

# Blue natural capital: towards a new economy

---

GULBENKIAN  
OCEANS INITIATIVE



CALOUSTE  
GULBENKIAN  
FOUNDATION

---

Our Vision, Goals & Study Scope



# Blue natural capital: towards a new economy

---

GULBENKIAN  
OCEANS INITIATIVE



CALOUSTE  
GULBENKIAN  
FOUNDATION

---

Our Vision, Goals & Study Scope

---

The Calouste Gulbenkian Foundation is a Portuguese private institution of public utility, created in 1956 in accordance with the last will and testament of Calouste Sarkis Gulbenkian (Scutari [Istanbul], 1869 – Lisbon, 1955). Its statutory aims are in the fields of the Arts, Charity, Education and Science. These statutory aims are pursued in Portugal and abroad through a wide range of direct activities and grants supporting projects and programs.

The Calouste Gulbenkian Foundation has its headquarters in Lisbon. The large premises comprise the head-office itself, the Calouste Gulbenkian Museum, the Modern Art Centre and the Art Library. The premises, which are set in the Gulbenkian Park, also include a large auditorium, a space for temporary exhibitions and a congress area. The Gulbenkian Science Institute, a leading international biomedical research center located inside a multi-building complex in Oeiras (near Lisbon), was created and is supported by the Foundation.

The Calouste Gulbenkian Foundation also has delegations in the United Kingdom (London) and in France (Paris).



CALOUSTE  
GULBENKIAN  
FOUNDATION

---

## **Gulbenkian Oceans Initiative**

Teresa Gouveia  
*Trustee*

Francisca Moura  
*Director*

*Project Officers*

Catarina Grilo

Filipa Saldanha

Gonçalo Calado

*Advisory Board*

Pavan Sukhdev

Carlos Duarte

Laurence Mee

Pushpam Kumar

Waddah Saab

*Steering Committee*

Henrique Cabral

Paulo Nunes

Tiago Pitta e Cunha

---

## Table of Contents

---

---

Executive Summary	4
1.1 Background	4
1.2 Vision, Mission and Strategy	5
1.3 Networking and Reporting	7
Vision & Goals	8
2.1 Developing the GOI Vision	11
2.2 Framing GOI Goals	15
Proposed GOI Workplans	17
3.1 Support Scientific Research	17
3.2 Increase Public Understanding	22
3.2 Promote Policy Action	23
Proposed GOI Partnerships	24
4.1 Governmental institutions	24
4.2 Other initiatives	24
4.3 Business sector - Corporate Environmental Responsibility	26

---

---

# Executive Summary

---

## 1.1 Background

---

Marine ecosystems are essential for human well-being, providing critical services such as food provisioning, livelihood generation, climate regulation, and recreation. Their contribution to human welfare, however, is rarely accounted for in decision-making.

The Economics of Ecosystems and Biodiversity (TEEB) is one such initiative that seeks to bring to light the valuable contributions of ecosystems – both marine and terrestrial. TEEB can, through valuing nature, provide evidence for decision-makers to recognize, demonstrate and capture the contribution of ecosystem services and biodiversity to human well-being.

The Calouste Gulbenkian Foundation aims to contribute to this effort with its Gulbenkian Oceans Initiative (GOI), a 5-year program that started in early 2013 and is focused on the economic valuation of marine ecosystem services.

The GOI will focus on Portugal, where the Foundation is based, but will address marine issues that are global in nature.

Portugal has one of the world's largest Economic Exclusive Zones (EEZ), Continental Shelves. Its geographic location, at the intersection between the North Atlantic, the South Atlantic and the Mediterranean, make it an important player in marine affairs at the European Union (EU) and at the international level. It counts both in the Iberian coasts areas and in its Atlantic archipelagos on the Macaronesia, with two large marine ecosystems, holding high levels of biodiversity dispersed by rivers, estuaries and other wetlands, seamounts, cold water corals and hydrothermal vents.

Portugal therefore is placed uniquely to lead the work on demonstrating the value of marine ecosystem services, and incorporating this knowledge into marine policies and legal obligations.

---

## 1.2 Vision, Mission and Strategy

---

### GOI Vision

We live in an increasingly ocean-dependent world: seafood is the largest source of animal protein in the developing world; ocean transportation carries most of the world's international trade; new forms of energy, pharmaceuticals and minerals can be sourced from the oceans; desalinated water may become the best solution to a widening freshwater gap between demand and supply; and a large proportion of the world's population lives in coastal areas.

However, the oceans today are poorly managed national, regional, and international commons. "Business as usual" threatens food chains by acidifying the oceans; contaminates the sea with plastics and chemicals; depletes fish stocks and degrades coral reefs as well as deep sea habitats by unsustainable fishing; and imperils the livelihoods of hundreds of millions.

Only responsible stewardship of the oceans and its biodiversity *can* deliver "the future we want" for our oceans... and for us, given the clean air, the water and gas recycling, the seafood, energy sources and other benefits they provide us with.

The time to act towards this future is now. We are already faced with various scarcities related to food and freshwater. These are further exacerbated by threats such as climate change and sea-level rise.

We at GOI believe that the future we need for our oceans can only be delivered by transitioning rapidly to a green economy, that is, one that "improves human well-being and social equity, while significantly reducing environmental risks and ecological scarcities."<sup>1</sup>

For this green economy to materialize for our oceans, we need to have: a better understanding of the benefits generated by marine ecosystem services and biodiversity; better information on private sector opportunities for sustainable use of the ocean's resources; and better administration of access rights and appropriate incentives to ensure that public benefits from ecosystem services are secured while attracting private sector investment.

---

## GOI Mission

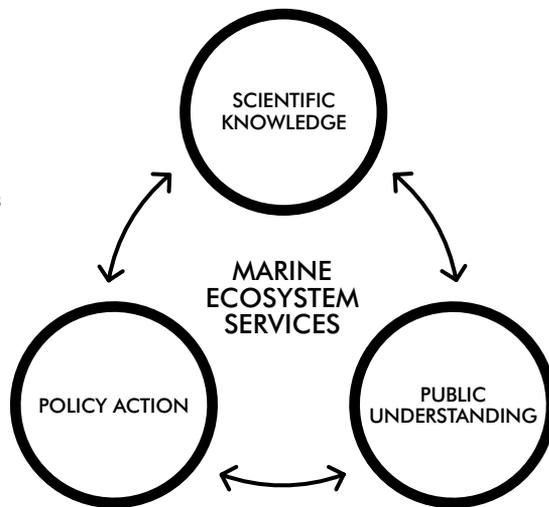
Our oceans need to be in better shape if they are to make enhanced and sustainable contributions to our well-being and economies, and for this not only we need to understand their real value, but to look at their protection and restoration not only as a cost but indeed as an investment. Achieving this understanding will be an improvement and such an improvement is the mission of GOI.

## GOI Strategy

While GOI will address marine issues that are global in nature, it will strategically focus on Portugal. With its unique geographical position, a wide variety of marine and coastal ecosystems and history of seafaring and ocean dependence, Portugal is well placed to be a champion for ocean stewardship at the EU and wider global levels.

The Gulbenkian Oceans Initiative will carry out its mission in three ways.

THE THREE DOMAINS OF THE  
GULBENKIAN OCEANS INITIATIVE



First, it will support scientific research on economic valuation of marine ecosystem services. This will start with a specific pilot study in Portugal, and will constitute a case study of the global “TEEB for Oceans and Coasts”. The GOI is committed to make Portugal an operative example of TEEB for Oceans and Coasts by recognizing, demonstrating and capturing the multiple values of marine and coastal ecosystem services and biodiversity, and integrating them into national decision-making processes.

---

Second, the GOI will increase public and political understanding of the multiple roles of our oceans in our economies and well-being. The GOI will target different audiences in Portugal, within EU institutions, and at the global level.

Third, it will promote policy action through the Oceans component of Portugal's "Country TEEB study", promote the development and implementation of new policies at the study site, at the national level in Portugal, and at the EU level.

---

### 1.3 Networking and Reporting

---

The GOI will seek out interested parties and nurture a wide partnership to achieve goals and deliverables. GOI will create a regular briefing format to inform its partners and the wider world of the progresses made.

It will produce several reports to inform action and to keep its partners updated on GOI's goals and achievements:

This first report of the Gulbenkian Oceans Initiative outlines its vision and goals, how it will contribute to these through its Project scope and work plan, and who will GOI partner with to maximize collective success towards a green economy for our oceans.

The GOI will also produce a mid-term report to be published in mid-2015. This mid-term report will inform the public on GOI's achievements and outlook for the future.

A final synthesis report will be released by late 2017, detailing GOI's accomplishments and suggesting ways in which future work can contribute to our vision of thriving ocean-based economies. This last report will include short summaries for the media, policy-makers, researchers, business, the non-governmental sector, and the general public.

In addition to these deliverables, the GOI intends to establish key partnerships with other ongoing initiatives that are working with similar visions and towards related goals.

---

# Vision & Goals

---

Humans took 10,000 years to go from hunter-gatherers to becoming stewards on land. If we are to avert serious damage to our oceans, our maritime economies and well-being, we need to make a similar transition towards ocean stewardship in only 10 years.

Human well-being is intricately inked to oceans. We depend on oceans and coasts for food, livelihood, trade, and water cycling, and yet, we have created conditions that threaten that critical relationship.

Near 40% of the world's population lives within 100 kilometers from the coasts<sup>2</sup>, enabling them quick access to coastal and marine resources.

World fish consumption is expected to reach 19.6 kilograms per capita by 2021, a value 16% higher than the average level for 2009-2011<sup>3</sup>. In the developing world, over a billion people receive most of their animal protein in the form of fish.

There is growing interest in the extraction of minerals from seabed to be used in electronic and electrical applications. While these higher grade minerals still hold high extraction costs, their exploitation may become commercially viable within the next decade.

Much of global trade depends on maritime transportation. As the Arctic becomes navigable during summer, world maritime transportation routes will be seasonally shortened and consequently, their associated global environmental impacts would reduce. Simultaneously, Arctic ecosystems will be under increasing environmental pressure through locally increased maritime traffic.

Increasing global demand for energy has fostered interest in marine energy sources, both renewable and non-renewable. Offshore drilling for fossil fuels is subjected to harsher conditions and greater environmental risks, due to distance from the shore and greater depths of the deposits. Technologies to harvest renewable marine energies from waves, offshore winds, and tides will soon reach the necessary maturity to be commercially viable.

---

The spectacular rise of marine aquaculture and marine renewable energy are resulting in competition for marine space with more traditional users and this generates more pressure on the environment and conflicts between users.

Oceans act as vast sinks for Carbon, sequestering 20 to 35% of anthropogenic CO<sub>2</sub> emissions, playing a critical role in mitigating the effects of climate change. While oceans continue to act as a sink, as they saturate with Carbon, their capacity to absorb emissions is decreasing<sup>4</sup>.

Coastal systems also play an important role in the global Carbon cycle. Globally, it is estimated that mangroves, salt marshes, and seagrasses altogether store about 42 billion tons of Carbon Dioxide<sup>5</sup> in the form of “Blue Carbon”. These important ecosystems however are being lost at an increasing rate. Their destruction not only increases CO<sub>2</sub> emissions, but also destroys the various other services they provide – coastal protection against storm surges, fish nurseries, and other aesthetic and cultural services.



---

In the future, our ocean dependence may be even greater. Safe drinking water will become scarcer, and oceans are to become a likely source of freshwater through desalinization.

AMBERJACK, GORRINGE BANK © JOSÉ TOURAIS



Increasing ocean dependence is further complicated by poor management of national, regional and international commons.

53% of the world's fisheries are fully exploited, and 32% are overexploited, depleted, or recovering from depletion<sup>6</sup>. Unless the current situation improves, stocks of many species currently fished for food are predicted to collapse by 2048<sup>7</sup>.

In the last 25 years alone, between 1980 and 2005, about 20% of the total area of mangroves was lost. Seagrass beds have declined by 29% since the 19th century, with an upsurge in the recent decades. Salt marshes and freshwater tidal marshes have lost more than 50% of their historical global coverage, with the current rate of loss estimated at 1 to 2% per year<sup>8</sup>.

The spread of opportunistic, often invasive, species carried by vessels from one part of the world to another are causing major and potentially irreversible changes in marine ecosystems.

---

Climate change also poses a host of challenges to our oceans and coasts.

While future sea level rise projections vary for different regions, global sea level for the next century is expected to rise at a greater rate than during the past 50 years<sup>9</sup> putting millions of coastal inhabitants at risk.

Ocean acidification threatens coral reefs that provide important fish habitats. If CO<sub>2</sub> concentrations continue to rise at their current rate, corals could become rare on tropical and subtropical reefs by 2050<sup>10</sup>.

Increase in sea temperature is provoking rapid changes in the marine food chain with unpredictable consequences.

---

## 2.1 Developing the GOI Vision

---

These challenges can be solved through improved stewardship of our oceans, a stewardship that gears us towards a green economy wherein we make efficient and environmentally conscious use of marine resources.

To achieve this transition, we need profound changes in the way we – governments, citizens and civil society and private companies make decisions, so that we can collectively tackle global challenges that affect us all.

The United Nations Convention on the Law of the Sea (UNCLOS) as well as the mandates of Regional Fisheries Management Organisations (RFMO) for high seas fisheries need to be strengthened and reformed.

The European Union is particularly well positioned to achieve this vision by encouraging its institutions to recognize, demonstrate and capture the values of marine and coastal ecosystem services and biodiversity, and integrate those into their decision-making processes. Geographically, historically and in terms of its institutional architecture, Europe has the foundations to forge such leadership. Furthermore the EU Marine Strategy Framework Directive provides a legal obligation for member states to reach a Good Environmental Status in their waters, which implies a sustainable and ecosystem based management of marine resources.

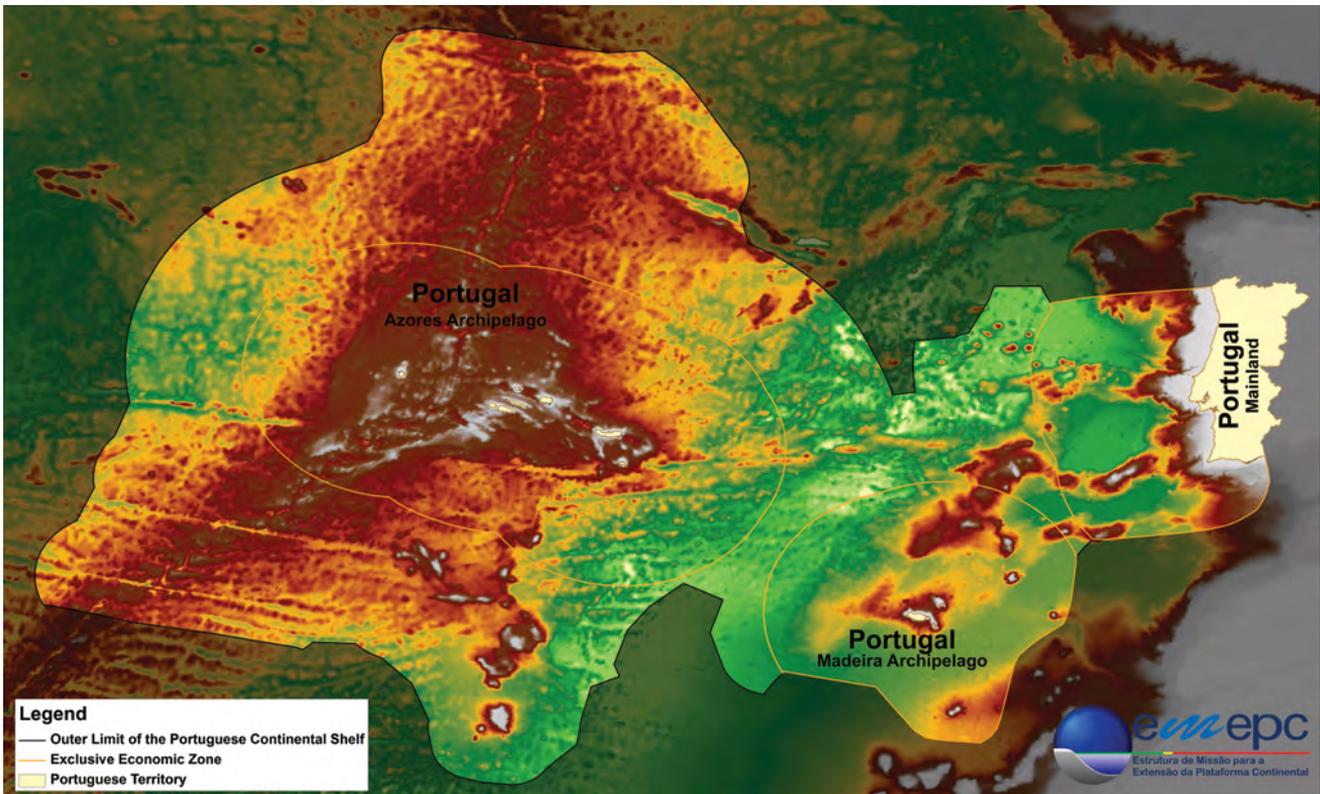
The EU covers a large part of the European continent, which has a coastline of almost 185.000 kilometers. This is nine times that of the USA and almost double of Russia's. In 2011, 40.8 % of the EU-27 population lived in coastal regions which covered 40.0 % of EU-27 territory<sup>11</sup>.

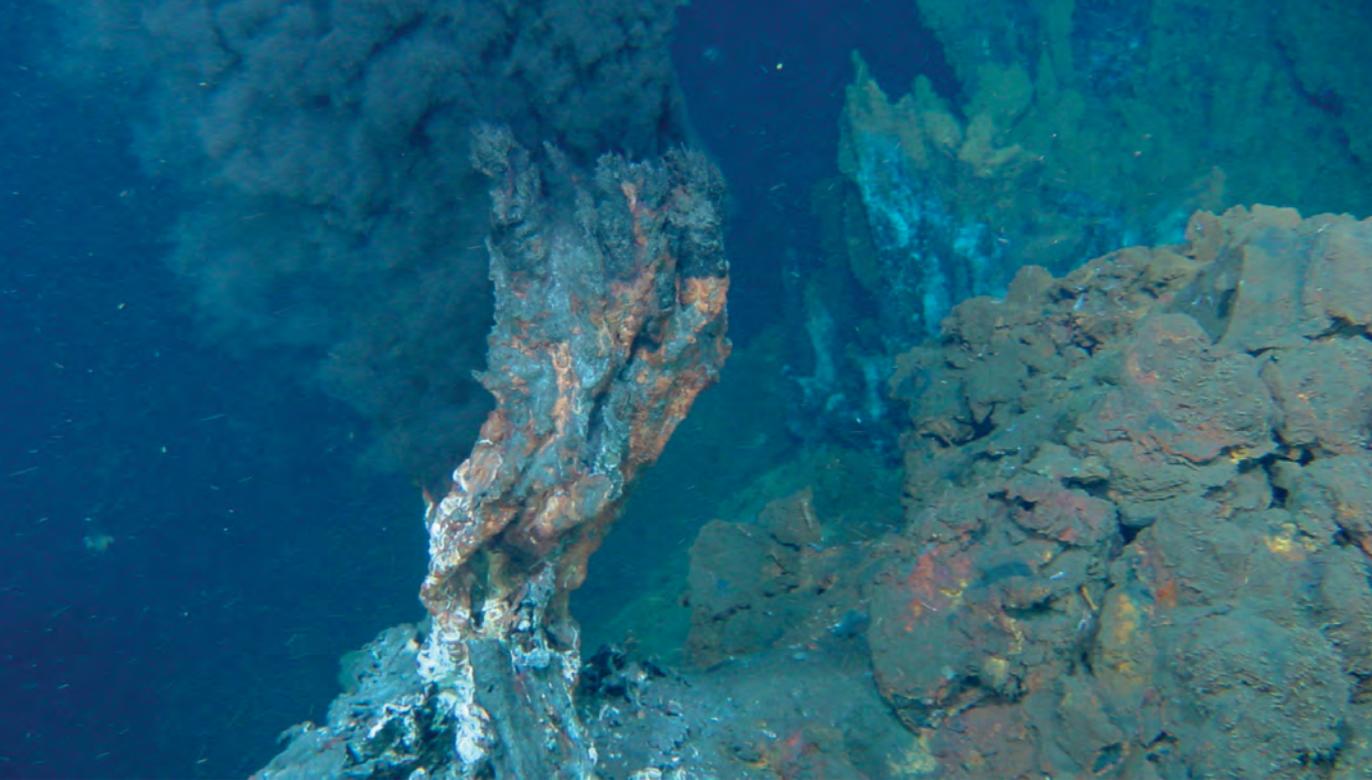
At the EU level, GOI's vision would materialize through the integration of economic valuation of marine ecosystem services into policy initiatives such as the Marine Strategy Framework Directive (MSFD), the Marine Spatial Planning Directive (MSPD), the creation and management of Marine Protected Areas (MPAs) under MSFD and various international obligations (e.g., World Summit on Sustainable Development, CBD's Aichi target 11 for MPAs, etc.), a revised Environmental Impact Assessment Directive (EIAD), to name a few.

Moreover, the European Commission has been a strong promoter of the ecosystem service approach, through for example its support of TEEB and in setting up an Expert Group on "The economics of environment and resource use".

Within the European Union, Portugal has a unique geographical position and a variety of marine and coastal ecosystems that can place it as a champion for ocean stewardship both at the EU, and wider global levels.

PORTUGAL'S PROPOSED  
ECONOMIC EXCLUSIVE ZONES (EEZ) © EMEPC





HYDROTHERMAL VENT, AZORES © MISSÃO SEAHMA, FCT PORTUGAL / IFREMER, 2002

Portugal has an EEZ 18 times the size of its terrestrial territory and a Continental Shelf 40 times that size. Portugal's marine zones are home to a wide variety of marine and coastal ecosystems for temperate standards, namely river estuaries, saltmarshes, rocky shores, several archipelagos, many sea mounts and hydrothermal vents, cold water corals, and close to 200 species of fish with a commercial value. These ecosystems provide key services such as Carbon sequestration, marine traffic corridors for over 50% of the European merchant fleet, and generation of pharmaceutical components by organisms living in extreme conditions.

The Millennium Ecosystem Assessment identified five main threats to Portuguese coastal and marine ecosystem services: overfishing, contamination, destruction of ecosystems, territory loss, and climate change. Some of these threats are associated with tourism and recreation activities. In estuaries, major drivers of ecosystem change are urbanization, increased input of nutrients and pollutants, and decreased input of sediments due to upstream dams. The latter is also associated with receding coast lines.

To revert these threats, and improve the quality and quantity of marine ecosystem services, we need to change both the ways we collectively use our oceans, and change our upstream land-use.

---

The future we want, and need, for our oceans has to be different from the one we are now contributing to. We believe that the viable future of our oceans can only be one with a green economy, that is, one that “improves human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.”<sup>12</sup>

For this green economy to materialize for our oceans, we need to have a better understanding of the value of benefits generated by marine ecosystem services and biodiversity. Accounting for these services has the potential to better inform our decision-making, help create incentives for better resource management, and contribute to efficient ocean-based industries and businesses.

At the international level, various actions may be taken to promote stewardship of our oceans:

The international institutional apparatus of ocean governance including the United Nations Convention on the Law of the Sea needs to be strengthened;

Fisheries in the High Seas cannot continue to operate as they have, with weak mandates of RFMOs for members and no applicability to non-members, and with easy access to flags of convenience;

Greenhouse gas (GHG) emissions need to be substantially reduced to reduce their already devastating consequences on the oceans, especially sea level rise and ocean acidification;

The role of biogenic calcification and other oceanic processes that absorb a very significant part of our CO<sub>2</sub> emissions needs to be formally recognized and firmly placed within the United Nations Framework Convention on Climate Change’s post-2015 agenda.

Ocean based geo-politics and international oceanic security will become increasingly important as Small Island Developing States (SIDS) begin to understand, plan, and realize their *true potential* as “Giant Ocean States” through exercising their rights on marine resources within their vast Exclusive Economic Zones.

---

Portugal has been a supporter of the SIDS´ agenda at the international level and further cooperation with these States will be capable of developing important mutual technological, ecological and commercial benefits over the next decades in order to realize an ocean-based green economy transition.

For Portugal, this change can be turned into reality by engaging the private sector through public-private partnerships. In recent years the Portuguese business community has shown a growing interest in developing the country´s maritime economy. This is indeed an opportune time for Portugal engage its business community in transitioning to an ocean-based Green Economy.

The GOI is committed in assisting Portugal in becoming an operative example of TEEB Oceans and Coasts by helping its institutions and organizations recognize, demonstrate and capture the multiple values of marine and coastal ecosystem services and biodiversity, to integrate them into national decision-making processes.

---

## 2.2 Framing GOI Goals

---

### **To contribute to its vision, the GOI will –**

Support scientific research by investing in research and development to recognize, demonstrate, and capture the contribution of marine ecosystem services to the economy.

The GOI will sponsor an *in situ* study in Portugal for marine ecosystem services assessment and economic valuation. It will consider also to sponsor a national review of a single marine ecosystem service and its impact to the economy and/or a review of how a given economic sector benefits from marine ecosystem services;

It will also promote the development of scientific research and knowledge on key marine ecosystem services, their relationship with human well-being and how they may be appraised through various valuation methodologies;

This will require using available expertise in economics and marine biology, as well as other scientific disciplines, thus fostering an interdisciplinary approach;

---

Further carry out the *Oceans* component of the national “Portugal TEEB” by contributing its pilot area research towards the global “TEEB for Oceans and Coasts”.

Increase public understanding of the role of marine ecosystem services to human well-being and economic development through capacity-building and communication.

The GOI will disseminate knowledge gathered from the study site and foster general awareness of the role of marine ecosystem services in human well-being and economic development;

It will convey the vision of a thriving and green marine economy that balances the best use of marine resources and the necessary protection of marine ecosystems;

Its activities will target various audiences, from civil servants to decision-makers, from the private sector to the non-governmental sector, and from individual citizens to large organisations, at the local and national levels;

Content creation will be tailored to the audience, and professional marketing support will be used to create an appropriate communications strategy.

Promote policy action through the integration of values of marine ecosystem services into decision-making:

Influence decision-making processes, across European Union institutions, by promoting the importance of valuing marine ecosystem services for implementation of national, EU and international obligations regarding the Marine Strategy Framework Directive, MPAs, Marine Spatial Planning, and Environmental Impact Assessment;

The GOI will explore forming and leading a coalition on “Blue Carbon”<sup>13</sup> for both voluntary markets and the regime created by the United Nations Framework Convention on Climate Change<sup>14</sup>;

Explore dialogue and partnership with today’s Small Island Developing States, as they may share the GOI vision and are most affected by the negative impacts of not valuing marine ecosystem services (the most threatened by climate change, with their population greatly dependent on ocean resources).

---

# Proposed GOI Workplans

---

## 3.1 Support Scientific Research

---

In our plans to run a pilot study and further to contribute to the Oceans component of “Portugal TEEB”, we shall use some available valuation research and seek out any more high quality research through a public ‘call for evidence’. This information will support a suitable meta-analysis of the ecosystem services of the oceans in and around Portugal and an assessment and evaluation will follow.

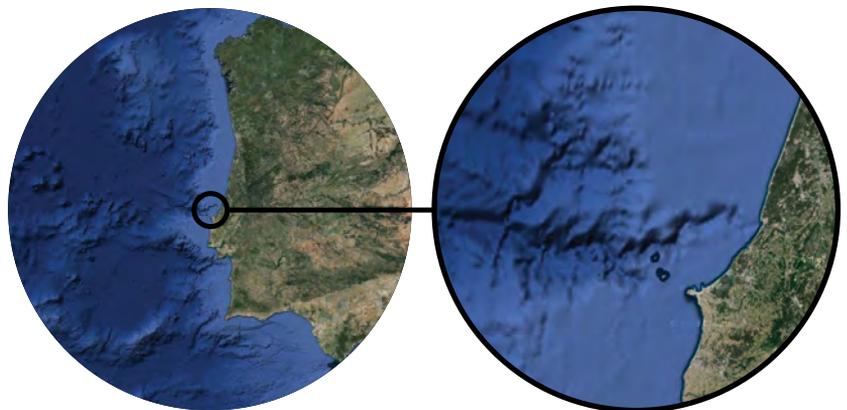
### GOI’s research

The GOI will sponsor an interdisciplinary study to evaluate economic value of marine ecosystem services in Portugal. This research is expected to produce policy-relevant scientific findings that would be used by “Portugal TEEB” to generate policy reforms for the sustainable management of marine ecosystems.

Research efforts will include, but not be limited to, a study focused on a pilot site in Portugal, to exemplify economic valuation of marine ecosystem services.

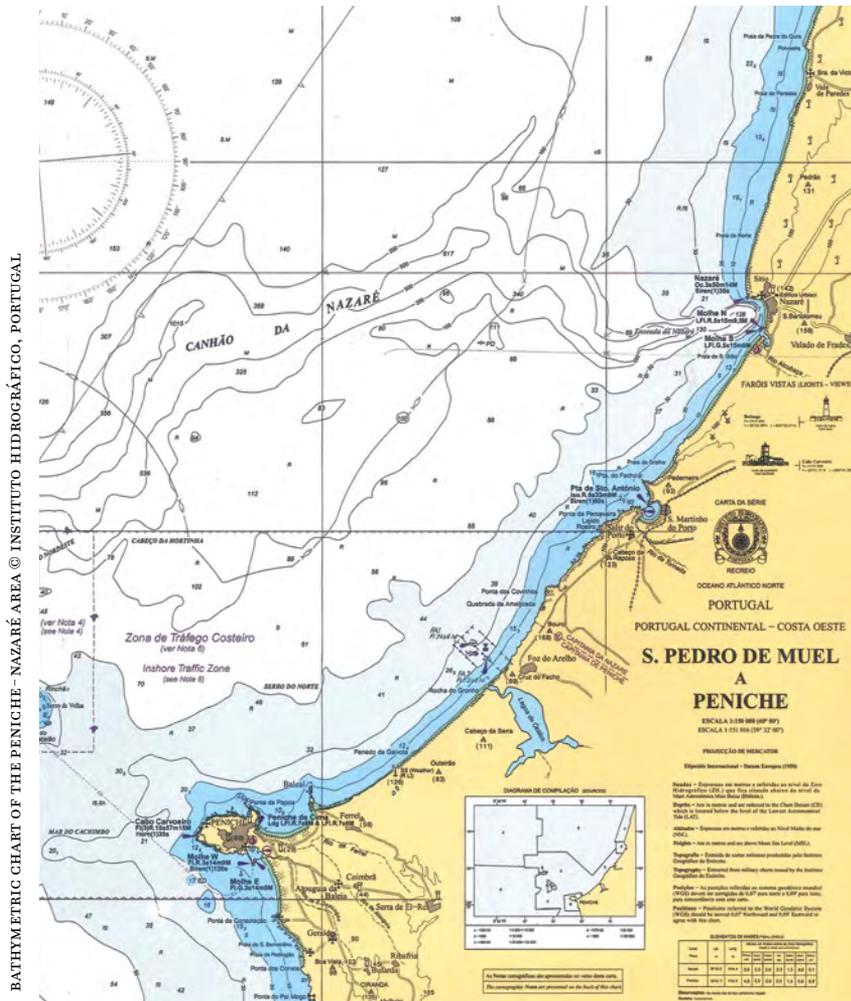
### Evaluation of the Peniche-Nazaré pilot site

The pilot site was selected over a competitive list of alternative regions in Portugal as it has the main characteristics to host a case-study with both national impact and international exemplification potential — exhibiting diversity and complexity across ecological, socio-economic and governance characteristics.



PENICHE-NAZARÉ PILOT SITE (SOURCE: GOOGLE MAPS)

The pilot site exhibits a wide diversity of ecosystems, a high level of complexity in its ecological functions and processes that support the provision of marine ecosystem services and also demonstrates the explicit link between alternative management options and marine environmental impacts (threats and opportunities). Moreover, the area offers governance exemplars with replication potential, due to the large number of national legislation and strategies that apply to the study site, and also due to the existence of one MPA in this area – the Berlengas archipelago.



Finally, there is a high probability for stakeholder involvement during and after the research project as there are many and diverse stakeholder groups in the area.

---

## Detailed evaluation of the Peniche-Nazaré pilot site

**Sea and land territory.** Bounded by Peniche to the south and by Nazaré to the north, along approximately 40 kilometers. The coastal territory in the study area is part of the West Region (NUT III) of Portugal. Around 400.000 inhabitants live in this territory of around 2.500 square kilometers.

**Habitats.** The Peniche-Nazaré coast and adjacent sea area has diverse marine ecosystems such as high cliffs and sandy beaches interspersed with small creeks and coastal lagoons, the sediments of the continental shelves, the Berlengas archipelago (Nature Reserve) and the Nazaré submarine canyon extending from near-shore to abyssal depths. Some distinctive ecosystems such as the Óbidos Lagoon, the Berlengas Nature Reserve and the Nazaré Canyon have been the focus of numerous studies that reflect the richness and complementarity of the biological assemblages, the uniqueness of some diversity patterns and the complex and dynamic nature of the processes they maintain. 7 out of 14 (TEEB) biomes are present or influence the study site: marine/open ocean; coastal systems; lakes and rivers; forests; grass and rangeland; cultivated areas and urban areas.

**Marine ecosystem services.** The structural and functional diversity of the region easily translates into a wide range of ecosystem services, so that all four MEA / TEEB categories of ESS, over time scales relevant to human decision-making and human well-being, can be found here:

**Provisioning:** Food such as fisheries, shellfish collecting, algae and aquaculture and raw materials such as sand and gravel;

**Regulating:** moderation of extreme events provided by Peniche and Nazaré beaches, dunes and cliffs and regulation of water flows and carbon sequestration provided by Óbidos lagoon;

**Supporting:** maintenance of life cycles of migratory species provided by the Berlengas archipelago, Óbidos lagoon, beaches, dunes and maintenance of genetic diversity also provided by Berlengas archipelago;

---

**Cultural:** aesthetic information present at the region's rocky shores, beaches, dunes, cliffs and waves of Peniche and Nazaré, the sea bed, Óbidos lagoon and Berlengas archipelago; opportunities for recreation and tourism such as surf, diving and other aquatic sports, beach, marine mammal and marine bird watching; inspiration for culture, art and design provided by the Berlengas protected area and underwater archaeological heritage.

WORLD CLASS TOW-IN SURFING AT NAZARÉ  
© NAZARÉ QUALIFICA / TÓ MANÉ



### Identification of the key economic activities.

The study site includes a wide variety of activities with expression in terms of socioeconomic relevance and marine environmental impact. The research project will analyze the most significant such as: commercial fisheries; manufacturing industry and aquaculture; algae and other products harvesting for food purposes; shipbuilding and ship repair industry; port activity; maritime transport; leisure and tourism; gas and oil prospection and extraction; renewable (offshore wind and wave) energy; educational and research activities.

---

## Identification of main threats.

The study area presents a range of threats to marine ecosystem services. These were divided into **primary threats** (inherent to biological entities) such as species extinction or decline, overabundance of seagull population, habitat loss and degradation and alteration of natural populations' behavior; **secondary threats** (immediate anthropogenic causes) such as overexploitation of biological resources, synthetic organic compounds (pesticides, antifouling...), marine litter, noise and tourism pressure and **tertiary threats** (emerging and/or global phenomena) such as toxic blooms and climate change.

## SEEA, WAVES, Natural Capital Accounting for Marine Ecosystem Services

The United Nations Statistical Commission has been shaping the vision of natural capital accounting throughout the world; however, this is still an emerging field of interest. The UN System of Environmental-Economic Accounts (UN SEEA) Central Framework, which became an international statistical standard only recently – February 2012 – has engaged countries to incorporate the value of natural assets into national accounts and to explicitly link human wellbeing and economic prosperity with the natural environment.

Recent efforts have been focused on SEEA Experimental Ecosystem Accounting, which is centered on the issue of measuring and valuing ecosystem degradation. As the framework is still under an experimental testing phase, the upcoming phases should focus on encourage countries to test the concepts and on involving national statistical offices.

The research project is expected to build capacity in Portugal in how to implement ecosystem accounting within national accounts and to demonstrate its benefits to national policy makers. Hence our researchers will engage with WAVES and SEEA to ensure that end-results will be consistent with United Nations ecosystem accounting experimental framework and it will make recommendations for specific ecosystem satellite accounts in Portugal.

---

## TEEB National Assessment of Marine Ecosystem Services

As a TEEB implementation partner in Portugal, the GOI will not neglect the national dimension of its research outputs. We shall identify marine ecosystem services for the entire Portuguese coast that can be affected by alternative policy choices. The goal is also to identify current knowledge research gaps and information needed for future national valuations.

The structure of the national assessment will be in line with the conceptual framework for linking ecosystem and human well-being adopted by TEEB. The research results will specifically deliver a consulting report with a detailed analysis of the relevant marine ecosystem services by sector of economic activity and make recommendations to undergo valuation in the future.

Our research and evaluation will cover at least one marine ecosystem service country-wide, applying benefits transfer if appropriate to generate national values for that marine ecosystem service.

---

### 3.2 Increase Public Understanding

---

Most often, it is challenging to communicate the information produced and published in scientific literature to the decision-making process. To address this, the GOI will organize non-academic policy paper writing courses to increase ability of researchers, ENCOs' staff, and senior governmental officials to communicate results of research and of empirical observations to decision-makers.

GOI will promote a varied range of activities targeting diverse audiences – children and youth, researchers, local communities, policy-makers, decision-makers, environmental NGOs, the corporate sector – with the overall aim of increasing their understanding of the importance of marine ecosystem services for human well-being and economic development. In some cases these capacity-building activities will have the additional purpose of showing how such knowledge can be integrated into institutional practices.

---

Public understanding of the importance of marine ecosystem services include: open lectures on MES by specialist speakers; informal discussions on MES in various coastal communities; an exhibition on MES for the general public; a documentary on the Portuguese case study on MES; educational programs for children on MES; courses in Marine Economics for NGO's and local/coastal associations; courses in Marine Economics for the corporate sector; Marine Ecosystem Training for the corporate sector.

Regarding engagement with the public, GOI will seek synergies with other projects pursuing converging goals, in particular EU funded social research and dissemination projects.

---

### 3.3 Promote Policy Action

---

Promoting policy action at various levels towards the GOI vision requires making good use of the knowledge produced by GOI-supported research, and of the increased understanding of various groups regarding marine ecosystem services.

Public and political opinion on marine ecosystem services will be critical to support the GOI vision and activities. The GOI has been participating in relevant public consultations at the national and EU levels, promoting the ecosystem services approach and its application to management of marine resources.

The economic valuation of marine ecosystem services can be applied to a variety of marine-related decisions. In Marine Spatial Planning, it can be used to assist decisions regarding zoning of marine areas for different activities. Knowing the economic value of marine ecosystem services, or even the economic impacts of certain maritime activities on specific marine ecosystems, can be a decisive factor when allocating marine activities (extractive or non-extractive) to certain areas. The same application can be useful in the creation and in the management of Marine Protected Areas and coastal areas in general, as well as in Environmental Impact Assessments (e.g. in relation to the Marine Strategy Framework Directive).

A "Blue Carbon Coalition" to assess and promote mechanisms for creating blue carbon markets may be established, if needed, in partnership with The Blue Carbon Initiative<sup>15</sup> and in collaboration with institutions such as UNEP, IUCN, GRID-Arendal and others. GOI can contribute towards a blueprint for a REDD like project where restoration of coastal habitats, especially in the developing world, can be financially supported.

---

GOI would be addressing marine issues that are global in nature. The SIDS have emerged as important players in the global stage for marine issues, especially through exercising their rights on their Exclusive Economic Zones (EEZ). As nations that depend entirely on coastal and marine resources, there may be various avenues for technical cooperation between GOI and SIDS on shared objectives targeting a sustainable model for managing the oceans and their resources.

---

## Proposed GOI Partnerships

---

### 4.1 Governmental Institutions

---

The GOI will participate in the “Oceans” sections of the “TEEB Portugal” country study being promoted by Portugal’s Ministry of Environment, Spatial Planning and Energy.

---

### 4.2 Other Initiatives

---

#### **The Economics of Ecosystems and Biodiversity (TEEB)**

GOI will contribute to key areas of “TEEB for Oceans and Coasts”: both globally (e.g.: valuing the services of Fisheries; Coral reefs; Oceanic carbon capture; etc.) and locally (Pilot + Portugal-wide ESS/TEEB)

The main outputs of GOI’s research project will be a case study for TEEB for Oceans and Coasts and consequently it will contribute to better reflection of marine ecosystem values in policy decisions at the international level. The GOI will specifically work towards contributing to key themes of TEEB for Oceans and Coasts such as fisheries, coastal habitats, coastal blue carbon and deep seabed. The GOI will also engage with TEEB partners and projects in business, along with key private companies in Portugal.

#### **Global Oceans Commission (GOC)**

GOI will review and where possible integrate GOC’s recommendations (on UNCLOS, RFMOs and other areas of international policy significance) into our Policy Advisory work.

---

---

## Natural Capital Project (NCP)

GOI may use an ecosystem mapping valuation tool (e.g. “InVest”, ARIES, etc.) to value Peniche-Nazaré (GOI Pilot Site) Ecosystem Services; if successful, use the same tool to value Portugal-wide EEZ services (one or more, based on scope) will be considered.

Currently, the most widely used ecological-economic models are InVEST and ARIES. These tools are composed of a number of models built to value different ecosystem services and to ease the integration of these values into the decision making process. InVEST enables decision-makers to quantify the importance of natural capital, to visualize the benefits delivered today and in the future, to assess the tradeoffs associated with alternative choices, and to integrate conservation and human development.

If using InVEST, the GOI will partner with the Natural Capital Project to integrate InVEST models, its science policy tools and its scenario development tools within the research project’s modelling phase. The GOI will also take advantage of its partnership with ARIES team as ARIES provides the users a modelling platform rather than a single model or collection of models to assist rapid ecosystem services assessment and valuation and to facilitate environmental decision-making.

## Wealth Accounting and the Valuation of Ecosystem Services (WAVES)

The Gulbenkian Oceans Initiative will develop a strong bridge of knowledge between its research team and natural capital accounting initiatives, including all entities responsible for international agreed methodologies such as the System of Environmental-Economic Accounting (UN Statistical Commission), Eurostat (European Commission) and national statisticians from the Portuguese National Statistics Office (INE). Furthermore, it will partner with WAVES, which is fundamental to support the GOI in promoting a future pilot project of natural capital accounting in Portugal.

The Gulbenkian Oceans Initiative will attempt to work with INE with the purpose of promoting an ecosystem accounting pilot project after the research project’s timeframe. The main goal is to incorporate the scientific outputs (i.e. physical, asset and monetary values of one ecosystem services at the national level) into existing environmental satellite account.

---

The research team of the Gulbenkian Oceans Initiative will be strongly connected with all accounting and technical procedures regarding the SEEA Central Framework and SEEA Experimental Ecosystem Accounting (UNSD). As for this purpose, it will develop a close relationship with WAVES global partners such as UNEP, UNDP and UNSC. Furthermore, GOI will also partner with the WAVES Policy and Technical Experts Committee (PTEC) to ensure that the scientific outputs are consistent with international agreed methodologies.

---

#### 4.3 Business sector — Corporate Environmental Responsibility

---

The Gulbenkian Oceans Initiative is committed to promoting corporate governance policies that take into account the importance and value of marine ecosystem services. The ultimate goal is to promote business decisions that explicitly value ecosystem degradation and the benefits provided by ecosystem services.

##### **TEEB for Oceans Coasts**

GOI will attempt to develop joint activities with the TEEB community to explore how to value externalities in key marine business sectors – including pelagic fisheries, aquaculture, ocean transportation, etc. Dialogue with TEEB Oceans Coasts will address this business dimension as well.

##### **World Business Council for Sustainable Development (WBCSD)**

The GOI will partner with BCSD Portugal to transfer the WBCSD's Business Ecosystems Training (BET) to Portugal. The main goals are to increase the awareness and understanding of the Portuguese corporate sector on the important links (impacts, dependencies, externalities) between businesses and ecosystems, to assess business impacts and dependencies on ecosystems, to learn the how to value ecosystem services and to manage and mitigate business impacts on ecosystems.

The GOI will promote the use of WBCSD's Corporate Ecosystem Valuation (CEV) among the corporate sector in Portugal. By enabling companies to identify ecosystem-related business risk and opportunities in their supply-chains and financing decisions, companies are able to make improved decision-making processes in relation to economic, social and environmental goals. This results

---

on a wide range of internal benefits such as improved revenues and reduced costs and external benefits which help companies to comply with external requirements, demands and actions.

---

## References & Notes

---

- 1 UNEP, 2011, *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication - A Synthesis for Policy Makers*. [www.unep.org/greeneconomy](http://www.unep.org/greeneconomy).
  - 2 T. Agardy, J. Alder (coords.). "Chapter 19 - Coastal Systems", *Ecosystems and Human Well-Being: Current State and Trends*, Vol. 1, Millennium Ecosystem Assessment Series, Washington: Island Press, 2005. PDF available for download at <http://www.maweb.org/documents/document.288.aspx.pdf>.
  - 3 FAO Fisheries and Aquaculture Department, *The State of World Fisheries and Aquaculture - 2012*. Rome: Food and Agricultural Organization, 2012. Accessed on 03/02/2014. <http://www.fao.org/docrep/016/i2727e/i2727e00.htm>.
  - 4 S. Khatiwala, T. Tanhua, S. Mikaloff Fletcher, M. Gerber, S. C. Doney, H. D. Graven, N. Gruber, G. A. McKinley, A. Murata, A. F. Ríos, and C. L. Sabine, *Biogeosciences*, 10: 2169-2191, 2013.
  - 4 J. Siikamäki, J. N. Sanchirico, S. Jardine, D. McLaughlin and Daniel F. Morris, *Blue Carbon - Global Options for Reducing Emissions from the Degradation and Development of Coastal Ecosystems*, Washington: Resources for the Future, 2012.
  - 6 FAO Fisheries and Aquaculture Department, *State of World Fisheries and Aquaculture (SOFLA) - SOFLA 2010*. Rome: Food and Agricultural Organization, 2010. Accessed on 03/02/2014. <http://www.fao.org/docrep/013/i1820e/i1820e00.htm>
  - 7 B. Worm, E. B. Barbier, N. Beaumont, J. E. Duffy, C. Folke, B. S. Halpern, J. B. C. Jackson, H. K. Lotze, F. Micheli, S. R. Palumbi, E. Sala, K. A. Selkoe, J. J. Stachowicz and R. Watson, "Impacts of biodiversity loss on ocean ecosystem services", *Science*, 314: 787-790. 2006
  - 8 M. Spalding, M. Kainuma, L. Collins, "World atlas of mangroves". IITD, ISME, FAO, UNEP-WCMC, UNESCO-MAB and UNU-INWEH, TNC. London: Earthscan, 2010; M. Waycott, C. M. Duarte, T. J. B. Carruthers, R. J. Orth, W. C. Dennison, S. Olyarnik, A. Calladine, J. W. Fourqurean, K. L. Heck, Jr., A. R. Hughes, G. A. Kendrick, W. J. Kenworthy, F. T. Short, S. L. Williams, "Accelerating loss of seagrasses across the globe threatens coastal ecosystems", *Proceedings of the National Academy of Sciences of the United States of America*, 106(30): 12377-12381, Washington: National Academy of Sciences, 2009.
  - 9 R. J. Nicholls, P. P. Wong, V. R. Burkett, J. O. Codignotto, J. E. Hay, R. F. McLean, S. Ragoonaden, C. D. Woodroffe, "Coastal systems and low-lying areas", *Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [M.L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden and C.E. Hanson (eds.)]. Cambridge: Cambridge University Press, 2007.
  - 10 United States Global Change Research Program, *Global Climate Change Impacts in the United States*. [Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson (eds.)], New York: Cambridge University Press, 2009; National Research Council, *Advancing the Science of Climate Change*. Washington: The National Academies Press, 2010; A. Fischlin, G. F. Midgley, J. T. Price, R. Leemans, B. Gopal, C. Turley, M. D. A. Rounsevell, O. P. Dube, J. Tarazona, A. A. Velichko, "Ecosystems, their Properties, Goods, and Services", *Climate Change 2007: Impacts, Adaptation and Vulnerability*. (M. L. Parry et al. [eds.]), 2007.
-

- 
- 11 EuroStat, 2013, "Coastal regions - population statistics". Accessed on 03/02/2014. [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Coastal\\_regions\\_-\\_population\\_statistics](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Coastal_regions_-_population_statistics).
  - 12 UNEP, 2011, *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication - A Synthesis for Policy Makers*. [www.unep.org/greeneconomy](http://www.unep.org/greeneconomy).
  - 13 B. C. Murray, L. Pendleton, W. A. Jenkins and S. Sifleet, *Green Payments for Blue Carbon: Economic Incentives for Protecting Threatened Coastal Habitats*, Nicolas Institute for Environmental Policy Solutions, Duke University, 2011. PDF available for download at <http://nicholasinstitute.duke.edu/sites/default/files/publications/blue-carbon-report-paper.pdf>.
  - 14 On the basis of the rough estimates of global conversion rates and those of carbon loss, the study finds that the annual mitigation potential across coastal wetlands is roughly between 300 and 900 million tons of CO<sub>2</sub>, approximately equal to the annual CO<sub>2</sub> emissions from energy and industry for Poland and for Germany, respectively. (B. C. Murray, L. Pendleton, W. A. Jenkins and S. Sifleet, *Green Payments for Blue Carbon*, 2011).
  - 15 See <http://thebluecarboninitiative.org/united-states-may-2013/> for further details.
- 

## Text

GOI Team and UNEP-TEEB Team

## Design & Production

Ian Anderson

*Art Direction*

The Designers Republic™

*Graphic Design*

## Contacts

Calouste Gulbenkian Foundation

Av. de Berna, 45A - 1067-001

Lisboa, Portugal

Telephone: (+351) 217 823 000

[www.gulbenkian.pt/oceanos](http://www.gulbenkian.pt/oceanos)

[oceanos@gulbenkian.pt](mailto:oceanos@gulbenkian.pt)



---

[www.gulbenkian.pt/oceanos](http://www.gulbenkian.pt/oceanos)



CALOUSTE  
GULBENKIAN  
FOUNDATION

---