Stable water isotope characteristics of the newly discovered lake bottom springs from Lake Kawaguchi, in the northern foot of Mount Fuji

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The existence of lake bottom springs have been suggested in Lake Kawaguchi, one of the Fuji Five Lakes at the northern foot of Mount Fuji, Japan, based on the patchy distribution of lake ice during winter. However, the knowledge on the distribution and the source of the springs is still limited. In this study, we conducted water quality survey using a CTD profiler from February to July in 2015 to explore the location of lake bottom springs, and measured stable water isotope ratios of lake bottom waters to examine potential source of the spring waters in Lake Kawaguchi. We found upwelling of relatively warm waters with low electrical conductivity (EC) at the east of the Unoshima Island (a small island located at the center of the lake) during winter, whereas the temperatures and the EC at the same location were significantly lower than the surrounding area during summer. These water quality anomalies suggest that the springs were likely distributed at the bottom of the lake within a radius of 25 meter at the east of the Unoshima Island. Stable (oxygen and hydrogen) isotope ratios of the lake bottom waters were ~2 per mil and ~10 per mil lower around the springs, respectively, suggesting the influence of groundwater from the surrounding mountains.

Keywords: Fuji Five Lakes, springs, stable water isotopes

