



**European marine ecosystems and
what we don't know about them:
The role of research towards the "2012 targets" and beyond...**

PRESENTATIONS

European Parliament
Private Salon, Members' Restaurant
15th March 2010
12:00-14:00



PRESENTATION 1

Professor Wolf-Christian Dullo
IFM-GEOMAR, Germany

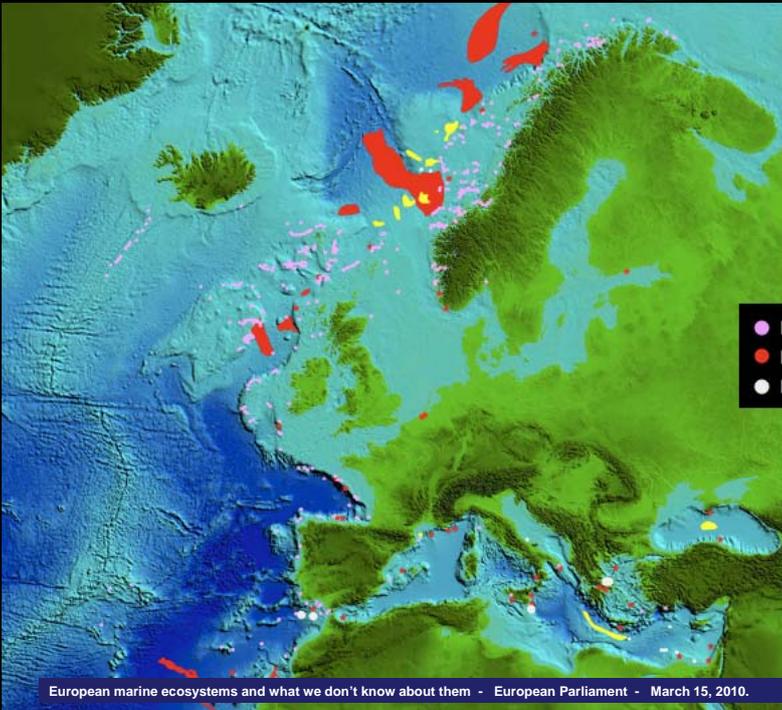
*The Largest Barrier Reef on the Planet:
Cold Water Coral Reefs along the
European Continental Margin*

The Largest Barrier Reef on the Planet: Cold Water Coral Reefs along the European Continental Margin

Wolf-Christian Dullo



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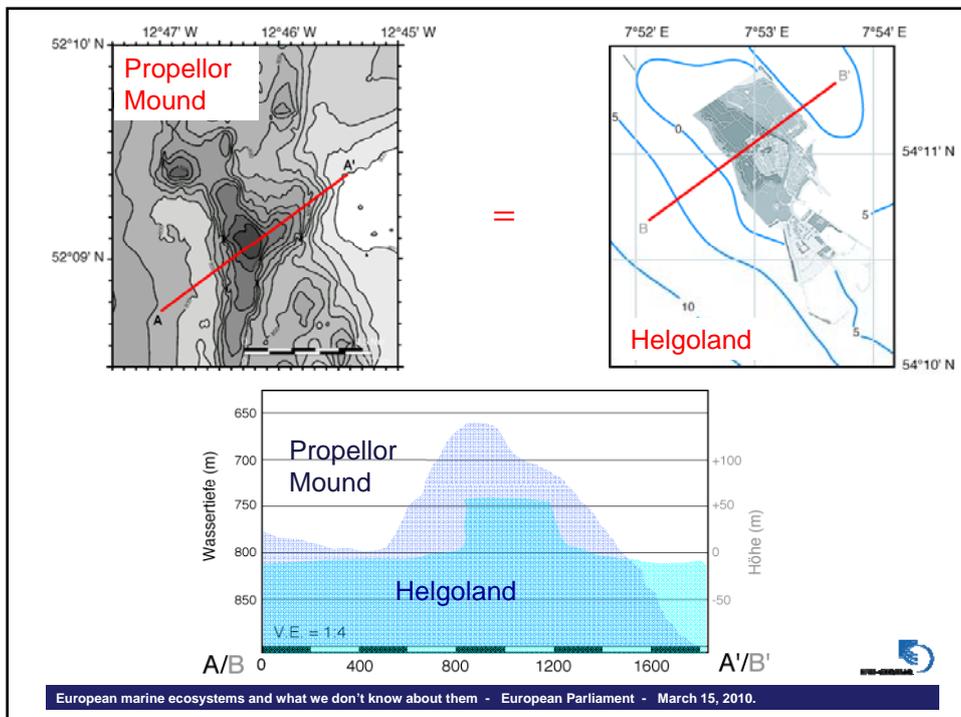
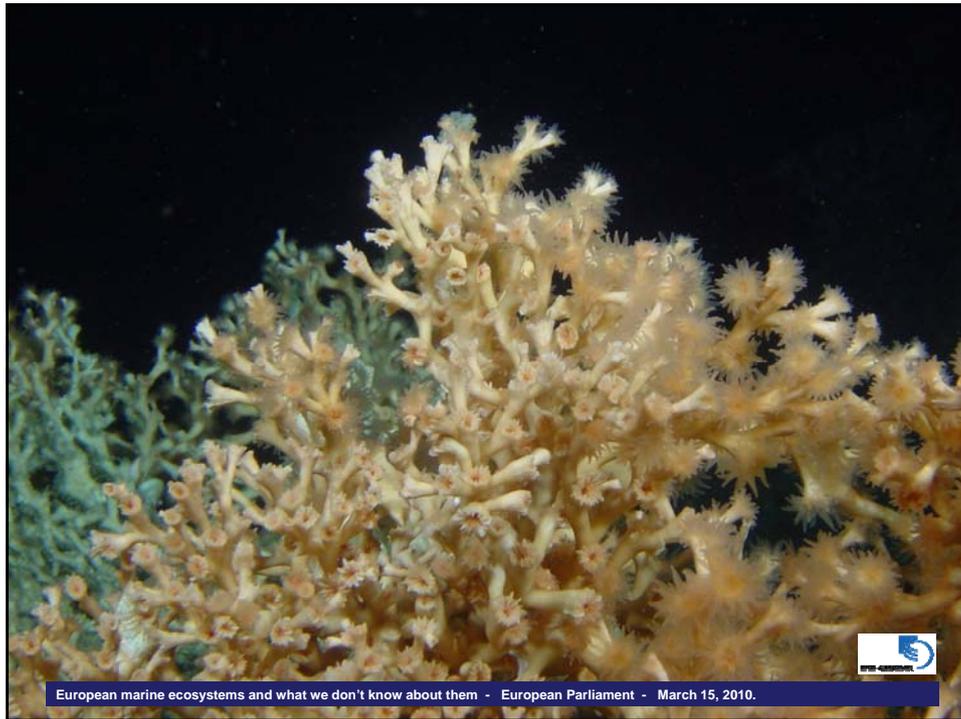
EUROPEAN SCIENCE FOUNDATION
SETTING SCIENCE AGENDAS FOR EUROPE

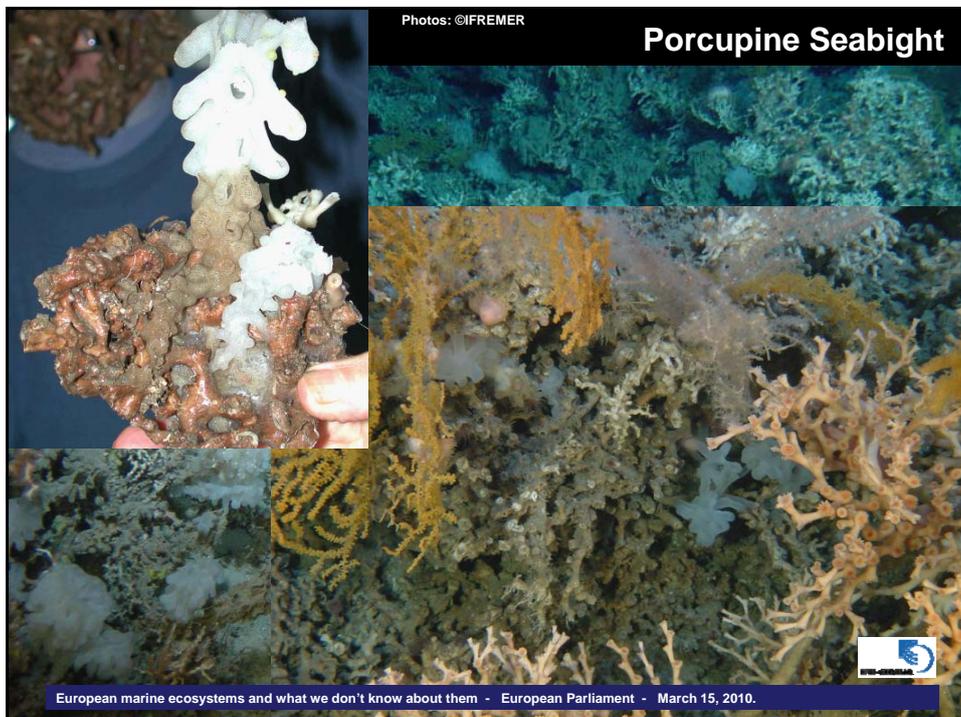
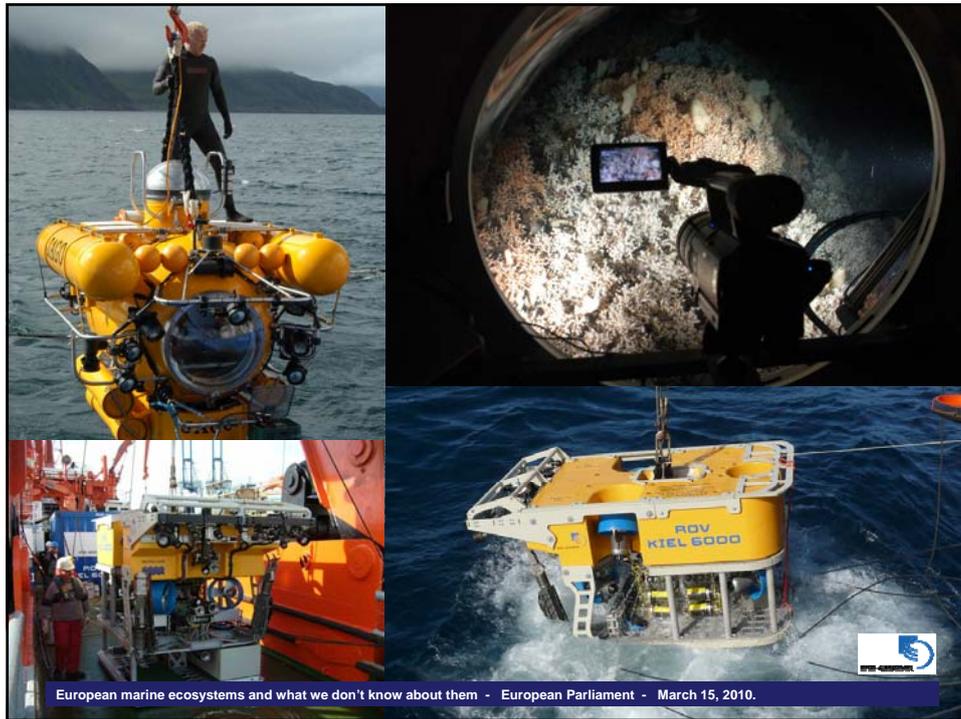
- Deep-water Corals
- Major Slides
- Mud Volcanoes

Weaver 2004



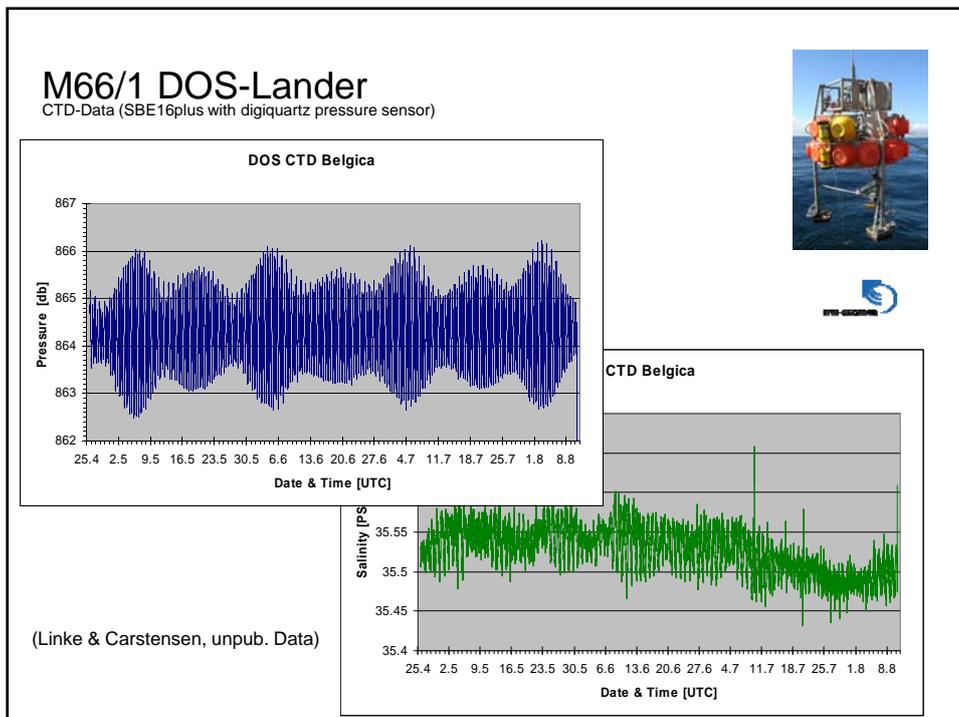
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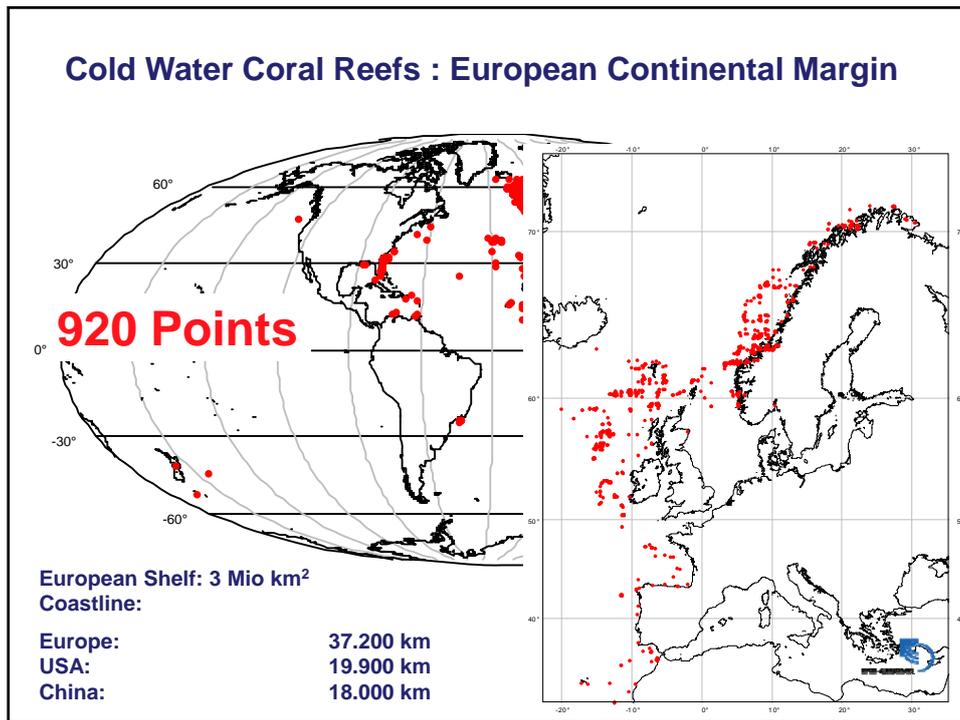




Dynamics of the water masses

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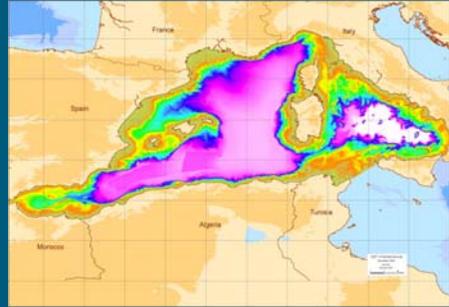
PRESENTATION 2

Dr. Jacques Populus
IFREMER, France

*A European Seabed Cover Map
How far are we from there?*

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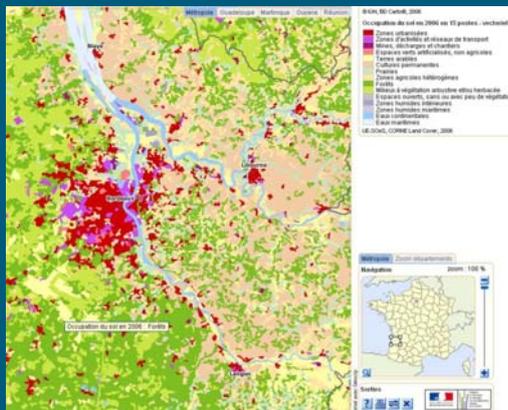
A European seabed cover map How far are we from there?



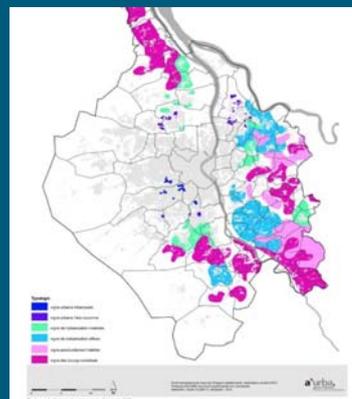
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Could we imagine a territorial planning scheme without a land cover map?

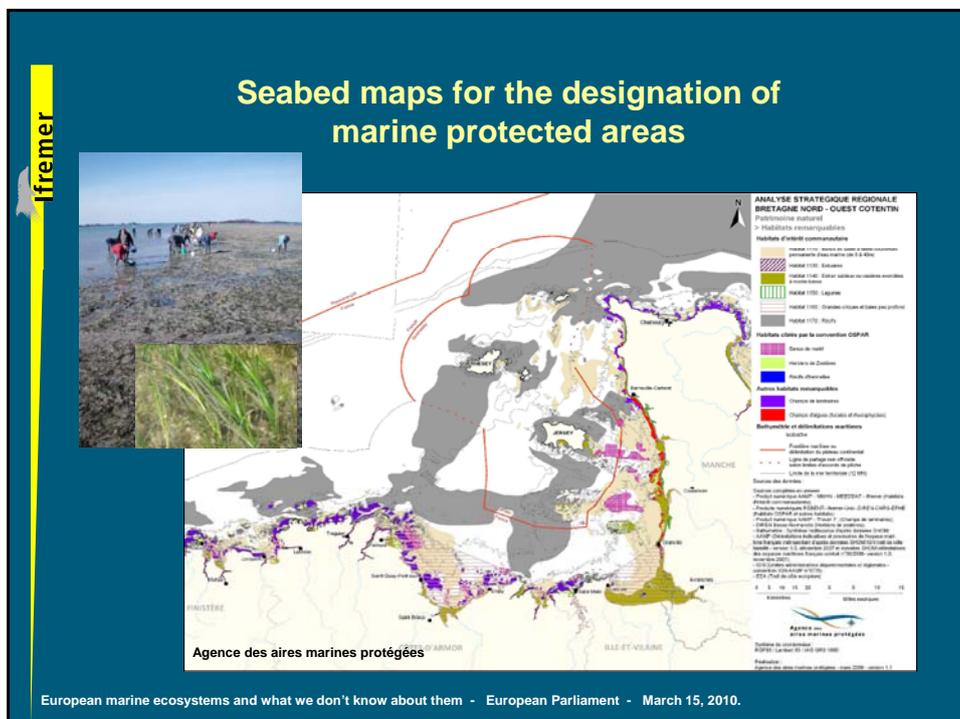
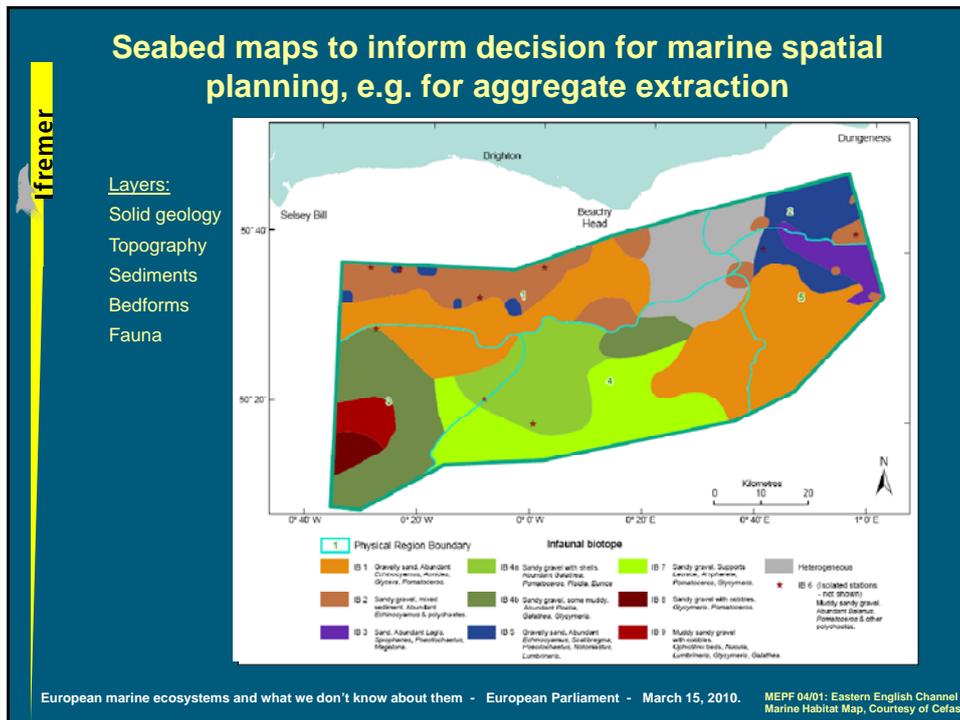


Corine land cover (scale 1/100000)



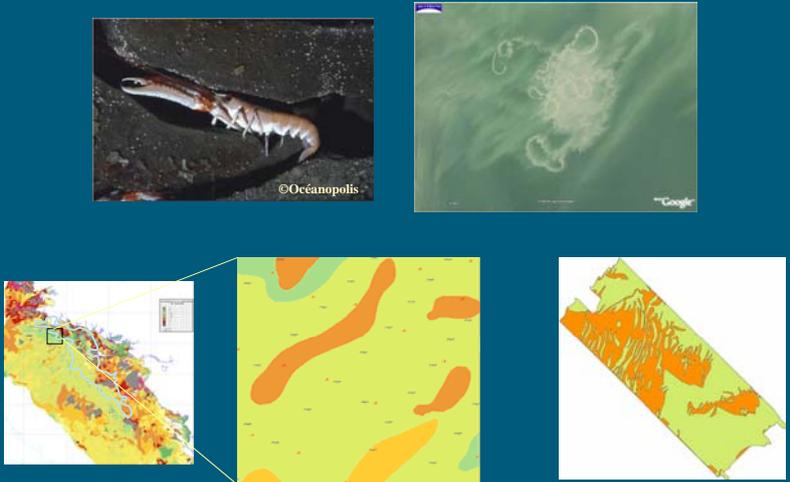
Vineyard typology

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Maps to understand processes and help with fisheries management and impact on seabed



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Mapping up to the 1990s: Interpolation from samples

New mapping approach: full coverage

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The first drivers to coastal and marine mapping in Europe

- The Habitats Directive (1992)
 - Natura 2000 sites
 - Habitats and species
- The Water Framework Directive (2000)
 - Priority habitats in the one-mile WFD zone

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The main driver today The Marine Strategy Framework Directive and Marine Spatial Planning

- Three spatial seabed features are addressed:
 - bathymetry/topography
 - habitats
 - species

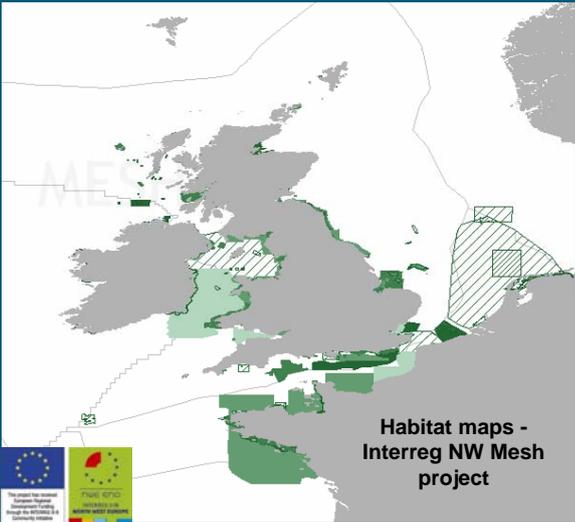
AND

- Two spatial descriptors of «Good Ecological Status»:
 - biological diversity
 - seabed integrity
- **Deadlines**
 - 2012: Initial assessment (status, usages)
 - 2020: Good ecological status

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The current status of habitat maps: the marine realm is mostly made of gaps!



Habitat maps -
Interreg NW Mesh
project

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**Going from Natura 2000 to the shelf:
a manyfold surface area increase!**

Natura 2000 initial : 1912 km² (completed)
Extension at sea : 7100 km² (just started)

Natura 2000 at sea: 7100 km²
Shelf: 78100 km²

Just in Brittany!

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**How do we go about covering such an immensity?
a) by surveying?**

Nice endeavours underway in from Ireland and Norway BUT:

- years to survey the shelf
- decades to survey the coastal zone

- Physics (GMES): 70M€/year
- DCF (Fisheries): 50M€/year
- Seabed mapping: not yet?

Irish national seabed survey

Mareano

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How do we go about covering such an immensity?
b) by « modelling » ?

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MESH predicted
EMODNET substrata

Precursor
The Mesh project

- A first « coarse » step based on best available historic physical data
- Approximate scale is 1/1M, insufficient for many issues

Emodnet EuSeaMap project

- Baltic Sea (incl. Kattegat)
- Celtic Sea
- Mediterranean Sea
- North Sea

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By all means a daunting task!

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8 to 20 km/h

Ocean seabed : 1 ship in 500 years

23000 km/h

Earth surface : 1 satellite in 15 days

But satellites do not see underwater!

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Where is the way forward for seabed mapping?

- More research to find innovative and cost-effective mapping ways (currently supported by the 7 Framework programme, Interreg etc.)
- DG/MARE Emodnet works on establishing what we know and what we don't know and on estimating the magnitude of the efforts needed
- Definitely the EU is needed to sustainably fund large-frame **operational** data acquisition programs, which research cannot afford

We do not have a map of our seabed !

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PRESENTATION 3

Dr. David Billett
NOCS, UK

*Policies in Deep Water?
Marine Strategy Framework Directive
2012 Targets and Beyond
Ecosystem Services and Impacts
What we need to know*

Policies in deep water?



**Marine Strategy Framework Directive
2012 targets and beyond
Ecosystem services and impacts
What we need to know**



**National Oceanography
Centre, Southampton**
UNIVERSITY OF SOUTHAMPTON AND
NATURAL ENVIRONMENT RESEARCH COUNCIL

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European seas are worldwide



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Analysis of impacts

HERMIONE
European Research and Training Programme on Oceanic Pollution

**OSPAR
Oslo-Paris
Commission**

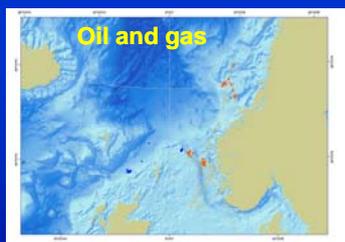
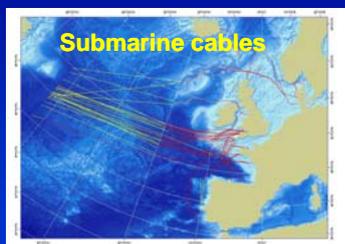
Depth zones
■ > 200m
■ 0 - 200m

— OSPAR regions

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Human impacts



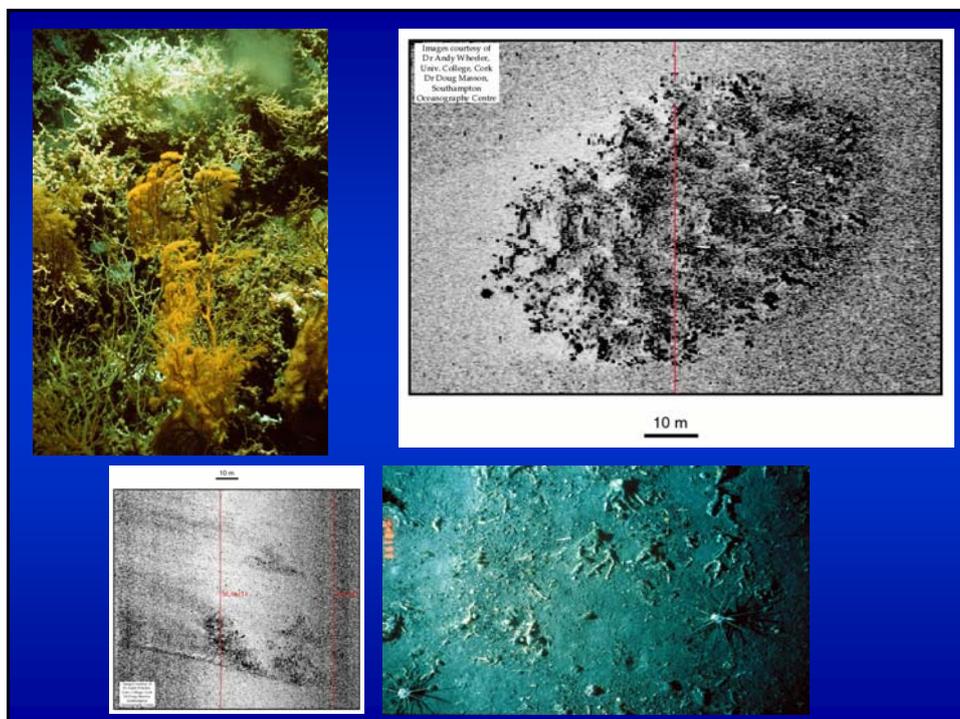
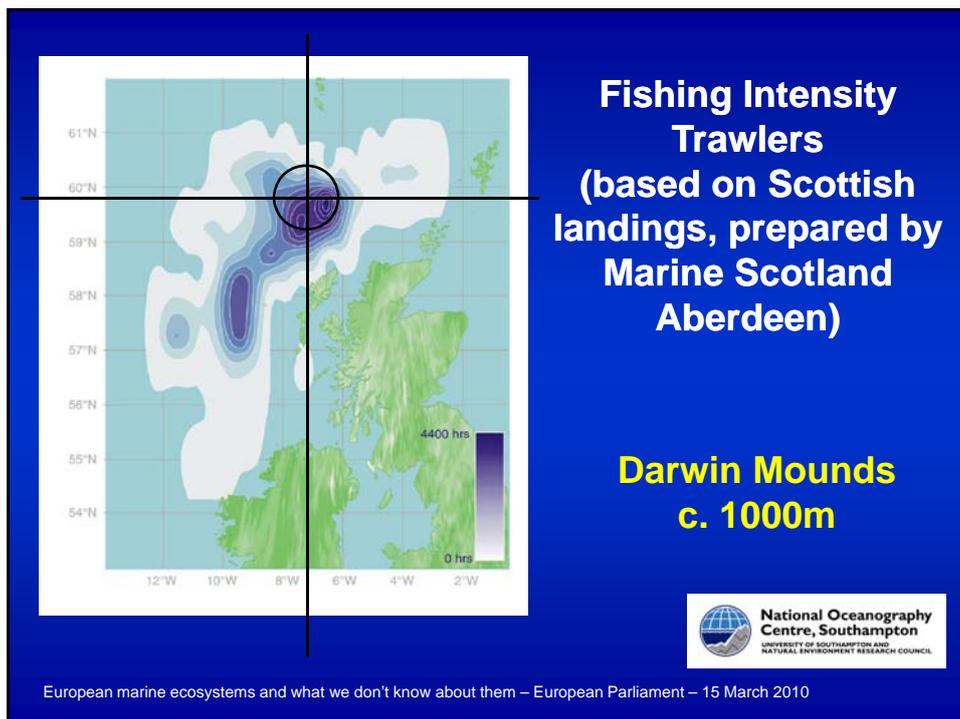
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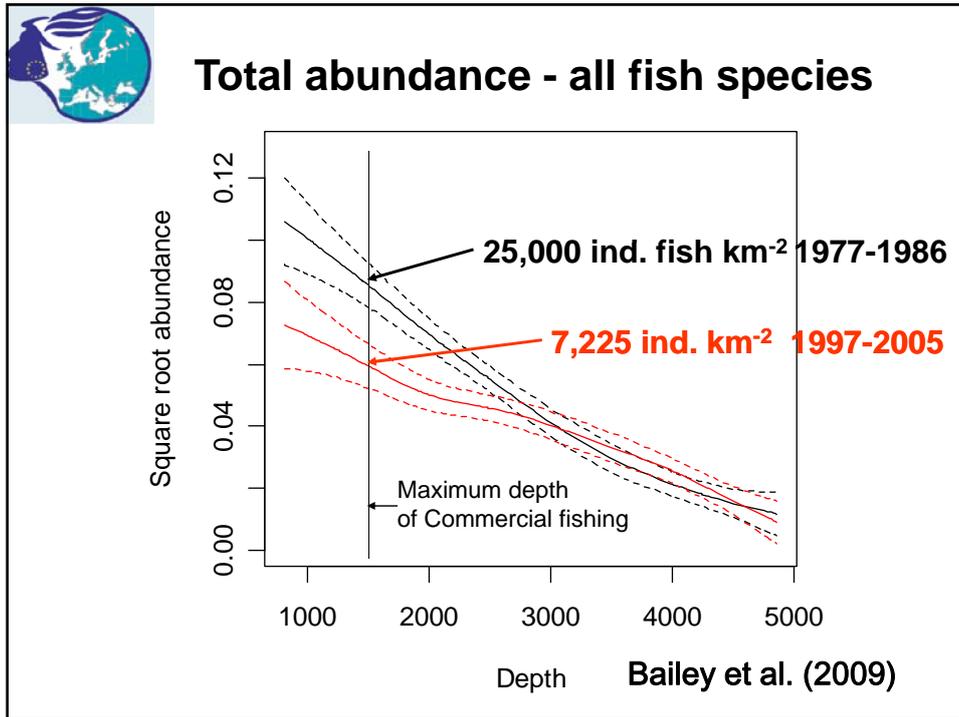
The scale of impacts in 2005

	km ²
• Science	0.9
• Cables	9.4
• Oil and gas	148
• Bottom trawling (Hatton)	21,563



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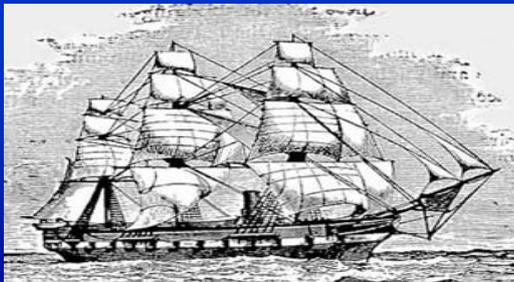




Orange Roughy



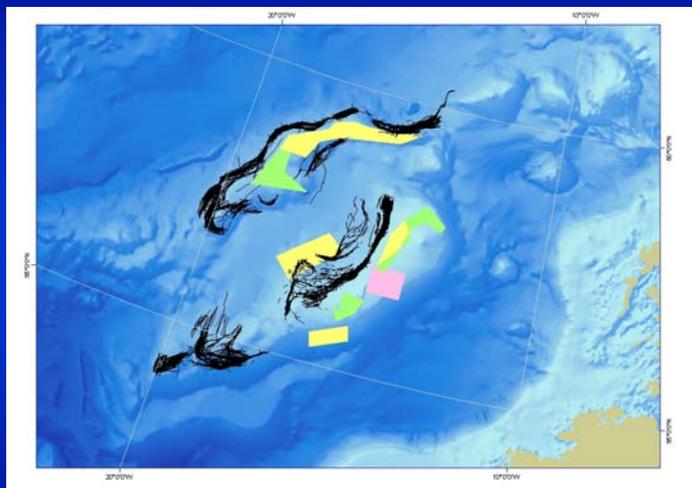
- 130 yrs old
- Did not spawn until it was 30-40 years old !



This fish may be almost as old as the science of deep-sea biology

HMS Challenger

North-East Atlantic Fisheries Commission closure areas



■ 2007-2009 ■ 2000 - present ■ 2008 - 2009

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World Summit on Sustainable Development 2002

- Halt the decline of biodiversity by **2010**
- Encourage an *Ecosystem Approach* in marine management by **2010**
- Establish a network of *Marine Protected Areas* by **2012**
- Restore depleted fish stocks to sustainable yields by **2015** (where possible)
- Good Environmental Status by **2020**

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Pressing research needs

- Habitat classification – what, where and how much?
- Ecosystem function and structure – rates and processes
- Connectivities – optimum MPA network design and molecular biology approaches
- Direct, indirect and cumulative effects of human activities
- Climate change
- Ecosystem services and Earth System feedbacks

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Communities

- Spatial management safeguards long term jobs, resources and biodiversity.
- Fish are just one resource, there is value in retaining an option on all biodiversity for future wealth creation



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IFM-GEOMAR is carrying out research in the areas of ocean circulation and climate dynamics, marine biogeochemistry, marine ecology, and dynamics of the ocean floor. In addition, there are presently two major collaborative research centres (SFBs) and a national Cluster of Excellence "The Future Ocean" within which the Institute conducts research in a very interdisciplinary approach. Its research facilities are located in Kiel, and the research infrastructure includes 4 research vessels, and an array of observational, experimental and monitoring tools.



IFREMER contributes, through studies and expert assessments, to knowledge about the ocean and its resources, monitoring of marine and coastal zones and the sustainable development of maritime activities. To these ends, it designs and operates observational, experimental and monitoring tools and facilities. IFREMER manages the ocean research fleet for the French scientific community.



NOCS is the national focus for oceanography in the UK. NOCS delivers a diverse mission, which ranges from managing the national research vessel fleet and other major facilities, technology development, sustained observations and programmes of strategic research and academic research and education in ocean and earth sciences. NOCS works with the wider science community to provide strategic leadership, coordination and facilitation.

"G3" is a group of cooperation in science and technology including **IFM-GEOMAR (DE)**, **IFREMER (FR)** and **NOCS (UK)**. All three institutes have strong common scientific interests in oceanography and marine technology. In view of the existing and expanding European coordination of marine sciences, IFM-GEOMAR, IFREMER and NOCS make special efforts to foster European projects within this field and the necessary technological developments, in particular in the context of the European Research Area (ERA) and its marine and maritime components. This cooperation also aims to design global projects of mutual scientific interest and benefit utilising their respective expertise in personnel and facilities.

FOR MORE INFORMATION, PLEASE CONTACT

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