EGU2020-21904
https://doi.org/10.5194/egusphere-egu2020-21904
EGU General Assembly 2020

Habitat mapping and change assessment of coastal wetlands by using Sentinel-2 time series and ecological expert knowledge

Maria Adamo[1], Valeria Tomaselli[2,3], Francesca Mantino[2], Cristina Tarantino[1], and Palma Blonda[1]
[1]Institute of Atmospheric Pollution Research (IIA), National Research Council (CNR), c/o Interateneo Physics Department, Via Amendola 173, 70126 Bari, Italy
[2]Institute of Biosciences and BioResources (IBBR), National Research Council (CNR), Via Amendola 165/A, 70126 Bari, Italy
[3]Department of Biology, University of Bari "Aldo Moro", via Orabona 4, 70125 Bari, Italy

Coastal wetlands are one of the most threatened ecosystems worldwide. In the Mediterranean Region, wetlands are undergoing rapid changes due to the increasing of human pressures (e.g. land reclamation, water resources exploitation) and climate changes (e.g. coastal erosion), with a resulting habitat degradation, fragmentation, and biodiversity loss.

Long-term habitat mapping and change detection are essential for the management of coastal wetlands as well as for evaluating the impact of conservation policies.

Earth observation (EO) data and techniques are a valuable resource for long-term habitat mapping, thanks to the large amount of available data and their high spatial and temporal resolution. In this study, we propose an approach based on the integration of time series of Sentinel-2 images and ecological expert knowledge for land cover (LC) mapping and automatic translation to habitats in coastal wetlands. In particular, the research relies on the exploitation of ecological rules based on combined information related to plant phenology, water seasonality of aquatic species, pattern zonation, and habitat geometric properties.

The methodology is applied to two Natura2000 sites, "Zone umide della Capitanata" and "Paludi presso il Golfo di Manfredonia", located in the northeastern part of the Puglia region. These two areas are the most extensive wetlands of the Italian peninsula and the largest components of the Mediterranean wetland system.

Land Cover classes are labelled according to the FAO-LCCS taxonomy, which offers a framework to integrate EO data with in situ and ancillary data. Output habitat classes are labelled according to EUNIS habitat classification.