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The properties of glacial meltwater and sea water isotopes in the Terra Nova Bay, Antarctica

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Supra- and sub-glacial meltwater drainage becomes widespread in Antarctica, but its contribution to regional water masses has not been thoroughly quantified. For a better understanding of physical-chemical fractionations, we employ water isotopes (δ18O, δD) as practical tracers for hydrological researches. During the Antarctic summer expeditions (2014/15, 2015/16, 2016/17, and 2017/18) conducted by Korea Polar Research Institute, we sampled seawater performed with CTD casts in the Terra Nova Bay, Western Ross Sea. Picarro L2301-i CRDS is used for water isotope analysis, and preliminary results represent that sampled glacial meltwater contains both terrestrial meltwater and fresh water from ice shelf basal melting. The relationship of δ18O and δD shows the slope value around less than 7 (P1: δD=6.74$\times\delta$18O-0.02), however, the glacial meltwater shows the value around 8 (P1:δD=7.69$\times\delta$18 O+0.41). Water isotope differentiated presenting various values relative to given salinity. The various values of water isotopes imply other differentiation factors like evaporation and sea ice formation occurred.