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Role of Mn for cycling of oxyanions (Mo, V and W) across the pelagic redox zone, Landsort Deep

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The Landsort Deep in the Baltic Sea is a stratified basin with a pelagic redox zone separating the oxic water from the sulphidic water below. In this zone redox cycling of Mn plays an important role for the distribution of trace elements. Freshly formed Mn oxide acts as carrier for trace elements across the redox zone. In the underlying sulphidic zone the adsorbed trace elements are released when Mn is reduced and the Mn particles dissolve.
Mn oxide has a negative surface charge at seawater pH conditions. Oxyanions would most likely adsorb on Fe oxides instead of Mn oxide due to the surface charge. The particulate Fe concentration in the redox zone of the Landsort Deep is 10-40 times lower than the concentration of particulate Mn. Therefore the Landsort Deep is an excellent place to study the role of Mn for cycling of oxyanions. This study shows uptake of Mo, V and W on Mn particles in the redox zone. Insights from this study may also be applicable for other oxyanion forming elements as P.
The Landsort Deep in the Baltic Sea was sampled over a two-year period. Detailed profiles for the dissolved (<0.22 μm) and particulate (>0.22 μm) fraction were taken across the pelagic redox zone. While the pattern of dissolved Mn is constant during the sampling period maxima for particulate Mn vary in concentration and depth. Throughout the sampling period Mo, V and W are following Mn in the particulate fraction within the redox zone.