

# Water chemistry and isotopic composition of river waters from the Pacific coast inland to central mountain range, northern Japan

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An approach for characterizing water chemistry, origins of groundwater, and groundwater flow system in the region from the Pacific coast inland to the central mountain range, northern Japan, is presented. The hydrochemistry of the region, 4500 km<sup>2</sup> in area, was studied by means of the conventional river water sampling from some 520 locations in a dry period, when the stream discharge was exclusively fed by groundwater.

Spatial distribution of water chemistry and isotopic composition proved to be highly irregular. A close investigation of the results indicates that water chemistry and isotopic composition anomalies found in the region can be attributed to the anthropogenic causes, sea-salt spray, difference in relative importance of summer and winter precipitation in shallow groundwater formation, mixture of volcanic volatiles, or influx of Na-Cl rich waters, possibly originating at depth, being channeled up through the fracture to shallower depths.

The study demonstrates that high-density hydrochemical and isotopic data on river waters in a dry period can be valuable for identifying origins of the groundwater and for solving groundwater flow system in a wide area.