Geophysical Research Abstracts
Vol. 16, EGU2014-1440-2, 2014
EGU General Assembly 2014

Hydrochemical fluxes from Baransky volcano, Iturup, Kuril Islands

George Chelnokov (1), Rafael Zharkov (2), Ivan Bragin (1), and Natalia Kharitonova (1)

(1) Far East Geological Institute FEB RAS, Vladivostok, Russian Federation (geowater@mail.ru), (2) Institute of marine geology and geophysics FEB RAS, Yuzhno-Sakhalinsk (rafael_zharkov@mail.ru)

The Sernaya River and its tributary the Kipyashaya River are the only rivers that drain all thermal waters coming down the Baransky volcano (Iturup, the Kuril Islands). Hydrological parameters and a chemical composition relating to these rivers and all inflow streams coming from the volcano were measured from August to October 2013. The main aims of this investigation were to develop a data baseline for the catchment of the Sernaya River in order to monitor the Baransky volcano, to estimate total discharge of solute elements and finally to identify thermal groundwater inflow.

Since the Kipyashaya River and the Sernaya River receive all water streams coming along the south-west and south flanks of the Baransky volcano within approximately 10 kilometers we can suggest that the whole thermal discharge runs into the Kipyashaya River. Thus a frequent sampling of the rivers presents the best way to monitor the volcano as they comprise a mix of all thermal waters from the Baransky volcano.

The Sernaia River, at the end of its course along the flanks of the Baransky volcano, has a total flux of 12 $m^3/s \pm 1\%$. Multiplication of the discharge by the concentration in main ions of the river at this point yields an aggregate flux of $\sim$130 tons/day $\pm$ 10%. This flux performs the dissolution flux as a result of rocks dissolution beneath the active crater and in the aquifer of the Kipyashaya River. Cl total discharge was estimated at $\sim$33 tons/day $\pm$ 10%, SO4 $\sim$67 tons/day $\pm$ 10%, and total cation discharge $\sim$28 tons/day $\pm$ 10%. The Kipyashaya River brings in to the Sernaya River 15 tons/day $\pm$ 10% of Cl, $\sim$30 tons/day $\pm$ 10% of SO4, and $\sim$3,5 tons/day $\pm$ 10% cations average. Several thermal springs with low water discharge are located on the right waterside of the Sernaya River 100 m up and down from the Kipyashaya River influx. These thermal springs with Cl discharge $\sim$ 5g/s have significant concentrations of Ca due to water-rock interaction with basement rocks. The way of sampling streams at the end of their course, just before confluence with the Sernaia River, provides more representative chemical composition of the Baransky volcano waters than a punctual sampling of springs and indicates the existing thermal groundwater inflow.

It is argued that a renewal in the activity of the Baransky volcano is a result of the changes in chemical ratios and Cl discharge. Studying the network of the Sernaya River presents one of the best ways of detection such pre-eruptive periods. The work was supported by RFBR grants 13-05-00544A, 14-05-00243, 14-05-00171 and FEB RAS grant 12-III-A-08-161.