



**MARES**

# Marine Ecosystem Services Program



**Conserving Ocean Ecosystems and  
Safeguarding Coastal Communities**



**FOREST  
TRENDS**

# Marine Ecosystem Services

## Supporting Coastal Ecosystems and Communities

Ecosystem services are produced by healthy, well-functioning environments and provide great benefit to humans worldwide. Such services include provisioning of food and water resources, as well as regulating and supporting functions such as flood control, waste management, water balance, climate regulation, and other processes. Human reliance on these ecosystem services is fundamental – although we rarely recognize the value of ecosystem services until they are lost.

The oceans provide a great many of these critical but undervalued services that support not only coastal inhabitants but all life on the planet. Wetlands maintain hydrological balances, recharge freshwater aquifers, prevent erosion, and buffer land from storms. Over 40% of the global population now lives within the thin band of coastal area that is only 5% of the total land mass, and dependence on these coastal systems, especially wetlands, reefs, or estuaries, is increasing.

Over 40% of the global population lives within the coastal zone, depending directly on coastal ecosystem services for livelihoods, as well as general human well-being.

Coastal and marine ecosystems are naturally dynamic, but recent changes have been unparalleled. Waterways have been dredged; wetlands filled or drained; and coastal areas developed. Overfishing and destructive fishing have caused major fisheries to collapse and have disrupted food webs. However, the impacts to the marine environment extend beyond those activities immediately along the coasts and in the oceans. Land and freshwater use in watersheds have dramatically altered sediment transport and hydrology. Too many nutrients, and too much of them, reaching our shores have made coastal waters the most highly chemically-altered environments in the world. All of these impacts compound the vulnerability to rising sea levels and more frequent and more severe storm events due to global climate change.



## Protecting Humans on Land by Looking Out to Sea; Protecting Oceans by Looking Back to Land

Coastal ecosystems are near thresholds for healthy functioning, putting coastal populations ever more at risk. Innovative solutions must be sought to complement conventional coastal and marine management in order to safeguard human well-being.

The very complex nature of coastal and marine ecosystems, while posing conservation challenges, also provides vast opportunities for marine conservation. The many ecosystem functions and services that coastal and marine ecosystems provide are in fact tightly interlinked. For example, by conserving mangroves to protect biodiversity, fish nursery habitats remain intact, leading to increased fisheries production; the natural waste processing function of mangroves remains, leading to better water quality; coastal zones are also better buffered from the potential damaging impacts of storms; and the carbon remains stored in mangrove soils and trees. Similar cases can be made for other marine ecosystem services.

Not only are marine ecosystem services themselves interconnected; coastal and marine ecosystems are also inextricably linked to the activities on land. Recognizing the impacts terrestrial systems have on coastal and marine areas, marine and coastal conservation strategies are increasingly taking a more holistic, or “ridge-to-reef”, approach. Focusing on the ecological relationships between terrestrial and marine ecosystems, such marine conservation strategies examine the “upstream” agricultural and industrial activities whose impacts flow “downstream” from the watershed and rivers to the coasts and the oceans. As such, effective marine conservation and coastal sustainable development will require more and more that this holistic approach be undertaken to identify the full spectrum of threats, impacts, and their causes in marine and coastal ecosystems.

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# MARES Mission & Objectives

Our **mission** is to protect crucial marine ecosystem services by harnessing markets and private sector investment in order to complement conventional coastal and marine management and safeguard human well-being.

We target the following four main **objectives** in promoting the overall goal of protecting marine ecosystem services:



- developing a solid foundation of understanding of marine ecosystem services and their economic value;
- elaborating best practices for the conservation of those services;
- communicating information about ecosystem services and the potential to effectively and efficiently protect them in order to raise awareness and generate political will; and
- helping to build a community of practice for marine payments for ecosystem services (PES) and other innovative financing mechanisms.

In meeting these objectives, MARES uses analyses, assessments, pilot projects, and other tools to derive lessons learned from PES initiatives and to build capacity for marine ecosystem services protection.

Ecosystem services are categorized into four functions: provisioning (e.g., food and water), regulating (e.g., climate regulation), supporting (e.g., waste processing), and cultural (e.g., aesthetics). MARES focuses on those key services that are currently at risk around the world, in particular the following five key services:

# MARES Focus on Marine Ecosystem Services



## Coastline and Beach Stabilization

Marshes and other coastal wetlands naturally buffer land from storms and prevent shoreline erosion, highlighted particularly in recent natural disasters. In addition, healthy coastal habitats also serve to maintain beaches by continually depositing back the sand and sediments removed by natural erosional processes. Commercial interests, such as private landowners, the tourism sector, and the insurance industry, all have much to gain by investing in and protecting coastal habitats to reduce their exposure to risk.



## Fish Nurseries

The fisheries management community has long recognized the value of fish nursery areas. Fishing interests are keen to look for ways to enhance or maintain production, and protection of nursery habitat provides a nexus for fishing and conservation interests to come together. However, since fish nursery areas are rarely the sites of fish harvest, i.e., not typically fishing grounds, it has been difficult to get the fisheries sector involved with their protection. There is great potential to target private sector investment in the protection of fish nursery habitat in developed and developing countries with robust commercial fisheries.



## Carbon Sequestration

Emerging science is pointing to the great potential of coastal habitats, such as mangroves, sea grass beds, and salt marshes, in capturing carbon and storing it, thereby mitigating further climate change. For example, mangroves in certain environments can sequester six times more carbon in soils than tropical forests. Since carbon markets already exist, the stage is set for the development of market-based incentives for protecting this ecosystem service in coastal environments.



## Water Quality

Water quality is both a public health issue and a broader economic one, especially in many developing countries. Lowered water quality in places like coral reef and beach environments affects livelihoods from fishing and tourism as well as human health. The development of markets can build upon examples of trading practices in the tried and true freshwater market that have full private sector support. Water quality standards already exist in many coastal countries, so the conditions are present for development interests upriver and along the coast to mitigate and trade credits in water quality.



## Marine Biodiversity

A valuable service in its own right, marine biodiversity also supports the marine productivity upon which so many communities and nations depend. 'Species banking' and biodiversity offsets are two tool sets whereby development in one location is exchanged for protection of the same species or community in another comparable habitat. Where a strong regulatory environment for the protection of marine and coastal species exists, species banking has great potential. Emerging regulation for coastal and offshore development will facilitate the adoption of marine biodiversity offsets as a conservation tool.

# Market-Based Solutions

The recent focus on ecosystem services has shifted the way we practice conservation, manage ecosystems, and even relate to the natural world. The recognition of the immense value of ecosystem services has also opened up the door to innovative approaches to conservation and greater engagement of the private sector.

On the marine front, such innovative tools and private sector investments are badly needed. Marine management has not prevented the loss of ecosystem services. Yet, the value of these services is so great and the public sector protection of them so ineffective that private sector involvement is both logical and necessary. The business community is interested in engaging more fully in the kinds of marine conservation that can support their sustainable use of marine resources, but they lack guidance in how to engage.



Coastal payment for ecosystem services (PES) systems and associated market offsets have the potential to achieve significantly better and more cost-effective conservation outcomes than currently result from projects which seek to isolate and protect coastal areas from human encroachment. By clarifying the linkages between ecological function, ecosystem service delivery, and market incentives, PES systems and conservation offsets can become a standard tool for humans operating at a broad range of economic sectors to lower risk and manage projects.

Much of what can be learned from terrestrial PES systems is applicable to marine PES systems, but marine and coastal areas face some unique challenges. Coastal ecological systems are highly complex and exist at the interface of terrestrial and oceanic systems and thus often suffer from the classic 'tragedy of the commons' dilemma. They are generally less well understood, undervalued, and largely at risk from coastal development

and the indirect impacts that arise from land use in connected watersheds. Lack of clear ownership and fuzzy jurisdictions of management authorities have kept back the sorts of market solutions that have been successfully applied in terrestrial conservation. At the same time, identifying and drawing in stakeholders is difficult in the coastal arena where aggregation is uncommon and where stakeholder interests are often underrepresented.

Despite all these special challenges, we see real opportunity in harnessing the private sector to protect key ecosystem services as is being done with other PES markets.



# MARES Initiatives

The MARES Program's scope of work includes developing the framework and tools for the application of market-based mechanisms for marine and coastal conservation, testing these methods in the field with pilot projects, and communicating and raising awareness about the usefulness of these tools and methods through producing publications, convening meetings, and forming networks. MARES works closely with other Forest Trends initiatives to bring these innovative solutions to marine conservation. We:

- Analyze market potential and PES development and experiences to accelerate the testing and adoption of these innovative financing strategies to protect marine and coastal ecosystem services. We are currently working on an analysis of the fisheries quota markets, and their costs and benefits for application in the developing world; a feasibility assessment of developing markets for fish nursery area protection and/or shoreline stabilization; and a feasibility assessment of integrating water quality markets that begin with land use in watersheds and freshwater use and extend to the coastal zone.
- Develop on-the-ground demonstration projects for marine PES applications around the world, targeting specifically fish nursery habitats, shoreline stabilization, water quality, and carbon sequestration. We are currently collaborating with local partners in the Riviera Maya region in Mexico and in the Seaflower Marine Protected Area in Colombia and scoping projects elsewhere in Latin America and Africa.
- Grow the Marine Katoomba Group, a network that includes public and private sector stakeholders, experts, practitioners, and policymakers to work on market-based mechanisms as an innovative strategy for marine conservation.



Myriad coastal and marine ecosystem services support human communities around the world; MARES is focused on five key services, harnessing market forces to safeguard them.



**F O R E S T  
T R E N D S**

## The Family of Forest Trends Initiatives



*Using innovative financing to promote the conservation of coastal and marine ecosystem services*

### Ecosystem Marketplace

*A global platform for transparent information on ecosystem service payments and markets*



*Building capacity for local communities and governments to engage in emerging environmental markets*



*Business and Biodiversity Offsets Program, developing, testing and supporting best practice in voluntary biodiversity offsets*



*Building a market-based program to address water quality (nitrogen) problems in the Chesapeake Bay and beyond*



*Linking local producers and communities to ecosystem service markets*

### Forest Trade & Finance

*Bringing sustainability to trade and financial investments in the global market for forest products*

Learn more about our programs at  
[www.forest-trends.org](http://www.forest-trends.org)

# About Us

**Forest Trends'** mission is to maintain, restore, and enhance forests and connected natural ecosystems, which provide life-sustaining processes, by promoting incentives stemming from a broad range of ecosystem services and products. Specifically, Forest Trends seeks to catalyze the development of integrated carbon, water, biodiversity and coastal and marine incentives that deliver real conservation outcomes and benefits to local communities and other stewards of our natural resources.

Forest Trends analyzes strategic market and policy issues, catalyzes connections between producers, communities and investors, and develops new financial tools to help markets work for conservation and people.

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MARES' work is made possible by:



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