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Speaker：Jing-En Chu

Advisors：Prof. Jia-Yuh Yu & Prof. Hien X. Bui

On the Response of the Aleutian Low to Greenhouse Warming

Abstract

Past and future changes in the Aleutian low are investigated by using observation-based sea level pressure (SLP) datasets and CMIP5 models. Both observations and multi-model historical simulations indicate that the Aleutian low intensity, measured by the North Pacific Index (NPI), has strengthened during the twentieth century. Under the strongest future warming (RCP8.5) scenario, the climatological-mean Aleutian low is projected to continue intensifying and expand northward. A suite of idealized experiments further demonstrates that the deepening of the Aleutian low can be driven by an El Niño–like warming of the tropical Pacific sea surface temperature (SST), associated with a reduction in the climatological-mean zonal SST gradient, which outweighs the dampening effect of a weakened wintertime land–ocean thermal contrast (LOTC) in a warmer climate.

Keyword

Aleutian low (AL)

Reference

Gan, B., Wu, L., Jia, F., Li, S., Cai, W., Nakamura, H., Alexander, M. A., and Miller, A. J., 2017: On the Response of the Aleutian Low to Greenhouse Warming. *J. Climate*, **30**, 3907−3925, doi: https://doi.org/10.1175/JCLI-D-15-0789.1