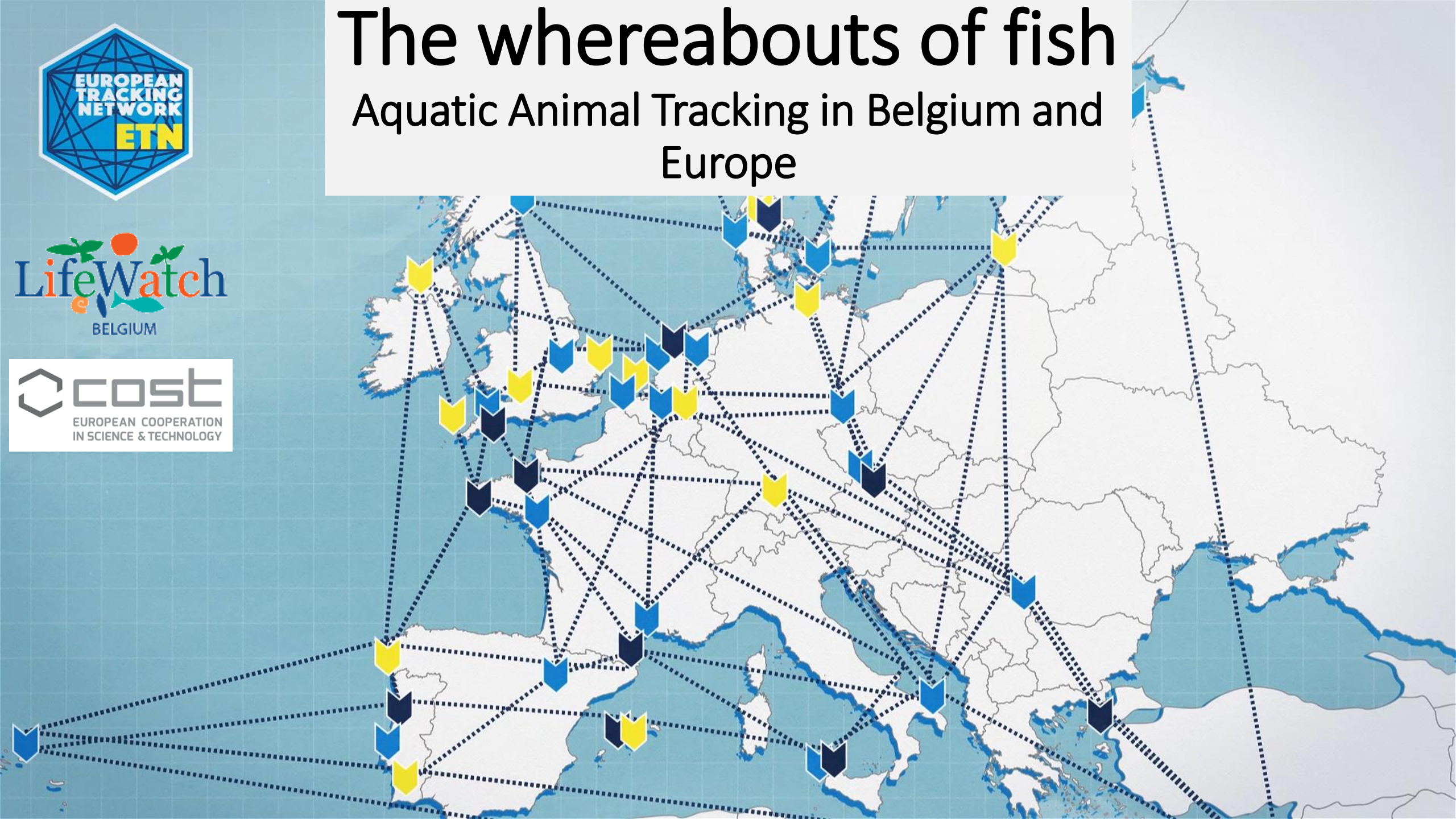
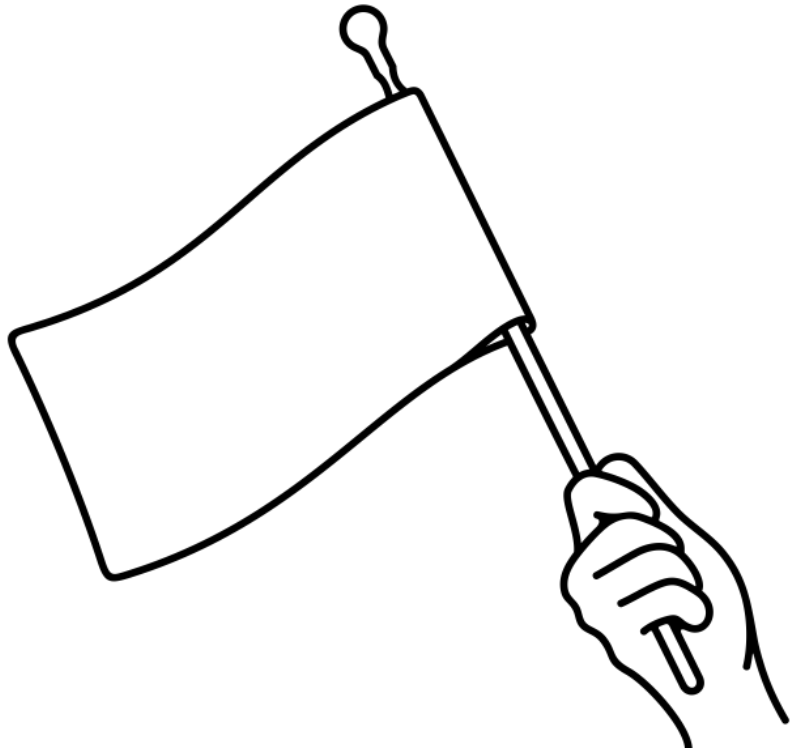
The whereabouts of fish

Aquatic Animal Tracking in Belgium and Europe





LifeWatch Fish Acoustic receiver network

LifeWatch ESFRI Landmark

E-Science Infrastructure for Biodiversity and Ecosystem Research

LifeWatch is a distributed RI to advance biodiversity research and to address the big environmental challenges and support knowledge-based strategic solutions to environmental preservation. This mission is achieved by providing access to a multitude of data sets, services and tools enabling the construction and operation of Virtual Research Environments.

Biodiversity research services:

- Observatories
- Data bases
- Semantic standards
- Web services
- Workflows and modelling tools
- Virtual labs
- Collaborative environment
- ICT resources & services

ESFRI LANDMARKS 2

An e-Infrastructure to support research for the protection, management and sustainable use of biodiversity

TYPE: distributed
COORDINATING COUNTRY: ES
PROSPECTIVE MEMBER COUNTRIES: BE, EL, ES, IT, NL, PT, RO

PARTICIPANTS: FI, FR, HU, NO, SE, SI, SK

TIMELINE
- ESFRI Roadmap entry: 2006
- Preparation phase: 2008-2011
- Construction phase: 2011-2016
- Operation start: 2016

ESTIMATED COSTS
- Capital value: 66 M€
- Operation: 10 M€/year

HEADQUARTERS
Statutory Seat: ES
Common facilities: ES-IT-NL

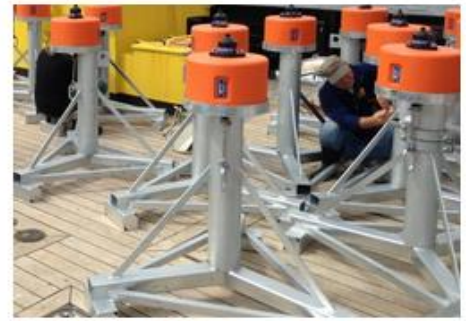
WEBSITE
http://www.lifewatch.eu

Sensors

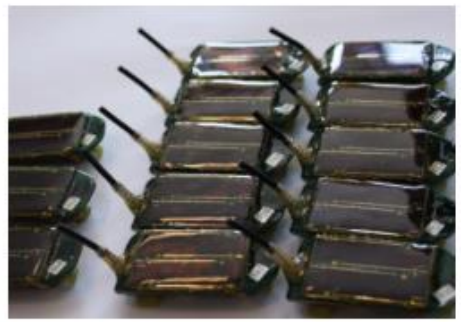
Find out about the Belgian LifeWatch observatory equipment and sensors.

RV Simon Stevin sampling campaigns

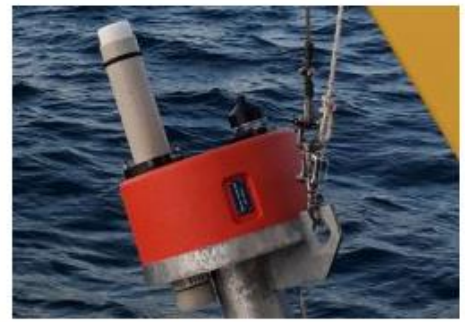
Broadband Acoustic Network



Fish acoustic receiver network



GPS Bird tracking network



Cetacean passive acoustic network

Sensor network for bat detection

Aquatic animal tracking in Belgium

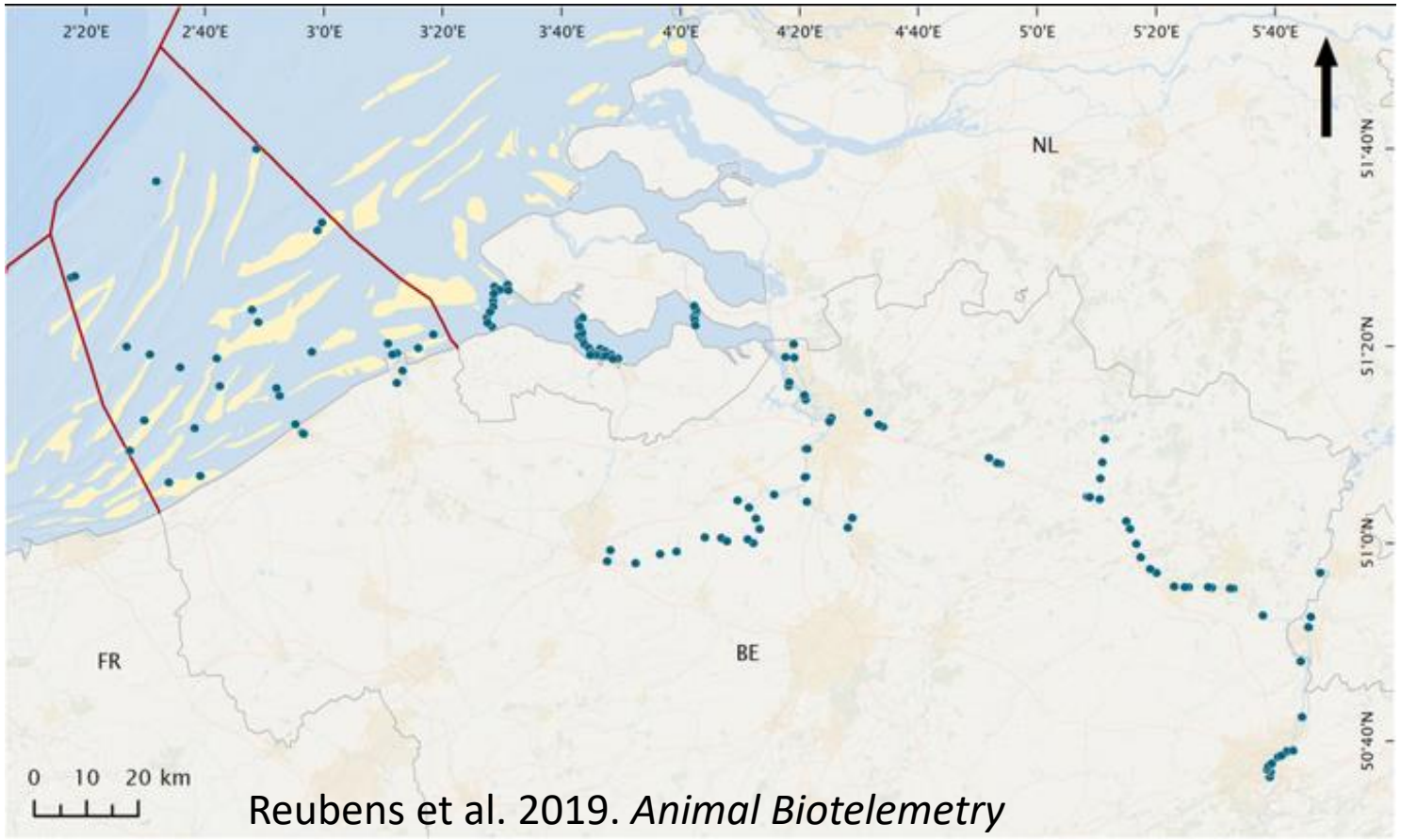
Acoustic Telemetry

Data-storage Tags

LifeWatch
BELGIUM

Fish Acoustic receiver network

- Since 2014
- Collaboration between INBO and VLIZ
- Marine, brackish, fresh water
- > 100 stations

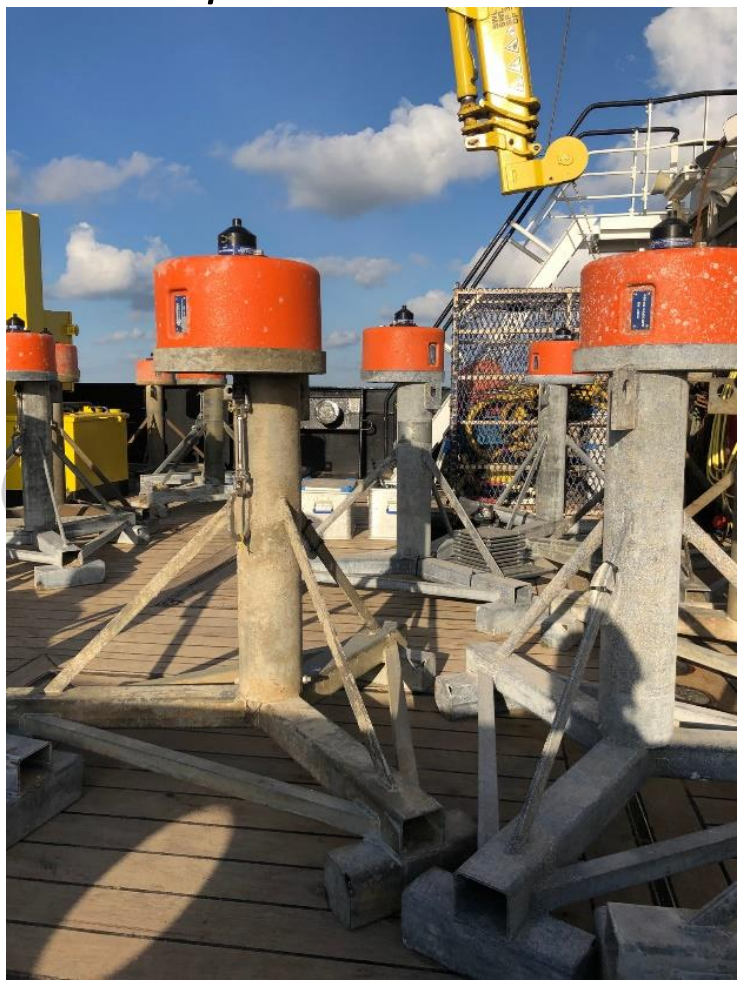


Reubens et al. 2019. *Animal Biotelemetry*

Receiver network Belgium

Permanent network

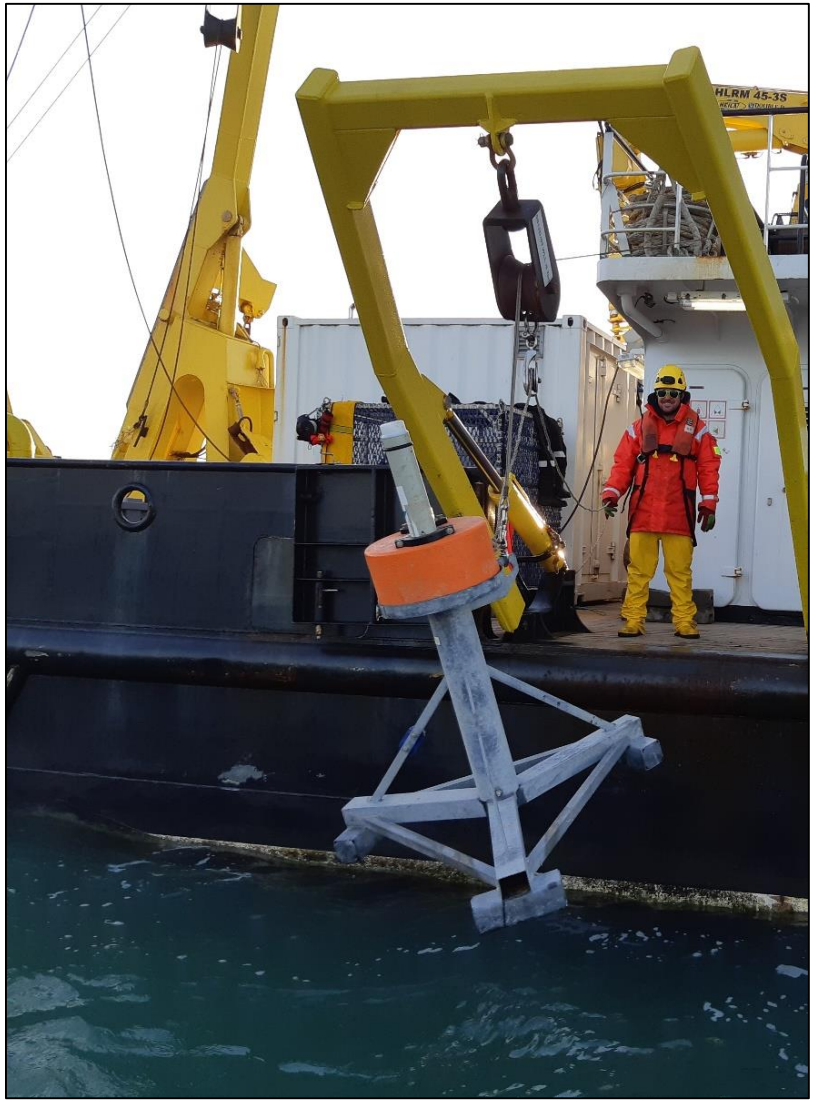
Temporal network



The frame can be modulated to hold extra scientific equipment.

ARMS (Autonomous Reef Monitoring Structures)

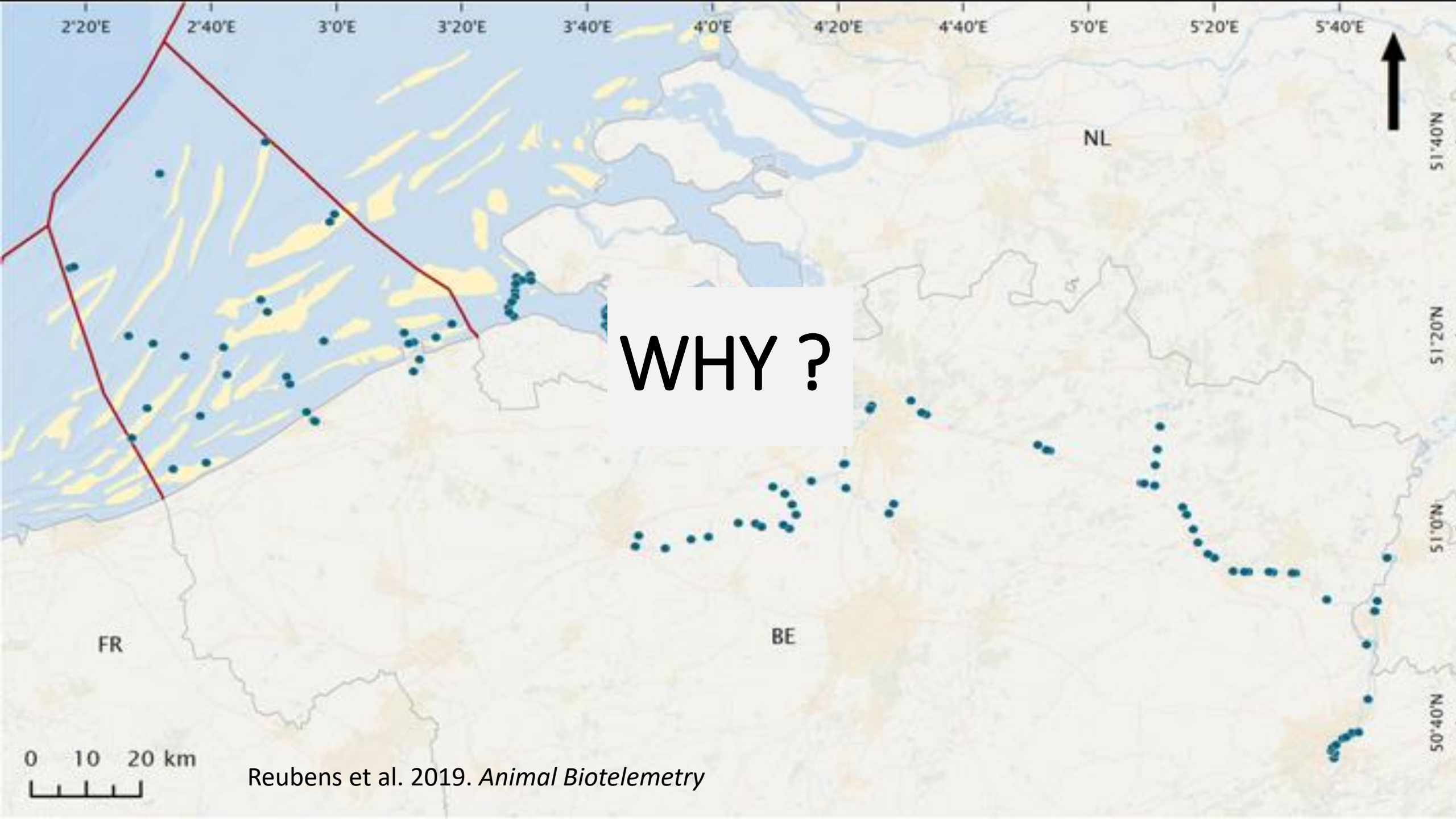
Second receiver



C-POD

SoundTrap hydrophone

ADCP



Reubens et al. 2019. *Animal Biotelemetry*

Value of the network

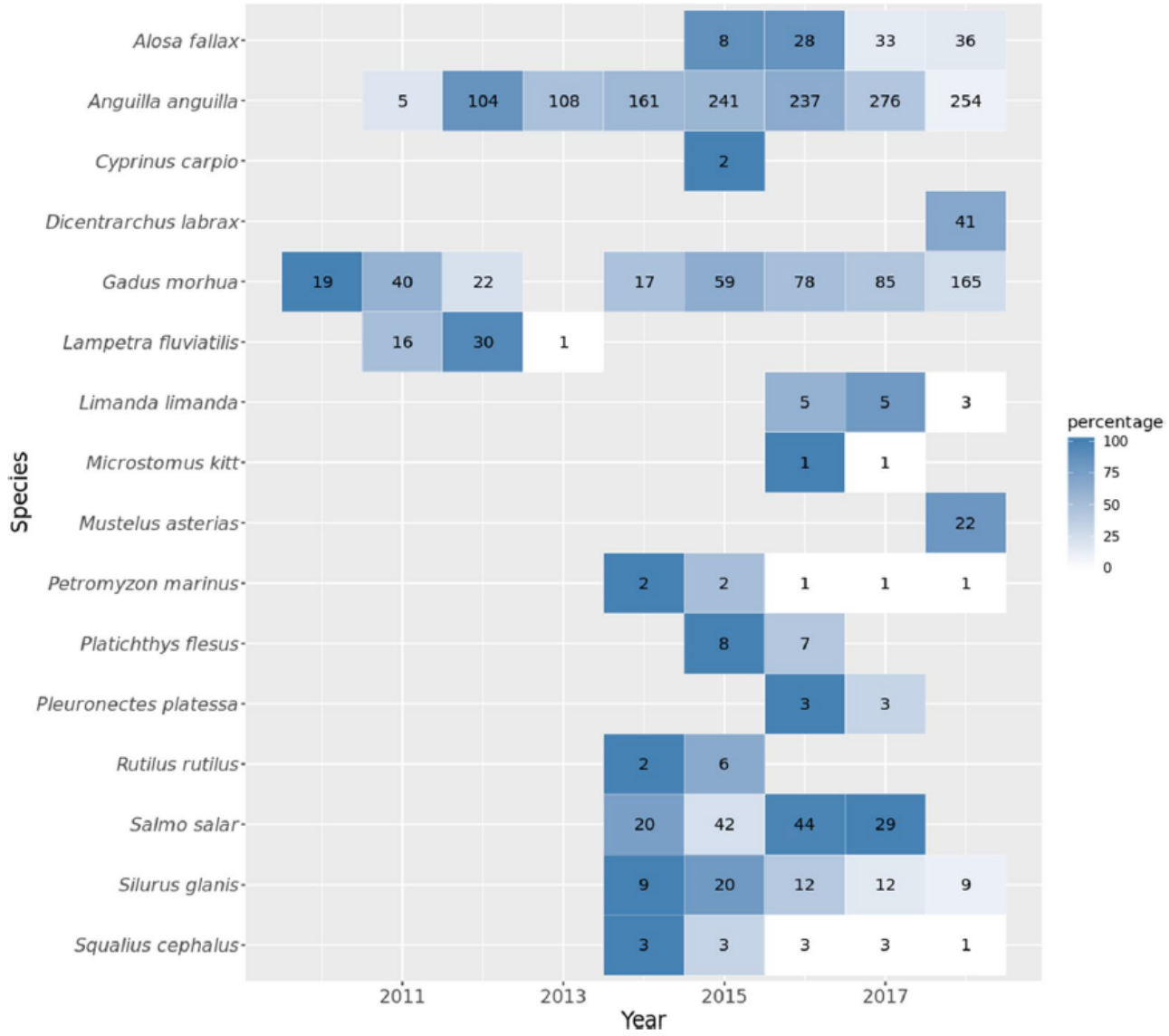
Focus

- Ecological knowledge
- Impact assessment
- Species conservation
- Fisheries/River management

Added value of the network

- Collaborations (National and International)
- Opportunities (Scientific and funding)
- Tackle the ‘larger’ questions

1324 tagged animals of 18 species

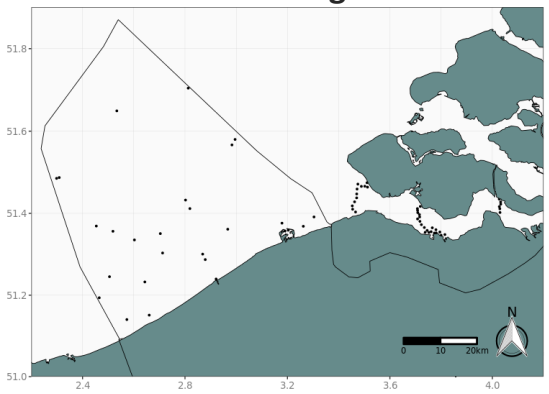


Case study 1:
Tracking European seabass in the SNS

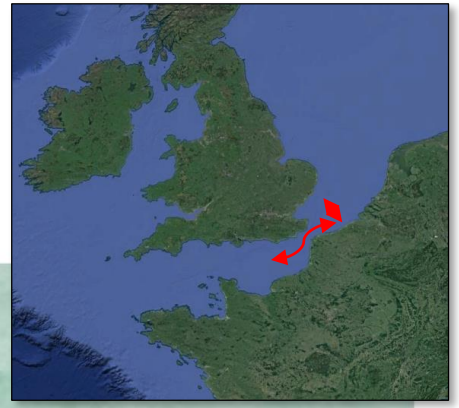
Jolien Goossens
Ghent University, Marine Biology Research Group

This research aims to understand seabass movements in the southern North Sea

Habitat use in Belgian waters



Migration behaviour

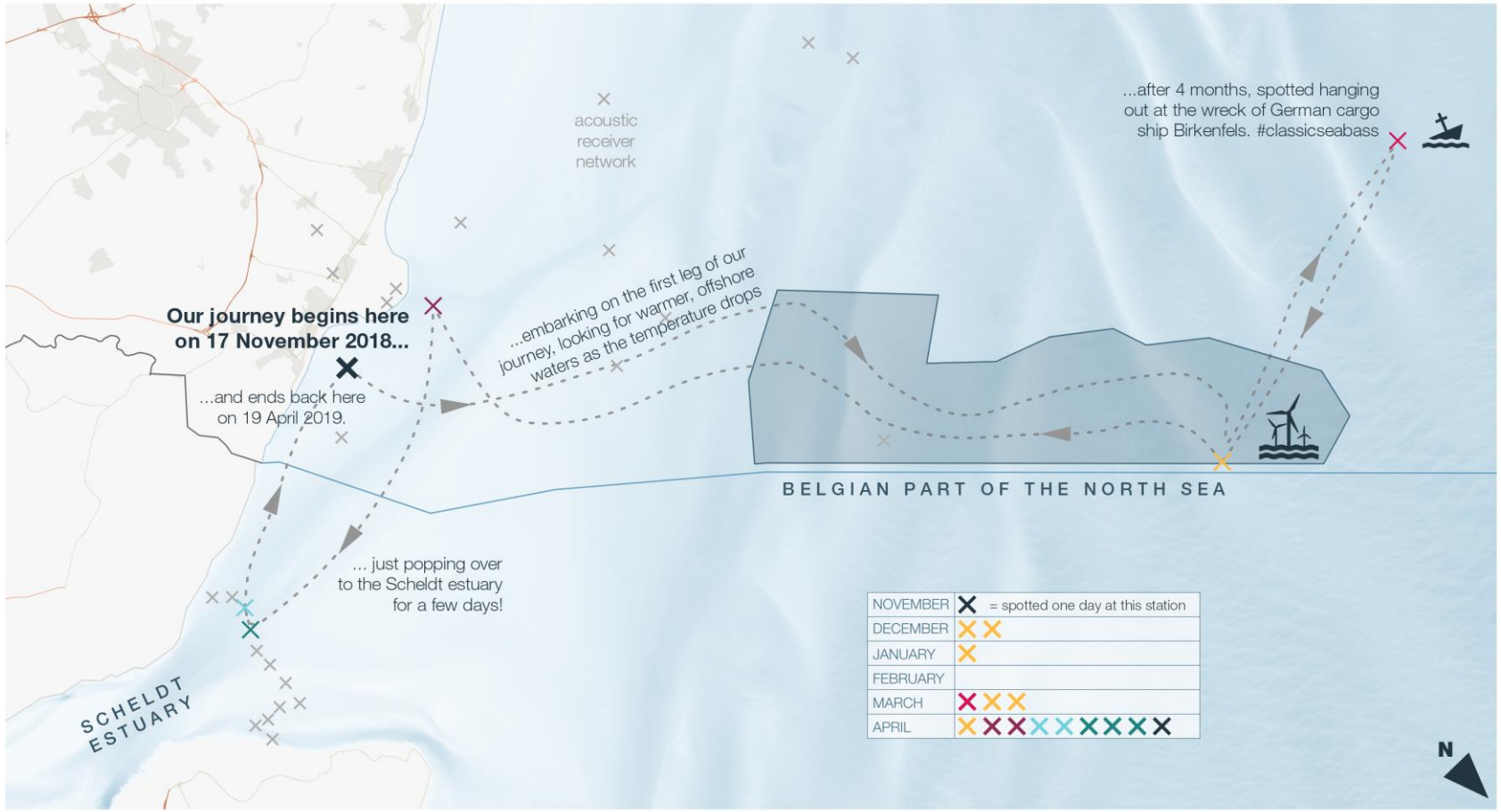


- Over 130 animal tagged
- ADST tags
- Collaboration with Ifremer (Mathieu)

Fisheries data

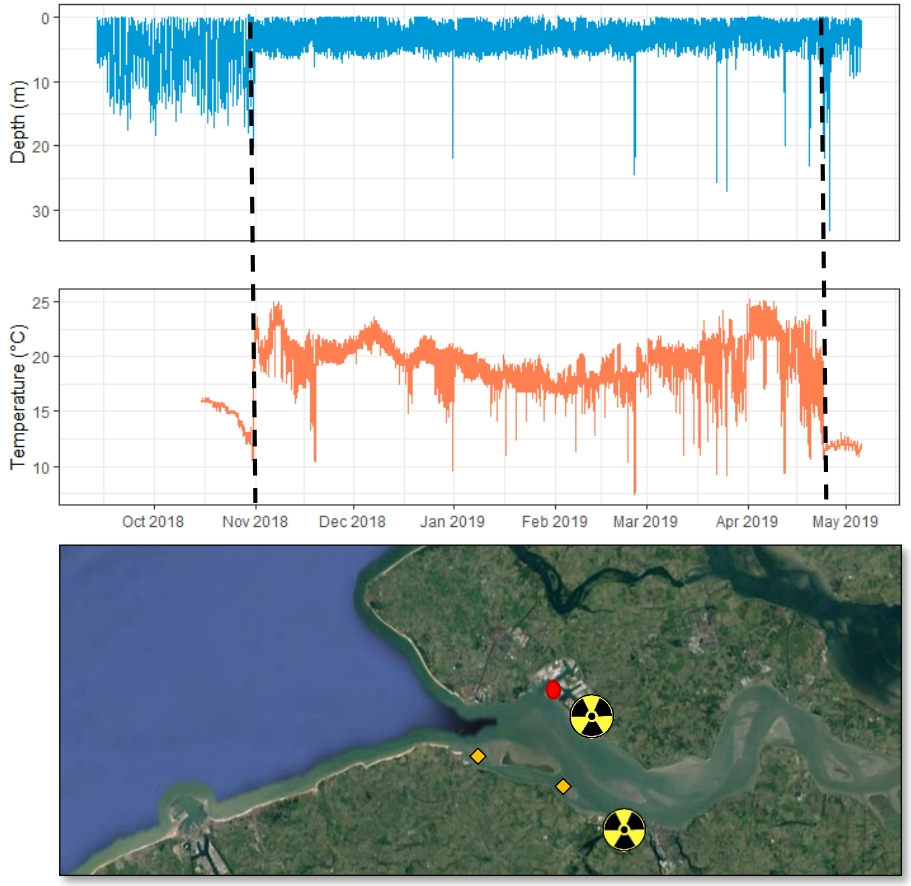
6 months in the life of a seabass

(aka at which receivers was seabass #3510 spotted?)



Basemap: EMODnet Bathymetry, Vlaamse Hydrografie, Eurostat, NGI, Statbel, OpenStreetMap & contributors - Windfarms: marineatlas.be

Seabass: ADST tag recovery!



Case study 2:
Tracking the migration of Chinese mitten crab

Jonas Schoelynck & Heleen Keirsebelik
Research group ecoystem management, Universiteit Antwerpen

Study the migration

Method 2: acoustic telemetry

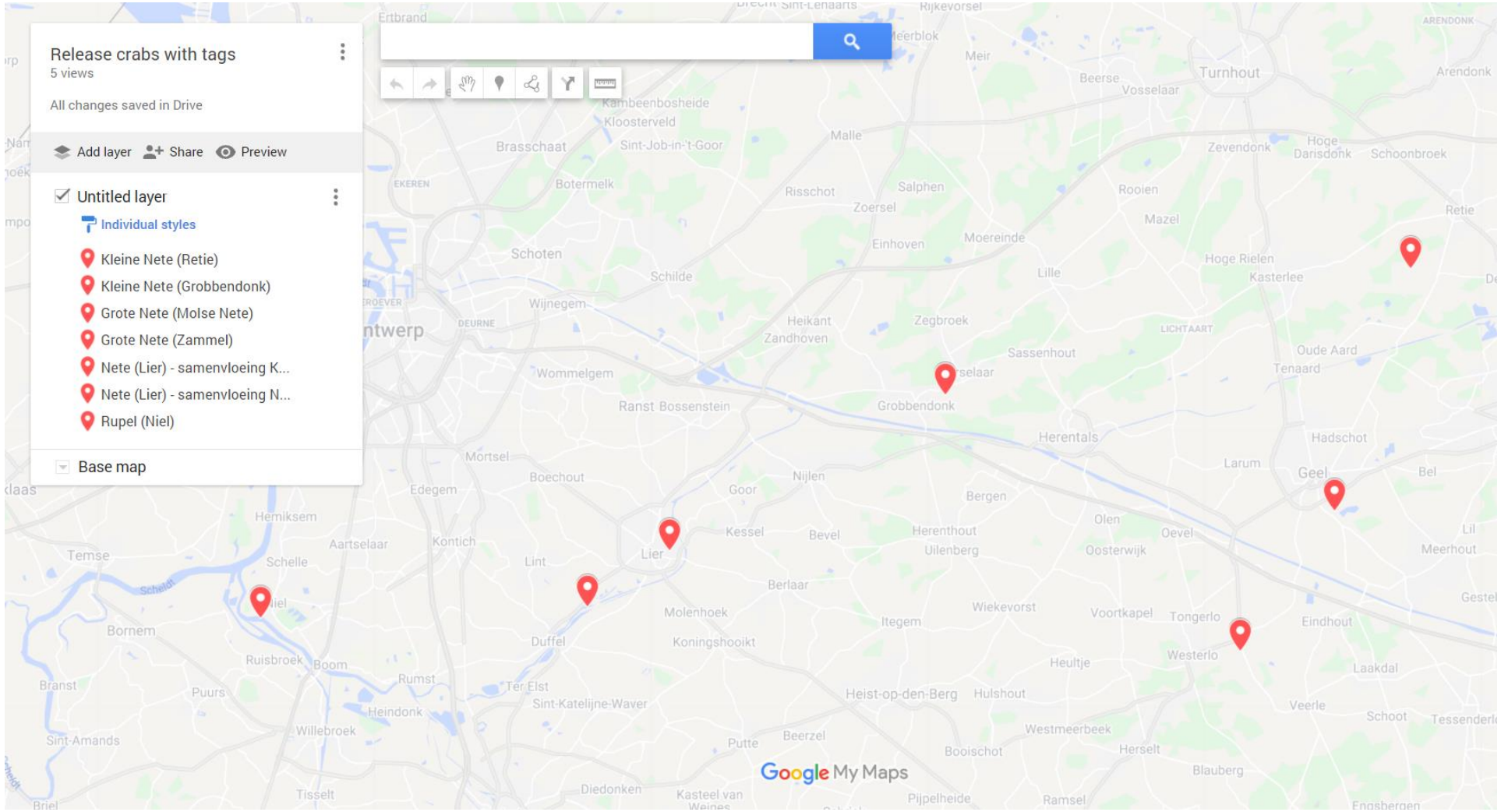
➔ Ongoing trial on downstream migration (upstream not possible)

➔ 8 crabs equipped with acoustic transmitters (Thelma Biotel, type ID-2LP6)

➔Attached with superglue and velcro (pretested in lab conditions)

➔ Released on 8 different locations (between Geel (Grote Nete river), Retie (Kleine Nete river) and Niel (Rupel river), all Scheldt estuary)

Study the migration



Case study 3: Twaith shad

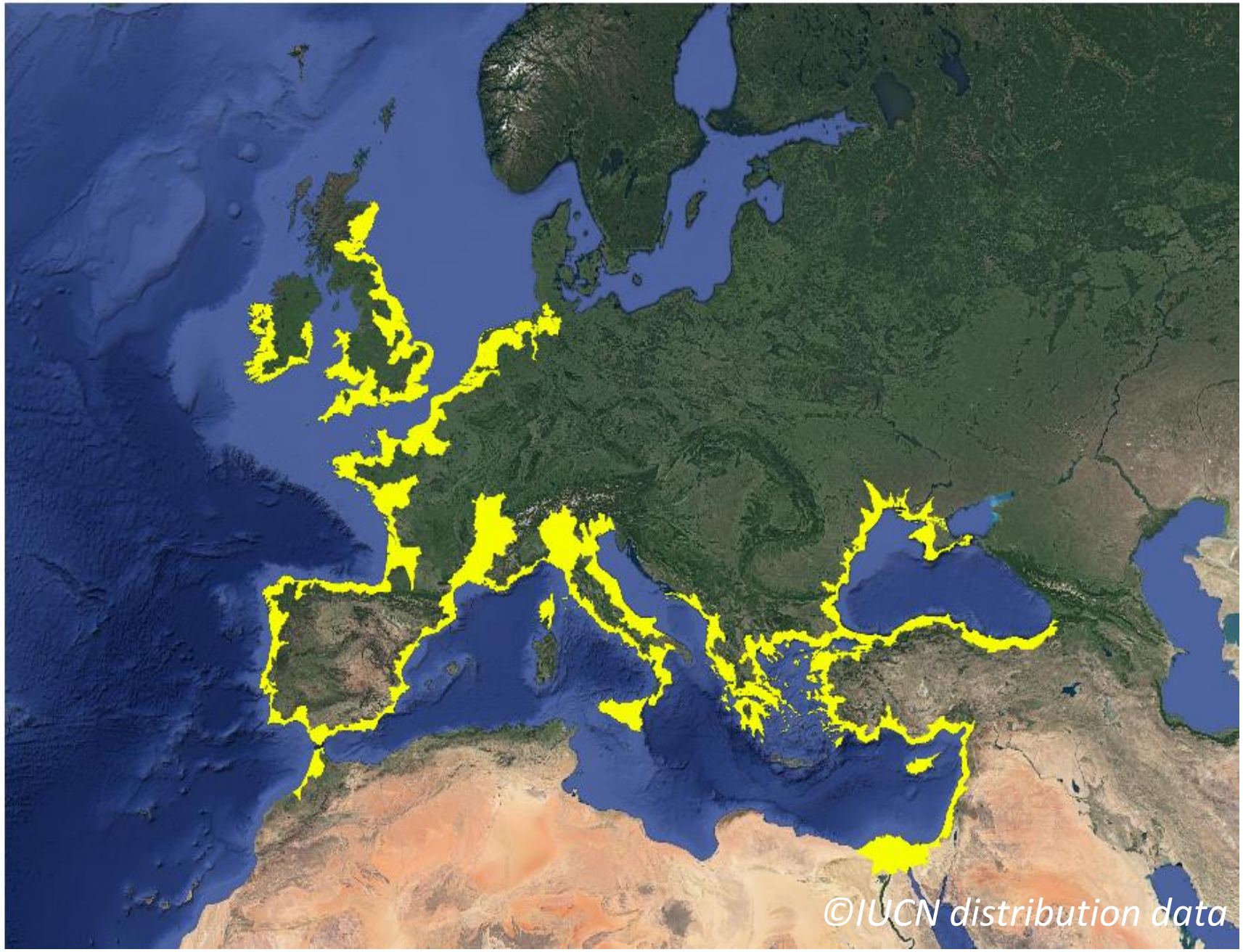
Pieterjan Verhelst & Ine Pauwels
Institute for Nature and Forest
Team Aquatic Management

RESEARCH INSTITUTE
NATURE AND FOREST

LifeWatch
BELGIUM

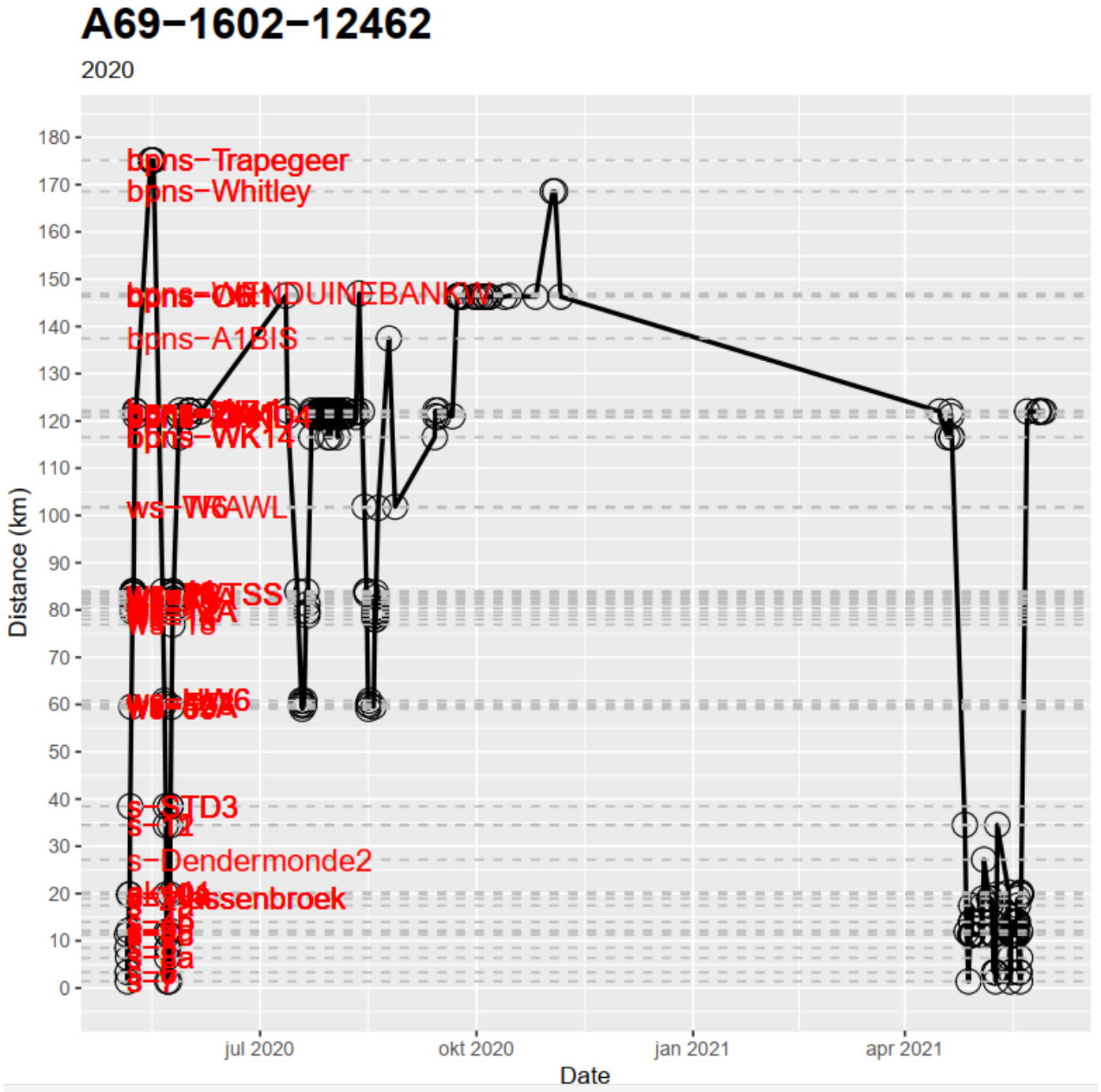
Spawning location in the Scheldt Estuary (Branst).

Distribution area of twaite shad according to IUCN.



- Migration trajectory of a shad:
  - Upon tagging at the spawning site in Branst, the fish swims back to the sea within 24h, whereafter it returned for a short period to the spawning grounds → up and down movement very likely the ‘tagging’ effect!
  - After spawning (after half May) it remained in the lower reaches of the Scheldt Estuary (Westerschelde)
  - It was ‘off radar’ from Nov to Dec and was detected again half April near Zeebrugge.
  - It arrived at the spawning locations half April and stayed there till half May

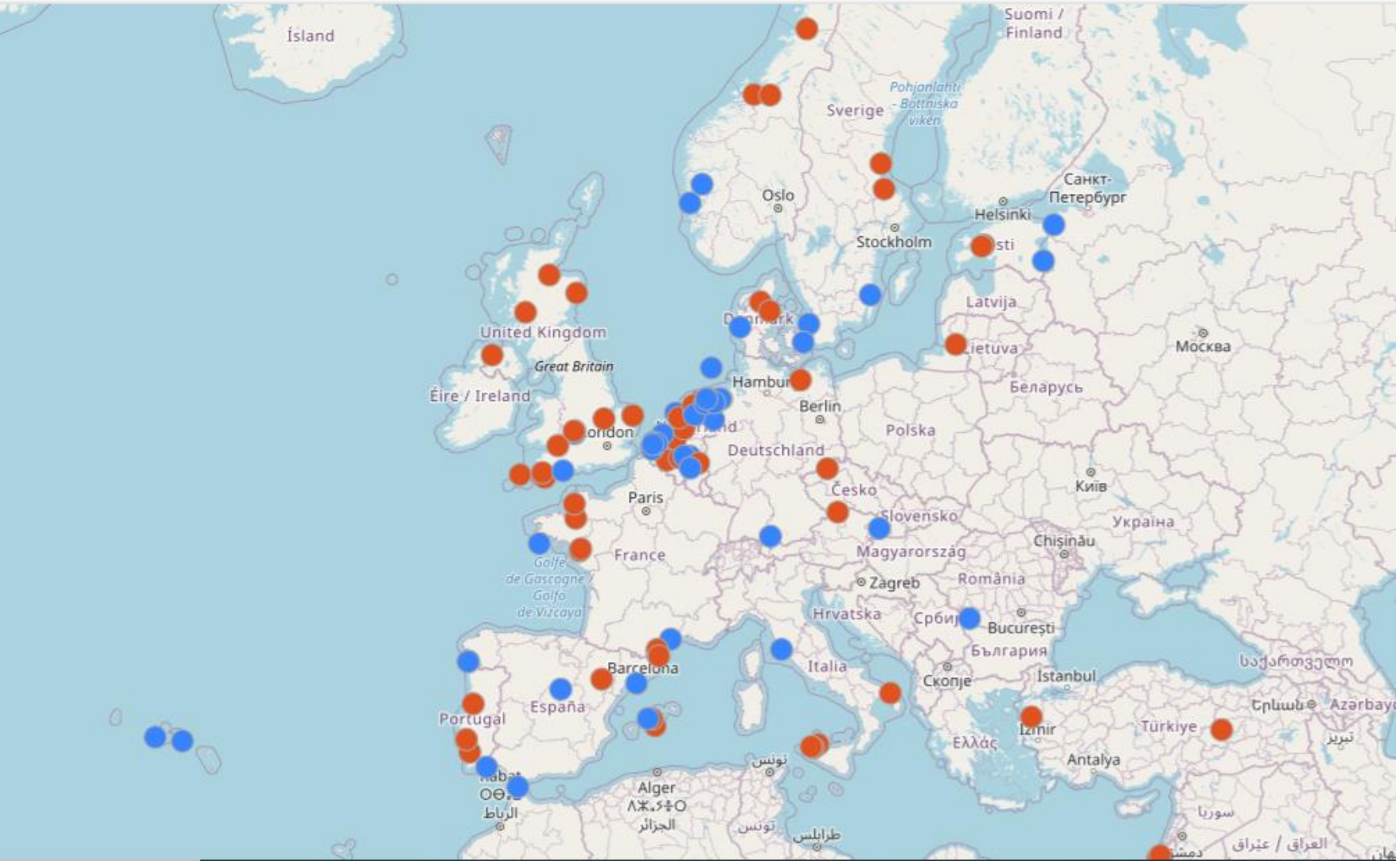
Note that ‘0-distance’ is the most upstream detection location of the individual.




EUROPEAN
TRACKING
NETWORK
ETN

ETN - European tracking network

Data platform, featuring **508495447** detections



307 users

508 M detection

101 institutes involved

8710 tagged animals

For more information

Jan.reubens@vliz.be

https://lifewatch.be/en/fish-acoustic-receiver-network

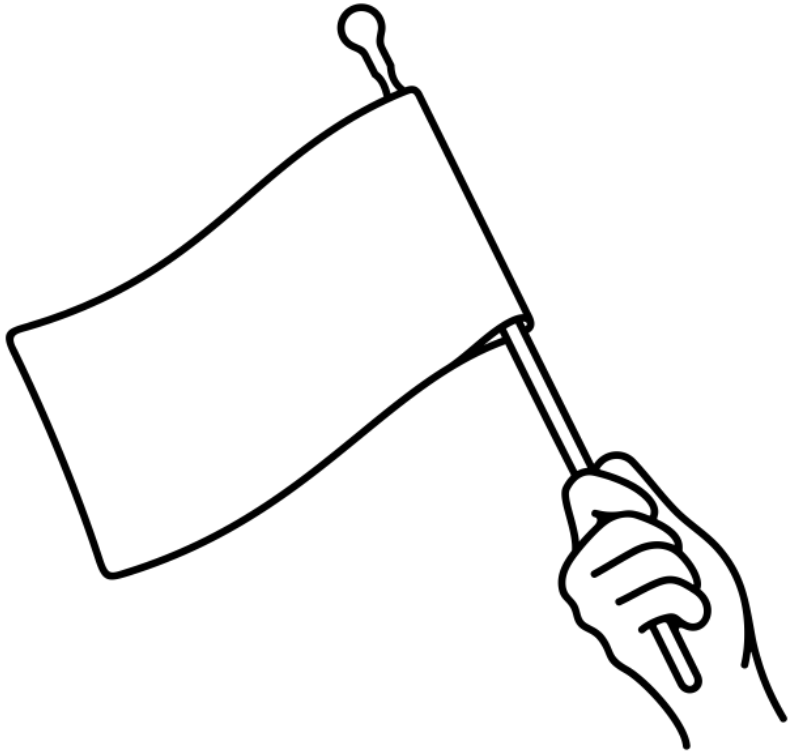
@LifeWatchVLIZ
@AquaticTracking

VLIZ
Vlaams Instituut voor de Zee vzw
Flanders Marine Institute

EUROPEAN TRACKING NETWORK ETN

cost
EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

LifeWatch
BELGIUM

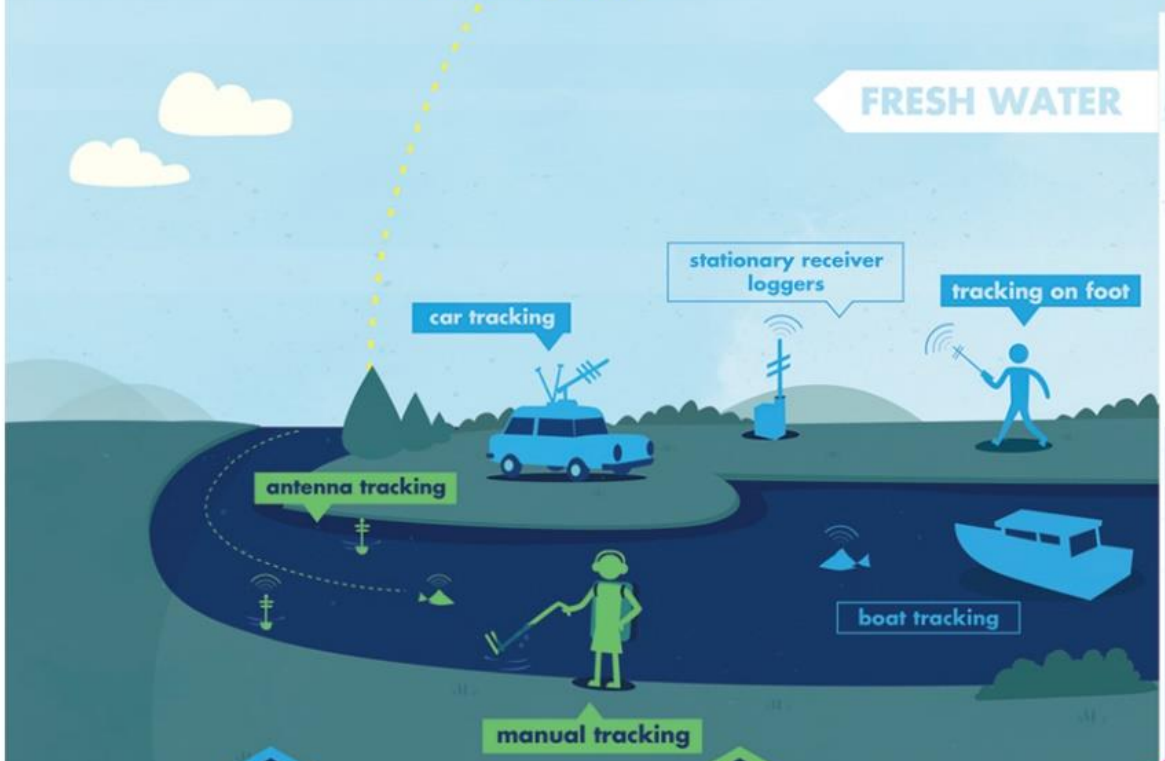


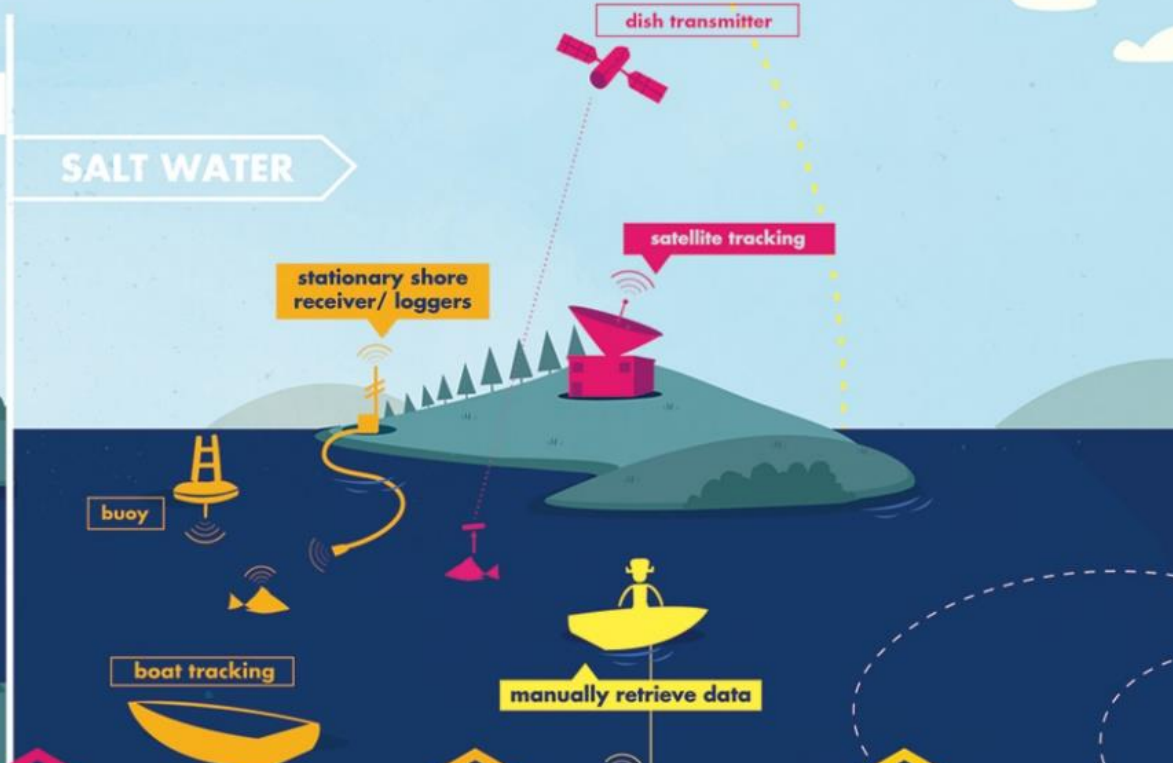
Created by Oleksandr Panasovskyi
from Noun Project

TRACKING METHODS

HOW WE TRACK AQUATIC ANIMALS IN THE WILD.

RADIO TRANSMITTERS | PIT TAGS | 'POP-UP' SATELLITE | ACOUSTIC TRANSMITTERS | ARCHIVAL TAGS





Works in fresh water

Used in rivers, streams, shallow lakes

Transmitter with antenna

Individual coded tags without battery

Charged by electomagnetic field

Long Lasting
Low detection distance (cm - m)

Stores and transmits data

Location and data sent via satellite uplink

Signal propagates through water

Used at sea, estuaries, lakes and rivers

Transmitter without antenna

Relatively cheap

Need to recapture fish to retrieve data