Does the Fukushima NPP disaster affect the Caesium activity of North Atlantic Ocean fish?

bg-2012-649

(07 Jun 2013)

Final Response to comments given by reviewer Dr. Nies on 13 May 2013

We thank the reviewer Dr. Hartmut Nies very much for careful reading and appreciate very much the helpful and important comment.

Regarding the early (and large) estimates of total discharge of Cs-137 into the sea and the total atmospheric Cs-137 release by the Fukushima accident, we followed the proposal by Dr. Nies to include more recent – and thereby lower – estimates of these source terms. We added these newer estimates (taken from Povinec et al., 2013; Miyzama et al., 2013, Estournel et al., 2013) in the first and second paragraph of section 1. We added these three references to the References section. Note that two of these references belong to this special issue of BGD.

> It was expected that between 6 and 47 PBq (1 PBq=10^{15} Bq) of ^{137}Cs (half-live 30.17 y) was directly discharged into the Pacific Ocean (e.g. Bailly du Bois et al., 2012) in the aftermath of the tragedy. More recently, lower estimates of 4 to 6 PBq were found (Povinec et al., 2013; Miyzama et al., 2013, Estournel et al., 2013).
>
> The explosions of units 1 to 4 of FD-NPP also released radionuclides into the atmosphere, with an amount of about 12 to 15 PBq for each of ^{137}Cs and ^{134}Cs, respectively, (Povinec et al., 2013; Estournel et al., 2013); they were detectable around the world (e.g. Hsu et al., 2012; Stohl et al. 2012; Jakobs, 2011)

The full references are:

Estournel, C., Bosc, E., Bocquet, M., Ulses, C., Marsaleix, P., Winiarek, V., Osvath, I., Nguyen, C., Duhaut, T., Lyard, F., Michaud, H., Auclair, F.: Assessment of the amount of Cesium-137 released into the Pacific Ocean after the Fukushima accident and analysis of its dispersion in Japanese coastal waters. J. Geophys. Res., 117, C11014, doi: 10.1029/2012JC007933, 2012.

Miyazawa, Y., Masumoto, Y., Varlamov, S.M., Miyama, T., Takigawa, M., Honda, M., Saino, T.: Inverse estimation of source parameters of oceanic radioactivity dispersion models associated with the Fukushima accident. Biogeosciences, 10, 2349-2363, 2013; doi:10.5194/bg-10-2349-2013

Povinec, P.P., Aoyama, M., Biddulph, D., Breier, R., Buesseler, K., Chang, C.C., Golser, R. Hou, X.L., Ješkovský, M., Jull, A.J.T., Kaizer, J., Nakano, M., Nies, H., Palcsu, L., Papp, L., Pham, M.K., Steier, P., Zhang, L.Y.: Cesium, iodine and tritium in NW Pacific waters – a comparison of the Fukushima impact with global fallout. Biogeosciences Discuss., 10, 6377–6416, 2013; doi:10.5194/bgd-10-6377-2013.