# Long term hypoxic/anoxic conditions and nutrient enrichment in an east Mediterranean embayment: West Saronikos Gulf, Aegean Sea, Greece)

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The relationship between climate, hydrology, oxygen depletion and increase in nutrient concentrations is studied in the west Saronikos Gulf, a sub-basin of the Aegean Sea in the east Mediterranean Sea. This sub-basin, with maximum depth of 420 m, is the focus of the oceanographic interest because of its evolution into a near-bottom hypoxic/anoxic environment in the last 25 years. Despite that prior to the early 90s, it used to have a renewal period of 5 years, the last two deep-water oxygen ventilations occurred in 1992 and 2012. The isolation of the deep layers and the resistance to the deep mixing in the water column during the winter period has very likely been related to climatic factors, since the increase of the atmospheric temperature due to the global warming after the mid 90's has in fact decreased the upper-layer density (increased the water buoyancy). Consequently, the oxygen content at the deeper layer decreased significantly, with values below 1 mL/L in 2000 and finally, in 2004, anoxic conditions developed coinciding with high nutrient concentrations (phosphate: 1.92 mmol/$m^3$; silicate: 44.5 mmol/$m^3$; Dissolved Inorganic Nitrogen - DIN: 10.2 mmol/$m^3$). In winter of 2012, a deep intrusion of oxygen occurred in the deeper layers (350 m) of the sub-basin. Recent data showed oxygen content at the deep layer of 1.65 mL/L and relatively high nutrient concentrations (phosphate: 0.92 mmol/$m^3$; silicate: 32.3 mmol/$m^3$; DIN: 8.49 mmol/$m^3$). A possible violent deep mixing in the future would suddenly enrich the surface in nutrients, probably causing a substantial change in the trophic status.