Biogeosciences Discuss., 9, C5657–C5660, 2012
www.biogeosciences-discuss.net/9/C5657/2012/

Biogeosciences Discussions

Interactive comment on "Inverse estimation of source parameters of oceanic radioactivity dispersion models associated with the Fukushima accident" *by* Y. Miyazawa et al.

Anonymous Referee #2

Received and published: 14 November 2012

This paper presents interesting results concerning the respective influence of the direct releases and the atmospheric deposit following the Fukushima Dai-ichi accident.

The main comment is that the model / measurement comparisons are not enough extended and detailed to appreciate the reliability of the results obtained.

Why the simulations stops the 6 May 2011? Significative extended measurements are available up to July 2011 with results from MEXT; TEPCO; Aoyama et al., 2012; Buesseler et al., 2012; Caffrey et al., 2012; Honda et al., 2012; Inoue et al., 2012.

Statistical quantification of the average differences between measured and simulated concentrations must be presented (normalized gross error and normalized bias error

for example).

In situ measurements are sufficient enough to made possible comparison between measured and simulated environmental half time and inventory of 137Cs quantities. The general reliability of the simulations could be tested in this manner with demonstration of how the models simulate the general dispersion process.

Figures 5 and 8 must be enlarged and quality improved. Significant differences between measured and simulated concentrations appear in Fig 8, the colour scale applied made difficult to appraise theses differences.

Fig. 10 must present results at stations at 15 and 30 km from the coast, which are more representative of the dilution in the Oyashio/Kuroshio mixing area.

If Table 3 presents the result of the best estimates, give the range of values tested. If it is not the case, a wider range of ocean and atmospheric multiple would be presented to appraise why the 5.9 and 9.5 values are finally selected.

Discuss the independence in time and space of the oceanic and atmospheric source terms as one contribution could masks the other and inversely. In particular, atmospheric contribution is characterized by a larger extent of deposit than the direct release. Could it mask a combined underestimation of the model dilution and oceanic contribution?

A map showing the total spatial distribution of the atmospheric deposit is not presented. Is it the same as from Fig.3 in Honda et al? In this case give the reference. If it is not, include a figure with the deposition map used.

Honda et al. do not present the time evolution of the atmospheric deposit. In Mathieu et al it appears that the end of the main atmospheric release is 17 March, do you agree? In this case, the 28-29 March deposition in Fig 2 appear late (10 days after). A consequence is that the oceanic and atmospheric contributions are more difficult to distinguish as they are nearly simultaneous.

Fig. 6 gives average contribution rates of the ocean and atmospheric parameters. I suppose this average encompass the whole simulation period (11 March – 6 May). It would be interesting to distinguish two periods: after the end of the atmospheric deposit (1 – 10 April for example), and at the end of the simulation (beginning of May). What explain the coloured dots distribution, are they the locations of in situ measurement?

P.13798 line 15 Is 38.5-43.3° N, 138.5-145.6°E the good area? Fukushima area is not included. P. 13786, line 20 the period duration is missing? (30 years). P. 13787, line 9 "." is missing before "Note". P. 13791, line 18 "." is missing after Bq in Bq.l-1 (two times).

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Interactive comment on Biogeosciences Discuss., 9, 13783, 2012.