

HGG001-03

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## The Amur Okhotsk system as a giant fish-breeding forest connected by dissolved iron

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The Amur River basin was found to play a key role in supporting primary production in the Oyashio region of the western subarctic Pacific Ocean by supplying dissolved iron which was essential element for phytoplankton growth. Because the dissolved iron mainly forms as a complex of iron and fulvic acids originating from forests and swamps in the Amur River basin, it is likely that land-cover changes in the Amur River basin may affect primary production in the Sea of Okhotsk and the Oyashio region.

The land-ocean linkage mention above reminds us of the Japanese concept of Uotsuki-rin (the fish-breeding forest). However, the Amur-Okhotsk-Oyashio linkage is much stronger than that in the conventional concept. More importantly, this is the first attempt to relate the continental-scale terrestrial environment with open waters. Therefore, we refer to the idea as "Kyodai" Uotsuki-rin kasetsu (the "Giant" Fish-Breeding Forest (GFBF) Hypothesis). We have conducted various kinds of scientific researches to verify the hypothesis since 2005 and we consider it was nearly done at present.

The GFBF is also recognized as a natural system that transport various nutrients, trace elements like dissolved iron, and pollutants from an upper area (i.e., the Amur River basin) to a lower area (the Sea of Okhotsk and Oyashio region). Fluxes of such materials can fluctuate significantly owing to various human activities including agriculture, forestry and industry. The human activities are then influenced by both local and international sociological, political and economic situations with which the lower stakeholders are closely related. Therefore, it is also possible to recognize the GFBF as a social system connecting various stakeholders beyond the national boundaries by cycling materials, information and properties.

In spite of its importance and uniqueness, there has been no framework for protecting/conserving the GFBF. This is mainly due to the geopolitical situation of the Amur River basin and the Sea of Okhotsk: the long-term political tensions in the area have hidden the environmental deterioration from the public. We would like to inform domestic and international communities of the GFBF and its importance. We, therefore, proposed an agenda for the conservation of the GFBF by collaborating with Russian and Chinese scientists in the beginning of 2010.

Keywords: Amur River, Sea of Okhotsk, land use change, dissolved iron, Oyashio