

**Research Project** 

Revisiting Mt. Fuji's groundwater origins with helium, vanadium and eD-NA tracers

## Project funded by own resources

**Project title** Revisiting Mt. Fuji's groundwater origins with helium, vanadium and eDNA tracers **Principal Investigator(s)** Schilling, Oliver ;

Project Members Tomonaga, Yama ;

Organisation / Research unit

Departement Umweltwissenschaften / Hydrogeologie (Schilling)

Project start 01.01.2018

Probable end 31.12.2022

#### Status Completed

Known locally as the *water mountain*, for millennia Japan's iconic Mt. Fuji has provided safe drinking water to millions of people via a vast network of groundwater and freshwater springs. Groundwater, which is recharged at high elevations, flows down Fuji's flanks within three basaltic aquifers, ultimately forming countless pristine freshwater springs along Fuji's foothills. Here, we challenge the current conceptual model of Fuji being a simple system of laminar groundwater flow with little to no vertical exchange between its three aquifers. This model contrasts strongly with Fuji's extreme tectonic instability due to its unique location on top of the only known continental trench-trench-trench triple junction, its complex geology, and its unusual microbial spring water communities. Based on a unique combination of microbial environmental DNA (eDNA), vanadium, and helium tracers, we provide evidence for prevailing deep circulation and previously unknown deep groundwater contribution to Fuji's freshwater springs. The most substantial deep groundwater upwelling has been found along Japan's tectonically most active Fujikawa-kako Fault Zone. Our findings broaden the hydrogeological understanding of Fuji and demonstrate the vast potential of combining eDNA, on-site noble gas, and trace element analyses for groundwater science.

**Keywords** microbes, noble gases, tracers, groundwater, surface water-groundwater interactions, Japan **Financed by** 

University funds Other funds

# Add publication

### Add documents

### Specify cooperation partners

ID	Kreditinhaber	Kooperationspartner	Institution	Laufzeit -	Laufzeit -
				von	bis
4658653	Schilling, Oliver	Kipfer, Rolf, Prof.	Eawag		
				01.01.2018	31.12.2022

ID	Kreditinhaber	Kooperationspartner	Institution	Laufzeit -	Laufzeit -
				von	bis
4658654	Schilling, Oliver	Kato, Kenji, Prof. Em.	Shizuoka University		
				01.01.2018	31.12.2022
4658655	Schilling, Oliver	Brunner, Philip, Prof.	Université de Neuchâtel		
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4658656	Schilling, Oliver	Brennwald, Matthias, Dr.	Eawag		
				01.01.2018	31.12.2022
4658657	Schilling, Oliver	Sohrin, Rumi, Prof.	Shizuoka University		
				01.01.2018	31.12.2022
4658658	Schilling, Oliver	Nagaosa, Kazuyo, Dr.	Shizuoka University		
				01.01.2018	31.12.2022