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Sources of Organic Carbon in a Recently Deposited
Floodplain Aquifer, Rifle, Colorado

The floodplain aquifer bordering the Colorado River in Rifle, Co has been shown to have a unique variety of bacteria that show metabolic processes previously associated only with archaea. However, the source of organic carbon utilized by these bacteria is unknown. The goal of this study is to determine the source of organic carbon utilized by these bacteria to gain a better understanding of both these unique organisms and organic carbon cycling at this recently deposited Colorado River floodplain site. Potential sources of this organic carbon are derived from rainwater and runoff, river water or sediment. The rainwater and subsequent runoff percolate through the soil zone and recharge the shallow aquifer either onsite or upgradient, the river water recharges the aquifer during spring runoff and organic carbon that was deposited with the sediment during the formation of this floodplain aquifer. In order to determine the source of organic carbon fueling bacterial metabolism groundwater was filtered to collect the bacteria and bacterial DNA was extracted and purified. Radiocarbon dating of the DNA will be utilized to differentiate modern carbon from the river, decades to century old carbon from recharge and older ages from sediment deposition. This work will help us understand organic carbon sources for unique bacterial metabolism found in this aquifer.