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## ***Interactive comment on “Carbonate mineral saturation states in the East China Sea: present conditions and future scenario” by W.-C. Chou et al.***

### **Anonymous Referee #1**

Received and published: 16 April 2013

Overview Chou et al. present a comprehensive dataset based on which a thorough discussion on the future scenarios (by the way, please change the title and use plural for scenario) of carbonate chemistry (i.e., carbonate saturation state,  $\Omega$ ) under increasing atmospheric CO<sub>2</sub> level and/or worsening eutrophication are explored for surface and bottom water in the East China Sea. The entire manuscript is well written. The data presentation and discussions are generally clear and easy to follow. This study corroborates the existing studies that examine different areas of the world coastal oceans that are subject to both anthropogenic CO<sub>2</sub> stress and terrestrial nutrient delivery, and further stresses the importance of nutrient management in order to reduce the potential detrimental effect caused by human activities. I support the acceptance of this

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manuscript after some minor revisions.

Detailed comments: P5558, L10,  $\Omega$  for magnesian calcite is not defined by this equation. Please refer to

Walter, L.M. and Morse, J.W., 1984. Magnesian calcite stabilities: A reevaluation. *Geochimica et Cosmochimica Acta*, 48: 1059-1069.

if you intent to discuss Mg-calcite, although I suspect this mineral is not needed in the context of this paper.

P5558, L26, it should be more CO<sub>2</sub> is dissolved in seawater as low temperature facilitate this dissolution.

Throughout the text, pH at 25°C could be written as pH<sub>25</sub> (subscript) to reduce the redundancy.

P5570, L15-18, it is still higher DIC/TA ratio in low temperature environment. The authors may want to point this out in the beginning.

Sections 4.2. and 4.4, it appears that the authors derived the projected  $\Omega$  for surface and bottom waters differently. Although it may not matter much, I would suggest that they stick with one (i.e.,  $\Delta$ DIC) instead of applying future CO<sub>2</sub> to the CDW directly, as production of biomass could probably maintain a CO<sub>2</sub> equilibrium in the surface water regardless of air CO<sub>2</sub> level.

Figures There are a lot of contour plots for the water chemistry parameters, I would suggest that the authors to use larger fonts. Right now some of them for example Figs. 2-4 are a little hard to read.

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Interactive comment on *Biogeosciences Discuss.*, 10, 5555, 2013.

**BGD**

10, C1006–C1007, 2013

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