
Water Quality: Current Trends and Expected Climate Change Impacts (Proceedings of symposium H04 held during IUGG2011 in Melbourne, Australia, July 2011) (IAHS Publ. 348, 2011). 106-114

Azores volcanic lakes: factors affecting water quality

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Abstract Azorean lakes represent strategic sources of freshwater and some supply water for human consumption. Several samples were collected from 13 volcanic lakes on four different islands. The lakes are cold, pH values ranged between 4.2 and 9.9 and demonstrated low levels of mineralization, except for Furnas do Enxofre, due to the input of volcanic gases that are responsible for the highest CO₂ and acidification of the lake. The lake waters were generally fresh and of Na-Cl and Na-HCO₃ types. The highest decline in lake water quality is related to anthropogenic pressure. Although the São Miguel lakes demonstrate a volcanic signature, the effect of the volcano is not a significant contributor to water quality decline, except in the case of Furnas, for which ion charge increased due to the thermal water input and volatile degasification. However, for Furnas do Enxofre, the lake is highly contaminated by volcanic fluids. Global warming will destroy the normal balance of water supply. During winter, the greater frequency of precipitation events will increase the input of fertilizers and sediments, causing an increase in water quality degradation. Temperature increases are expected to combine with water shortages due to increased evaporation to decrease lake water volume. Eutrophication is expected to worsen. Consequently, it is hypothesized that climate change will generally lead to an increased water quality degradation of these strategic water reservoirs.

Key words volcanic lakes; eutrophication; volcanic fluids contamination; climate change