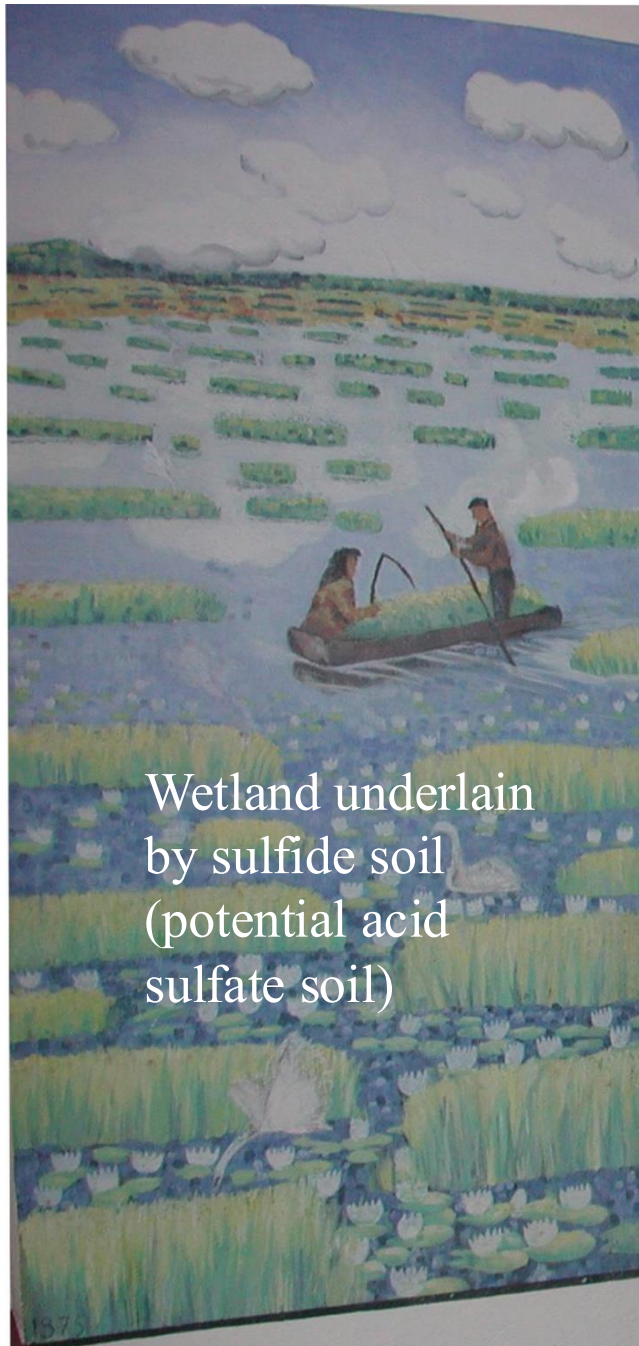


Waterlogging of acid sulfate soils (oxidised sulfide soils)



Wetland underlain
by sulfide soil
(potential acid
sulfate soil)



Acid sulfate soils





Acid sulfate soil

acidic ($\text{pH} < 4$) and metal
contaminated

Sandsjön, Västerbotten



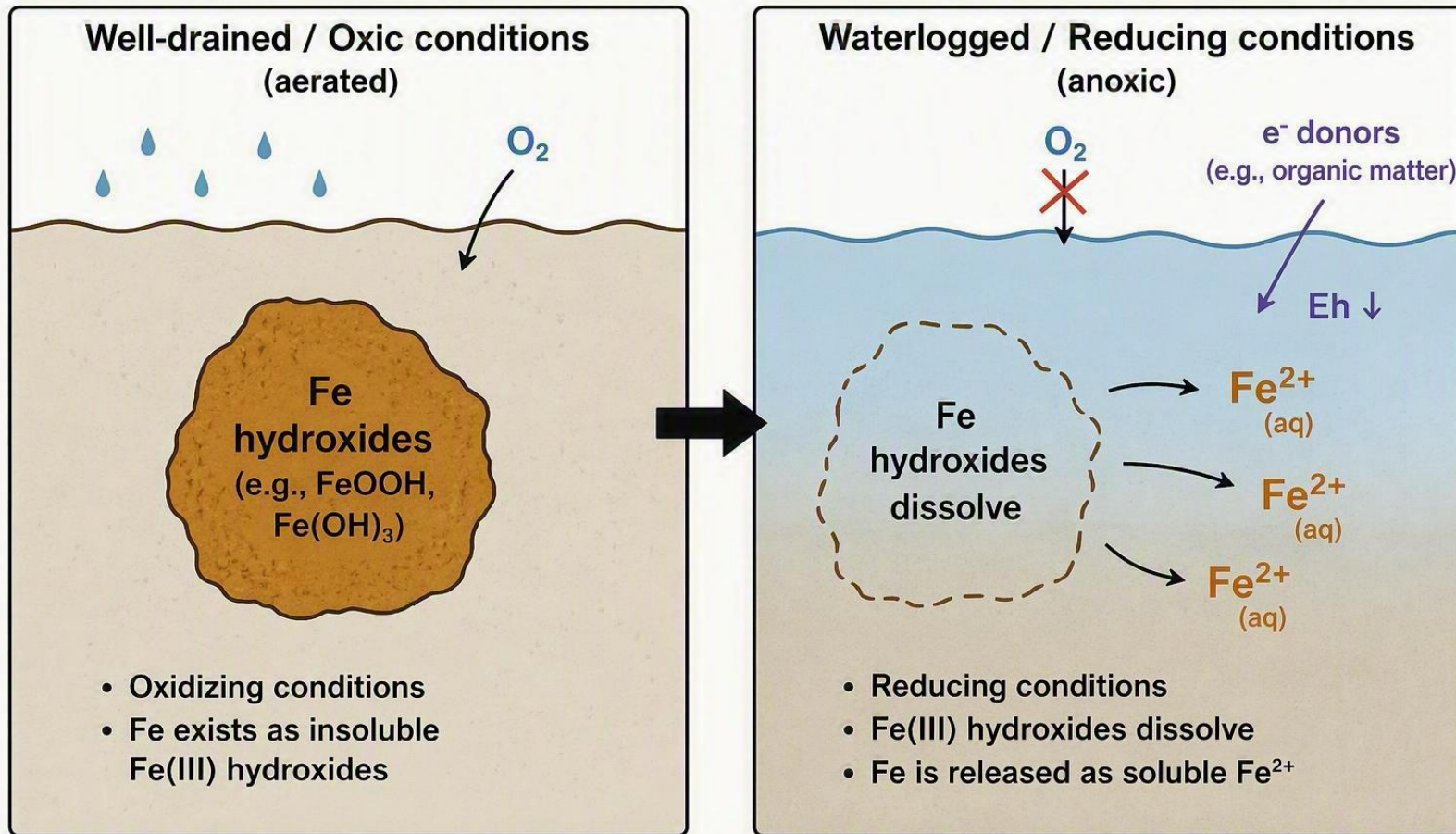
Photos: Tobias Eriksson

Is it a good idea to convert an acid sulfate soil into a wetland?
(ignoring their value as productive agricultural land)

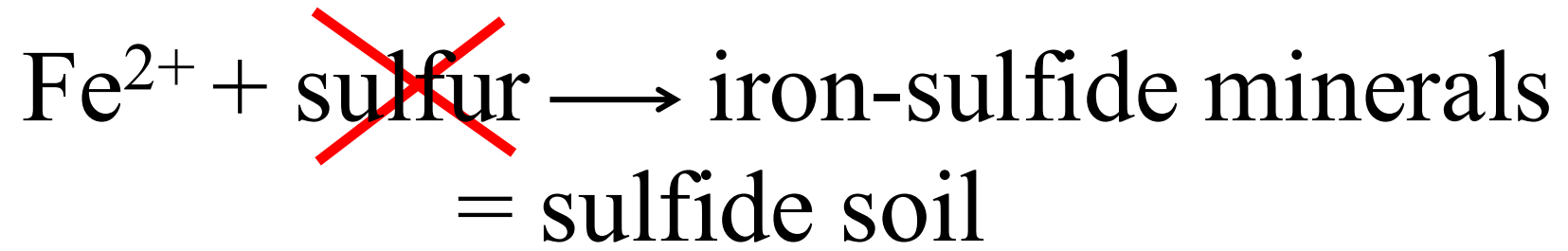
Yes, because in addition to the common benefits of wetland restoration it will cause:

- the pH of the soil to slowly increase
- toxic metals like aluminium, nickel, cadmium and manganese to become more immobile





$FeOOH$, $Fe(OH)_3$ = iron (III) hydroxides (insoluble)
 Fe^{2+} (aq) = ferrous iron (soluble)



Extensive accumulations of Fe hydroxides and microbial biomass



Biosphere reserve Kristianstads Vattenrike, south Sweden

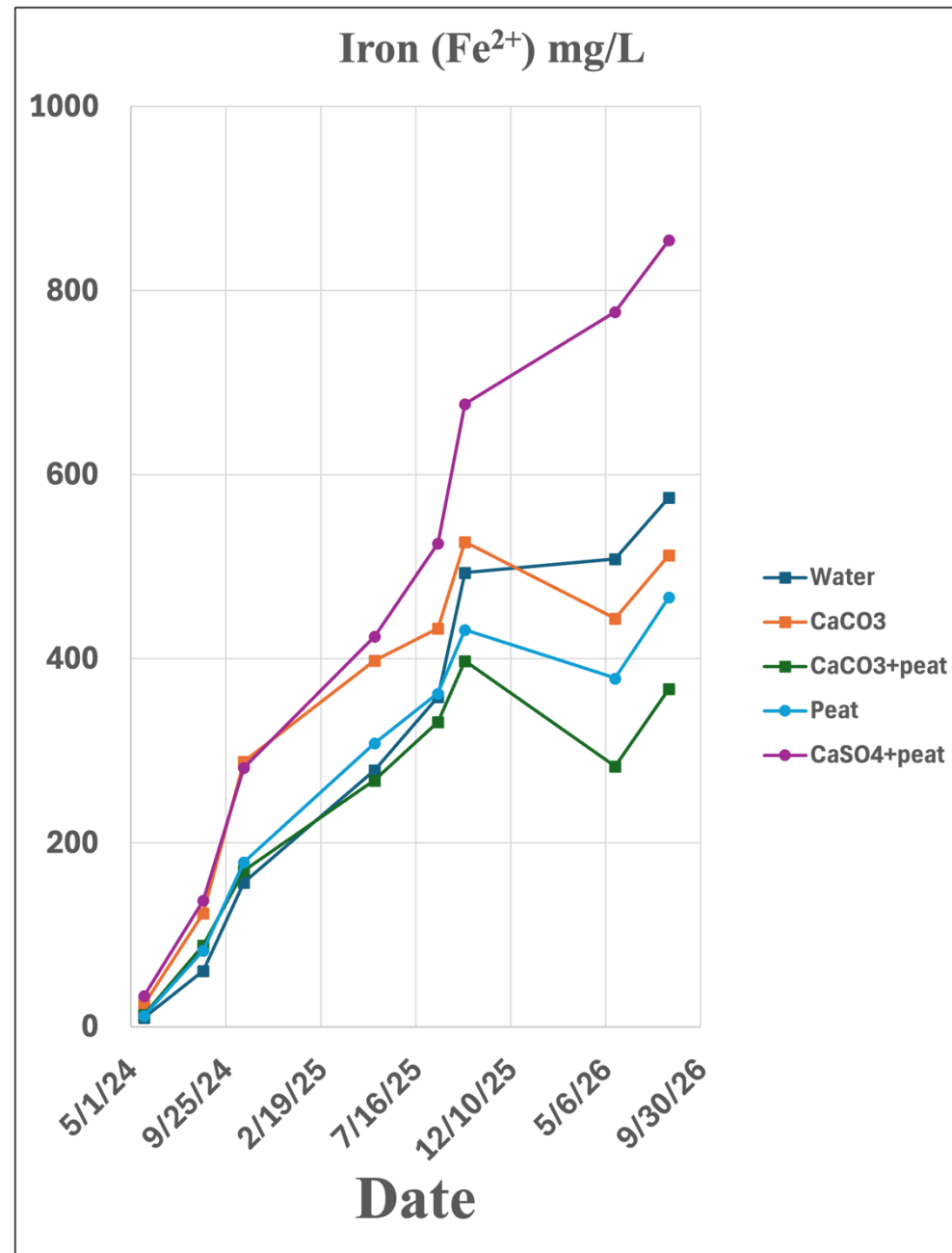


Photo: Sina Shahabi Ghahfarokhi

Mesocosm experiment



Photos: Eva Högfors-Rönholm



Furthermore, the Fe hydroxides efficiently bind phosphorus and other chemical elements like arsenic and chromium

Conclusions and recommendations

- Acid sulfate soils have the potential to release huge amounts of Fe when converted to wetland
- The extent of the impacts caused by the release of Fe (as well as other elements) will depend largely on the prevailing hydrological conditions and the ecological sensitivity of the receiving environment
- We need to clarify under which conditions and in which settings the negative impacts on the aquatic environment may be significant relative to the benefits associated with converting acid sulfate soils into wetlands.
- There is a clear need for further investigation of these phenomena under full-scale field conditions

Thank you for your attention

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