

## ***Interactive comment on “Detecting changes in Labrador Sea Water through a water mass analysis of BATS data” by A. Henry-Edwards and M. Tomczak***

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The main concern of referee #1 is the viability of our finding that the nitrate concentration in the Labrador Sea must have varied during the study period, while oxygen, phosphate and silicate apparently remained unchanged. One particular argument is that the relatively high weight allocated to nitrate may emphasize nitrate over other nutrients and that a different weight distribution could invalidate our finding.

As we said in our paper, we found consistently that the residuals were best minimized if nitrate was allowed to vary but all other nutrients and oxygen were kept constant. This finding is independent of the selection of weights, as can be seen by comparing our Figures 3 and 4. The figures use very different weights, but in both cases nitrate decreases over time, while phosphate undergoes unsystematic variations. TROMP analysis does not produce a clear minimum of the residuals if nitrate, phosphate and

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oxygen of Labrador Sea Water are varied while they are linked with a time-invariable Redfield ratio.

A discussion of the role of the weights is better placed in the description of the TROMP method and has therefore been clarified in the revised companion paper “Remote Detection of Water Property Changes from a Time Series of Oceanographic Data.”

The referee wonders why we included upper Western North Atlantic Central Water in the analysis. The water mass is present at some levels in small amounts and was therefore included in the water mass analysis. At the lower depth levels discussed here this may be irrelevant; however, as the original analysis was done at more depth levels it is carried through the analysis.

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Interactive comment on Ocean Science Discussions, 2, 417, 2005.

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