

**CONTINENTAL SHELF ADJUSTMENT AND CIW FORMATION IN THE BLACK SEA  
- A STRATEGY FOR ANALYSES AND MODELLING**

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**ABSTRACT**

Water cooled in wide continental shelf areas in winter is a possible source contributing to the Cold Intermediate Water (CIW) in the Black Sea and to the North Aegean Deep Water (NADW) in the northern Aegean. The compensating effect of low salinity with respect to lowered temperature in winter is expected to oppose dense water formation in the inner shelf, while the cooling and increased salinity outside the river plumes but still within the shallow shelf areas can contribute to dense water production. The particular cross-shelf dependence and localization of possible dense water production are not well established. The analysis of limited winter data and some numerical experiments seem to suggest that the dense water contribution to the CIW occurs somewhere between the river influenced inner shelf and the rim current, from where it feeds the CIW in the interior region, subject to inter-annual variability.

The adopted approach involves data analyses and two-dimensional modeling to better understand the dynamical adjustment processes at continental shelves and slope regions based on the roles of rotation, friction, topography, variable stratification and mixing, boundary currents, changes in momentum and buoyancy fluxes, river / shelf-break fronts, and winter convection. The dense water after an adjustment process often remains on the shelf and attached to the slope regions. Dense water injection into the interior following formation on the shelf and a series of transient adjustment processes is an important but little understood process with potential to influence ocean climate.