UNITED RESEARCH FORUM
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4th International Congress on Earth and Geological Sciences

July 21-22, 2025 | Paris, France

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Assessment of Water Chemistry across the Podhale Basin (Southern Poland)

This study presents preliminary results on the concentrations of various chemical elements in surface waters and shallow groundwater of the Podhale Basin, southern Poland. The Podhale Basin is a geologically complex area in the Carpathians, known for active faults and geothermal waters that are used for heating and recreational purposes. The aim of the study was to investigate the influence of the complex geology of the area on water composition. The samples were collected along a 15 km transect that runs from Szaflary to Zakopane, with an average lateral deviation of 1 km on both sides. A total of 104 water samples were collected, including 43 from local wells and 61 from streams and rivers belonging to the Biały Dunajec catchment area. In cases where geological fault zones were suspected to influence the chemical composition of the waters, surface water samples were taken both upstream and downstream of the faults. In the field, the temperature, pH, and electrical conductivity of the water were measured in situ. Concentrations of individual elements were determined through laboratory analysis using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). The geochemical background for the area was established, and anomalous values were identified. Extremely high and low values were often associated with smaller, intermittently drying streams. The next step in this research will involve an attempt to correlate the obtained results with zones of active geogenic gas migration along the geological profile across the Podhale Basin, which will represent the first such study conducted in this area.

The research project was supported by program “Excellence initiative – research university” IDUB for the AGH University of Krakow (project number 12685).

Keywords: surface water, groundwater, chemical composition, Podhale Basin

Biography

I hold a B.Sc. in Environmental Engineering and Protection from the AGH University of Krakow and am currently a M.Sc. in Applied Geology specializing in hydrogeology and engineering geology at AGH University Krakow.

My academic focus includes hydrogeology, hydrogeochemistry and engineering geology. Currently I’m a president of Hydrogeology Student Science Circle “Hydro”.

ISBN: 978-1-917892-13-1

doi.org/10.51219/URForum.2025. Marta-Kusy