Building a digital zooplankton sample library as part of the LifeWatch marine observatory

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Zooplankton is ubiquitous in the marine environment and concentrations of the different zooplankton species are used to determine the ecologic quality of these water bodies. Furthermore, as these organisms are at the base of the food chain, serving as food for higher trophic levels, zooplankton is a crucial component of the marine ecosystem of the North Sea.

As part of the marine observatory for LifeWatch, VLIZ is building a sample library of digital zooplankton images. Whereas traditional methods to study zooplankton are intensive and difficult to automate, the processing of zooplankton samples with a Zooscan is a quick, straightforward method that gives a clear insight in the taxonomic assemblage of a zooplankton sample. In addition, the data is collected and processed in a cheap, low risk and controlled environment.

With the ZooScan, high resolution digital images of preserved zooplankton samples are taken in a semi-automated way. Specific software (Plankton Identifier) can calculate several parameters on each particle in your sample. After creating a learning set for the digitized particles (e.g. manually assign taxonomic ranks to some specimens), the software is capable to assign specimens to high taxonomic level (e.g. *Calanus*, Apendicularia, Gammaridae, Cumacea, Isopoda,...). This method provides exact counts and size calculations of individuals on each taxonomic level. The visualization and count of micro-debris (e.g. plastics, fibres) is also possible. Long time series on zooplankton can yield information on ecosystem variability, or provide indication of anthropogenic changes, etc.

LifeWatch supports biodiversity and ecosystem research by building an infrastructure that allows researchers to communicate, share data, analyse results, create models, manage projects and organise training. All collected samples, both original and digital, are accessible to the scientific community.