







# Smart observations and solutions Inspiration, practices and experiences from Lifewatch

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#### LifeWatch ERIC

#### e-Infrastructure for Biodiversity and Ecosystem Research

A distributed e-Infrastructure to support research and sustainability of biodiversity and ecosystems













## Marine Observatory Sensors





RV Simon Stevin sampling campaigns



Broadband Acoustic Network



Fish acoustic receiver network



Video Plankton Recorder (VPR)



Zooplankton imaging sensor Zooscan



Marine genomic observations



GPS Bird tracking network



Cetacean passive acoustic network



Sensor network for bat detection



Birdcams



Remote groundwater monitoring



Climate monitoring research infrastructure (KLIVEG)



Motus wildlife tracking network



Phytoplankton scanning sensor Flow cytometer



Phytoplankton imaging sensor FlowCam



Camera trap research infrastructure (CATREIN)



Space remote sensing sensors





## Marine Observatory

Smart moorings

End.





### LifeWatch Species Information Backbone Tools to process and standardize biodiversity data







#### **urobis**

European Ocean Biodiversity Information System



Marineregions.org









## Online portals and virtual labs

| 120            | Lifewatch               | data exp        | lorer  |   |                                  |                            |                         |  |                 |   |                         |  |
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#### **Belgian LifeWatch e-lab**

Straightforward user interface to run several data services in order to standardize, analyze and visualize data.



**Software packages** Open source software



Q

**Tutorials & Use cases** Documentation and illustration of LifeWatch web services







#### LifeWatch data cloud







## What's in here for port monitoring?





### Use Cases

Inspiration for intelligent monitoring in ports



- 1. Non-Indigenous Species
- 2. Underwater soundscape and detections
- 3. Camera detections in a marine environment
- 4. Tracking plastic pollution







#### Use Case I Non-Indigenous Species (NIS)







- **Problem**: Time intensive plankton microscopy
- Solution: high-throughput DNA/Imaging techniques









## Use Case II

#### Underwater soundscape and event detection







- Monitoring of the underwater sound environment
- **Problem**: Many interactions
- **Solution**: Al classification and detection of soundscape and marine mammals





#### Use Case III Camera detections in marine environments





- Tracking of movement on camera (birds)
- **Problem**: difficult scenery, waves,...
- **Solution**: Algorithms to automatically detect and track birds





### Use Case IV Tracking Plastic Pollution





- Where does the plastic come from?
- **Problem**: tracking of plastic movement
- **Solution:** Acoustic fish tags and the LifeWatch Permanent Belgian Acoustic Receiver Network
- Bert Teunkens (UAntwerpen), VLIZ Brilliant Marine Research Idea









