Annual Variations of Total Massflux in Ulleung Basin of East Sea

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Sediment traps were moored at depths of 500 m, 1000 m, and 2000 m from October 2011 to September 2018 to investigate the flux and temporal changes of settling particles entering the deep sea of Ulleung Basin, East Sea.

The total massflux was found to be 0.01–1.59 g/(m²·day) [average of 0.38 g/(m²·day)] at a seawater depth of 500 m, and 0.05–1.61 g/(m²·day) [(average of 0.38 g/(m²·day)] at a seawater depth of 1000 m, and 0.09–1.43 g/(m²·day) [(average of 0.42 g/(m²·day)] at a seawater depth of 2000 m , which was more than 10 times different depending on the time. In the spring and fall blooming seasons, more than twice as much particle flux was observed, and settling particle fluxes were similar in size, and the flux peaks did not show any time difference.

Total massflux is increasing by year from 2014 to 2016 as compared to 2011–2013, and it has been decreasing since 2017. Compared with various environmental factors, the productivity of surface primary productivity calculated from satellite data increased from 2014 when the total mass flux increased, and the Pacific Decadal Oscillation phase was changed to a positive value. Water temperature distribution at 200 m depth of the Ulleung Basin reveals that there is a strong warm eddy around the sediment trap mooring station.

However, lithogenic flux and particulate organic matter in collected particles have increased since 2014. The results of this study suggest that sediments with large amounts of lithogenic materials deposited on the Ulleung basin slope transport laterally by resuspention and flow into the deep sea of the Ulleung Basin.