Replies to Referee #1

Thank you very much for your helpful suggestions and constructive comments. Below are our responses to all your comments.

Fig. 1: I find the station numbering to be confusing. Would it be possible to number the stations sequentially from proximity to Amur River outflow? This would reduce the need to constantly refer to Fig. 1 while reading the text.

The station numbers have not been changed, because these are the same as those in our companion papers which have already been published from elsewhere (e.g., Jing et al., 2009; Isada et al., 2013; Nishioka et al., 2013) or are going to be published from an Okhotsk Sea special issue of the journal *Progress in Oceanography* soon. If the station numbers are identical, it would be helpful for readers to refer our data to the companion papers.

P376 L18-24: bit of a reasoning gap. Ligands protect Fe from scavenging, so we need to know Fe bioavailability to determine Fe limitation?

We have amended the sentence as follows:

The removal of Fe can vary depending on the origin and chemical structure of the Fe provided into the coastal waters, because Fe complexes with organic ligands may act to protect Fe from removal by scavenging (Buck et al., 2007). Therefore, to determine to what extent Fe is available for phytoplankton growth in such regions is crucial (Chase et al., 2007), because this in turn can control the structure and dynamics of lower trophic level processes in the near-shore environment.

P377 L3: suggest deleting "On the other hand"

Deleted.

P377 L21: just report dissolved Fe concentration in uM (not mg/L) Corrected.

P377 L24: this value (<0.2 nM) is representative of low-Fe HNLC waters, not just pelagic waters.

Corrected.

P379 L18-19: suggest moving "using the immunochemical Fd and Fld assays" to after "revealed" in this sentence

Amended.

P380 L21: Niskin-X bottles, or are these a different set of bottles from those referenced above (L4)?

"Niskin-X bottles" has been used in the revised manuscript.

P381 L11: water was passed through 200 μ m after passing through 20 μ m? I believe this is reversed.

This sentence is correct. The seawater concentrated with a plankton net of 20 μ m nylon mesh contained phytoplankton with \geq 20 μ m in size, and then it was filtered through 200 μ m mesh.

P381 L16: this Fd analysis is specific to diatoms? If so it would be helpful to remind the reader of that here.

Yes, the Fd analysis is specific to diatoms. Therefore, "diatom-specific Fe and Fld" has been used in the revised manuscript.

Fig. 8: What constrains the upper limit in Fig. 8? Why do the fits not go higher? Is anything constraining the max Fd and Fv/Fm?

We used a non-linear regression model for fitting our data into the Michaelis-Menten equation. Therefore, relatively low values of Fd index or F_v/F_m against D-Fe levels constrained their maxima. For example, the Fd index value at Stn C1 was clearly low (0.62) as compared with the D-Fe level of 10.80 nM.

P386 L9: why is it necessary to assume that Fucox and Peri were derived from diatoms and dinos? Isn't the regression independent of this assumption?

The following sentence has been added to our revised manuscript:

Although it is known that some dinoflagellates contain Fucox (Zapata et al., 2012), these could not be identified in this study.

P386 L24: Where is station E2? It isn't on map.

This was an erratum - It should be E3, not E2. We have amended it.

P387 L11-16: Are not both Fv/Fm and Fd indicators of physiological adjustments? Therefore, either measures might reflect Liebig limitation, and both measures may also change in response to nutrient stress.

In the revised manuscript, Boyd et al. (2005) has also been cited for the definition of nutrient stress. We believe F_v/F_m is not an indicator of physiological adjustment, because it is a proxy for algal growth rate – It is unnecessary to be accompanied with any physiological adjustment.

P387 L23: delete "simply"

Deleted.

P388 L13-14: If comparisons between the two studies are difficult then it shouldn't be done in the preceding sentences. Otherwise, this sentence should be removed. You can't make the comparison and then argue against making the comparison when it doesn't match. Also, this is quite a long paragraph. Can it be split into 2 paragraphs?

Following your suggestions, we have deleted the sentences "Since the sampling time differed between Yoshimura et al. (2010) and this study, that resulted in slightly different hydrographic conditions. Therefore, direct comparisons of the results between the two studies could be difficult." Also, this paragraph has been split into two in the revised manuscript.

P389 L17: delete "mainly". Also, in these discussion paragraphs you don't need to restate the correlation statistics which have been previously supplied in the results sections. They serve to break up the text and flow of ideas.

We have removed both "mainly" and the correlation statistics from the text.

P389 L24-25: two verbs in this sentence

"was also found" has been removed.

P390 L23: the work of Marchetti et al. (2009, Nature, 457: 467) would be good to cite here, as they show diatom Fv/Fm dropping before growth rate in diatoms that have accumulated luxury Fe.

Marchetti et al. (2009) has been cited.

P391 L5: clarify that the diatoms mainly consisted of Chaetoceros concavicornis in this area (as opposed to in either area)

This sentence has been modified as follows:

The results suggest that the micro-sized diatoms, which mainly consisted of *Chaetoceros concavicornis* and the species was minor off the Sakhalin Island (Table 2), were growing under Fe-deficient conditions.

P391 L25: change "covers" to "cover"

Amended.

P392 L3-9: not clear how this section relates to the previous section of the paragraph. Please clarify. Earlier you suggest that C. concavicornis may have been light limited, but then you suggest that they may be low-light adapted.

To remove this confusion, the section has been deleted.