Late Pleistocene stratigraphy and paleoceanography in the Chukchi Plateau, western Arctic Ocean

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Two piston cores PC01 and PC04 along with multiple cores PL01 and PL04 were collected from the Chukchi Plateau in the western Arctic Ocean on the R/V Mirai Cruise MR09-03. Multiple cores PL01 and PL04 were used for the compensation of the top-loss of piston cores PC01 and PC04, respectively, from which two complete composite cores were obtained. Age of the composite core PL01/ PC01 was estimated by correlation of sediment properties with those of well-dated cores in complement to 9 AMS ^{14}C dates of bulk sediments. The stratigraphy of both composite cores shows the three lithologic units (unit 1: last glacial gray mud with an intervened IRD layer, unit 2: deglacial thick IRD layer, unit 3: Holocene brownish sandy mud). Glacial massive or laminated mud sediments may be deposited by suspension settling from meltwater plume. Absence of coarse-grained sediments may have been caused by limited iceberg drift due to relatively thick sea-ice cover during the last glacial period. The glacial muds are characterized by low $CaCO_3$ content, low TOC content, low C/N ratio, fairly high $\delta^{13}C$ value, and low kaolinite/chlorite ratio. The distinct deglacial interval of the composite core was characterized by high $CaCO_3$ and TOC content, high C/N ratio, and low $\delta^{13}C$ value, which clearly indicates the increased terrestrial contribution. Based on the microscope and SEM observation, the major IRD constituents are composed of carbonate minerals, indicating the transportation from the Canadian Arctic Archipelago. High kaolinite/chlorite ratios due to the increase of kaolinite correspond to the abundant IRD layers, confirming the IRD delivery. Holocene brownish sandy mud sediments show high opal content, high TOC content, low C/N ratio, and high $\delta^{13}C$ value which indicates the increase of marine diatom production.