Project	AtlantOS – 633211
Deliverable number	D3.21
Deliverable title	ETN Database
Description	**D3.21** ETN Database: Development of a European Tracking Network component of researchers and database, sharing common standards and protocols, data formats and platforms, and interlinked to other existing or developing Atlantic Ocean networks in Canada, the USA, Africa, and South America (starting in Brazil) to provide a global Atlantic tracking network. **PM45**
Work Package number	3
Work Package title	Enhancement of autonomous observing networks
Lead beneficiary	Dalhousie University (Ocean Tracking Network)
Lead authors	Dalhousie University (Ocean Tracking Network-F. Whoriskey)
Contributors	VLIZ (Jan Reubens), IMAR (Pedro Afonso)
Submission date	3 June 2019
Due date	Month 45
Comments	The database was initiated in January 2018 and has been operational since June 2018. VLIZ designed and built the system with input from OTN and other members of the network and is now hosting and operating it.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement nº 633211.

Stakeholder engagement relating to this task*

WHO are your most important stakeholders?	☒ Private company If yes, is it an SME ☒ or a large company ☐? ☒ National governmental body ☐ International organization ☐ NGO ☒ others Please give the name(s) of the stakeholder(s): Private companies are Vemco/InnovaSea (Canada), Lotek (Canada), Sonotronics (USA) and Thelma Biotel (Norway). Other stakeholders include various academic and government science establishments participating in the network, including CEFAS-UK, NINA-NO, INR-IT, VLIZ-BE, IFREMER-FR, DTU-DK, IMAR-PT, OTN-Canada, LIFEIF-ES, NRC-IT, Loughs Agency-UK, Marine Institute-IE, University of Glasgow-UK, Queen's University Belfast-UK, University College Cork-IE, GMIT (Galway Mayo Institute of Technology)–IE, CCMAR-UAlg-PT, MARE University of Lisbon-PT, Cork University-IE, University of Karlstad-Sweden, University of Gothenburg-Sweden, MBL-UK, NTNU-NO
WHERE is/are the company(ies) or organization(s) from?	☒ Your own country ☒ Another country in the EU ☒ Another country outside the EU Please name the country(ies): Companies are from Canada, USA and Norway. Other organizations come from Belgium, Canada, Denmark, France, Ireland, Italy, Norway, Portugal, Spain, Sweden, and the UK
Is this deliverable a success story? If yes, why? **If not, why?**	☒ Yes, because the deliverable has from its inception networked researchers working with electronic telemetry systems across the EU and internationally. The networking will result in a more efficient, cost-effective use of existing resources to meet the needs of the EU and its citizens. By combining capacities and capabilities the network will allow European researchers to address significant research questions of importance to the EU for management and regulatory purposes that could not be addressed otherwise. The data system has found a home at VLIZ and will provide a lasting legacy that will live on beyond the end of the AtlantOS project.

	☐ No, because …
Will this deliverable be used? **If yes, who will use it?** **If not, why will it not be used?**	☒ Yes, by the European scientific community engaged in aquatic animal telemetry, marine resource management and climate change monitoring, and by national and international authorities who will use the knowledge available from the data system to inform decisions about managing blue growth, evaluating environmental impact assessments of proposed projects in European waters, and to address the requirements of various legal instruments such as MSFD and N2000. It is also expected that results from past and future aquatic animal telemetry studies will also be instrumental in informing and operationalizing proposed new Global Ocean Observing System (GOOS), Ecosystem and Biology (EcoBio), and Essential Ocean Variables (EOVs) on ***Fish Abundance and Distribution***, and ***Marine Turtles, Birds and Mammals Abundance and Distribution***. ☐ No, because …

NOTE: This information is being collected for the following purposes:

1. To make a list of all companies/organizations with which AtlantOS partners have had contact. This is important to demonstrate the extent of industry and public-sector collaboration in the obs community. Please note that we will only publish one aggregated list of companies and not mention specific partnerships.
2. To better report success stories from the AtlantOS community on how observing delivers concrete value to society.

*For ideas about relations with stakeholders you are invited to consult D10.5 Best Practices in Stakeholder Engagement, Data Dissemination and Exploitation.

ETN Database and interface

ETN Data portal

The European Tracking Network (ETN) data management platform is the central data portal of the ETN (Fig. 1). It is designed to give access to all types of fish electronic telemetry data (currently acoustic telemetry is supported, but this will be expanded in the future to other telemetry techniques such as data loggers and satellite tags as ETN aims at being all-inclusive) and provides an interface to manage, explore and download the metadata and data. The site is password protected and a data policy has been established by the community to manage access to stored data. An initial data restriction is in place limiting who may view data when the data is first stored, in order to protect the work of students/investigators, and in some cases individuals of species which may be facing conservation concerns and which could be put at risk (e.g., poaching) should the animal's location be revealed.

The ETN data portal has been developed by the Flanders Marine Institute (VLIZ) and is open to all European telemetry users. New developments and additional features are added on a continuous basis. The web application is built using PHP (using the Symfony framework) for the back-end side and Bootstrap/jQuery/Datatables/… (among others) to facilitate the development of the front-end side.

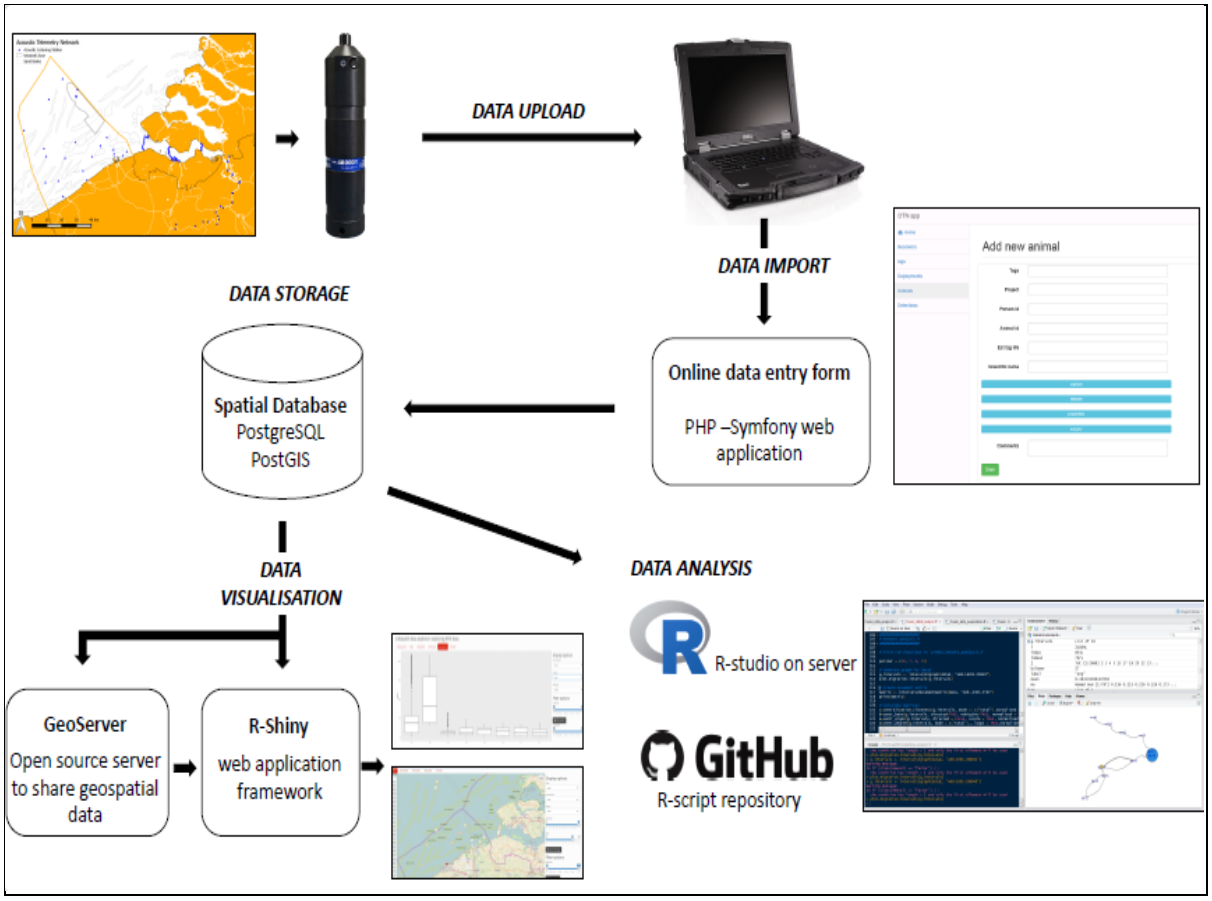

Figure 1. Overview of the dataflow from its registration on an acoustic receiver moored in the environment (top left) to the ETN data portal (bottom right).

Data model and Format

Within the data management portal, **4 general sections** (Fig. 2) are available to manage, explore and visualize the (meta)data:

1) Technology type
2) Metadata and Detection data upload
3) Metadata folders
    a. Receivers
    b. Tags
    c. Deployments
    d. Animals
4) Detection view

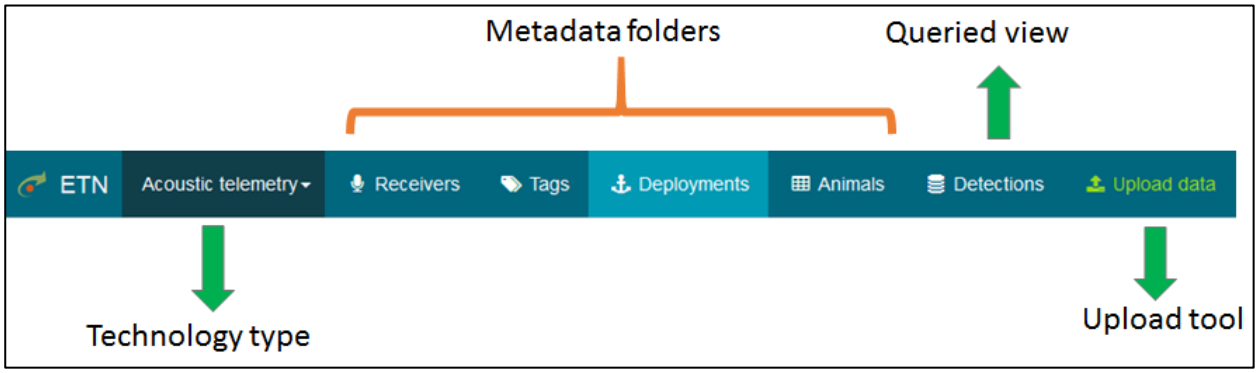

Figure 2- Overview of the different sections available in the data management portal

The ETN Format consists of two parts – the first applying to metadata and the second to detection data records. These formats are described by a number of downloadable documents and example files that are available on the portal.

All files, both for meta data and detection data, are required in .csv files using the established standardized formats. For detection data this will change in the future to accommodate brand specific files (e.g, Vemco .vrl files) that are used by the manufacturers of the telemetry equipment.

Quality control

There are several quality controls in place on different levels that help to improve data quality and avoid human errors.

Implemented Quality Controls:

QC on Detections	Identifying detections that occur before an animal's release date
QC on Detections	Identifying detections occurring before receiver deployment date

QC on Detections	Identifying detections occurring after receiver recovery date
QC on Deployments	No receiver is reported as assigned to more than one location at any given time ("overlapping deployments").
QC on Tag reuse	The data system accepts tag reuse, but first requires documentation of the original animal's recapture and a new metadata record for reuse of the tag

Additional QCs are planned to be added in future versions.

Data Access rights

Access to the data portal is restricted to registered members only. Individuals wishing to access the data portal may become a member of ETN, by registering at http://www.lifewatch.be/etn/login.

By registering, an individual indicates that they accept the ETN data policy (see below). Once an individual has their account, they can be added to user groups. A user group has restricted access to (meta)data of specific projects.

Data policy

By signing up to ETN new users automatically agree to accept the terms of the ETN data policy

1. Access to ETN

ETN makes a distinction between Restricted and Unrestricted Data. Unrestricted Data is all data that the data owners have agreed to make publicly accessible, or which have become publicly accessible as per the conditions of the ETN data policy. This data can be publicly accessed through the R-shiny data explorer: http://rshiny.lifewatch.be/etn-data/.

Restricted Data is data initially placed under a moratorium as described above. Access to this data is restricted to the Data Owner and their designated Collaborators and is in accordance with the moratorium rules as outlined in section 6.2 of the data policy.

2. Moratorium rules

- Receiver characteristics: there is no moratorium on receiver information (model, specifications, etc.).
- Tag specifications: there is no moratorium for tag information (model, programming, etc.).
- Receiver deployment information: there is no moratorium on deployment information (receiver location, date of deployment, etc.). All metadata is made publicly available immediately after installation. All open deployments (i.e. without an end date) will be visualized on a map on the ETN Data Portal. In exceptional cases (e.g., to protect endangered species), a deployment data moratorium can be requested, with the ETN Data Committee reviewing such requests.
- Tagged animal information: metadata related to tagged animals are by default placed under moratorium, in accordance with moratorium rule 5 of this policy.
- Detection data: detection data are by default placed under moratorium, with access or release of information granted as described below:

- Tag owners (and their designates) have access to all detections of their tags (including from receivers that do not belong to the tag owner);
- Receiver owners: all detections on the devices are shown together with species information (including from tags than do not belong to the receiver owners);
- Others: no access to detection information from data under moratorium is allowed unless granted by the tag owner.

- The moratorium period is by default set at 4 years, starting from the moment a tag is attached to an animal. The moratorium period can be extended on request, but earlier release of data is highly desirable. Principal Investigators may request extension to this moratorium period by one-year increments, with the ETN Data Committee reviewing requests. Upon the end of the moratorium period, all data become publicly accessible.
- Only detections from tags that are registered in the database (i.e. tags that are linked to a specific project) will be listed.

3. Use of Public Data

Any use of ETN Data in a publication, product or commercial application shall provide proper attribution to ETN and its members.

ETN should be cites as 'European Tracking Network – data management platform. Flanders Marine Institute, [year-of-data-download], [data-access-URL], accessed [date-of-access]' (e.g 'European Tracking Network – data management platform. Flanders Marine Institute, 2017, http://www.lifewatch.be/etn/, accessed 20-12-2017').

ETN should be acknowledges as 'Data was sourced from the European Tracking Network data portal (http://www.lifewatch.be/etn/), developed by the Flanders Marine Institute as part of the Flemish contribution to LifeWatch.'

Investigators using ETN-provided data have the responsibility to investigate and understand any limitations of the datasets. Neither ETN nor the Data Collaborators are not responsible for any inaccuracies in the provided data. Any problems with the ETN datasets provided should be reported to ETN for investigation.