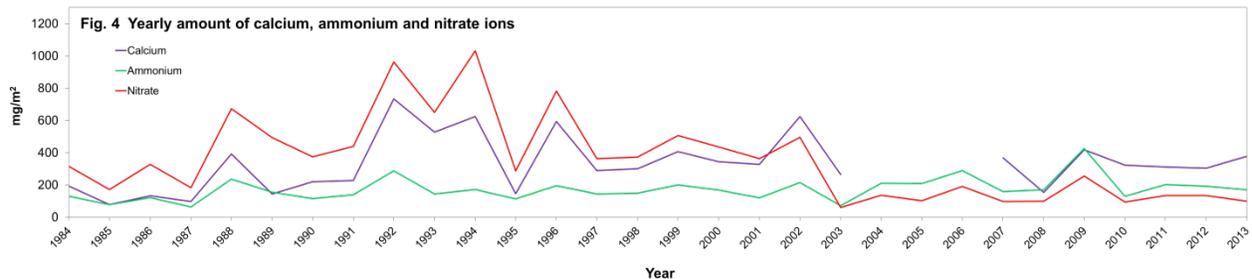


Rainwater chemistry, Jornada Basin, New Mexico

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Abstract: Over time, cumulative deposition from the atmosphere accounts for a large fraction of nutrients contained in terrestrial ecosystems (Schlesinger, 1997). These include calcium, magnesium, potassium, nitrogen, and sulfur. In the Jornada Basin, like many dryland regions, calcium carbonate in soils (caliche) is an important component of the landscape. It is an indicator of soil age (Gile et al., 1966), a sink for atmospheric carbon dioxide (Monger 2014), and a subtle reservoir of soil moisture (Hennessy et al., 1983; Duniway et al., 2007). Because prominent horizons of calcium carbonate occur in soils formed in parent materials very low in calcium, the atmosphere has been identified as an important source of calcium (Gile et al., 1981). Early measurements of Ca indicated an average in rainwater of about 3 mg/L (Junge and Werby, 1958). This amount is three times the concentration of Ca from dry dust (Gile and Grossman, 1979).

Because of their ecological and geomorphological importance, ionic constituents in rainfall have been measured at the Jornada LTER since 1984. The samples were collected at the weather station on the northeast bajada of Summerford Mountain on the Chihuahuan Desert Rangeland Research Center. Elevation at this site is 4400 ft and the mean annual rainfall is 240 mm. Calcium, sodium, potassium, and magnesium were measured with a Perkin Elmer 4300 Dual View ICP-OES while ammonium, sulfate, nitrate, and chloride were measured with a Lachat Quikchem 8000 FIA Automated Ion Analyzer with ion chromatography. Yearly amounts of calcium, ammonium, and nitrate that enter soil are expressed as mg/m² by multiplying average yearly rainfall by average yearly ion concentration.



Relationship with the LTER VI proposal: The long-term data support all parts of the LTER VI program.

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