

A numerical study on Natural and Anthropogenic effects on Primary Production in Gwanyang Bay, Korea

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The environment of Gwanyang Bay in Korea has been affected by natural and anthropogenic influences that impact primary production. However, identifying the leading cause of environmental changes is challenging due to the complexity of these effects. The bay's environment is greatly affected by natural variations in river discharge. Anthropogenic factors such as industrial development, dam construction, and sewage treatment plant construction have significantly altered the bay's environment over the past few decades. Long-term observations show a marked reduction in chlorophyll concentration in February and August since 2016. Previous studies have demonstrated that changes in light, temperature, nutrients, and dominant species can all affect the biomass of phytoplankton, which is vital for the bay's primary production. Turbidity and water temperature changes may also impact phytoplankton photosynthesis. This study aims to improve our understanding of the long-term effects of natural and anthropogenic factors on primary production in Gwanyang Bay. Using the ROMS-Fennel model, the study intends to assess the impacts of these factors on primary production and quantify the contributions of natural variability and human-induced environmental changes.