



Future challenges in understanding and managing fisheries impacts on marine ecosystems

ICES Symposium on Effects of fishing on benthic fauna, habitat and ecosystem function
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Trailer: *The Times They Are a-Changin'*

- A new reality in the sea leading to changing focus for policy and science
- New policies emphasising integration
- A different data landscape
- Towards integrated assessments and integrated advice
- New modes for science and advice delivery



A new reality in the sea

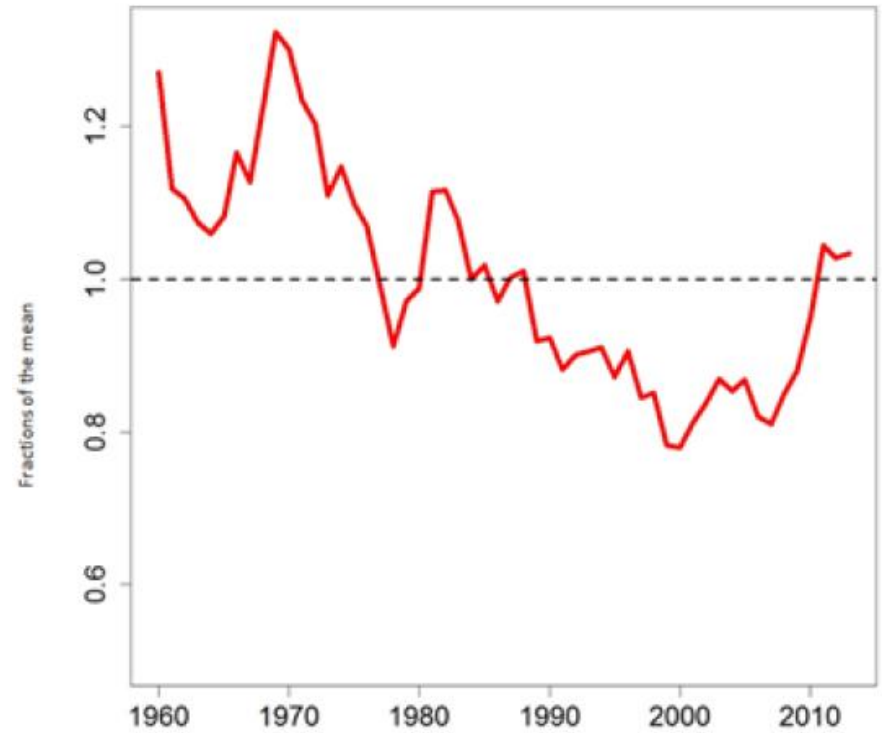
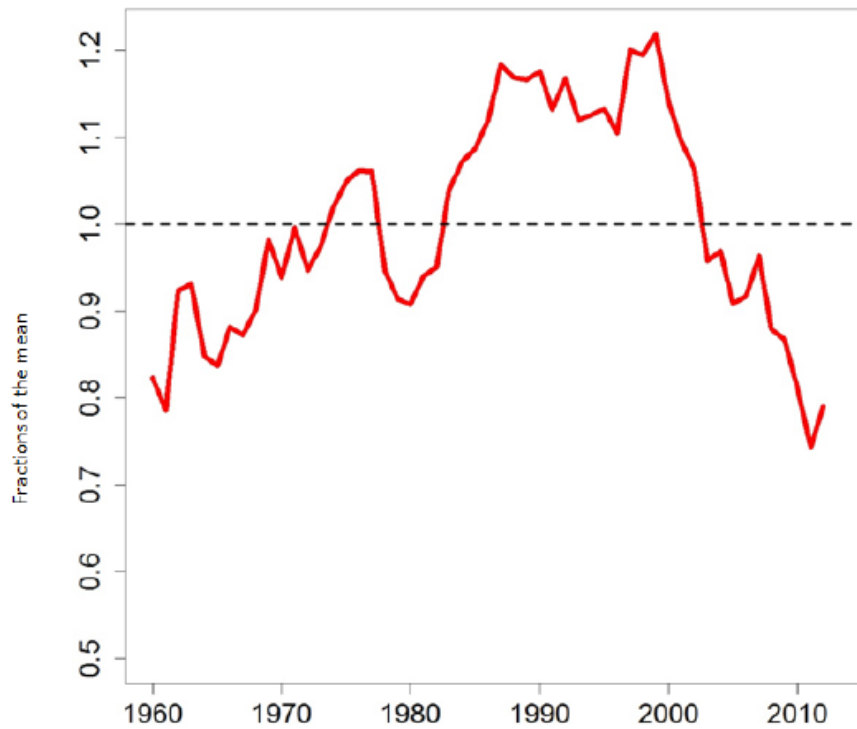
- Fishing mortality for many stocks in the NE Atlantic 2-4 times F_{MSY}
- Main policy focus: reduce F to sustainable levels
 - Thereby overall ecosystem impacts would also be reduced

Policy focus – 10 years ago

- Reduce fishing pressure to sustainable levels
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- Then take specific measures to:
 - Protect sensitive bottom habitats - reduce bottom habitat impact where relevant
 - Protect ecosystem functioning – manage stocks so that marine food webs are not disrupted
 - Protect biodiversity – minimise by-catches of threatened and endangered species

Ecosystem approach – 10 years ago



Average fishing mortality and average stock biomass for 85 major fish stocks in the Northeast Atlantic, Scaled to the mean over the time period (1960-2013)

The state of stocks has changed - Recent developments in exploitation in the NE Atlantic



A new policy landscape –
seeking integration

- Many jurisdictions are moving from a Single Fish Stock Policy through an Ecosystem Approach to Fisheries towards integrated marine policies as intent
- EU: An ecosystem approach including:
 - Marine Environmental policy (MSFD)
 - Protection of Marine Habitats (Habitats Directive)
 - A reformed CFP to be consistent with both
 - “The CFP shall implement the ecosystem-based approach to fisheries management so as to ensure that negative impacts of fishing activities on the marine ecosystem are minimised, and shall endeavour to ensure that aquaculture and fisheries activities avoid the degradation of the marine environment. “
 - “be coherent with the Union environmental legislation, in particular with the objective of achieving a good environmental status by 2020 as set out in Article 1(1) of Directive 2008/56/EC, as well as with other Union policies. “
- Not about an Ecosystem Approach to Fisheries but about an Ecosystem Approach to Marine Policy
- Implies integration across sectors, ecosystem components, disciplines

From SFSP to EAF to EAMP

- ~~• Reduce fishing pressure to sustainable levels~~
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- ~~Then~~ take specific measures to:
 - Protect sensitive bottom habitats - reduce bottom habitat impact where relevant
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Ecosystem approach – now

ICES advice must address the needs of policies with an intent to have an integrated approach

EU: “advisory deliverables shall be based on an ecosystem approach consistent with the targets and objectives for GES determined through MSFD”

ICES to provide integrated advice

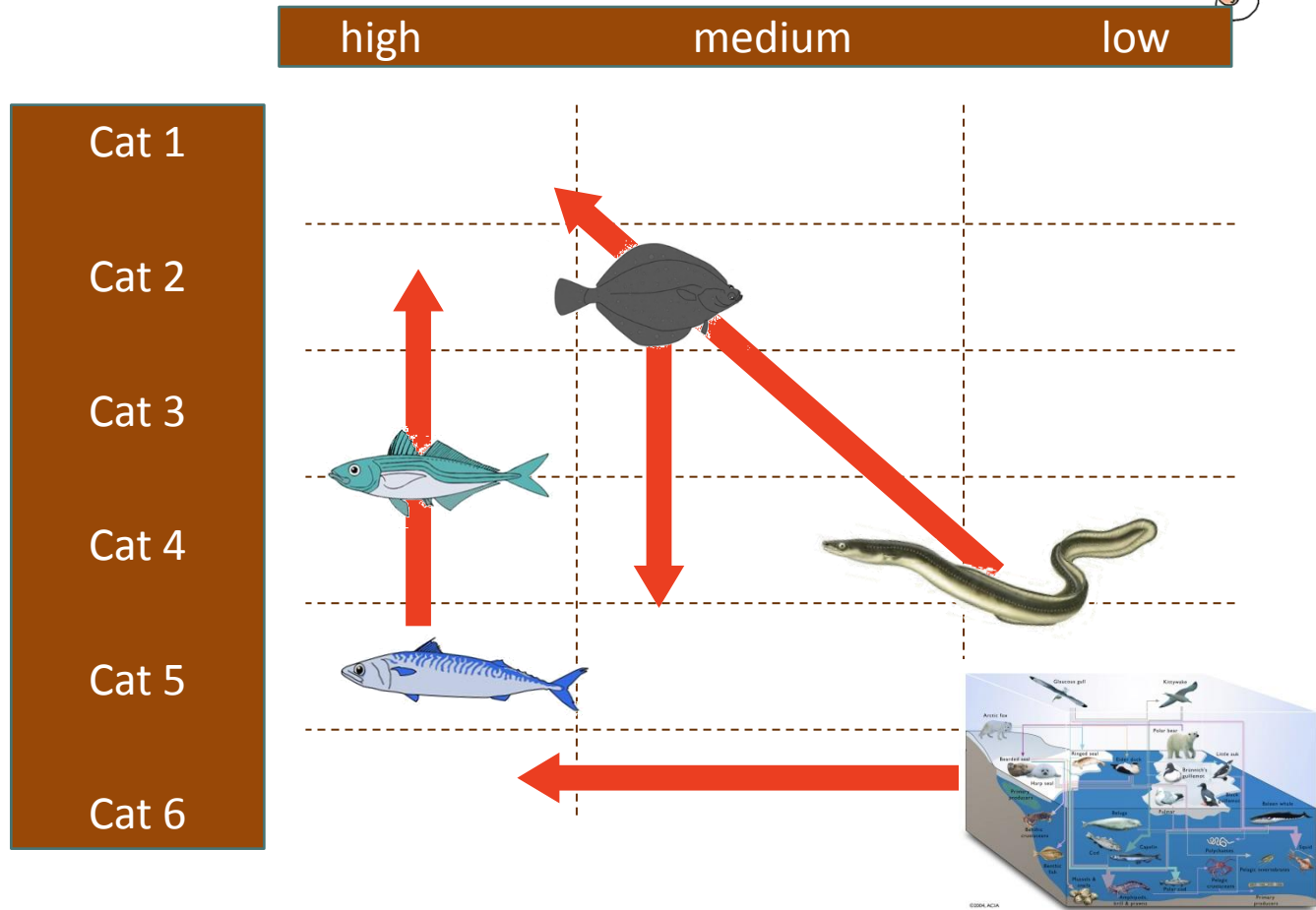
A new data landscape



Data & knowledge provision for biodiversity & ecosystem function



Data & knowledge provision for yield



Data for classical fisheries assessments AND ecosystem impact assessment

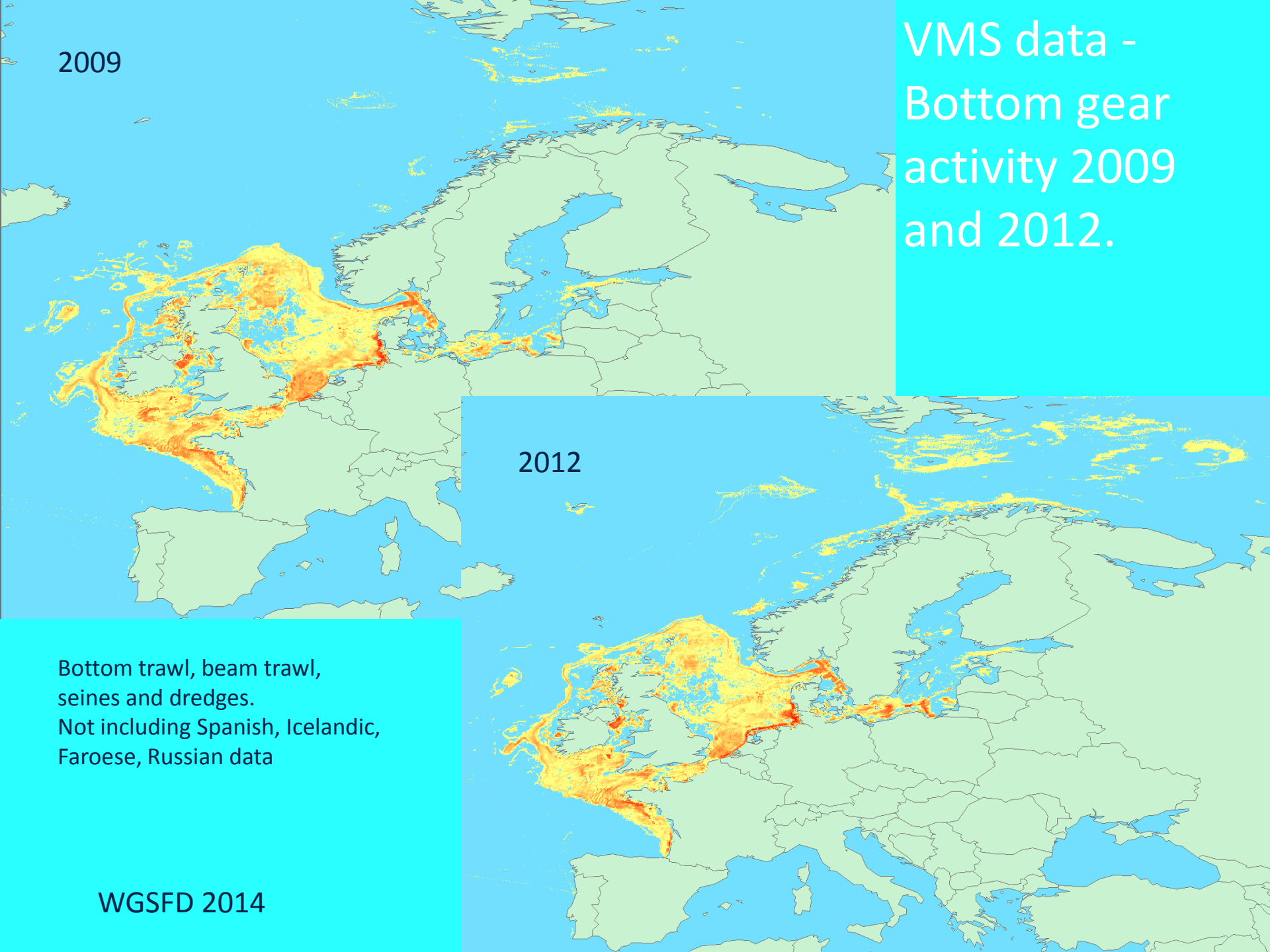
2009

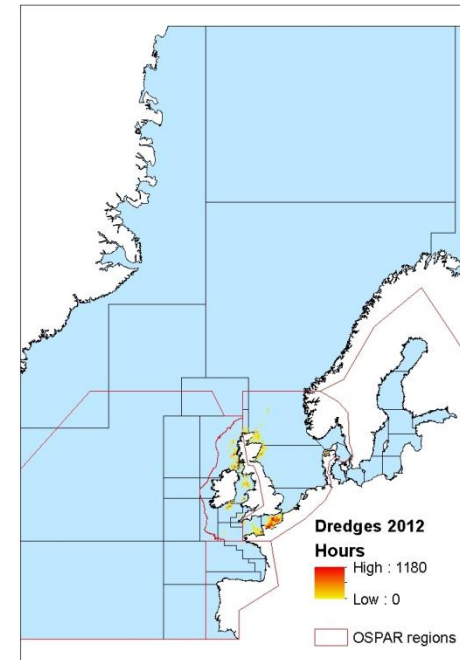
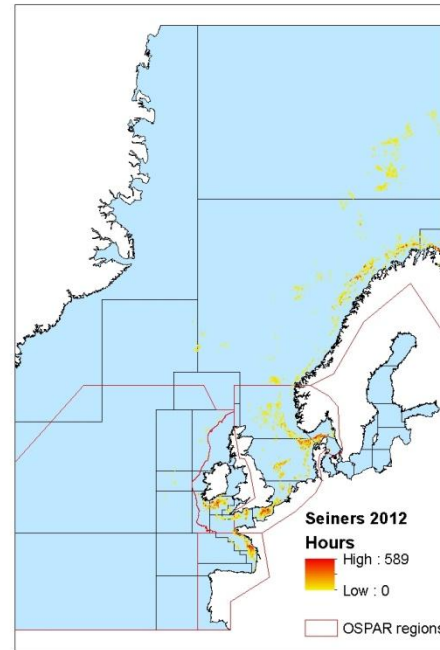
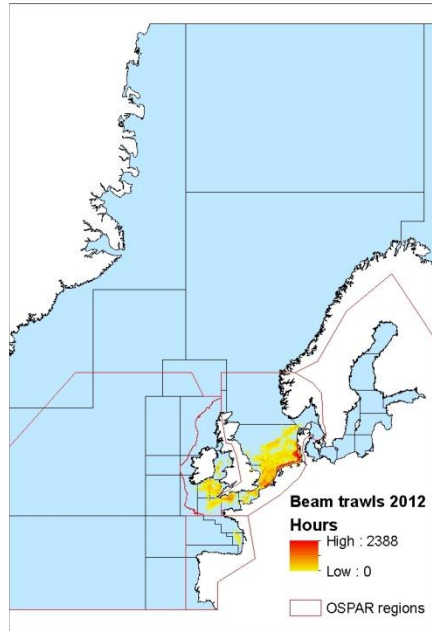
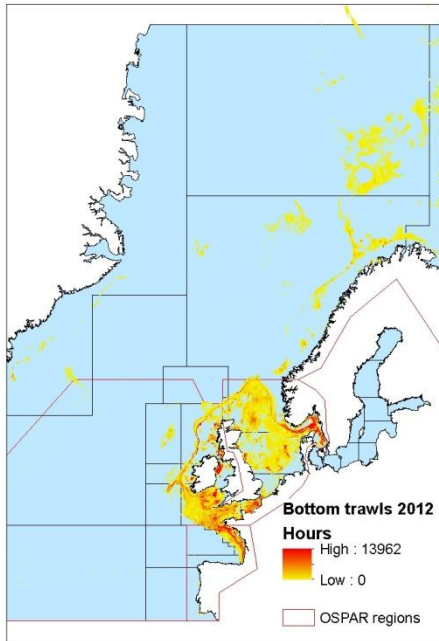
VMS data -
Bottom gear
activity 2009
and 2012.

2012

Bottom trawl, beam trawl,
seines and dredges.
Not including Spanish, Icelandic,
Faroese, Russian data

WGSFD 2014

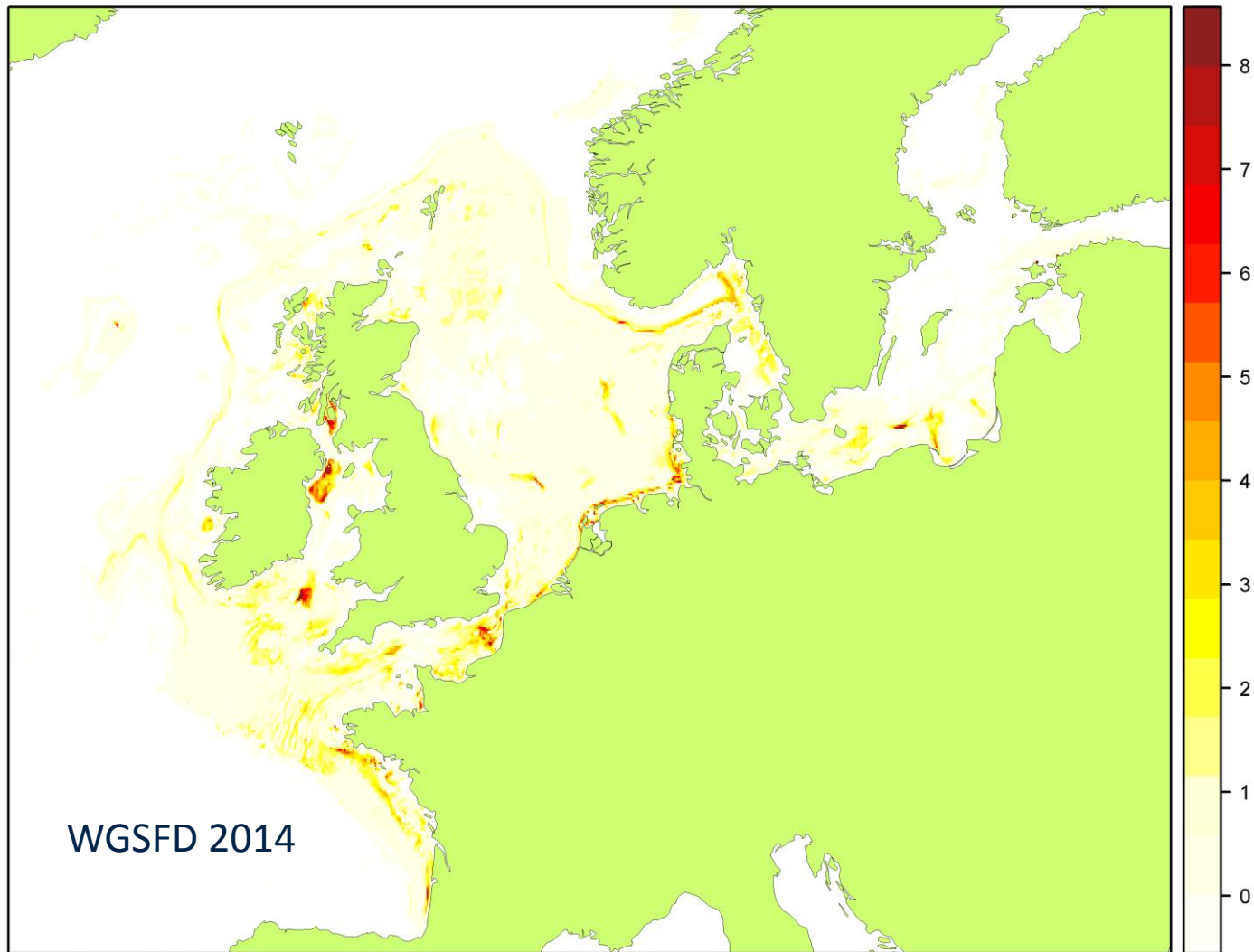




Example of VMS data info - Hours per gear category 2012
 VMS data call 2014 – OSPAR
 Working Group on Spatial Fisheries Data 2014 (WGSFD 2014)

VMS data are forthcoming

Surface + sub-surface bottom contact (number of times impacted per year)



Bottom contact w fishing gear within each 0.05 by 0.05 deg square (2009-2012) times / year

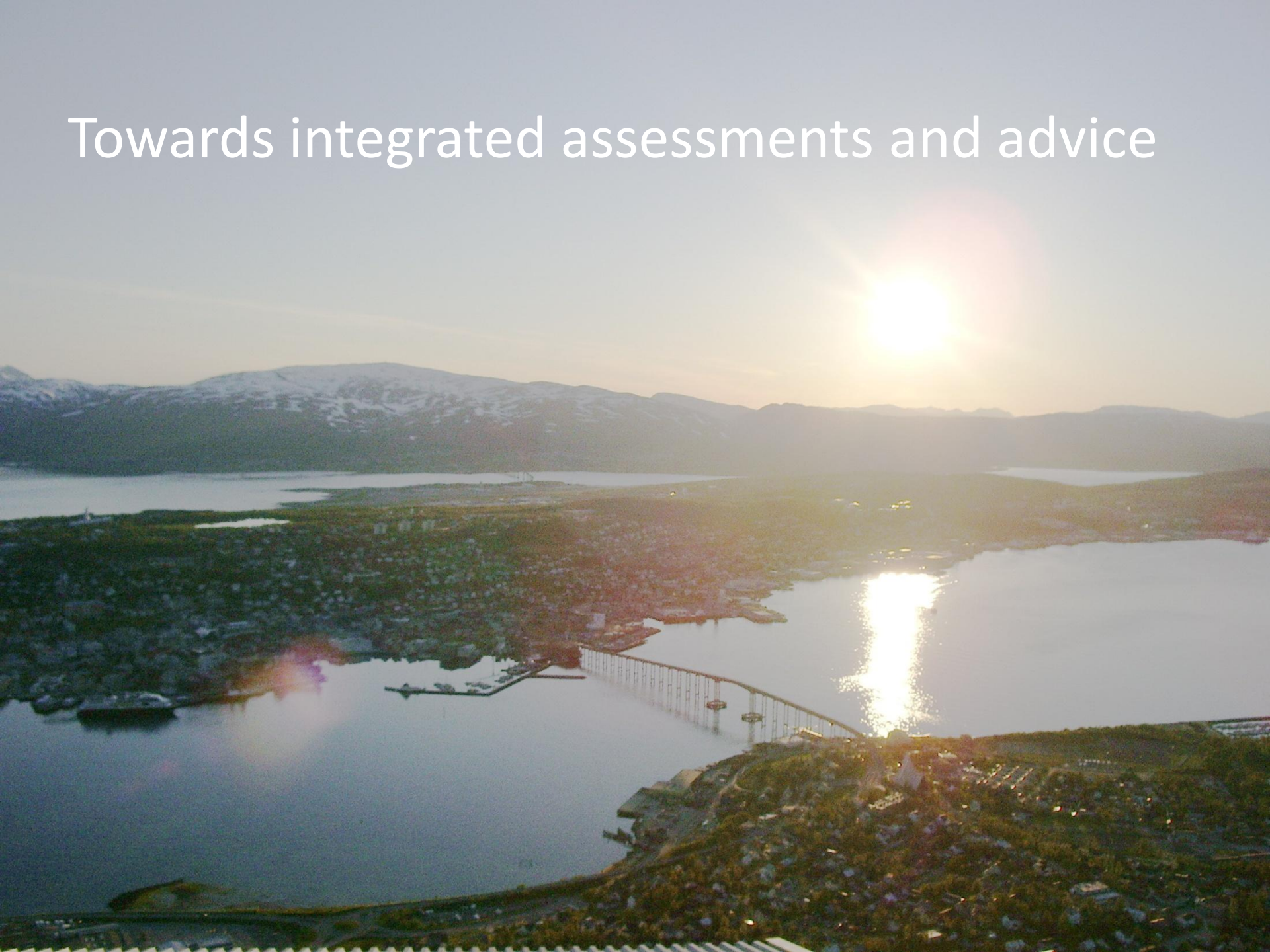
- Within the EU: Scientists have a right to get VMS data after 3 years = data from 2009 and 2010 are now legally available for scientists ¹
- *Art 2: 'end-users' means bodies with a **research** or management interest in the scientific analysis of data in the fisheries sector;*
- *Art 18.1 : Member States shall make detailed and aggregated data available to **end-users to support scientific analysis ... (c) for scientific publication***
- *Art 20.3: Where detailed and aggregated data are requested for scientific publication referred to in Article 18(1)(c), Member States:*
 - *(a) may, in order to protect the professional interests of the data collectors, **withhold data transmission to the end-users for a period of three years** following the date of collection of the data. Member States shall inform the end-users and the Commission of any such decisions. In duly justified cases the Commission may authorise that period to be extended;*
 - *(b) shall **in case that three years period has already expired, ensure that the data is provided to end-users within two months** from the receipt of the request for these data.*

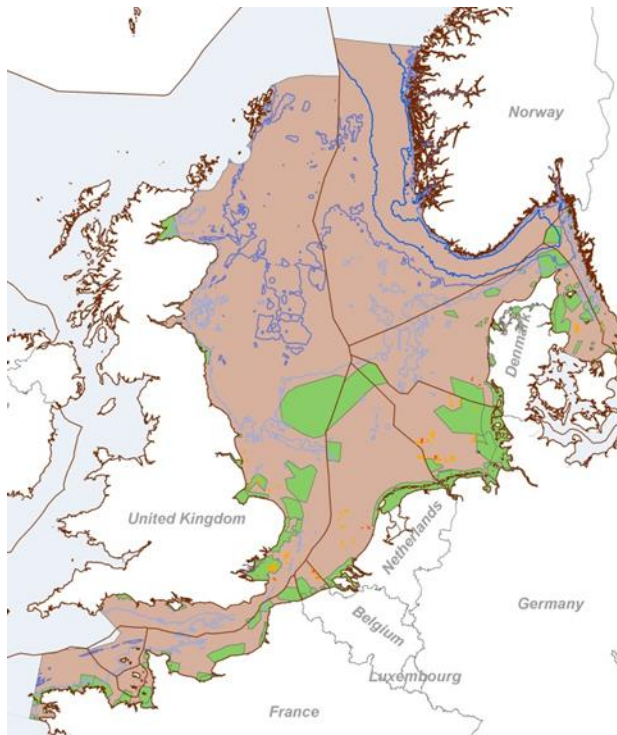
Scientists have legally access to VMS data from 2009 up till 3 years prior to the present



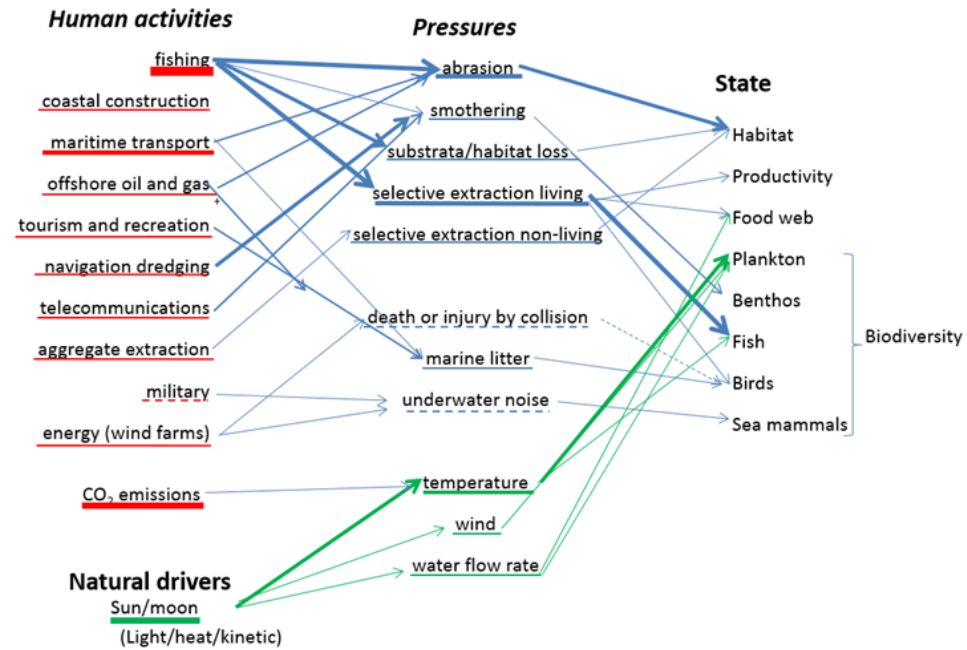
¹ COUNCIL REGULATION (EC) No 199/2008

Towards integrated assessments and advice





Ecosystem overview North Sea



Creating overviews for advice process of main drivers and anthropogenic pressures in each eco- region

Integrated assessments to inform integrated advice

New modes of science and advice delivery



- . An integrated approach across sectors implies that multiple interests are at stake simultaneously
- . No single solution is 'optimal'
- . The societal choice is about selection of the most acceptable trade off between outcomes according to interests

An integrated approach =
trade offs becomes the core

- Role of research based advice:
 - Not to provide 'truth'
 - But to provide transparency about trade off choices
- Must be based on full engagement with stakeholders
 - Mobilising all forms of knowledge
 - Transparent and participatory
 - Extended peer review
- Advisory PROCESS rather than advice PRODUCT

Role of science in an
integrated approach



Vatican model

Black box

Non-transparent

Appears to be based
on divine revelation



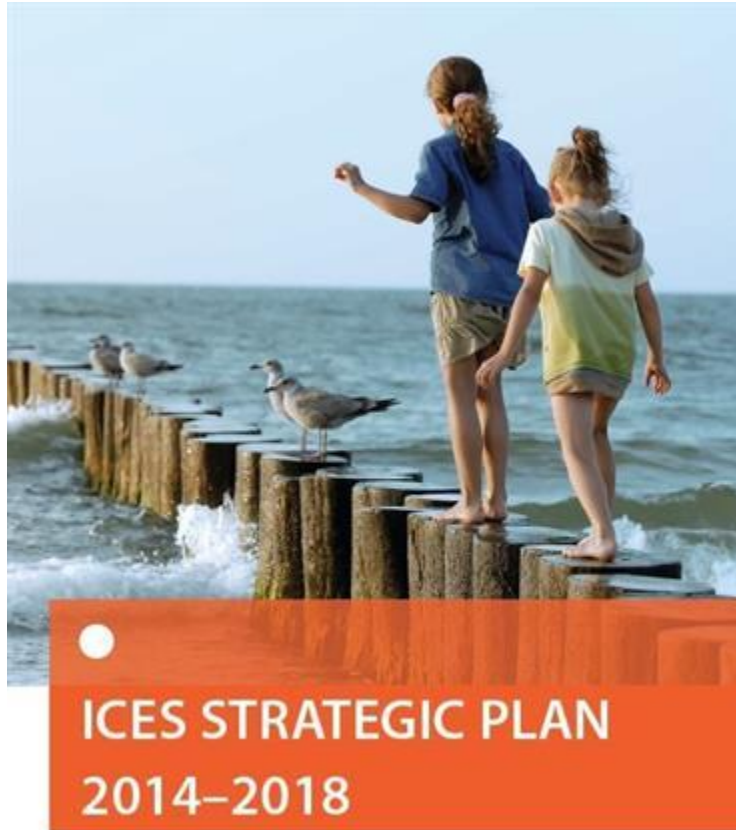
Socratic model

Dialogue based

Exploratory of trade offs in
options

Based on transparent
evidence and argument

New advice delivery models



ICES Strategic Plan : Towards integrated ecosystem science and advice

<http://www.ices.dk/explore-us/what-we-do/Pages/Our-strategy.aspx>

In short:

- The reality in the sea is changing as reductions in fishing pressure have been or are being reduced –
- Which means that further reductions of ecosystem impacts now must focus on direct measures to achieve this
- The policy landscape has changed towards a requirement / intent for an integrated approach
- New data and a new focus for data collection are needed
- ICES will move towards an integrated approach – for data, science and advice
- An integrated approach including ecosystem impacts of fisheries requires new modes of science and advice delivery

The times they are-a changin' - Ecosystem impacts science is moving center stage to address societal concerns and inform policy

Thanks