Reducing coastal hypoxia …* (30 pp)**
GUIDES	**•Guide to resources on nutrient reduction , integrated coastal and water resources management*** •Indicators, data needs* •Hypoxia decision tree and tools for project managers
BACKGROUND DOCS	**•Evidence-based science summary*** **•Survey of hypoxia in GEF LME projects*** **•Case studies*** •Bringing in hydrology models
COMMS & OUTREACH	**•Reports of Expert Consultations I & II** **•STAP website materials** **•Message map** **•Clearing house for outreach** •Links with agriculture sector

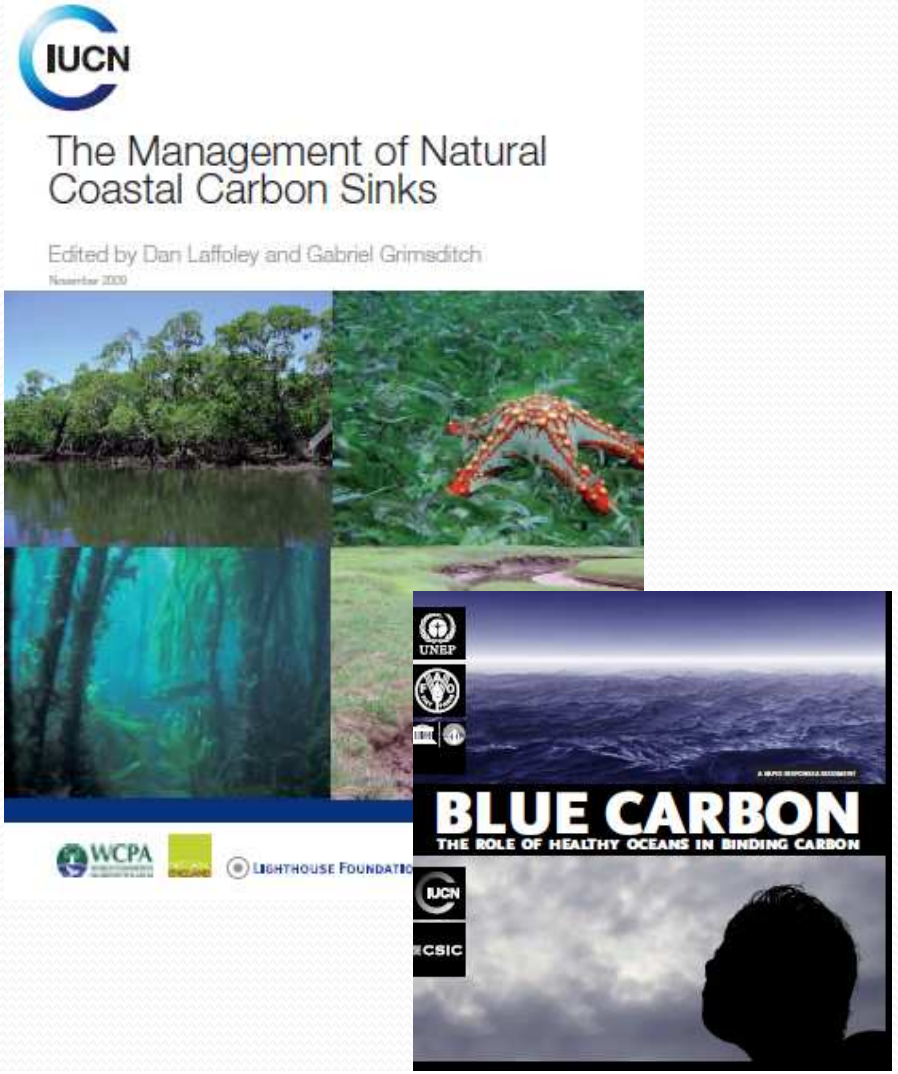
Restoring Healthy Oceans

Ocean acidification – the other carbon problem



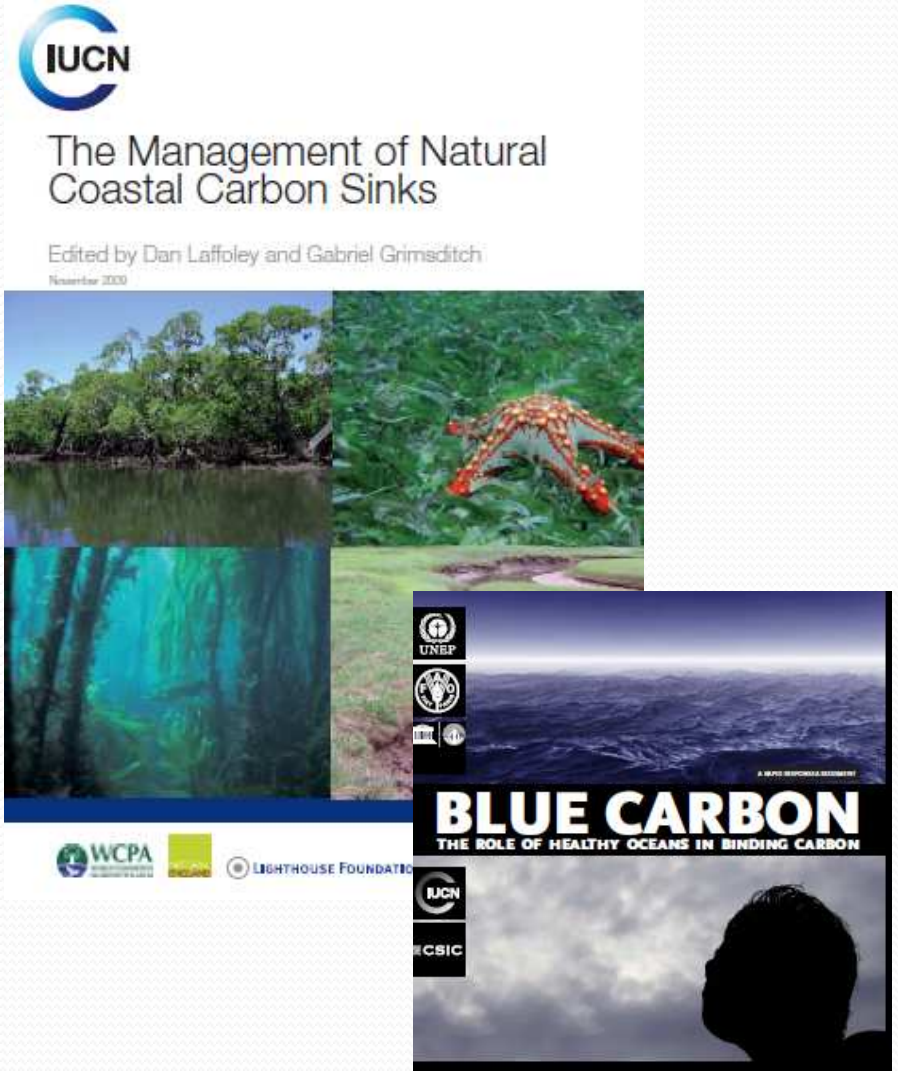
Restoring Healthy Oceans

- Magnitude of restored/healthy oceans to function as carbon sinks (or not) while enhancing or, at worst, not compromising the biodiversity and ecosystem services of the oceans.
- 2011-12: in collaboration with IUCN, UNEP, to extend coastal assessments to open ocean carbon sinks.



Restoring Healthy Oceans

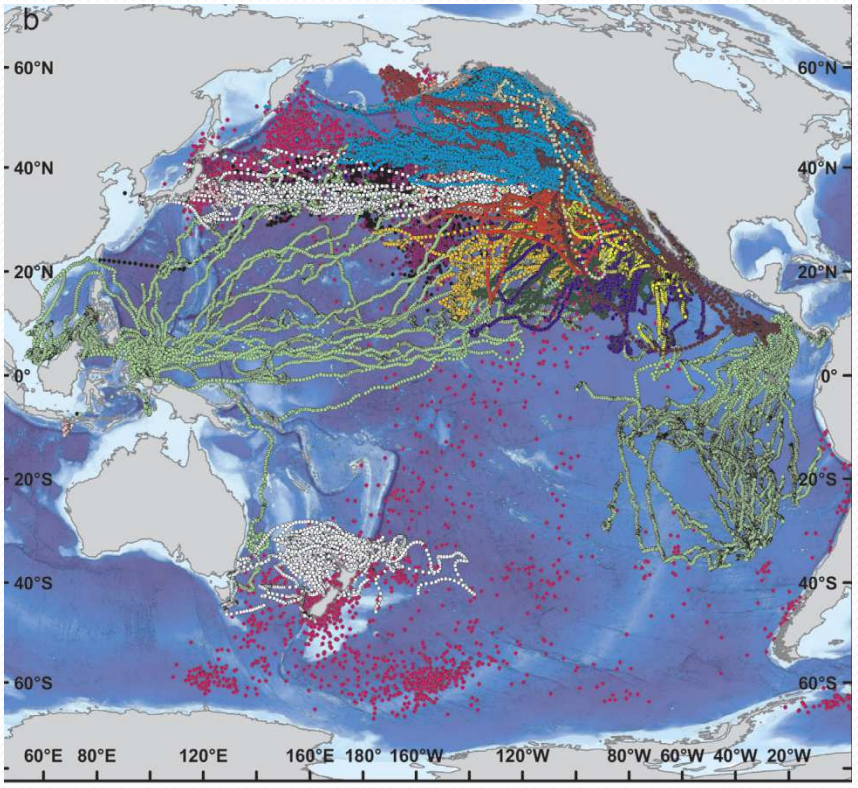
- What are the best options for GEF interventions?
  - mangrove replanting?
  - reducing hypoxic zones?
  - geoengineering options?
  - Etc?
- What will be the co-benefits including restoring fish and shellfish stocks?



Protecting Marine Biodiversity in Areas Beyond National Jurisdiction

GEF-5 Program

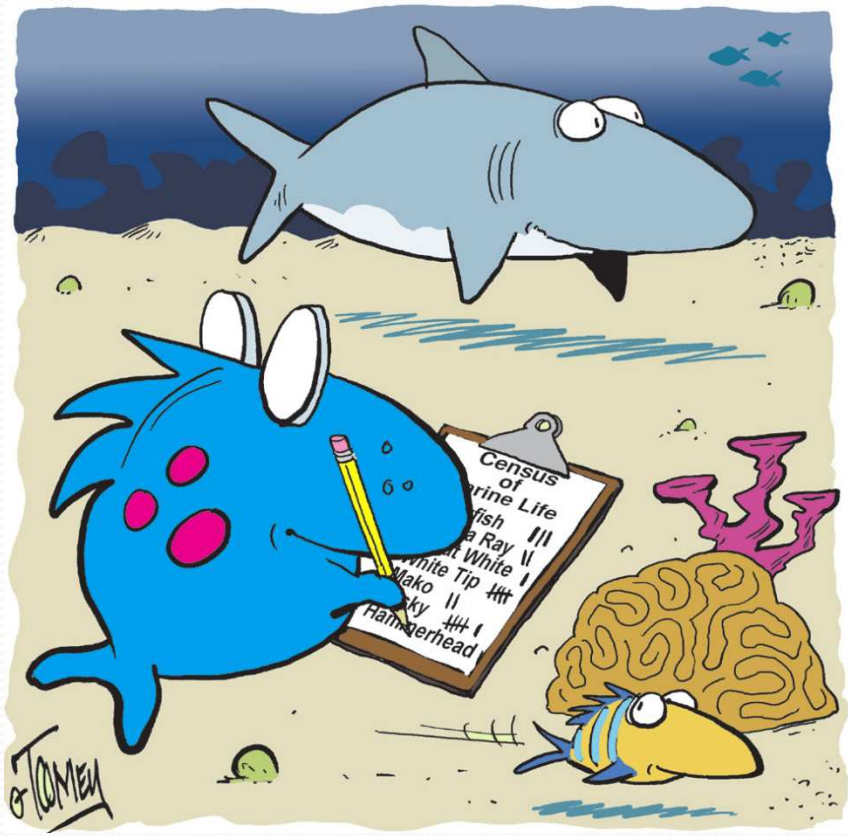
- Global Pilot program on protecting marine biodiversity in areas beyond national jurisdiction
  - 64% of ocean areas are beyond national jurisdictions.
  - CBD COP Decision IX/20 addresses criteria for marine protected areas in ABNJ.



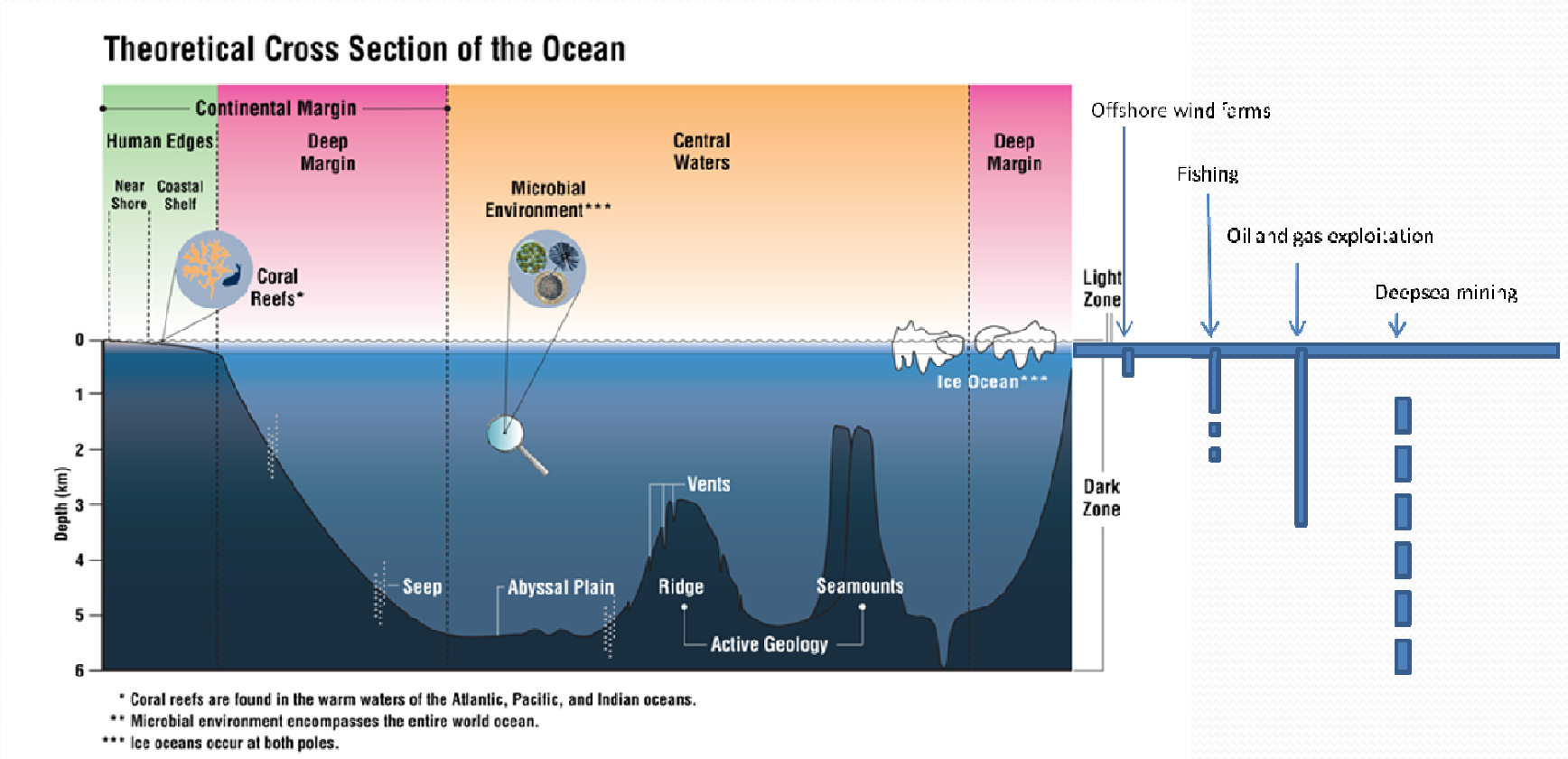
Census of Marine Life 2010: Ocean highways revealed by Tracks of tagged animals

Marine biodiversity

- Census of Marine Life results
  - 230,000 marine species known, 1million species estimated
  - Microbes (90% of ocean biomass) may have 1 billion kinds
  - Oceans richer in marine biodiversity than expected, and more impacted by humans.



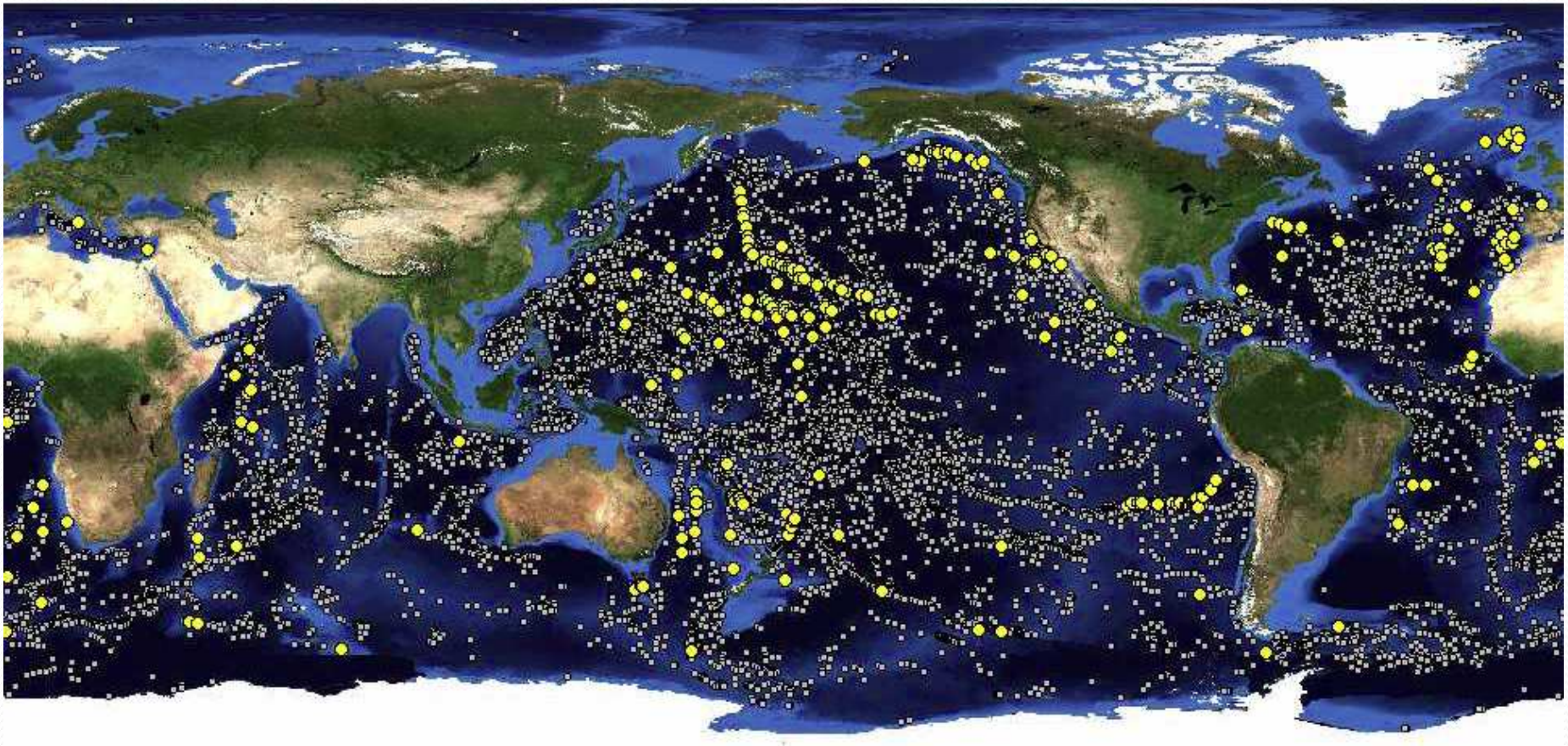
Ocean exploitation reaches new depths



Source: Census of Marine Life & Williams et al PLOS Biology 2010

More than 50,000 seamounts

- <1% sampled, <0.1% surveyed in detail



Seamounts increasingly fished