

Recent grain size coarsening of Amur River floodplain deposits in the Sanjiang Plain, China

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The Amur River is an international river that flows from mountains in Mongolia to the Sea of Okhotsk gathering tributaries from far eastern Russia and northeastern China. Recently, remarkable land cover changes have been occurring in the Amur River Basin. In particular, the cultivated area has increased in China, while deforestation has advanced in Russia. It is possible that these land cover changes will affect the hydrological environment of the Amur River, and the movement of material through the river. We sought to reconstruct the historical environmental changes in the Amur River Basin using floodplain sediments. We focused on the Sanjiang Plain in Northeast China, which is situated in the middle reach of the Amur River, where the Amur River is joined by the two major tributaries: the Ussuri and Songhua Rivers. We investigated sediment profiles in the floodplain of the Amur River and its tributaries from outcrops or sediment cores obtained by hand boring. These confirmed recent coarsening of the fluvial deposits at many localities on the floodplain along the Amur, Songhua, and Ussuli Rivers, where silt-clay layers are covered by 30-70-cm-thick sandy deposits. In the surrounding Sanjiang Plain and upper reaches, farm land has spread onto hillsides. We postulate that the grain size coarsening of the floodplain deposits has ensued from an increase in peak discharge and coarse material supplied by farmland expansion and forest reduction. There are large areas of wetland, which are an important source of nutrients, on the floodplain in the lower and middle reaches of the Amur River. The recent coarsening of fluvial deposits could alter the environment of these wetlands.