VALMER

TOPIC PAPER 4

Using ecosystem service valuation for marine management

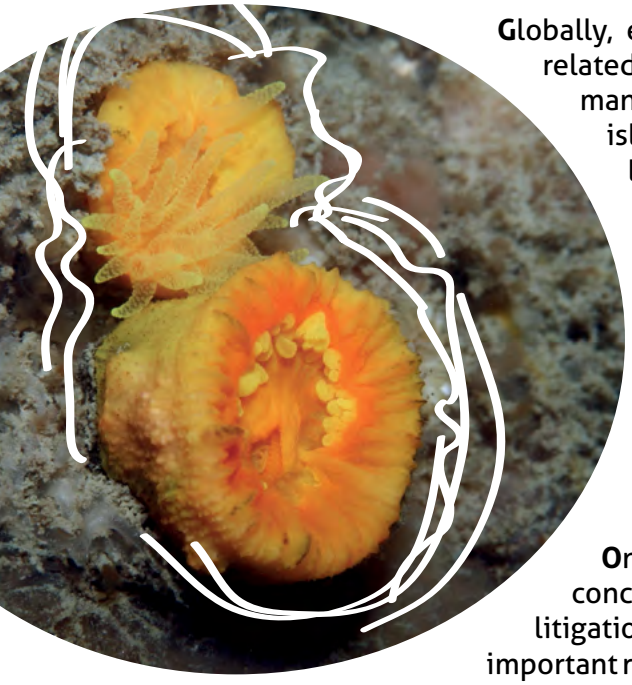
The ecosystem service approach as a marine management tool

The marine environment supports our health and wellbeing through a wide array of ecosystem services. Marine ecosystem services range from the provision of fish and aggregates, through regulation of the planet's climate and protection of our coastlines, offering a setting for recreation, cultural and spiritual experiences. The provision of these essential services and resources is increasingly threatened by marine degradation. To halt this degradation, we need to manage our marine activities in the best possible way to reduce pressures and impacts on the marine environment.

The ecosystem services approach is a tool to identify marine ecosystem services and assess how the associated benefits are linked to ecosystem processes, habitats and species. These services and benefits can be valued in terms of their contribution to our economic, social and cultural wellbeing. Ecosystem service assessment and valuation can support marine management by contributing to better decision making that takes into consideration the ecological, economic and societal importance of healthy seas.

In recent years there have been an increasing number of studies investigating the value of marine ecosystems. But how are these valuations actually being used in the management of the marine environment? To answer this question, the VALMER project reviewed 38 case studies around the world for which evidence was found that ecosystem service valuation had been used in marine decision making. This topic paper gives a flavour of where and how ecosystem service valuation is currently informing and supporting marine management.

Ecosystem service valuation in marine management around the world



Globally, ecosystem service valuation is being used in various contexts related to the conservation of marine ecosystems and marine resource management use. For example, in Bonaire and several other Caribbean islands, ecosystem service valuation helped determine appropriate levels of entrance fees to marine protected areas for divers and other visitors.

In the Philippines, valuation studies led to the banning of destructive logging and shrimp aquaculture in mangrove forests and encouraged investment in mangrove conservation.

In Florida and Hawaii, ecosystem service valuation supported the design and introduction of a penalty payment system for damage caused to coral reefs.

One of the most famous cases using ecosystem service valuation concerned the Exxon Valdez oil spill in Alaska in 1989. After a lengthy litigation process in which ecosystem service valuation played an important role, Exxon was fined $500 million for damages to the environment.

Two thirds of the 38 case studies were located in the Caribbean and the South and West Pacific, where countries are highly dependent on their marine resources for subsistence and income to the national economies.

In Europe, the use of ecosystem service valuation in environmental policy making is a more recent development. Here, valuation studies have been used, for example, to inform coastal risk management strategies in the United Kingdom or as part of environmental impact assessments of harbour development and gas extraction projects in the Netherlands.

Three ways to use ecosystem service valuation

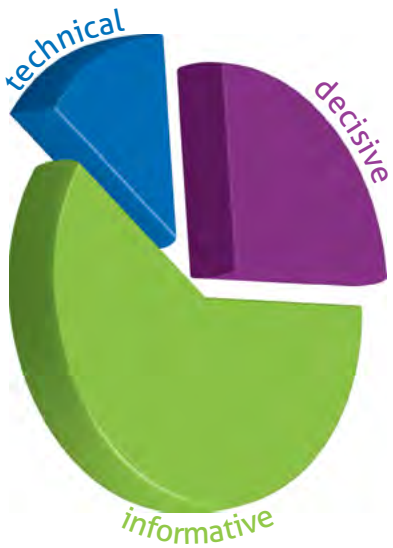
Ecosystem service valuation can be used to support marine management decision making in three different ways:

1) **Informative use**: to support policy and decision making in general;
2) **Decisive use**: to inform a specific decision, legislation, regulation, project, etc.;
3) **Technical use**: to design economic instruments, for example fees, taxes.

In the 38 case studies, ecosystem service valuation was most frequently used to inform policy and management, justify potentially controversial decisions or investments, support stakeholder engagement, or raise awareness about an issue. In several cases it also supported decisions about the formulation of regulations, development permitting, or court rulings. The most frequent technical use was to determine user fee levels for marine parks.

Distribution of informative, decisive and technical use of ecosystem service valuation across the 38 case studies, including examples for each type of use

- Environmental damage estimates based on ecosystem service valuation informed the setting of fines and compensation payments in the Belize ship grounding and Exxon Valdez court cases.
- Ecosystem service valuation was used to design a penalty system for reef damage in Florida and Hawaii.
- In the Caribbean, valuation studies helped determine appropriate user fees for visitors of marine protected areas.



- In the Netherlands, ecosystem service valuation was part of the cost-benefit analysis of plans to expand the port in Rotterdam.
- Across various Pacific islands, valuation studies led to bans of destructive activities such as mangrove reclamation and logging, shrimp aquaculture and coral mining.
- Valuation studies played key roles in court cases following a ship grounding causing major reef damage in Belize and the Exxon Valdez oil spill in Alaska.

- Valuation studies justified the establishment of marine protected areas and investment in marine conservation in several Caribbean and Pacific islands.
- In Bonaire, the Florida Keys and Belize, valuation studies helped improve the dialogue between marine park management and local stakeholders.
- In Belize, ecosystem service valuation was used in a public campaign which successfully prevented an offshore oil drilling project from going ahead.
- In the UK, a valuation study providing evidence on the benefits of establishing a network of marine protected areas was given to Government to inform marine conservation designation policy.

Ideal management conditions for using ecosystem service valuation

In some of the 38 case studies ecosystem service valuation was more influential than in others. Valuation studies were particularly effective in supporting marine management on small islands that are highly dependent on their marine resources. Other identified factors that proved to be important for the successful use of ecosystem service valuation as a marine management tool were:

- Transparent, participative decision making structures, involving local stakeholders
- A clear policy question to which the valuation study was applied
- A good communication strategy tailored for the right audience

On the other hand, difficulties of conducting ecosystem service valuation studies limited their use and influence in several case studies. These included methodological issues such as under or overestimations and double counting of ecosystem services, but also lack of resources for site specific valuations, uncertainties about scientific data and limited scientific knowledge of marine ecosystem services.

Is ecosystem service valuation all about the money?

In all 38 case studies considered in this study, marine ecosystem services were valued in monetary terms. There is an ongoing debate about the moral and ethical implications of putting a price on nature; and monetary approaches have clear limitations when it comes to capturing the more intangible societal and cultural benefits of ecosystems. Despite this, monetary valuation has so far been the most commonly used form of ecosystem service valuation in environmental management. This is because money often plays a central role in political and management decision making, but also because these economic methods have been around for a couple of decades.

Non-monetary valuation of ecosystem services, on the other hand, is a fairly new concept. The research and management community is still trying to work out how to quantify and measure the well-being value of an open horizon sea view, the societal value of rock pooling or the cultural value of surfing. This kind of information will become increasingly relevant as policy makers and managers begin to recognise the importance of taking into consideration non-monetary societal benefits in their policies and management decisions. These benefits include, for example, improved mental and physical health from spending time at the seaside.

One type of non-monetary valuation that could inform management decisions is the assessment of the cultural significance of places. For example, a recent study conducted by the University of Exeter and VALMER project partners looked at the role that a specific stretch of Cornish coast plays for local residents' well-being, identifying places along the coast that are particularly important for people's cultural identity and wellbeing. Studies like this can contribute to the evidence base for coastal development strategies.

VALMER – moving forward with the application of the ecosystem service approach in marine management

VALMER is testing the ecosystem services approach at six case study sites across the western English Channel. Each case study is taking a different approach to assessing and valuing local marine ecosystem services. The project is exploring informative, decisive and technical ways of using these valuations and assessments in addressing site specific management issues.

Introduction to the six VALMER case studies, including the focus of the ecosystem service approach and its application in the local marine management context

- In **Plymouth Sound to Fowey** the VALMER team is valuing the ecosystem services provided by intertidal and subtidal habitats. The outcomes will support the implementation of the Cornwall Maritime Strategy.
- In **Poole Harbour**, VALMER measured the economic value of six recreational activities in the Harbour. This valuation will support management of the Harbour, including the Poole Harbour Aquatic Management Plan.
- The **Golfe du Morbihan** case study is applying the contingent valuation approach to ecosystem services provided by local sea grass beds. This will support the development of a sustainable management strategy for sea grass in the Golfe.
- The **North Devon** case study is looking at the value of subtidal sedimentary habitats in supporting commercial fisheries, carbon sequestration and waste remediation. This study will add to the evidence base for the management of the North Devon Biosphere Reserve.
- In the **Iroise Sea Marine Park** VALMER is valuing the ecosystem services provided by local kelp forests. This will inform the management of the kelp as a resource within the marine park.
- In the **Golfe Normand Breton** a broad assessment and valuation of the various ecosystem services provided by tidal and subtidal habitats, will provide important evidence to support the development of a new marine park in the Golfe.

Projects like VALMER can play an important role in increasing the visibility and acceptance of the ecosystem service approach as a tool for marine management in Europe. In particular, the VALMER case studies can significantly add to the understanding of how the ecosystem service approach can support marine management by:

- Testing and refining the ecosystem service approach as a management tool in six different marine management contexts;
- Identifying strengths and weaknesses of different methods, including methodological issues with valuing marine ecosystem services and lesser studied cultural services;
- Testing the ecosystem service approach as a tool to explore stakeholder views and preferences for different management options;
- Exploring if the use of ecosystem service valuation in marine decision making processes can improve stakeholder engagement

In the United Kingdom, for example, the VALMER findings will help support organisations like the Marine Management Organisation in implementing marine planning. In France, organisations like the Agence des aires marines protégées are testing the ecosystem service approach as a tool to bring together economic, social and environmental data to help inform site management and facilitate stakeholder engagement.

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