



Toward tracing routes of bottom waters in the Eastern Mediterranean basin using a multidisciplinary approach

Angelo Rubino (1), Davide Zanchettin (2), Manuel Bensi (3), Vanessa Cardin (3), Dagmar Hainbucher (4), Franco Baldi (5), Davide Marchetto (5), Francesca Mapelli (6), and Sara Borin (6)

(1) Dipartimento di Scienze Ambientali, Informatica e Statistica, Università Ca' Foscari di Venezia, Calle Larga S. Marta 2137 - 30127 Venice, Italy, (2) Ocean in the Earth System Department, Max Planck Institute for Meteorology, Bundesstr. 53, 20146, Hamburg, Germany, (3) Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, OGS, B.go Grotta Gigante 42/c, Sgonico, Trieste, Italy, (4) Institut für Meereskunde, ZMAW Universität Hamburg Bundesstraße 53 20146 Hamburg Germany, (5) Dipartimento di Scienze Molecolari e Nanosistemi, Università Ca' Foscari di Venezia, Calle Larga S. Marta 2137 - 30127 Venice, Italy, (6) Dipartimento di Scienze per gli Alimenti, la Nutrizione e l'Ambiente, Università degli Studi di Milano, Milan, Italy

We use near-bottom measurements of total mercury, biopolymeric carbon and its constituents, microbial activities, and bacterial diversity to attempt tracing routes of convectively generated bottom waters toward the abyss of the Eastern Mediterranean basin. The advantage of employing these parameters -which are often linked to persistent biological activities rather than to episodic flow phenomena- to complement the traditionally used ones (temperature, salinity, and dissolved oxygen) is twofold: they can yield valuable information even when the values of temperature and salinity in competing sources are virtually indistinguishable and they can allow also for a spatial and temporal integration of the export of newly formed deep waters. In our case study -the Eastern Mediterranean basin, which can be considered as a miniature global ocean - the proposed method seems to be able to capture two different exporting routes from the northern convective source and one exporting route from the eastern convective source, thus elucidating further aspects of the structure and variability of the local deep stratification.