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CO_2 exchange episodes in the last deglaciation at Shatsky Rise, NW Pacific: implications for Pacific circulation

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The deglacial CO_2 outgassing intervals of the Heinrich Stadial-1 (HS1; 17.5-15 kyr) and the Younger Dryas (YD; 12.9-11.5 kyr) provide key into the oceanographic carbon storage system (Shuttleworth et al., 2020). In the North Pacific (NP; Gray et al., 2018) and East Equatorial Pacific (EEP; Martinez-Boti et al., 2015), a distinct CO_2 outgassing event appears even in late LGM (18-20ka). On the other hand, in the West Equatorial Pacific (WEP; Palmer and Pearson, 2003), the CO_2 content of surface seawater in thewas much lower, so it is difficult to explain WEP pattern .

In this study, we present a new high-resolution boron isotope-derived $pCO_{2,sw}$ record for 23-12 ka at Shatsky Rise, North West Pacific (NWP). This area is known as the Kuroshio-Oyashio Extension system, one of the largest surface current mixing areas in the Pacific. Our records were reconstructed from multi-species planktonic foraminifera, each representing water mass at different habitat depths: *G. sacculifer* (n=21) and *G. ruber* (n=18) in the tropical-subtropical group, *O. universa* (n=28) and *G. bulloides* (n=16) in the open ocean-transition group, and *N. Pachyderma* (n=26) in the transitional-cold water group.

For late LGM (20-18 ka), data from all species indicated high $pCO_{2,sw}$ (pH 8.0~), the CO_2 source peak appears at the same time as the peaks in NP and EEP. However, in HS1, the behaviors of the tropical-subtropical group and other groups were different, and the signals of EEP and NP were mixed. Through the similarity analysis of these results, we suggest several hypotheses for the NWP carbon storage mechanism along with the Pacific Ocean circulation.