

Biogeochemical characteristics as indicators of anthropogenic alteration in Nakdong estuary, Korea

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In estuaries, biogenic silica(BSi) content of sediments is controlled by dissolved silica(DSi) flux to estuaries. Decrease in DSi flux after damming is reported in many estuaries. DSi is mainly supplied to estuaries through river discharge and there is no anthropogenic source of DSi. Modified DSi flux could lead to nutrient ratio change that may influence plankton communities and potentially aquatic food webs. Nakdong estuary dam was installed in mid 1980s and the phytoplankton composition might have been modified after the installation. In order to determine damming effect in Nakdong estuary, sediment cores were collected in 2015 and 2017 at tidal flats of Nakdong estuary. Sediment dating was conducted using ²¹⁰Pb. The sedimentation rate of each core was 1~2.5cm/yr, indicating both sediment cores include the period of Nakdong estuary dam construction. During the period of dam construction, sand content of sediment was decreased at Eulsuk tidal flat. BSi content and BSi/TOC(total organic carbon) ratio might also decrease after dam construction. BSi content and BSi/TOC ratio decrease in sediment cores could indicate that DSi flux reduction and its effects on phytoplankton composition, resulting from Nakdong estuary dam construction. Therefore, BSi/TOC ratio is a useful tool for tracking phytoplankton composition change because sedimentary BSi content and TOC content are used as indicators of diatom productivity and total primary productivity respectively.