Slater, G.F., White, H.K., Eglinton, T.I, and Reddy C.M., *Determination of microbial carbon sources in petroleum contaminated sediments using molecular 14C analysis*, Env. Sci. and Technol., 2005; v39, 2552-2558

Understanding microbial carbon sources is fundamental to elucidating the role of microbial communities in carbon cycling and in the biodegrdn. of org. contaminants. Because the majority of anthropogenic contaminants are either directly or indirectly derived from fossil fuels that are devoid of 14C, radiocarbon can be used as a natural inverse tracer of contaminant carbon in the contemporary environment. Here, 14C anal. of individual microbial phospholipid fatty acids (PLFA) was used to characterize the carbon sources utilized by the active microbial community in salt marsh sediments contaminated by the Florida oil spill of 1969 in Wild Harbor, West Falmouth, MA. A specific goal was to det. whether this community is actively degrading petroleum residues that persist in these sediments. The D14C values of microbial PLFA in all sediment horizons (contaminated and noncontaminated) matched the D14C of the total sedimentary org. carbon after petroleum removal, indicating that no measurable metab. of petroleum residues was occurring. This result agrees with ancillary data such as the d13C content and distribution of PLFA, and the residual hydrocarbon compn. detd. by comprehensive two-dimensional gas chromatog. (GCxGC) anal. We hypothesize that microbes have chosen to respire the natural org. matter rather than the residual petroleum hydrocarbons because the former is more labile. Future efforts directed at detg. indexes of microbial degrdn. of petroleum hydrocarbons should consider competition with natural org. matter.