

Enrichment of heavy iron isotopes in suspended matter during estuarine mixing

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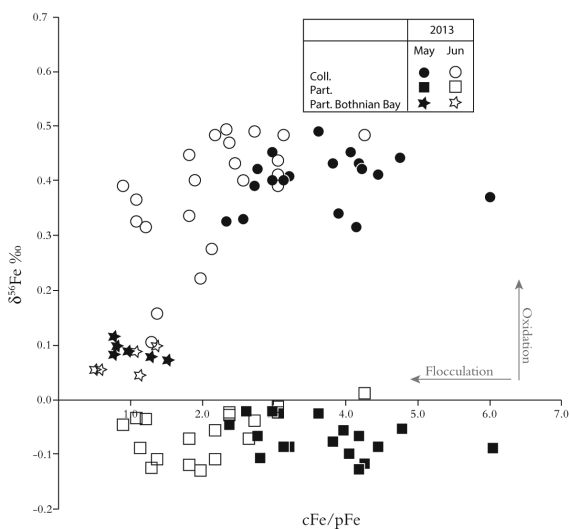


Figure 1: The figure shows that both colloids and particles are flocculating during estuarine mixing. The flocculation index is colloidal Fe/particulate Fe. Note the distinct separation between colloids (positive signature) and particles (negative signature).

Two groups of iron isotope signatures can be recognized during spring discharge in the northern part of the Baltic Sea (Fig. 1). Colloidal iron ($< 0.22 \mu\text{m}$) enriched in heavy isotopes and particles ($> 0.22 \mu\text{m}$) enriched in light isotopes. Negative colloids and particles are formed in the riparian zone during spring discharge. Both colloids and particles flocculate during early mixing without changes in the iron isotope signature. Data indicate that much of the negative particles are sedimenting below 2 psu, and another fraction is oxidized forming more positive suspended matter. In the open Bothnian Bay suspended matter shows only positive iron isotope signatures. Negative suspended matter is observed only during high discharge in spring, rest of the year riverine suspended matter is enriched in the heavy iron isotopes.