



The EMSO-E2M3A Southern Adriatic Regional Facility: Interconnectedness of a variety of processes at different spatial and temporal scales, their interaction and recurrence.

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The EMSO-E2M3A South Adriatic Regional Facility provides high-frequency (every hour) temperature and salinity data from 2006 to 2019 along the water column from 150 dbar to the seafloor. Their study reveals processes on different temporal scales, i.e. daily, seasonal, intra-annual and inter-annual, as well as their recurrence (seasonal or not) and climatic trends. The area is characterized by cyclonic circulation, which preconditions deep convection processes that involve both atmospheric and ocean dynamics, forming new, dense and oxygen-rich waters. There are intermittent influxes of high salinity water from the Ionian Sea, that favor salt fingering, and dense overflows from the northern Adriatic. The region is also subject to strong surface cooling. Data collected by the E2M3A observatory allows monitoring of variability on short scales related to convection and submesoscale processes. On an intermediate time scale, changes in basin circulation are monitored, and on a larger time scale, climate variability in the area is monitored. The various processes interact in a nonlinear manner, highlighting the importance of high-frequency measurements of rapid processes and their interaction with and correction of slowly varying properties on a longer time scale.

From ADCP data, the signature of zooplankton migration at the surface/intermediate layer is determined to be enhanced by convection-induced mixing. On the monthly scale, thermohaline variability increases substantially due to oscillations triggered by a combination of factors that include salinity intrusion into the intermediate layer, strong heat loss at the surface, and variability in vorticity during the winter months. The lower layer of the pit has been characterized by a slightly positive trend in temperature and salinity over the last decade, interrupted only by the inflow of dense water from the northern Adriatic Sea cascading through the Canyon of Bari.