Human Impacts on Nitrate Dynamics in Hyporheic Sediments Using a Stable Isotope Tracer

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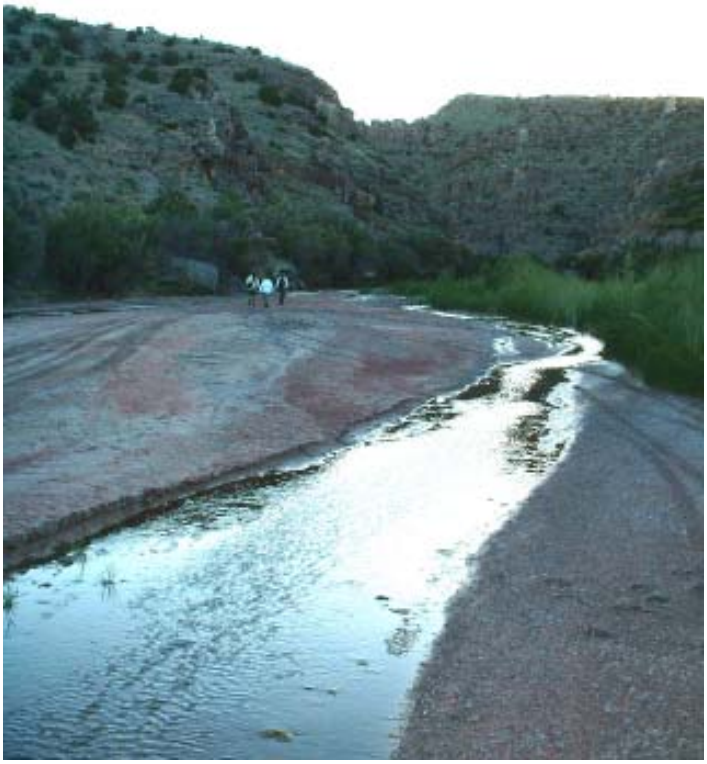
PURPOSE OF STUDY

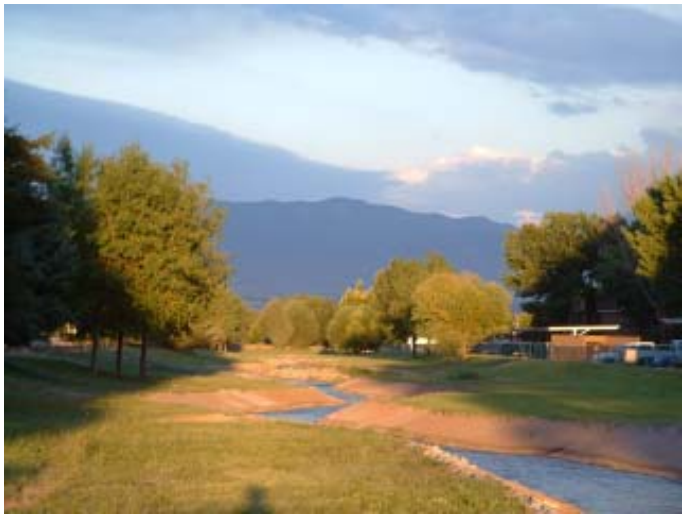
Global concentrations of nitrogen have increased over time. Although streams and rivers can process nitrate anions before they reach slower moving bodies of water, the high concentrations of nitrogen still pose a global problem. Understanding how streams remove excess nitrogen is critical in finding a solution to the problem. The major way to remove nitrate from water is the process of denitrification. Denitrifying bacteria requires nitrate and organic carbon. The researchers will examine organic carbon availability and the rates of denitrification. The researchers will also study hyporheic zones, or areas of surface and groundwater interactions, to determine how human disturbances affect nitrate retention and removal in stream ecosystems and how organic carbon affects this retention and removal.

STUDY UNDERWAY

- Eight of nine streams (three urban, agriculture, and native vegetation) have been studied. Native vegetation streams are defined as streams that contain less than 5% of human land-use throughout the watershed; disturbed streams greater than 25% of human land-use.
- Well networks will be established along each stream where wells were allowed. The network will consist of six to ten wells with an injection well upstream of the network. Three injections will be conducted within the first week.
- Water, gas, and sediment samples will be taken from each well before, during, and after each injection.
- Microbial profiling techniques will be conducted on hyporheic sediments during ht 15N injections.



The Rio Salado is an example of a pristine stream in New Mexico.



Corrales Drain is an example of an urban system in New Mexico.