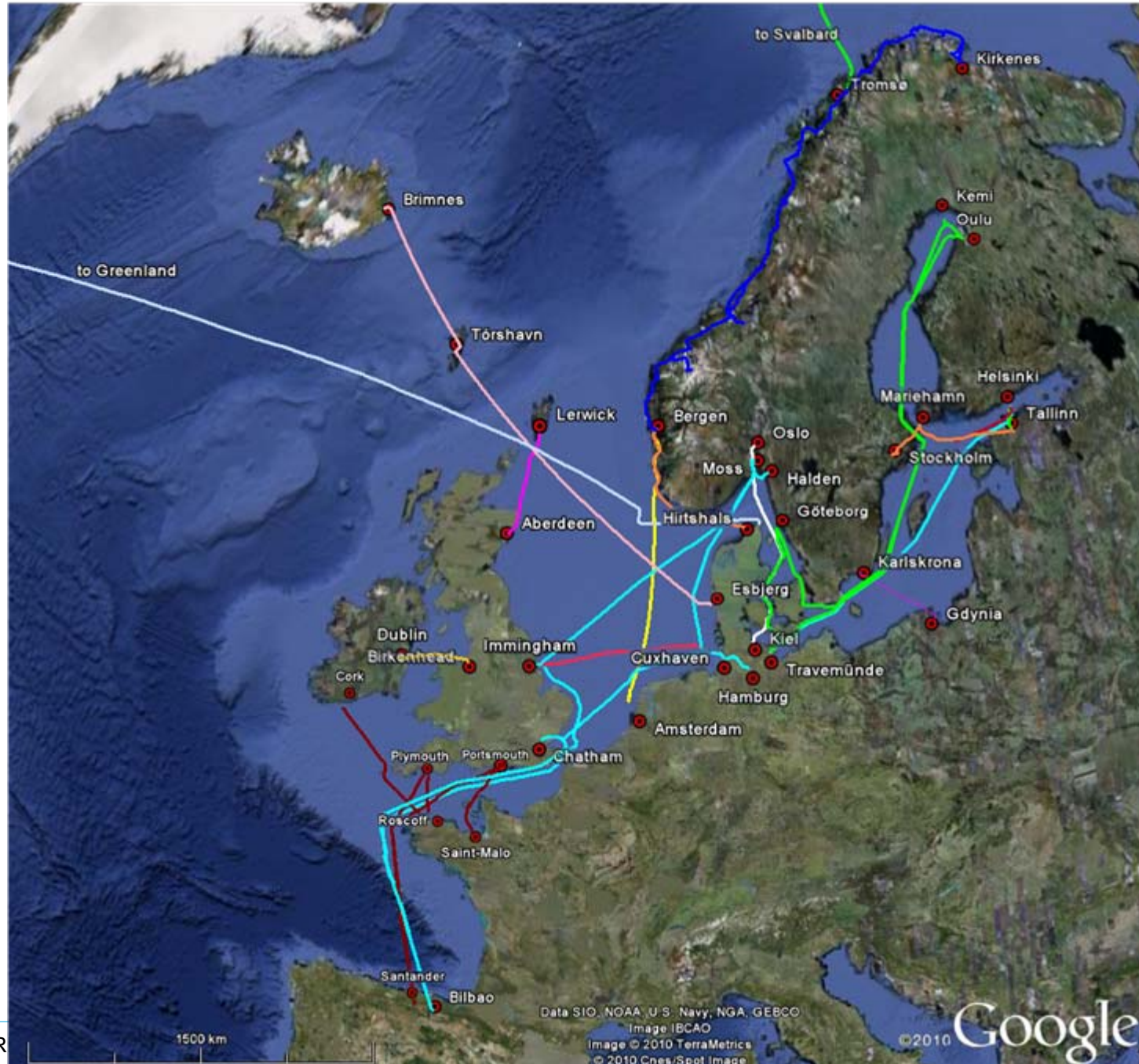


FB Routes in Europe (Aug 2011)

Institutions:

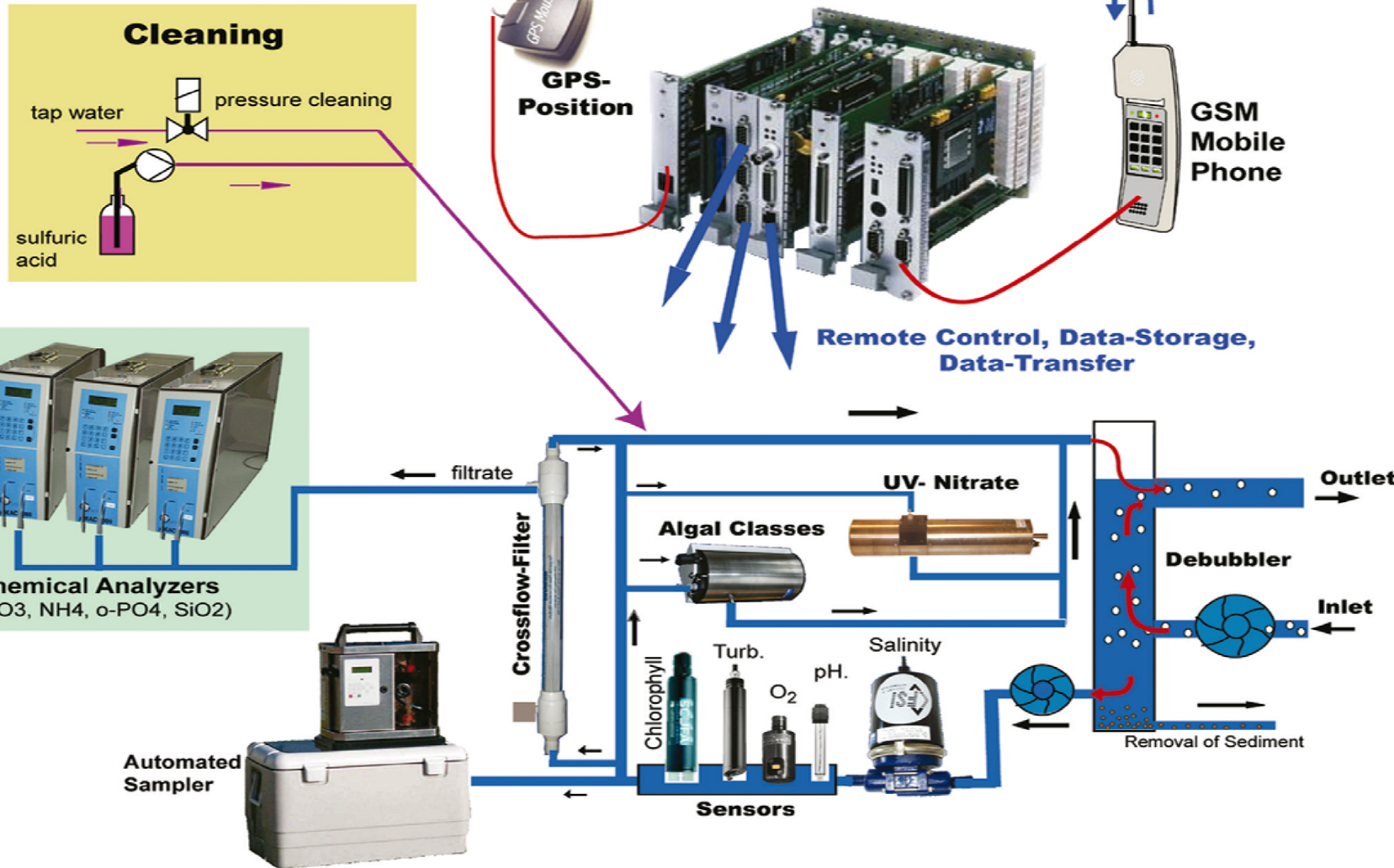
- BCCR (NO)
- CNRS/INSU (FR)
- HZG (DE)
- IFREMER (FR)
- GSO (US)
- IMWM (PL)
- LOMI (EE)
- Marlab (UK)
- NIVA (NO)
- NOC (UK)
- SMHI (SE)
- SYKE (FI)
- TTU (EE)



Overview FerryBox at HZG

Wilhelm Petersen (wilhelm.petersen@hzg.de)

FerryBox Flow-Through System



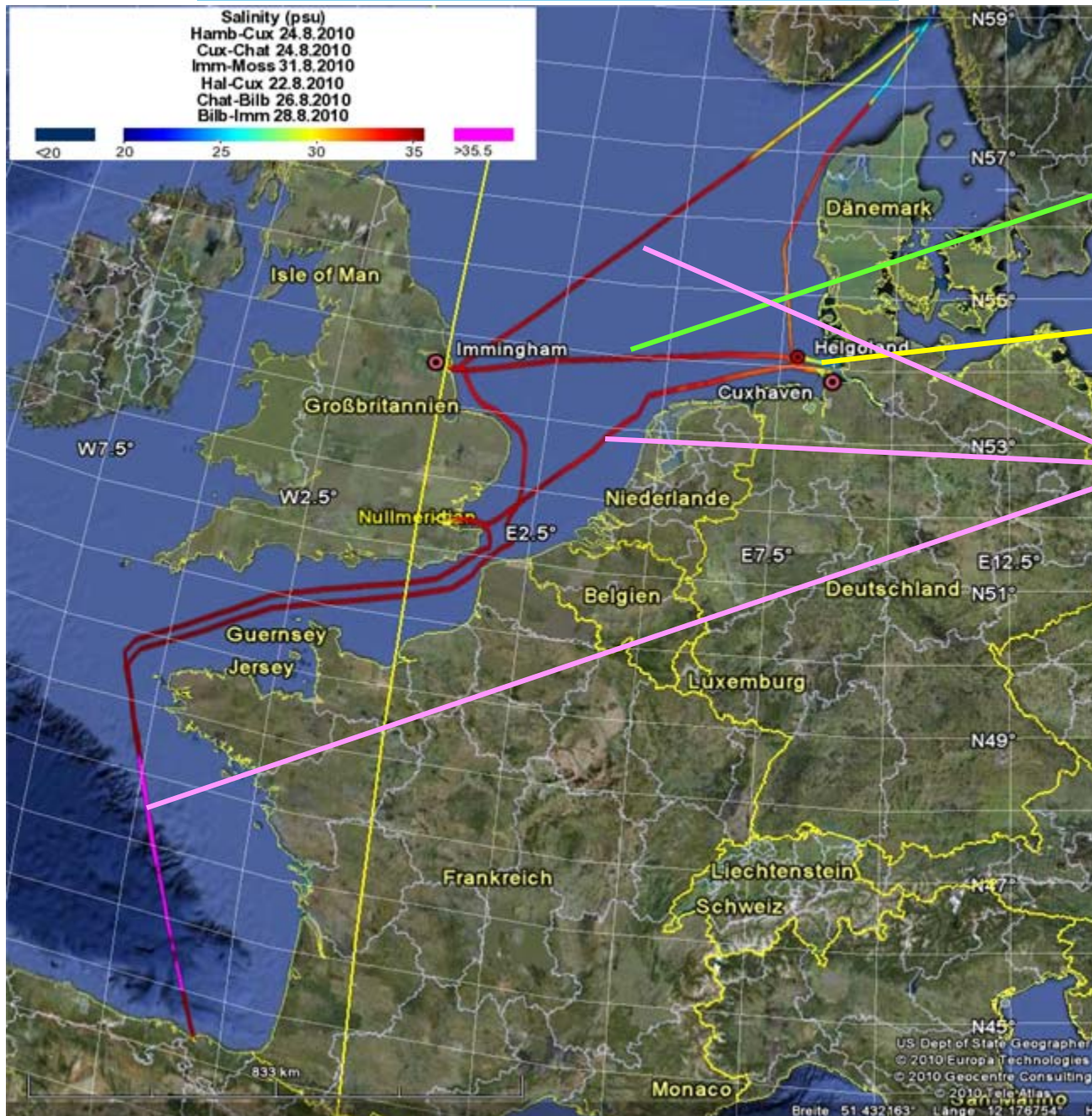
Measured Variables

- temperature
- salinity
- turbidity
- chlorophyll
- oxygen,
- pH
- algal groups
- nutrients

Main Features:

- running autonomously
- controlled by GPS position
- self cleaning (after each cruise)
- + automatic water sampler for further lab analysis

FerryBox Lines currently operated by Helmholtz Zentrum Geesthacht (HZG)



FerryBox Routes (HZG)

- **TorDania (RoRo ship)**
Immingham (UK) <-> Cuxhaven (DE)
~ 6 transects/week
- 2. **FunnyGirl (passenger ferry)**
Helgoland (DE) <-> Büsum (DE)
~ 2 transects/day
- 3. **LysBris (cargo ship)**
Halden (NO) → Cuxhaven (DE) → Chatham (UK) →
Bilbao (ES) → Immingham (UK) → Moss (NO)
~ fortnightly

Stationary FerryBoxes operated by HZG

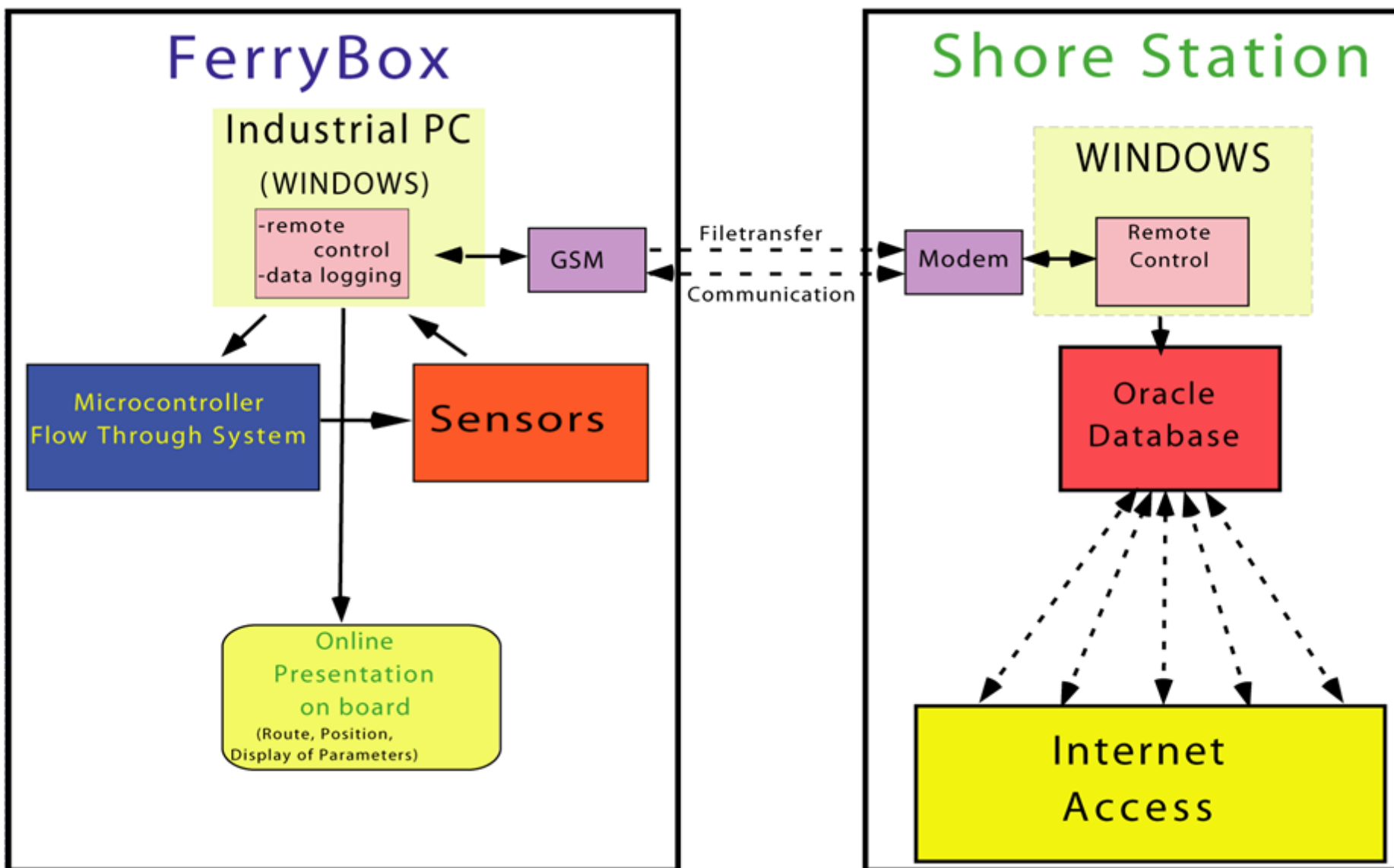


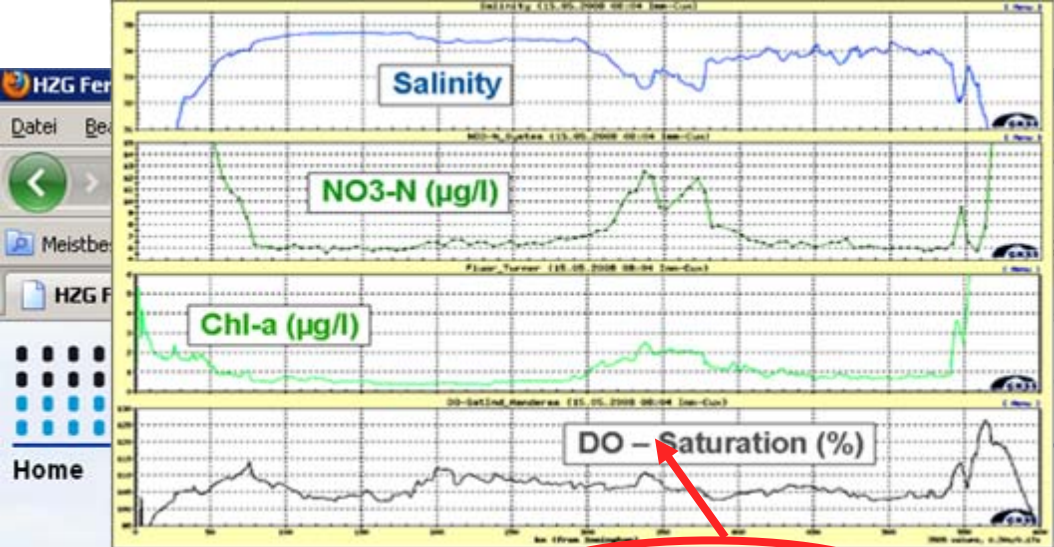
FB-Station
at FINO 3
Installation:
July 2011



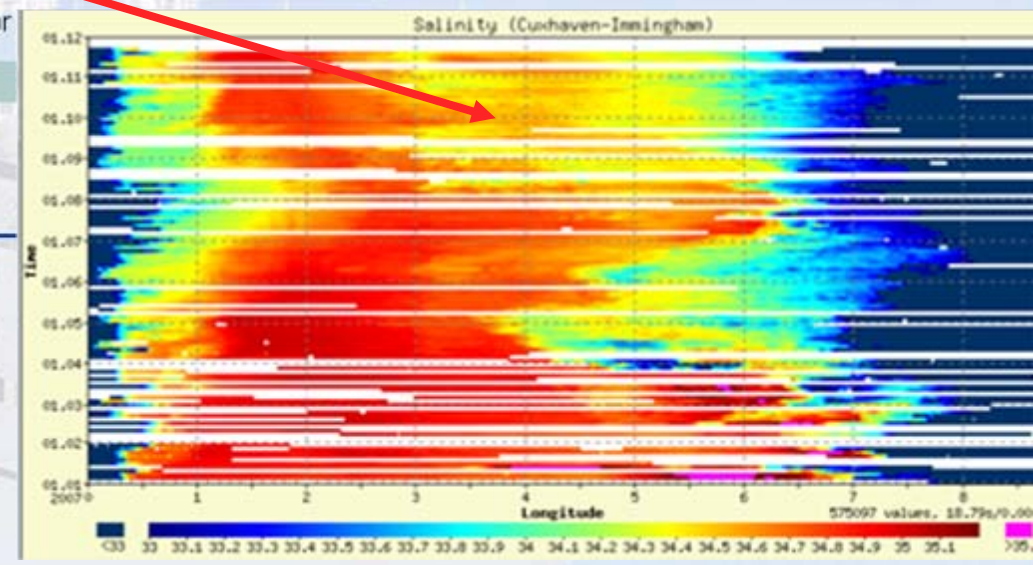
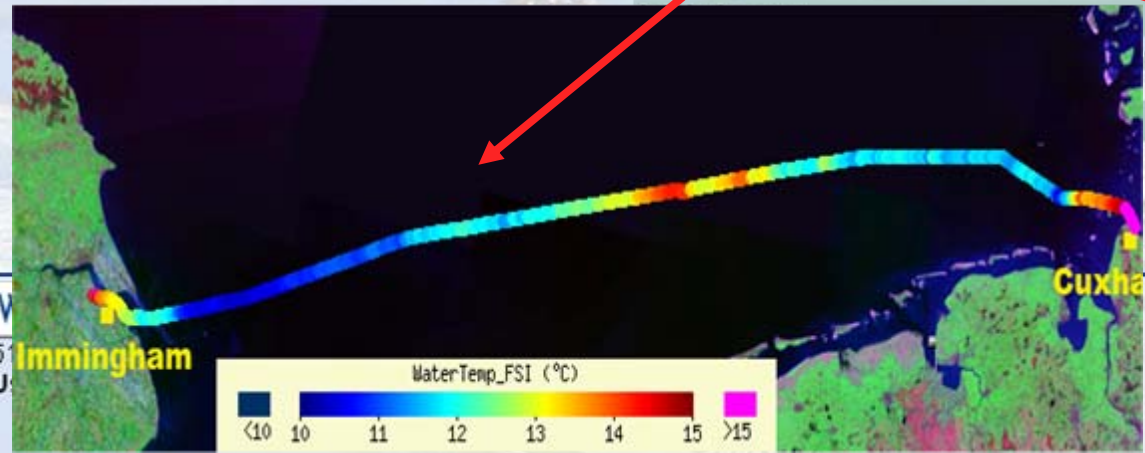
FB-Station
Cuxhaven
since Okt'10:







- [Transect Plot I](#) Plot of one select variables/parame
- [Transect Plot II](#) Plot of one or mo variable/paramet
- [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



FerryBox Lines HZG: General information

Name of platform		Shipping Company & website		Name of system (e.g. Algaline)	public awareness website	name of contact person	email of contact person	phone number of contact person	Destination harbours	Start of operation	End of operation
Duchess of Scandinavia	car/passenger ferry	DFDS A/S	http://www.dfdsseaways.de	COSYNA	www.cosyna.de	Wilhelm Petersen	wilhelm.petersen@hzg.de	+49 4152 872360	Cuxhaven - Harwich	2002	2005
TorDania	Ro/Ro-ship	DFDS TorLine	http://www.dfdstorline.com	COSYNA	www.cosyna.de	Wilhelm Petersen	wilhelm.petersen@hzg.de	+49 4152 872362	Cuxhaven - Immingham	2006	today
LysBris	cargo ship	DFDS Lys Line	http://www.lysline.com	COSYNA	www.cosyna.de	Wilhelm Petersen	wilhelm.petersen@hzg.de	+49 4152 872359	Moss-Cuxhaven-Hamburg-Chatham-Bilbao-Immingham	2007	today
MS Funny Girl	passenger ship	Reederei Cassen Eils	http://www.Helgolalndreisen.de	COSYNA	www.cosyna.de	Wilhelm Petersen	wilhelm.petersen@hzg.de	+49 4152 872358	Büsum - Helgoland	2008	today
MS FunnyGirl	passenger ship	Reederei Cassen Eils	http://www.Helgolalndreisen.de	COSYNA	www.cosyna.de	Wilhelm Petersen	wilhelm.petersen@hzg.de	+49 4152 872361	Cuxhaven-Helgoland	2009	today

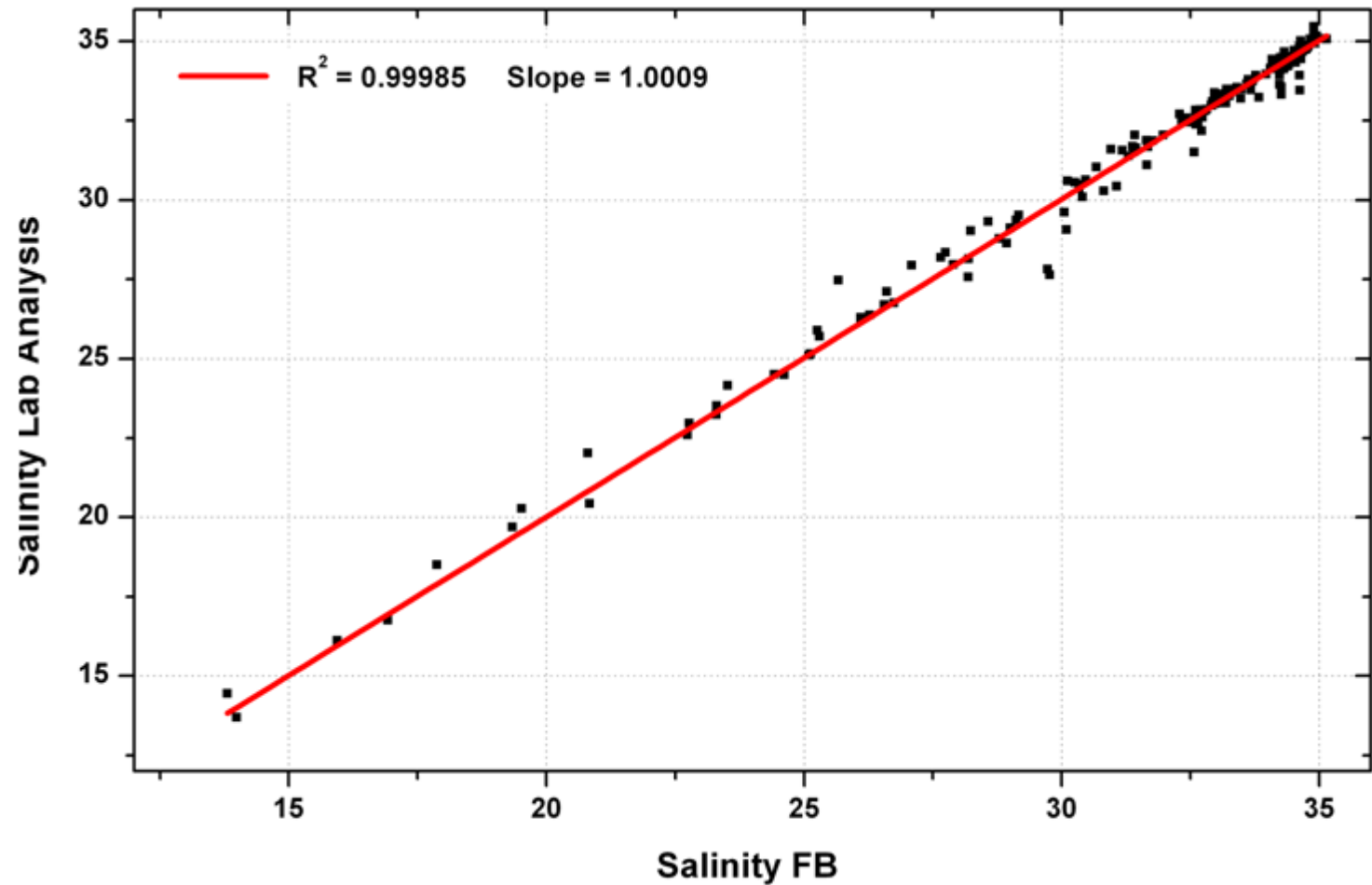
FerryBox Lines HZG: Parameter and QA

Institution	Name of platform	Sensor list	Data handling				Quality Assessment (details in separate sheet)			
		Observed parameters (detailed information in separate sheet)	Data transfer	Data storage	SeaData Net compliance	Other parameter dictionary	Public access to data	Levels (steps)	Where QC/QA applied	Access to QC/QA meta data
HZG (GKSS)	Duchess of Scandinavia	T, S, DO, Chl-a, pH, Trb, nutrients	automatically in harbours	local DB (COSYNA)	partial	-	http://ferrydata.hzg.de	manually	ship, lab and data-centre	www.cosyna.de
HZG (GKSS)	TorDania	T, S, DO, Chl-a, pH, Trb, nutrients	automatically in harbours	local DB (COSYNA)	partial	-	http://ferrydata.hzg.de	automatically & manually	ship, lab and data-centre	www.cosyna.de
HZG (GKSS)	LysBris	T, S, DO, Chl-a, pH, Trb, nutrients	automatically in harbours	local DB (COSYNA)	partial	-	http://ferrydata.hzg.de	automatically & manually	ship, lab and data-centre	www.cosyna.de
HZG (GKSS)	MS Funny Girl	T, S, DO, Chl-a, pH, Trb	automatically in harbours	local DB (COSYNA)	partial	-	http://ferrydata.hzg.de	automatically & manually	ship, lab and data-centre	www.cosyna.de
HZG (GKSS)	MS FunnyGirl	T, S, DO, Chl-a, pH, Trb	automatically in harbours	local DB (COSYNA)	partial	-	http://ferrydata.hzg.de	automatically & manually	ship, lab and data-centre	www.cosyna.de

Data Quality Assurance of Salinity Data

Check of Salinity Sensor:
Comparison with bottle
samples:

All data from 2007 until 2010



New technologies

High precision pH sensor

- new sensor (under development) for automatic more precise pH + alkalinity measurements for quantifying carbon budget (**presentation Aßmann at FB workshop**)

p-CO₂ Sensors (installations in 2011)

- Test of different membrane based systems (ProOceanic, Contros) with FerryBox systems

Zooplankton Recorder (MOKI) (development AWI)

image objects of sizes below 100µm with high resolution

towed from research vessels,
or as a component of the FerryBox or other platforms



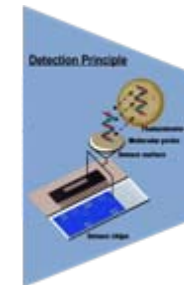
Zooplankton Recorder

Nucleic Acid Biosensor (AWI & GKSS)

Algae taxa and algal groups

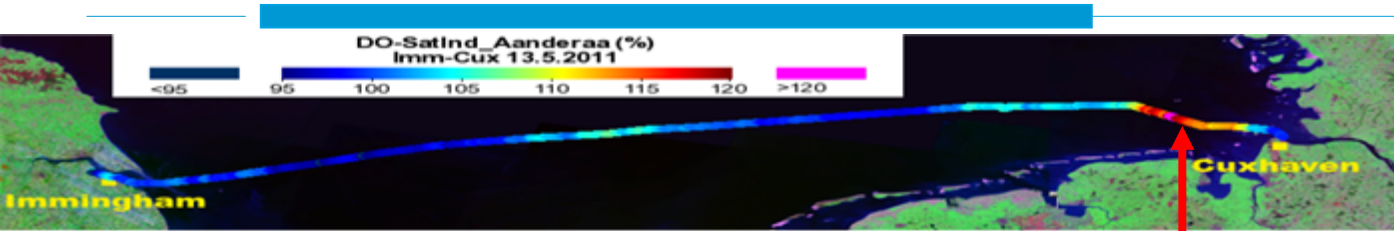
PSICam

- point-source integrating-cavity absorption meter for better quantification of chlorophyll-a and detection of algal species (**poster Wollschläger at FB**)

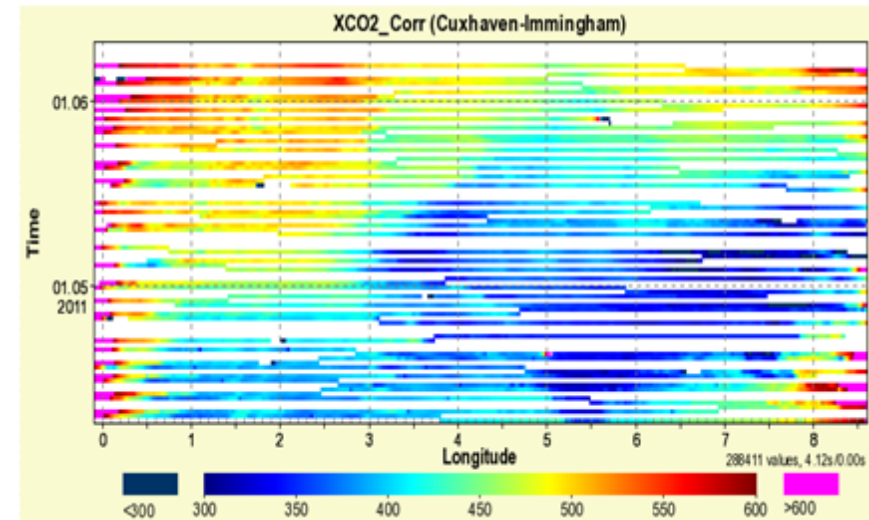


Biosensor

From physical towards biological relevant data: Algae dynamics and impact on carbon budget (pH and pCO₂)



Pooled raw data of
pCO₂ along the track
Immingham – Cuxhaven
from April to June 2011



Transect 13th of May 2011