

Variability of the inorganic carbon system in the mid-east coast of South Korea

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One of the ocean areas vulnerable to ocean acidification (OA) is coastal region which is frequently exposed to wind-driven upwelling. Thus we investigated temporal changes in the seawater carbonate system and the effect of upwelling on OA in Hupo, a central part of the east coast of South Korea. The estimated mean net sea-air carbon dioxide (CO_2) flux was $-1.99 \pm 1.18 \text{ mol C yr}^{-1}$, indicating that this region was a sink for atmospheric CO_2 . Our monthly data revealed that temporal changes in surface CO_2 concentrations and calcium carbonate saturation states (Ω) were mainly governed by physical and biological processes. In particular, the wind-driven upwelling observed in July 2013 brought waters with high nutrients/ CO_2 and low pH/ Ω to the surface and thus enhanced biological production in surface waters. OA in this coastal ecosystem is expected to be exacerbated by anthropogenic CO_2 uptake and upwelling.