

Effects of natural climate change and human activity on the lagoon ecosystem in the northeast Korea

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Although both human activity and natural climate change affect the aquatic environment and ecosystem of lagoon, the majority of previous researches on lagoon eutrophication discussed the effects of human-induced eutrophication. The effects of climate change have been comparatively less discussed. Thus, we reconstructed the environment and ecosystem changes since the little ice age in a seasonally frozen lagoon Hwajin-po locates along the northeastern coast in Korea, based on multi proxy analyses (CNS, XRF, grain size, diatom, foraminifera, ostracoda) of sediment samples, in order to discover the impact of eutrophication and climate change on the lagoon ecosystem.

Lagoon Hwajin-po locates along the northwestern coast in Korea, and is seasonally ice-covered. At present, Hwajin-po is eutrophic lagoon dominated by plankton. Although Hwajin-po is shallow as maximum depth is about 4 m, anoxic water mass was observed during summer time. In July 2012, two 2-m long sediment cores (Hw12-A and -B) were obtained from the outer lake of Lagoon Hwajin-po using a push-in piston corer; at that time the water depths were 3.85 and 3.92 m. Based on the sediment core analysis, eutrophication of lagoon Hwajin-po started in late 1970s by human activities. Before the 1970s, lagoon Hwajin-po was probably sea-grass dominating lagoon. Effect of human activity in itself was confirmed since the early 20th century. Volume of sediment inflow from the catchment area increased since then, and it changed the assemblages of benthic biota in the Lagoon Hwajin-po. On the other hand, lagoon environment and ecosystem showed the cyclic change before the 19th century. In this presentation, impact of climate change on the lagoon ecosystem is discussed based on this periodical environmental change between 15th and 19th centuries.

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