



A study of Inorganic Carbon Cycling in Scotian Shelf Waters Using Stable Carbon Isotopes

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The stable carbon isotopes of dissolved inorganic carbon (DIC) can be used as a strong signal of biological processes in carbon cycling, however, so far, few, if any, studies have been conducted on Scotian Shelf (NW Atlantic) waters focusing on $^{13}\text{C}/^{12}\text{C}$ (^{13}C) in DIC. In this study, the spatio-temporal distributions of DIC and its ^{13}C in Scotian Shelf waters are investigated. The data were collected in April and October of 2014 as a part of the Atlantic Zone Monitoring Program, run by Fisheries & Oceans Canada. Throughout the research period, a combination of biological processes such as photosynthesis, river input and air-sea exchanges resulted in the changes of DIC concentration and its ^{13}C in the surface waters. From the vertical profiles of DIC and ^{13}C , the Deep Western Boundary Current signals are captured and discussed, as these deviate from the biologically dominated pattern of the remaining watermasses observed at the Scotian Shelf. Based on this research, a proper baseline of carbon cycling in Scotian Shelf waters is presented.