Distinguishing Nutrient and Light Drivers of Productivity Trends In the North Atlantic Intergyre Region

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The North Atlantic Ocean absorbs 23% of the atmospheric carbon dioxide taken up by the ocean, making it the most intense carbon sink region. The solubility pump is major driver for this sink, with the added influence of the biological pump that is characterized by a dramatic spring phytoplankton bloom. In the boundary zone between the subtropical and subpolar gyre, a large region spanning 40-60 N, 20-40 W experienced a significant decline in satellite-observed chlorophyll a concentrations over the period 1998 to 2007. Phytoplankton growth is limited by the abundance of light and nutrients in the ocean, and this intergyre region is one of transition between subtropical nutrient-limitation and subpolar light-limitation. We are using a biogeochemical general circulation model to quantify the degree to which nutrients and/or light have driven the decreasing chlorophyll a concentrations in the intergyre region.