

Impact of the fish farming on sedimentary organic matter composition in Lake Soyang (South Korea)

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Lake Soyang is the deepest and largest artificial dam reservoir in South Korea constructed in 1973. Since 1980s, Lake Soyang had experienced an expansion of the fish farm area until the fish farming was prohibited in 1999. In this study, we investigated the impact of fish farming on sedimentary organic matter (OM) in Lake Soyang. We collected a 50-cm long sediment core in the past fish farm area and analysed total organic carbon (TOC) and total nitrogen (TN) contents and stable isotopic composition of TOC and TN ($\delta^{13}\text{C}_{\text{TOC}}$ and $\delta^{15}\text{N}$). The age model of the sediment core is based on the ^{210}Po analysis. All parameters considered shows a distinctive shift at 10 cm core depth, which corresponds to the age of ~2000 AD. Our geochemical data indicate that OM derived from the fish farming impacted the sedimentary OM composition in our study site until 2000 AD. After the removal of the fish farm, the aquatic contribution to the total carbon pool increased. Accordingly, our study indicates that the fish farm removal caused a drastic change in sedimentary OM composition from an anthropogenic source to a natural source.