Benthic Diversity In Messolonghi Lagoon, Greece

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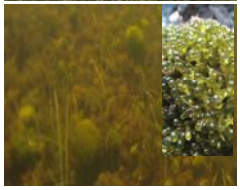
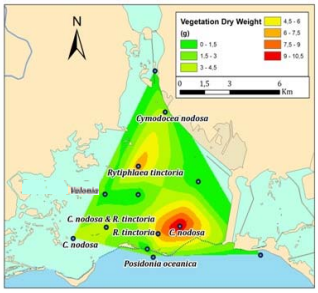
The lagoon system of Messolonghi is the largest lagoon complex in Greece covering about 15.000 ha. It is a Ramsar Site, Important Bird Area (IBA), and part of the Natura 2000 network. It was chosen as a case study to be included in the Initial Training Network project " Monitoring Mediterranean Marine Protected Areas" (MMMPA), aiming at developing tools for the assessment and management of coastal lagoons using benthic fauna and processes. The results of a preliminary survey carried out in the Central Messolonghi lagoon at the end of Spring 2012 are presented here.

Sampling site

The central Messolonghi lagoon is a relatively open basin communicating with the sea through a long frontal area interrupted by sand barriers. The North part of the lagoon is hydraulically connected to Aetoliko lagoon (brackish water) and receives the discharge of seasonal rivers. Effluent from a small sewage treatment plant enters at the head of the lagoon. The depth ranged from 0.40m to 3.0 m at the coastal stations.

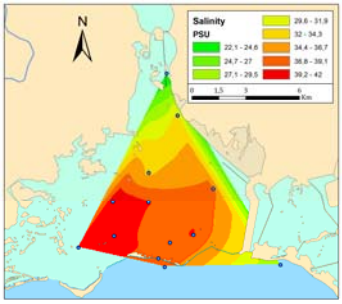
Benthic habitats

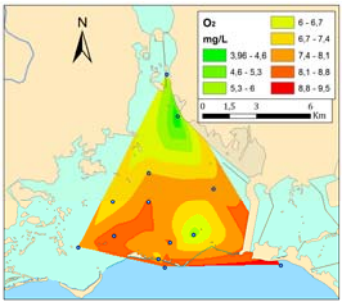




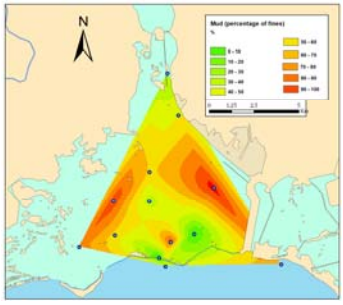
The muddier parts of the lagoon were bare while in the rest the sea-grass *Cymodocea nodosa* prevailed. Other, locally abundant, plants were the algae *Valonia aegagropila* and *Rytiphlaea tinctoria*. The outermost stations marked the beginning of a *Posidonia oceanica* meadow.

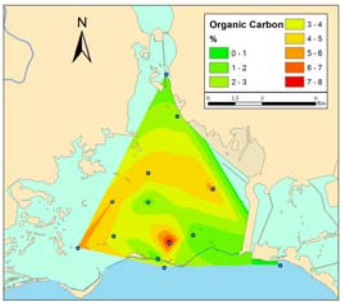
Environmental characteristics





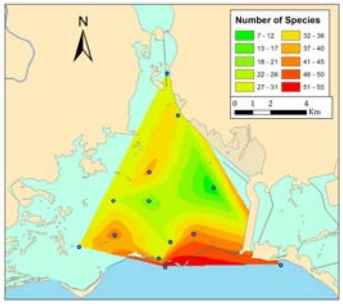
Salinity showed a gradient from N to S and from E to W with highest values at the SW due to the small depth, the restricted water circulation and the high evaporation.
Oxygen was lower at the inner parts influenced by the low oxygen water entering from Aetoliko and higher in areas communicating with the marine environment and in vegetated bottoms.

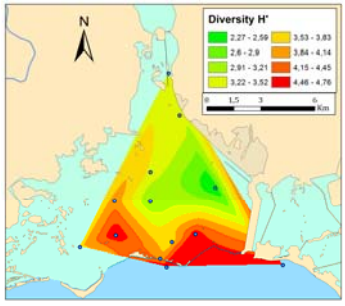




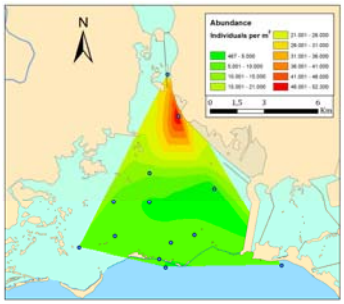
Finer sediment was found in the South-West and East parts of the lagoon and in the inner area of the barrier islands, reflecting the predominant hydrodynamics of the system.
Organic C content in the sediment (ranging from 1.6 to 11.7%) was highly correlated with sediment mud content ($p<0.005$).

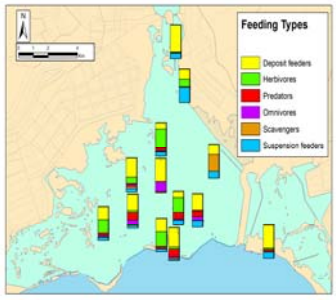
Benthic fauna





Typically lagoonal species, *Abra segmentum* and *Cerastoderma glaucum* were only found at the innermost station. Most ubiquitous and abundant were the species of the amphipod genus *Microdeutopus*. The sewage treatment plant did not show a direct effect on the fauna.
Higher number of species and highest diversity, exceeding those usually found in coastal lagoons, was found where communication with the coastal water was higher.





Abundance was extremely high in the inner parts of the lagoon. **Diversity of feeding types** was greater at the vegetated areas

Environmental and faunal characteristics in Messolonghi differ from those found in other coastal lagoons in Greece due to its openness: There is a greater variety of biotopes, higher diversity and species richness but no typical gradients and no significant correlation between biotic and environmental indices or confinement. Variation of species richness and abundance are determined by the habitat type.
Presently, to assess the environmental status of Messolonghi lagoon, a series of biotic indices based on seasonal sampling are being evaluated. Together with benthic diversity the distribution of the Colored Dissolved Organic Matter, the sediment-water fluxes and the organic matter processing by the benthos are being determined.