

Sea bottom sediments of Elefsis Gulf: A potential secondary source of metals under simulated ocean acidification conditions

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Hypoxic coastal areas are considered as high-priority systems for Ocean Acidification (OA) research, because the cooccurrence and interaction of low oxygen with other environmental stressors, such as elevated pCO₂, warming and eutrophication, may put them at greater risk. In this work, an anoxic coastal phenomenon exhibiting relatively reduced pH at the near bottom water layer was studied. In-situ and microcosm experiment measurements, simulating OA conditions, were conducted in order to assess the fate of dissolved trace metals that could either sink towards the sediment or be released towards the water column. OA conditions seem to induce the release of Al, Ni, Cd, Fe, Mn and As from the sediment while, in combination with anoxia, a restriction in this dissolution mechanism was found. Cr, Zn and Pb seem to follow a sink type mechanism under more acidified conditions while, in addition to anoxia, a source type mechanism is revealed. Hg seems to follow a source type mechanism under OA in any case. Regarding Fe species, it becomes evident that Fe (II) is the dominant species, indicating an increased stability as a result of acidified conditions.