

## ***Interactive comment on “Factors influencing the dissolved iron input by river water to the open ocean” by R. Krachler et al.***

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As someone who is interested in modeling the oceanic iron cycle, this appears to be an interesting paper with interesting implications for the global cycle. The estimate of 15 Gmol of bioavailable input is particularly interesting, as it is quite large in contrast to what we are using for windborne dust estimates. Estimates of the export flux of carbon from the surface ocean are in the 10 Gt/yr range, and estimates of the Fe:C mass ratio are of order 1:10000, leading to an estimate of around 1 Mt/yr of bioavailable iron uptake or  $10^{12}$ g. This is about 20 Gmol/yr- a value that is significant in comparison with the estimate proposed here. So whether or not this complexed iron can make it out into the open ocean is a question of major interest to us.

However, it occurs to me to wonder whether the iron bound to fulvic acids really can stay bioavailable in riverine systems. In particular, I'd wonder whether mixing with more

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basic river water (for example water which contains higher levels of calcium carbonate) would have the same or different effect than mixing with seawater. Also, given that I believe some investigators have proposed that there may be particle scavenging of ligand-bound iron, I wonder what would happen if the iron-rich waters were mixed with more turbid river waters.

It would also be useful to cast these results in the light of Hutchins and Bruland's work off of the California Coast (see for example Hutchins and Bruland, *Limnology and Oceanography*, 43, 1037-1054, 1998), which shows a mosaic of iron limitation depending in part on riverine input. This work would suggest that one should also expect to see variability depending on the drainage basin of the different rivers.

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