



# **European Marine Long-term Time-series Observatories: critical issues:**

## **Towards a network of Marine Observatories in Europe: what elements are missing?**

**By  
Hans Dahlin  
Director, EuroGOOS**



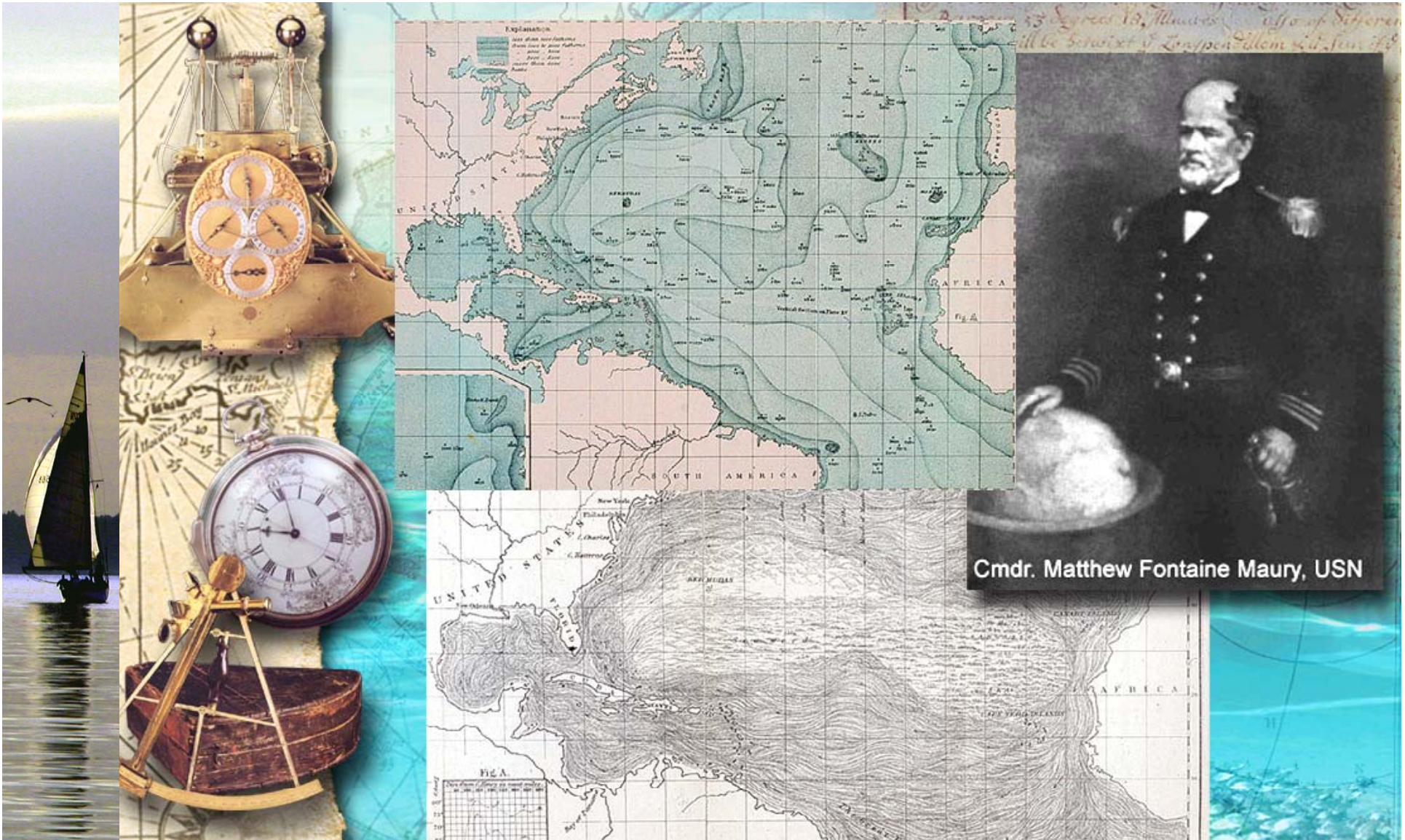
## Critical issues

The conference established the basic principles of operational meteorology and oceanography:

- Common standards/formats for data collection
- Common standards of data quality control and analysis
- Free and open exchange of data/information for global public good

## Which Conference ?





Cmdr. Matthew Fontaine Maury, USN

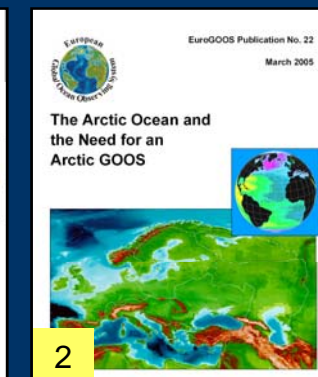
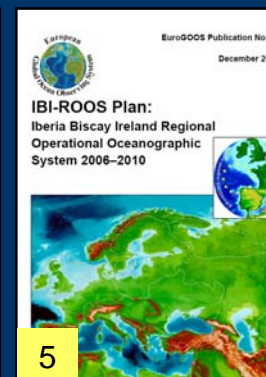
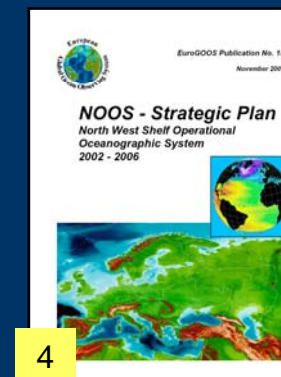
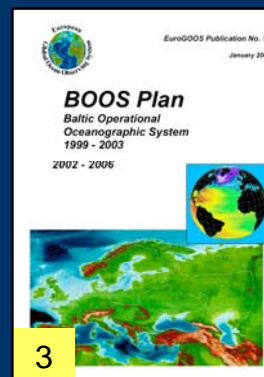
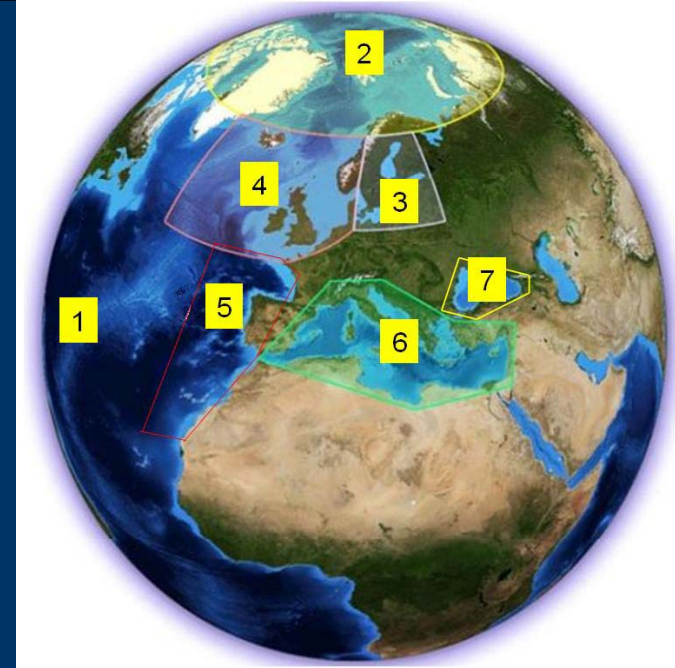
# Maury and the 1853 Brussels Conference



# To build a sustained European Ocean Observing System

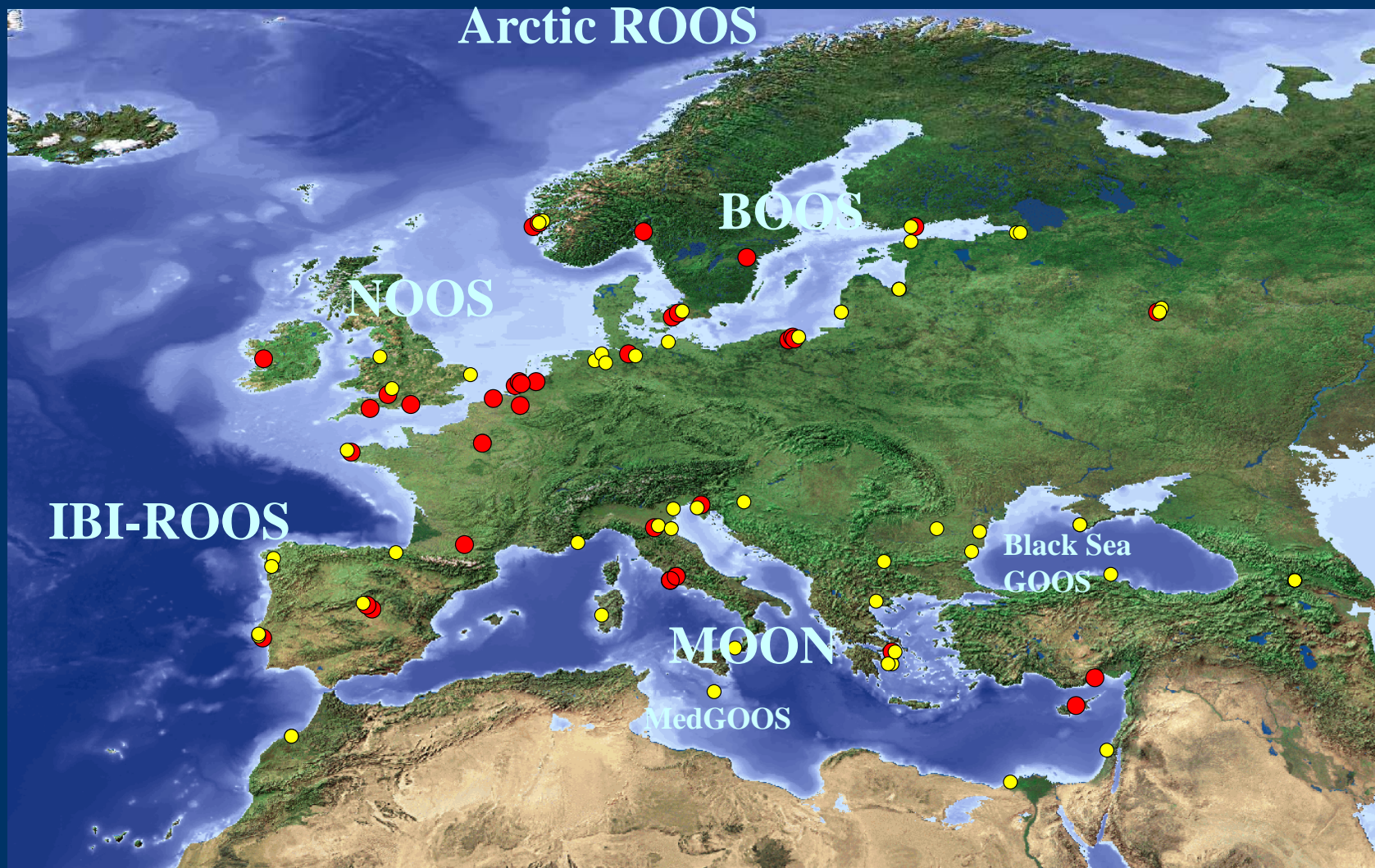
National systems to satisfy national needs or commitments have existed for a long time. To co-ordinate EuroGOOS chose a user-driven bottom-up approach where the regional scale was the most appropriate scale for co-operation and co-production.

EuroGOOS Regional Task Teams have built and continue to build Regional Operational Oceanographic Systems, ROOSs. These are the operational arm of EuroGOOS



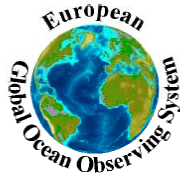


# EuroGOOS The European Ocean Observing System



Deep, shelf, warm, cold, enclosed, brackish, eutrofied, oligotrophic



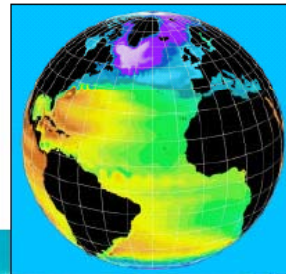


EuroGOOS Publication No. 14

January 2000

# **BOOS Plan**

**Baltic Operational  
Oceanographic System  
1999 - 2003**



I chose the  
BOOS Plan as  
an example.  
It builds on an  
inventory from  
1996

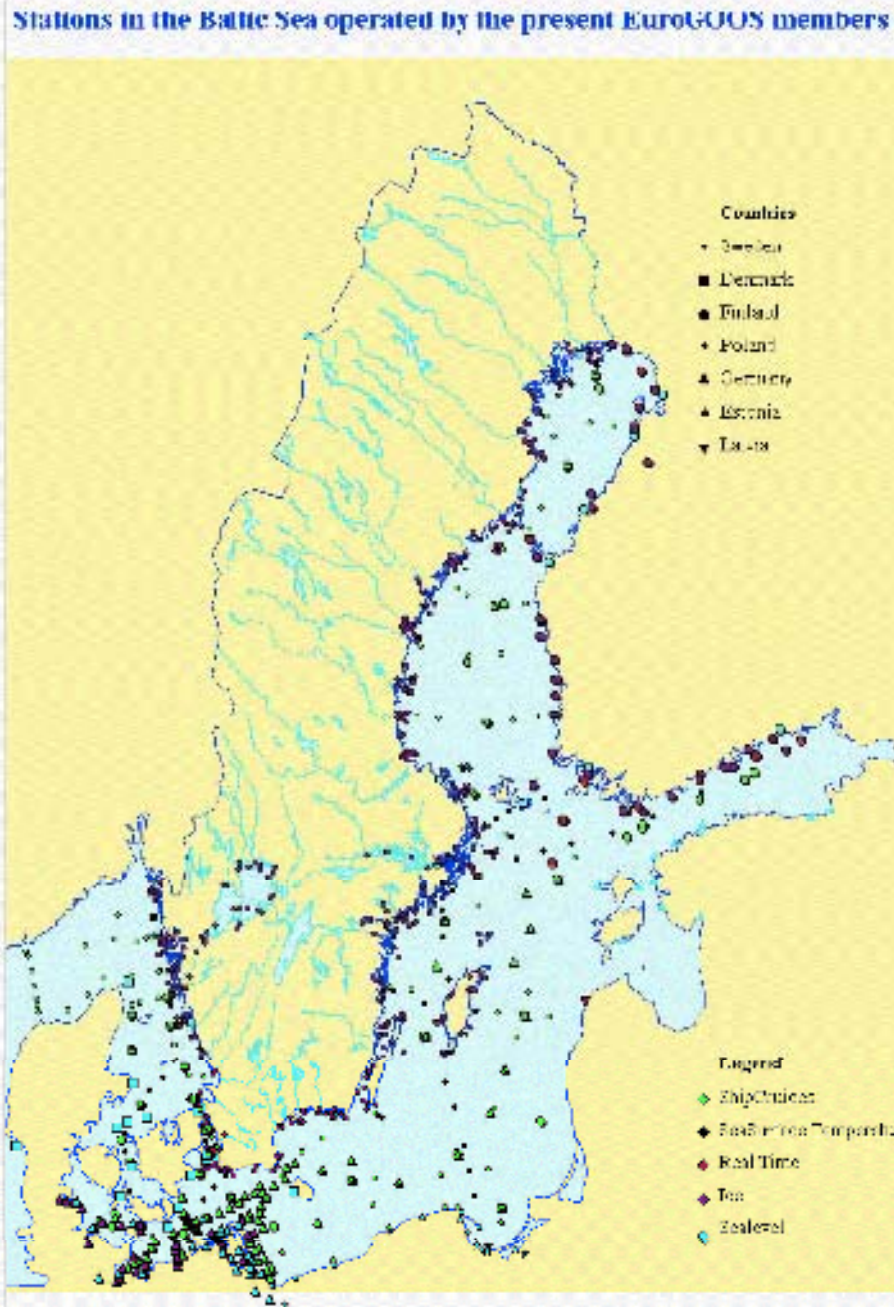



Figure 23. Oceanographic stations in the Baltic Sea operated by the BOOS partners

Only EuroGOOS  
Members

Systems operated by  
Russia, Estonia, Latvia  
and Lithuania not  
included.

Data from all stations  
were available for use by  
BOOS.



The observing systems were directly related to user areas

The most important marine related areas which require operational oceanography in the Baltic are:

- Shipping - all kinds
- Navigation in shallow areas and entrances to harbours
- Rescue operations, drift forecasting
- Military purposes
- Storm surge warnings
- Flood protection
- Coastal protection
- Transport calculations of water, substances and passive biological material, e.g. algae and fish eggs
- Bottom water renewal, oxygenation
- Environmental protection, impact assessment and management
- Ecosystem assessment
- Fisheries planning and management
- Recreation purposes
- Public warnings
- Research

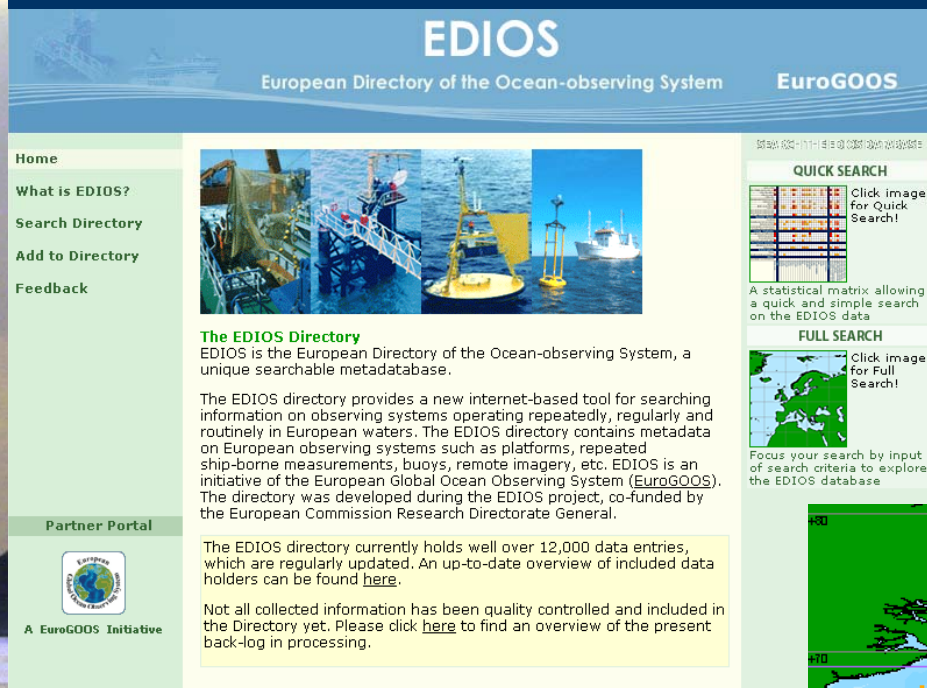


# The main role of BOOS was to co-ordinate, optimise and exchange

**Table 1. Existing operational components**

Observations (Only partly co-ordinated)	Forecasts	Analyses
<ul style="list-style-type: none"> <li>• Meteorological synoptic</li> <li>• Meteorological climate</li> <li>• Sea level</li> <li>• Fixed stations, real time</li> <li>• Automatic buoys, real time</li> <li>• SST-ice network</li> <li>• Satellite remote sensing</li> <li>• Regular research vessel cruises</li> <li>• HELCOM monitoring</li> <li>• Ships of opportunity</li> <li>• Bottom fauna</li> <li>• Contaminants</li> <li>• Biological effect</li> <li>• Fish stock</li> <li>• Mussel watch</li> <li>• River discharge</li> <li>• Atmospheric deposition</li> <li>• Event</li> <li>• Local monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Weather               <ul style="list-style-type: none"> <li>Global forecasting</li> <li>High resolution limit area</li> </ul> </li> <li>• Sea level</li> <li>• Wave</li> <li>• Sea ice</li> <li>• 1, 2 and 3 dimensional ocean</li> <li>• Local area ocean</li> <li>• Drift</li> <li>• Hydrological discharge</li> <li>• Atmospheric deposition</li> </ul> <p>Pre-operational models for ecology and water quality</p>	<ul style="list-style-type: none"> <li>• Mesoscale gridded analysis               <ul style="list-style-type: none"> <li>Meteorology</li> </ul> </li> <li>• Sea surface temperature</li> <li>• Ice maps</li> <li>• Regional environmental</li> <li>• Periodic Baltic area environment</li> <li>• Assessment of commercial fish</li> </ul>

# What existed at European Scale ?



The screenshot shows the EDIOS website interface. At the top, it says "EDIOS European Directory of the Ocean-observing System" and "EuroGOOS". Below this is a navigation menu with links for "Home", "What is EDIOS?", "Search Directory", "Add to Directory", and "Feedback". A central image shows various ocean observing systems like buoys and ships. To the right, there are sections for "QUICK SEARCH" (with a grid of colored squares) and "FULL SEARCH" (with a map of Europe). A "Partner Portal" section features the EuroGOOS logo and text about the directory's 12,000+ entries and quality control process.

## The EDIOS Directory

EDIOS is the European Directory of the Ocean-observing System, a unique searchable metadata base.

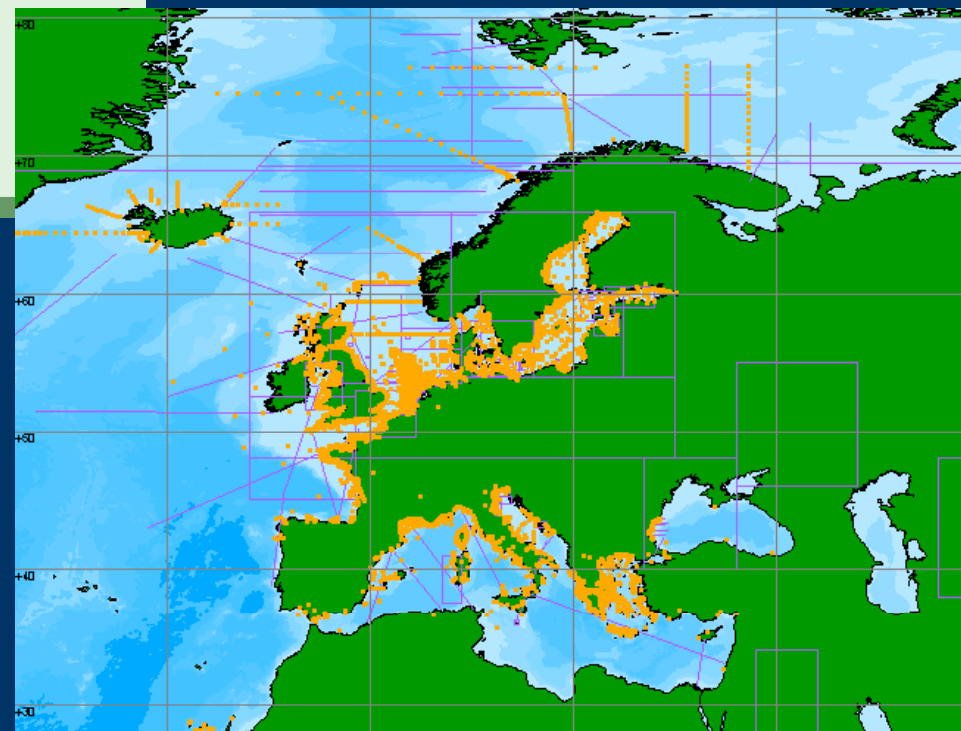
The EDIOS directory provides a new internet-based tool for searching information on observing systems operating repeatedly, regularly and routinely in European waters. The EDIOS directory contains metadata on European observing systems such as platforms, repeated ship-borne measurements, buoys, remote imagery, etc. EDIOS is an initiative of the European Global Ocean Observing System (**EuroGOOS**). The directory was developed during the EDIOS project, co-funded by the European Commission Research Directorate General.

The EDIOS directory currently holds well over 12,000 data entries, which are regularly updated. An up-to-date overview of included data holders can be found [here](#).

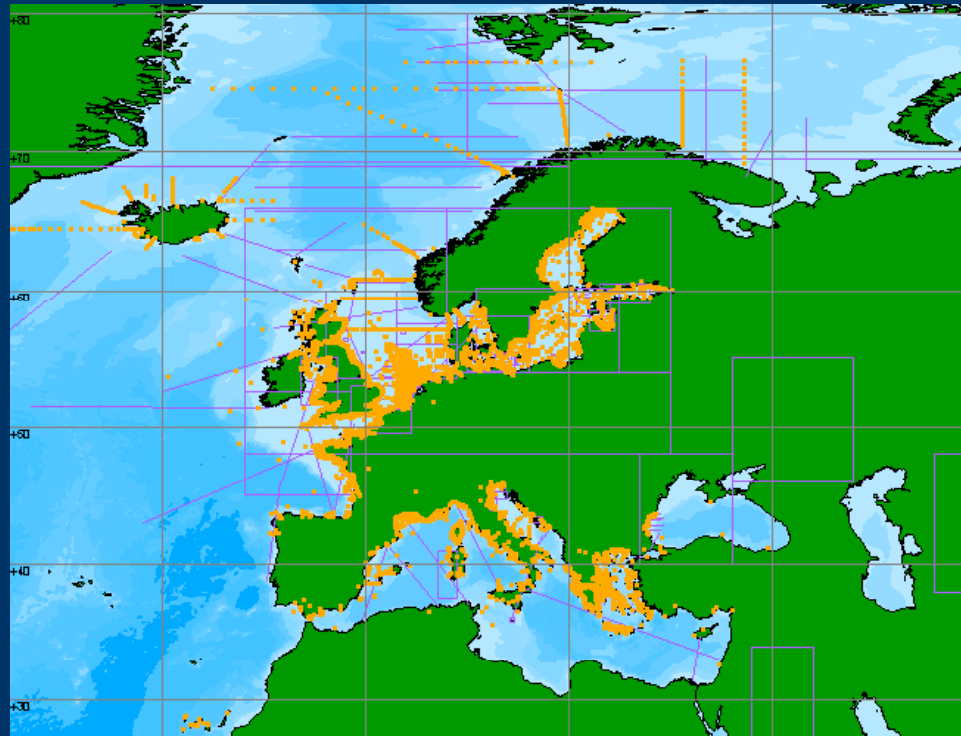
Not all collected information has been quality controlled and included in the Directory yet. Please click [here](#) to find an overview of the present back-log in processing.

Co-funded by European Commission DG Research

- Around 15 000 entries into the meta data base
- Now being updated by SeaDataNet







- ✧ The observing system is slowly changing, e.g. today we have
- ✧ ARGO-floats in the deep water areas
- ✧ EuroSite stations
- ✧ Ferrybox lines
- ✧ Surface observations from space.
- ✧ Several stations have also disappeared.

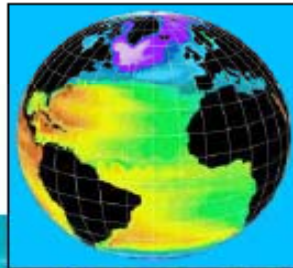
But

- some areas are empty
- do we satisfy requirements ?
- do we deliver correct information ?



EuroGOOS Publication No. 12  
February 1999  
EG99.04

## ***Operational Oceanography: Data Requirements Survey***




We know that there is a long list of requirements from different user sectors.

Several we can not satisfy.

One reason is that the relation between the cost for the production of the data and the benefit for the user is not good enough.





# The observing task has five dimensions.

## Space

- 1 point, line
- 2 surface, section
- 3 volume, contents

## Time

## Variable

Can we resolve these properly  
in relation to requirements ?

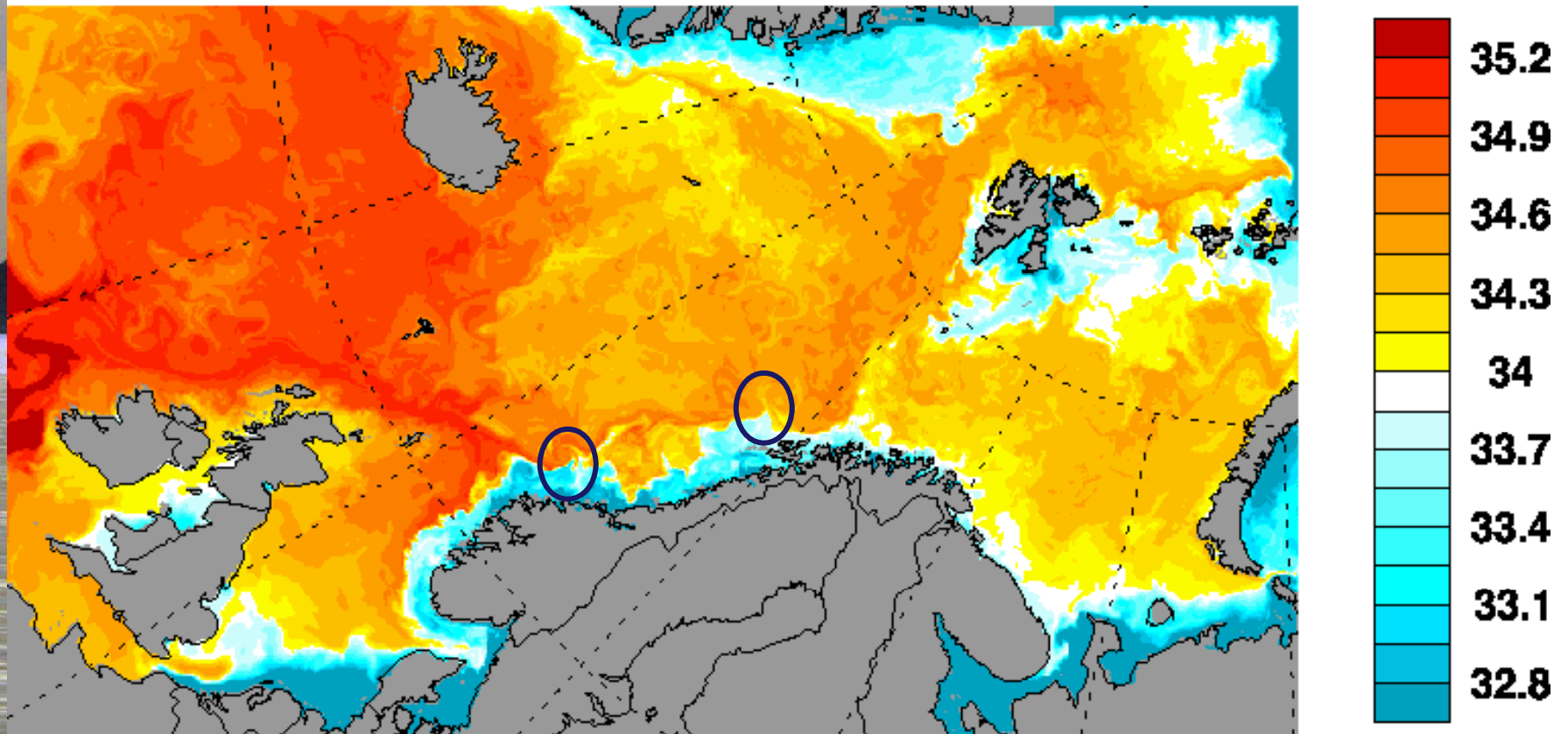


EuroGOOS

MARINE  
BOARD

# Oceanic lows are much smaller and atmospheric, modelled salinity

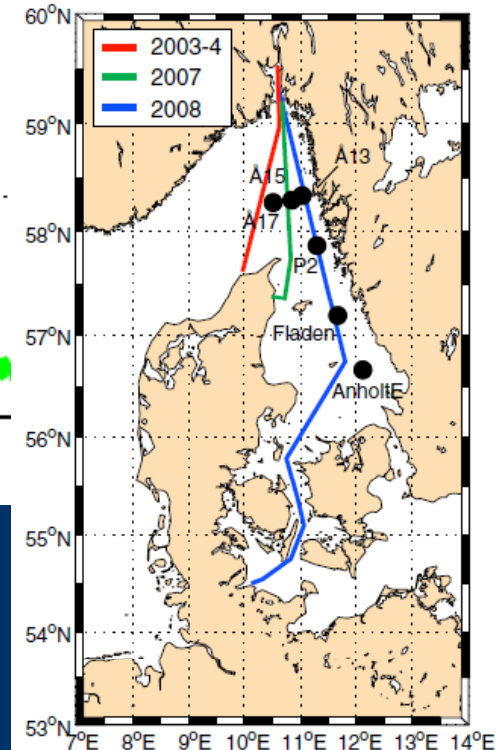
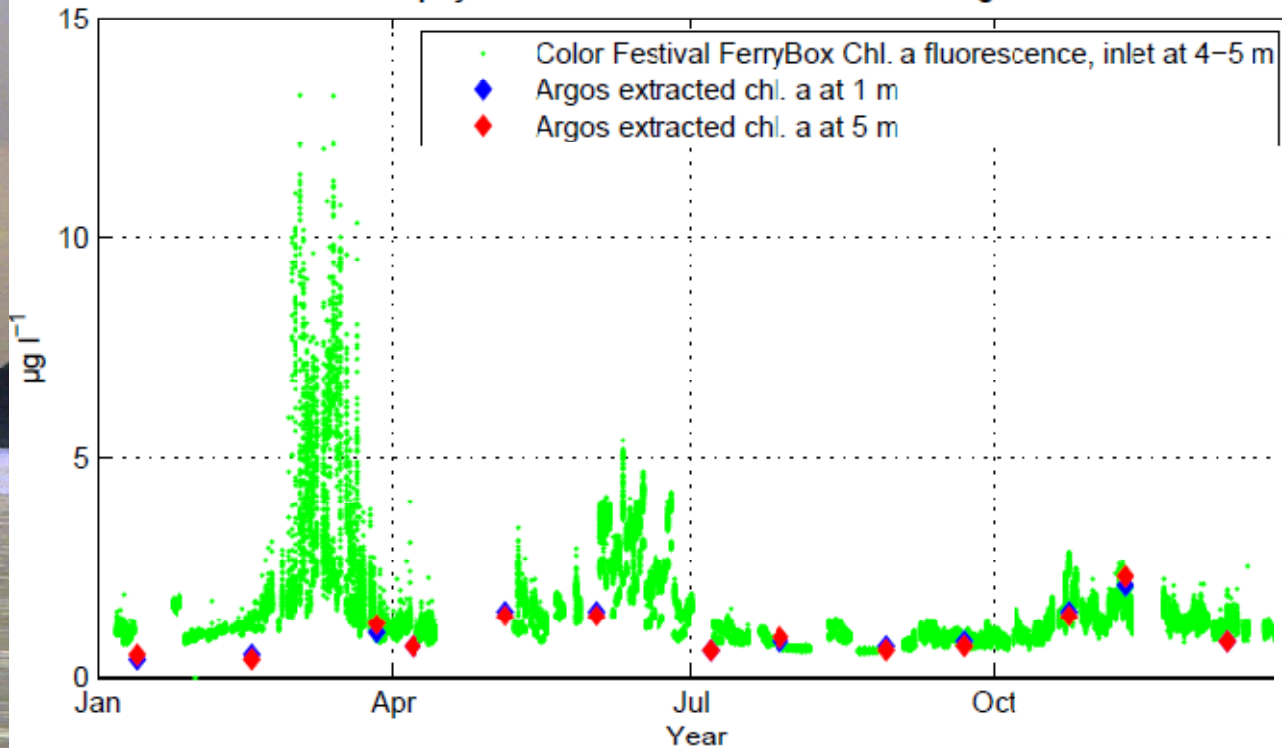
2009-10-12 18





# The necessity of high frequency sampling - an example from the Skagerrak in 2003

Chlorophyll a 2003 near station Å17 Central Skagerrak



Bengt Karlson, Philip Axe, Lennart Funkquist, Seppo Kaitala and Kai Sørensen 2009



We can not meet the requirements.

Is there a way forward ?

Yes !

Coastal Laboratories in  
the more strict definition.



# Coastal Laboratories

- some well defined ocean areas where governmental organisations, industry and science co-operate,
- where we can afford and manage high spatial and temporal resolution,
- and where we have technical and scientific capability to observe a wider range of variables with highest quality.