

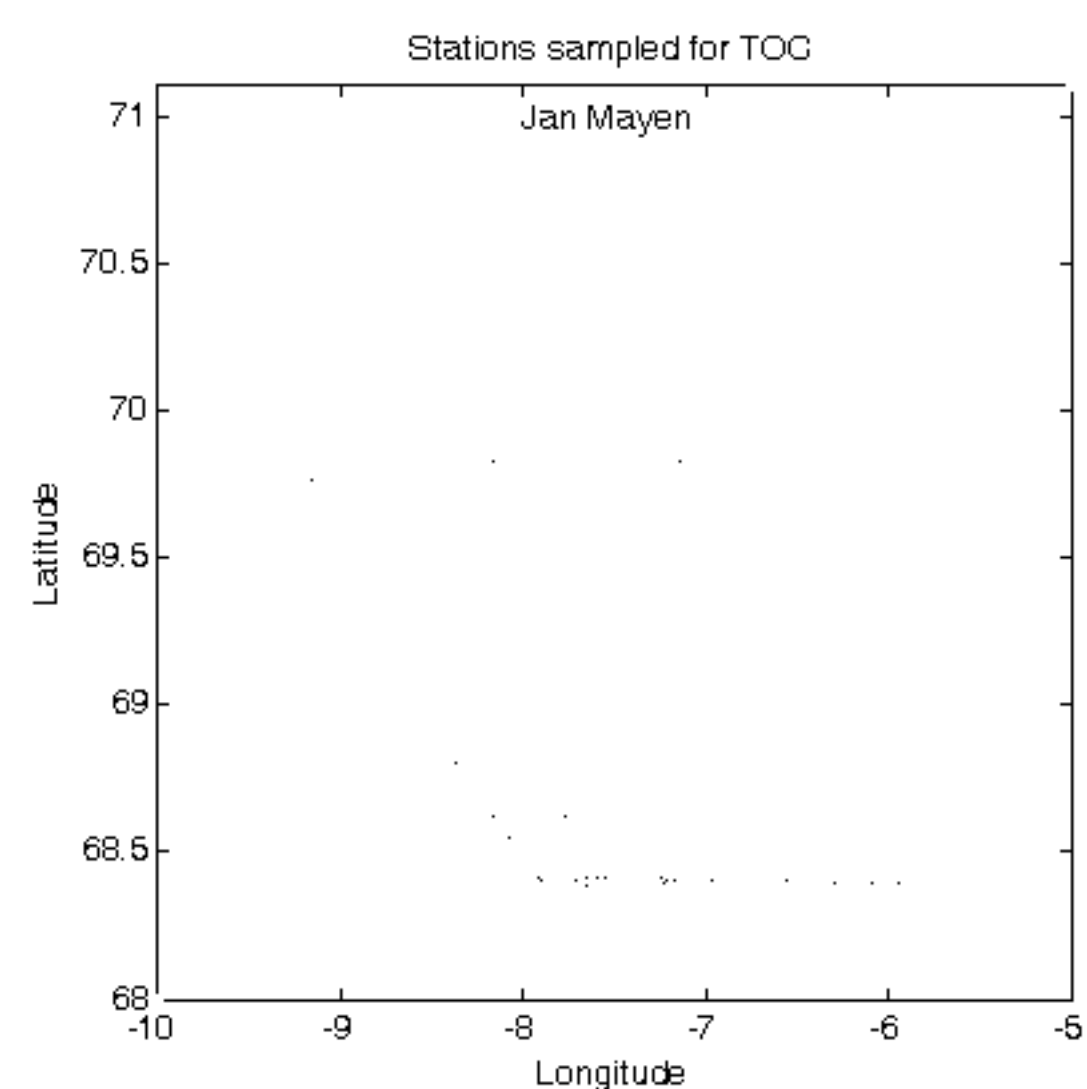
Gradients in TOC concentration at the Arctic Front south of Jan Mayen

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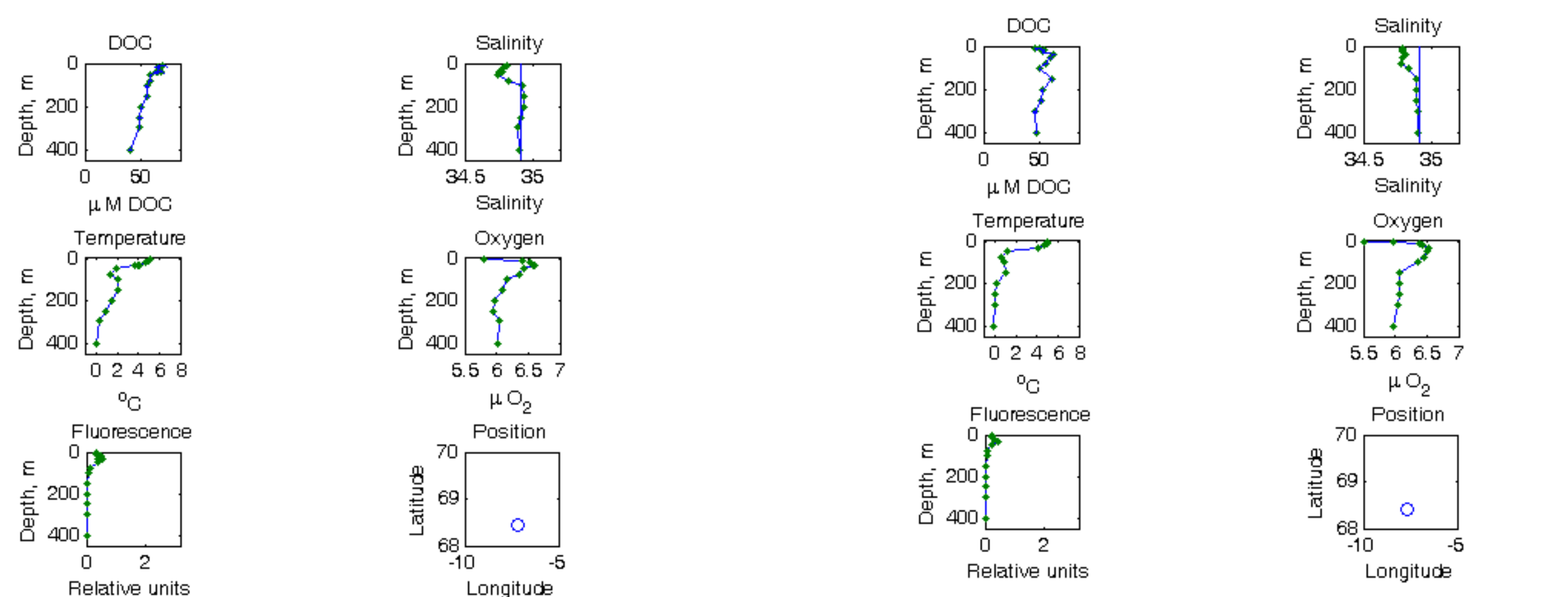


This poster was made to illustrate current efforts in the Bjercknes Centre to link the biological carbon cycle and the inorganic carbon cycle.

As a part of our efforts to further advance our knowledge of the dynamics of DOC in the Nordic Seas, distribution of DOC concentration was measured in samples collected from the NESSAR expedition to the Arctic Front south of Jan Mayen in the summer of 2007.



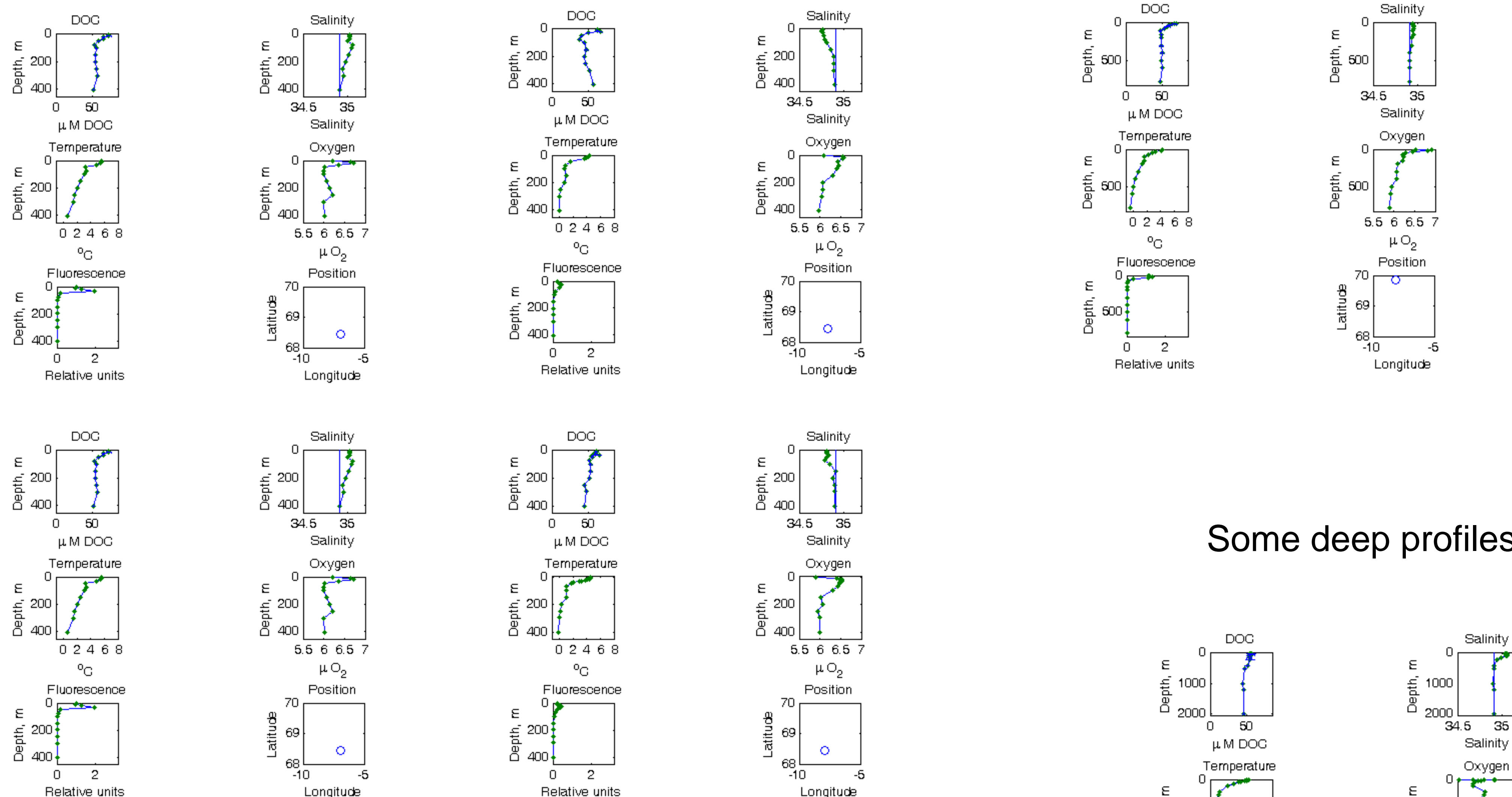
The vertical bar on the salinity plots is 34.91. Saltier water are supposedly Atlantic.



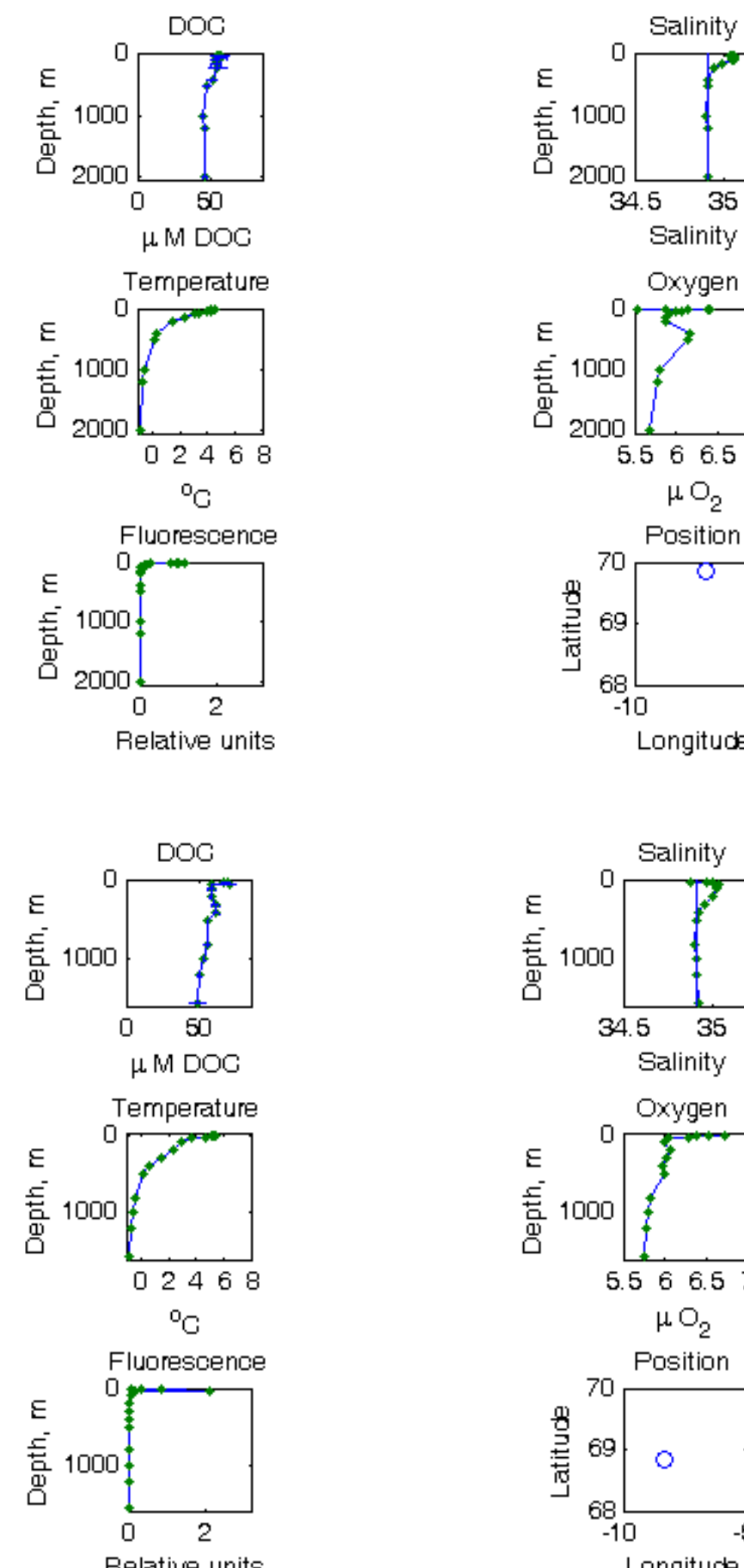
There are at least two reasons for being interested in marine DOC:

One: DOC is a large reservoir of carbon globally, comprising an amount of carbon comparable to the amount existing as CO₂ in the present atmosphere.

Two: The transient DOC in the euphotic zone has an apparent turnover comparable to 50% of the primary production.



Some deep profiles:



More from the DOC front:
Just an advertisement, not necessary to read:

A set of samples from the Polar Front in the Barents Sea is being analyzed. The samples were collected during the NESSAR expedition to the Polar Front east of Hopen in August 2007. It will be interesting to compare these results with the results presented here from the Arctic Front, because both sample sets were collected with identical sampling strategy.

Very exciting results on DOC dynamics inferred from mesocosm experiments conducted in Ny Ålesund in August 2007 are being prepared for publication.

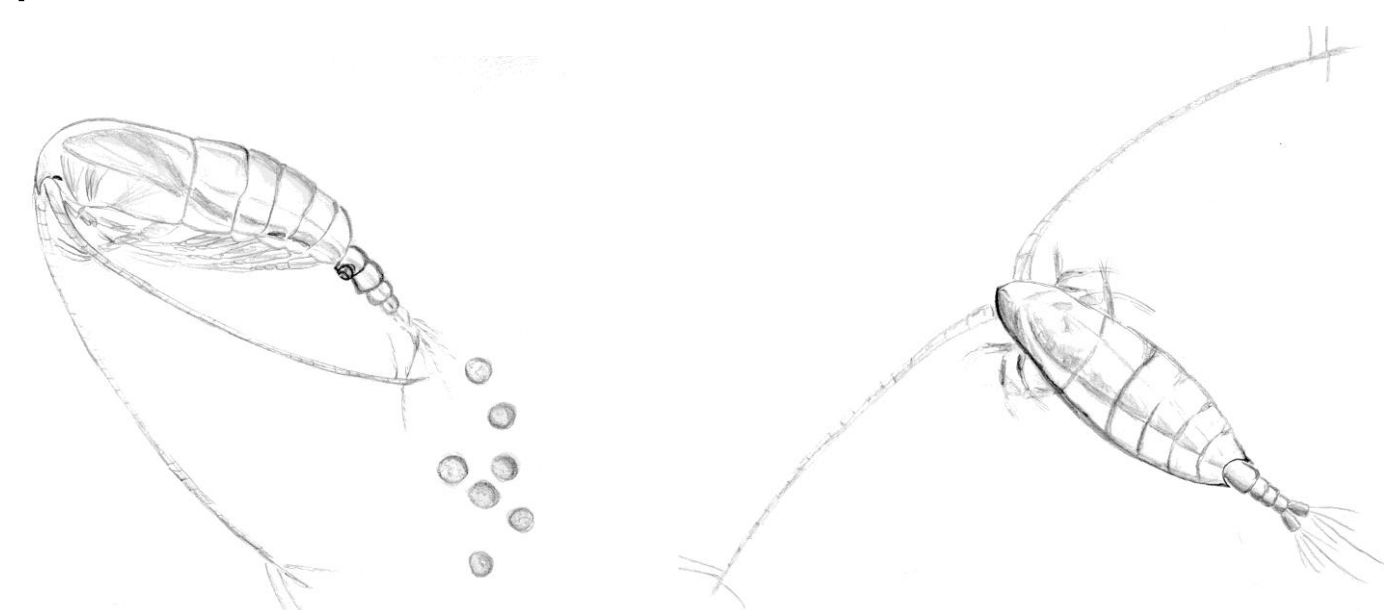
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Background

All living organisms contribute to the pool of dissolved organic compounds in water. Any cell both leaks passively and exudates actively some organic material. Animals release organic wastes, sometimes as particulate faecal pellets but even pellets leak dissolved organic matter. However, it is believed that phytoplankton are the main source of marine DOC. The fate of DOC after it is produced remains unclear. In the Nordic Seas, DOC accumulates in the euphotic zone during the growing season. At the termination of the growing season DOC concentration start to decrease, partly due to bacterial degradation, and partly due to mixing of surface water with subsurface water. This annual appearance of transient DOC has been established from time series collected at Station Mike at 66N, 2E. It is known that bacteria continuously degrade organic material all through the growing season. Therefore the total production of DOC certainly exceeds the measured net accumulation of DOC. The flux of organic material through DOC seems large even from the measurements of accumulation, but in reality it must be larger.

It is clear that both mathematical and conceptual models of upper ocean carbon cycle need to have a grip on the dynamics of major flow paths, and the flux through DOC is one of those.

We would like to know the turnover of transient DOC. Furthermore we would like to know the distribution of DOC concentration among the main watermasses, and annual variation patterns.



Also zooplankton contribute to DOC

