

Radiocesium in the Kuroshio region and the Taiwan Strait from 2017 to 2018

*Wei-Jen Huang¹, Chen-Tung Arthur Chen¹, Ming-An Lee², Sen Jan³, Yiing-Jang Yang³

1. National Sun Yat-sen University, 2. National Taiwan Ocean University, 3. National Taiwan University

Anthropogenic radiocesium, such as, long half-lives ^{137}Cs (30.2 yr) and short half-lives ^{134}Cs (2.06 yr), were exported to the Pacific Ocean through atmospheric deposition and direct discharge by the global fallout from atmospheric nuclear weapons testing (which peaked in the early 1960s) and the Fukushima Daiichi nuclear power plants (FDNPPs) accident in 21 century. However, the spatial distribution of ^{137}Cs and ^{134}Cs around the Kuroshio Current and the Taiwan Strait is still unclear. This study collects near-surface waters (shallower than 5 m depth) and subsurface to deep waters (10 m to deeper than 200 m) to analyze ^{134}Cs and ^{137}Cs in the region among 116-123°E and 20-27°N from 2018 to 2019. The result displays that ^{134}Cs activity in all samples was below the detection limit ($0.6 \text{ Bq}\cdot\text{m}^{-3}$). The average of ^{137}Cs activity in the near-surface water was $1.2\pm 0.3 \text{ Bq}\cdot\text{m}^{-3}$ and was among the range reported by previous studies in the near-surface water at the western North Pacific Ocean. A maxima value of ^{137}Cs in the subsurface water was $2.2 \text{ mBq}\cdot\text{m}^{-3}$ at 200 m depth. We analyze the water temperature, salinity, and density with ^{137}Cs activity and suggest that the distribution of ^{137}Cs activity was related to the water mass transportation in this study area.

Keywords: cesium-137, cesium-134, Fukushima