Biogeosciences Discuss., 8, C3955–C3956, 2011
www.biogeosciences-discuss.net/8/C3955/2011/

Biogeosciences Discussions

Interactive comment on "A comparison of biogenic iron quotas during a diatom spring bloom using multiple approaches" *by* A. L. King et al.

E. P. Achterberg (Referee)

eric@noc.soton.ac.uk

Received and published: 27 October 2011

The relationships between supply of Fe, pools of Fe in surface waters and the Fe requirements by phytoplankton and their internal Fe pools are very hard to determine. The measurement of the pool of Fe in phytoplankton, and the Fe:C and Fe:P ratios provides a very useful approach to addressing this challenge. This research issue is important in the assessment of the iron status of phytoplankton and the CO2 uptake by phytoplankton as a result of natural or artificial Fe additions.

The submitted paper compares and contrasts three different approaches to determine Fe:C and Fe:P quotas in phytoplankton communities sampled during the onset and

demise of a diatom bloom in an Eddy off New Zealand. The dynamic environmental conditions did not make the comparison study easier, but did provide for interesting natural induced changes to the Fe pools and Fe quota. The quality of the data is high, and the data interpretation is thorough. This is a well written and important manuscript. The research community will benefit greatly from this thorough intercomparison exercise. It provides clear explanations on the advantages and drawbacks on the various approaches, which will aid modellers with their parameterisations. The paper does refer on a number of occasions to FeCycle II manuscripts which are in preparation. I understand the timing challenges of publishing research from an interdisciplinary study, and think that this manuscript can be published before the other work. However, the authors will need to be careful in their phrasing when referring to the papers in preparation (see below). I therefore recommend publication of the manuscript following minor corrections.

Specific comments P 9385 L 25: deionised water unit: mΩ cm-1 P 9393 L 25: higher concentrations P 9395 L 3: were.....those....

P 9400. Line 6-7: provide units P 9401. Line 16. It is awkward here to state that Boyd et al (2011) report..... This paper is not accessible as it is in prep. P 9402 The sampling for DFe was occasionally undertaken at different times to the sampling of cells. What would the effect be of this on 55Fe uptake measurements. P 9402. Line 6: uptake ratio P 9410. Line 11: There are approaches available to obtain a very high specific activity for 55Fe (e.g. see Zubkov et al., 2007 DSRII). This will then allow the addition of near-negligible 55Fe additions (low pM level). P9411. The very last sentence of the paper does not leave the observational or modelling community with a clear guidance. A better clarity in this sentence is required.

Interactive comment on Biogeosciences Discuss., 8, 9381, 2011.