

Yamaguchi, J., Y. Kanno, G. Chen, and T. Iwasaki, 2019: Cold air mass analysis of the record-breaking cold surge event over East Asia in January 2016. *J. Meteor. Soc. Japan*, **97**, 275-293. <https://doi.org/10.2151/jmsj.2019-015>

Plain Language Summary: An extreme cold surge event occurred in January 2016 was studied by means of the isentropic cold air mass analysis method. We traced the cold air masses below a potential temperature of 280K more than a week, and found that a clump of thick cold air masses gathered on the eastern Siberia, moved to Lake Baikal, and then spilled southeastward over East Asia.

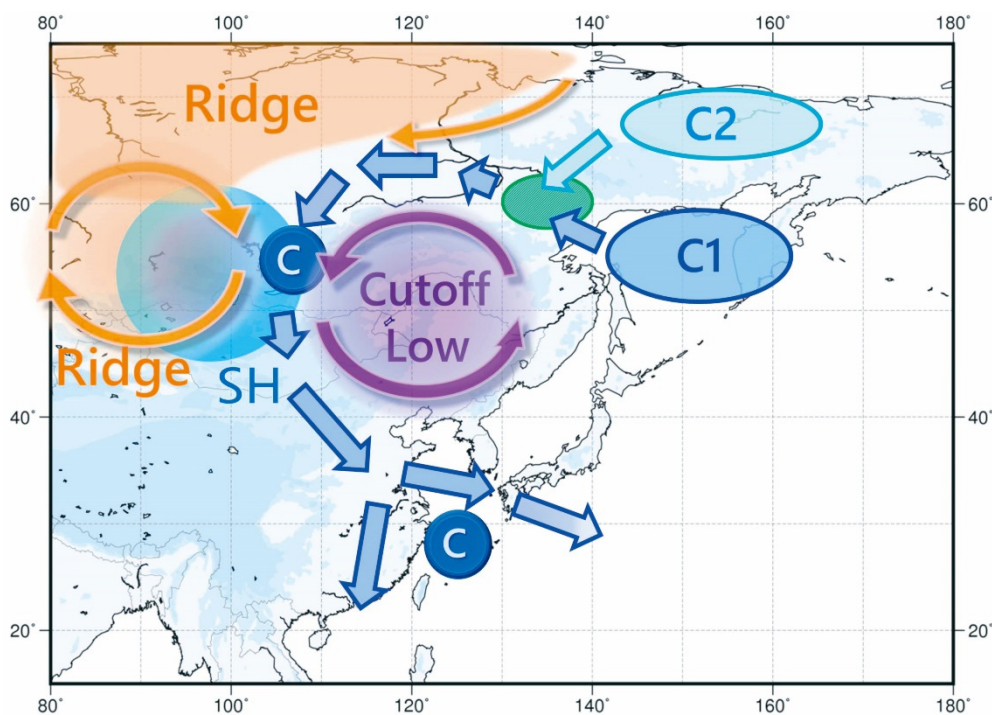


Fig. 1 Schematic diagram showing the evolution of extreme cold surge event in January 2016. A blue circle with white text “C” marks the center of the cold air mass clump. Dark blue arrows indicate the propagation route. A light blue circle with text “C2” represents a cold air mass over the Kolyma Lowland. A dark blue circle with text “C1” signifies a cold air mass over northern Sea of Okhotsk on the same day.

- The cold air mass is blown by the circulation related with two ridges, cutoff low, and surface intense Siberian High.
- The time evolution of cold air mass is dominated by adiabatic processes, especially advection, when moving over the continent.
- The abnormality of the cold air mass thickness increases considerably as cold air mass migrates southward, although the thickness itself shows slight change, suggesting that the normal cold air mass from the Sea of Okhotsk and northeastern Siberia becomes abnormal during westward and strong southward migration.