LATE WISCONSIN-HOLOCENE CHANGES IN NITROGEN UTILIZATION IN WEST ARCTIC OCEAN: EVIDENCE FROM $\delta^{15}$N AND C/N STRATIGRAPHY


(1) Institute of Marine Science, University of Alaska, Fairbanks, Ak 99775. U.S.A. (2) U.S. Geological Survey, Menlo Park, (3) International Arctic Research Center, University of Alaska (4) Water Environmental Research Center, University of Alaska (ffsan@uaf.edu/Fax +1-907-474-7204)

We report the Late Wisconsin-Holocene (past 49ka BP) stratigraphy of $C_{org}$, N, C/N, $\delta^{13}$C, and $\delta^{15}$N of three AMS $^{14}$C dated cores from the Mendeleyev Ridge and slope, Arctic Ocean. Glacial to postglacial increases are shown in $C_{org}$ (0.2-1.), N (∼ 0.05 to 0.13.%), C/N (3.5 to 7.2), $\delta^{13}$C (-25 to -23o/oo) and $\delta^{15}$N (∼ 4 to 7.8o/oo). We contend that the stratigraphic shifts in $\delta^{15}$N and C/N reflect relatively higher glacial to postglacial nitrate utilization in surface waters, linking to greater primary productivity in the more ice-free Holocene. The Holocene higher production is supported by the higher concentration then in C and N. The higher values in Holocene $\delta^{13}$C reflect several possible conditions combined: increased flux of marine phytodetritus and lower $p$CO$_2$ and growth rates of phytoplankton. The temporal shifts in $\delta^{15}$N and C/N do not reflect glacial to postglacial increased denitrification of the waters, as the Canada Basin has been oxic in the Holocene. The downcore decrease in C/N imply that diagenesis is a minor factor in all the temporal changes. Our conclusions concur with those of Schubert and associates, linking $\delta^{15}$N and nitrate utilization during glacial and interglacial in the Arctic Basin.