

## **Areal distribution, chemical feature and flux of slab-derived fluid upwelling to the surface in Japan: geochemical evidence from groundwater surveys**

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Amounts of aqueous fluids are released from pores and hydrated minerals in the subducting slabs (e.g., Jarrard [1]; Hacker [2]). A part of the slab-derived fluids contribute to generate partial melt in the wedge mantle and others upwell directly through the mantle as aqueous fluids. We have conducted groundwater surveys in Japan islands and analyzed chemical and isotopic compositions to detect slab-derived components in groundwaters collected from over 10,000 places from natural springs and deep bore holes. We report here areal distribution of upwelling of the slab-derived (and magmatic) fluid into groundwater system in Japan as geochemical evidence, and discuss water circulation style and processes in Japanese subduction systems. To detect slab-derived fluid, use of lithium (Li) and halogens (Cl, Br, I) is proposed as an indicator, which can be applied even for complicated mixing groundwater systems. The areal distribution indicates that upwelling process of slab-derived fluid is distinctively different between SW and NE Japan arcs, and is well explained by water circulation models for SW and NE Japan arcs (e. g., Iwamori [3]). Hydrologically determined slab-derived fluid fluxes are also shown as an evidence of upwelling that gives consistent values with the presumed values calculated by Hacker [2].

[1] Jarrard (2003) *GGG* **4**, 5. [2] Hacker (2008) *GGG* **9**, 3. [3] Iwamori (2008) *EPSL* **160**, 65-80.