Radiocaesium derived from FNPP1 accident in the North Pacific Ocean as tracer of transfer processes in layers of surface, STMW, and CMW

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^{134}Cs and ^{137}Cs, hereafter radiocaesium, were released to the North Pacific Ocean by two major pathways, direct discharge and atmospheric deposition from the TEPCO Fukushima Dai-ichi Nuclear Power Plant (FNPP1) accident in March 2011. Surface pathway and speed of eastward movement from Western Paciifc Ocean to the west coast of North American continent were revealed. The eastward speed was about 8 and 3 km day^{-1} in the western and eastern Pacific Ocean, respectively. The major pathway from surface to ocean interior after injection in the ocean surface can be subduction of central mode water (CMW) and subtropical mode water (STMW) at potential density layers of 26.0-26.6 and 25.0-25.6 for CMW and STMW, respectively. In 2015 along 165 deg. E, FNPP1-derived radiocaesium in the STMW layer spread entire subtropical gyre and reached 2 deg. N. Recirculated radiocaesium in the subtropical gyre returned to Japanese coast. There are only week radiocaesium signal of subduction of CMW in 2015. Subducted radiocaesium in the CMW layer might move eastward from subduction area.