



# Challenges for international cooperation

Case Examples of Needs in the Environmental Monitoring Sector

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# Content

- **Regional international challenges**
- **Current activities in the Baltic Sea**
- **Future challenges – needs/how to make the system operational**



# International requirements

- **EU Marine Strategy Framework Directive**
  - Requirement to reach “Good environmental status”
  - High level Objectives (Descriptors)
  - Operational Objectives – Targets - Indicators
- **HELCOM Baltic Sea Action Plan**
  - Regional contribution to EU MSFD in achieving good environmental status
- **Monitoring to show how the objectives and targets are met**
  - Ecosystem Approach
- **Management actions to be based on sound science**

# Challenges in providing sound scientific advice

- **High expectations and decreasing resources**
  - **Decreasing funding of the environmental administration**
  - **Monitoring activities not supported by EU funds**
  - **No paying customers**
- **High natural variability in marine environment**
  - **How to reach adequate sampling frequency?**
  - **How to provide information on current state?**
  - **How to foresee the future?**

# Automation and Operational Oceanography

## Sensors

Sensors to measure continuously and autonomously physical, chemical and biological parameters



- salinity, temperature
- turbidity, oxygen
- chlorophyll, nutrients
- p-H, alkalinity
- bathymetry
- primary production

## Platforms

Platforms or structures anchored on the seabed, floating in the water column or drifting at the sea surface, and remote sensing from satellites.



- buoys, floats
- gliders
- mooring
- AUVs, lander
- FerryBox
- cabled networks
- remote sensing
- living Argo

## Analysis

Sampling and consecutive laboratory analyses from research ships, or shore, including water, sediments and biota (phytoplankton, bacteria, zooplankton, fish)



- inorganic trace compounds
- gases, eg. CO<sub>2</sub>, CH<sub>4</sub>, DMS
- organic microcontaminants
- abundance & function of biota
- food web
- HABs

## Data transfer

Communication systems to transfer in real-time data from sensors to the network and to the land stations



- satcom
- GSM, GPRS
- fibre optics
- acoustics

## Data management

Data collection and management system for direct control of data quality, and data storage systems to enable data analysis and use for model applications



- data bases
- quality control
- data standards

## INFORMATION

Softwares and web based information tools to analyse data for trends, compliance to EU directives, to distribute and disseminate data to end users



- analysis
- Presentation
- web
- GIS

# High-level Objectives

## EU MSFD Descriptors

- **Biodiversity; Sea floor integrity; Food Webs**

- **Non-indigenous species**

- **Eutrophication**

- **Commercial fish**

- **Contaminant pollution effects; Contaminants in food**

- **Marine litter**

- **Energy (u/w noise);**

## HELCOM BSAP

- **Natural marine and coastal landscapes; Thriving and balanced communities of plants and animals; Natural oxygen levels; Natural distribution and occurrence of plants and animals**

- **No introductions of alien species from ships**

- **Concentrations of nutrients close to natural levels; Clear water; Natural level of algal blooms**

- **Viable populations of species**

- **Concentrations of hazardous substances close to natural levels; All fish safe to eat; Healthy wildlife; Radioactivity at pre-Chernobyl level.**

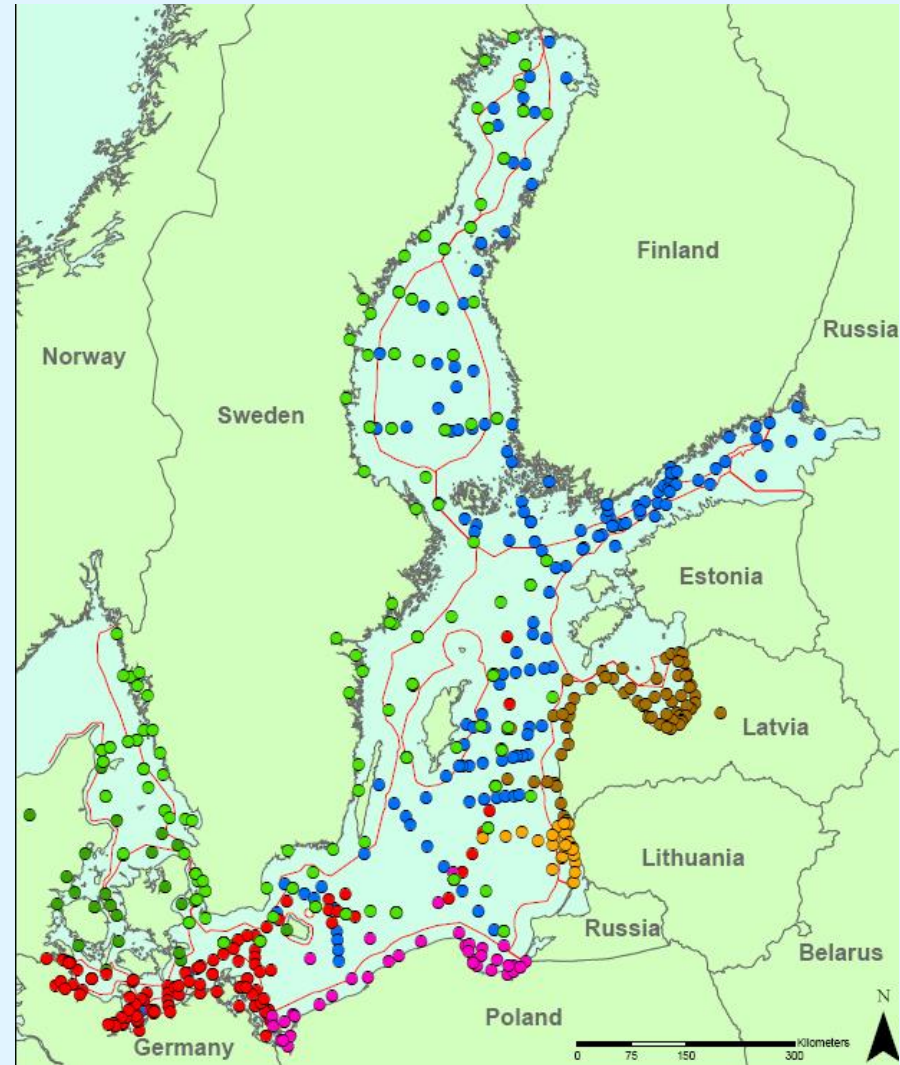
# Current activities in the Baltic Sea

- **Joint sampling programmes**
- **Satellite remote sensing**
- **Ship-of-opportunity transects**
- **Autonomous buoy systems**
- **CooperationCoordination**



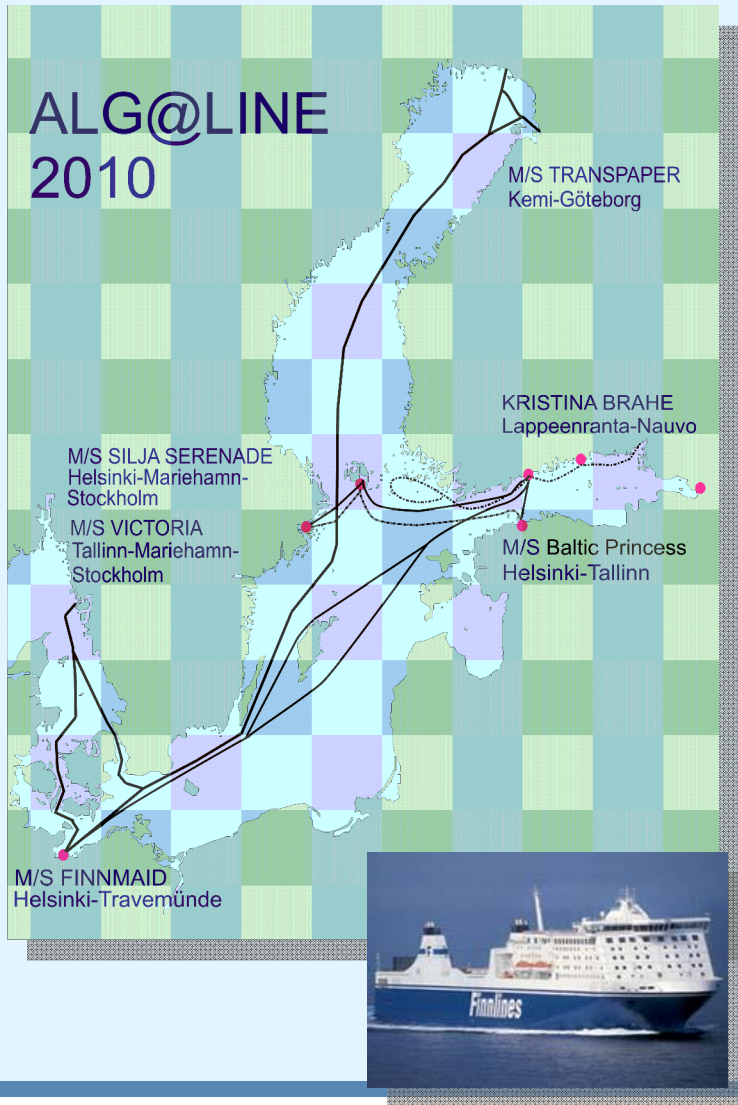
# COMBINE Programme

- **Mainly traditional sampling with research vessels**
- **Nationally “protected”**
- **Effects of the EU Directives**
  - **WFD concentrated monitoring to coastal waters**
  - **MSFD may limit monitoring within the national EEZ**





# Alg@line



## ■ Cooperation

- Finnish Institute of Marine Research
- Estonian Marine Institute
- Uusimaa Regional Environment Centre
- City of Helsinki Environment Centre
- SMHI
- IOW
- Shipping companies
- Luode Consulting

## ■ 2003-2005 : Ferrybox EU project

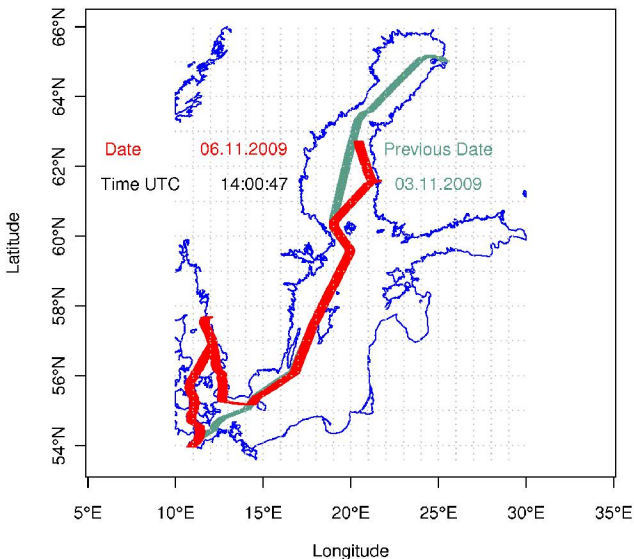
## ■ 2005- 2008: ESA/MarCoast baseline servic

# Near real-time observations on commercial ferries

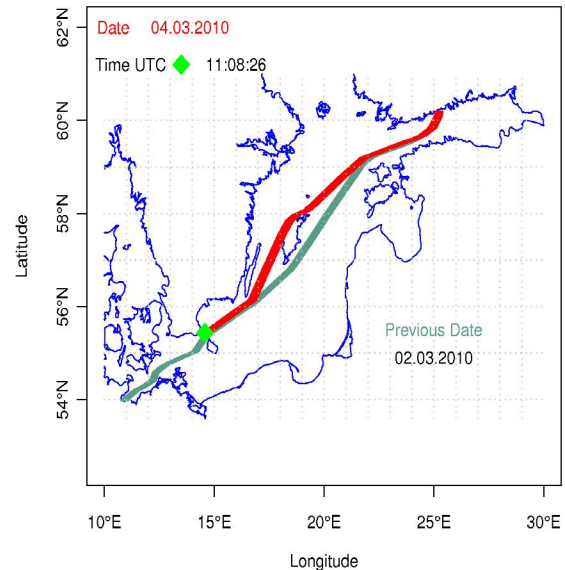
Time, location, from GPS  
Salinity  
Temperature  
Chlorophyll  
Phycocyanin  
Turbidity  
CO<sub>2</sub>  
Nutrients  
Plankton

Traspaper in cooperation with SMHI  
Finnmaid in cooperation with IOW  
Silja Serenade in cooperation with Uusimaan ELY Center and Helsinki Environment Center  
Buoy station with Luode Consulting

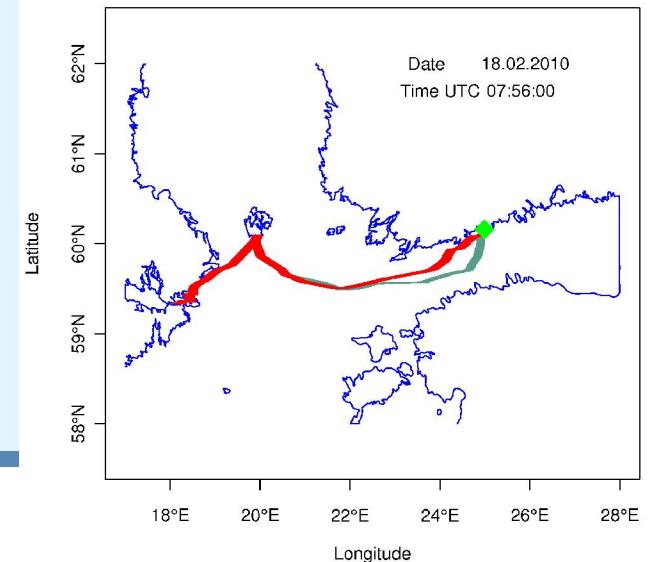
TRANSPAPER Ferry Route



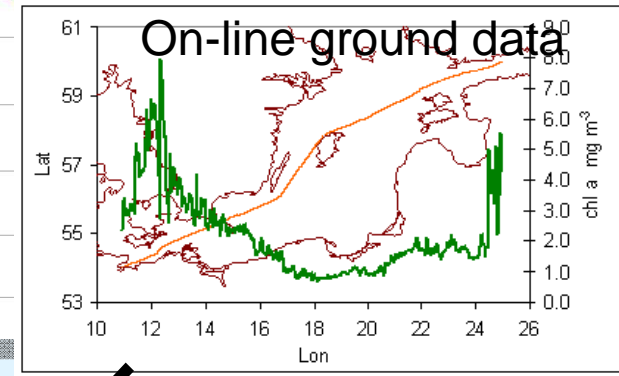
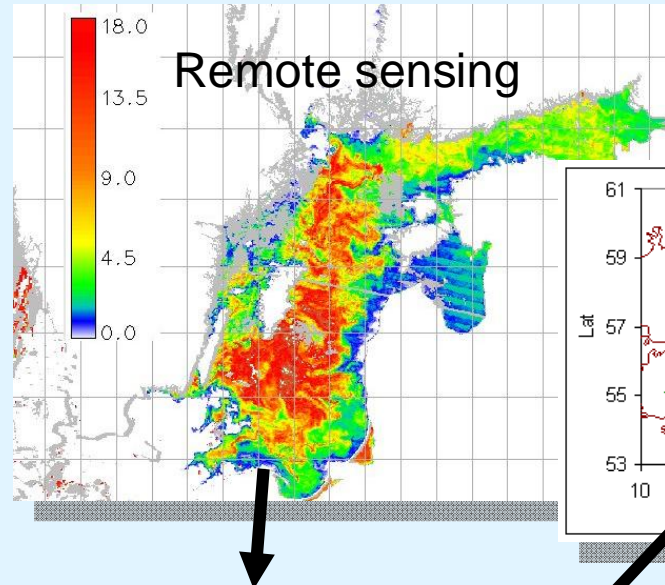
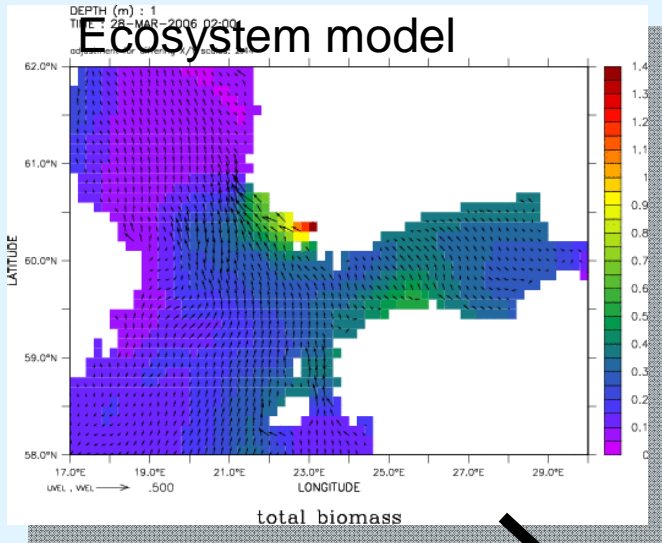
FINNMAID Ferry Route



Silja Serenade Ferry Route



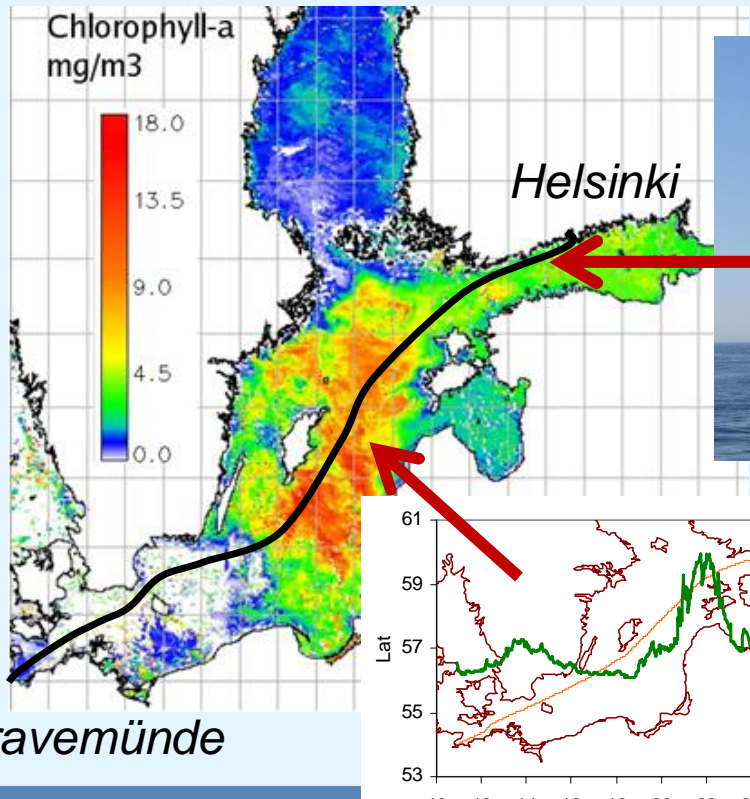
# ESA MARCOAST EXTENSION OF BALTIC WATER QUALITY AND ALGAL BLOOM B SERVICE



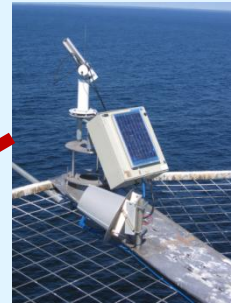
## NEW COMBINED WQ PRODUCT

- Optimal use of satellite images
- Continuous data coverage
- WQ and AB forecasts
- Input to assessments

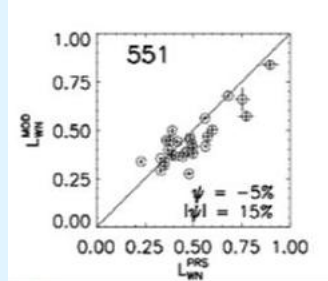
# Combination of different sources are used for Ocean Colour validation



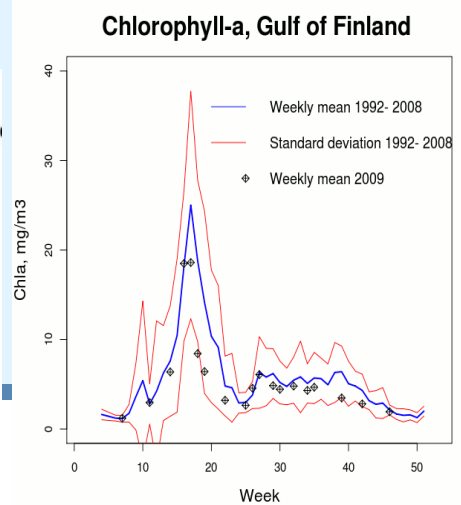
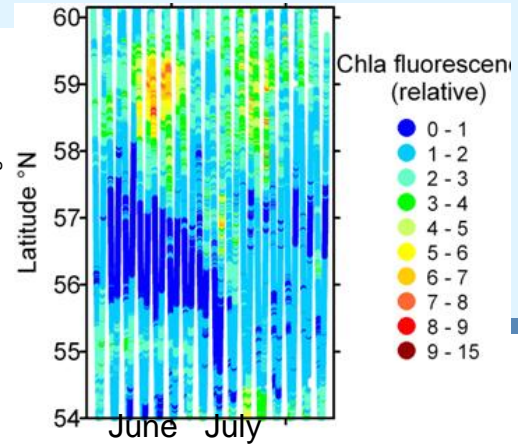
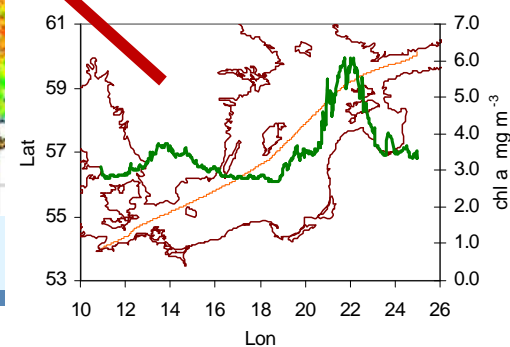
Helsinki Lighthouse



SeaPrism/Aeronet with EU-JRC

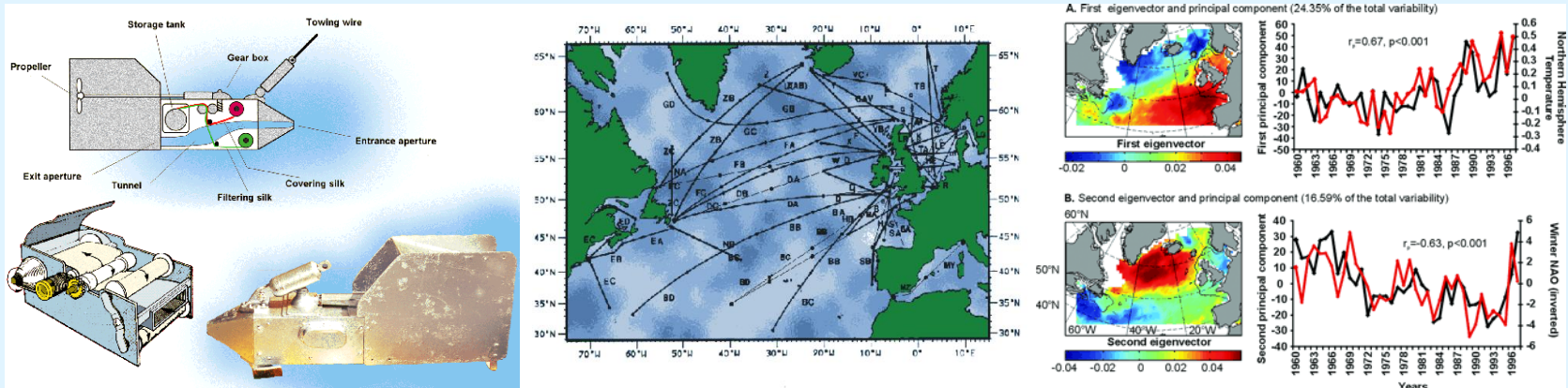


Algaline monitoring on FINNMAID biweekly

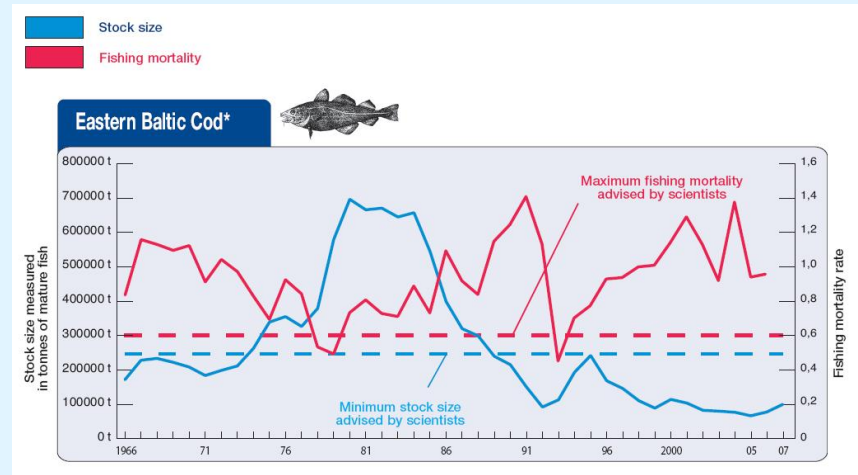


# Continuous Plankton Recorder, CPR

- Old but proven technology, marine environmental data successfully gathered and interpreted since 1920s

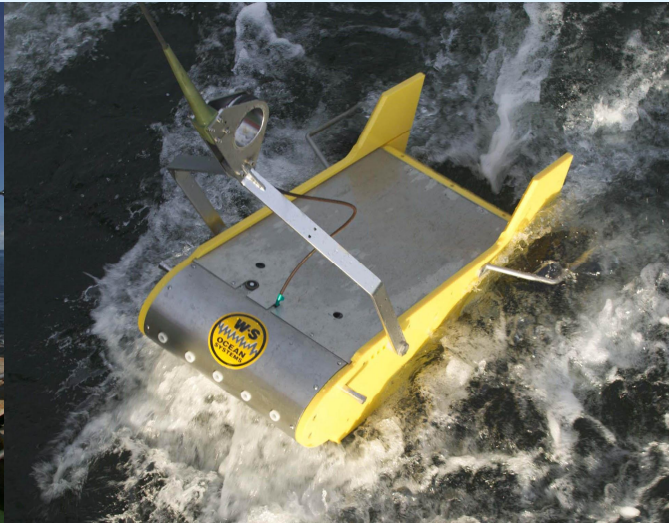


- Zooplankton is a good indicator of marine ecosystem health, especially in connection with fisheries



# Modernized versions of the old thing, multi-tasking towed vehicles

- Capable of variable depths, on-line & logged measurements of hydrography, nutrients, etc etc.
- Water and plankton samples
- Variable instrumentation payload according to needs
- Expensive, delicate, still need development before applicable as SOOP gear





myOcean

*in Situ* Tac

# International cooperation

- ICES
- HELCOM
- BOOS - EuroGOOS



International Council for the Exploration of the Sea - Conseil International pour l'Exploration de la Mer

**ICES**  
CIEM

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News from ICES Training Programme (24/03/10)  
Acknowledging the worldwide move towards ecosystem-based management of marine resources, a training course on "Using Ecosystem Modelling for Fisheries Management" was conducted at ICES HQ in Copenhagen 8-12 March 2010. [Click to read more](#)

ICES Awards - Call for nominations (14/03/10)  
The ICES Awards Committee is inviting nominations for the 2010 Outstanding Achievement Award. Candidates can also be nominated for the Prix d'Excellence Award, but please note that this award is not expected to be presented until 2011. The awards and the nomination procedures are fully described at the [ICES Awards website](#).

**NEW** Read more

**ICES Groupnet**  
Click [here](#) to go to ICES SharePoint site for Expert Groups and meetings. (Login and password required).

Have you forgotten your GroupNet password? Click [here](#) to get a new one.

**ICES Science & Advice**

The next SSC will be held in Nantes, France from 20-24 September 2010. Deadline for submission of abstracts is Thursday 15 April.

Read about the Symposium on "Climate Change Effects on Fish and Fisheries: Forecasting Impacts, Assessing Ecosystem Responses, and Evaluating Management Strategies" to be held in Sendai, Japan, from 26-29 April 2010.

ICES Training Programme: stay updated on the coming courses [here](#).

**NEW** - ICES 2010 meeting calendar is now available [here](#).

Problems with Internet Explorer 8.0? - click [here](#)

**Hot articles and publications**

**ICES Insights**  
ICES Insights #6, September

**ICES E-newsletter**  
New Issue

**Helsinki Commission**  
Baltic Marine Environment Protection Commission

Front page  
Vacancies  
The Helsinki Commission  
Historical Declarations  
Recommendations  
Baltic Sea Action Plan  
Groups  
Publications  
Press office  
Headings and Documents  
News and press releases  
Indicator Park Sheets  
Shipping  
The marine environment  
Data and maps

**ICES**  
Statement by HELCOM Executive Secretary at the annual Meeting HELCOM to discuss preparations for the Moscow Ministerial Meeting and the Baltic Sea Summit  
Opening statement by HELCOM Chairman at the 5th Stakeholder Conference on the Baltic Sea Action Plan  
HELCOM conference identifies topics for new projects to restore the Baltic Sea

**ICES**  
Baltic News  
Environmental risks identified in Copenhagen (ENIG)  
Growing anxiety as end of UK climate talks near (ENIG)  
Europe ready on accounting rules in climate deal (ENIG)  
Europe agrees 12-point "Top level climate deal" (ENIG)

**ICES**  
HELCOM hopes this website will provide inspiration for anyone wishing to get the message into the environmental issues affecting the Baltic Sea - and for everyone interested in protecting our common sea.

HELCOM uses Swedish Baltic Sea Water Award

HELCOM Moscow Ministerial Meeting, 18-20 May 2010

HELCOM Baltic Climate Summit Moscow, Russia, 18 May 2010

www.helcom2010.eu

**BOOS**  
Baltic Operational Oceanographic System

describes the actual, integrates the data, and classifies the state of the Baltic Sea

**NEWS**

28.02.10 1121  
Workshop on Coastal Radar for Oceanographic Applications - Gdansk/Berlin  
ICEDU has been requested by the Finnish Environmental Protection Agency to organize a workshop on...  
[read]

16.03.10 0951  
Phytoplankton Trends in the Baltic Sea  
PPT Presentation authors: N. Wisniewski, J. Tanski, L. Vassiljeva, A. Kozberg  
[read]

08.03.10 1620  
12.4.2010 Workshop Helsinki  
BONUS ERIC, Finnish Funding Agency for Technology and Innovation (TEKES) and

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are to:

- Improve the safety and efficiency of maritime transport and marine operations.
- Enable the sustainable exploitation and management of Baltic Sea resources (fisheries).
- Support safe and efficient offshore energy activities.
- Mitigate the effects of environmental hazards and pollution crisis.
- Contribute to ocean climate variability studies and seasonal climate prediction.
- Federate the resources and expertise of diverse institutes, agencies, and companies in the public and private sector.



# Future challenges

- **Resources**
- **Co-ordination: HELCOM - ICES - BOOS**
- **Co-operation: local – sub-regional - Baltic Sea - European**
- **Co-working: private – public**
- **New thinking**
  - **Novel technologies in operation**
  - **Open data policy and exchange**
  - **Open data format**
  - **Open firewalls!**

