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Transport of FNPP1-derived radiocaesium from subtropical mode water in the western North Pacific Ocean to the Sea of Japan

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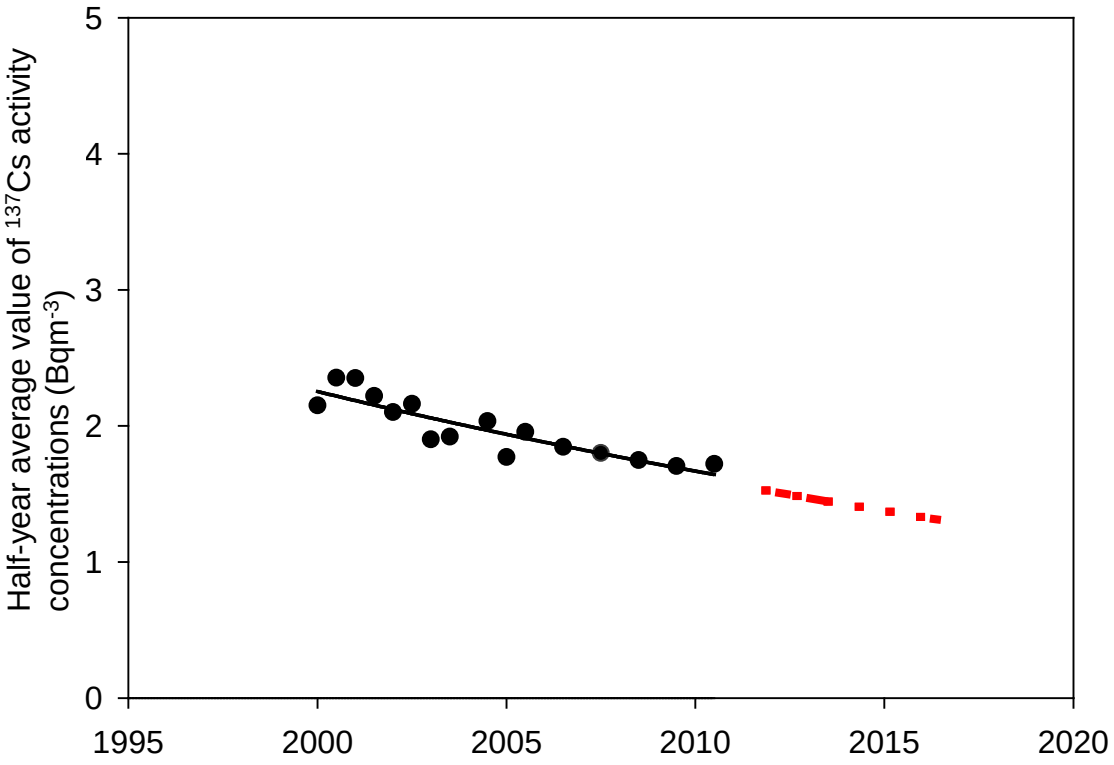


Fig. S1. The half-year average value of ^{137}Cs activity concentrations from 2000 to 2010 (black circle and line). Based on the exponential curve fitting, ^{137}Cs activity concentrations after 2010 were extrapolated to 2016 (red broken line).

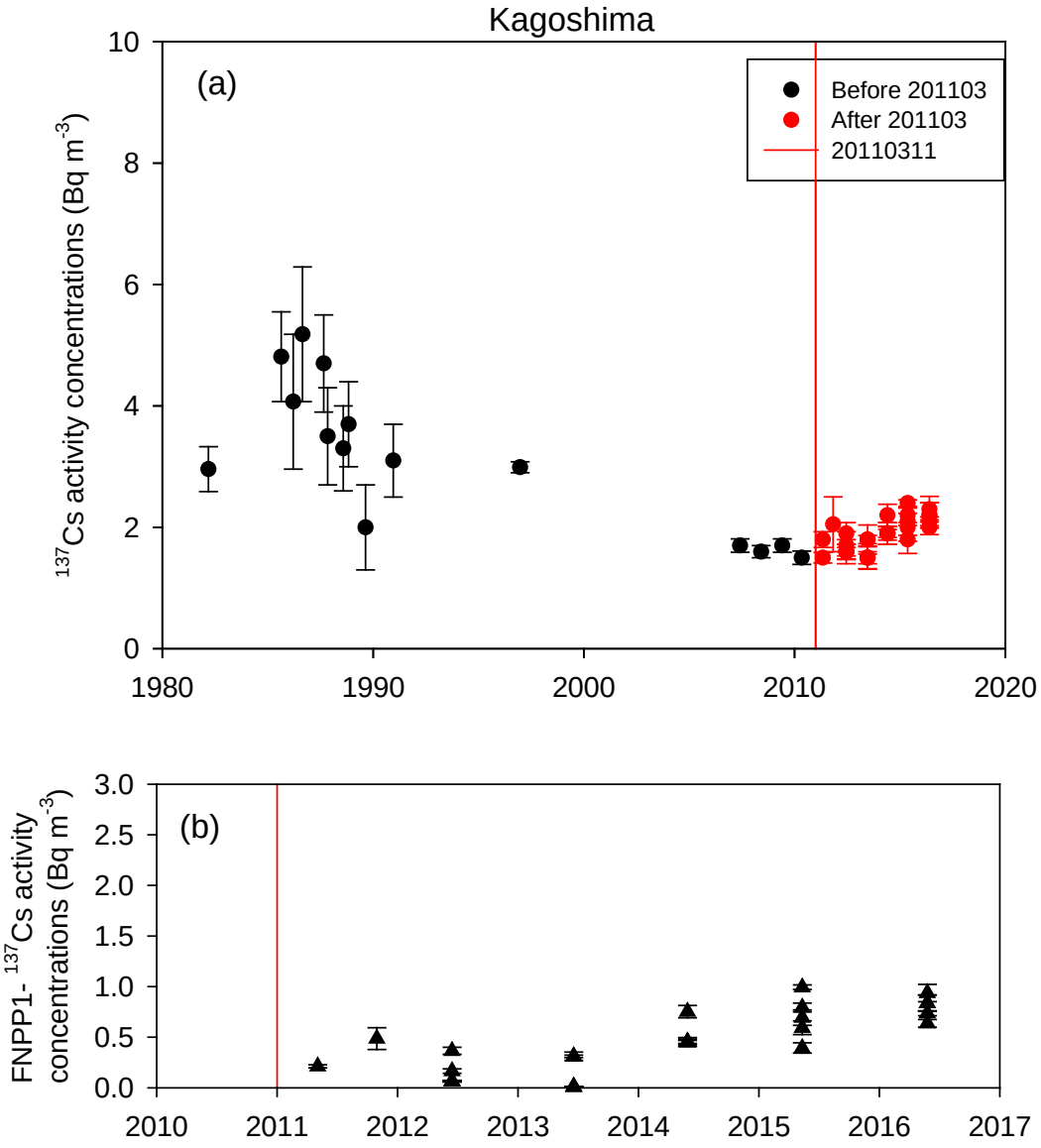


Fig. S2. Time variation of (a) ^{137}Cs activity concentrations from 1980 to 2016, (b) FNPP1-^{137}Cs activity concentrations at the station Kagoshima. The value was decay corrected to 11th March 2011.Vertical red line mean the FNPP1 accident day (11 March 2011).

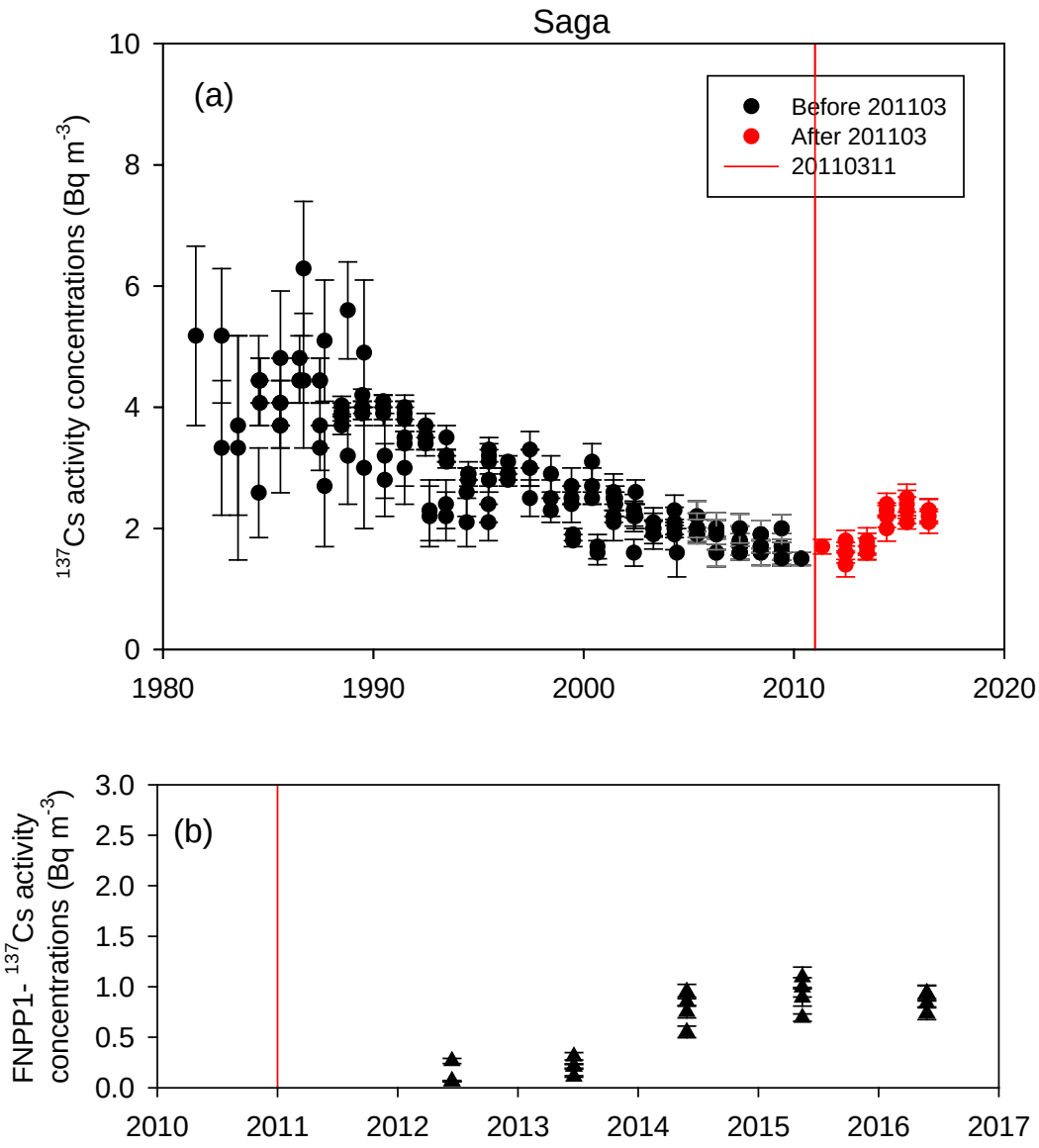


Fig. S3. Time variation of (a) ^{137}Cs activity concentrations from 1980 to 2017, (b) FNPP1-^{137}Cs activity concentrations at the station Saga. The value was decay corrected to 11th March 2011.Vertical red line mean the FNPP1 accident day (11 March 2011).

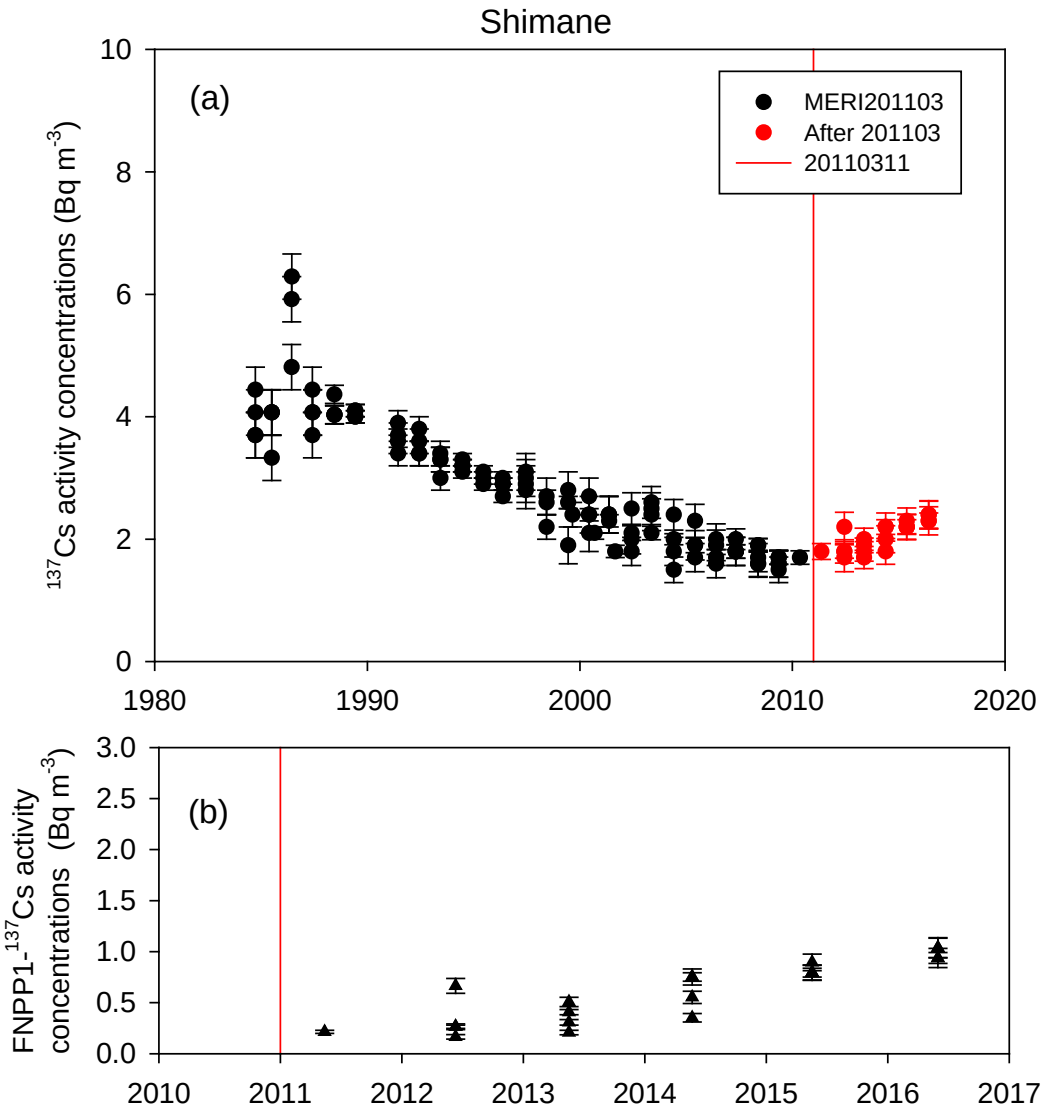


Fig. S4. Time variation of (a) ^{137}Cs activity concentrations from 1980 to 2017, (b) FNPP1-^{137}Cs activity concentrations at the station Shimane. The value was decay corrected to 11th March 2011.Vertical red line mean the FNPP1 accident day (11 March 2011).

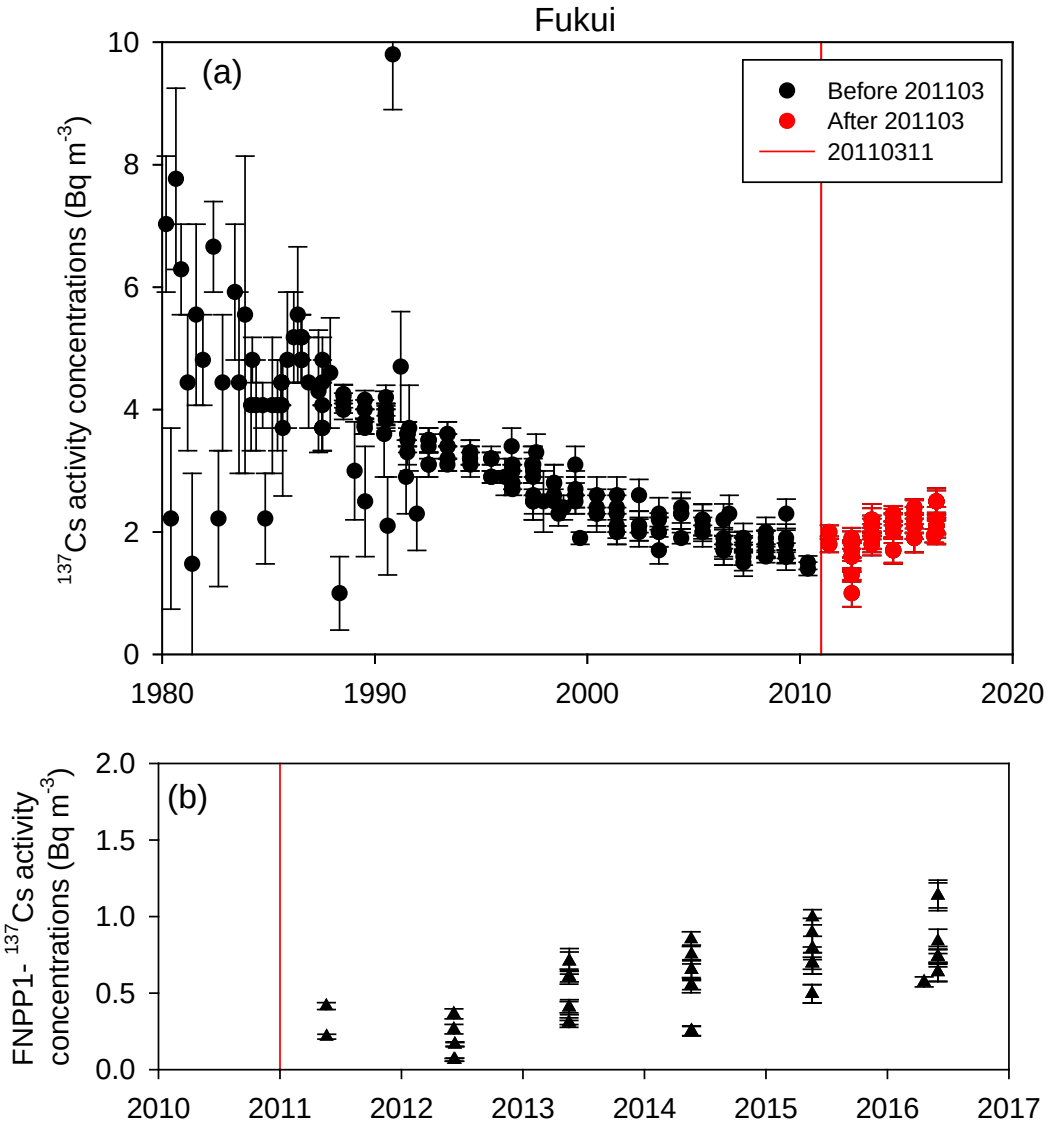


Fig. S5. Time variation of (a) ^{137}Cs activity concentrations from 1980 to 2017, (b) FNPP1-^{137}Cs activity concentrations at the station Fukui. The value was decay corrected to 11th March 2011.Vertical red line mean the FNPP1 accident day (11 March 2011).

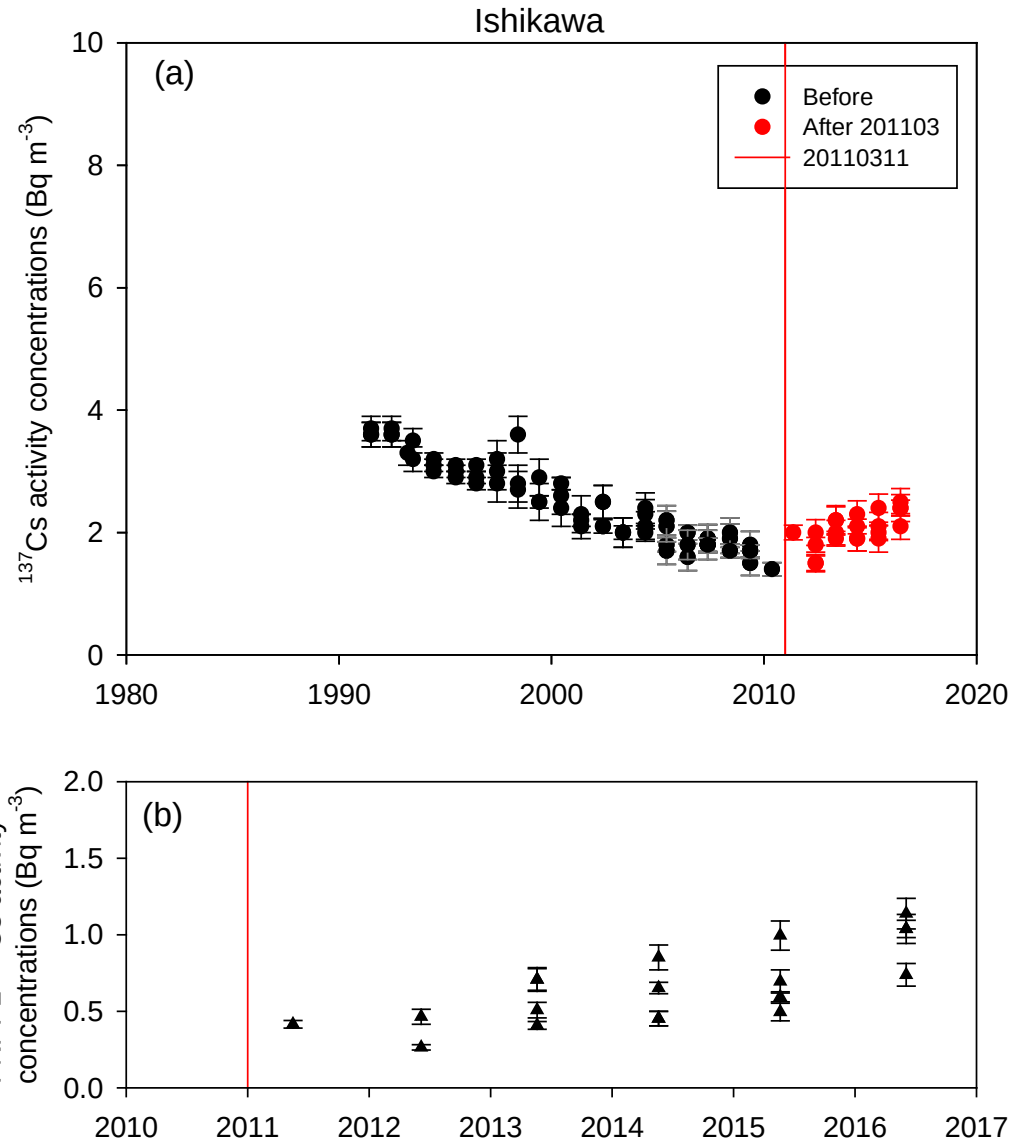


Fig. S6. Time variation of (a) ^{137}Cs activity concentrations from 1980 to 2020, (b) FNPP1-^{137}Cs activity concentrations at the station Ishikawa. The value was decay corrected to 11th March 2011.Vertical red line mean the FNPP1 accident day (11 March 2011).

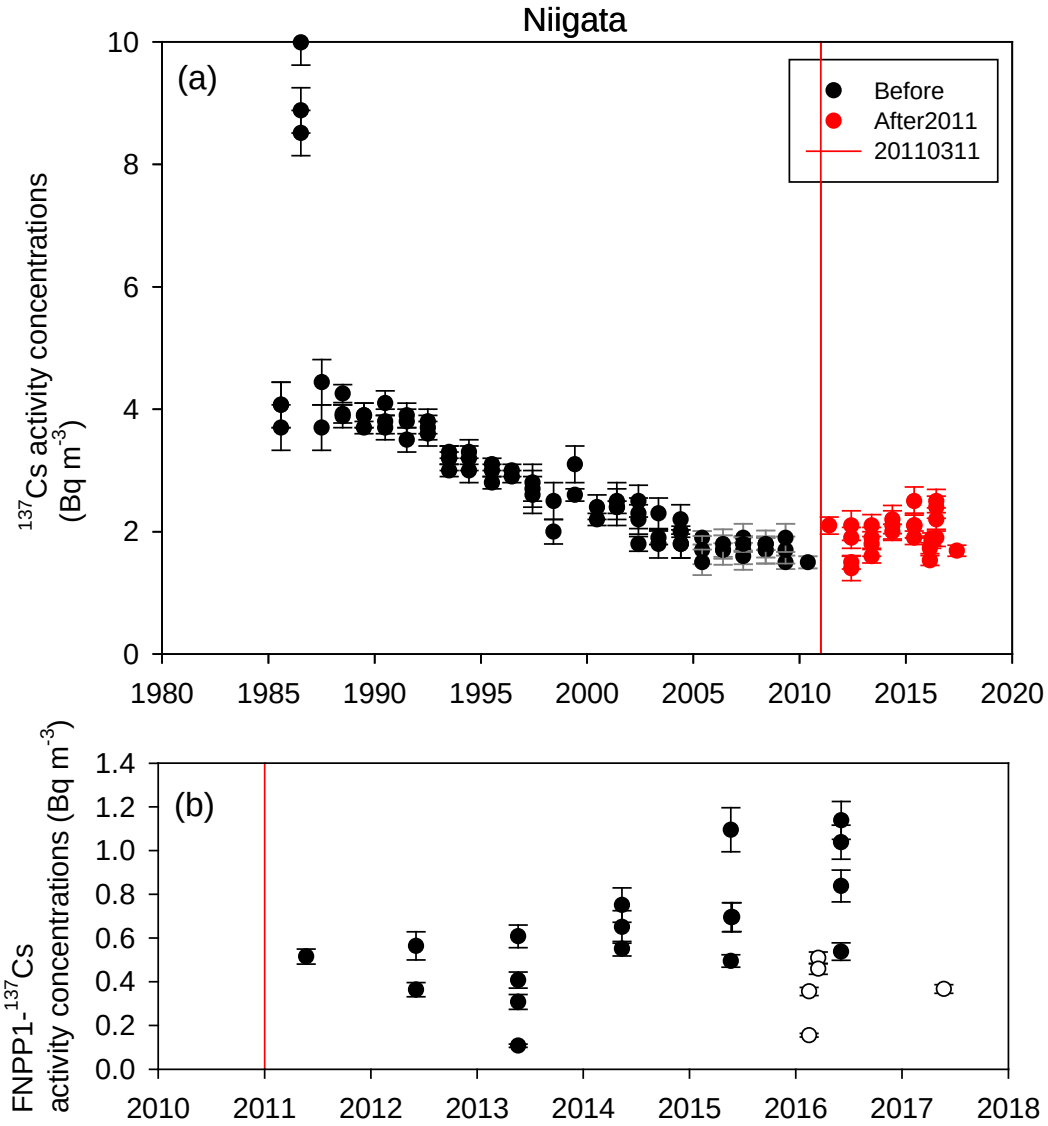


Fig. S7. Time variation of (a) ^{137}Cs activity concentrations from 1980 to 2017, (b) FNPP1-^{137}Cs activity concentrations at the station Niigata. The value was decay corrected to 11th March 2011.Vertical red line mean the FNPP1 accident day (11 March 2011). In (b), black circles are Japanese government monitoring data, and white circles are measured in this study.

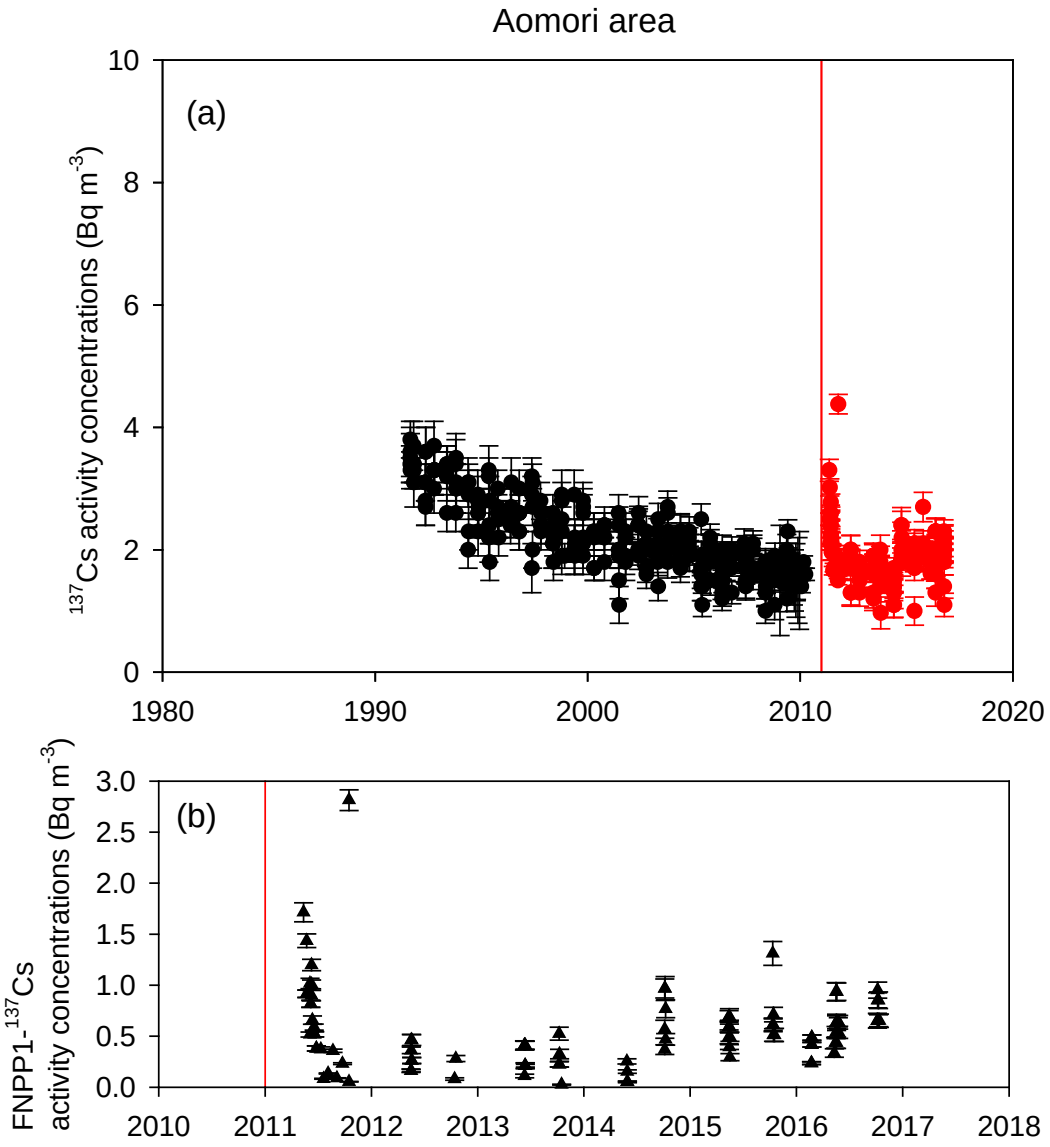


Fig. S8. Time variation of (a) ^{137}Cs activity concentrations from 1980 to 2017, (b) FNPP1-^{137}Cs activity concentrations at the station Aomori. The value was decay corrected to 11th March 2011.Vertical red line mean the FNPP1 accident day (11 March 2011).

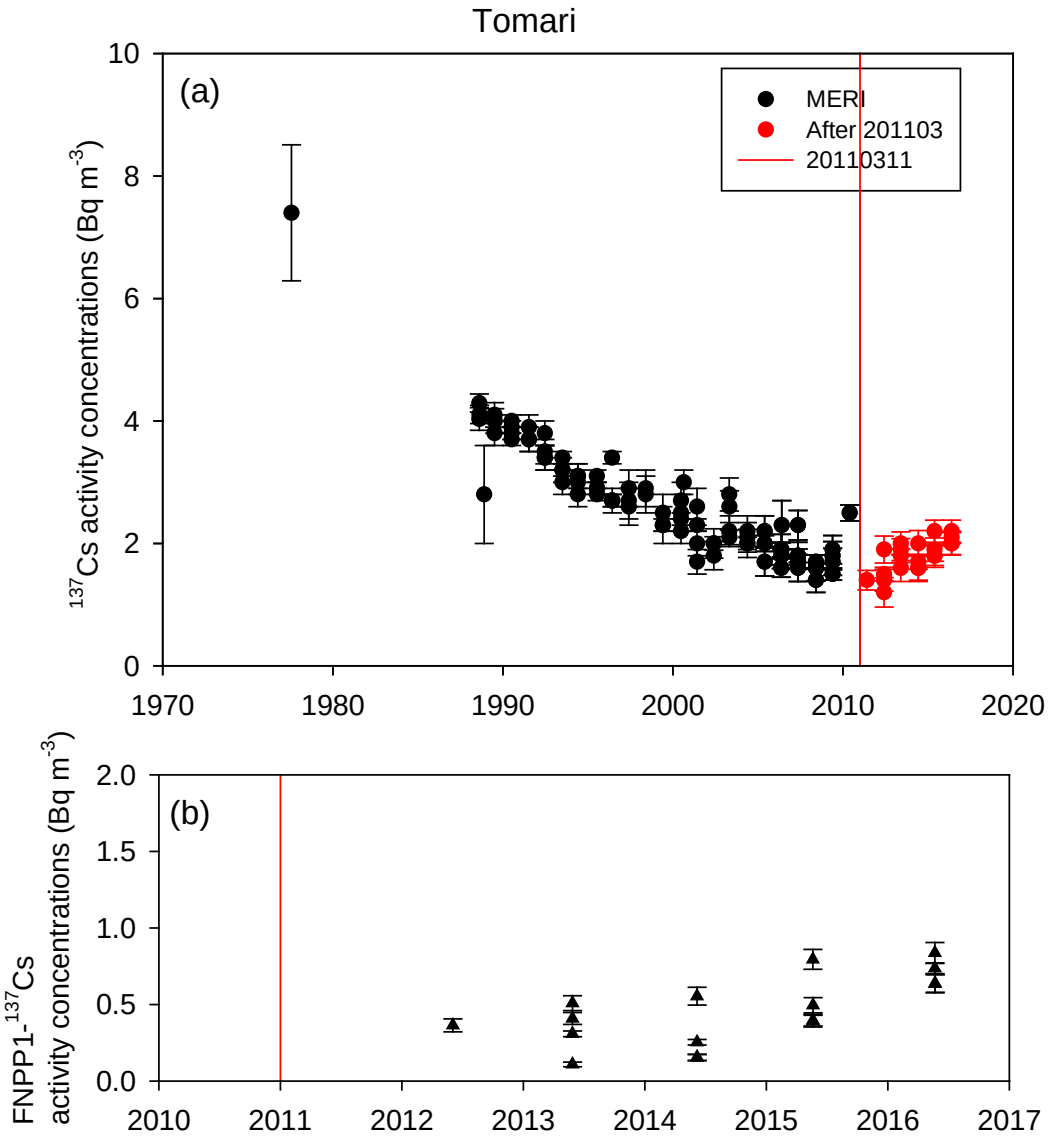


Fig. S9. Time variation of (a) ^{137}Cs activity concentrations from 1970 to 2017, (b) FNPP1-^{137}Cs activity concentrations at the station Tomari. The value was decay corrected to 11th March 2011. Vertical red line mean the FNPP1 accident day (11 March 2011).

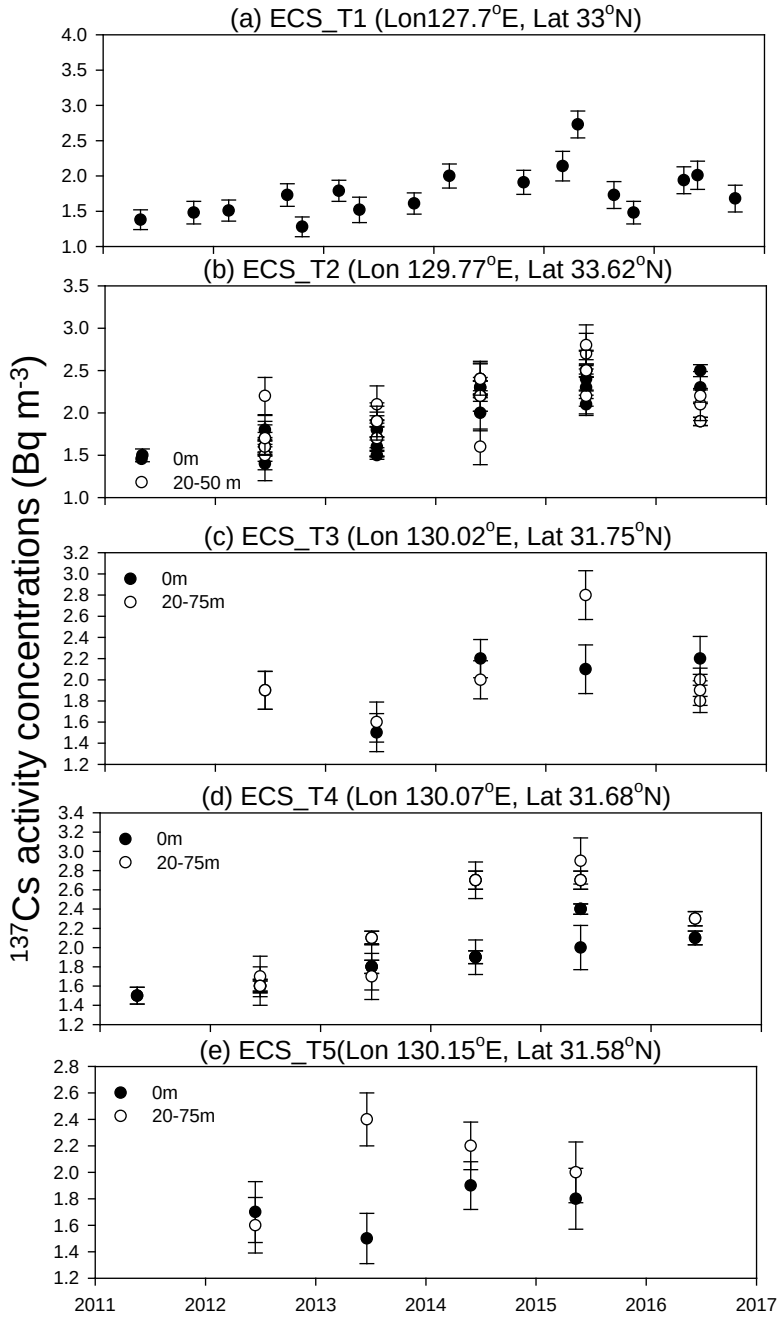
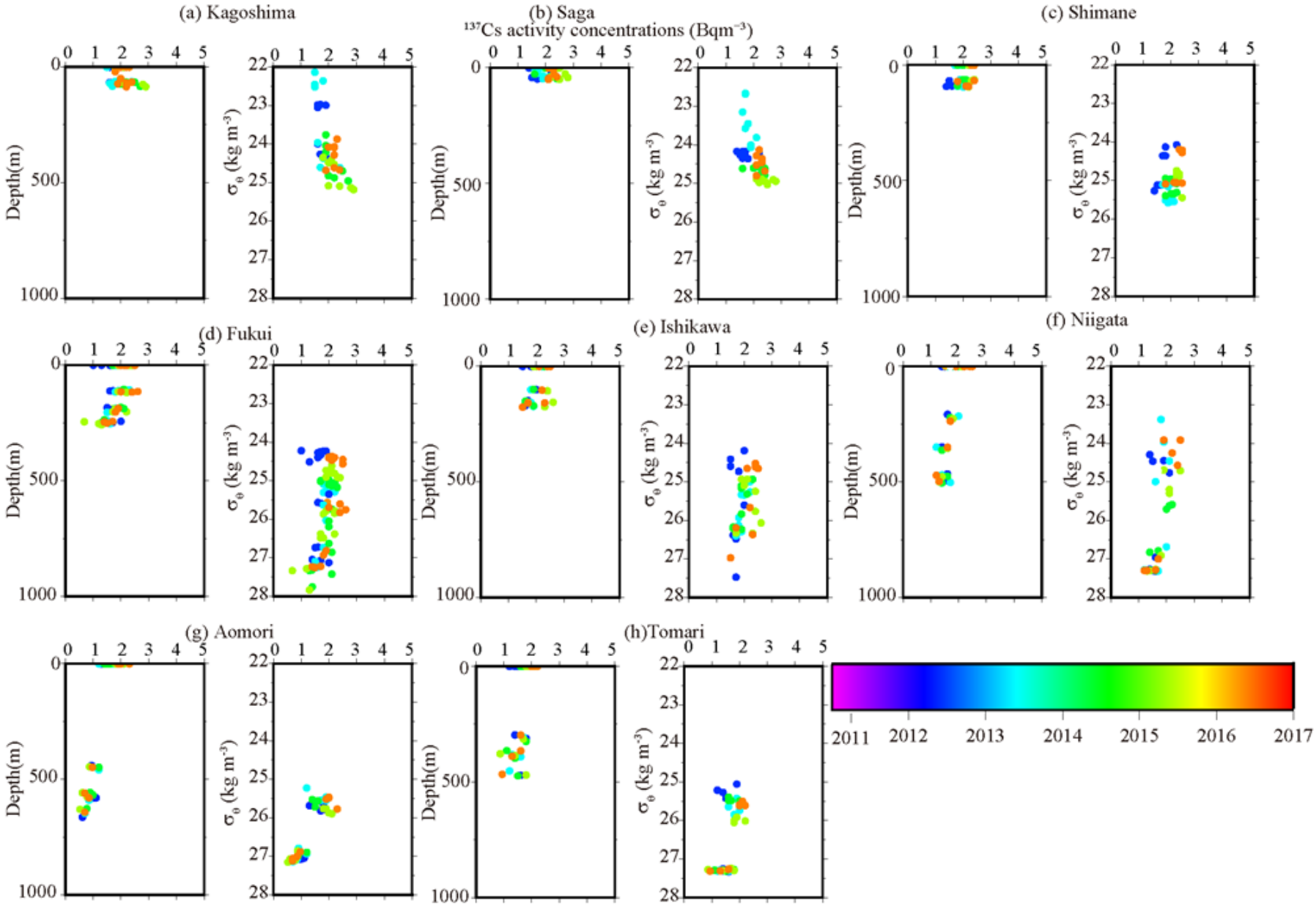


Fig. S10. Temporal variations of ^{137}Cs activity concentrations at the five stations in the ECS. (a) T1: Longitude 127.7°E, Latitude 33°N, (b) T2: Longitude 129.77°N, Latitude 33.62°N, (c) T3: Longitude 130.02°E, latitude 31.75°N, (d) T4: Longitude 130.07°E, Latitude 31.68°N, (e) T5: Longitude130.15°N, Latitude 31.58°N. These are monitoring stations denoted as triangle with arrows in Fig. SI12.


(a) Kagoshima
(b) Saga
(c) Shimane
(d) Fukui
(e) Ishikawa
(f) Niigata
(g) Aomori
(h)Tomari
^{137}Cs activity concentrations (Bqm^{-3})
Depth(m)
σ_θ (kg m^{-3})
2011
2012
2013
2014
2015
2016
2017

(continued)

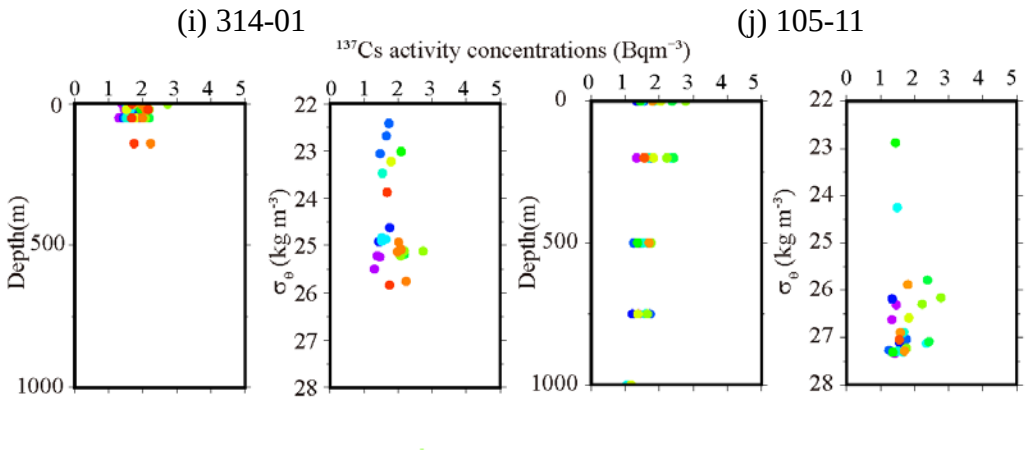


Figure S11: Vertical distributions of ^{137}Cs activity concentrations against depth and potential water density anomaly (σ_q) in the monitoring stations along the Tsushima Warm Current. (a) Kagoshima, (b) Saga, (c) Shimane, (d) Fukui, (e) Ishikawa, (f) Niigata, (g) Aomori, (h) Tomari, (i) 314-01, (j) 105-11. Color indicates the collected time.

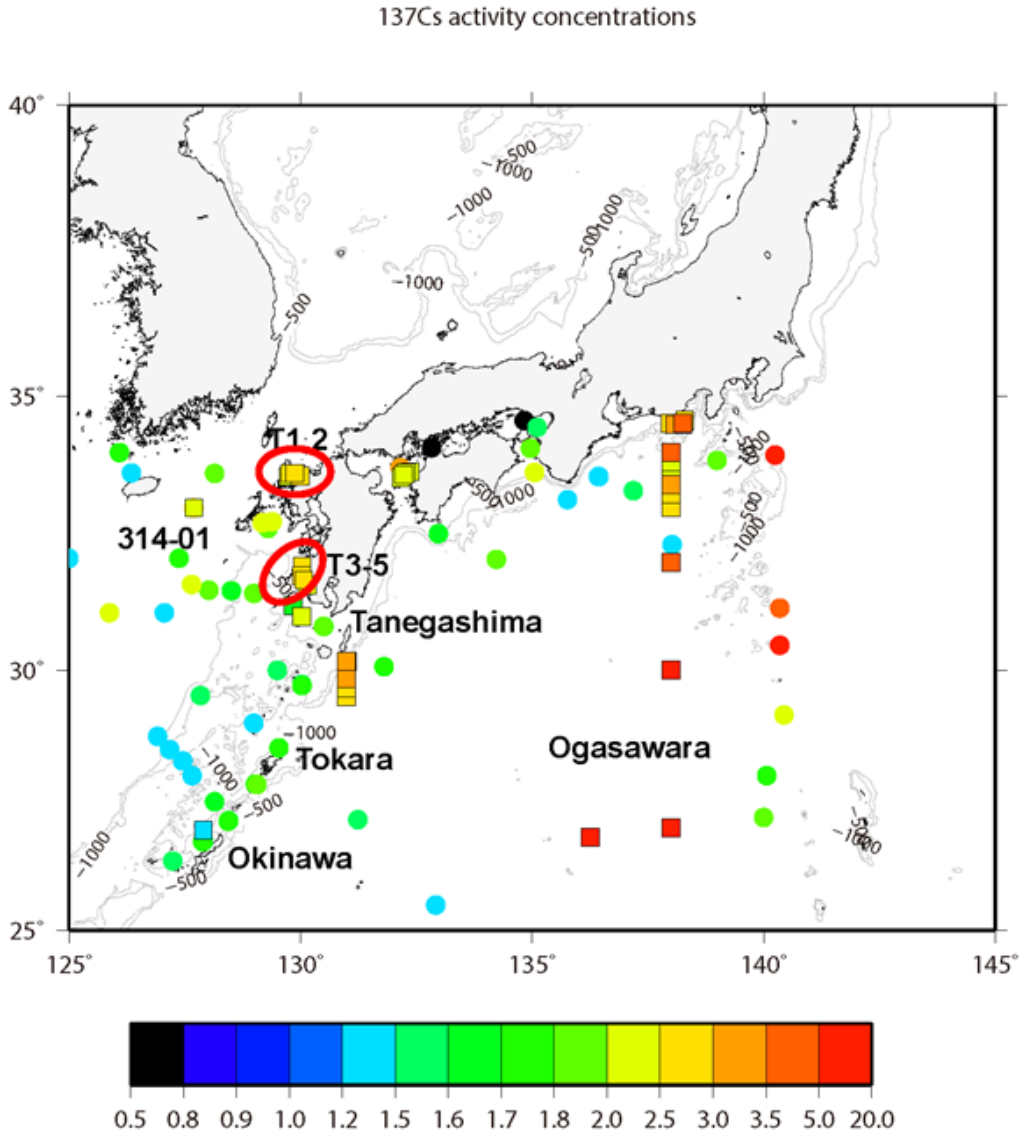


Figure S12. Horizontal distributions of ^{137}Cs activity concentrations in the NPSJ and the ECS from 2011 to 2016. Circles mean the surface measurement data. Square denotes stations having vertical distribution. Unit is Bq m^{-3}. Higher activity concentrations around 25-30ºN and 135-140ºE were measured in the year of 2012.

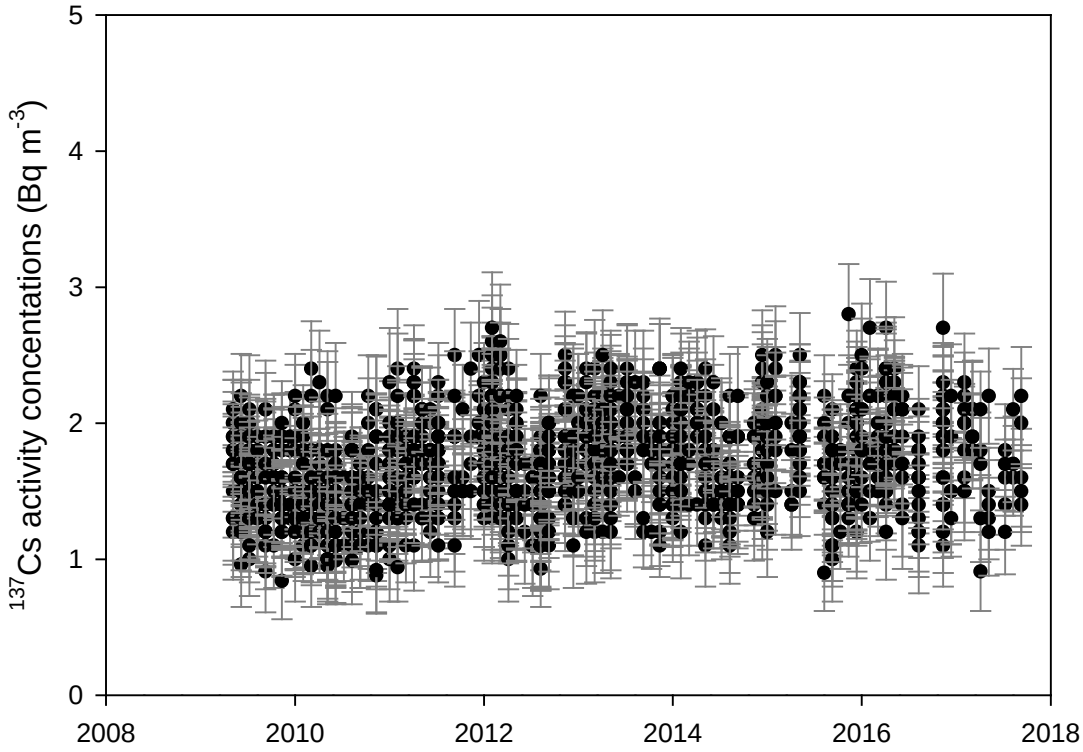


Figure S13: Temporal variations of ^{137}Cs activity concentrations at the station Okinawa from 2009 to 2017.