A macro-ecological approach to the study of the vulnerability of aquatic environments to non-indigenous species: a case study by the Virtual Research Infrastructure LifeWatch Italy

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LifeWatch, the European Virtual Biodiversity Research Infrastructure, is a reference point for researchers, policy makers, public authorities and enterprises operating in the field of protection, management and the sustainable use of biodiversity and ecosystems.

LifeWatch Italy has proposed a European-level case study designed to assess the vulnerability of aquatic and terrestrial ecosystems to the arrival of non-indigenous species (NIS), in order to demonstrate the functionality of the e-infrastructure and its potential. Here we present the results of a first analysis conducted, on a national scale, on NIS presence in various typologies of aquatic environments (freshwater, transitional and marine), aimed at verifying the link between vulnerability to NIS and human activities.

Each of these environments is diversely affected by the NIS problem, which is of great interest both at national and international level, showing different rates of biodiversity alteration. To understand the mechanisms that cause the NIS success and to find adequate means of prevention, the LifeWatch community proposes a macro-ecological approach. It analyzes the drivers of NIS occurrence and the role played by climate change in facilitating their spread, so as to provide solutions that will lead to their reduction by applying effective measures for biodiversity conservation. The data used refer to a 30-year time span and include several taxonomic groups. All analyses were performed using dedicated R packages, which are one of the services provided by LifeWatch on the web.