Proposal for a Common European FerryBox Database

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Susanne Reinke
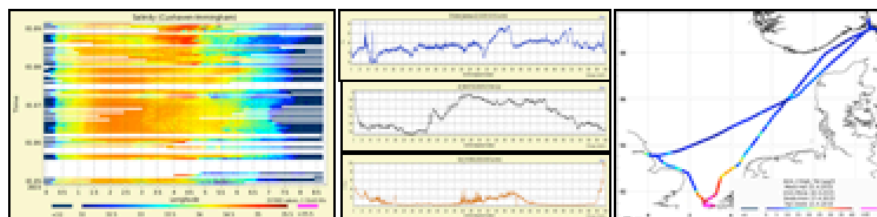7th FerryBox Workshop
Heraklion 7th April 2016

Database for FerryBoxes on fixed routes

- In MyOcean/CMEMS FerryBox data are provided as daily or monthly files which are not suitable because the data are not transect oriented.
- The conversion of daily or monthly files into transects showed a lot of problems.
- HZG developed a relational database with a corresponding data model for transect oriented data.
- The data model consists of:
  - Fixed routes (e.g. Cuxhaven-Immingham)
  - Every route has 2 or more sections (e.g. Cuxhaven-Immingham and Immingham-Cuxhaven)
  - Every transect on a section has an ID.
  - All data are stored within one table together with the transect ID.
- Such a data model should be the base of the European FerryBox database as proposed by the European FerryBox Task Team.
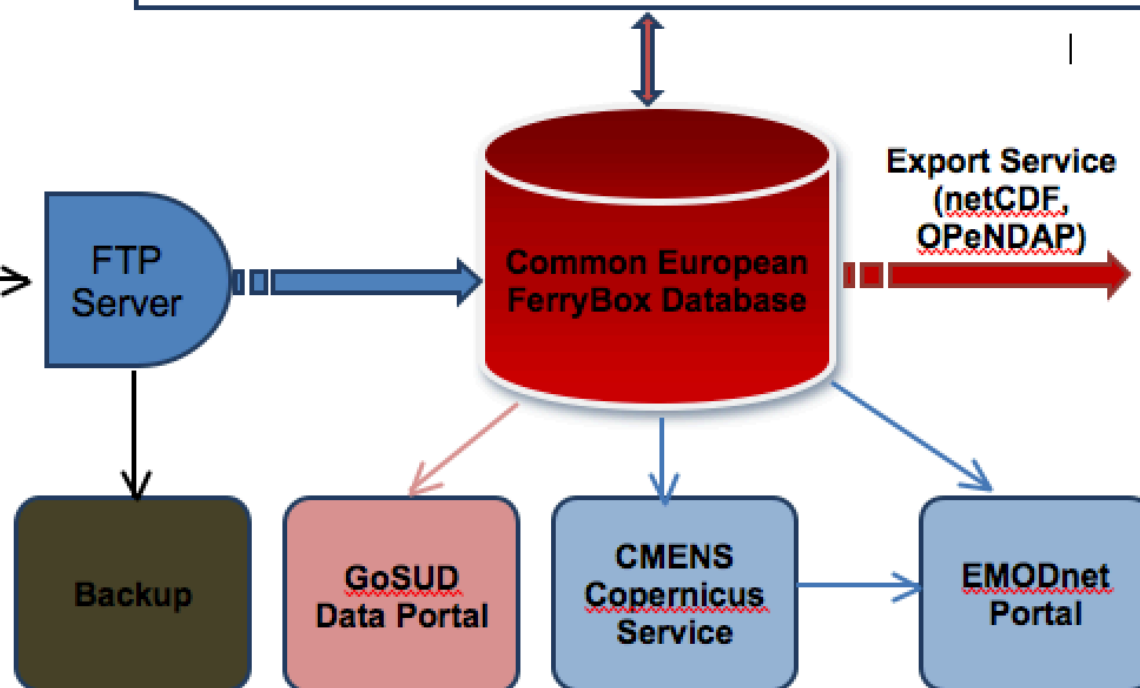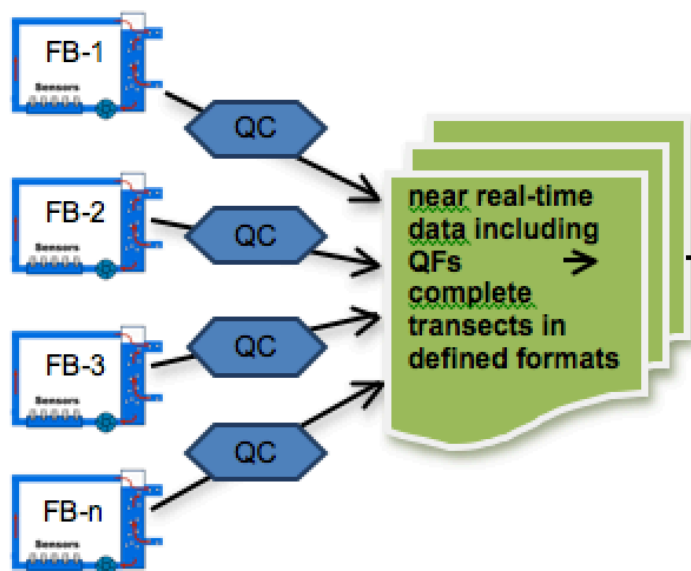
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Proposed Scheme for a Common European FerryBox Data Management

European FerryBox Data Portal

- free choose to set a parameter as public or private
- all web based tools are also available for private parameters (e.g. for sensor development, testing etc.)

From Operator/Institute or via ROOSs

FB-1

FB-2

FB-3

FB-n

QC

near real-time data including QFs complete transects in defined formats

FTP Server

Common European FerryBox Database

Export Service (netCDF, OPeNDAP)

Backup

GoSUD Data Portal

CMENS Copernicus Service

EMODnet Portal

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Upload of data

- Data upload should be performed at the end of every transect. It could be done directly by the operator or via ROOS's.

- Later, a real-time upload during transects will be made possible.

- Data providers are responsible for near real-time mode quality control.

- All data providers should agree to a small number of data formats with preference for the existing HZG format (ASCII text files).

- Each data provider will have a specific account just for his own data and has the rights to correct data, delete data, or switch between public or private visibility (e.g. for testing new sensors etc.)

- Subsets of these data can be automatically provided for the different ROOS's for fulfilling their duties within CMENS (Copernicus marine environment monitoring service)

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Possible Export of Data

- Direct export from the database is offered as:
  - ASCII export
  - ASCII export as cdl (netCDF language as input for ncgen)
  - netCDF binary export (output of ncgen)
- SOS Sensor Observation Service GetObservation
- Automatic netCDF export to OPeNDAP accessible files
- In work: SOS V2 access together with 52North

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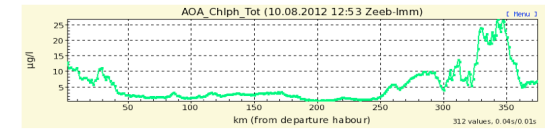**European FerryBox Data Portal** (ferrybox.org)

web-based tools for:
- **visualisation**
- **export**
- **manual QA**
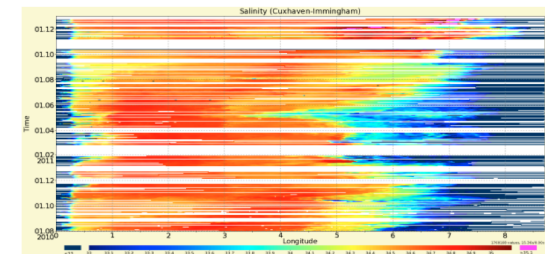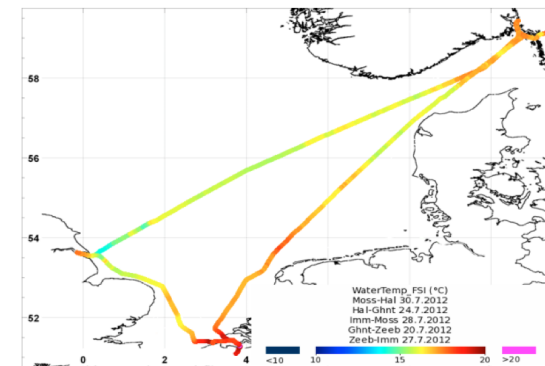 (delayed mode, password protected for operators)

Common European FerryBox Database
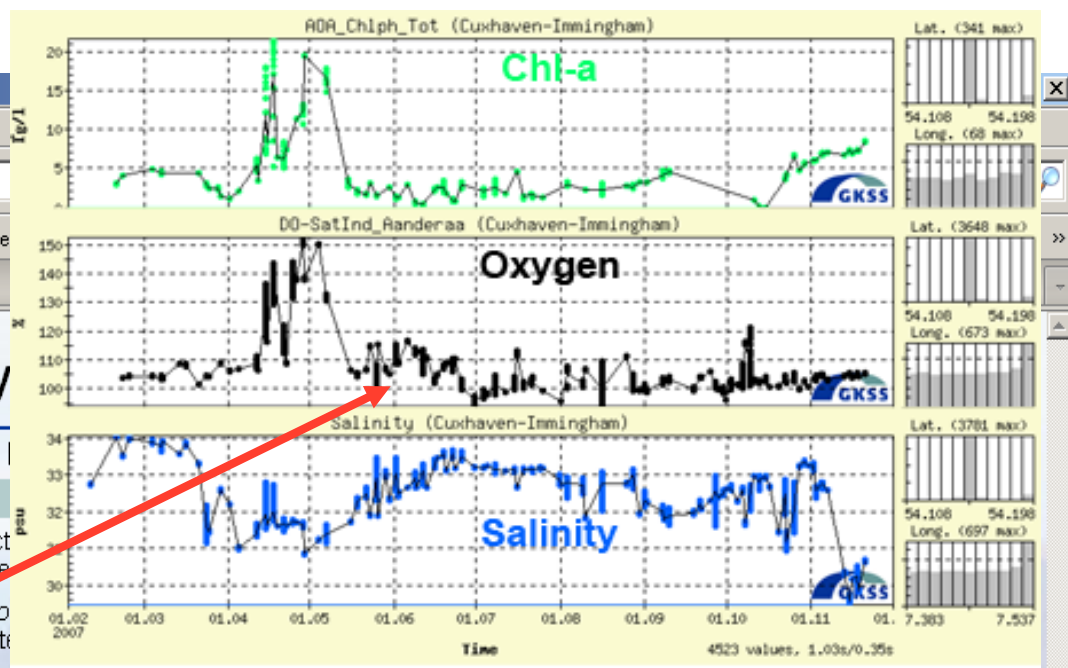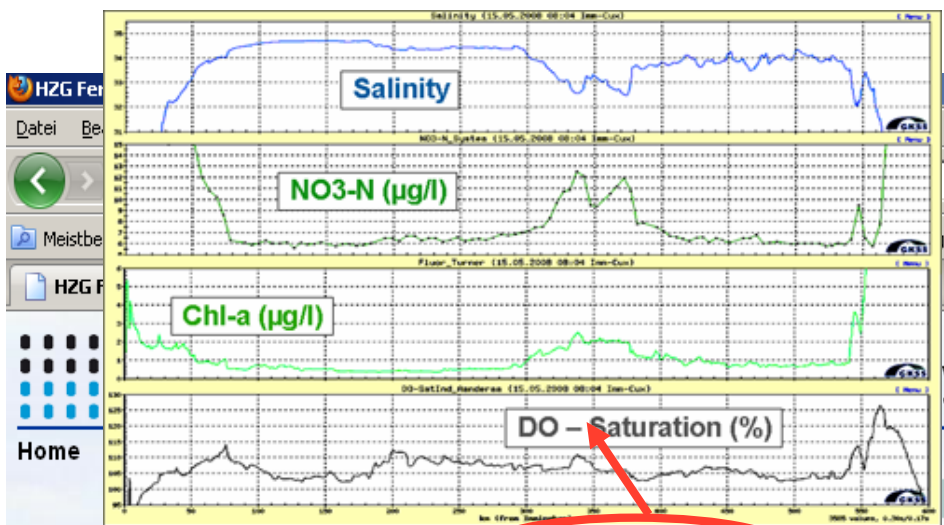
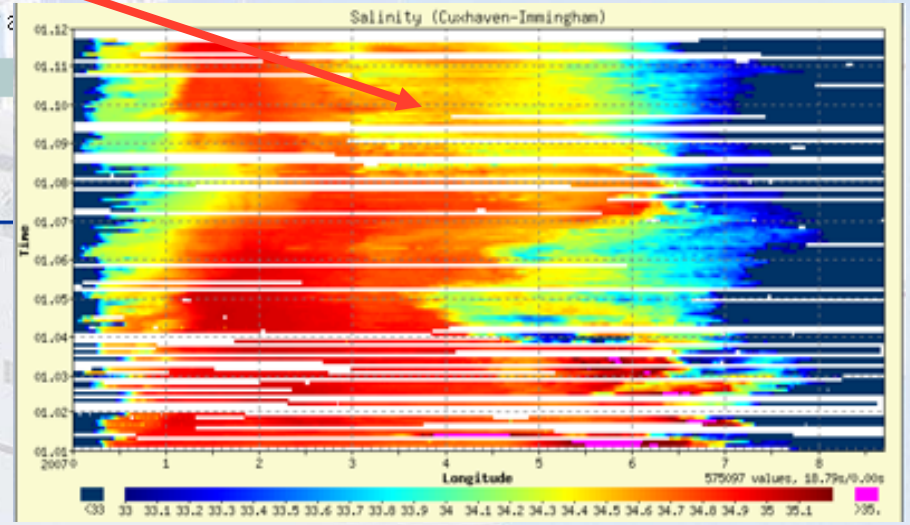## Visualisation Examples:

Transect Plot:

Scatter Plot:

Map Plot:

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Salinity (15.05.2008 08:04 Imm-Cux)

Salinity

NO3-N_System (15.05.2008 08:04 Imm-Cux)

NO3-N (µg/l)

Fluor_Turner (15.05.2008 08:04 Imm-Cux)

Chl-a (µg/l)

DO-SatInd_Aanderaa (15.05.2008 08:04 Imm-Cux)

DO – Saturation (%)

AOA_Chlph_Tot (Cuxhaven-Immingham)

Chl-a

DO-SatInd_Aanderaa (Cuxhaven-Immingham)

Oxygen

Salinity (Cuxhaven-Immingham)

Salinity
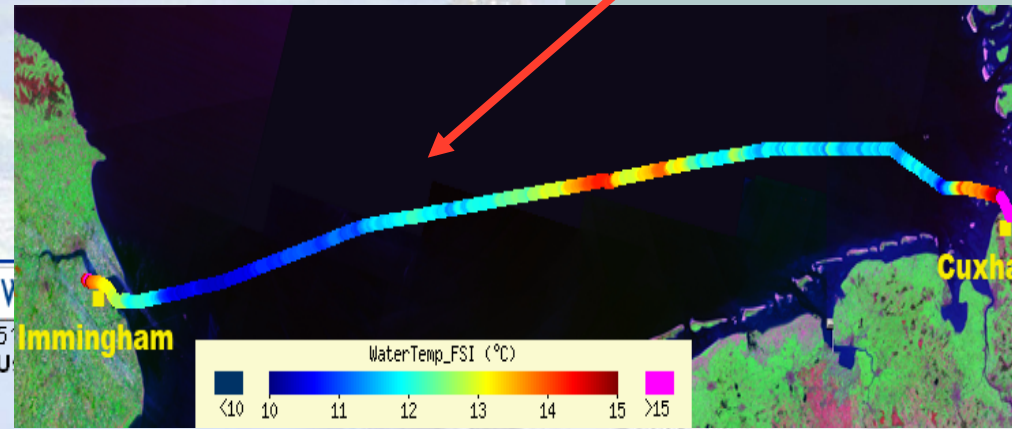
Transect Plot I   Plot of *one* select variables/parame

Transect Plot II   Plot of *one* or mo variable/paramete

Time-Series Plot   Plot at a selected position of the route: *One or more* variables/parameters vs. time

Scatter Plot   Scatter Plot

Map Plot   Map Plot

WaterTemp_FSI (°C)

<10   10   11   12   13   14   15   >15

Immingham   Cuxha
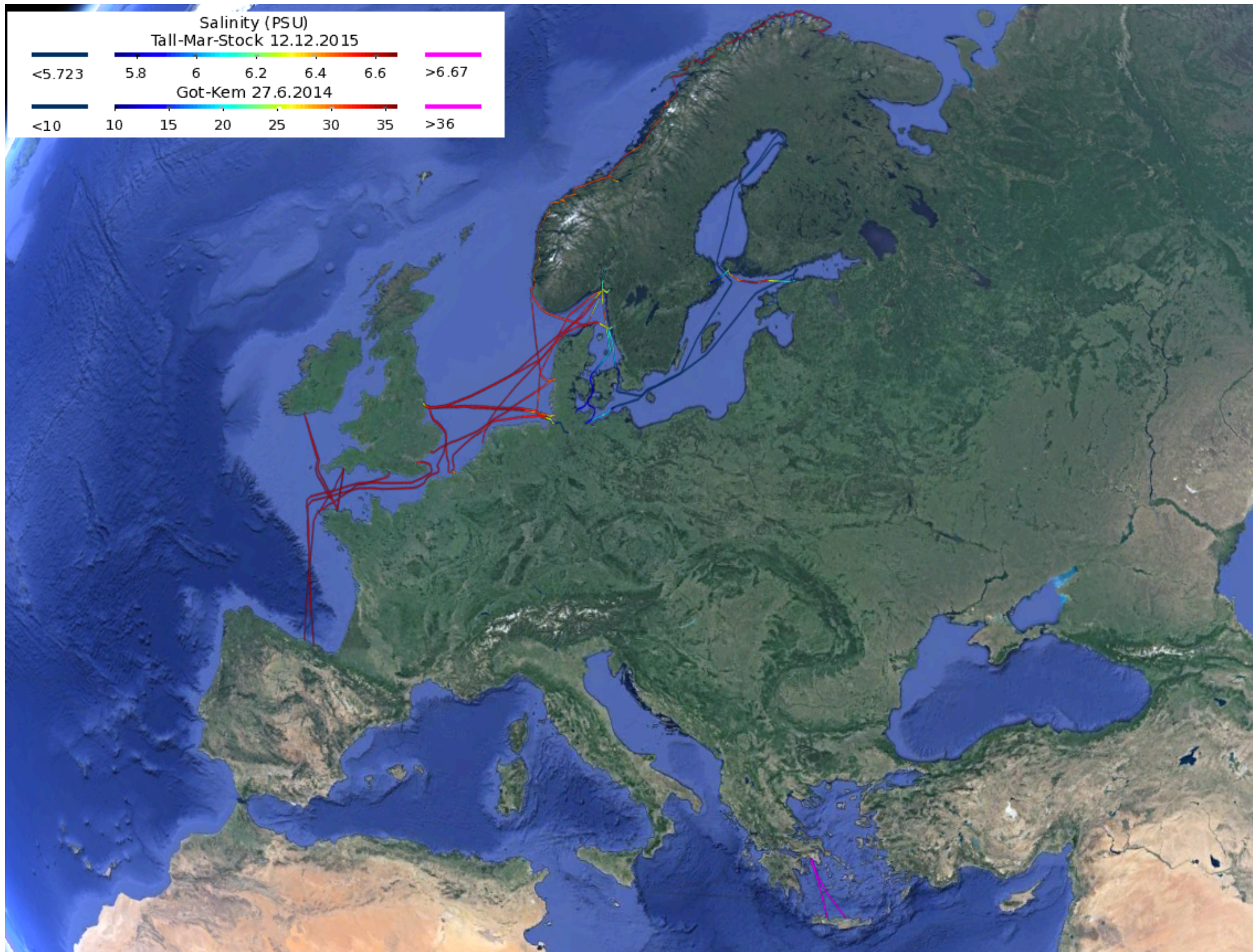
Salinity (Cuxhaven-Immingham)

Testing the import of transect data of other operators in the HZG FerryBox database

- IMR Bergen-Kirkenes (2015-10 last)

- EMI Tallinn-Stockholm (2015-12 last)

- CNRS/INSU Roscoff-Plymouth (2014-07 last)

- SYKE Helsinki-Travemünde (2016-02 last)

- HCMR Peraues-Souda (2014-09 last)

- Importing tasks:
  - Include new header
  - Time synchronisation
  - Sorting by time

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Import of non-transect oriented data

- The conversion of FerryBox netcdf-timed files to transect files needs about 450 lines of code.

- Exception catching took about 1400 lines of code (duplicate values, GPS errors, ...)

- Still problems to handle situations when FB starts later and stops earlier. Then it is difficult to find start and destination harbour.

- Sometimes the FerryBox system stops measuring offshore. Afterwards there is a data gap (e.g. 20 h). Then a new start from offshore happens.

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Salinity (PSU)
Tall-Mar-Stock 12.12.2015

| <5.723 | 5.8 | 6 | 6.2 | 6.4 | 6.6 | >6.67 |

Got-Kem 27.6.2014

| <10 | 10 | 15 | 20 | 25 | 30 | 35 | >36 |

Additional tools

- FerryBox data could be integrated into CODM – the COSYNA data portal.
- This integration needs an expanded set of metadata with additional sensor information and responsible people.
- By this integration a comprehensive access to very different observations of the same parameter is provided (Chl-a from Satellite and FerryBox …).
- Data provider are mentioned not only within the metadata but also in the names of the platforms and the data.
- This additional tools offer numerical data access based on SOS (Sensor Observation Service), data plots, maps based on WMS (Web Map Service) and time-series.

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COSYNA data web portal CODM

Usage hint: 1. Select Parameter, Time and Area. 2. Select all datasets. 3. Create map, Create plots or Download

[Feedback](#)

Parameter category:
Basic Parameters ▲▼

Parameter:
salinity ▲▼

Water depth:
All water depths ▲▼

From: **15.01.2010**
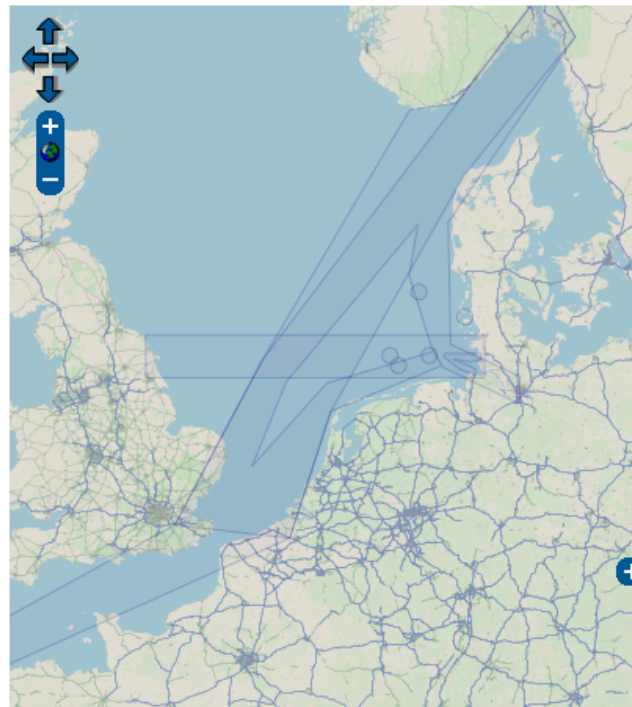(dd.mm.yyyy)

To: **15.06.2010**
(dd.mm.yyyy)

Use CTRL+Pg up/Pg down and Pg up/Pg down
to switch between years and months.

☑ Remote sensing data
☑ Insitu data
☑ Model data

COSYNA Data Use

1. COSYNA Homepage
2. COSYNA Product: Currents (Maps)
3. COSYNA Product: Currents (Downloads)
4. COSYNA Product: Currents (Online Validation)
5. COSYNA Glider Campaigns in Google Earth
6. COSYNA Glider Live Data
7. COSYNA TSDATA, time series at fixed positions
8. COSYNA FERRYDATA, database for Ferryboxes on ships (permnanent routes)
9. COSYNA SURVEYDATA, database for underway data on surveys
10. Imprint/Disclaimer
11. Data disclaimer

Modify size: **−** **+**
Click and drag for panning.
<SHIFT>-click and drag for zooming.

7.46045, 56.52038

1. ?? OpenStreetMap and partners, License: CC BY-SA.
2. ImportXml script(s) provided for free by http://www.howtocreate.co.uk.

Select all datasets

List datasets   Number of datasets per platform: **20** ▲▼

According to your search criteria, 10 platform(s) were found in this area.

Num datasets (total / selected)

▶ Ferrybox on FunnyGirl (to Helgoland)   (141 / 141)

▶ Ferrybox on Lysbris (Germany-England-Norway)   (25 / 25)

▶ Ferrybox on Lysbris (Norw-Holl_Belg-Engl)   (19 / 19)

▶ Ferrybox on RV Polarstern provided by AWI and HZG   (2 / 2)

▶ Ferrybox on TorDania (Cuxhaven-Immingham)   (40 / 40)

▶ MARNET Data from Platform FINO1 provided by BSH (Meteorology: DWD)   (2 / 2)

▶ MARNET Data from Platform FINO3 provided by BSH   No datasets available!

▶ MARNET Lightship "German Bight" provided by BSH (Meteorology: DWD)   No data available!

▶ MARNET LightshipTWEms provided by BSH (Meteorology: DWD)   (2 / 2)

▶ Pile Hoernum1   (1 / 1)

For selected data sources:

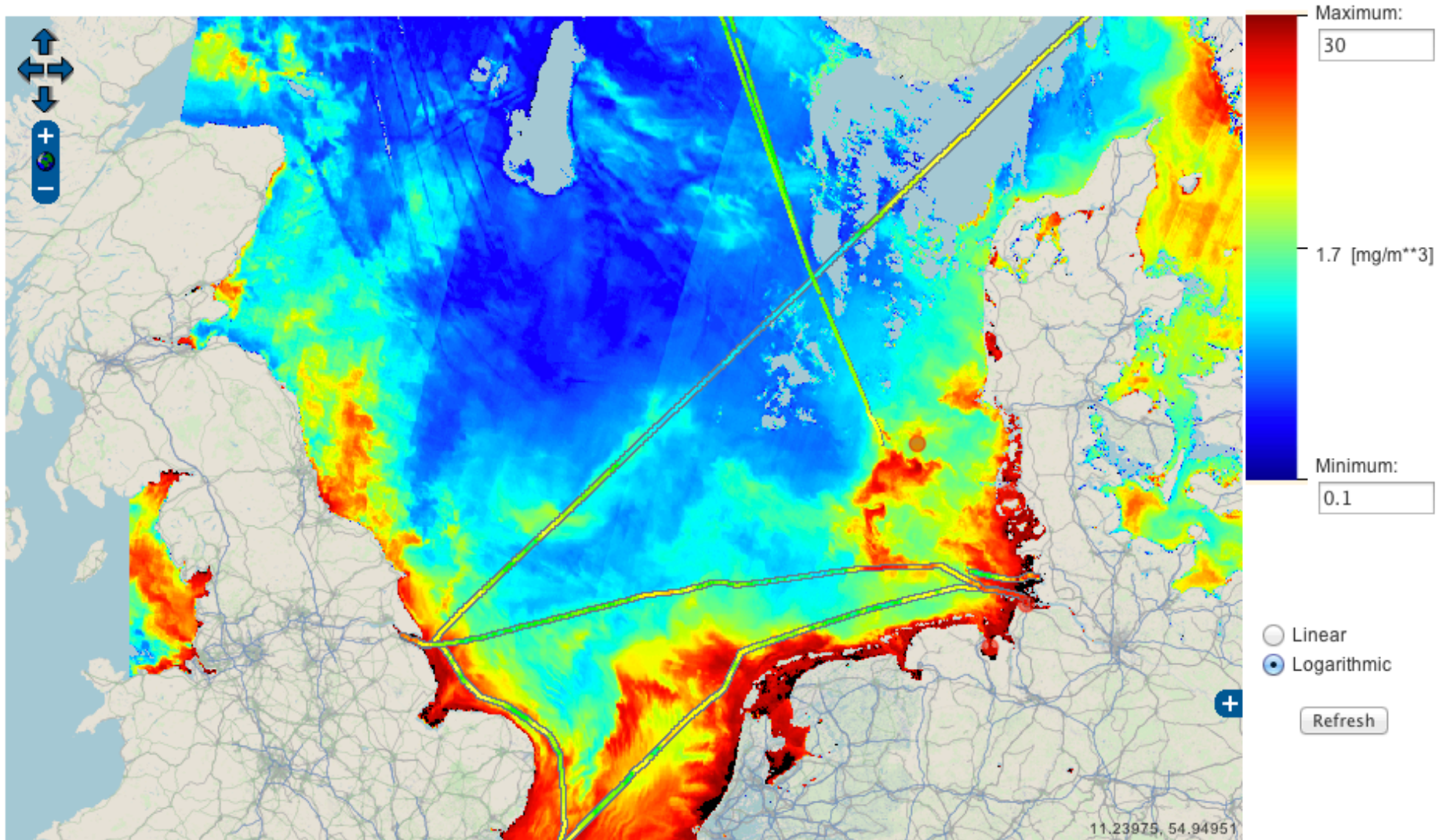**Create map**   **Create plots**   **Downloads**

Maps for chlorophyll-a [mg/m**3]

Date range: 13.09.2010 - 13.10.2011

Modify size: — + Click and drag for panning. <SHIFT>-click and drag for zooming.

Maximum:

30

1.7 [mg/m**3]

Minimum:

0.1

11.23975, 54.94951

○ Linear
● Logarithmic

Refresh

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Conclusion

- The EuroGOOS FerryBox Task Team proposes a European FerryBox database and data portal.
- The European FerryBox database can act as:
  - Central FerryBox data provider
  - Showcase for FerryBox activities in Europe
  - Visualisation tool of all available FerryBox data
  - Control instrument for FerryBox operators
  - Interface to EMODnet and others.
- HZG could operate this database as a contractor because infrastructure is long time tested and already available.

Thank you