

A MODEL OF WINTER ATMOSPHERIC COOLING AND CONVECTION IN THE LEVANTINE BASIN

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Process studies investigating the dynamics and mechanisms of formation of the Intermediate and Deep Water in the Levantine basin are made, based on model simulations driven by initial oceanographic data and high resolution atmospheric forcing. The important effects of the interannual variability of winter atmospheric cooling in the formation process are emphasized by comparing realizations in different sets of conditions in different years.

The Princeton Ocean Model (POM) was used for simulations, initialized with real data. The periods of interest, supported by extensive synoptic data coverage were : (a) October 1986 - March 1987, (b) July 1988 - March 1989, and (c) October 1991 - March 1992, for which initial conditions covering the entire Levantine Basin and verification data at the end of the simulation were available. Persistent open boundary conditions for the semi-enclosed oceanic domain were determined by data extension and melding techniques, using synoptic / climatological data.

The 1987, 1989 and 1992 winters are characterized with massive LIW formation in the region. In addition, Deep Water was formed in the extreme winters of 1987 and 1992. The specific atmospheric and oceanic states leading to such differences are compared between these two cases.

