

# A dynamical model for destratification triggered by the Oyashio intrusion into Sea of Japan after the Last Glacial Maximum

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It is well known that the Sea of Japan was rapidly destratified owing to the Oyashio intrusion from Tsugaru Strait after the Last Glacial Maximum. However, there remains a gap between the destratification of Sea of Japan and Oyashio intrusion, because heavy seawater masses (dense Oyashio water in this case) do not always result in the vertical mixing in the basin, but lead to an intrusion into intermediate layers with the similar seawater density. We herein established a one-dimensional dynamical box model in which the vertical mixing, Oyashio water intrusion, and convection of heavy seawater into the abyssal ocean, were reproduced to interpret the Oyashio-induced destratification of Sea of Japan after the LGM. The saline Oyashio intrusion triggered the transition from the “shallow convection” to “deep convection” in the Sea of Japan. The occurrence of the deep convection diminished the hypoxia in the deep layer. The saline Oyashio water intruded into the intermediate layers, and the stratification owing to the less saline water in the upper Sea of Japan gradually disappeared. In addition, the Oyashio intrusion had a role to maintain the deep convection because the surface water changed to be dense owing to the mixing with the dense Oyashio water.

Keywords: Sea of Japan, Oyashio intrusion, destratification, LGM