



Short-term variation of triple oxygen isotopes and gross oxygen production in the Sagami Bay, central Japan

Sarma, V. V. S. S., O. Abe, A. Hinuma, T. Saino

Limnol. Oceanogr., 51(3), 2006, 1432-1442 | DOI: 10.4319/lo.2006.51.3.1432

ABSTRACT: We studied diurnal and daily variations in triple oxygen isotopes in the euphotic zone of the Sagami Bay during summer 2003 and 2004. There were sharp changes in physical processes, driven by changes in wind speeds, during the study period. Mixed-layer $\delta^{17}\text{O}$ anomalies were negatively correlated with wind speeds, whereas dissolved oxygen (DO) and chlorophyll a (Chl a) were positively correlated, suggesting that both physical and biological processes influence the $\delta^{17}\text{O}$ anomaly. Vertical mixing affected estimation of gross oxygen production (GOP) in the mixed layer, whereas horizontal advection was negligible in the Sagami Bay during the study period. Hourly GOP estimates are consistent with fast repetition rate fluorometer (FRRF) measurements; relatively higher estimates from the former method were due to the storing of past productivity signal. Daily integrated production estimated from $\delta^{17}\text{O}$ anomaly and FRRF were consistent during the entire study period, whereas the estimation from a ^{18}O spike incubation technique showed good agreement with the other two techniques only when the water mass structure was unchanged in the mixed layer.

Article Links

[Download Full-text PDF](#)

[Return to Table of Contents](#)

Please Note

Articles in L&O appear in PDF format. Open access articles may be freely downloaded by anyone. Other articles are available for download to subscribers only, or may be purchased for \$10 per article. All L&O articles are moved into Open Access after three years.