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Adriatic mix layer depth changes in September in the recent years

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In the recent years Adriatic Sea witnessed to different microbiological, termohaline with also the sea surface temperature changes interleaved with human impact, climate change and shifts in synoptical patterns. Adriatic Sea is under permanently modulated with Adriatic-Ionian Bimodal Oscillating System and North Atlantic Oscillation. This paper shows changes in termohaline properties in September, the period between Summer and Autumn. During summer months most cyclones that are appearing in the Adriatic basin and their tracks are classified as Genoa cyclones with a smaller number of Adriatic Cyclones. Autumn shows a different picture, with an equal number of Genoa, Adriatic, and non-Genoa and non-Adriatic cyclones. Large-scale air flow superimposed with Adriatic circulation have an impact during the transition from summer to autumn. The mix layer depth and termohaline conditions over Eastern Adriatic in the September in the period 2005 – 2020 are detected form a large database of CTD measurements. The data used in this study were collected during acoustic surveys conducted within framework of projects PELMON (2005-2012) and MEDIAS (2013-2020), carried out by Institute of Oceanography and Fisheries and supported by Croatia's Ministry of Agriculture. The CTD SBE25 probes used in the experiment were regularly calibrated and all measurements was quality controlled. In order to extract characteristic patterns from temperature and salinity vertical profiles and to connect them to wind and sea surface air pressure obtained from ERA5 reanalysis the unsupervised learning approach was utilized and the Neural gas algorithm was applied. The results show that the changes in mix layer depth are connected with interannual changes in cyclone path are connected with wind regime.

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