

economic and ecosystem point of view. For these reasons, in our opinion, and according to the precautionary approach to fishery, further studies should be carried out in order to map this priority habitat, identify its boundaries, and then give precious information for the fishery management in the area.

**DEMO OF THE LIFEWATCH DATA SERVICES:  
ONLINE DATA PROCESSING TOOLS  
FOR BIODIVERSITY RESEARCH**

**S. Dekeyzer, F. Waumans, R. Houthoofd, B. Vanhoorne,  
A. Trias Verbeeck, L. Vandepitte, K. Deneudt, F. Hernandez**

*Flanders Marine Institute (VLIZ) – InnovOcean Site, Wandelaarkaai 7, 8400 Oostende, Belgium*

European and global biodiversity facilities, such as observatories, data bases and data systems, are often distributed and not linked to each other. Furthermore, the current availability of and access to biodiversity data at species level can be rather poor. Therefore, scientists who want to solve a certain scientific question first have to figure out which data can be found where, then they have to go to each facility separately and request the data, and, in case the data were indeed available, they have to face the challenge of piecing together all data to come to a coherent answer.

LifeWatch, a new e-infrastructure launched within the European Strategy Forum on Research Infrastructures (ESFRI) aims to integrate observatories, databases, web services and modelling tools, and thus act as a virtual laboratory to support and encourage scientific research on biodiversity and ecosystem functioning.

As part of the Flemish contributions to LifeWatch, the Flanders Marine Institute is making available several databases and data systems: e.g. the World Register of Marine Species (WoRMS, <http://marinespecies.org/>), Marineregions (<http://www.marineregions.org/>), the (European) Ocean Biogeographic Information System ((Eur)OBIS, <http://iobis.org/>, <http://www.eurobis.org/>), etc., and is developing several data services to make these and many more European and global data systems interconnected and accessible in one place. These data services are available through an online interactive data portal (<http://lifewatch.be/data-services/>), and assist scientists in data standardization, quality control, visualization, analysis and retrieval of additional data. As LifeWatch is still in its construction phase, the number of available data services will increase in the next years.

When used in a concatenated way (i.e. where the output of one data service is the input for another data service), these data services are currently already able to answer certain scientific questions: (1) For instance, the user uploads a list with marine place names (e.g. name of a sea or ocean) and wants to know which species have already been observed in these areas and how many times. To answer this question two data services were built: the first data service (Get lat-lon by name) matches these uploaded place names to the Marineregions gazetteer and translates these place names into MRGIDs (Marine Regions Geographic Identifier). The second data service (Taxon list of a certain region) checks how many species observations are linked to these MRGIDs in OBIS, and generates a species list per geographical area. (2) Or perhaps the user uploads a list with their own species observations (marine species name, latitude, longitude) and wants to know how many times these species were already observed in a certain radius (e.g. 1000m) around their observation points. To find the answer to this question, two more data services were developed: the first data service (Taxon match) matches the uploaded marine species names to WoRMS and translates them into an AphiaID (the unique identifier of Aphia, the database behind WoRMS). The second data service (Number of observations in a 1000m radius around a point) first defines a radius of 1000m around the uploaded latitude and longitude, and then, based on the AphiaIDs generated by the taxon match, determines the observation records for these species in OBIS, in this specific radius.

In the future, more European and global databases and data systems, containing both marine and terrestrial taxonomic, biogeographic, ecological and genomic data, will be linked to each other through additional LifeWatch data services. The final goal is to be able to answer scientific questions such as: (1) If I take a benthos sample in the North Sea, which species can I expect? (2) Which invasive pelagic species are known to occur in the Black Sea, (3) Give me the maximum and minimum salinity where organisms with DNA seq homology above x% with this DNA sequence (=seqA) have been found, etc.