

INMS Plenary Meeting

Session 2: Sharing the INMS vision and baseline activities

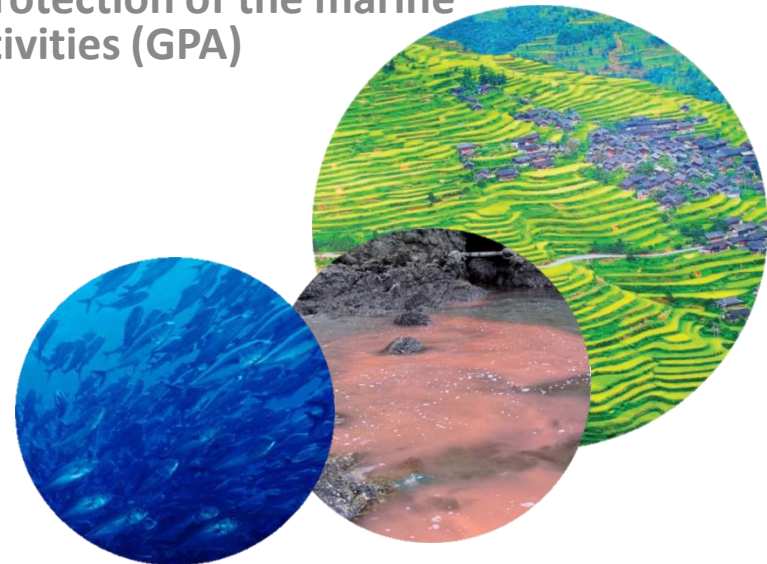
Outcomes from relevant GEF projects, including the
**Global foundations for reducing nutrient
enrichment and oxygen depletion from land based
pollution, in support of Global Nutrient Cycle**

(UNEP/GEF Global Nutrient Cycle Project)

UNEP Global Programme of Action for the protection of the marine
environment from land-based activities (GPA)

Dr. Christopher Cox
Programme Officer

Lisbon, 27-28 April 2015



About the GEF-GNC Project



Building the knowledge-base for improved nutrients management

- **GEF-Global foundations for reducing nutrient enrichment and oxygen depletion from land based pollution, in support of Global Nutrient Cycle (GNC Project)**
 - US\$4.1 million from GEF International Waters (1.7 million from GEF; 2.4 million co-financing from partners)
 - **Under implementation**
 - **GPNM technical partnership support**
- **Component A:** Strengthen the Global Partnership on Nutrient Management; play leadership role for driving the agenda
- **Component B:** Scientific analysis of relationships between nutrient sources and impacts to guide decision making on policy and technological options
- **Component C:** Establish scientific, technological and policy options to improve policies in LMEs and support national strategy development
- **Component D:** Develop nutrient reduction strategies through the application of quantitative source-impact modeling and best practices (Manila Bay watershed, Philippines; Chilika Lake, India)



About the GEF-GNC Project

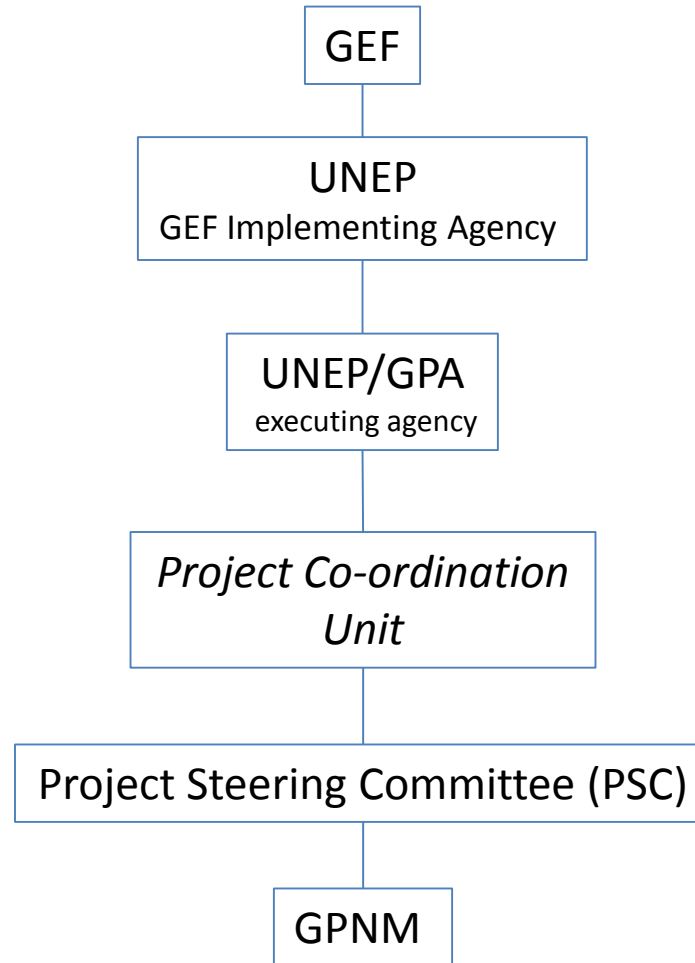
Project objective

- *provide the foundations (including partnerships, information tools and policy mechanisms) for governments and other stakeholders to initiate comprehensive, effective and sustained programmes addressing nutrient over-enrichment and oxygen depletion from land based pollution of coastal waters in Large Marine Ecosystems.*



About the GEF-GNC Project

Project governance arrangements



About the GEF-GNC Project

Partners and information flows by component

Component A: Global Partnership on Nutrient Management addressing causes and impacts of coastal nutrient over-enrichment and hypoxia

Component lead



Component B: Quantitative analysis of relationship between nutrient sources and impacts to guide decision making on policy and technological options

Component lead



Modelling outputs

Policy and field mgmt best practice tools

Component C: Establishment of policy, technological options, integration of the policy toolbox with modeling component, training of experts etc

Component lead



Lessons learnt

Component D: Development of nutrient reduction strategies through the application of nutrient source-impact modeling and analysis and best practice measures and options in the Manila Bay watershed

Component lead



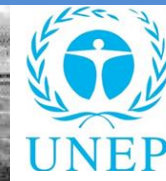
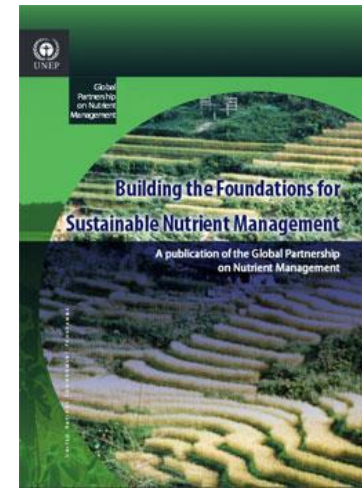
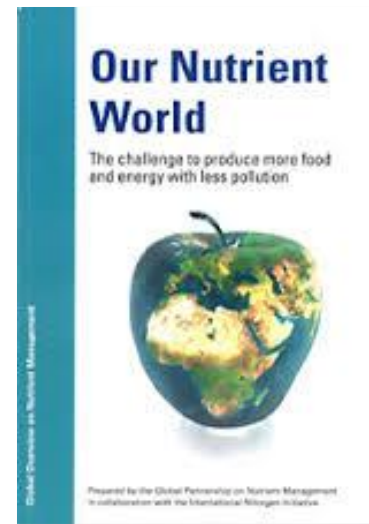
Component A

Global Partnership on Nutrient Management addressing causes and impacts of coastal nutrient over-enrichment and hypoxia

- **Global partnership of stakeholders actively engaged in addressing nutrient over-enrichment in coastal waters**
 - Engage international and regional fora to promote the GPNM /seek new members
 - Over 40 Partners engaged; research academia, government, private sector
 - Communications and outreach strategy **under development**
 - Publish and disseminate an advocacy manual on **Effective Nutrient Management; Our Nutrient World**
 - Engage with other GEF LME projects e.g., BOBLME - **underway**
 - Develop and maintain partnership (and project) web-based knowledge platform – **site up and running**



GPNM Steering Committee, December 2014



The Nutrient Challenge portal: <http://www.nutrientchallenge.org/>



Global Partnership on Nutrient Management

HOME ABOUT GPNM GNC PROJECT NEWS & EVENTS INFORMATION OPPORTUNITIES CONTACT

The five key threats of too much or too little nutrients

Our Nutrient World and the five key threats of too much or too little nutrients

[Read More](#)



NEWS ITEMS

Global News Data available

Using version 2 of the Global NEWS model, modeled river nutrient exports to the coast and inland (endorheic) drainages are now available.

[read more](#)

Advancing 4R Nutrient Stewardship Knowledge in Support of Crop Production Intensification in Ethiopia

A joint IPNI/IFA Initiative on advancing 4R Nutrient Stewardship knowledge was launched at the

PUBLICATIONS

Framework Code for Good Agricultural Practice for Reducing Ammonia Emissions



This is the "Framework Code for Good Agricultural Practice for Reducing Ammonia Emissions" by the Economic Commission of Europe (ECE) Long-range Transboundary Air Pollution (LRTAP), Task Force on Reactive

TRANSLATE

Select Language

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[join us](#)

BMP Database

Searchable categories

Ammonia Control	Conservation Buffers	Conservation Covers
Drainage Control	Erosion Control	Grading Management
Irrigation Management	Manure Management	Nutrient Management
Retention Management	Land Use Conversion	Nutrient Cycling
Shoreline Erosion Control	Wetland Creation/Restoration	

Urban BMP Categories:


Detention	Filtration	Infiltration
Septic Management	Shoreline Erosion Control	Urban Erosion Control
Urban Streams	Urban Wetland Restoration	Creation/Restoration

BMPs Search Template

Sector Type: [dropdown]
BMP Category: [dropdown]
Climate Zone: [dropdown]
Text Search: [input]
Search [button] Reset [button]

Agricultural Waste Composting

Category: Nutrient Recycling
Practice Type: Management
Landuse/Agriculture Type: Row Crop, Fodder, Rice
Climate Zones: Temperate, Tropical, Semiarid
Regions: North America, South Asia, Europe
Pollutants Treated: Nitrogen, Phosphorus, Sediment



Description: Agricultural waste products (unused portions of crops or waste products from processing) including have the potential to contribute nutrients and should be managed in a manner that prevents nutrient contamination to surface and ground waters. Consideration should be given to the amount of raw waste generated, the nutrient content of the waste product, and recognition that nutrient loading depends on the way in which the waste is handled after harvest. Most vegetable waste, such as sweet corn fodder, cut ears and stalks can be used as a green manure by plowing it to production fields.

Scalable to small farms? Yes

Alternative Tile Intakes: Perforated Risers

Component A

Global Partnership on Nutrient Management addressing causes and impacts of coastal nutrient over-enrichment and hypoxia

- **Inform GEF projects, countries and stakeholders about the importance of nutrient over-enrichment and hypoxia, including economic and environmental costs**
 - Support to Regional nutrient platforms – Caribbean, Asia, Africa in progress
- **Ensur access to continued guidance and support for the development of nutrient reduction strategies (this will be implemented with inputs from Component B & C)**
 - Hold training workshops with the participation of IW Learn and GEF projects - **ongoing**
 - Establish a Community of Practice based on eXtension agricultural services – **in planning**
 - Replication and upscaling - Guidelines, tools and data for nutrient impact analysis - **ongoing**



Launch of the Caribbean nutrient platform, Trinidad & Tobago, 2013

Policy database – 28 case examples to date

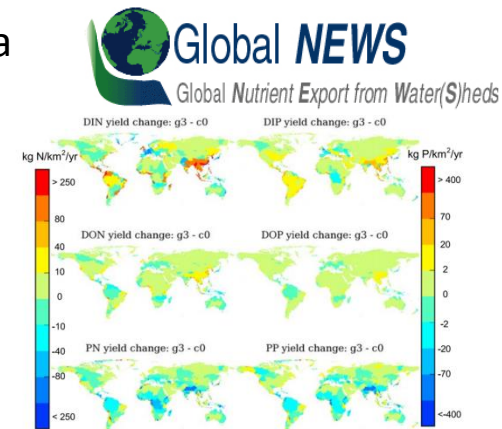
The screenshot shows a web-based policy database interface. On the left, there is a 'Policies Search Template' section with various search criteria. On the right, there is a 'Searchable categories' section with a dropdown menu for 'Policy Type' and a list of categories including 'Ecosystem Restoration & Rehabilitation', 'Environmental Outreach & Education', 'Institutions and Capacity', 'Market-Based Instruments', and 'Regulatory Approaches'. Below this, a 'Policy examples' section displays a detailed entry for the 'Chesapeake Clean Water Fund', including its category, region, and a brief description of the fund's purpose and impact.



Component B

Quantitative analysis of relationship between nutrient sources and impacts to guide decision making on policy and technological options

- **Overview of existing tools for source-impact analysis of nutrients in LMEs and their target audiences - completed**
- **Global database development with documentation of data on nutrient loading and occurrence of harmful algal blooms, hypoxia, and effects on fish landings, fish abundance, and composition of fish populations.**
 - Data Base: Global-Nutrient Export from Watersheds (NEWS) data for river nutrient export - **completed**
 - Data base: Nutrient release from aquaculture - **several publications available**
 - Global database development with data on coastal conditions, non-land based nutrient sources, as well as coastal effects - **in progress and will be completed 2015**
 - Synthesis report and maps on occurrences of hypoxia and harmful algal blooms - **ongoing**
 - Synthesis report “impacts on fisheries” based on data and model output from regions - develop relationships between fishery production and potential controlling variables and hypoxia - **ongoing**



Component B

quantitative analysis of relationship between nutrient sources and impacts to guide decision making on policy and technological options

- **Nutrient impact modeling for global and local to regional nutrient source impact analysis**
 - Assessment of effects of nutrient loading in coastal marine ecosystems
 - Analysis and maps of past, current and future contributions of different nutrient sources, forms and ratios in watersheds to coastal effects.
 - All activities are ongoing to be completed by September 2015
- **Development of regional models for the Manila Bay watershed of coastal effects**
 - Data assembly for the Manila Bay watershed
 - High resolution river export model for Manila Bay rivers
 - Ecosystem model for Manila Bay
 - Validation of models and development of a summary model for Manila Bay
 - most outputs available by October 2015
- **Contribution of component B modeling and analysis outcomes to policy tool development (component C) - by September 2015**
- **Regional, national scientists, policy experts, trained in using nutrient source-impact modeling, analyzing nutrient reduction policies.**
 - Training - preliminary scheduled for IWC8 VN late 2015
- **Nutrient source-impact guidelines and user manuals for integrated eutrophication assessment and nutrient criteria development - To be developed**



Source: PRMSEA



Component C

establishment of scientific, technological and policy options to improve coastal water quality policies in LMEs and national strategy development

- **Production of a fully operational 'policy toolbox' and delivery of the training.**
 - draft BMP toolbox, synthesis online, 25 cases available. Basis for training at Lake Chilika. **Planned training activity for June 2015**
- **Replication and up-scaling of BMPs, measures etc. through training workshops; up-scaling strategy**
 - **Based on WRI visit to Manila Bay and the Chilika training, this will be completed shortly thereafter.**
- **integration of component Policy Tool Box with Component B (training-demonstration-type activity)**
 - **To be delivered at IWC8 - November 2015**
- **Holding of 2-3 training session during the GEF International Waters Conference and other global meetings of nutrient relevance**
 - **To be completed at the IWC - Oct/Nov 2015.**




GNC Project Toolkit

Technical and policy applications

- The tool includes
 - Case studies of BMP examples that are being implemented around the world by key partners
 - 23 in database
 - agricultural BMPs and urban BMPs;
 - in total about 100; categorized into 14 groups, with some tagged to multiple categories. The database is searchable
 - policy database
 - 28 case examples; 7 categories
 - possible to search the database by region and sector



Case Studies – 23 to date; provide BMP examples that are being implemented around the world by key partners



Toolbox

Global Partnership on Nutrient Management

Home Learn Resources **Toolbox** Gallery News & Events About GPNM

Resources

Case Studies

The case studies listed in this section provide BMP examples that are being implemented around the world by key partners including:

- International Plant Nutrition Institute (<http://www.ipni.net/>)
- American Society of Agronomy (<https://www.agronomy.org/>)
- Conservation Technology Information Center (<http://www.ctic.purdue.edu/>)
- Millennium Challenge Corporation (<http://www.mcc.gov/>)
- Winrock International (<http://www.winrock.org/>)

The documents identify the region, cropping systems and approach for implementation and list specific BMPs in the toolbox.

Please click on the PDF to download your case studies of interest.

For more information on any of the cases please contact Chuck Chaitovitz with GETF at chuckc@winrock.org

Payment for Ecosystems Service

Name: Payment for Ecosystems Service

GLOBAL PARTNERSHIP ON NUTRIENT MANAGEMENT

BMP Case Study

Overview

Name: Payment for Ecosystems Service: Finding Long-term Market-based Solutions for Electric Challenges

Location/Terrain: Upper and Middle Shire Basin, Malawi

Crop(s): Variety of unsustainable land use practices to produce predominant pigeon pea and vegetable crops.

Nutrient(s): Sediment buildup from soil erosion and runoff

Rationale: Sediment buildup increases nutrients loads that speed the operational risks of Malawi's vital Nkula hydroelectric plant.

Issue(s) of Concern/Challenges:

The Nkula plant is one of three hydroelectric plants along the Upper Shire River. Collectively provide Malawi with 98 percent of its electrical power and unsustainable land use practices, such as deforestation and vulnerability to soil erosion. Runoff sediment travels downstream, silts up sediment islands and limits the plant's water intake and damage economic development and protect the hydroelectric land management.

Practice Description:

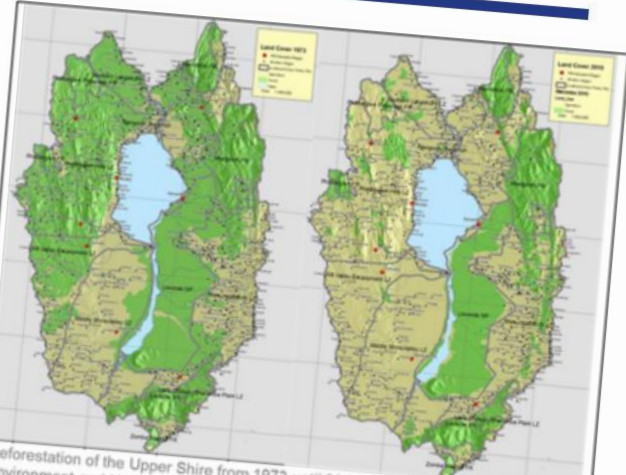
Millennium Challenge Corporation is working with the Government of Malawi to launch an innovative payment for ecosystem services (PES) long-term approach to managing Malawi's water-energy-food nexus. The approach involves governmental organizations (NGOs) and community-based organizations working directly with the local community to promote better land management practices.

Practice Objectives:


Establish an Environmental Trust supported by funding from donors through a PES mechanism to provide sustained funding through the watershed. MCC would like support the Trust through administrative and operational sustainability.

Through these grants to NGOs and CBOS, MCC will implement measures to reduce degradation and soil erosion to increase agricultural productivity in the Upper Shire River. Additionally, MCC aims to establish a long-term mechanism to address sediment buildup and nutrient overloads that impair Malawi's hydroelectric power generation.

Data/Graphs:



Deforestation of the Upper Shire from 1973 until 2010 (LANDSAT and Malawi Environment and Natural Resource Management Action Plan for the Upper Shire Basin, 2011).



For further information, please contact Ben Campbell at MCC: CampbellB@MCC.gov

BMP database – 100 BMPs available

Toolbox

BMP Database

Submitted by admin on Wed, 10/22/2014 - 11:09pm

User login
[Log in/ Register](#)

BMP Database Intro

This database provides an inventory of best management practices (BMPs) related to nutrient management. The BMPs in this database are categorized into two main sectors, agriculture and urban. Each sector has a series of associated BMP categories (listed below). Users can also search BMPs by specific climactic zones (arid, semiarid, tropical, temperate). Agricultural sector BMPs are further categorized by landuse/agriculture type and their scalability to small/limited resource farms. BMPs are categorized as follows:

Agriculture BMP Categories:

Ammonia Control	Conservation Buffers	Conservation Covers
Drainage Control	Erosion Control	Grazing Management
Irrigation Management	Manure Management	Nutrient Management
Rotation Management	Land Use Conversion	Nutrient Cycling
Shoreline Erosion Control	Wetland Creation/Restoration	

Urban BMP Categories:

Detention	Filtration	Infiltration
Septic Management	Shoreline Erosion Control	Urban Erosion Control
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[---MORE---](#)

Searchable categories

Sector Type

BMP Category

Climatic Zone

Text Search

Search Reset

Download: My

← Previous 1 2 ... 12 13 14 15 16

BMPs Search Template

Sector Type

BMP Category

Climatic Zone

Text Search

Search Reset

← Previous 1 2 3 4 5 6 7 8 9 ... 19 20 Next →

Agricultural Waste Composting

Category: Nutrient Recycling
Practice Type: Management
Landuse/Agriculture Type: Row Crop, Fodder, Rice
Climatic Zones: Temperate, Tropical, Semiarid
Regions: North America, South Asia, Europe
Pollutants Treated: Nitrogen, Phosphorus, Sediment

Description: Agricultural waste products (unused portions of crops or waste products from processing) including have the potential to contribute nutrients and should be managed in a manner that prevents nutrient contamination to surface and ground waters. Consideration should be given to the amount of raw waste generated, the nutrient content of the waste product, and recognition that nutrient loading depends on the way in which the waste is handled after harvest. Most vegetable waste, such as sweet corn fodder, cull ears and husks can be used as a green manure by applying it to production fields. ¹

Scalable to small farms? Yes

¹ Belman, Mindy, and Suzie Greenhalgh. "Eutrophication: Policies, Actions, And Strategies to Address Nutrient Pollution." WRI Policy Note, Water Quality: Eutrophication And Hypoxia. Sept. 2009. Web. Feb. 2014.
http://pdf.wri.org/eutrophication_policies_actions_and_strategies.pdf.



A compost heap handles vegetable and other plant waste on an organic farm (Baudier, Miss.). Photographer: Stephen Kirkpatrick. Photo Courtesy of USDA NRCS.

Alternative Tile Intakes: Perforated Risers

← Previous 1 2 3 4 5 6 7 8 9 ... 19 20 Next →



Policy database – 28 case examples to date

Searchable categories

Policy Database Intro
Submitted by admin on Fri, 11/07/2014 - 4:40pm

This policy database provides an overview of various policy instruments around the globe that have been implemented to address nutrient pollution. The database includes a wide range of policies that decision-makers can reference when considering options and approaches to reduce nutrient losses and can be searched by policy category, policy type, region, country and/or sector. Policies are categorized as follows (policy taxonomy borrowed from [Greenhalgh & Selman 2014](#)):

- Environmental outreach & education—including environmental education; public awareness; and technical assistance.
- Regulatory approaches—including environmental bans & restrictions; environmental standards; environmental caps & limits; and regulatory frameworks.
- Priced-based instruments - including taxes, fees and levies; tax credits & rebates; subsidies, grants & incentive payments; low-interest loans; and income support.
- Market-based instruments—including environmental markets (regulated and voluntary); auctions & tenders; and ecolabeling.
- Ecosystem preservation and restoration—including ecosystem restoration; protected areas; land purchases; covenants and easements; and stewardship agreements.
- Institution and capacity—including institutional capacity; transparency & accountability; bridging Institutions; partnerships; and frameworks & guidance.
- Research, monitoring, and evaluation—including research; monitoring; evaluation; and biophysical models.

---- [READ MORE](#) ----

Policies Search Template

Category: Market-Based Instruments
Policy Type: [Search]
Region: [Dropdown]
Sector: Ecosystem Restoration & Protection
Text Search: [Search] [Reset]

Download: My [RESULTS](#) | [ALL POLICIES](#)

--- Previous 1 2 3 Next ---

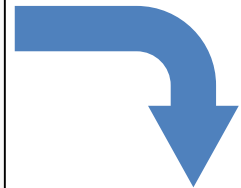
Chesapeake Clean Water Fund

Category: Market-Based Instruments; Institution & Capacity; Environmental Outreach & Education
Policy Type: Voluntary Environmental Markets; Partnerships; Public Awareness
Sector: Mixed
Region: North America
Country: United States
Description: The Chesapeake Clean Water Fund established a voluntary water quality market in the Chesapeake Bay watershed with a goal reducing excess nitrogen. As a partnership of Forest Trends, the Chesapeake Bay Foundation, and the World Resources Institute, the Chesapeake Clean Water Fund hoped to increase the awareness of the contribution that businesses, institutions and citizens make to the pollution flowing into local rivers and streams; provide the opportunity to purchase "offsets" for those impacts that cannot be reduced; invest these funds in on-the-ground projects that reduce pollution thus catalyzing the water quality restoration efforts; and link this approach to other market-like ecosystem service financing schemes such as for carbon and biodiversity.

Category
Policy Type
Region
Sector
Text Search

Search [] [Reset]

Market-Based Instruments
All
Ecosystem Restoration & Protection
Environmental Outreach & Education
Institutions and Capacity
Market-Based Instruments
Price-Based Instruments
Regulatory Approaches



Policy examples

Download: My Results | All Policies

← Previous 1 2 3 Next →

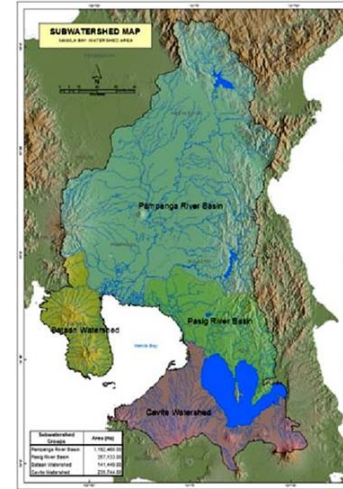
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Outcome: The Chesapeake Clean Water Fund generated nutrient offsets by implementing agricultural nutrient reduction projects. The offsets were then sold to businesses who wished to voluntarily offset their impact on the Chesapeake Bay.
Reference: [Chesapeake Clean Water Fund \(U.S.\)](#)

Component D

Development of nutrient reduction strategies through application of quantitative source-impact modeling and best practices in Manila Bay watershed

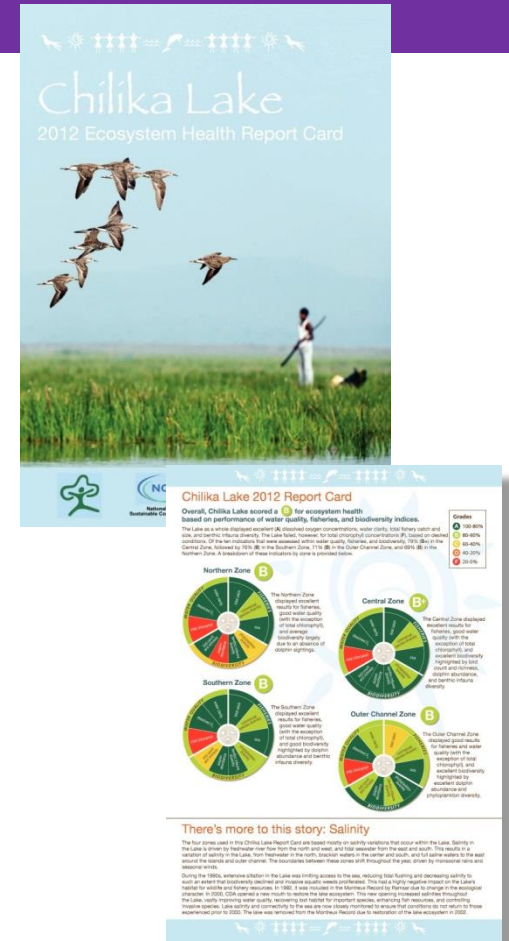
- **Strengthening decision support system for Manila Bay watershed**
 - **State of the Coasts reports** of the Provinces of Bataan, Cavite and Pampanga – stakeholders consultation and validation; Technical review; Publication and dissemination. **Completed by October 2015**
 - Completion of updating of **Manila Bay Environmental Atlas** - Technical review; Interagency consultation; Publication and dissemination. **Completed by December 2015**
- **Building the Foundations and Agreement on nutrient reduction strategies for Manila Bay**
 - Building the foundations for the nutrient reduction strategies: application of first version source-impact models and best practices
 - Finalize updated report on **Total Pollutant Loading Study** - Laguna de Bay-Pasig River-Manila Bay Watershed; Determination of allowable pollutant discharge and testing of model scenarios for other management interventions
 - Finalization of the **Manila Bay clean-up strategies, policy analysis and case studies**.
 - **Completed by December 2015**
 - Development and application of the **final source-impact models for Manila Bay** in developing nutrient reduction strategies
 - Modeler's workshop on TPL and ecosystem modeling in Manila Bay watershed; development of nutrient reduction strategy and investment plan; stakeholders workshop on nutrient reduction strategy. **Completed by February 2016**
 - presentation and **adoption of final nutrient reduction strategies** integrated with broader water quality objectives for region
 - Policy forum/stakeholders consultation on nutrient management strategy. **February 2016**



Component D

Development of nutrient reduction strategies through application of quantitative source-impact modeling and best practices in Manila Bay watershed

- **Application of ecosystem health report card in Lake Chilika and Laguna de Bay**
 - Workshop - Lake Chilika - agreement on/production of ecosystem health report card; application of model and overall water quality status of Lake Chilika and adjacent Bay of Bengal [Link to component C](#)
 - Workshop - Laguna de Bay - consider and facilitate application of report card model - [April to August 2015](#)
 - Management plan for application/implementation of report card; incorporation into nutrient reduction strategies for Manila Bay watershed. [October 2015](#)
- **Lessons drawn for replication and up-scaling**
 - Workshop to discuss the replication and upscaling strategy and lessons learned. [February to March 2016](#)



Lessons Learned

Addressing the 'Nutrient Challenge'

- Management of multiple stakeholders is challenging
- Leadership & commitment of governments to integrative planning is in its infancy
- Lack of appreciation of need to involve non-state actors
- Scientific discourse, public engagement and publications are key drivers of change



Lessons Learned

Addressing the 'Nutrient Challenge'

- 'Nutrient management' concept does not attract public attention; idea be simplified in advocacy efforts towards effective action
 - Needed at all levels
- Global partnerships do not negate the need for government action at local level
 - Global partnerships important in gaining broad consensus; details of implementation falls within state responsibility.
 - The NPA framework operates at national level
- Transparent decision-making, clear roles and regular dialogue (to establish common agenda and monitor progress) are critical to achieving results



Thank you

More at

<http://unep.org/gpa/About/about.asp>

