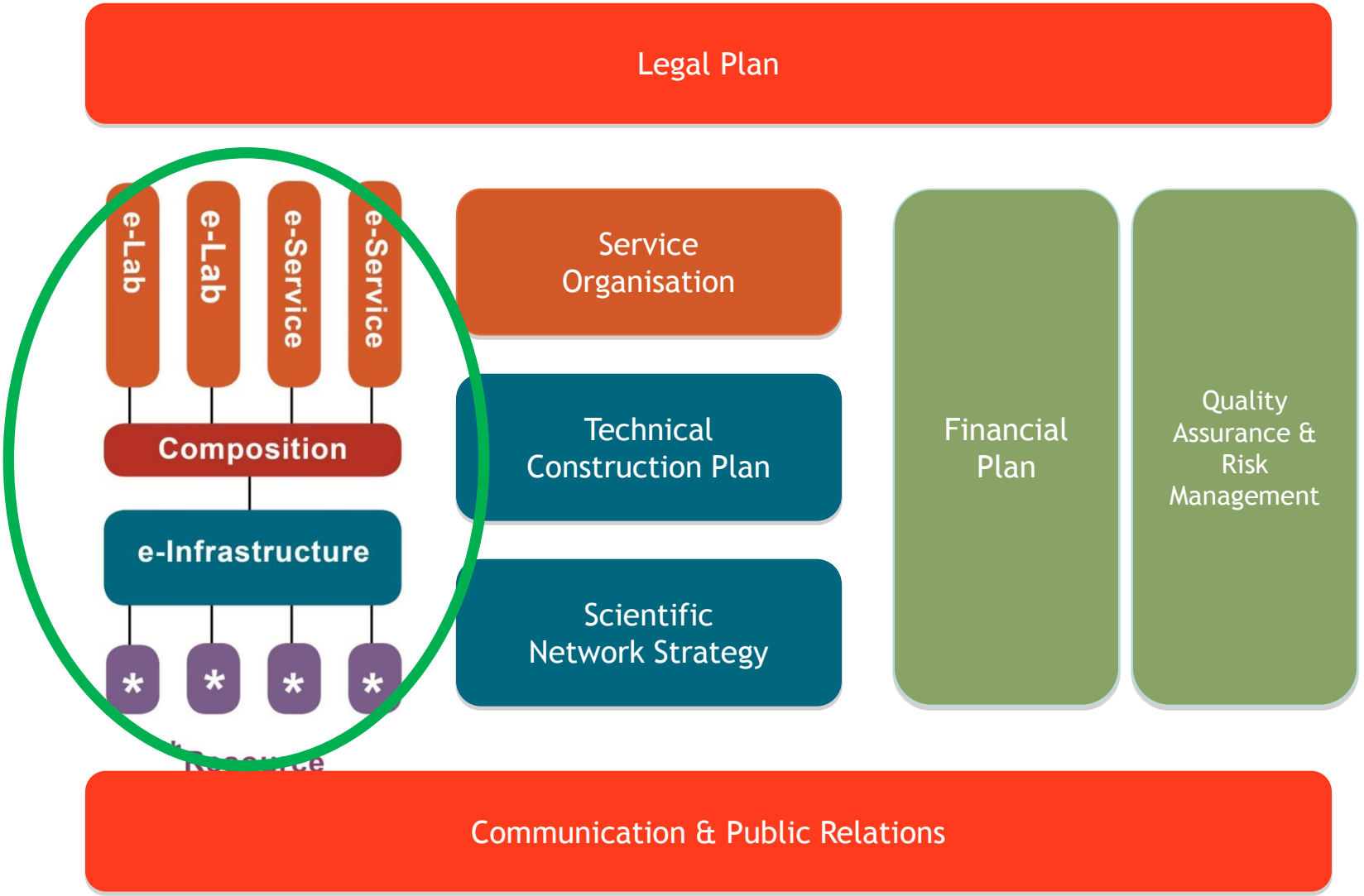
Handling a Data Stream from the Flanders Marine LifeWatch Observatory

Fernando Aguilar
IFCA - CSIC

Lifewatch

- **LifeWatch** is the European e-Science infrastructure for biodiversity and ecosystem research. ESFRI
- Aims to provide advanced capabilities for research on the complex biodiversity system.
- e-Science infrastructures capitalize existing resources and data from physical infrastructures, distributed centers and single research groups.
- The capabilities offered by the LifeWatch, as a e-Science infrastructure, allow users to tackle the big basic questions in biodiversity, as well to address the urgent societal challenges concerning biodiversity, ecosystems and other crosscutting issues.

Construction Plan



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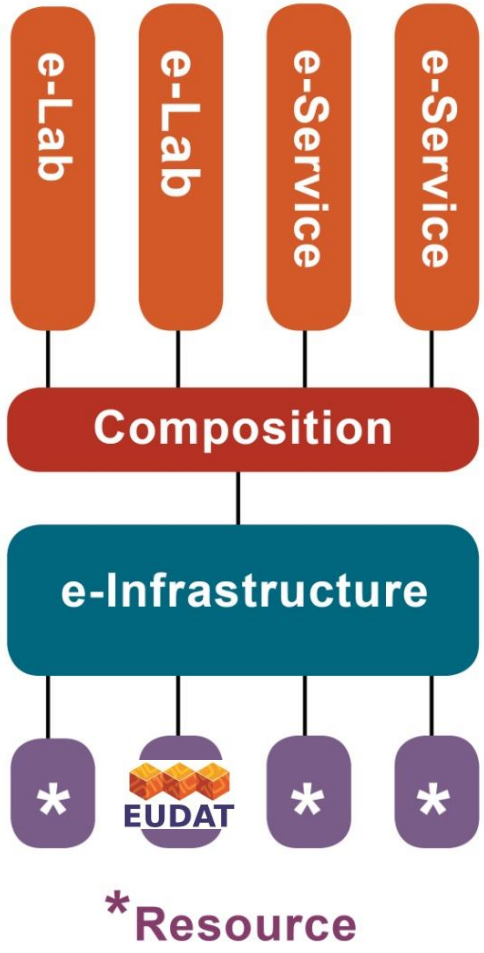
ICT Core

- Virtual laboratories for scientific cooperation
- Select the data, software and computing power for your project
- Integrate resources
- Linking to resources (databases, sensors, software, computing power)



Virtual Labs

Optional in-kind construction

Common Facilities

Compulsory construction

Third party contributions

Courtesy of Wouter Los

EUDAT services for LW?

- EUDAT has two key sides for LW:
  - Knowledge about DATA management
  - New services:
    - B2 SHARE
    - B2 STAGE
    - B2 FIND
    - B2 SAFE

- Select topic(s):
  - Real Time
  - Semantic Mapping
  - Workflow Execution
  - Data Lifecycle

Lifewatch national projects

- The Netherlands
  - Bird Tracking
- Sweeden
  - Analysis portal
- Belgium
  - Data adquisition and analysis
- España – ICT core

Components

- Taxonomic backbone :
  - http://www.lifewatch.be/project/taxonomic-backbone
  - Rich species information : attributes & traits, identification keys, references
  - QC'ed species observations, distributions, lifestages
  - Focus : Marine, freshwater & polar species, PESI
  - Available as webservices: check BIOVEL
    - http://www.marinespecies.org/aphia.php?p=webservice
    - http://www.eu-nomen.eu/portal/webservices.php
    - http://www.lifewatch.be/data-services

Courtesy of VLIZ

EurOBIS WoRMS World Register of Marine Species .be FADA SCAR-MarBIN EU-NOMEN Pan-European Species directories Infrastructure OBIS EMODnet European Marine Observation and Data Network

Components

- New data generation
  - All trophic levels plankton -> mammals
  - Marine, freshwater, terrestrial observatories
  - Sensor networks, big data
- Data archeology
- New data products
  - Habitat data from remote sensing
  - Maps: environmental, biogeography, biological value
  - OGC, WMS & WFS
  - Marine gazetteer
  - Species abundance maps

- 50 Tb/year
- Calibration data
- HPC
- Data visualisation

Courtesy of VLIZ

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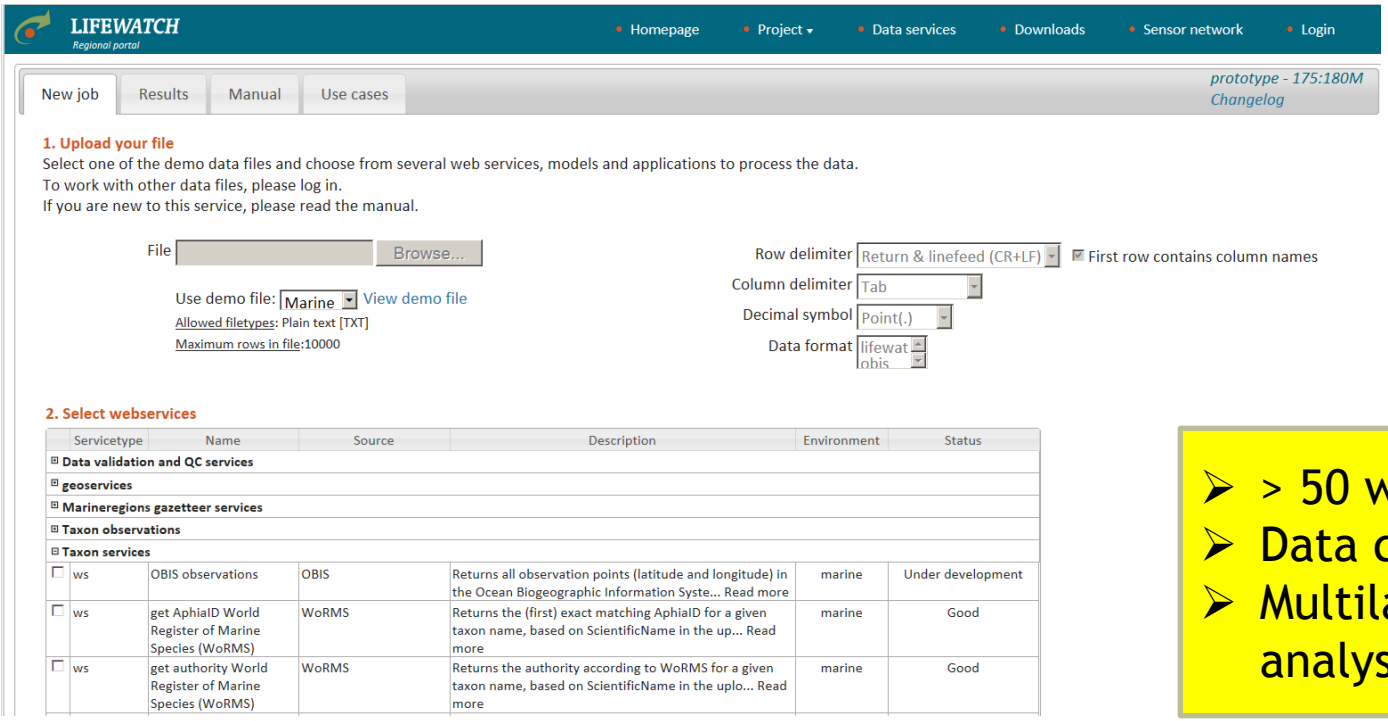
Marineregions.org
towards a standard for georeferenced marine names

EMODnet
European Marine Observation and Data Network

Components

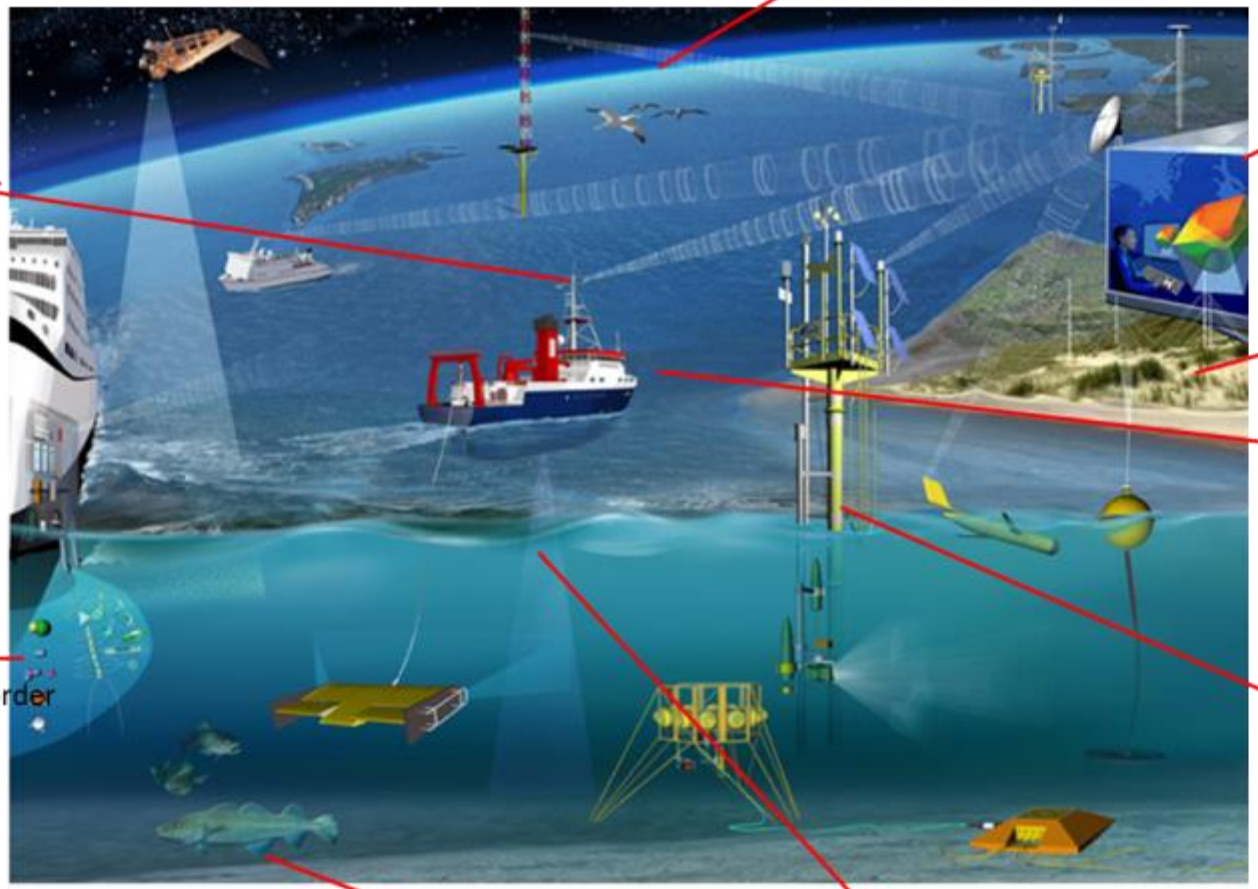
- Data services interface
  - http://www.lifewatch.be/data-services



- > 50 webservices
- Data quality check
- Multilayers analysis

Courtesy of VLIZ

Sensor data



- Discreet -> continuous
- Delayed -> realtime

Courtesy of VLIZ

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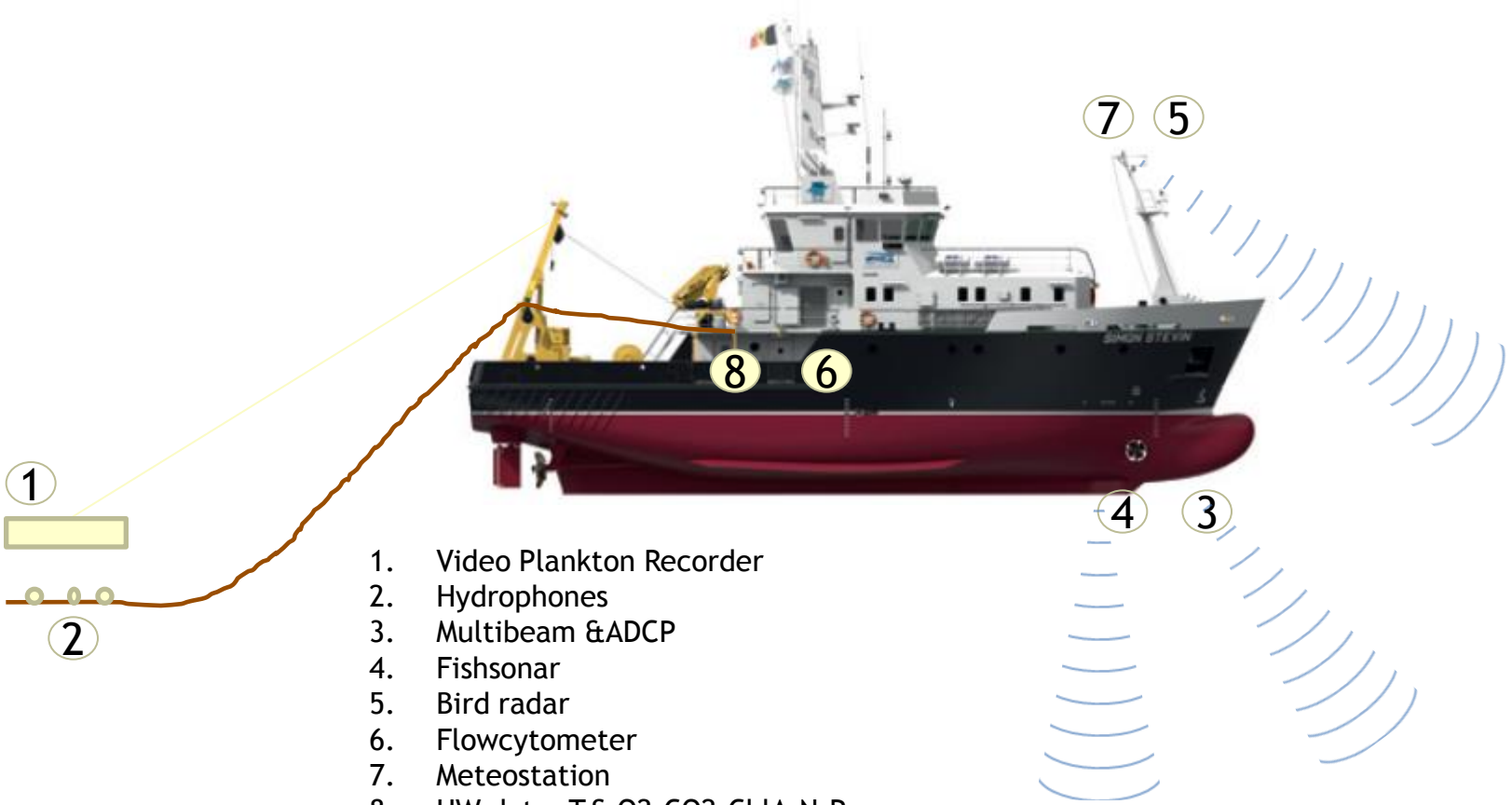
Research Vessel Simon Stevin

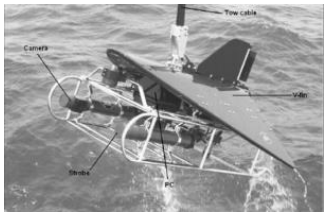


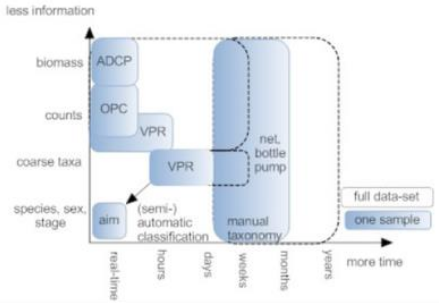
1. Video Plankton Recorder
2. Hydrophones
3. Multibeam &ADCP
4. Fishsonar
5. Bird radar
6. Flowcytometer
7. Meteostation
8. UW data: T,S,O2,CO2,ChlA,N,P

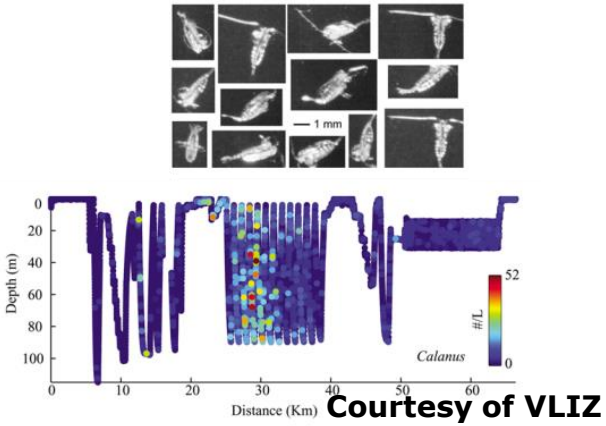
Courtesy of VLIZ

Video Plankton Recorder (VPR)

- Real-time underwater digital camera system + strobe
- Rapid quantification of plankton taxonomic composition and abundance
- Image acquisition: 30 frames/second of 7.2 ml image volume
- Data generation: +/- 10GB/hour (at 150kb/image)
- Analysis: pattern recognition software (Visual Plankton software [Matlab])







Courtesy of VLIZ

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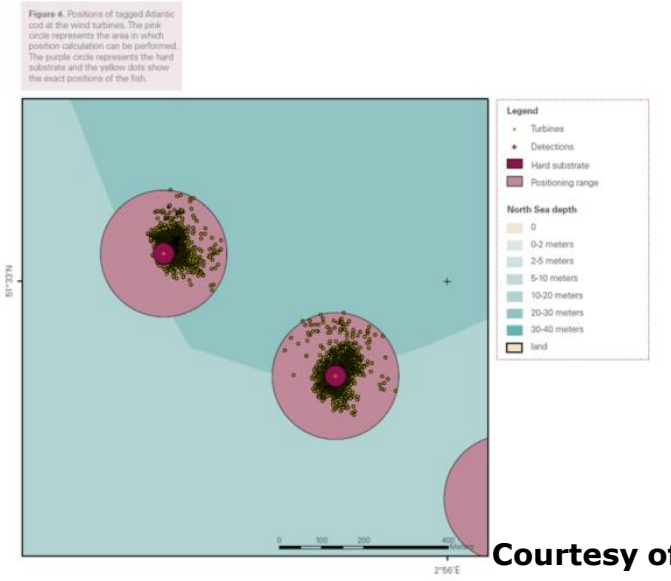
Acoustic fish telemetry

- Acoustic fish tag tracking
- Studying distribution, migration and habitat use
- Data generation: 25 MB/month
- Analysis: GIS mapping & visualization (CartoDB), behaviour analysis (Matlab, Python)



Courtesy of VLIZ

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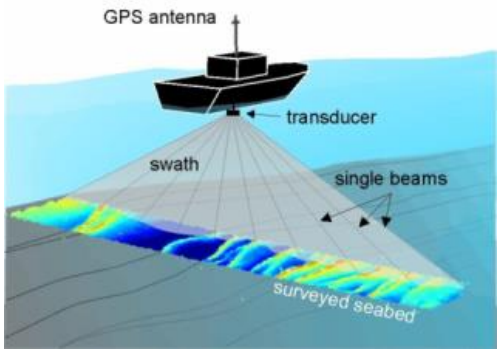
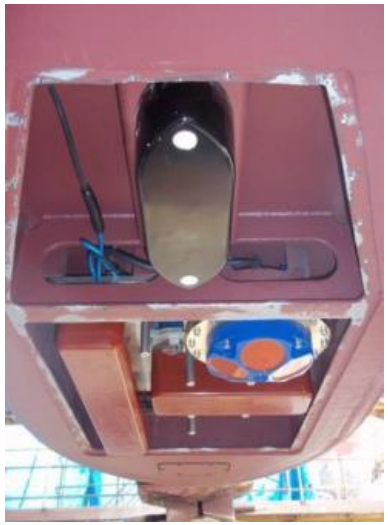
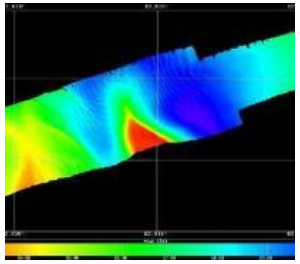
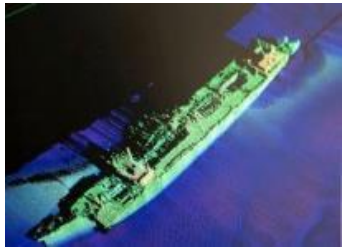
Multibeam echosounder

- Acoustic high resolution depth sounding sonar
- Bathymetry and sediment typology
- Data generation: water column data 5Tb/year
- Analysis: data cleaning and validation, chart creation, deriving sediment typology (CARIS, Fledermaus)









Courtesy of VLIZ

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EUDAT Use Case

- Use case ~ 50 TB per year.
- Store that amount of data (B2SAFE).
- Process raw data to get meaningful information with added value (B2STAGE).
- Share data witch research community (B2SHARE).

Thanks for your attention