Ammonium regeneration and nitrification rates in the oligotrophic Atlantic Ocean: Implications for new production estimates

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ABSTRACT: N regeneration was measured on a transect of the North and South Atlantic, from the United Kingdom to the Falkland Islands, that included extreme oligotrophic conditions. NH_4^+ and NO{2 oxidation rates were measured from the surface and base of the photic zone at 16 stations, using an isotope dilution technique in conjunction with gas chromatography/mass spectrometry analysis. NH_4^+ regeneration rates were 10-160 nmol L^{-1} d^{-1}, NH_4^+ oxidation was ~1-10 nmol L^{-1} d^{-1}, and NO_2^- oxidation was 1-30 nmol L^{-1} d^{-1}. Outside the oligotrophic central gyres, high rates of NH_4^+ regeneration