

Seasonal variations in fluorescent dissolved organic matter (FDOM) and dissolved organic carbon (DOC) in the Nakdong River estuary in Korea

SHIN-AH LEE* AND GUEBUEM KIM

School of Earth & Environment Sciences, Seoul National University, Korea (*correspondence: sina87@snu.ac.kr)

Water samples were collected at a fixed station in the Nakdong River Estuary, Korea, from September 2014 to present. The sampling was performed every hour using an auto sampler during spring tide once a month. The Nakdong River, which is the longest river in Korea, is a major source of drinking water, agricultural irrigation, and industrial supply. The Nakdong River Dam located 560 m upstream from the sampling site controls the river-water discharge and prevents the saltwater intrusion. We analyzed the fluorescence intensity of dissolved organic matter (DOM) using a spectrofluorometer and the concentration of DOC using a TOC analyzer. The fluorescence spectra were further characterized by parallel factor analysis (PARAFAC). In general, salinities ranged from 0.1–27. The concentrations of DOC and FDOM showed significant correlations with salinity ($r^2=0.65\sim 0.98$). These relationships indicate that terrestrial fresh water is the major source of FDOM and DOC in this region and that they are conservative over the estuarine mixing processes. The large seasonal variations in riverine endmember values suggest that the cycling of DOM in rivers is dynamic and might have critical impacts on biogeochemistry of DOM in receiving coastal waters.