

Recent anthropogenic environmental change in domestic lakes revealed by multi-elements and isotope analyses

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Multi-elements and Sr isotope analyses of lake sediments were done for Lake

Rausu, Lake Niseko-Ohnume, Lake Mikuriga-Ike, Lake Kizaki, Lake Biwa, Lake Akan, and Lake Oshima-Ohnuma in order to detect recent anthropogenic environmental change.

Increase in Mn and As at the top of the sediment was found in Lake Biwa as reported previously. It is probably due to oxidation and fixation of reduced form of these elements transported from the deeper part of the sediments. Increases in Mn, As, Cu and Zn were also found in Lake Akan and were likely due to the input of material containing these elements to the lake. Pb concentration variation was found in Lake Ohima-Ohnuma and Lake Mikuriga-Ike, suggesting the atmospheric input and influence of regulation for the use of leaded gasoline. In Niseko-Ohnuma, Pb and Zn concentration increased since the beginning of 20th century, which coincided with increased sedimentation rate, suggesting the increased input of detrital material containing these elements. Sr isotopic ratios indicate two components mixing at Niseko-Ohnuma. No large variation in elemental composition was found for the sediment in Lake Rause during the last 100 years. Principle component analysis for the Lake Kizaki analytical data indicates the possibility to distinguish the behavior of elements from anthropogenic origin and that supplied by detrital sediments.

Keywords: lake sediment, multi-element analysis, Sr isotope, anthropogenic environmental change