

Geochemical properties of the sediments from Lake Towada

Miwa Kotoku[1]; Koichi Nishimura[2]; Yoshihito Ohtsuka[3]; Hiroshi Hidaka[4]; Yuichi Takaku[3]

[1] Earth and Planetary Systems Sci., Hiroshima Univ.; [2] TN; [3] IES; [4] Earth and Planet. Sys. Sci., Hiroshima Univ.

Geochemical variations in sediments reflect anthropogenic contaminants, hydrological circulation, climatic condition, geologic events, and so on. Isotopic and chemical analyses of drilling-core of sediments offer historical information of the environmental conditions during sedimentation. In particular, lake sediments are one of good indicators for reconstruction of paleoclimatic conditions. Many studies have been carried out on larger lake sediments even in Japan. However, Lake Towada has received no mention about the environmental records in the past probably due to its small size. We report herewith a possible anthropogenic pollution record from the chemical variations in the sediments from Lake Towada.

Lake Towada is at the top of a 400 m-high mountain on the border between Aomori and Akita prefectures. It is a dual crater lake that was formed by the caving in a volcano mouth formed by a giant eruption. There are two Pb mines, Namariyama and Towada, in western shore. Therefore, a part of the sediments may have been contaminated from the mining drain.

One of eight drilling-cores, sized 25cm length and 15cm diameter, collected from the central part of the lake was preliminary used in this study. In order to estimate the sedimentation rate of the core, radioactivity of ^{137}Cs was measured by g-spectroscopy. From the profile of ^{137}Cs fallout data (maximum in 1963), sedimentation rate is calculated as 1 mm/yr. The core sample was sliced in every 10mm thickness, and used for chemical analysis.

22 elements (Si, Ti, Al, Fe, Mn, Mg, Ca, Na, K, Ba, Ce, Cr, Cu, Ga, Nb, Ni, Pb, Rb, Sr, Y, Zn, Zr) were quantitatively measured by XRF. Other trace elements including REE were measured by ICP-MS.

Chemical compositions of the core show no variation of the major elements with the depth, which suggests no effects of major geological event around the lake for the last 250 years. On the other hand, Ba, Cu, Zn and Pb show significant peaks in the core, probably due to the effect of mining drain into the lake. We are now trying to identify the source of contamination from other geochemical information such as trace element profile and Pb isotopic signature in the core.