



Dissolved iron in the Cretan Sea (eastern Mediterranean)

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ABSTRACT: Dissolved iron (Fe) distributions in the water column of the Cretan Sea show consistent patterns of elevated surface mixed layer concentrations (mean values of 1.44 and 1.95 nmol L⁻¹ in March and September, respectively) that rapidly decrease with depth to low and relatively uniform concentrations in deep waters (circa 0.5 nmol L⁻¹). These features are consistent with inputs of dissolved Fe to surface waters and with rapid scavenging to low values in deep waters. The main source of surface dissolved Fe is probably Saharan atmospheric dust, the supply of which is variable depending on sporadic dust storm events and transport to the Cretan Sea. The short residence times estimated for dissolved Fe in the mixed layer (0.7-2 yr) emphasize the rapid removal of this element from surface waters and are consistent with recent mass balance calculations for Fe in the western Mediterranean Sea, in which rapid removal of Fe to sediments is needed to provide a balance in the budget. The deep-water concentrations are strikingly constant and similar to or slightly lower than those reported for the open ocean. The high surface concentrations we observed would be ample to support substantial primary production, and it is likely that the macronutrients, and phosphorus in particular, limit production in this region.

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