

# **Observatories and Time Series in European systems for ocean observation and forecasting.**

## **EU Maritime Days Gijon May 2010**

**Peter M. Haugan, Geophysical Institute,  
University of Bergen, Norway**



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# Main themes

- Take stock of where we are in Europe in 2010
    - Infrastructure gaps
    - Needs for continuous long time series
    - Regional gaps
  - Convergence between research and environment monitoring?
  - Common interests geographically and thematically?
  - European mechanisms
    - EU programmes
    - COST
    - ESFRI
- > Marine Board process

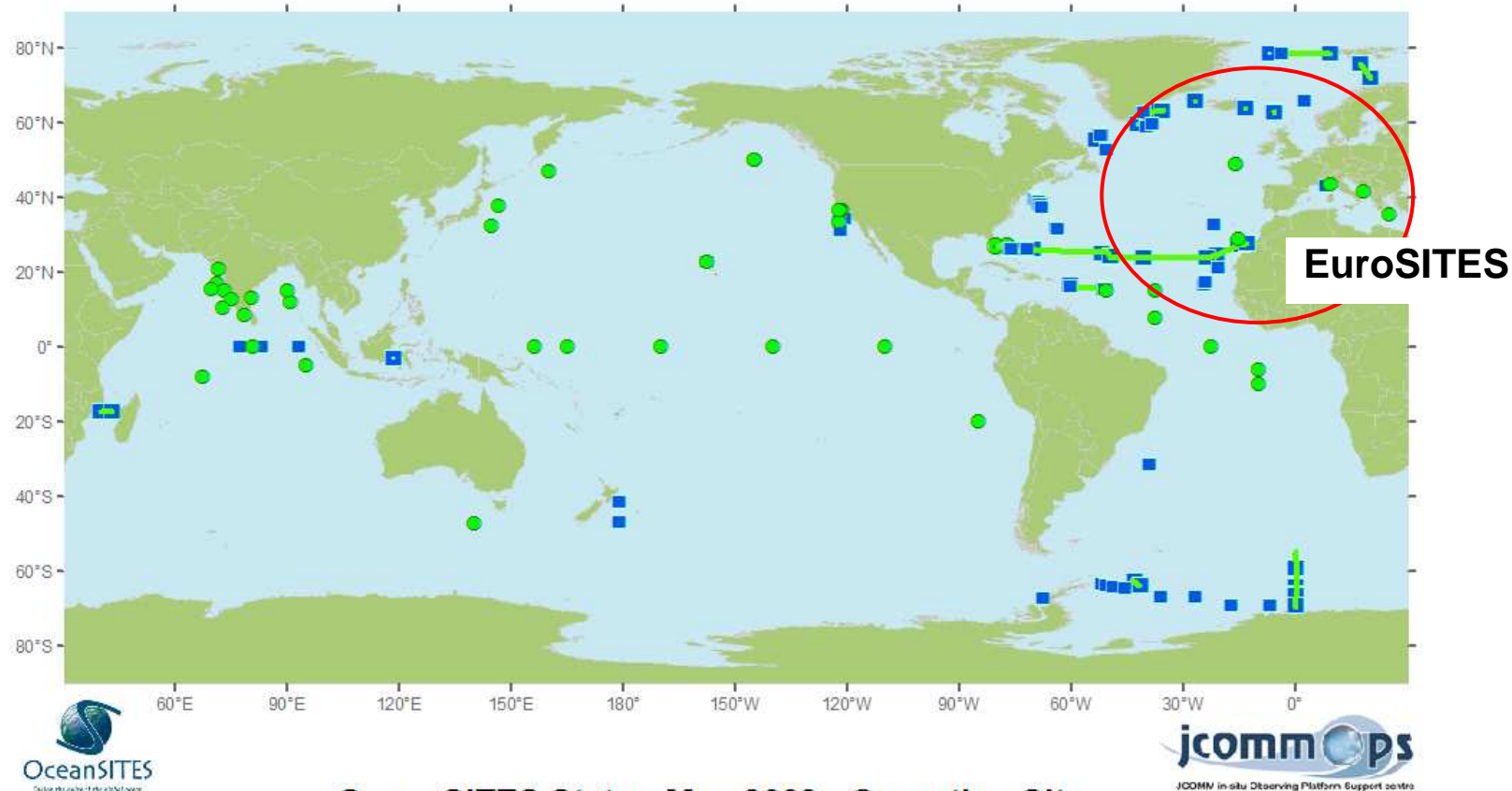


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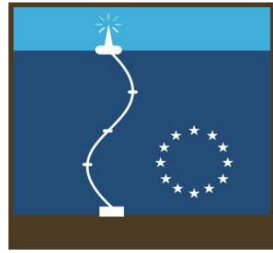
**OceanSITES:** Global network of deep water reference stations. An essential component of **GOOS**. **EuroSITES** is a regional implementation of OceanSITES



**OceanSITES Status Map 2009 - Operating Sites**

- OceanSITES Moorings and Observatories (91)**
- Transport sites (16)**
- Transport Stations (67)**
- OPERATING Real time data (44)
- OPERATING Delayed Mode data (47)
- OPERATING
- OPERATING Real time data (2)
- OPERATING, Delayed Mode data (65)

*Note: This status was based on information provided in 2009.*

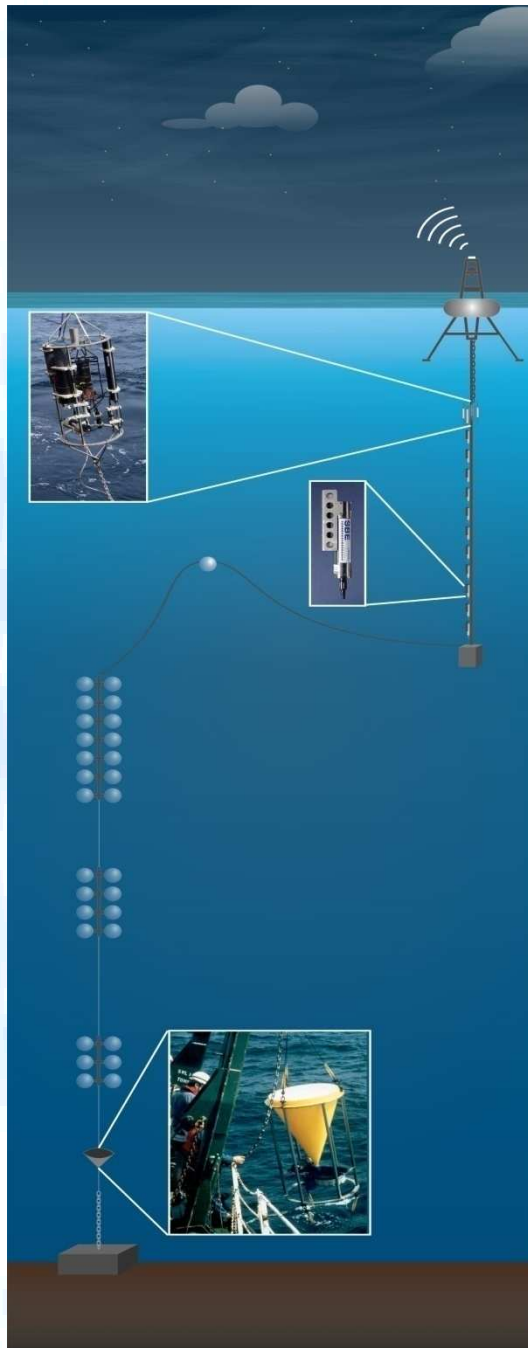


**EuroSITES**  
European Ocean  
Observatory Network



- **EU FP7** Collaborative Project
- **3 years**: April 1<sup>st</sup> 2008 – March 31<sup>st</sup> 2011
- Coordination: **NOCS, UK**
- **13 partners** (7 EU, 1 ICPC)
- International **Oversight Committee**
- **open ocean** (>1000m)
- **Full depth, *in situ***: Ocean interior, seafloor and subseafloor

**[www.eurosites.info](http://www.eurosites.info)**



EuroSITES is **integrating** and **enhancing** 9 existing deep ocean (>1000m) fixed point time-series across Europe





# How can we understand the global Ocean?



-Remote sensing

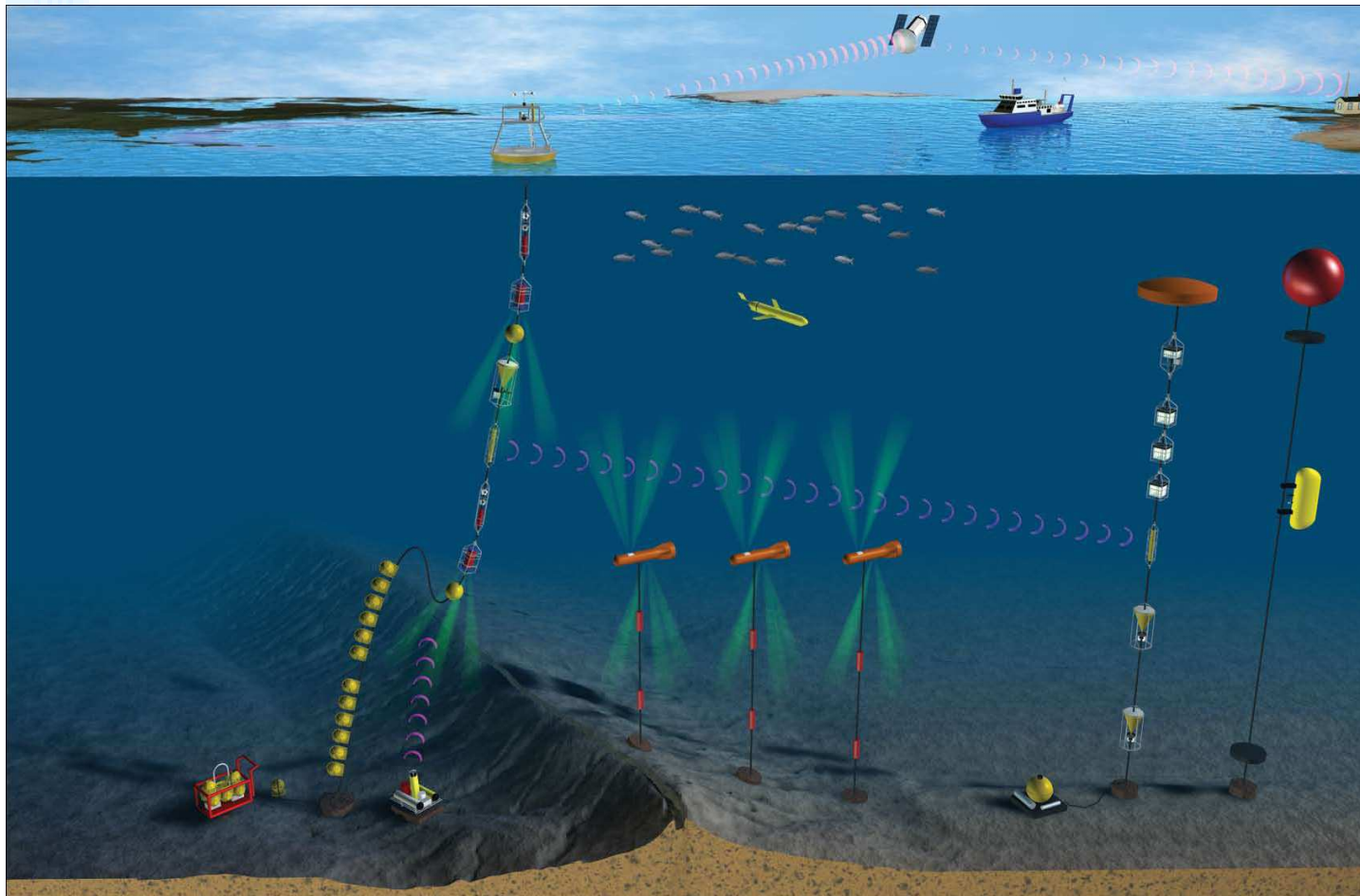
-Research cruises

-Ships of opportunity

-Lagrangian observatories

-\*Eulerian observatories (such as EMSO and EuroSITES)

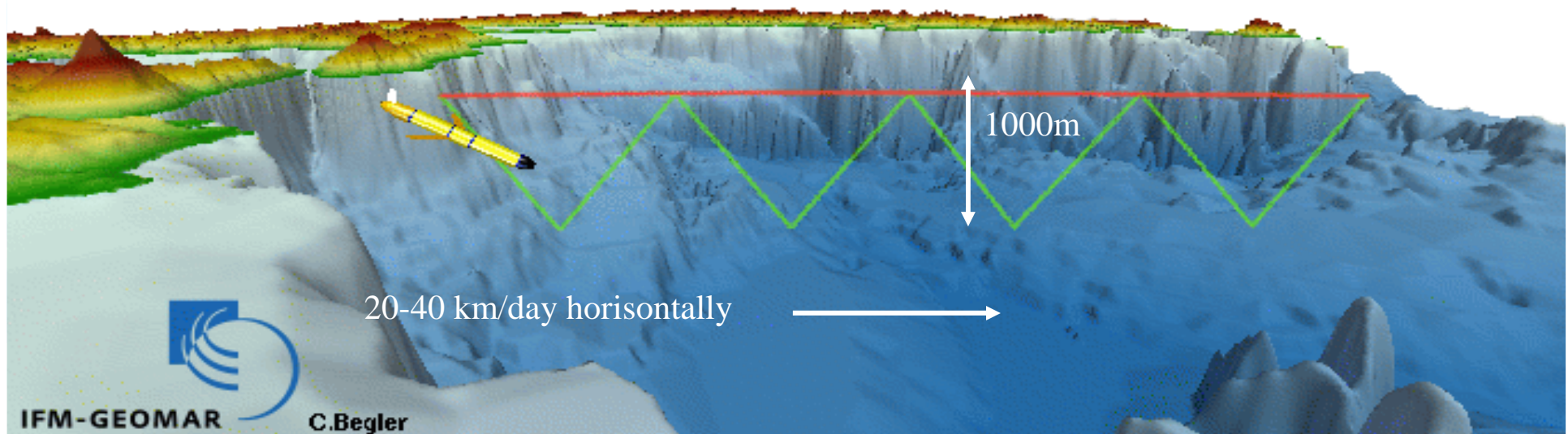
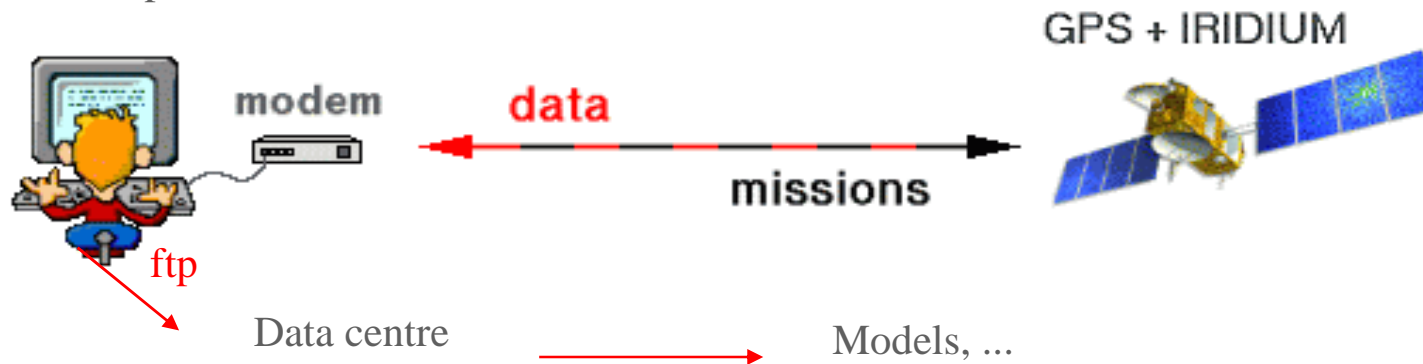
-*probably also gliders and new technology?*



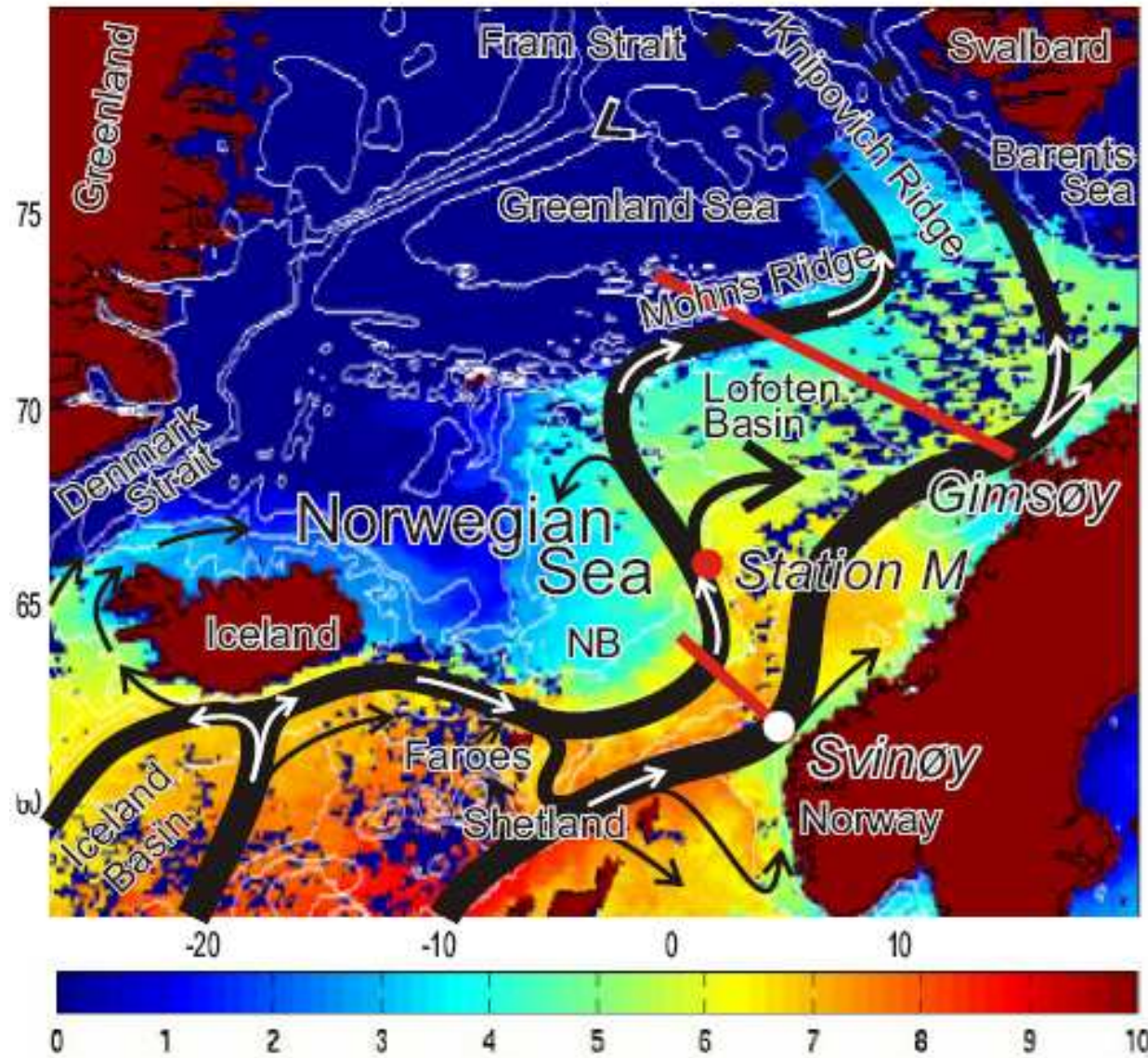
# Norwegian Atlantic Current Observatory (NACO)

Gliders off the mid-Norwegian shelf, funded by the Norwegian Research Council, run by the Geophysical Institute from 2011

Operation central

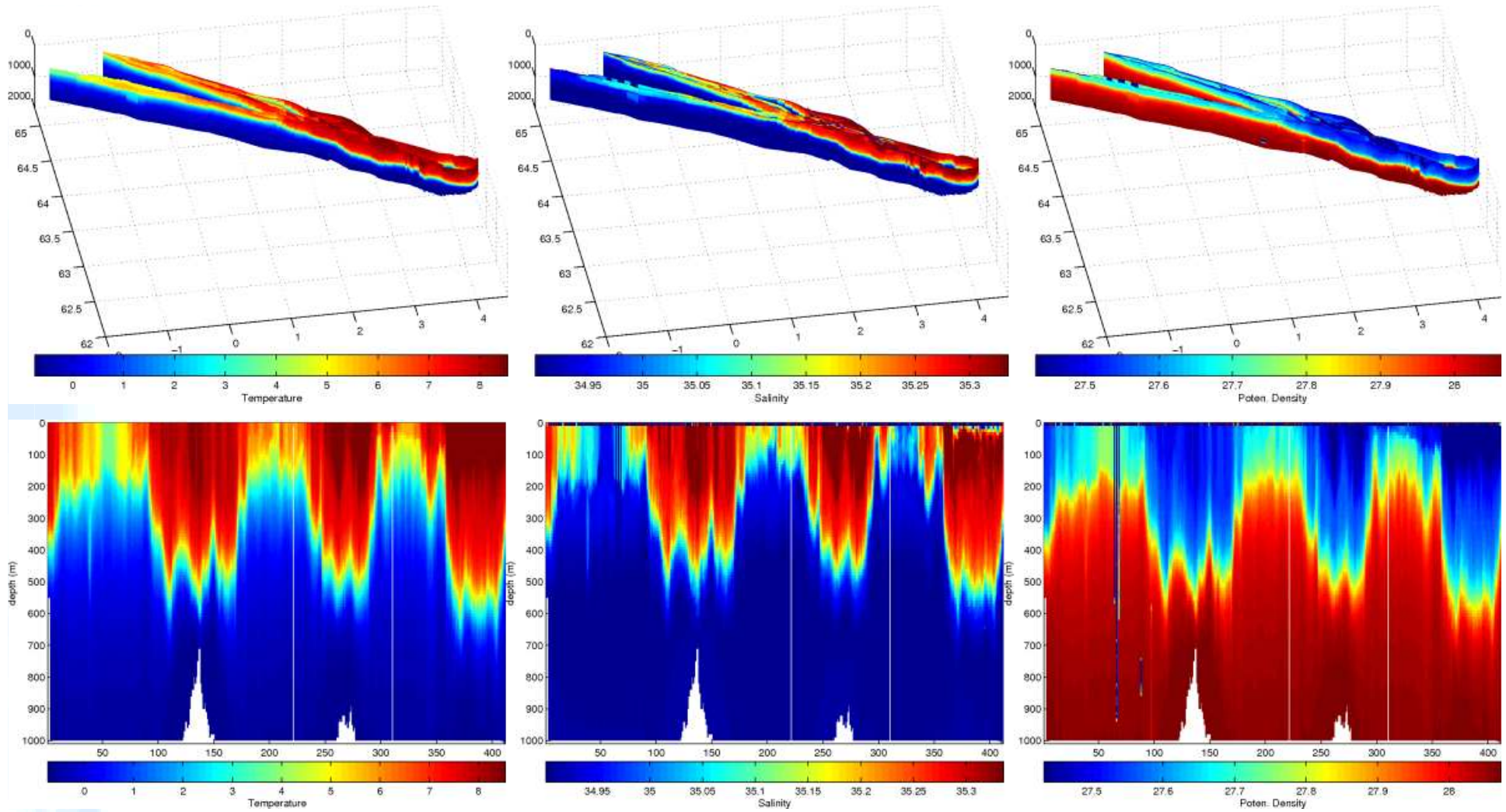




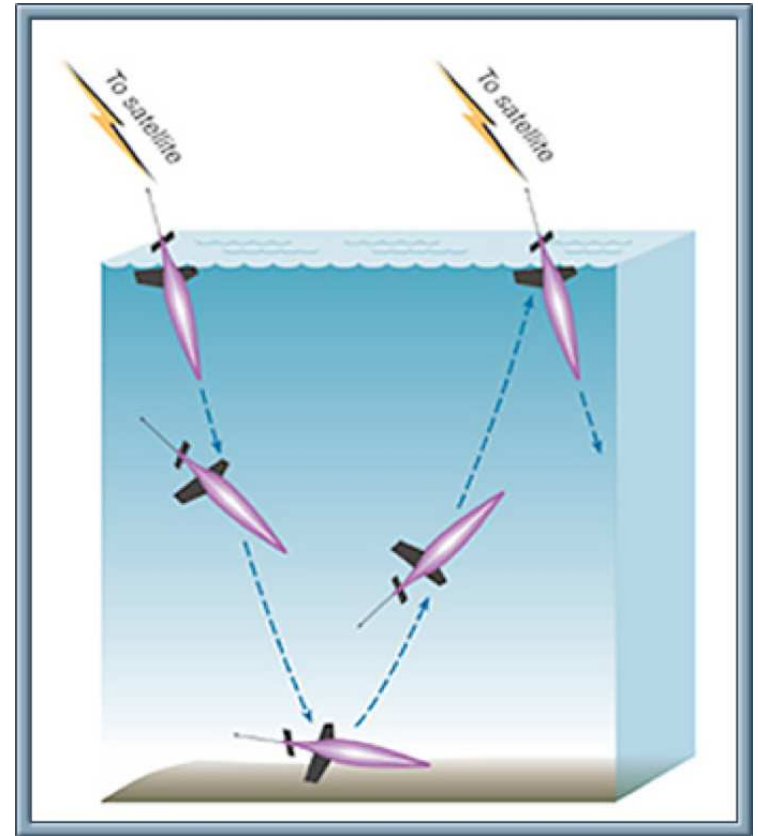


Focus area for NACO, national base funding for 6 gliders and support, available for international research projects contributing to running costs





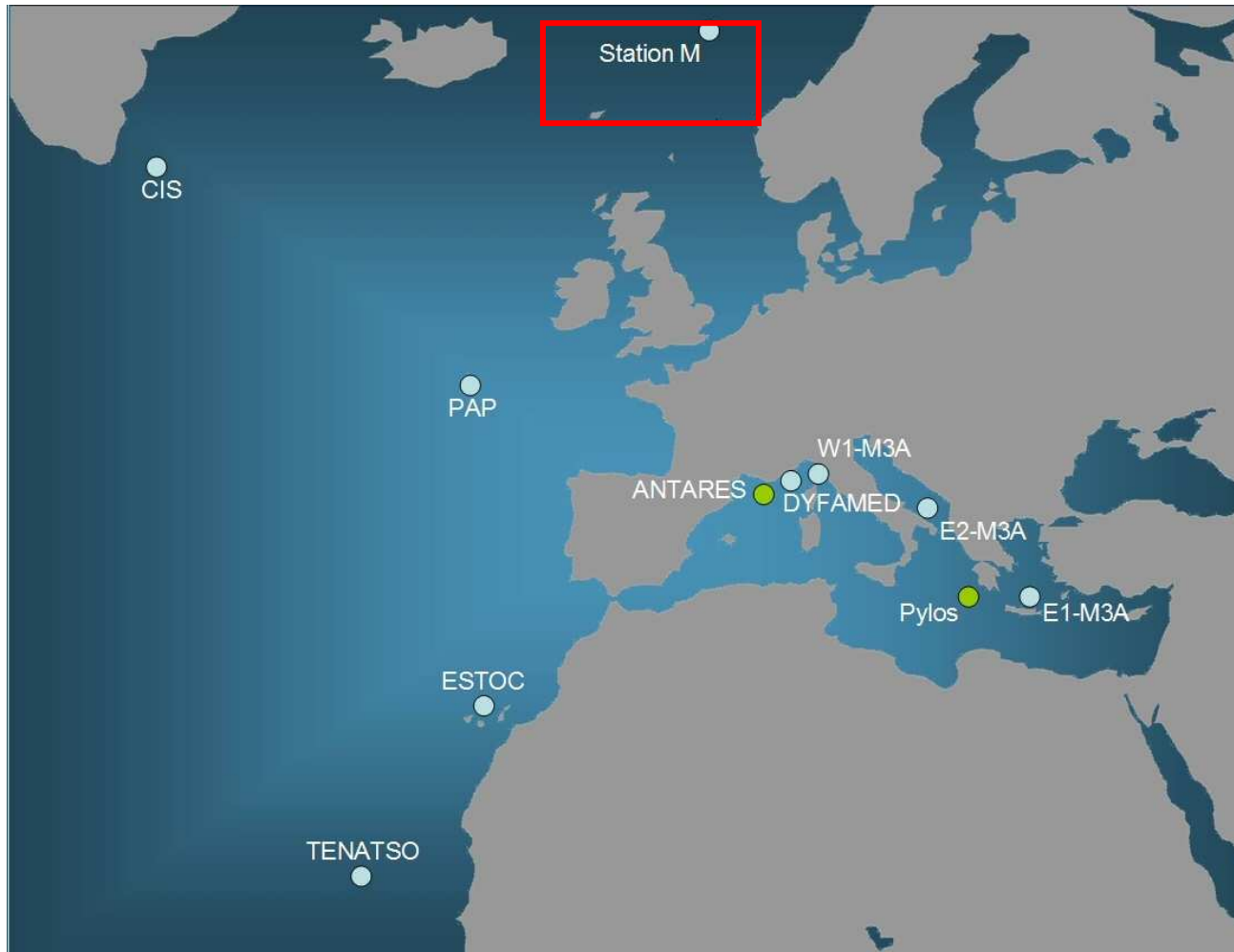
Test of gliders in NACO area January 2009  
Variations in warm and saline Atlantic Water



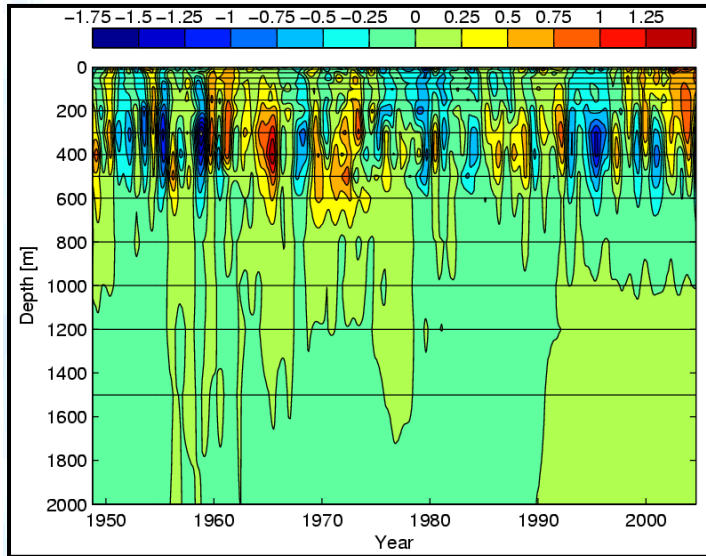
Gliders that measure temperature, salinity, ocean current velocity, suspended matter  
+ Other sensors to be added

# Example of EuroSITES time-series data

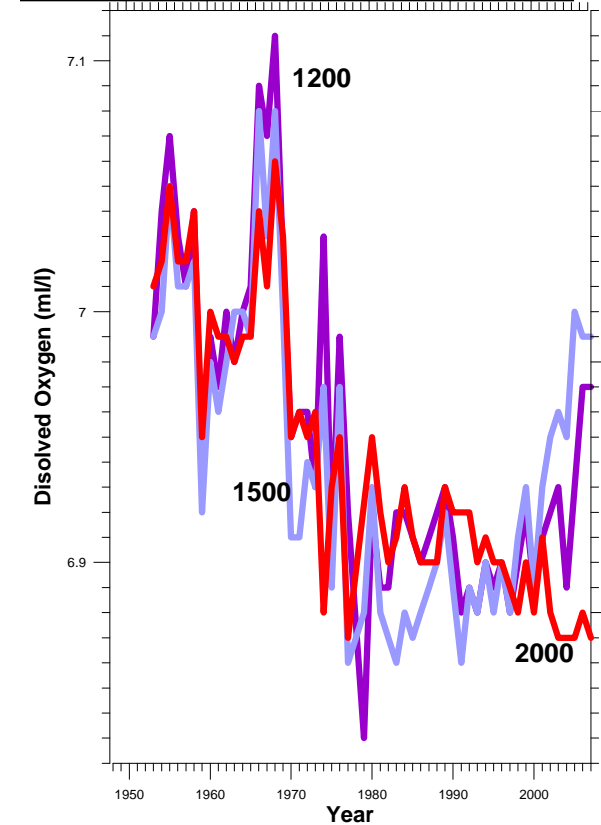
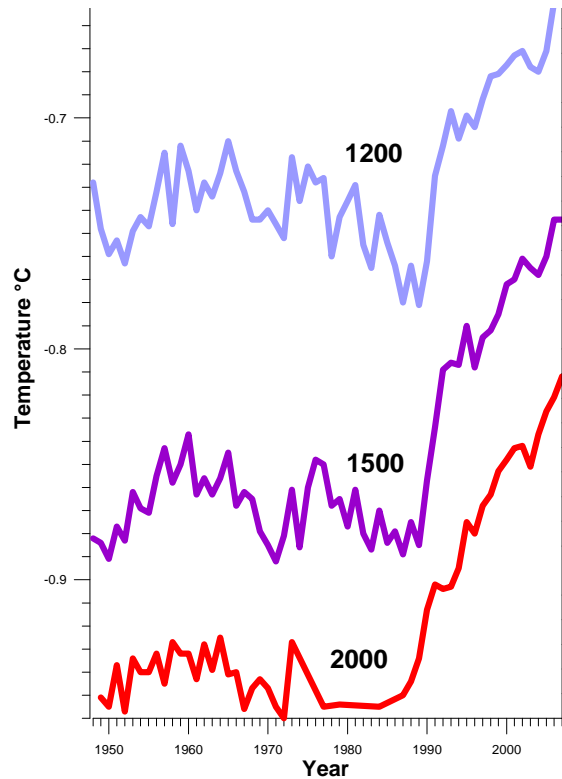
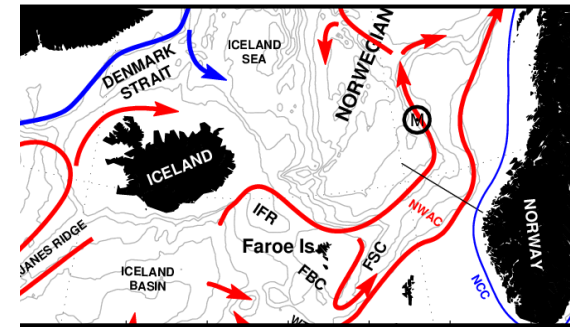
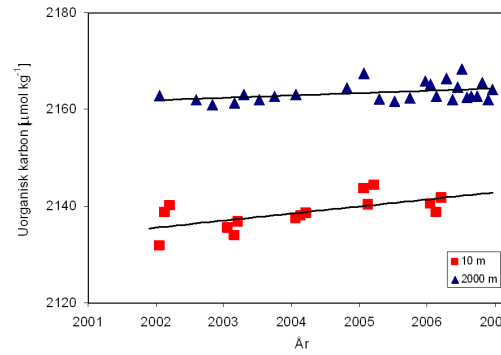
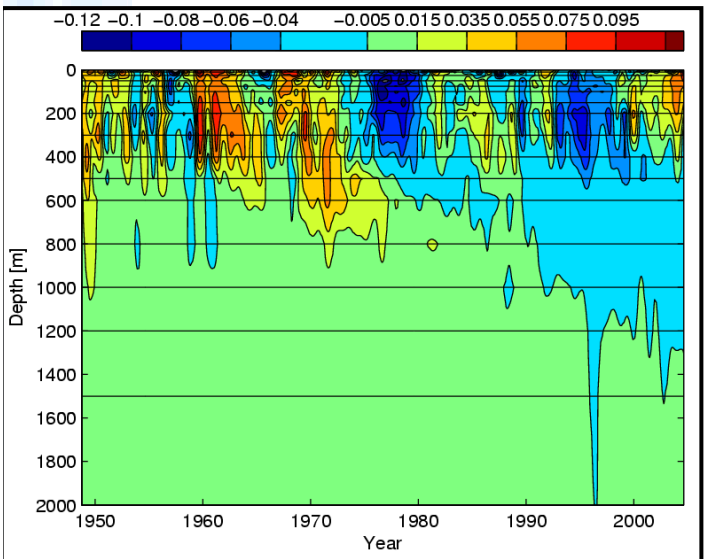
## Station M, Norwegian Sea



# M-60 years in the Nordic Seas



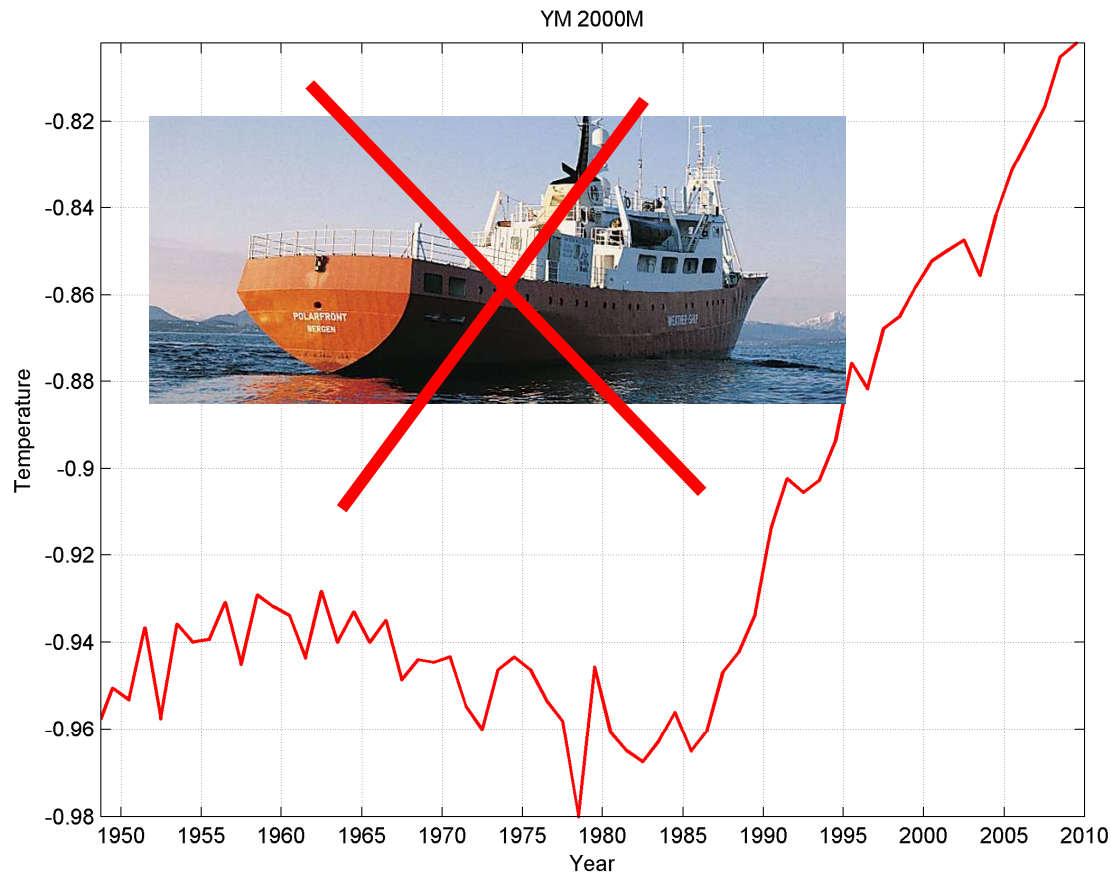
Temperature & salinity anomalies



Temperature and O<sub>2</sub> at 1200, 1500, 2000 m



# 1948-2010 Temperature from 2000 m depth at station M



Ship operations discontinued December 2009. Cost 2-3 MEUR/year not sustainable over Met Office budget.

**New "PolarBuoy" funded from Norwegian Research Council with similar one time investment cost. Will not measure atmospheric parameters or ocean carbon with similar precision, but provide continuity in deep ocean hydrography.**

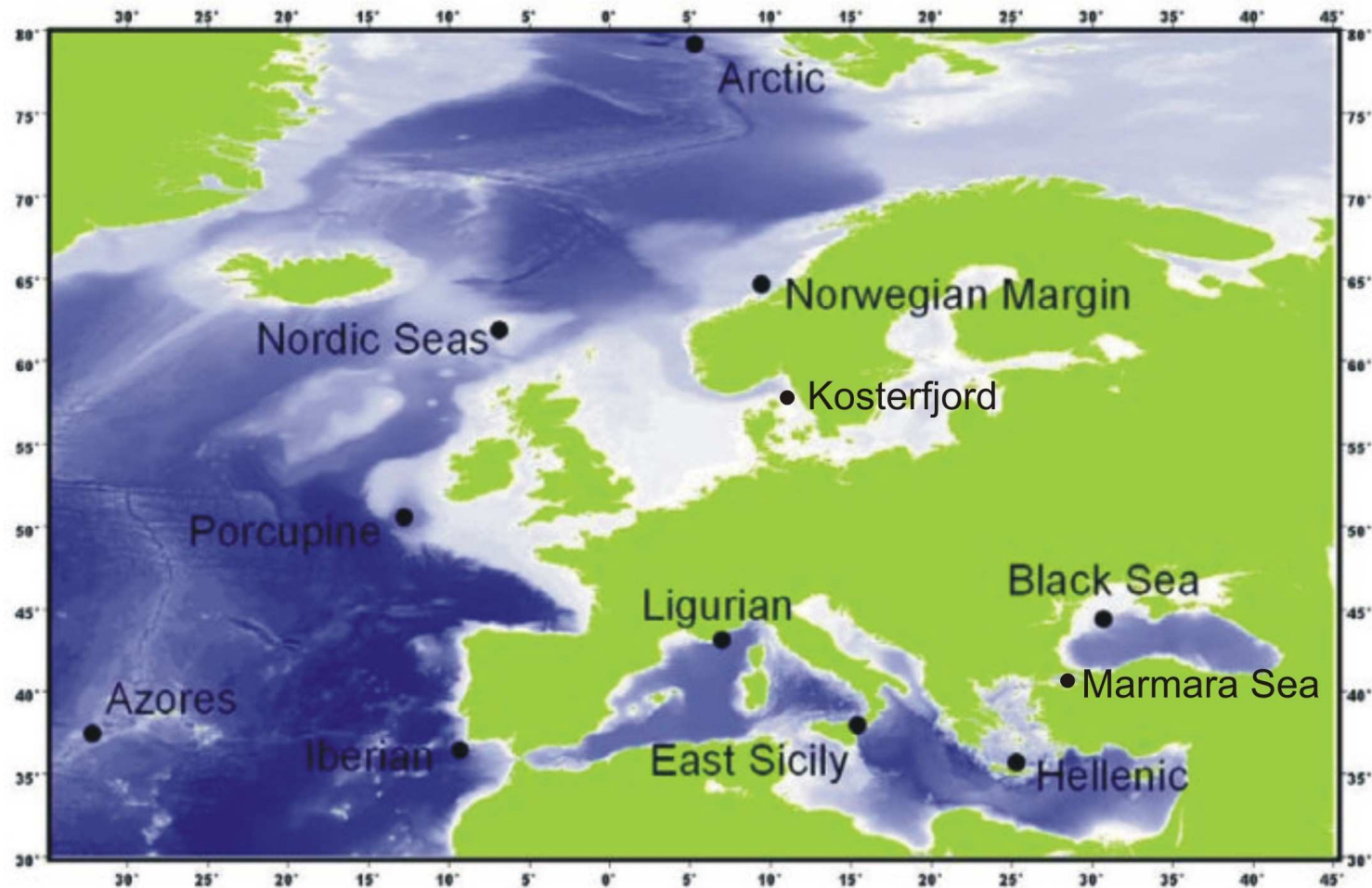
**Business model including provision of ship time still has to be worked out.**

The Ocean Weather Ship "POLARFRONT"

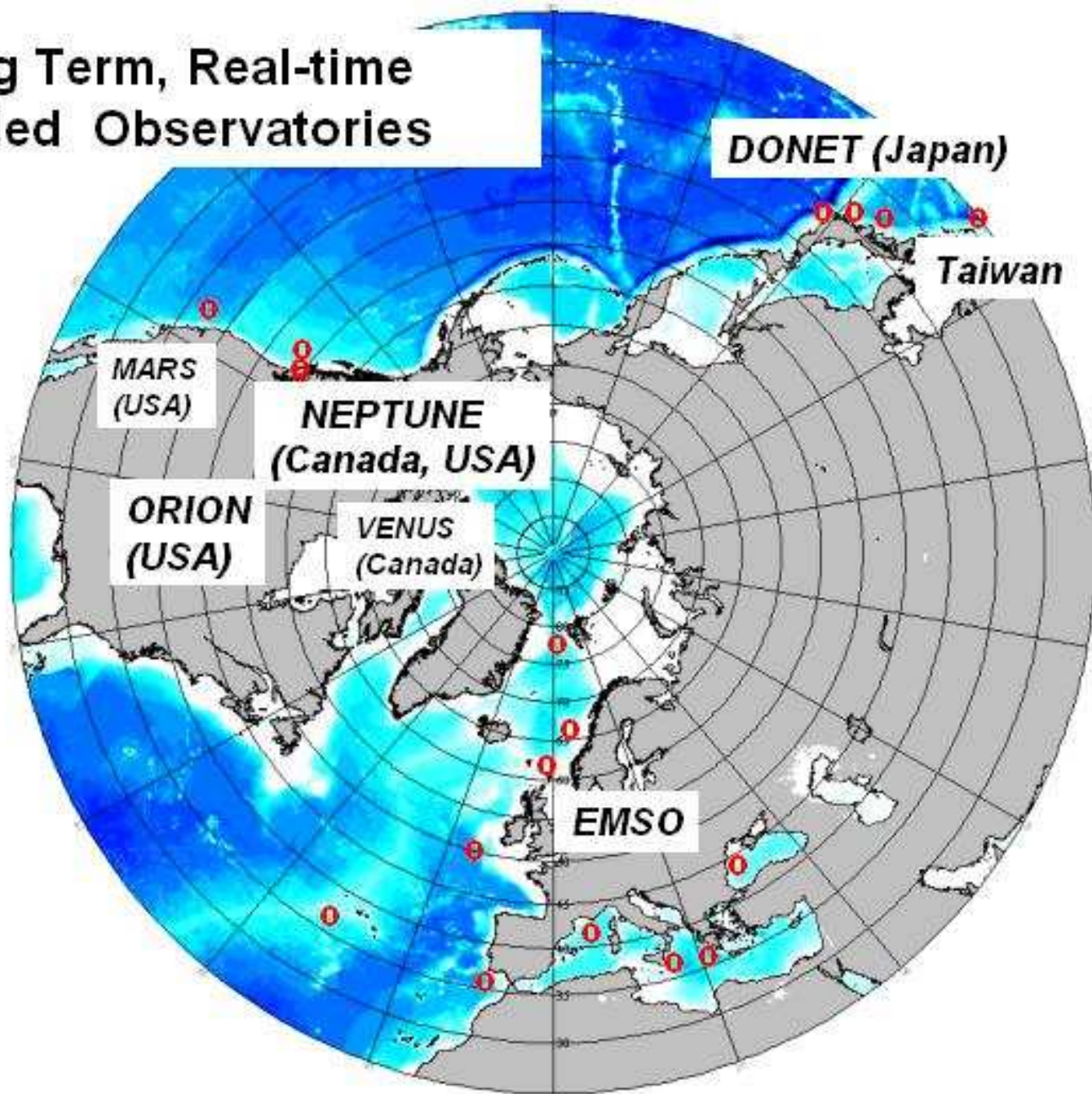


ESONET NoE (European Sea Observatory Network) is the continuation of ESONET concerted action which recommended to install long term observatories on 11 sites around Europe.

EMSO is a Preparatory Phase for ESFRI (European infrastructure)

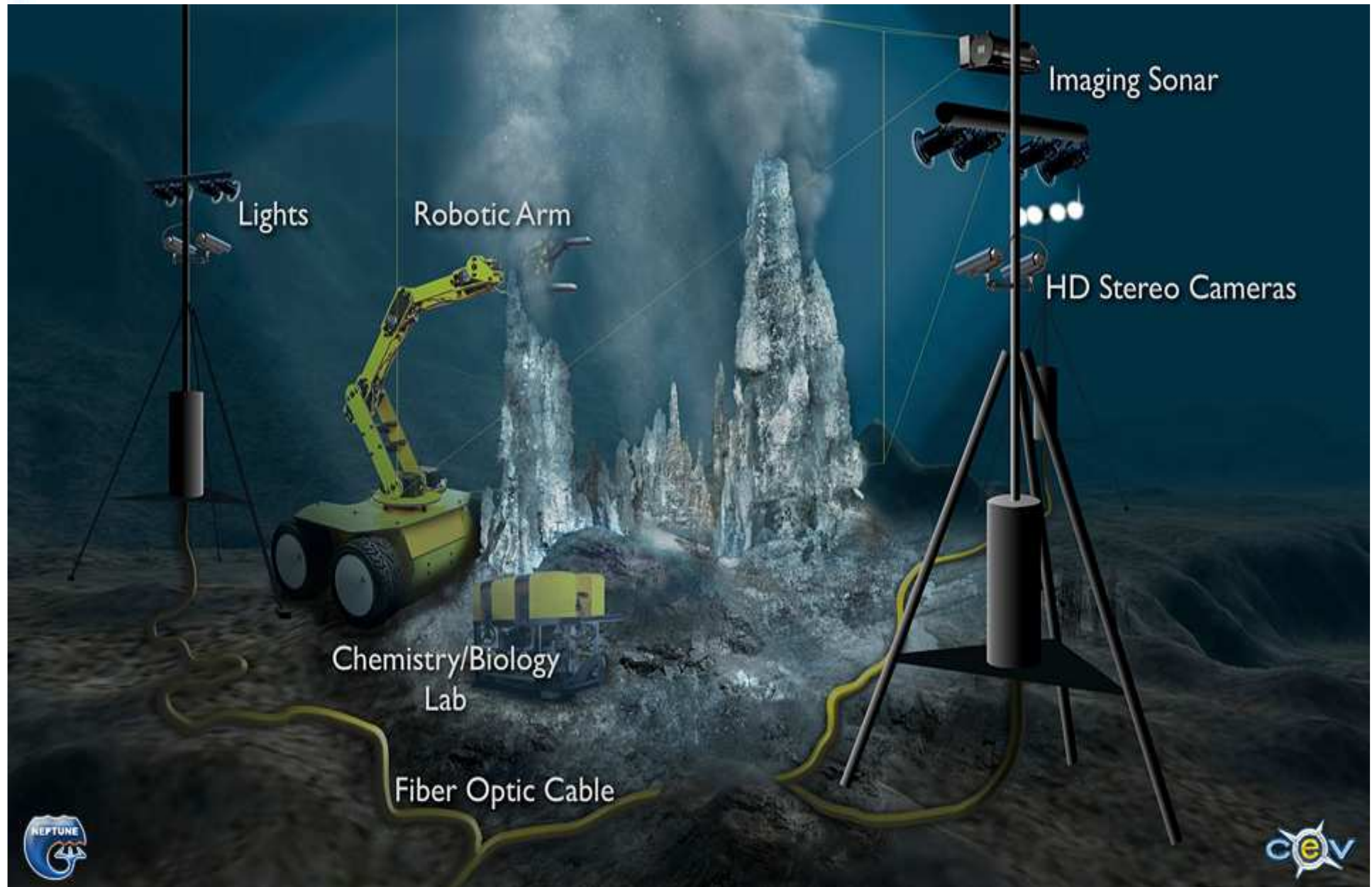


# Long Term, Real-time Cabled Observatories



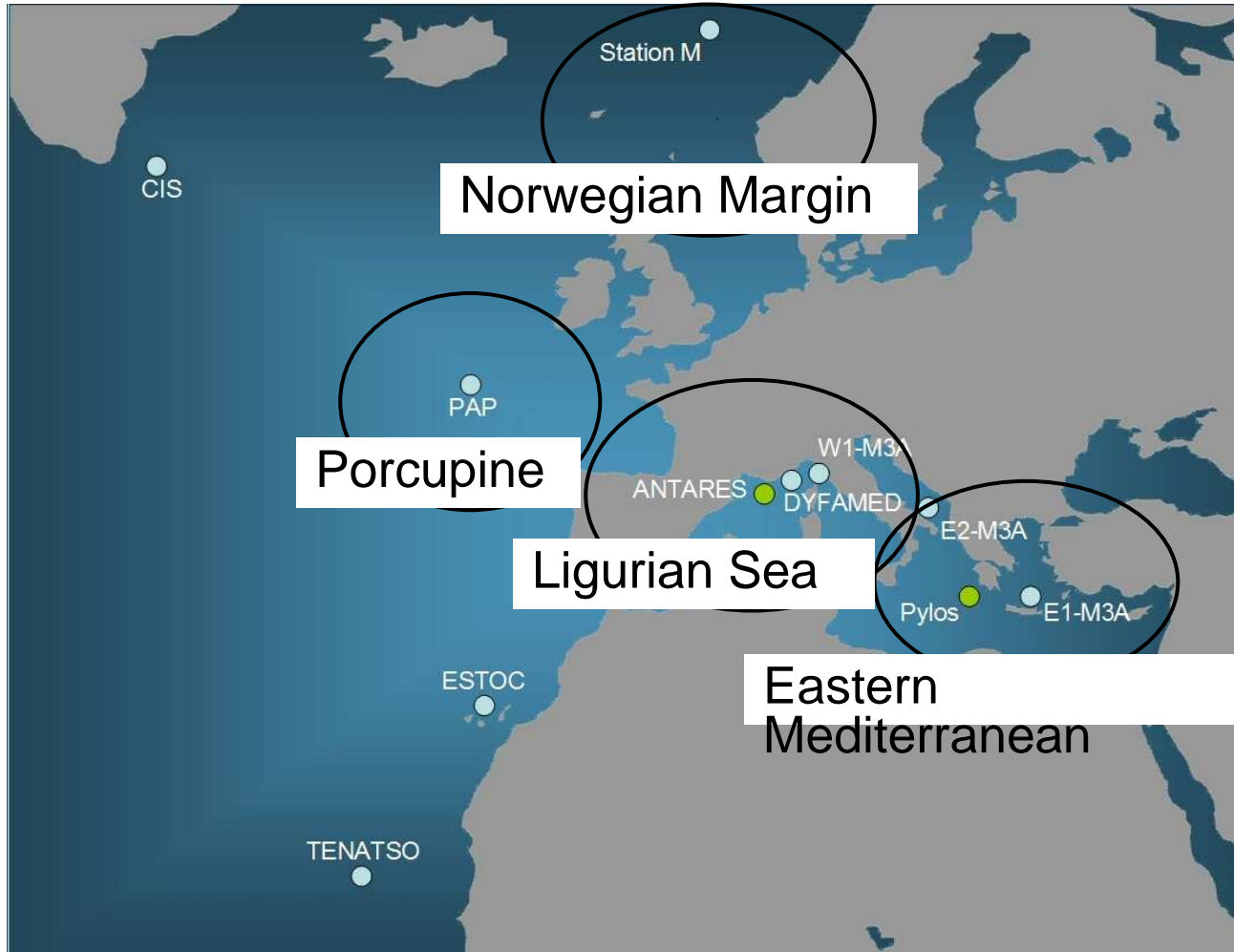
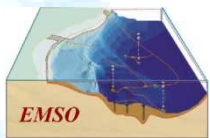


# Few limits to cable observatory options – Choose and design !





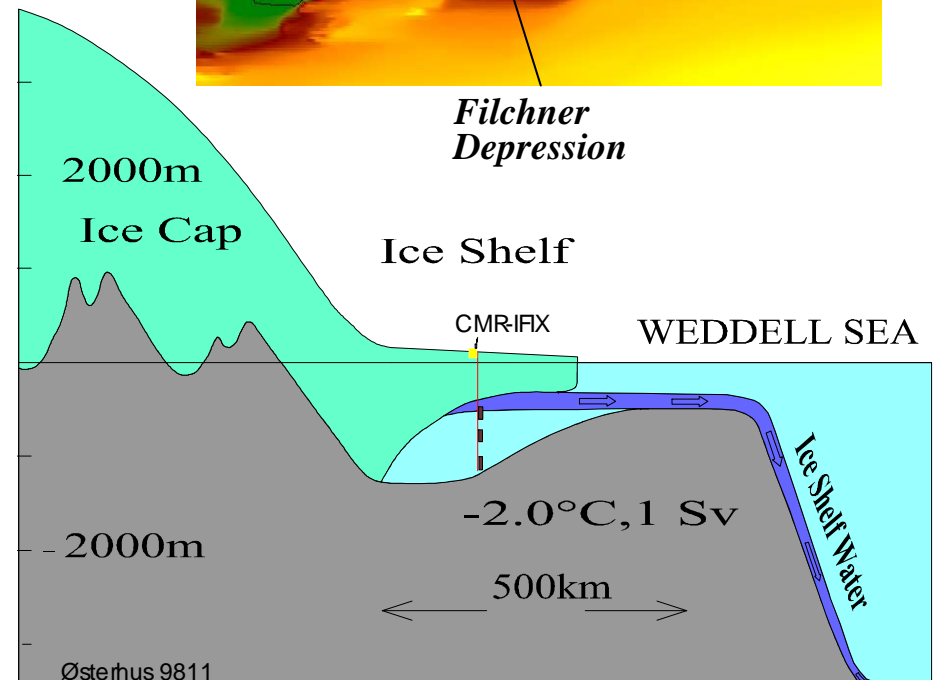
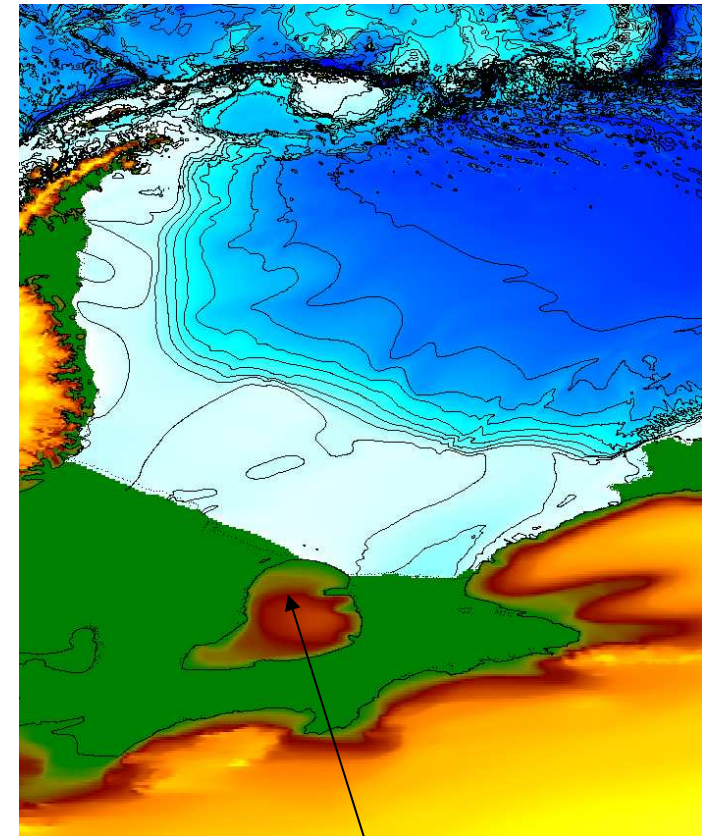
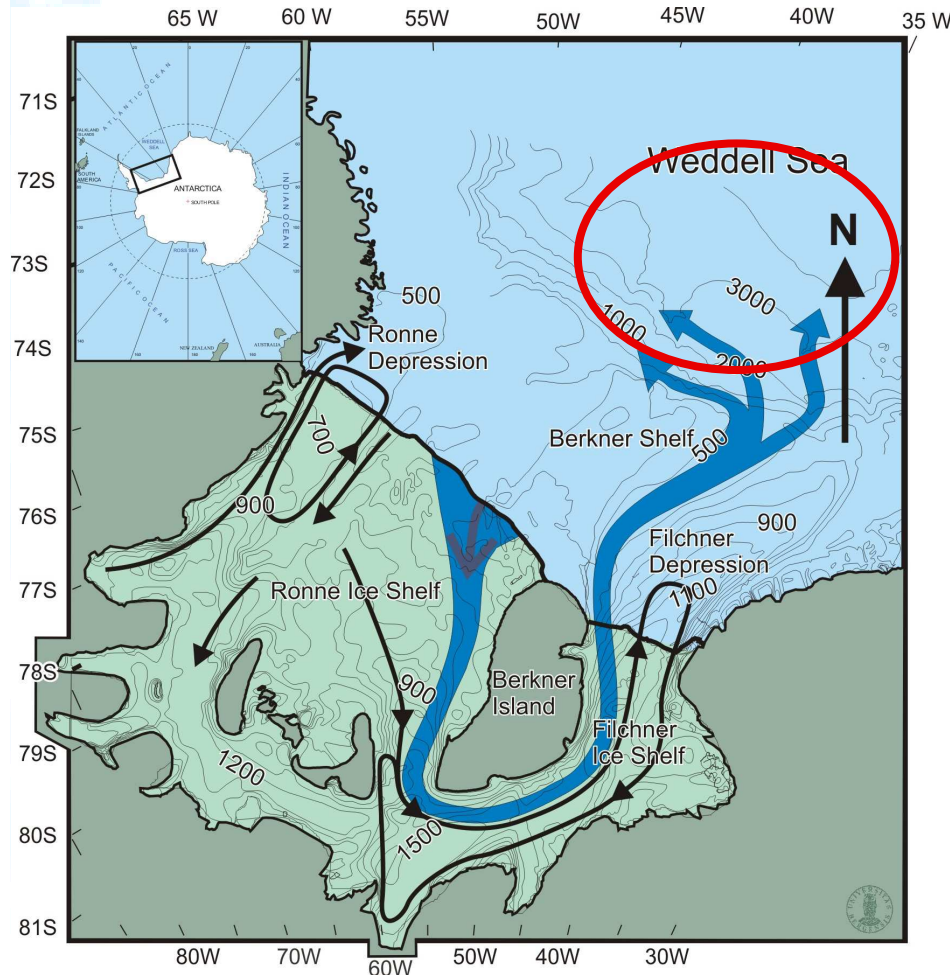
# Regional, collaborative science



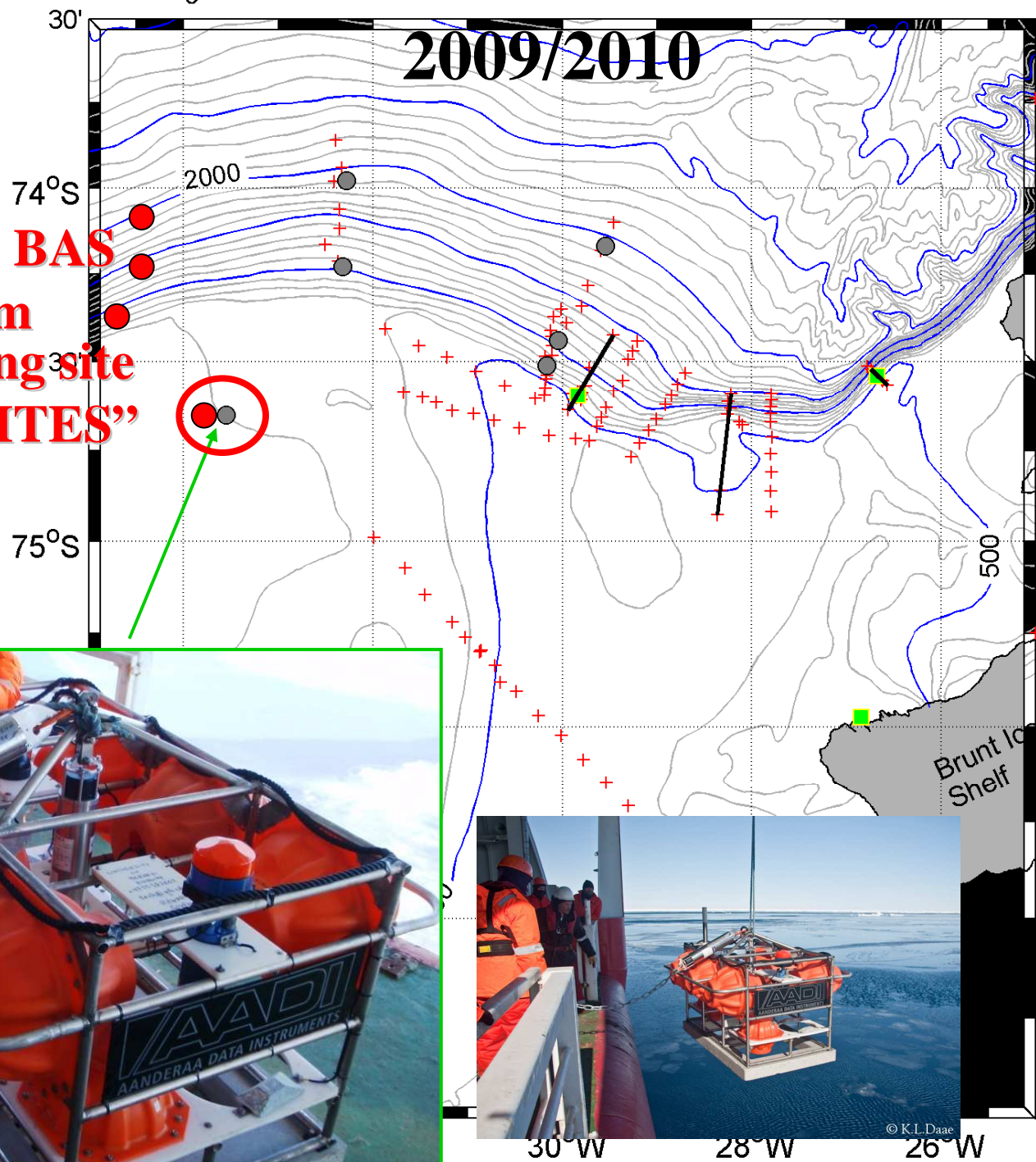
EuroSITES and ESONET/EMSO: 4 Common regions

## Possible collaboration in other areas

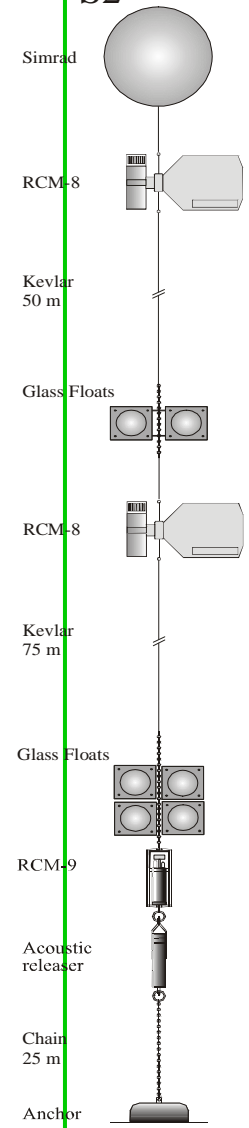
- Cable observatories in the Arctic -> EMSO and SIOS (both ESFRI PP)
- Time series stations in the Antarctic such as in the southern Weddell Sea



**BCCR & BAS  
Long term  
monitoring site  
"OceanSITES"**



NARE 0102  
S2



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# Key issue/message: Efforts on a European level would be cost-effective and stimulate development

- Given the cost of acquiring data, it is crucial to maximise synergies at EU level - EMODNET and the principle of "producing data once and using it as many times as possible"
- Utilize European mechanisms:
  - EU FP projects like EuroSites
  - COST such as Everyones Glider Observatory (EGO)
  - ESFRI such as EMSO and SIOS
- Take part in process initiated by the Marine Board ESF ->



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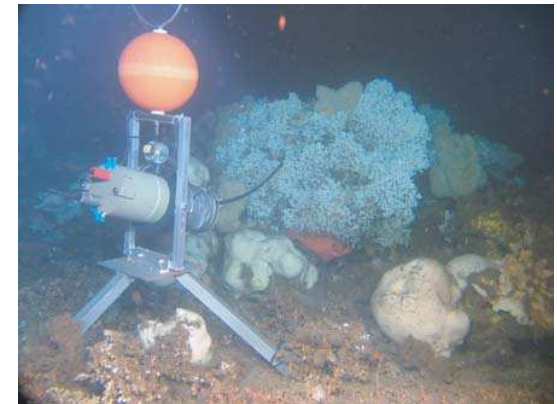




## 2nd Marine Board Forum

*“Towards a European Network of Marine Observatories for monitoring and research”*

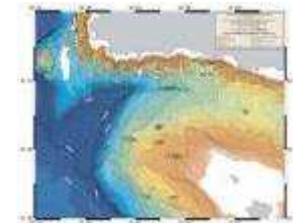
**Brussels, 16 September 2010**



# Marine Board-ESF

The Marine Board provides a pan-European platform for its member organisations to develop common priorities, to advance marine research, and to bridge the gap between science and policy in order to meet future marine science challenges and opportunities.

- Established in 1995; by Member Organisations in consultation with the European Commission
- 30 Member Organisations (Research Funding and Performing Organisations) from 19 countries
- Node for:
  - Knowledge exchange between national science organisations
  - Science Forum, with members and other networks (EuroGOOS, EFARO, ICES, ECORD, WaterBorne TP, etc.); MB Biennial Forum
  - Policy Interface: European Commission = Permanent observer



European focal point for marine science

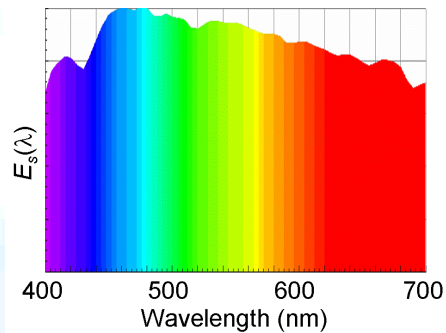
Forum

Voice



Strategy

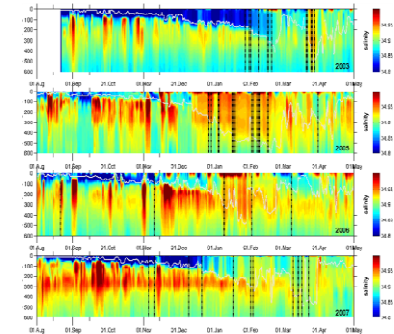
Synergy



## Marine Board Fora series:

- **1st Marine Board forum** on *“Marine Data Challenges: From Observation to Information”* (2008)
  - contributed to development of the European Marine Observation & Data Network (EMODNET) initiative launched by European Commission
  
- **2<sup>nd</sup> Marine Board forum** on *“Towards a European Network Marine Observatories for monitoring and research”*
  - Provide long-term time-series data sets to support science, industry and policy making.
  - Maintain momentum of marine and maritime RTD efforts in this field and enhance their interactions
  - Secure long-term political support (from Member States, EC etc.)

The 2<sup>nd</sup> Forum will address and discuss **at both managerial and strategic levels and on a multiscale approach**, issues for the **implementation, operation and maintenance of a European network of marine observatories**



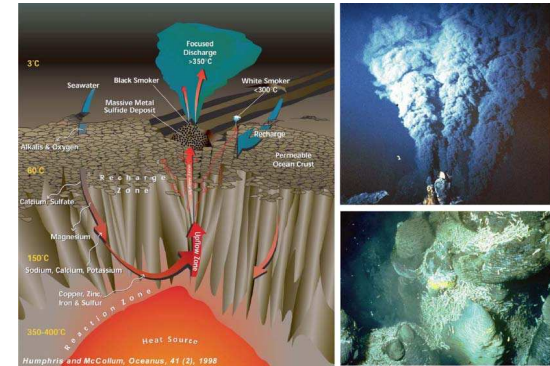
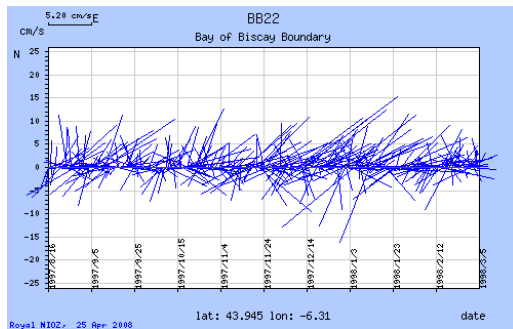


## Programme of the 2<sup>nd</sup> Marine Board Forum

The Forum will provide a timely opportunity to:

- Define the role of marine observatories in the marine research and policy landscape;
- Discuss some technical challenges (interoperability, data management etc.);
  - Profile EU and US initiatives and systems currently in operation
  - Discuss long-term perspectives in terms of sustained funding schemes, partnerships and governance.
- **Europe needs to design strong foundations for a stable and integrated network of observatories around Europe;**
- This 2<sup>nd</sup> Forum will provide a real opportunity to act together towards this target, this vision of **“A network of Marine Observatories for Monitoring and research”**





## Output of the 2<sup>nd</sup> Marine Board Forum

- The Forum will deliver a statement providing a **Vision and Recommended Actions** to secure, with a long term commitment, a **European network of long-term marine observatories**;
- It will be presented at **EurOCEAN 2010**, the Belgian EU presidency Conference on **“Grand Challenges for Marine Research in the Next Decade” (12-13 October 2010, Ostend)**.

## **2nd Marine Board Forum 16 September 2010**

### **Audience:**

European and National policy makers/advisors and programme managers, marine scientists, stakeholders including NGOs. Estimated number of participants: 100

**Registration:** Free of charge until 16 July 2010

### **Venue:**

Auditorium Maria Baers,  
Martelaarsplein 7,  
1000 Brussels, Belgium

**For further information  
and up-to-date  
Programme**

**[www.esf.org/marineboard/2ndforum](http://www.esf.org/marineboard/2ndforum)**

**Caution: limited places!!**