



## **pCO<sub>2</sub> distribution in the East China Sea continental shelf estimated from satellite sea surface temperature, Chla, and climatological salinity**

**A. Watanabe** (1), A. Morimoto (2), T. Takikawa (3), G. Onitsuka (3) and T. Saino (2)

(1) Graduate School of Environmental Studies, Nagoya University (2) Hydrospheric Atmospheric Research Center, Nagoya University (3) National Fisheries University

The efficient CO<sub>2</sub> absorption on the continental shelves has been paid much attention recently. But the observation of air-sea exchange of CO<sub>2</sub> has been limited in space and time, and seasonal variations of pCO<sub>2</sub> have not been well understood. This study aims at revealing pCO<sub>2</sub> distribution in the East China Sea with monthly time resolution. For the purpose we have conducted yearly observation around the Tsushima Straits located at the north-eastern edge of the East China Sea continental shelf. From the observation we successfully obtained empirical relationships between carbonate parameters (total alkalinity (TA) and dissolved inorganic carbon (DIC)) and other parameters (SST, Chla, and salinity). With the relationships monthly pCO<sub>2</sub> distribution in the East China Sea was estimated using satellite SST, Chla, and climatological salinity. The estimated pCO<sub>2</sub> shows clear seasonal variation. pCO<sub>2</sub> is low in winter due to low SST, and increases toward summer with increasing SST. From June to September, freshwater transport from the Changjiang River becomes high and decreases salinity, leading to low pCO<sub>2</sub> distribution in the areas affected by this freshwater. The estimated pCO<sub>2</sub> field coincided well with previous observations in winter and summer. We roughly estimated seasonal air-sea exchange of CO<sub>2</sub> in the East China Sea. The area acts as a sink for atmospheric CO<sub>2</sub> throughout the year, and it is high in winter (0.04-0.07PgC/yr) and low in summer (0.01-0.02PgC/yr). Yearly-averaged gas exchange is 0.02-0.04PgC/yr, which is 1/100-1/50 of the open ocean uptake although the areal coverage of the East China Sea is only 1/500 of the world ocean. High efficiency of the continental shelf pump in the area was indicated by this study.