# Release of iron and manganese from Louisiana continental shelf sediments and impact on the water column

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Iron (Fe) and manganese (Mn) are key micronutrients for phytoplankton. Continental shelves are a major source of both Fe and Mn to the water column. The mechanisms controlling benthic release and its lateral transport on continental shelves ("shuttling") depend on a range of factors such as bottom water oxygen concentrations, rates of organic matter deposition and macrofaunal activity. The role of each of these factors in controlling the shelf dynamics of Mn and Fe is still incompletely understood.

In this study, we assess the benthic release of Fe and Mn at six stations along a shelf-to-basin transect on the Louisiana shelf in the Gulf of Mexico using water column, porewater and sediment data of Fe and Mn combined with *in-situ* benthic flux measurements. The two shallowest sites of our transect are located in the seasonally hypoxic area on the shelf. These sites are characterized by high benthic release of Mn and limited release of Fe. Further offshore, no benthic Fe and Mn release was observed due to limited deposition of organic matter. Water column concentrations of total Fe are an order of magnitude higher than those of total Mn, while dissolved Mn dominates over dissolved Fe. We discuss the controls on benthic release of Fe and Mn at the coastal sites including the potential for mobilization of both elements from the sediment later in the year and the impact on the water column. We also compare the benthic release and forms of Fe and Mn in the water column on the Louisiana shelf with those in the Baltic Sea and on the Romanian shelf in the Black Sea [1].

[1] Lenstra, W. K., et al., The shelf-to-basin iron shuttle in the Black Sea revisited, Chemical Geology, doi:10.1016/j.chemgeo.2018.10.024, 2018.