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
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.

Diaz & Rosenberg 2008, Rabalais et al. 2010, WRI 2010
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**.

Díaz & Rosenberg Science 2008
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)

- **Official STAP site:** [http://www.unep.org/stap/](http://www.unep.org/stap/)
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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, 1 million 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