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Structure of phytoplankton (Continuous Plankton Recorder and SeaWiFS) and impact of climate in the Northwest Atlantic Shelves

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All marine organisms are affected to some extent by the movement and thermal properties of oceanic currents. However phytoplankton, because of its small size is most directly coupled to the physical environment. The intense hydrodynamic activity observed in the Northwest Atlantic Shelves Province makes this region especially intriguing from the point of view of physical-biological interactions. In the present work, remote sensed data of Sea Surface Height (SSH) anomalies, Sea-surface chlorophyll a concentrations (SeaWiFS), and Sea Surface Temperature (SST) are used to complement the Continuous Plankton Recorder (CPR) survey that continuously sampled a route between Norfolk (Virginia, USA; 39˚N, 71˚W) and Argentia (Newfoundland; 47˚N, 54˚W) over the period 1995-1998. Over this period, we examined physical structures (i.e. SST and SSH) and climatic forcing associated with space-time phytoplankton structure. Along this route, the phytoplankton structures were mainly impacted by the changes in surface flow along the Scotian Shelf rather than significantly influenced by the mesoscale features of the Gulf Stream. These changes in water mass circulation caused a drop in temperature and salinity along the Scotian Shelf that induced changes in phytoplankton and zooplankton abundance.