Paired RNA Radiocarbon and Sequencing Analyses from Aquifers in Colorado and Bangladesh

Determining the carbon sources for active microbial populations in the subsurface is a challenging but highly informative component of subsurface microbial ecology. Radiocarbon analysis of DNA and PLFA has shown that in alluvial aquifers microbes respire relatively young advected carbon sources and not carbon deposited with the sediment. In order to target active microbial populations, the methods were further adapted to analyze the radiocarbon signature of RNA. Analysis of samples from an alluvial aquifer in Colorado highlighted the importance of autotrophy in aquifer systems. Analysis of samples from Bangladesh indicated that carbon may be transported through aquifers more rapidly than expected; signifying that the deep, low-arsenic aquifers might be less sustainable than initially thought.