



Department
for Environment
Food & Rural Affairs

EMECO Data Tool

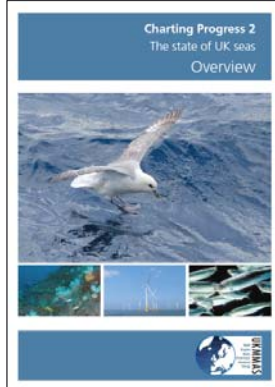


Debbie Hembury, Defra
27th February 2015

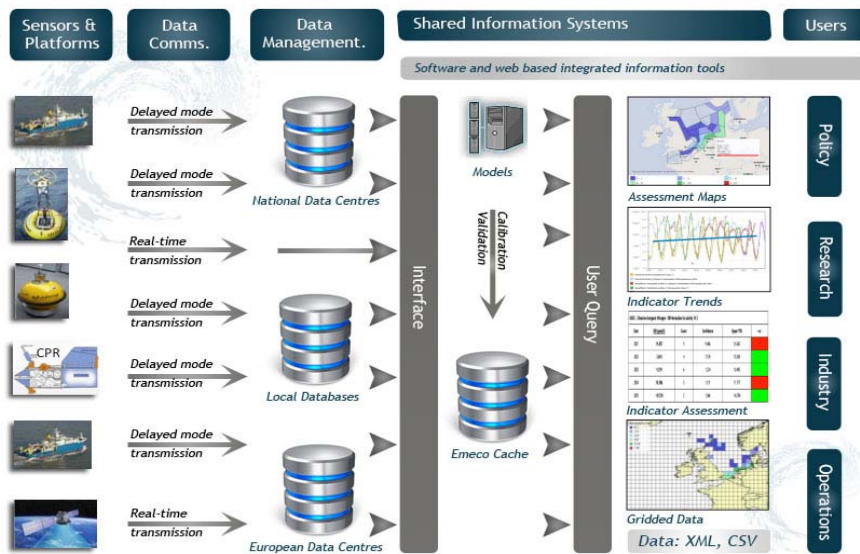
Summary

- Drivers for creating the EMECO Data Tool, and overall aims of the Tool
- Using the EMECO Data Tool
- Indicator assessment development in the EMECO Data Tool to date

Drivers for Marine Assessments



Data landscape



Overarching aim

“A streamlined ‘on-line’ assessment system that enables rapid integration and assessment of multi-national, multi-agency, multi-platform and multi-variate data”

Using EMECO

EMECCO
European Marine Ecosystem Observatory

info@emecogroup.org

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GO

1. Select Output
Output Type: [Graphs / Chart]

2. Select Date Range
Date From: 11 Jan 2011
Date To: 11 Jul 2014

3. Select Depth Range (metres)
Depth From: 0
Depth To: 9999

4. Select Averaging Period
Average: [Average by Day]

5. Select Area and Region
Regions: [Area] [Map View]
 Coarse Grid
 CPZ
 European Seas
 ICES Areas
 OSPAR North Sea modelling areas
 UK OSPAR Common Procedure areas
 My Regions

6. Select Data
Platform: []
Parameter: []
Show top of form A: []

7. Map Layers

EMECO Assessment Tools
The EMECO Assessment Tools are a suite of web-based tools that aim to streamline environmental assessments.
Set-up projects that semi-automate the environmental assessment process. Produce assessment quality outputs and create full, collaborative reports on marine environmental status.

About EMECO
EMECO is a consortium of agencies and institutes with responsibility for both monitoring and assessment of marine ecosystem threats and status (health), and also for improving understanding through research in European shelf seas.
The consortium brings together an existing monitoring, modelling, research capabilities to create a European infrastructure.

EMECO Datatools
The EMECO Datatools hold observational data from in situ monitoring tools (e.g. buoys, Ferryboxes, research vessels and ships of opportunity), remote sensing platforms and numerical models.
Using an interactive online tool, users are able to query the EMECO Datatools to produce integrated data sets and information products as outputs.

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5. Select Area and Regions

Regions Areas KML Map View

5. Select Area and Regions

Regions Areas KML Map View

- Coarse Grid
- CP2
- European Seas
- ICES Areas
- OSPAR North Sea modelling areas
- UK OSPAR Common Procedure areas
- My Polygons

Belgium
BC1
BO1

Denmark
DC1
DC2
DO1
DO2

France
FC1
FC2
FO1

Germany
GC1
GO1
GO2
GO3

Netherlands
NLC1
NLC2
NLC3
NLO1
NLO2
NLO3

Norway
NO1

med Out

IRELAND ISLE OF MAN UNITED KINGDOM DENMARK NETHERLANDS BELGIUM LUXEMBOURG GERMANY FRANCE

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6. Select Data

Platforms

Parameter

- Air Temperature (deg. C)
- Atmospheric pressure (mb)
- Ammonium ($\mu\text{mol/l}$)
- Chlorophyll ($\mu\text{g/l}$)
- SmartBuoy (calibrated archive)
- Satellite
- Research Vessel
- WCO Buoy QC
- Sepa Monitoring Buoy

EMECO is a consortium of agencies and i

Metadata

Research Vessel

Data Source: ICES Oceanographic Data Centre
Data owner: ICES (contact person: Else Juul Green)

Description: The ICES (International Council for the Exploration of the Seas) ocean monitoring data collected by research vessels. The data in the ICES database are

The EMECO database holds the following ICES information for each data record:

- Date and time (dd/mm/yy hh:mm)
- Longitude (decimals)
- Latitude (decimals)
- Sample depth (m)
- Parameter
- Value of parameter
- Unit of measure

The EMECO Datatools hold the following parameters from ICES:

- Temperature
- Salinity
- Oxygen concentration
- Nitrate

The following information will be collect

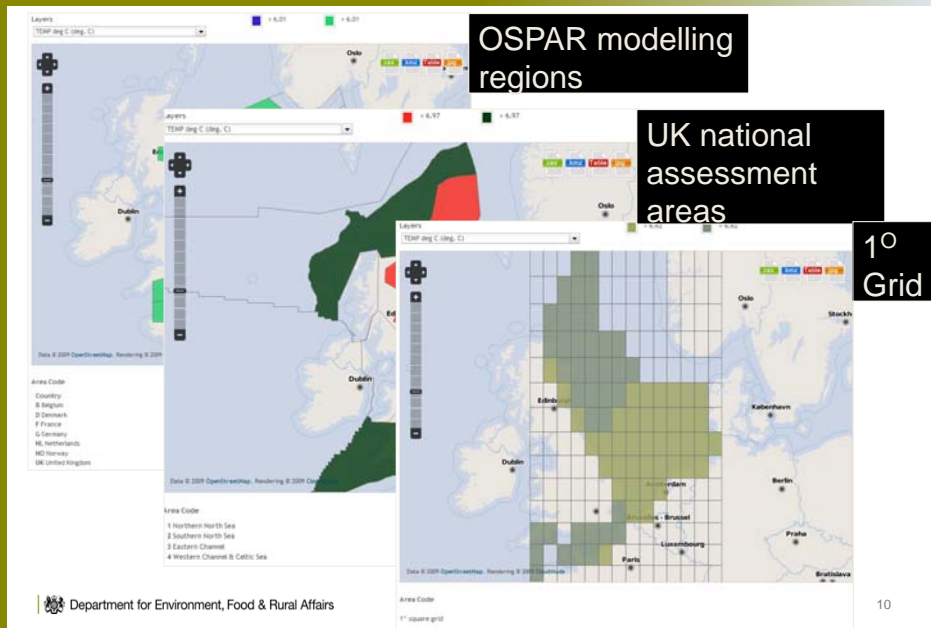
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Using EMECO



Using EMECO

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Cefas Stock Status 2011: Edible crab (*Cancer pagurus*) in the XXXX

	2009	2010	2011
Stock status in relation to MSY	Green	Yellow	Red
Stock trend	Green	Yellow	Red
Exploitation rate in relation to FMSY	Green	Yellow	Red
Exploitation trend	Green	Yellow	Red

Assessment Methodology

The assessment is based on length-based models to infer stock exploitation rates. Length-based virtual population analysis (L-VA) uses the catch numbers at length together with estimates of growth rate and the rate of death from natural causes ('natural mortality') in order to determine the rate at which fish are recruited to the fishery. Stock recruitment has been defined as the number of fish surviving to 12 months of age from natural causes (predation, disease or old-age) each year.

Reference point definition

Stock status is measured in terms of the stock's capacity to produce their larvae (provision of spawners) resulting from each female (spawner per female (SPM)) in comparison to what might be expected when the stock is at an unfished state (SPM₀). The target level is defined as 50% of virgin SPM (spawner per recruit level), at which the stock is considered to be sustainable. The stock recruitment has been defined as half of the virgin stock level.

The fishing mortality reference levels are defined as the fishing mortalities that result in the stock reference levels, i.e. fishing at the FMSY level should, in the long term result in the stock being at the stock MSY level.

Fishery Unit Definition

The stock reference level is defined for each of the Central Fishery Units (CFU) that have been defined for England and Wales. These units have been defined upon what is known of larval distributions and development, hydrographic conditions and the distribution of the fisheries. Each CFU encompasses waters covered by international, national and local (PFA) legislation which may be different within each region. UK legislation extends to 12 nautical miles offshore.

International PFA treaties apply between the location border and the river Tyne, and out to 6 nautical miles from coastal baselines. North Eastern PFA fisheries apply between the river Tyne and the river Ure (part of their area) and extend to 6 miles out from coastal baselines.

Fishery Management measures

- EU regulation sets a minimum landing size of 100mm for crabs in the North Sea and 100mm for crabs in the English Channel.
- EU regulation also restricts the proportion of the crab landings which is retained (crabs caught to getting to less than 1% by weight) for which mortality is more than 70% per day of crab claws other to other gear types can be used.
- National legislation restricts the number of amateur licences available (in England and Wales) and also prohibits landing of female and soft crabs.
- Local PFA legislation varies and is detailed in the table below.

Table 1. Regional status on Central North Sea (UK) fisheries	
Minimum legal length (mm)	100 (Northumberland PFA), 100 (Wales PFA)
Maximum gear used	100 (Northumberland PFA), 100 (Wales PFA)
Code of effort (days per year permitted)	Yes
EU legislation	Yes (Northumberland PFA), Yes (Wales PFA)

Biology

Edible crab can be found from Scandinavia to Portugal. Stock boundaries for edible crab remain poorly understood, as does recruitment. Both sexes mature early at three months of age and are generally found in large size classes, generally female to recruit because they are larger and live longer, but when carrying eggs are smaller than males.

Uncertainty

The assessment model assumes that the population is at equilibrium (i.e. constant recruitment). In order to smooth out the effect of fluctuating recruitment strategies we have assumed the constant practice of getting the three most recent years of length data. Recruitment is assumed to be constant (i.e. applying mortality or mortality) into future years. Catch data at the model results. The assessment also assumes that the fishery is operating over the entire stock and does not significantly or systematically change to avoid overfishing. A reduction in natural mortality may result in increased recruitment, but the fishery is likely to increase growth and therefore using larger previously unreported crabs. i.e. may represent expansion of fishing area to previously unreported grounds rather than reduction in F.

Growth rates in the model is assumed to be continuous (rather than in steps at each month) and constant across years. Growth data for crabs are difficult to obtain and uncertainty in growth rate estimates is high. Stock results are sensitive to variation in growth rate parameters.

Different values of natural mortality also have a large impact upon estimates of sustainability. The value of 0.1, although justified in naturally low compared to most fish stocks, and it is also highly likely that natural mortality varies with size and length based VPA models assuming 10-15% support very large fish in effort would be required to move from 0.1 to 0.2 (0.15-0.20) (or FMSY/MSY 0.15-0.20) for both males and females. This level of effort reduction would provide small (1% female) and small (1% male) stock.

Central North Sea Crab Stock Assessment for 2011 Page 2 of 3

Current content

- Assessments can be made in the EDT, including
 - Eutrophication – OSPAR assessment
 - Life Form pelagic indicators
 - Large Fish Indicator
- Comprehensive trials have been made in the EDT, including
 - Seabird Indicator
 - Marine Litter

Further information

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