



Interdecadal thermohaline changes in the Ionian Sea (Eastern Mediterranean) and their link to large-scale climate variations

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In situ observations indicate that the Mediterranean Sea has been experiencing significant thermohaline changes in the past decades both at the surface and in its deep part. Most prominent during the last 25-30 years are the progressive basin-scale warming trends observed at the surface and in the ocean interior. In this context, the deep Eastern Mediterranean Sea and in particular the Ionian basin experienced a warming of about 0.13°C according to data collected at depths larger than 2500 m. However, scarseness and shortness of instrumental records prevent robust attribution of such interdecadal oceanic changes to long-term variability of anthropogenic origin or natural interdecadal variability.

Here, we use available observational datasets to quantify interdecadal thermohaline changes in the Eastern Mediterranean and relate them to known large-scale forcing of Mediterranean climate variability. We also use outputs from numerical ocean model to identify potential forcing mechanisms and dominant propagation pathways of signals in the Mediterranean Sea, from the sea surface toward the ocean abyss. We focus on the deep Ionian Sea, which is a major basin of the Eastern Mediterranean where local water masses and circulation are deeply influenced by Adriatic and Aegean dense water contributions. Finally, we discuss our results in the light of the present knowledge of the central Mediterranean Sea response to long-term global warming.