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Spatial and temporal variability in the chemical properties of the oxic and suboxic layers of the Black Sea

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ABSTRACT

The Black Sea, a land-locked deep basin with sulfide bearing waters below 150-200m, has been subject to anthropogenic pressures since the 1970's. Large inputs of nutrients (nitrate-N, phosphate-P, silicate-Si) with high N/P but low Si/N ratios and subsequent development of intensive eutrophication over the basin have changed vertical distributions and inventories of nutrients and redox-sensitive metals in the oxic, suboxic and anoxic layers. Chemical data sets obtained between 1988-2010, and older data from before 1970 were evaluated to assess spatial/temporal variations of the dissolved oxygen (O_2), nutrients and dissolved/particulate manganese (Mn_d , Mn_p) in the water column from the lower salinity, oxygenated surface waters through the SubOxic Layer (SOL; $O_2 < 20 \mu M$; $H_2S < 1 \mu M$) to the anoxic, sulfidic water interface. Correlations were observed between salinity and nutrients (nitrate, silicate) in the nearshore waters off the Danube delta and in the southwestern (SW) coastal waters which had low Si/N ratios. Surface waters from the western central gyre were consistently depleted

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