

## **ASSESSMENT OF GROUNDWATER AVAILABILITY, WATER QUALITY, AND HABITAT OF THE ÉTANG SAUMÂTRE REGION, HAITI FOLLOWING THE 01-12-2010 EARTHQUAKE**

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Étang Saumâtre is a brackish lake located in the southeast region of Haiti, ~45 km from Port-au-Prince. An essential source of irrigation and drinking water for the populations of Thomazeau, Ganthier, and Fond Parisien are freshwater springs and shallow wells tapping the complex, fractured aquifer system surrounding Étang Saumâtre. Thus, the present study is particularly timely in that we will not only assess direct effects of the 01-12-2010 earthquake on the lake and surrounding groundwater system but also provide vital baseline data for monitoring the future impact of natural and anthropogenic changes on groundwater quality and the lake ecosystem. We present physical and chemical hydrologic and sediment data for the lake and its surrounding aquifers to classify Étang Saumâtre and its recharge zone. Specifically we present an analysis of stable isotopes, C, H, and O and the trace element chemistry. We will pay particular attention to the trace elements which can reveal unique insights into water-rock interactions in saline systems. Sediment samples (1cm intervals) and particulate material will be used to evaluate grain size, sedimentation characteristics, and mineralogy. In addition, we will determine the age of sediments in order to monitor the history of sedimentation rate. Water samples will be analyzed for a subset of dissolved gases (i.e. CFC, SF<sub>6</sub>, He, Ne, Ar, radon, N<sub>2</sub>, CO<sub>2</sub>, CH<sub>4</sub>), and age dating techniques (3H/3He and radiogenic 4He) will be used to construct a model for hydrological transport rate and regional flow for the region surrounding Étang Saumâtre. This model will include sub-lacustrine (groundwater discharge vs. deep water fractured flow) inputs to the lake. Bearing in mind that any significant reduction in annual fish production at Étang Saumâtre due to quake-induced disturbance of the ecosystem may exacerbate the already precarious health situation of communities living in its vicinity, it is critical that as part of the broader research focused on water quality that we assess the impact of the quake on Étang Saumâtre in terms of the ability to sustain a productive fishery. These data are vital to the development of a management plan to protect the livelihood of fishers and maintaining the health of the communities surrounding the lake.

Keywords: water, irrigation, human health