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Using planktonic B/Ca to reconstruct high latitude surface ocean PCO_2 during the last deglacial period

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Abstract

The atmospheric CO_2 concentration (pCO_2) is directly affected by CO_2 partial pressure (PCO_2) of surface oceans. Measurements of PCO_2 of modern surface oceans show that high latitudes are major sinks of CO_2 while low latitudes mainly serve as sources of CO_2 to the atmosphere. Therefore, reconstruction of surface CO_2 in these regions would provide important information about causes for past atmospheric pCO_2 changes. Although PCO_2 reconstructions are available for low latitude regions, surface ocean PCO_2 reconstructions for high latitudes are more limited. Here we use core-top and down core results from the North Atlantic Ocean to demonstrate that planktonic B/Ca ratios can be used as a new tool for surface PCO_2 reconstructions. We request funds (\$8000) to extend our research to the Southern Ocean and the North Pacific Ocean areas in order to obtain a comprehensive understanding about surface PCO_2 variation at high latitudes during the last deglacial period.