

Marine Strategy Framework Directive

Yann-Hervé de Roeck, IBIROOS Lisboa 2010

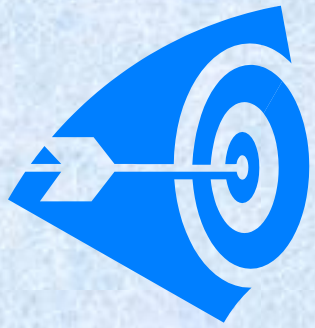
**achieving good environmental status
for all European marine waters**

http://ec.europa.eu/environment/water/marine/index_en.htm

Descriptors for determining GES

MSFD ANNEX I: Qualitative descriptors for determining GES (referred to in **Articles 3(5), 9(1), 9(3) and 24**)

- (1) Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.
- (2) Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems.
- (3) Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.
- (4) All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.
- (5) Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters.
- (6) Sea floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.
- (7) Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems.
- (8) Concentrations of contaminants are at levels not giving rise to pollution effects.
- (9) Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards.
- (10) Properties and quantities of marine litter do not cause harm to the coastal and marine environment.
- (11) Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.



2012

initial assessment

Member States must make an **assessment** of their marine waters:

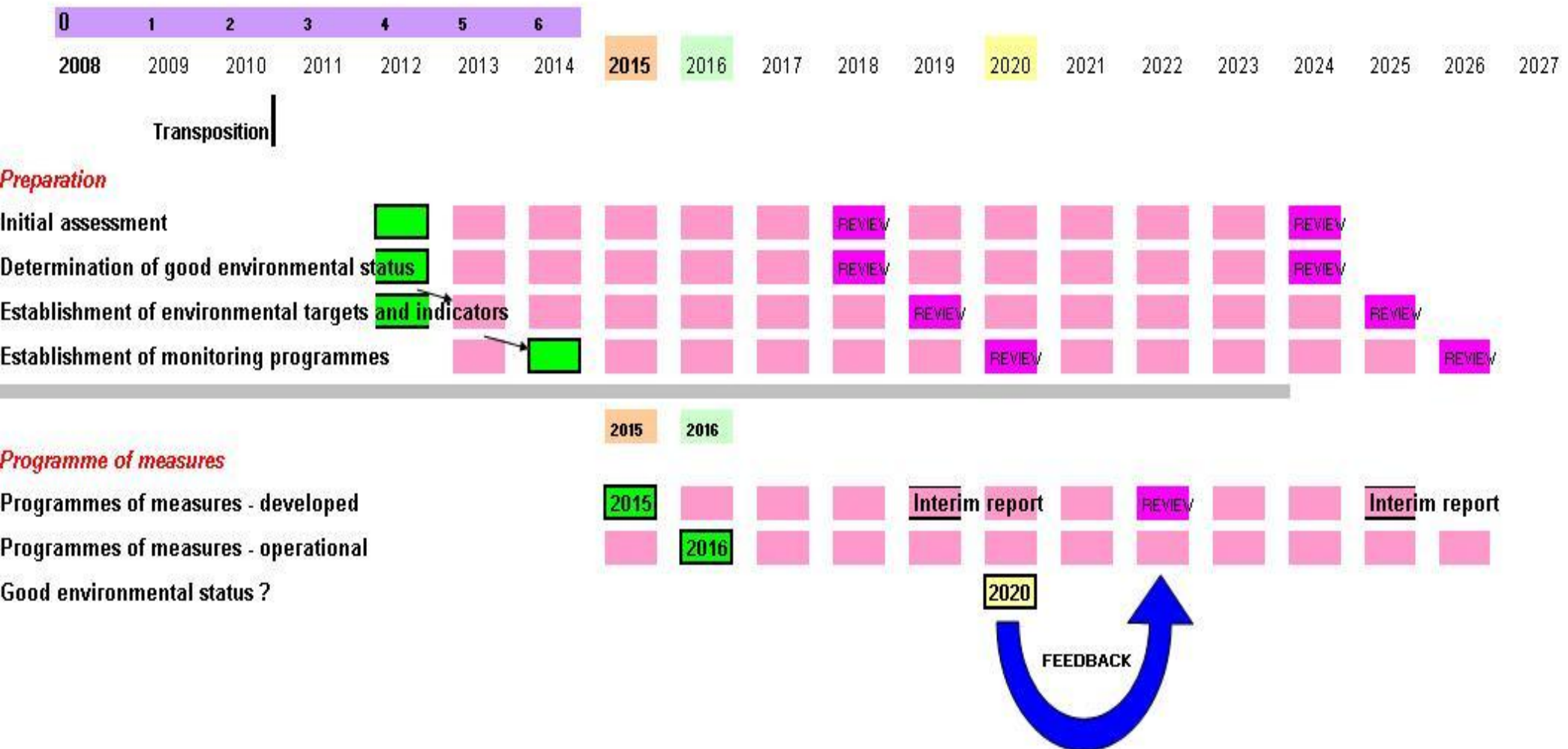
analysis of the essential characteristics and **current environmental status** of those waters (physical, chemical and biological features)

analysis of the predominant pressures and impacts, including human, on the environmental status of those waters, covering the main cumulative effects

economic and social analysis of the use of those waters and of the **cost of degradation** of the marine environment

Timeline for implementation

TIMELINE and MARINE STRATEGY ELEMENT DEADLINES



IEO Initial Status Report

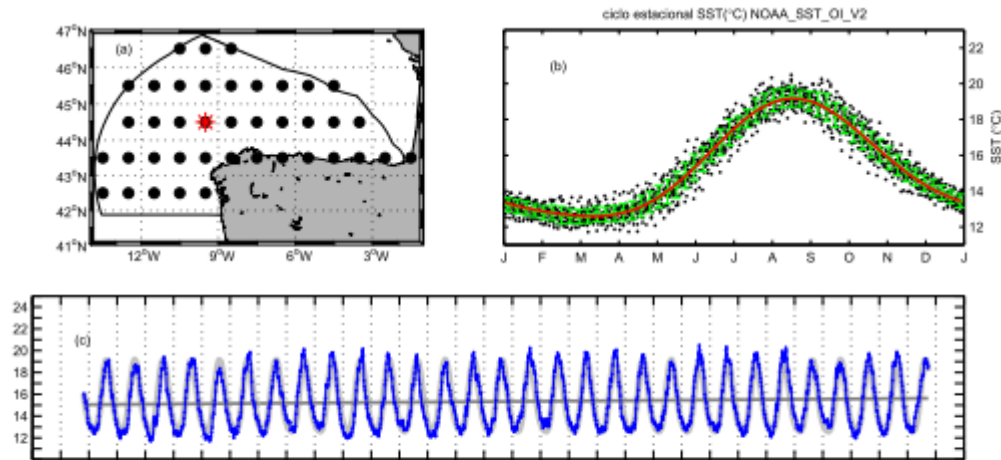


Figura 7.1: Ciclo estacional (b) y variabilidad interanual (c) de la SST en un punto representativo de la Demarcación Noratlantica (a). El registro reconstrucción SST de la NOAA (*Reynolds et al.*, 2002) que ofrece datos semanales en una malla de $1^\circ \times 1^\circ$ desde principios de los 80.

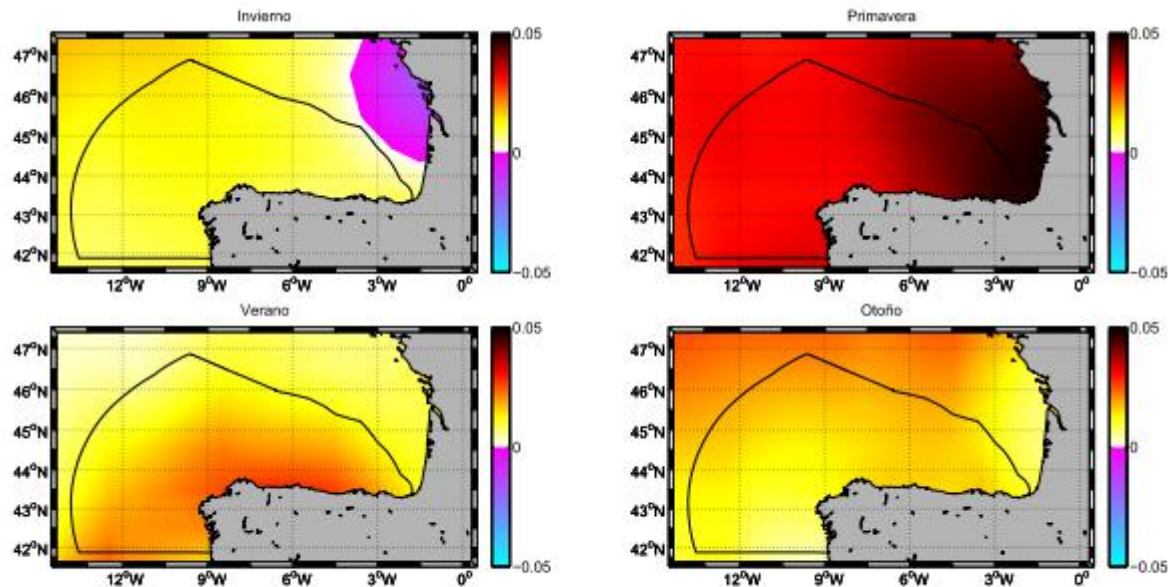
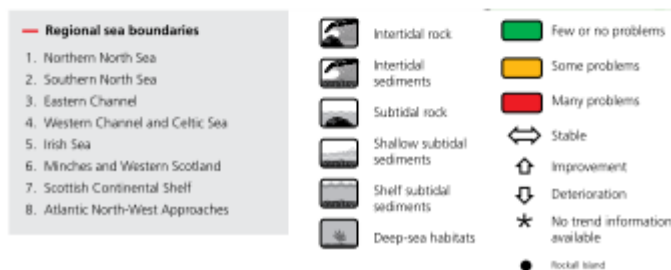


Figura 7.2: Tendencia de la SST por estaciones en la DM Noratlantica

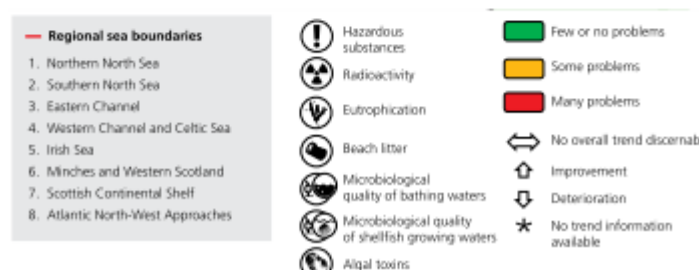
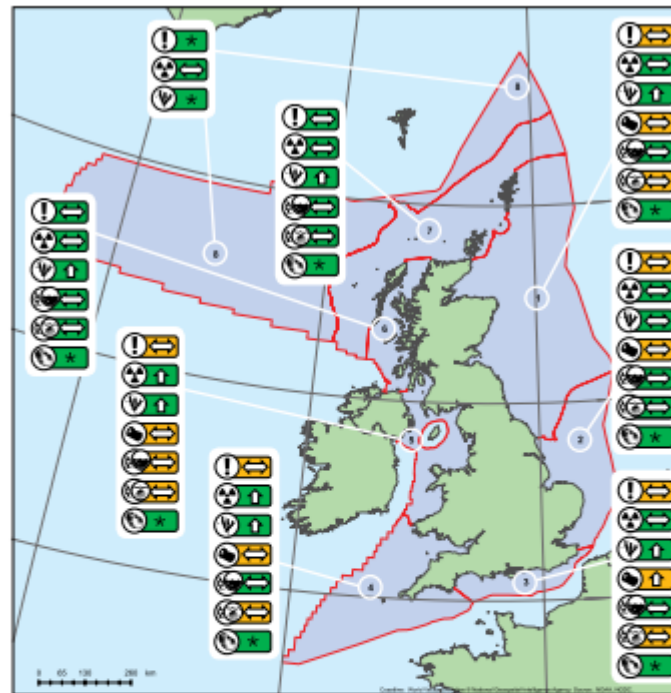
DEFRA

Charting Progress 2 The state of UK seas Overview

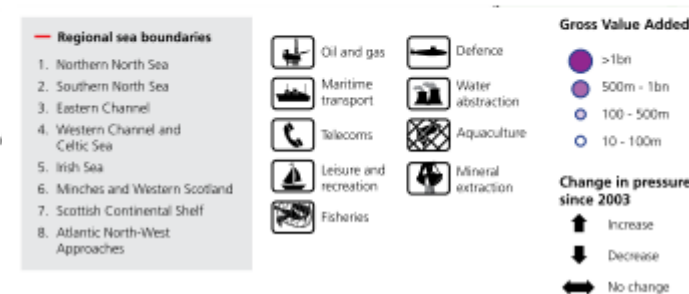
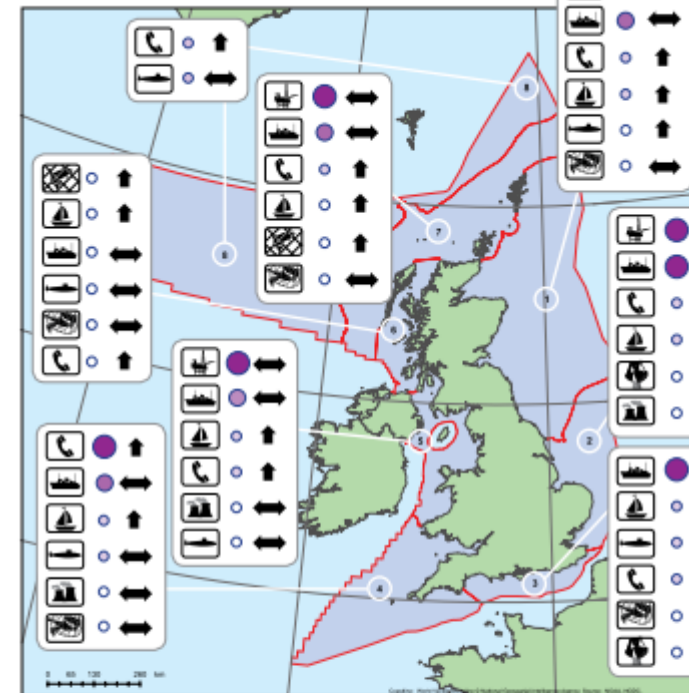
Healthy and Biologically Diverse Seas – Habitats



Clean and Safe Seas



Productive Seas





INGV

**MFS
Indicators**

Indicators

SST

SST Anomaly

SSS

HC

HC Anomaly

Net Volume
Transports

Net Volume

Mediterranean Forecasting System (MFS) Indicators

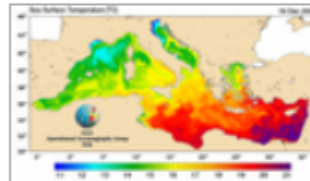
News: European Environment Agency has started to disseminate our products on SST, click [here](#) to see the EEA SST viewing service

BOSS4GMES MFS Indicator List

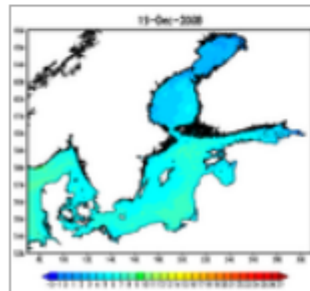
SST	Sea Surface Temperature [°C]
SST anomaly	Sea Surface Temperature Anomaly [°C] The difference between the SST of the model and the SST of the Medatlas climatology ⁽¹⁾ .
SSS	Sea Surface Salinity [PSU]
HC	Heat Content [10^{21} J] Calculated in 0-150 m upper layer by multiplying the volume of water by its density and specific heat capacity.
HC anomaly	Heat Content Anomaly [10^{21} J] The difference between the HC of the model and the HC of the Medatlas climatology ⁽¹⁾ .
Net Volume Transports	Net Volume Transports [Sv] Calculated for the Strait of Gibraltar, Sicily Channel, and Corsica Channel. $Sv = 10^6 \text{ m}^3/\text{s}$.
Net Volume Transports Anomaly	Net Volume Transports Anomaly [Sv] The difference between the Net Volume Transport of the model and the Net Volume Transport of the MFS sys3a climatology ⁽²⁾ . Calculated for the Strait of Gibraltar, Sicily Channel, and Corsica Channel. $Sv = 10^6 \text{ m}^3/\text{s}$.

http://gnoo.bo.ingv.it/mfs/B4G_indicators/MFS_indicators.htm

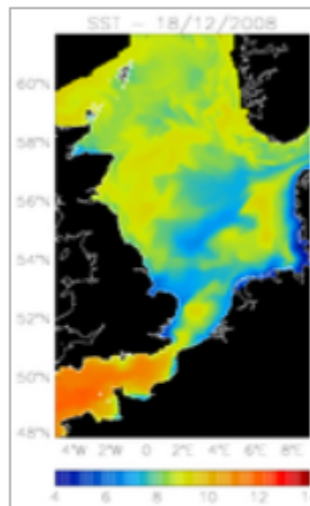
Today's sea surface temperature



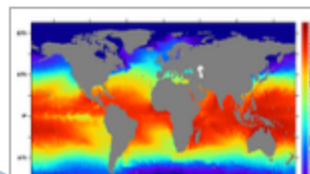
Mediterranean Sea
Today



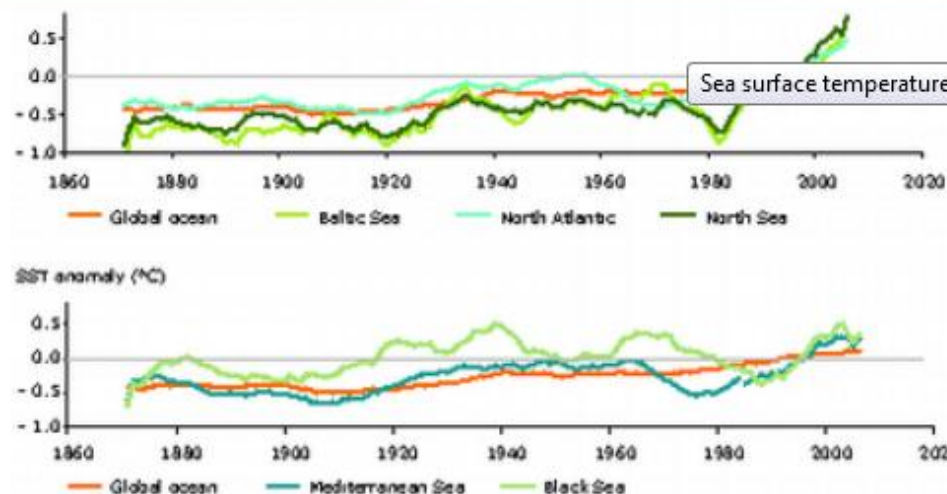
Baltic Sea
Today



North Sea
Today



Global Ocean
Today



Hadley Center. HADISST1: <http://hadobs.metoffice.com/hadisst/data/download.html>. ENEA within Mediterranean Operational Oceanography Network (MOON), and Bundesamt für Seeschifffahrt und Hydrographie (BSH) within the Baltic Operational Oceanography System (BOOS).

[Downloads and more info](#)

Fig. 1: Sea surface temperature anomaly for

Sea surface temperature anomaly for period 1870-2006

Note: Data (oC) show the difference between annual average temperatures and the period 1982-2006 mean in different European seas

Data source:

Coppini, G.; Pinardi, N.; Marullo, S. and Loewe, P., 2007. Compiled for EEA by the Istituto Nazionale di Geofisica e Vulcanologia (INGV) based on datasets made available by the

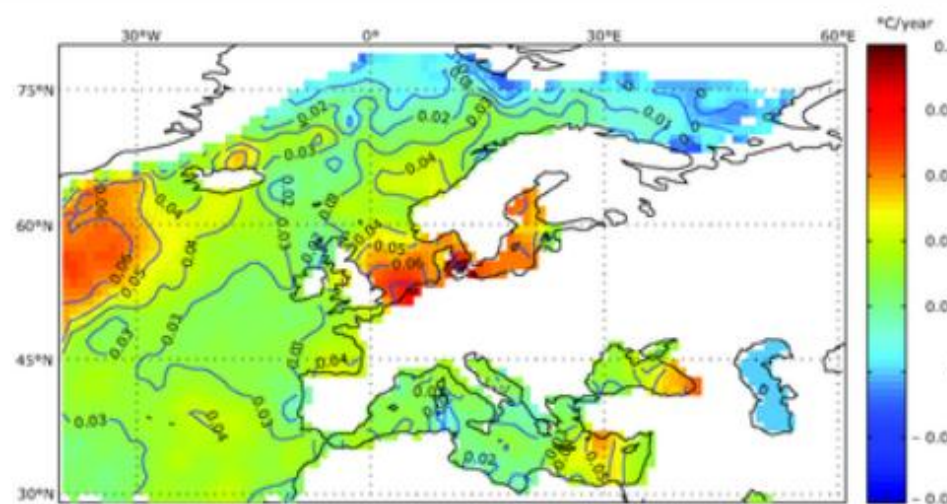


Fig. 2: Sea surface temperature changes for the European seas 1982-2006

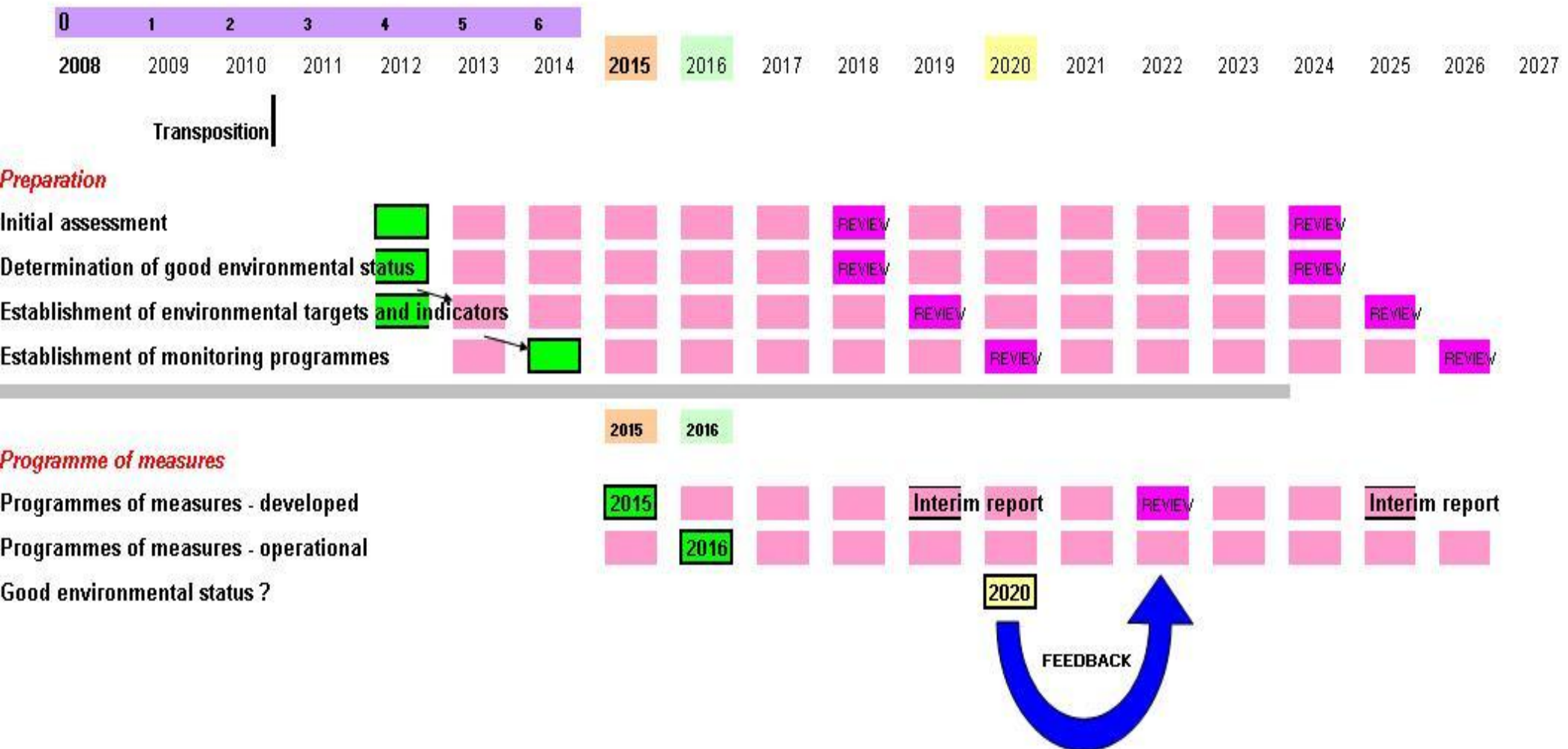
Note: N/A

Data source:

Coppini, G. and Pinardi, N., 2007. Compiled for EEA by the Istituto Nazionale di Geofisica e Vulcanologia (INGV) based on datasets made available by the Hadley Center HADISST1: <http://hadobs.metoffice.com/hadisst/data/download.html>.

Timeline for implementation

TIMELINE and MARINE STRATEGY ELEMENT DEADLINES





What can be provided by OO for MFSD needs ?

Example of “indicators” product, developed in PREVIMER

« Indicators » product

➤ Objective

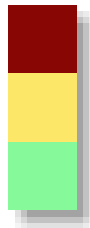
- To synthesize on a map all the parameters from **models/measurements** over thresholds
- To allow monitoring/alert, to prevent from physical/biogeochemical coastal risks

➤ Daily synthetic map green/orange/red

➤ Can be applied particularly for MFSD

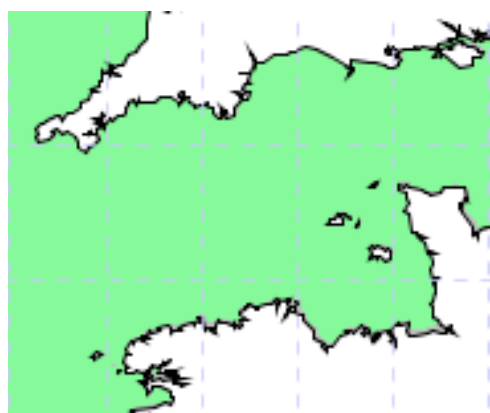


Indicators & thresholds to be defined

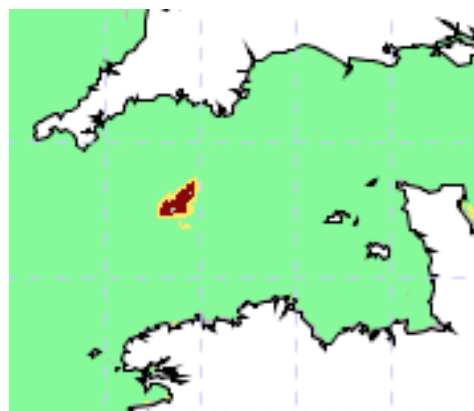


Very high indicator
High indicator
Low indicator

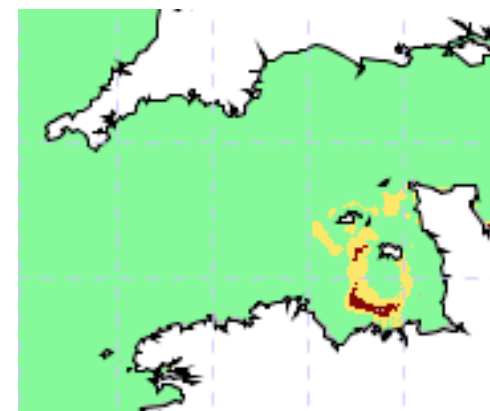
Indicator : bloom of *Karenia mikimotoi*



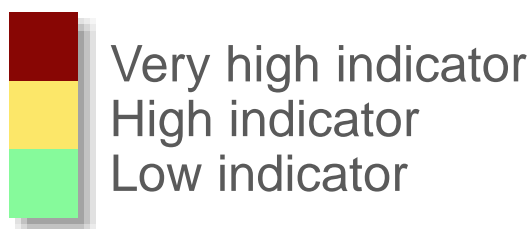
21/01/2012



09/07/2010



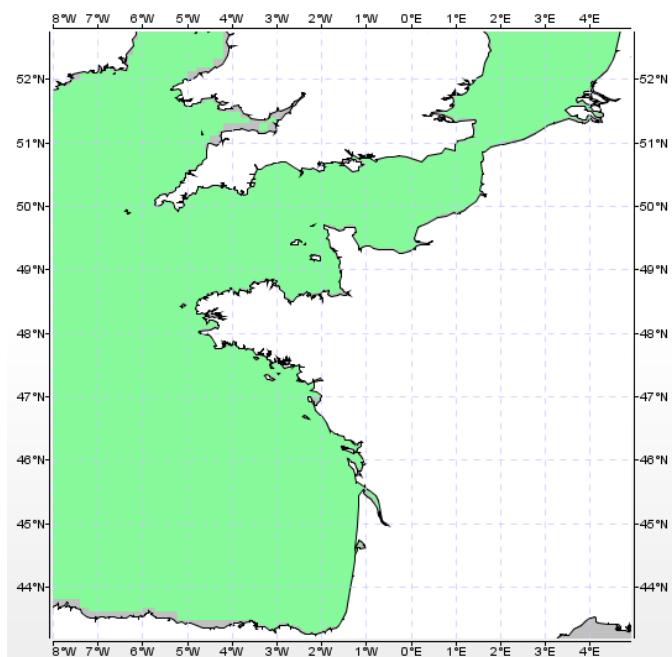
06/08/2003



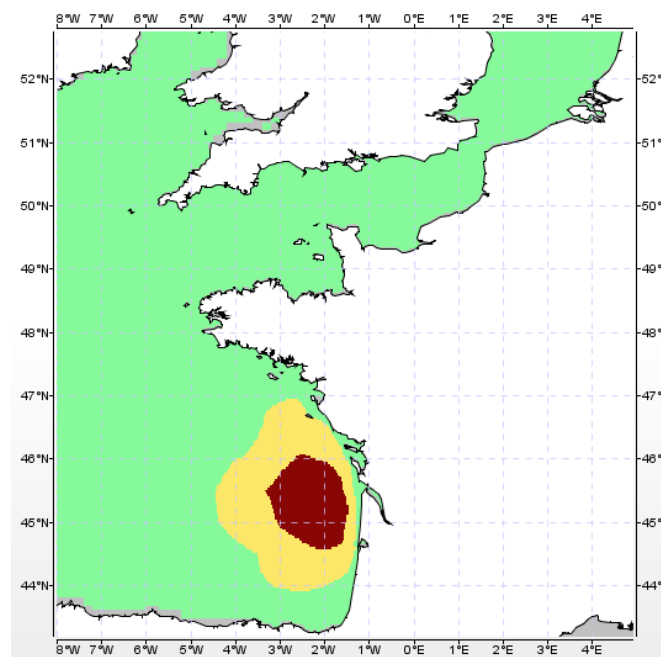
Thresholds: 5 - 10 mg/m³

Bloom of *Karenia mikimotoi*
Dead fishes mentioned in North
Britanny

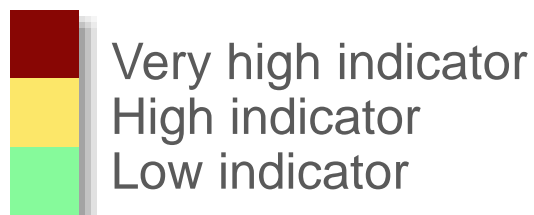
Indicator : wave



01/07/2010 à 12h

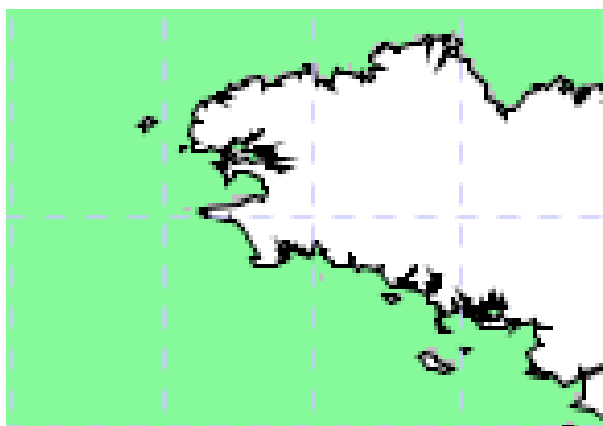


28/02/2010 à 3h

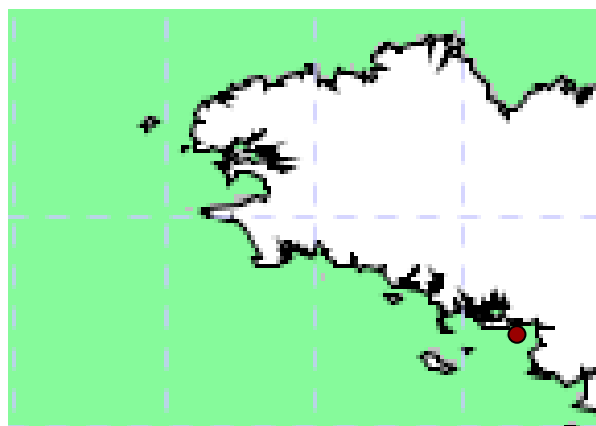


Thresholds: 5 – 6 m

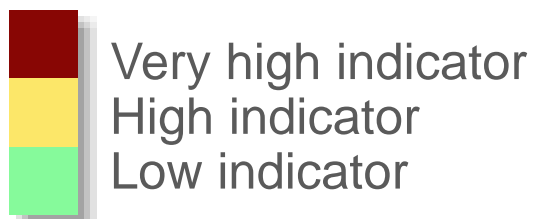
Indicator : anoxia



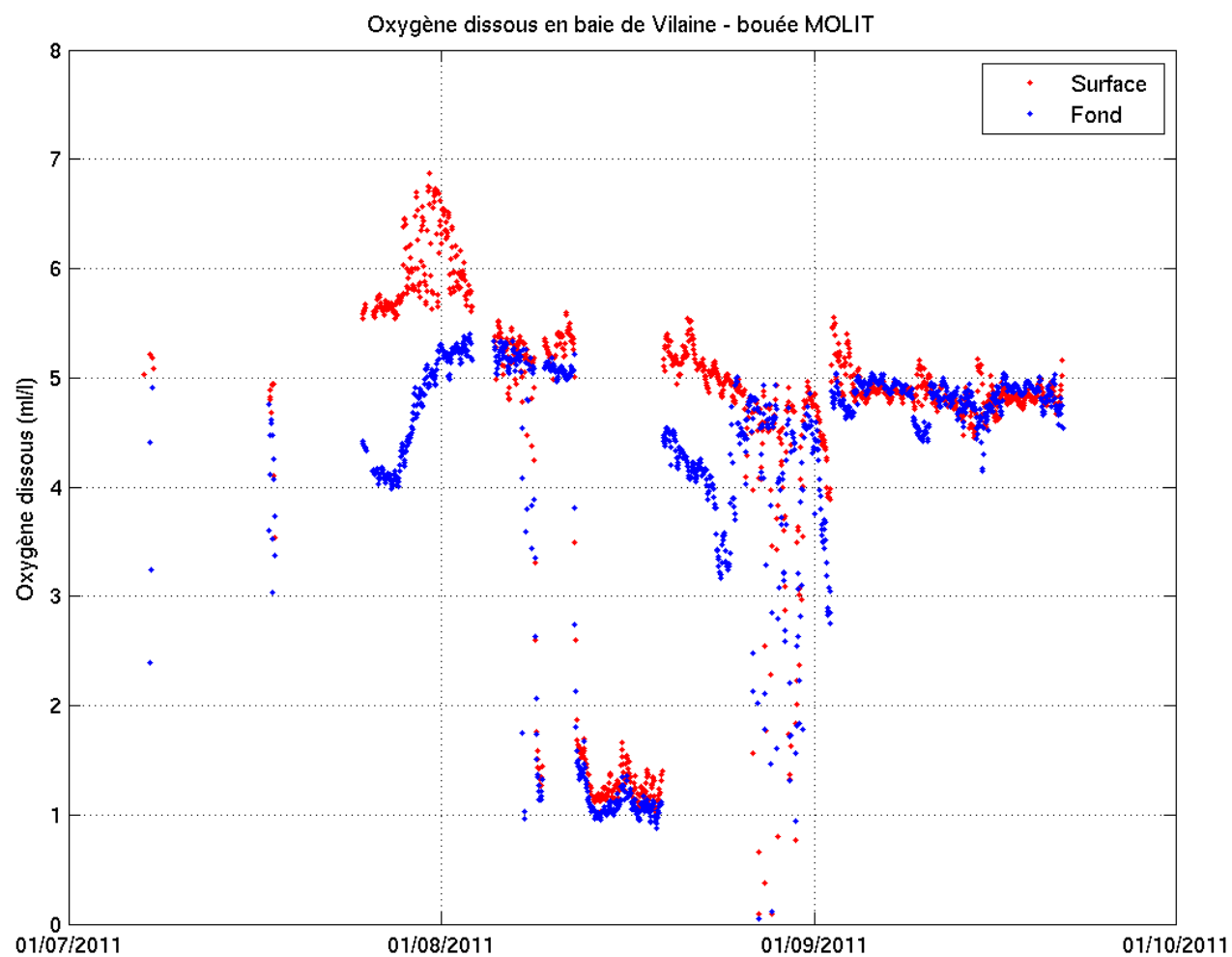
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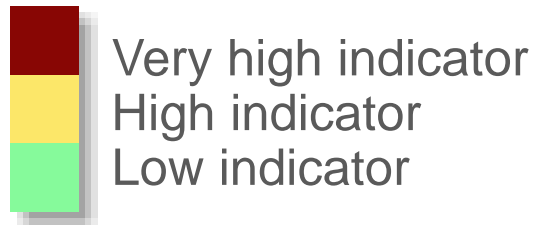
15/08/2011



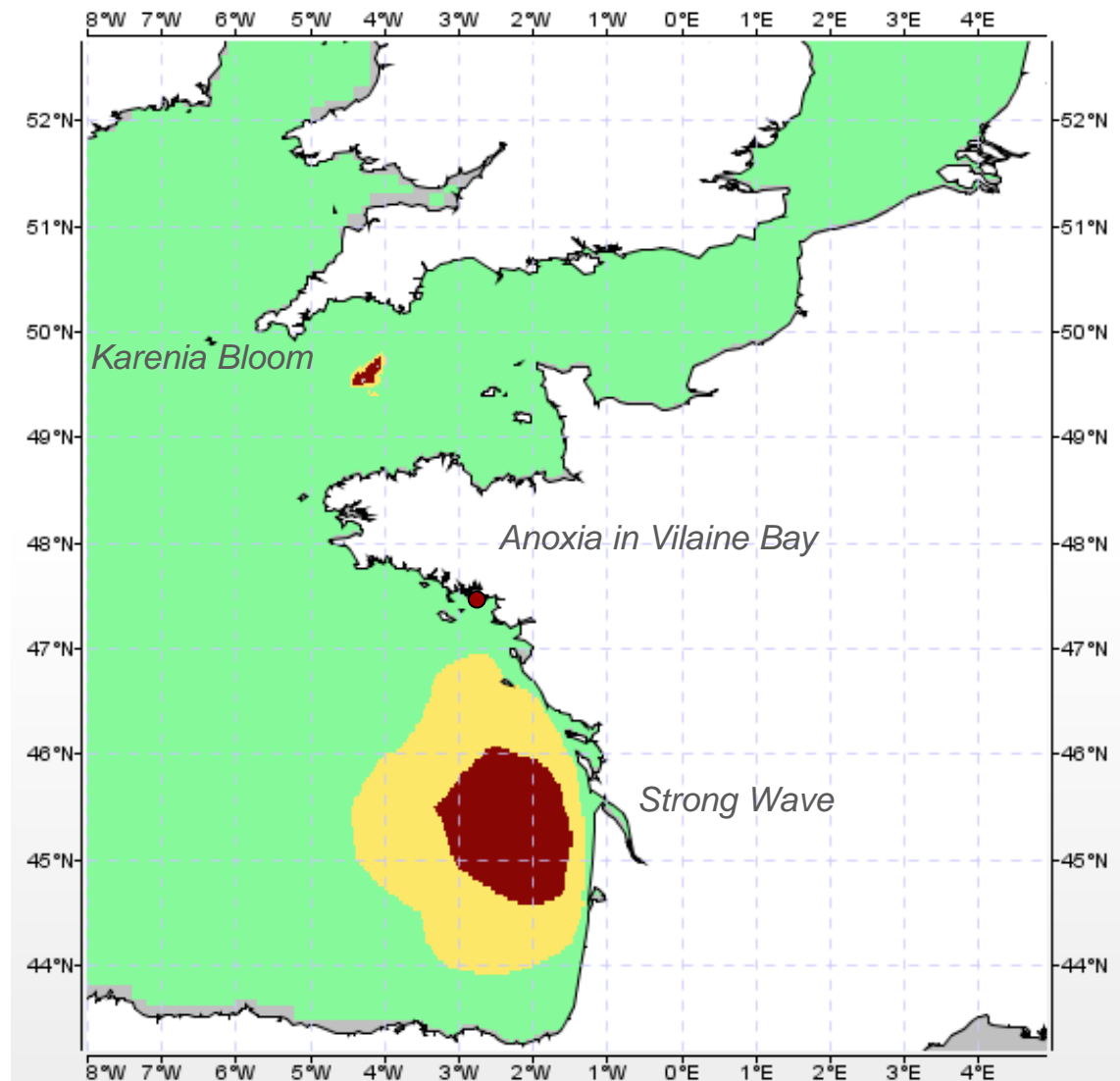
Thresholds : 2 – 4 mg/l



Indicators



- Indicators & thresholds to be defined
- Data : in-situ measurements, satellite images, models



Example of indicators

- Biomass (chlorophyll-a)
- Anoxia (oxygen rate)
- Oyster mortality (based on temperature)
- Risk of mollusc contamination
- Turbidity
- Sea level
- Surge
- Wave
- ...