



# ODEMM NEWSLETTER

Options for Delivering Ecosystem-Based Marine Management

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## Background and aims

It is already well known that human activities are impacting marine ecosystems on a global scale and that there are considerable threats to marine ecosystem goods and services such as seafood provision, climate regulation and aesthetic value. In 2008 Europe adopted its first legally-binding directive on sustainable use of the marine environment, the Marine Strategy Framework Directive (MSFD, Directive 2008/56/EC) and there is now a heightened need for the EU member states to act on this. ODEMM is an FP7 EU (Contract 244273) collaborative project involving 17 partners from 13 countries that are located around Europe's four regional seas. We aim to critically explore the barriers to implementation of the MSFD (and other related policies, e.g. the Habitat's Directive) and to help both broaden understanding and develop approaches required to overcome these barriers. By involving partners across Europe we will consider the regional diversity in these issues, taking account of the similarities and differences in both the natural and human environments of those areas. ODEMM's work is relevant to a wide range of practitioners and stakeholders including those involved in research, strategy development, or implementation of policies relevant to sustainable use of the marine environment, in addition to those who might be affected by this, either in terms of use or conservation of the environment.

## Marine Strategy Framework Directive:

The Marine Strategy Framework Directive (Directive 2008/56/EC) set out a common framework based on cooperation between Member States to ensure the sustainable use of marine goods and services by current and future generations. It stated that each Member State must achieve or maintain Good Environmental Status (GES) in the marine environment by 2020.

## Good Environmental Status (GES):

GES is defined as:

"Environmental status of marine waters where these provide ecologically diverse and dynamic oceans which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations..." European Commission Marine Strategy Framework Directive (2008/56/EC)

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## Existing governance structures (WP2)

WP2 involved a review and consultation on existing European governance structures in terms of their suitability to support implementation of policies related to sustainable use (such as the MSFD), in particular focusing on the legal aspects, suitability of institutional structure and on stakeholder preferences. This resulted in the production of three publications which are either published or in review. In the first publication (Long in press), the legal development of the ecosystem-based approach in global and European Directive is explored. This paper highlights the legal complexities and obstacles that may impede the implementation of the ecosystem-based approach for EU Members States. The second publication (van Leeuwen et al. submitted), defines institutional ambiguity and explores this concept in the context of applying the MSFD at European Regional and Member State levels. The third publication (Ounanian et al. submitted), explores the social, economic and political significance of the MSFD, and the dilemmas of implementation, for EU stakeholders.

The outputs from WP2 will inform the development of WP7, which intends to develop governance structures that will support sustainable and integrated management of European Regional Sea marine ecosystems through the implementation of the MSFD, with consideration of other directives such as the Habitats Directive and NATURA 2000 network. WP7 will involve stakeholders, giving them the opportunity to input their opinions, values and beliefs to help shape the outcome of ODEMM's toolkit.

## Objectives to support sustainable use and current risk to these (WP3)

WP3 first reviewed the high-level objectives of the MSFD and mapped related policies around Europe onto these. In the second stage, status, trend, pressure and impact information compiled under WP1 was applied to a risk assessment framework developed in WP3 to assess the risk of failure of achieving the high-level objectives of the MSFD (Breen et al., in prep; summarised in Chapter 3 of D1). High risk of failure to achieve GES was identified for many of the GES Descriptors in Europe's regional seas including Commercial Fish and Shellfish, Non-indigenous species and Marine Litter (see details in the regional foci on pages 4 & 5). Finally, a review of existing operational objectives was undertaken for a range of GES descriptors across Europe to see where these might already be available and expose where there are gaps and further work is required (Deliverable 6, available to download on our website). Significant gaps do exist in terms of the availability of operational objectives either in a particular regional sea or across the whole

of Europe and in some cases globally. The review will be used to guide the work undertaken next in WP4 where operational objectives on indicators used to assess the status of particular GES Descriptors must be developed for proposed management options.

## Next steps...

In the next phase of the project we will identify management options that are suited to the types of issues currently threatening GES around Europe, and using tools we develop based on approaches such as management scenario evaluation (WP4), risk assessment (WP5) and cost-benefit analysis (WP6) we will put together a tool kit (WP8) that can be used to fully weigh up management options to support sustainable use in Europe's regional seas. At the same time we will identify stakeholder opinions on the creation of governance structures suited to the implementation of the MSFD (and other congruent policies) so that we can provide recommendations for governance that would evolve to be able to successfully implement and regulate measures that support the integrated ecosystem approaches required (WP7). A second wave of outputs from ODEMM is due in autumn 2012 (WPs 4-6), with our final web-based toolkit and implementation plan due in spring 2013 (from WPs 7 & 8). For updates on outputs and progress please sign up on the following link: <http://www.liv.ac.uk/odemmm/subscribe.html>



## NE Atlantic

### Regional Teams:

University of Liverpool (UK); Cefas (UK); IMARES (Netherlands); MLOPRS Ltd (Ireland); SAC (UK); Wageningen University (Netherlands)

### Issues:

All components of the marine environment were identified as under threat or at high risk of failure to achieve GES. Areas of concern were identified for all 11 GES descriptors as well as for habitats and species listed under the Habitats Directive. GES and Habitats Directive descriptors at high risk of failure to achieve GES include:

**Non-indigenous species (NIS)** – Several non-indigenous species have increased in abundance and extended their range throughout the NE Atlantic region with potential detrimental impacts on native flora and fauna

**Commercial fish and shellfish** – Several species are at risk and either in poor status or exhibiting reduced spawning stock biomass. Patterns are regionally variable, however species such as cod or hake are at risk from over-fishing and landings (a proxy for stock size) continue to decrease.

**Food webs** – A reduction in primary producers in the North Sea and a decrease in top predator abundance

**Seafloor integrity** – Several activities including coastal infrastructure, fishing and non-renewable energy (oil & gas) introduce widespread and persistent pressures that threaten one or more of the NE Atlantic predominant habitats.

**Marine litter** – Large quantities of litter are removed from NEA beaches and water column each year and quantities continue to increase

**Underwater noise** – Marked increases in renewable energy development and shipping result in greater levels of underwater noise and may have detrimental impacts on marine species

**Habitats Directive Habitats and Species** - a large proportion of habitats (90%) and species (57%) are in unfavourable condition for at least one of the five assessment criterion. Only 1 species, the dolphin *Lagenorhynchus albirostris*, is currently in favourable conservation status.

## Baltic Sea

### Regional Teams:

SFI (Poland); SYKE (Finland); IFM-AAU (Denmark)

### Issues:

All components of the marine environment were identified as under threat or at high risk of failure to achieve GES based on a combination of existing status and trend assessments, pressure and impacts information. Areas of concern were identified for all 11 GES descriptors as well as for habitats and species listed under the Habitats Directive. GES and Habitats Directive descriptors at high risk of failure to achieve GES include:

**Predominant Habitats** – eutrophic conditions continue to threaten predominant habitats in the Baltic Sea to the extent that the dominance or persistence of those habitats is under threat

**Non-indigenous species** – there are several invasive species in the Baltic Sea that are both increasing in abundance and rapidly expanding their geographic range

**Commercial fish and shellfish** – Several species (e.g. cod and salmon) are in poor condition and outside safe biological limits

**Food webs** – There has been a change in the dominance of plankton species and a decline in the distribution and population size of top predators

**Eutrophication** – There is widespread eutrophication throughout the region resulting in high-biomass algal blooms, oxygen deficits and mortality events

**Seafloor integrity** – Several human activities represent a high threat to the marine environment including agriculture, fishing, coastal infrastructure, shipping and waste water treatment\*

**Marine litter** – Microplastic concentrations have increased throughout the region, and over 12,000 kg yr<sup>-1</sup> 500 m<sup>-1</sup> is collected from beaches per annum

**Habitats Directive Habitats and Species** – a large proportion of habitats (81%) and species (50%) are in unfavourable condition for at least one of the five assessment criterion

## Black Sea

### Regional Teams:

IBSS (Ukraine); IO-BAS (Bulgaria); IMS-METU (Turkey); NIMRD (Romania);

### Issues:

Most components of the marine environment were identified as under threat or at high risk of failure to achieve GES. Areas of concern were identified for 9 of the 11 GES descriptors. Descriptors of least concern include Biodiversity-Plankton and Hydrographic conditions. GES descriptors at high risk of failure to achieve GES include:

**Biodiversity (seabirds)** – several seabird species are currently under threat in terms of distribution and population size and listed by IUCN as threatened, vulnerable or endangered.

**Non-indigenous species** – Two NIS species, *Rapana venosa* and *Mnemiopsis leidyi* have historically caused widespread problems. Despite a reduction in *M. leidyi* abundance, the density and distribution of the species continues to cause impacts in the region

**Commercial fish and shellfish** – Destructive fishing practices and over-exploitation has led to the decline of many benthic and pelagic fish species and stock collapses in the 1980s. Stocks have been slow to recover with several species under threat

**Food webs** – Historic over-fishing practices have led to food web destabilisation and removal of top predators, in part supporting NIS expansion in the region

**Seafloor integrity** – Several activities including agriculture, coastal infrastructure, fishing, shipping, tourism and recreation and waste water treatment introduces widespread and persistent pressures into the marine environment

**Marine litter** – The amount of litter in the Black Sea is largely unreported but it is a 'visible' problem along the coast arising from coastal infrastructure, fishing, land-based industry and shipping

**Underwater noise** – Shipping is widespread and continues to increase throughout the region introducing low-frequency sound throughout the region

## Mediterranean Sea

### Regional Teams:

HCMR (Greece); NIO-IOLR (Israel); TAU (Israel); UTH (Greece);

### Issues:

Most components of the marine environment were identified as under threat or at high risk of failure to achieve GES. Areas of concern were identified for all 11 GES descriptors. GES descriptors at high risk of failure to achieve GES include:

**Biodiversity (marine mammals & reptiles)** – Several species are threatened under IUCN criteria with trends in abundance and distributional range indicating that the Monk seal is critically endangered.

**Non-indigenous species** – The Mediterranean continues to be one of the most invaded regional seas of the world with introductions associated with shipping, mariculture and the Suez Canal, resulting in widespread impacts for biological diversity and socio-economy.

**Commercial fish and shellfish** – More than 25% of stocks are exploited beyond sustainable levels. Contributing factors include overfishing, unregulated practices, lack of enforcement, non-selective and illegal gears and absence of appropriate management measures.

**Food webs** – the prevalence of invasive jellyfish species and structure of top predators suggest that the Mediterranean food web is in an advanced state of degradation

**Seafloor integrity** – Several activities including coastal infrastructure, fishing and non-renewable energy (oil & gas) introduce widespread and persistent pressures that threaten one or more of the Mediterranean predominant habitats.

**Marine litter** – Mediterranean marine litter originates largely from land-based sources. Beach litter is mostly linked to shoreline and recreational activities. Plastics/microplastics dominate beach, seabed and floating litter. In addition there are reports of many species having ingested marine litter or being caught in lost fishing gears.

**Underwater noise** – Trends indicate shipping activity is increasing leading to further noise pollution

**Habitats Directive Habitats and Species** – More than 35% of habitats and >50% of species are in unfavourable condition under one or more of the assessment criteria.

## ODEMM Project team and Guidance:

The expertise held in the project team consists of ecology, marine management, social science, governance and environmental economics across the four regional seas.

The first ODEMM meeting was held in Liverpool from 29th—31st March 2010. The majority of partners were in attendance and all those there held positive discussions on the best way to move forward with this project. Subsequent meetings have since been held in:

Crete, Greece, Constanta, Romania, Wageningen, The Netherlands and Galway, Ireland.



ODEMM is guided by an Advisory Committee to ensure that its work is of direct relevance to end users and to improve quality of its products through a peer review process.

The ODEMM Advisory Committee comprises of :

- John Steele (Chair) (Woods Hole Oceanographic Centre)
- Eva Gelabert (EEA)
- Virgine Hart (UNEP/MAP - GEF MedPartnership)
- David VanderZwaag (Dalhousie University)
- Anastasius Eleftheriou (HCMR Crete)
- Valeria Abaza (Black Sea Commission)

The expertise of the Advisory Committee covers a



European and International perspective and includes ecology, marine management, governance, law and environmental policy.

The first Advisory Committee meeting was held on 8th & 9th December 2010, in central London. The Project Coordinator and other principle scientists from the ODEMM project also attended. A further meeting was held during the Galway meeting in June 2011.

ODEMM partners will be showcasing the major outputs of the project at several meetings over the next few months, including:

- “World Conference on Marine Biodiversity: Our Oceans, Our Future”, Aberdeen, UK, September 2011
- “VI International Conference on Current Problems in Optics of Natural Waters”, St. Petersburg, Russia, September 2011
- “Black Sea Outlook”, Odessa, Ukraine, October/November 2011
- “Marine Alliance for Science & Technology”, Scotland.
- “7th International Conference on Marine Bioinvasions”, Barcelona, Spain, August 2011
- “Working Group meeting on Stock Assessment of Demersal Species”, Chania, Crete, October 2011
- “Hamburg International Environmental Law Conference” <http://www.hielc.org/>, September 2011
- “The Law of the Sea Institute Conference, The Limits of Maritime Jurisdiction ANCORS”, Wollongong, Australia, 28 November - 2 December 2011

Broader dissemination of the project:

- Joint cluster meetings with other common projects (KnowSeas/MESMA)
- Common partners working in MEECE, MESMA, CoralFISH and other EU projects.
- Contribution to forthcoming PISCES Workshop
- Publication: Robinson LA: Ecosystem Approach. International Innovation August 2011:29-31