

**CHANGES IN THE SEA OF OKHOTSK DUE TO GLOBAL WARMING
– WEAKENING PUMP FUNCTION TO THE NORTH PACIFIC –**

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Since large amounts of sea ice are formed in the Sea of Okhotsk, the densest water in the North Pacific is produced there. Sinking of this dense water creates the overturning down to the intermediate depths in the North Pacific. The Okhotsk thus plays a role as the pump of the North Pacific. We found that the water temperature in the intermediate layer of the Okhotsk has increased over the past five decades while the oxygen has decreased. This means that sinking of cold oxygen-rich surface water into the intermediate layer has decreased. These signals have spread to the North Pacific along the pathway of the seawater flowing out of the Okhotsk. The Okhotsk is sensitive to global warming: over the past 50 years, sea ice production has decreased and dense water sinking has thus declined, thereby weakening the overturning in the North Pacific. The weakened overturning possibly affects the iron circulation, since the iron in the western North Pacific presumably originates from the dense (intermediate) water from the Okhotsk. Current global warming, through sea ice reduction, might decrease the iron supply in the North Pacific as well as in the Okhotsk, thus reducing levels of biological productivity and fishery resources.