

## **THE LIFEWATCH TAXONOMIC BACKBONE: SUPPORTING THE MARINE BIODIVERSITY AND ECOSYSTEM FUNCTIONING RESEARCH COMMUNITY**

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To support and encourage scientific research on biodiversity and ecosystem functioning, Europe launched LifeWatch within the European Strategy Forum on Research Infrastructures (ESFRI). LifeWatch functions as a central virtual laboratory, integrating observatories, databases, web services and modeling tools distributed throughout Europe.

As part of the Flemish contributions to LifeWatch, the Flanders Marine Institute (VLIZ) is setting up a central taxonomic backbone (TB) to facilitate the standardization of species data and the integration of the distributed biodiversity facilities.

The TB includes species information services (taxonomy access services, a taxonomic editing environment, species occurrence services and catalogue services) and integrates different component databases and data systems. Next to taxonomic information (taxonomic databases, species registers and nomenclatures), the TB will also include biogeographical data (species observations), ecological data (traits), genomic data and links to the available literature.

An important contributing database to the LifeWatch TB is the World Register of Marine Species (WoRMS), which currently holds >222.000 accepted species. Taxonomic information is supplemented with synonymy, vernacular names, species attributes, etc. Furthermore, there is a strong link between WoRMS and the (European) Ocean Biogeographic Information System ((Eur)OBIS) (currently >17.300.000 distribution records of marine species). To further complement the marine species distribution data in EurOBIS, a close cooperation with the European Marine Observation and Data Network (EMODnet) was established. To standardize geographic names between all data systems, Marine Regions, a standard list of marine georeferenced place names and areas (currently >32.000) is used. All these data systems are updated on a daily basis. As the TB is being constructed, more component databases and data systems will be integrated. In the near future the FADA database (Freshwater Animal Diversity Assessment) will be incorporated into the TB. Furthermore the collaboration with FishBase and Catalogue of Life (CoL) is being intensified. LifeWatch is supporting all these communities with a central data management task force, which is providing technical, logistic and financial support for upgrading and expanding the component databases. The LifeWatch TB should be fully operational by 2016.

This central TB will be a valuable asset to the biodiversity and ecosystem functioning research community. Through the species information services, researchers can standardize and validate their own biodiversity data. These services, along with geographic and tidal services are available on the Flemish LifeWatch portal (<http://www.lifewatch.be/data-services>).

## **ROV BASED DEEP-SEA INVESTIGATIONS OF THE A.V. ZHIRMUNSKY INSTITUTE OF MARINE BIOLOGY, FAR EASTERN BRANCH OF THE RUSSIAN ACADEMY OF SCIENCES**

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In 2011 and 2013, two expeditions aboard the RV *Akademik Lavrentyev* (owned by FEB RAS) to the Sea of Okhotsk have been organized together with the Far Eastern Aquarium, FEB RAS. For the first time, complex investigations of the deep-sea ecosystems of the Derjugin Basin (1700 m) in the deepest zone of the sea were performed using underwater robotics, among them a ROV, which is capable of sampling bottom substrates and certain marine invertebrates. Biological diversity was examined in active gas emission zones with high methane concentrations and in heavy-hydrocarbon seep areas.

The so-called Barite Mountains or barite "smokers", which provide the substrate for numerous benthic invertebrates, were examined with the use of remotely operated robotics for the first time. The peculiarities of the bottom landscapes of the Derjugin Basin were for the first time described in detail with the use of high resolution video equipment. Unique bottom communities with high densities and biomass of sea organisms that are supported by bacterial chemosynthesis and methanotrophy were described. About 200 species of deep-sea organisms were recorded, which is indicative of the high biological diversity of these deep-water communities. Mass assemblages of Okhotsk Sea endemic mollusks that are maintained due to chemoautotrophic symbiotic bacteria were discovered. Aggregations of pogonophore worms that are also nourished by symbiotic bacteria were discovered. Remarkably, the most active zones marked by mol-