Title: Phytoplankton assemblages associated with water quality and salinity regions in Chesapeake Bay, USA
Author(s): H. G. Marshall,* Lacouture, R. V., J. M. Johnson, and C. Buchanan
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Abstract:
Based on an 18-year data base (1984-2002), seasonal (spring, summer) phytoplankton relationships to specific environmental determinants were identified within different salinity regions of Chesapeake Bay. Growth conditions in these areas were identified as either less favorable (Impaired) or favorable (Least Impaired) for phytoplankton development. Diatoms represented the greatest cellular abundance and biomass during spring in different salinity regions and water quality conditions. In contrast, the dominant summer floral biomass was produced by a combination of diatoms, chlorophytes, and cyanobacteria in tidal freshwater and oligohaline waters, with diatoms and dinoflagellates representing the major algal biomass in mesohaline and polyhaline regions. Chlorophyte and cyanobacteria abundance and biomass decreased with the increasing salinities of the mesohaline and polyhaline regions, in contrast to increased biomass and abundance by dinoflagellates and diatoms. Thecommon background taxa and an additional biomass source throughout these seasons were cryptophytes. Increased summer cyanobacteria abundance and biomass in the Impaired water of the tidal fresh and oligohaline regions were associated with reduced light availability and higher nutrient concentrations. The summer diatoms and dinoflagellates had increased mean cell sizes in the Least Impaired mesohaline and polyhaline waters compared to their populations in Impaired regions. This relationship was enhanced by increased abundance of neritic diatoms and dinoflagellates entering the Bay from Atlantic coastal waters. The data suggested a general reduction of existing nutrient levels and improved light availability in the Impaired waters would still continue the dominance of diatom flora over any additional cyanobacteria development.