

# ***Interactive comment on “Lagrangian simulation and tracking of the mesoscale eddies contaminated by Fukushima-derived radionuclides” by Sergey V. Prants et al.***

## **Anonymous Referee #1**

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### - Summary

This paper presents Lagrangian maps that visualize the origin, history and fate of the water masses in the mesoscale eddies off the coast of Japan. From the results, the authors argued: 1) the potential risk of contaminated water derived from the Fukushima nuclear power plant, 2) transition of water properties included in the mesoscale eddies and 3) qualitative correspondence between the Lagrangian maps with the observed Cs-137 data (Buesseler et al., 2012, Kaeriyama et al., 2013). The methodology is very interesting and the authors arguments 1) and 2) are understandable. However, the argument 3) is not supported by the results presented by this work. Paragraphs describing comparison with the observed data are just repeating the arguments of

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their previous works (Prants et al., 2014 and Budyansky et al., 2015). The argument 3) is very important if the authors discuss about the potential risk of contaminated water (argument 1). Consequently, I recommend to reinforce the argument 3) with their results presented in this work. The concrete problems regarding the argument 3) are described below.

- Problems regarding the argument 3)

p. 9 L. 32-p. 10 L. 7: This paragraph is totally describing results by Prants et al. (2014) and not by this paper. The observed data by Kaeriyama et al. (2013) showed especially high Cs-137 concentrations in the green segment of Fig. 2d. The result of this study showed that the green segment is corresponding to the blue color water mass (Fig. 2d), which means Cs-137 concentrations are low. The authors need to address this inconsistency and discuss possible reasons explaining it.

p. 10 L. 26-29: Kaeriyama's transect is not reaching to "yellow water"; I do not agree with the authors conclusion is supported by the observation by Kaeriyama et al. (2013).

p. 11 L. 4-13: This paragraph is describing results by Budyansky et al. (2015). There are no discussion for correspondence between the Lagrangian map with the observed data.

- Other issues

p. 9 L. 11: The meridional transect by Buesseler et al. (2012) is 144E, not 145E.

It is strongly recommended to add figures comparing the Lagrangian maps with the observed data. The comparisons are described in text, but they are hard to understand as readers need to look around the papers Buesseler et al. (2012) and Kaeriyama et al. (2013). Their data are publicly available and number of the data are not so many, it is easy to make figures to compare the Lagrangian maps with the observed data.

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