Air quality and precipitation chemistry

The precipitation chemical components are good indicators of the air quality as atmospheric particles and gases from different sources could be removed by rain. Water-soluble ions such as SO_4^{2-}, NO_3^-, H^+, and NH_4^+ will be indicative of anthropogenic sources (e.g., anthropogenic emissions of SO_2 and NO_X); while Cl^-, Na^+, Mg^{2+}, Ca^{2+}, NH_4^+, and K^+ can be attributed to natural sources, construction activities and biomass burning. Through the year, Puerto Rico can have the influence of different type of air masses such as marine, African dust, volcanic ash, and anthropogenic. This project seeks to study the influence of air masses of different origin on the precipitation chemistry. We will use a precipitation collector that can be programmed to collect samples at different time frequencies. In parallel, we will collect aerosol samples. Sampling will be performed at an urban site (University of Puerto Rico Río Piedras Campus) and a forest site (Pico del Este, El Yunque National Forest). Continuous measurements of pH and conductivity will be automatically performed as rain water is collected. Also, water and aerosol collected samples will be analyzed using ion chromatography and total carbon analysis for the water soluble ions and the total and dissolved carbon, respectively.

El Yunque provides potable water to 10% of PR's population; therefore, it is critical to better understand the hydrologic cycle and the factors that may affect it, such as pH and conductivity.