

## Variation of water isotopes and control mechanisms in lakes of the Cameroon Volcanic Line (CVL), Cameroon (West-Africa)

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The water in most crater lakes is meteoric in origin. Due to their peculiar setting, their water sometimes mixes with volcanic fluids that migrate from depth to the Earth surface. Monitoring the physico-chemical characteristics of these volcanogenic structures provides useful information which can be used to forecast volcano-related hazards. This study is part of an overall objective aimed at setting up a base line geochemical data bank for risk assessment and volcano-related hazard mitigation in Cameroon following the lakes Nyos and Monoun gas explosions that killed about 1800 people in the mid-80s. Lakes Nyos and Monoun are among the about 38 crater lakes located on the CVL. The lakes occupy either maars or depressions dammed by lava flows or pyroclastic materials underlined by alkalic and/or calcic crystalline basement. In the southern coastal region, the lakes experience an annual rainfall up to 11 000 mm while those in the north receive one order of magnitude less precipitation. This write up reports the isotopic composition of 8 crater lakes. The study indicates that, while isotopic variation in rain is marked by negative gradient northwards due to the continental effect, a South-North isotopic enrichment of +0.90 per-mil/100km is instead observed in lake water. Unlike in rainfall where isotopic composition is influenced by the altitude effect, no such effect is discernible to the isotopic signature of lake water. Among the lakes, d18O and dD vary from -1.91 to 14.4 per-mil and from -33.95 to -7.18 per-mil respectively while intra-lake variation is characterized by the presence of an isotopicline that separates heavy isotopically enriched surface water from depleted bottom water. We ascribe this enrichment to the South-North aridity increase characterized by a negative gradient rainfall/evaporation (P/E) ratio.