

Interactive comment on “Determination of plutonium isotopes in marine sediments off the Fukushima coast following the Fukushima Dai-ichi Nuclear Power Plant accident” by W. T. Bu et al.

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We appreciate the constructive comments of the reviewer. Our responses are as below:

General comments: In this report the authors measured Pu concentration in sediments before and after the FDNPP accident and concluded that the FDNPP accident did not cause detectable Pu contamination to the studied area. It is worthwhile to publish the data taken before the accident in the area where contamination would occur if Pu is discharged from the plant or through rivers from contaminated area in the future. And also it is important to investigate the fate of Fukushima-derived Pu, that was detected

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in the soil on land (Zheng et al., 2012a), in the ocean. However, the manuscript needs revision. The authors, especially Zheng and Yamada have been contributing to expansion of the knowledge base in marine geochemistry of Pu. Especially, the behavior of Pu in the coastal regions has been well documented in their series of papers. In addition, Zheng et al (2012b) already reached the conclusion that the sediments in the waters off Fukushima Prefecture have no detectable Pu from the accident. The sampling area in this manuscript is almost same as that in the previous paper. It would be better to place more emphasis on difference in the manuscript from the previous paper. And then the title, which is ambiguous, should be changed accordingly.

Response: The reviewer is right that we should emphasize the difference between this manuscript and the previous paper to make it clearer for the readers. Our previous paper only focused on the surface sediment Pu characterization to make a quick assessment (Zheng et al., *Geochem. J.*, 46, 361-369, 2012). In this work, we determined the vertical distribution of Pu in the sediment cores to make a more complete assessment as the possibility existed that quick downward migration of the deposited Pu in surface sediments could have occurred by diffusion and bioturbation effect since the sampling time was several months after the accident. In addition, information about the vertical distribution of Pu in the sediment cores can give more evidence for Pu source identification. For comparison, we also determined Pu isotopes in the sediments collected from seven Japanese estuaries before the accident. Following the reviewer's suggestions, we revised our manuscript by adding the above discussed contents to the introduction part. Please see page 4, line 21-26. We changed the title to be “Vertical distributions of plutonium isotopes in marine sediment cores off the Fukushima coast after the Fukushima Dai-ichi Nuclear Power Plant accident” to make it clearer.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/10/C426/2013/bgd-10-C426-2013-supplement.pdf>

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