

Diurnal variation of pH in Oshoro Bay, Hokkaido: A monitoring study assessing and projecting impacts of ocean acidific

TAKAO, Shintaro¹ ; FUJII, Masahiko^{1*}

¹Faculty of Environmental Earth Science, Hokkaido University

Coastal marine species have already been experiencing a low pH environment (<7.9) that is not predicted until 2100 in open oceans in a high CO₂ world. To properly assess impacts of ocean acidification on them inhabiting wide ranges of diurnal variation of pH, we need to conduct long-term and high-frequency monitoring measurements of environmental parameters. In this study, to investigate the diurnal variation of pH in subarctic region, which is less known than tropical and subtropical regions, we conducted monitoring measurements of pH, seawater temperature, and salinity in Oshoro Bay, Hokkaido from 2013 to 2014. Mean, maximum, and minimum pH values obtained by a pH meter were 8.02, 8.47, and 7.33, respectively. Although ranges of diurnal variation of pH were different with season, increases in pH during the day and decreases during the night were found in all periods. There are no statistically significant relationships between the variation of pH and that of seawater temperature or salinity except in some cases. These results suggest that observed diurnal variations of pH may be driven by photosynthesis and/or respiration in resident organisms in Oshoro Bay.

Keywords: subarctic region, ocean acidification, coastal ecosystem, diurnal variation