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Interactive comment on "Rapid recirculation of FNPP1 derived radiocaesium suggesting new pathway of subtropical mode water in the western North Pacific to the Sea of Japan" *by* Yayoi Inomata et al.

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In this paper, the authors analyze radiocaesium, which originated mainly from nuclear bomb tests during 1950's-1960's and the Fukushima Nuclear Power Plant Accident in March 2011, in seas around Japan, specifically in the North Pacific south and east of Japan, the East China Sea, and the Japan Sea. The main finding of the manuscript, inferred from the title, seems to be the transport of subtropical mode water (STMW) from the North Pacific to the East China Sea through the Tokara Strait between Kyushu and the Ryukyu Islands and further to the Japan Sea, but I do not think that this finding

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is fully supported by the data.

This finding is probably based on Fig. 6 showing that the 137Cs activity concentration distribution in the East China Sea was relatively high north of 30N and low south of 30N. However, the Tokara Strait is the place where the Kuroshio rapidly flows eastward from the East China Sea to the North Pacific. If STMW transported westward by the Kuroshio recirculation approaches the strait, how can it cross the intense Kuroshio front? A more plausible explanation is that STMW containing radiocaesium reaches the western boundary at lower latitudes, is entrained into the Kuroshio, and is transported to the west of Kyushu by the Tsushima Warm Current bifurcated from the Kuroshio.

Other major deficits of the manuscript are:

1. There are too many grammar errors and typos throughout the manuscript.

2. I do not well understand what the words “recirculation” and “timescale” in this manuscript mean. In physical oceanography, recirculation means the return flow associated with an intense western boundary current, but the word seems to be used for “transportation” in this manuscript. Also, timescale usually means a cycle of temporal variability, but this manuscript does not treat any variability. All “timescale” in this manuscript can be deleted. For example, it is more appropriate to rewrite the first sentence of the abstract to “137Cs derived from the Fukushima Nuclear Power Plant Accident rapidly transported to the Sea of Japan several years after its release to the environment in March 2011."

3. In Sec. 1, the authors need to explain which part of the Japan Sea was influenced by atmospheric deposition in March 2011. They also need to explain clearly what the main purpose of this study, with necessary explanation of its background.

4. Section 2 does not explain at what depths radiocaesium was sampled, especially at the coastal monitoring stations maintained by the Japanese and Korean governments (Fig. 7). In addition, readers cannot understand in which part of the East China Sea

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(especially south of 30N) radiocaesium was sampled from Fig. 6, which does not show islands or bathymetry. These make it very difficult to understand the analysis in Sec. 3.2.

5. Although the aim of this paper is important to understand the “fate” of STMW (e.g., Gary et al., 2014, Journal of Physical Oceanography), the authors should understand that STMW is characterized by its low stratification or low potential vorticity, and not all water with potential density of 25.0-25.6 kg m-3 is STMW. When STMW is entrained into the Kuroshio at the western boundary, it rapidly loses its low potential vorticity and is not STMW anymore.

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