

## **THE CHEMICAL COMPOSITION OF RAIN IN UPSTATE SOUTH CAROLINA**

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Acidic deposition and its effects on surface waters has been a topic of concern over the past several decades. The areas subject to acidic deposition, the acidity of the deposition, and affects on the surface waters of the earth have all increased in the recent past. The increases stem mainly from the increase in emissions of the combustion of fossil fuels and of industrial processes. Greenville, South Carolina is an area affected by acidic deposition, yet there is not a nationally recognized precipitation monitoring site near the area. The last monitoring station, near Greenville or in the upstate of South Carolina was the Clemson site, which shut down in 1986. During the last nine months of the year 2000 wet deposition was collected and analyzed at the Furman University campus. The rainwater was collected from a sampler into clean plastic bottles. The water was immediately filtered through 0.45-micron filters in to two bottles. One bottle was preserved and was analyzed for cation concentrations using ICP-AES. The unpreserved bottle was analyzed for pH and anion concentrations. pH was measured using a coupled electrode and unbuffered pH=4.0 and pH=5.0 standards prepared from 0.010 N certified hydrochloric acid. Anion concentrations were determined by ion chromatography. The chemical composition of rainwater collected at Furman University reveals data similar to the old Clemson NADP site data, and other sites around the country. The pH range was from 3.59 to 6.94, with an average of 4.88. The average Na to Cl concentration ratio is 0.62, indicating that cyclic sea salts are an important source of Na and Cl. The Na to Cl ratio, however, varies greatly between rain events. Nitrate nitrogen concentrations averaged 2.6 mg/L, suggesting that atmospheric deposition is a major source of nitrogen to surface waters. Sulfate concentrations averaged 2.7 mg/L, indicating that both sulfuric and nitric acids contribute to the acidity of rain.

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