Magmatic volatile flux into the groundwater system in and around Kutcharo caldera, east Hokkaido, Japan

M. OHWADA[1]*, K. KAZAHAYA[1], N. MORIKAWA[1], M. YASUHARA[1,2], H. A. TAKAHASHI[1], M. TAKAHASHI[1], A. INAMURA[1], Y. OYAMA[1,3], I. MIYAGI[1], J. ITOH[1], AND H. TSUKAMOTO[1]

[1]Geological Survey of Japan, AIST, Tsukuba, Ibaraki, Japan (*correspondence: ohwada.m@aist.go.jp)
[2]Rissho University, Kumagaya, Saitama, Japan
[3]Marimo Research Center, Kushiro Board of Education, Kushiro, Hokkaido, Japan

As active caldera volcanoes thought to have big magma chambers, the influence to the surrounding area by magmatic volatiles is supposed to be large. The study area, Kutcharo caldera, located in east Hokkaido is the largest caldera in Japan. In this study, we calculate the magmatic ^{3}He flux into the groundwater by an applied method using helium isotopes, and perform the evaluation of influence area and magmatic volatile fluxes into groundwater system in and around Kutcharo caldera.

Magmatic ^{3}He fluxes in and around Kutcharo caldera have values in wide range and the distribution of flux indicates the three-dimensional anisotropy of magmatic volatile supply to the groundwater. The high magmatic ^{3}He flux is observed in shallow and deep groundwater inside the caldera and in deep groundwater at the northern part of outside the caldera. Combining the chemical and isotopic data with the obtained magmatic ^{3}He flux, we can calculate magmatic volatile flux for each species. The estimated magmatic volatile fluxes of Kutcharo caldera are from one to two orders of magnitude larger than those of Iwate volcano [1], which is typical polygenetic volcano in Japan. In addition, the influence area of magmatic volatiles in the Kutcharo caldera is very larger than that of Iwate volcano. These results imply that the source of magmatic volatile is markedly large, which is consistent with the petrological study of the Kutcharo magma system [2].

[1] Ohwada *et al*. (2012) *J. Geophys. Res.-Solid Earth* **117**, B02204. [2] Miyagi *et al*. (2012) *J. Volcanol. Geotherm. Res*. **231-232**, 50-60.