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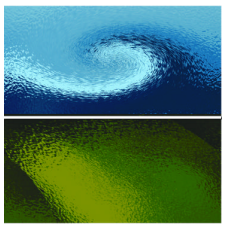

RESEARCH ARTICLE

TWReferenceNET: management and sustainable development of protected transitional waters.

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TWReferenceNET has been one of the largest European projects dealing with monitoring and conservation of transitional water ecosystems

The project involved 22 partners of five different countries, Albania, Bulgaria, Greece, Italy and Romania, which developed common field research activities on 16 lagoons in the Eastern Mediterranean and Black Sea, including a number of protected ecosystems and Ramsar sites (Le Cesine, Torre Guaceto and Grado-Valle Cavanata in Italy, Karavasta and Patok in Albania, Agiasma in Greece, Sinoe and Lehaova in Romania), a number of saltworks (Margherita di Savoia in Italy, Narta in Albania, Kalloni in Greece) as well as a few ecosystems heavily impacted by industrial activities (Pialassa-Baiona and Grado-Marano in Italy, Varna in Bulgaria) (Fig. 1).

The project had three major strategic objectives: (1) to ameliorate conservation of transitional water natural heritage health in the CADSES area, by deepening knowledge, producing technological innovation, reinforcing regulation and overcoming fragmentation of expertise and activities, of scientific, socio-economic and decision-maker competencies; (2) to reinforce territorial integration in the CADSES area on the environmental policy conservation strategies, according to the UE Directives (e.g., Nature 2000, Water Framework Directives); (3) to encourage socio-economic development in NMS coastal areas, by translating the efforts on conservation into sustainable development strategies, creation of new jobs opportunities and improvement of quality of life.

Fig. 1 – Map of the transitional aquatic ecosystems studied in TWReferenceNET.

Common field research activities addressed topic within the first two project objectives, representing the larges compelling intercalibration exercise currently existing at the European scale on transitional water ecosystems. In fact, one of the project work-packages was designed in order to support the implementation of the Water Framework Directive in the Mediterranean and Black Sea Eco-Regions. It dealt with trans-national studies and innovative strategies on monitoring and conservation of protected transitional waters and its major objective was to develop

methodological tools and standardise procedures to improve conservation strategies of public administration through an effective monitoring of the protected ecosystem ecological status.

TWReferenceNET fields studies focused on three biological quality elements, among those reported in the Water Framework Directive with respect to transitional water ecosystems, i.e., phytoplankton, phytobenthos and benthic macro-invertebrates. For every quality element, population and community level variability were accounted for at a hierarchy of different scales: the within ecosystem level, according to spatial differences in the major abiotic niche axes (e.g., water salinity and oxygen content, nutrients, substrate), the ecosystem level, according to differences in the hydrological, physiographic and physical-chemical component defining the abiotic niche space characterizing each ecosystem, and the eco-regional scale, according to climate and macro-distribution of species. Taking advantage of the experimental design, comparing a number of potential reference condition ecosystems with a number of differently stressed ecosystems, with which gradients of abiotic pressures were considered, the most compelling descriptors of ecological status and new descriptors, based on body size measurements and conceptually founded on the metabolic theory, were determined.

The size based approach offers an alternative and sensitive technique for describing and comparing benthic and pelagic communities. Body size is the first intrinsic attribute of each organism and numerous physiological and ecological processes are linked to it through the same general form

$$Y = a W^{b}$$

Where, Y = dependent variable, W = body size, a = normalization constant, b = scaling exponent. This equation is a power-law relationship because dependent variable can be expressed as power of another. The relationship is also called *scaling law* given that it describes how a dependent variable (Y) scales with a indipendent variable (W). On the basis of this fundamental relation, population and community level parameters scale with body size at some expected rate, which are likely to represent model reference condition.

In this issue, a number of contributions on both structural and functional characteristics of transitional water ecosystems, in the light of the implementation of the Water Framework Directive, are presented. The contributions were originally presented to the final meeting of TWReferenceNET, which was held in Lecce on November 30th – December 2nd, 2007, in the section dealing with trans-national studies and innovative strategies on monitoring and conservation of protected transitional waters. These papers, in a very synthetic form presents the bulk of data collected within TWReferenceNET and may represent a useful literature for researchers working in the area of interest regarding the evaluation of ecological status in Mediterranean and Black Sea transitional water ecosystems.

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