

Distribution, structure and state of seagrass habitats in the SW Black Sea (Burgas Bay, Bulgaria)

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Seagrass habitats play an important role in maintaining the biodiversity and functions of coastal marine ecosystems of the Black Sea. Eutrophication pressures in the 1970s and 1980s had a severe impact on phytobenthic communities, including deterioration, decrease in geographical and depth distribution and disappearance from certain areas. The state of *Zostera spp.* habitats in the SW Black Sea has not been studied since the 1970s. The purpose of this study is to evaluate the current distribution, structure and overall condition of seagrasses in Burgas Bay, Bulgaria.

Historical sites with seagrass meadows were surveyed by SCUBA diving between 2009 and 2014, using destructive sampling and georeferenced digital photogrammetry. Nutrient concentrations in water were measured seasonally at selected sites to study the effects of eutrophication on seagrasses. Seagrass biomass, shoot density, leaf length and leaf area index were measured. Species diversity and biomass of zoobenthic organisms were also determined. Community structure was analyzed with multivariate statistical methods based on photo and destructive samples. The geographical extent of the meadows was mapped in GIS on recent satellite images, then verified by georeferenced photo samples.

Results indicate that most of the seagrass meadows reported in the area in the late 1970s are present today. A decrease in the depth limit of the habitat was established in areas under local eutrophication pressures. A clear depth-related change in community structure was observed, where *Zostera noltei* dominated the 1-3 m depth range, followed by a mixed *Z. noltei* – *Zannichellia palustris* - *Zostera marina* community (3-4 m), and dominance of *Z. marina* between 4 and 7 m. Zoobenthic communities within seagrass meadows were dominated by the gastropods *Bittium reticulatum* and *Rissoa* sp., the bivalve *Loripes lucinalis*, and oligochaetes. Abundance and species richness, as well as faunal dominance were significantly higher in seagrass meadows than in adjacent unvegetated sediments.

Biometric parameters of *Z. noltei* showed significant correlations with measured eutrophication pressures (nutrient concentrations, LUSI index, sediment organic matter content). The ecological quality status of selected meadows was evaluated by using a multimetric indicator based on *Z. noltei* phenology data, which also showed clear correlation with anthropogenic pressures.