



FerryBox: the solution for Dutch North Sea monitoring?

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In the Netherlands it is recognized that the use of high rate autonomous data such as from a FerryBox may be a major contribution to the increase of knowledge of the marine ecosystem. The FerryBox system aboard the Rijkswaterstaat survey ship Zirfaea is a very suitable platform for instrument testing and its use is strongly advocated.

Nevertheless, the main interest of Rijkswaterstaat with respect to FerryBox developments is to effectively and cost efficiently assess the geo-chemo-physical status of the North Sea by replacing (part of) the traditional low rate ship borne measurements on predefined discrete locations by high rate autonomous measurements along selected transects or at fixed positions (poles and/or buoys). With this poster we wish to communicate the challenges which we think we are still facing on different levels before reaching that situation.

Information Need:

- Water Framework Directive (WFD)
- Marine Strategy Framework Directive (MSFD)
- OSPAR

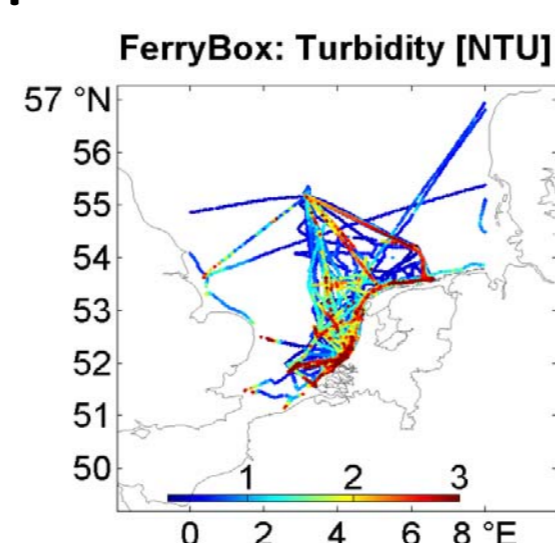


- Eutrophication Policy
- Natura 2000
- System Knowledge
- Modelling and Advise

Parameter need (criteria from ICES 2010):

Necessary:

- Water temperature
- Salinity
- DIP (phosphate)
- DIN (nitrate, nitrite, ammonium)
- Chlorophyll-a (\cong fluorescence)
- Oxygen (at several depths)
- Phaeocystis (number of phytoplankton cells)



Two out of:

- Total Alkalinity
- Total Dissolved Inorganic Carbon (DIC)
- pH
- pCO₂
- Total Nitrogen
- Total Phosphate
- Silicate
- Conductivity
- Turbidity

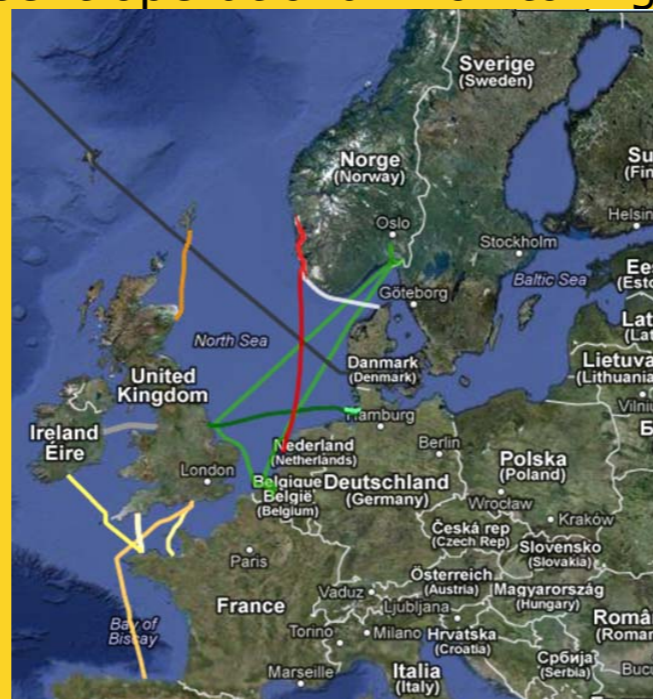
Challenges..... Challenges..... Challenges..... Challenges..... Challenges.....

Monitoring:

- How to use Ferrybox data in monitoring programmes & assessments
- Innovation of the strategy for bio-geo-chemical monitoring with:
 - o Cost efficient replacement of the actual monitoring programme by e.g.
 - o Remote sensing information
 - o Modelling information
 - o Autonomous measurements e.g. by FerryBoxes
 - o data from buoys or poles
- Giving account to legal obligations such as assessments for MSFD, OSPAR, ..
- International coordination and harmonization
- Cooperation with other countries around the North Sea



present operational monitoring



future inclusion of ferryboxdata?

Parameters:

- Robust and reliable measurement of all relevant parameters, including:
 - nutrients*
 - phytoplankton,*
 - algae species composition*
 - preferably also chemical substances*
- How can data management and data exchange be organised and optimised?
- Quality Assurance and Quality Control
- Intercomparability of data & information

Measurement system:

- Optimization of sea water inlet system (inlet orifice, pipes, pumps, valves, filters, flow rate management, etc.)
- Measurement instruments have to meet the required ranges and accuracies
- Measurements and samples have to reliably represent the properties of the water taken outside the ship
- Autonomous use on ships:
 - o no need for highly qualified personnel during surveys
 - o one week of unattended operation is possible
- Addition of a good quality auto sampler

