

Tracing terrestrial organic matter along the Mackenzie Trough in the Beaufort Sea

김다해^{1,2}, 김정현^{1*}, Tommaso Tesi³, 강수진², Alessio Nogarotto³, 박광규¹, 이동현⁴,
진영근¹, 남승일¹, 신경훈²

¹극지연구소

²한양대학교 해양융합학과

³Institute of Marine Sciences, National Research Council

⁴국립수산과학원

Recent Arctic warming accelerates the release of vast amounts of organic carbon from the terrestrial permafrost to the Arctic Ocean, having the potential to affect Arctic biogeochemical carbon cycles. The Mackenzie River is one of the largest rivers draining into the Arctic Ocean and the most important source of terrestrial freshwater and sediment input to the Beaufort Sea. In this study, we investigated surface sediments collected along the Mackenzie Trough during the ARA04C, ARA05C, and ARA08C expeditions of the Korean ice-breaker R/V ARAON in the Canadian Beaufort Sea in 2013, 2014, and 2017, respectively. We analyzed the samples for bulk (TOC, TON, C/N ratio, $\delta^{13}\text{C}_{\text{TOC}}$, and $\delta^{15}\text{N}_{\text{TON}}$) and molecular (concentrations and $\delta^{13}\text{C}$ of *n*-alkanes, lignin phenols) parameters to trace the terrestrial organic matter input from the Mackenzie River to the Beaufort Sea. In addition, we analyzed the radiocarbon content ($\Delta^{14}\text{C}$) to calculate the petrogenic contribution of OC to the total OC pool. Our results provide information on the effect of thawing permafrost and thus the contribution of the activated old OC along the Mackenzie Trough. (*Corresponding author: J.-H. Kim, jhkim123@kopri.re.kr)