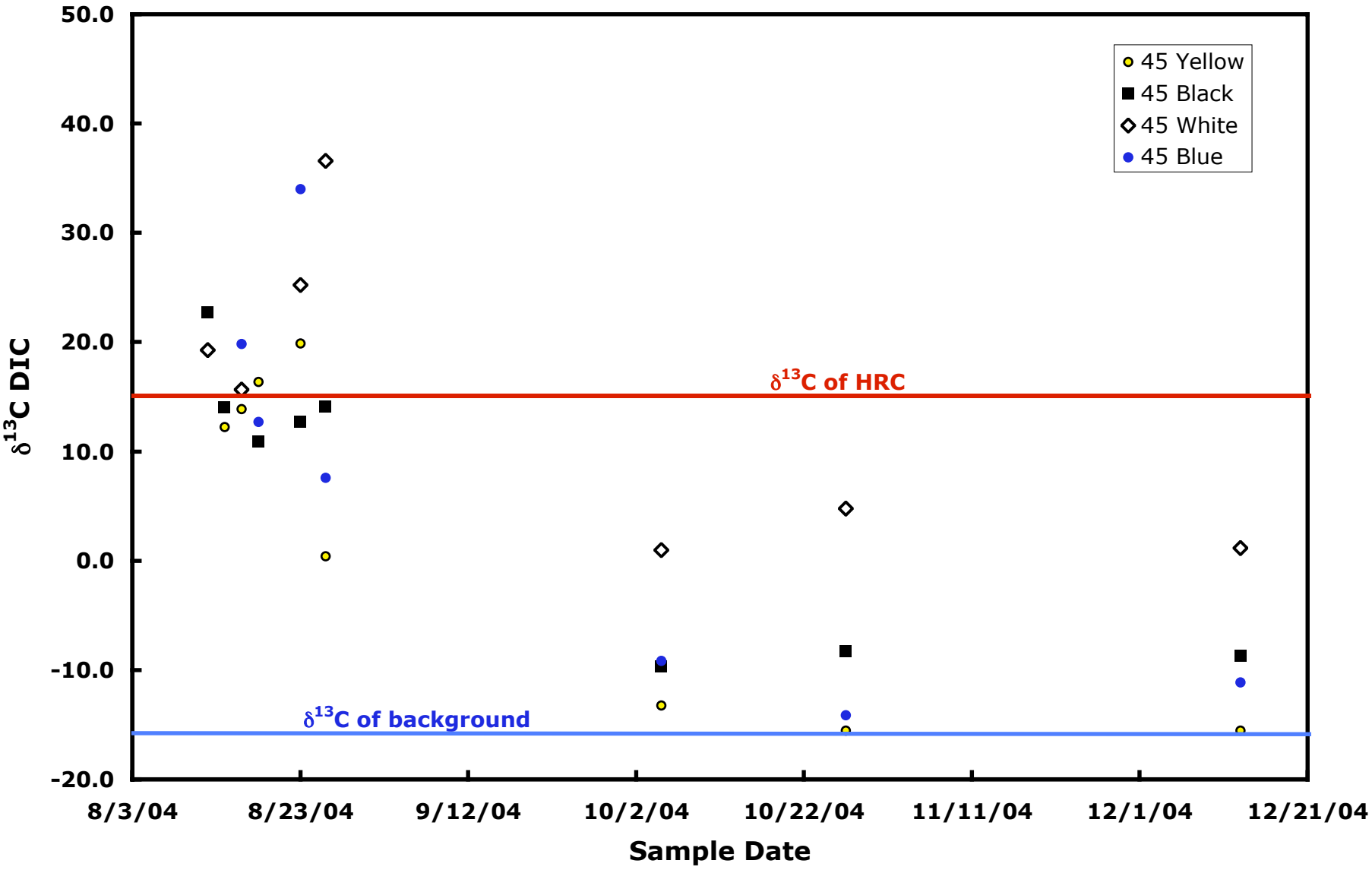
Isotope Measurements to Date

- Carbon isotope compositions of dissolved inorganic carbon compounds - Byproduct of metabolism of HRC.

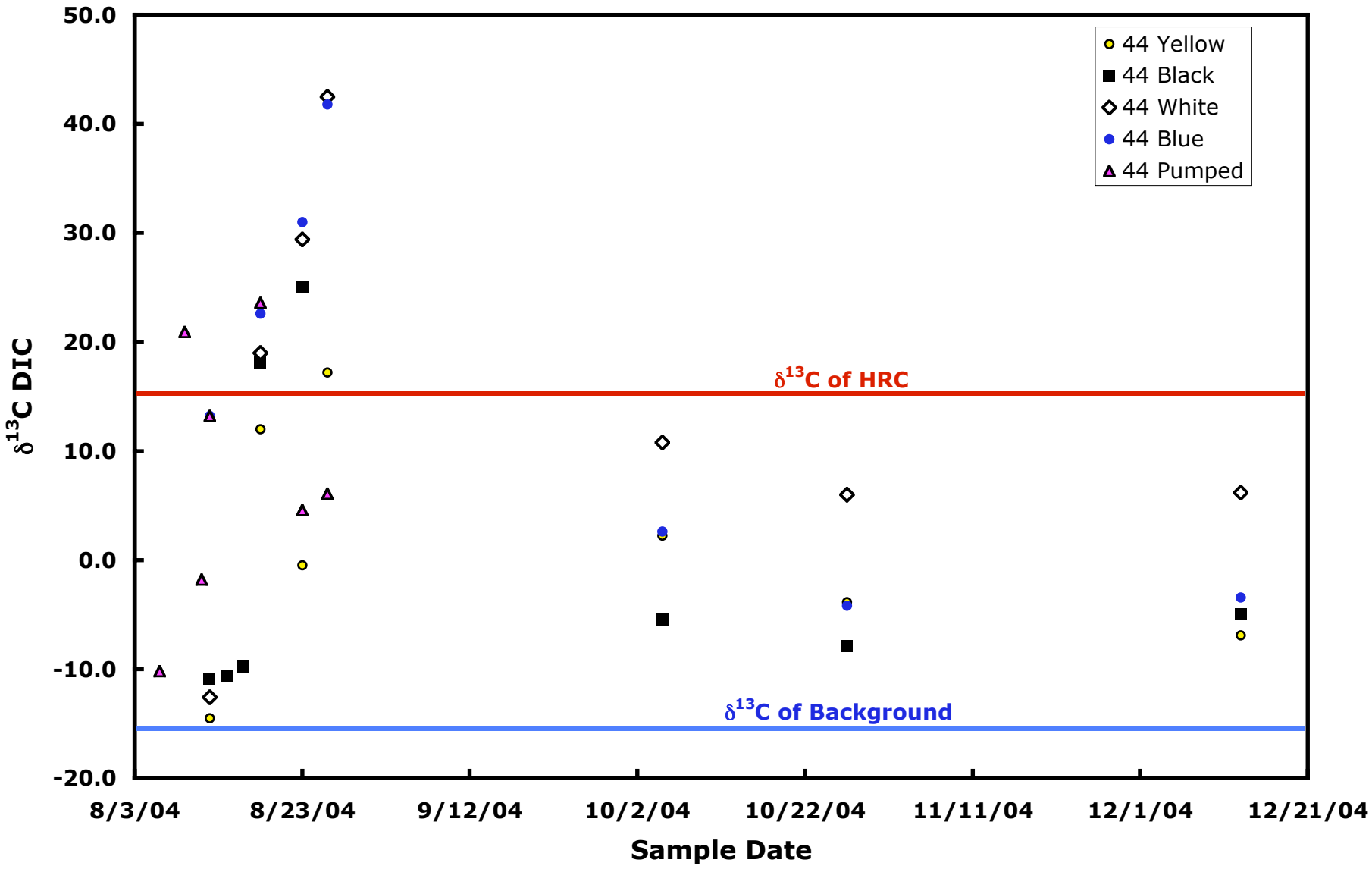
- Carbon isotope compositions of methane - Indicator of methanogenic conditions.

- Nitrogen and oxygen isotope compositions of nitrate - Evidence for extent of denitrification.

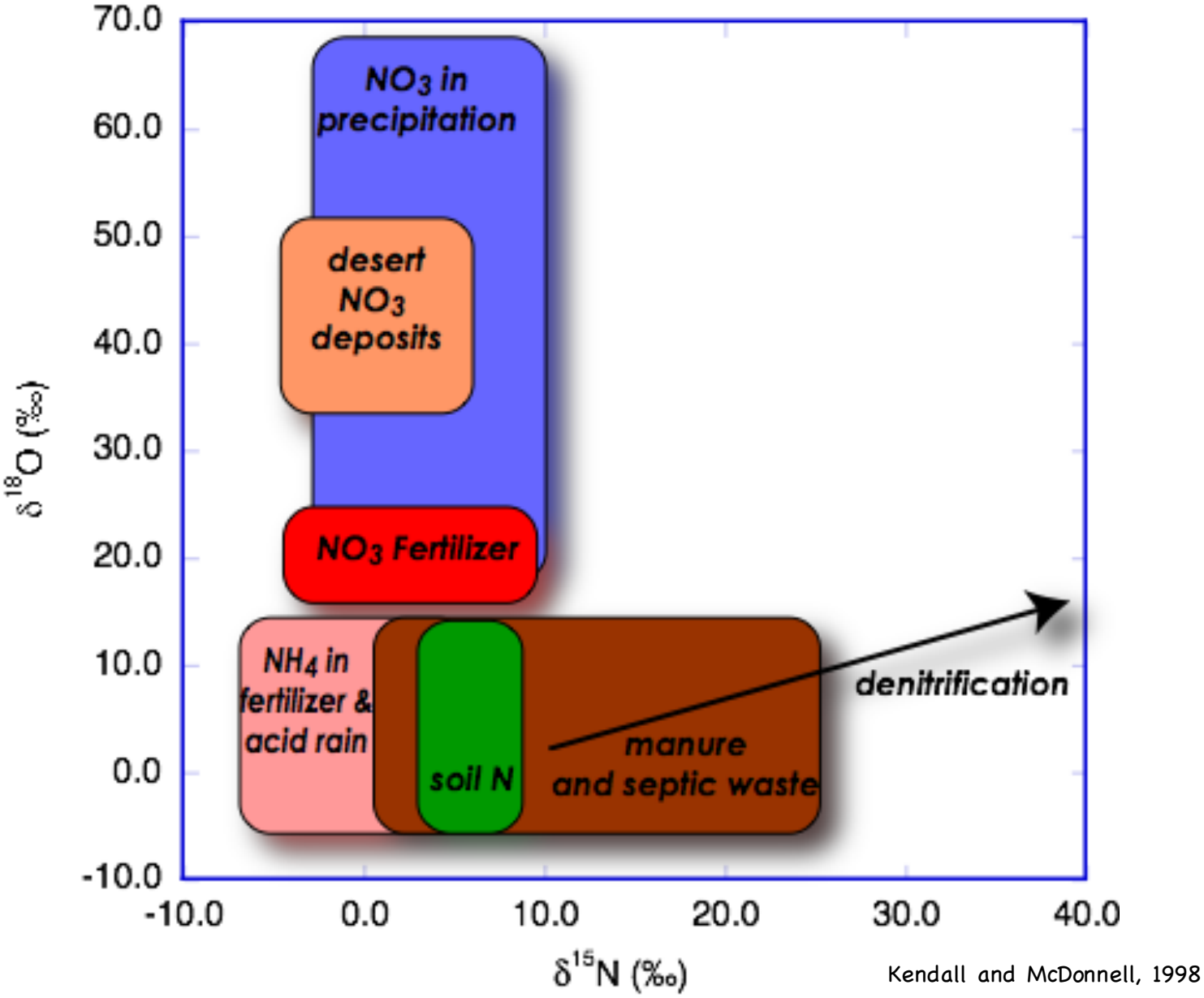
Carbon Isotope Compositions of Well 45 DIC



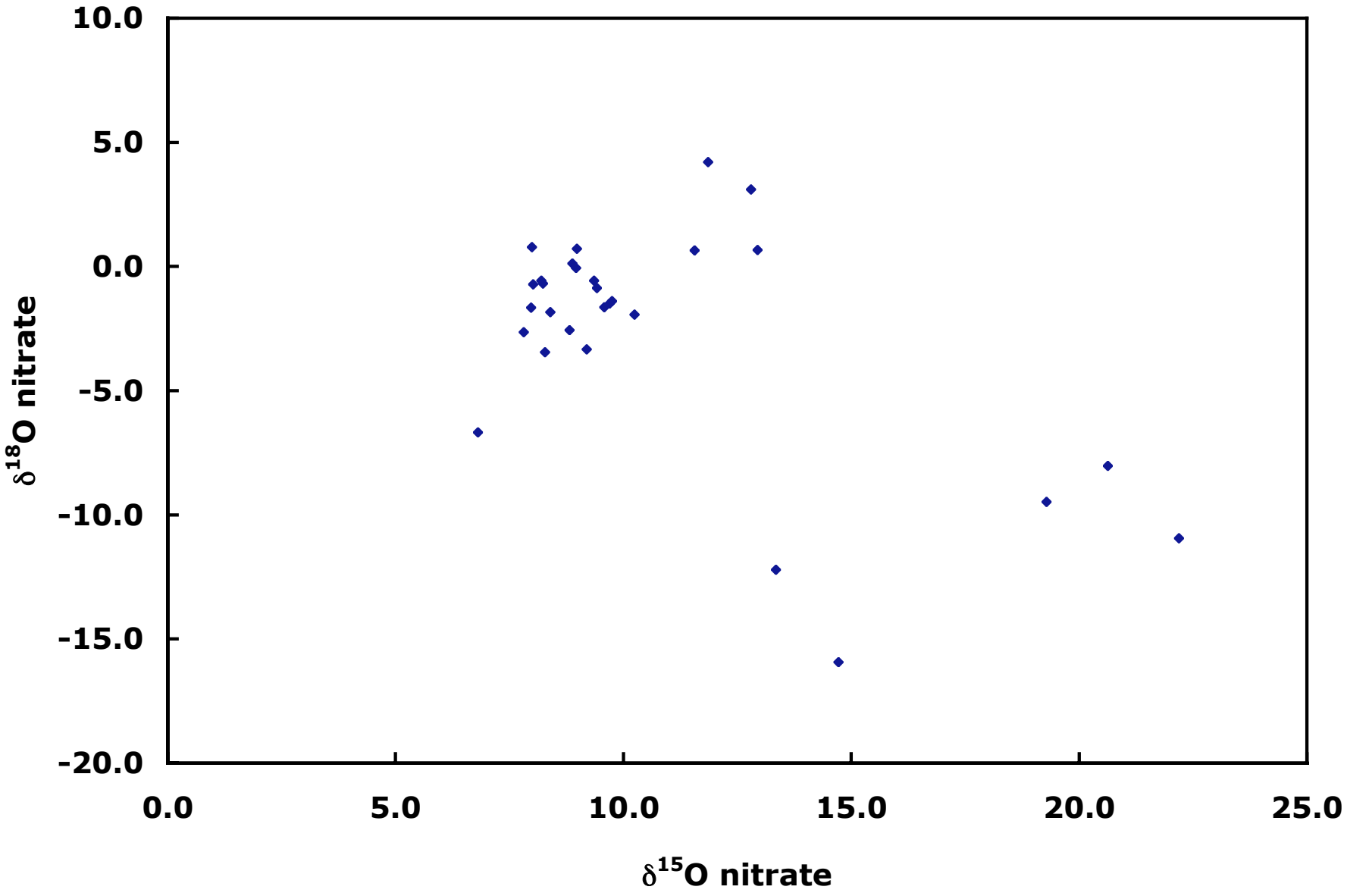
Carbon Isotope Compositions of Well 44 DIC



Isotopic compositions of nitrate sources



Kendall and McDonnell, 1998


Nitrate Isotopes
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
δ18O nitrate
0.0
5.0
10.0
15.0
20.0
25.0
δ15O nitrate

Isotope Summary

1. Increase in carbon isotope ratios of DIC in Well 44 are coincident with increases in bromide, chloride and acetate and decreases in nitrate.
2. Carbon isotope ratios of DIC decrease after August 26, but remain above background in all intervals in Well 44 and in the main injection interval (White) in Well 45 into December.
3. No measurable methane was detected in samples tested.
4. The isotopic composition of nitrate is consistent with natural background sources (not agricultural sources) with minor modification due to biodegradation. Low oxygen isotope ratios may indicate high concentrations of nitrite.

Planned Work

1. Finish analyses of all samples.
2. Measure carbon isotope ratios of PLFA extracts to determine which organisms are metabolizing HRC.
3. Analyze carbon isotope ratios of dissolved organic carbon in select monitoring samples to determine fraction of organic carbon derived from HRC.
4. Measure chromium isotope ratios of chromium in monitoring well samples. The Cr(VI) to Cr(IV) conversion causes an isotope shift that can be used to calculate the amount of reduction.