

Oxygen fluxes in seagrass and macroalgal of Omura Bay, Nagasaki, Japan

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Given the interest in primary production of shallow coastal ecosystems, we investigated the oxygen fluxes in two shallow water ecosystems in Omura Bay, Nagasaki, Japan. Omura Bay is an extremely enclosed water body located in western Japan. Along the shoreline of the bay, Sargassum forests and *Zostera marina* meadows are abundant. They form dense stands within 20 m of the shoreline. Among the variety of instruments we deployed, an array of dissolved oxygen loggers and submersible light loggers were used to characterize the daily variations in oxygen, temperature, and underwater light. A generalized additive model was used to estimate the hourly changes in oxygen concentrations, with the results integrated over a day to estimate daily rates of net oxygen flux. Briefly, the depth integrated net oxygen fluxes within the seagrass meadow was approximately $2000 \text{ g O}_2 \text{ m}^{-2} \text{ yr}^{-1}$, whereas in the sargassum forest, it was $500 \text{ g O}_2 \text{ m}^{-2} \text{ yr}^{-1}$. Yearly changes in net oxygen concentration averaged $520 \text{ g O}_2 \text{ m}^{-3} \text{ yr}^{-1}$ in the seagrass meadow and $480 \text{ g O}_2 \text{ m}^{-3} \text{ yr}^{-1}$ in the sargassum forest. More details shall be provided during the presentation.

Keywords: Macroalgae, Seagrass, Oxygen flux