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(moving to WHOI later this year)

I am interested in measuring the triple isotopic composition of oxygen, namely $\Delta^{17}\text{O}$, on the North Atlantic GEOTRACES cruise. Although not a TEI itself, $\Delta^{17}\text{O}$ will aid in elucidating the processes that affect TEI uptake and regeneration. $\Delta^{17}\text{O}$ data quantify gross primary production (GPP) while O_2/Ar ratios, which will easily be made on the same samples, quantify net community production (NCP). Thus two key parameters of the carbon cycle are determined from these gas tracers. By measuring NCP and GPP, I will be able to assess how tightly carbon is being recycled, which in turn can have important ramifications on the recycling of the TEI. Additionally, I am eager to measure $\Delta^{17}\text{O}$ because in order to understand some intriguing deep profiles of $\Delta^{17}\text{O}$, we need to have a broader picture of the distribution of $\Delta^{17}\text{O}$ in the ocean, specifically in different water masses. The attraction of this section is that it goes through the upper and lower limb of the MOC as well as through the mode water formation area and the interior of the subtropical gyre. Furthermore, the cruise track goes through high and low productivity areas and it will be interesting to see how $\Delta^{17}\text{O}$ and the NCP/GPP ratio varies across these gradients and especially to measure the $\Delta^{17}\text{O}$ composition in the oxygen minimum zone. Samples for $\Delta^{17}\text{O}$ require at most 500 mL of water and are easily taken from the CTD Rosette. I would like to coordinate for someone on the ship to take the samples. I plan to submit a proposal for $\Delta^{17}\text{O}$ measurements for the August, 2009 NSF deadline.