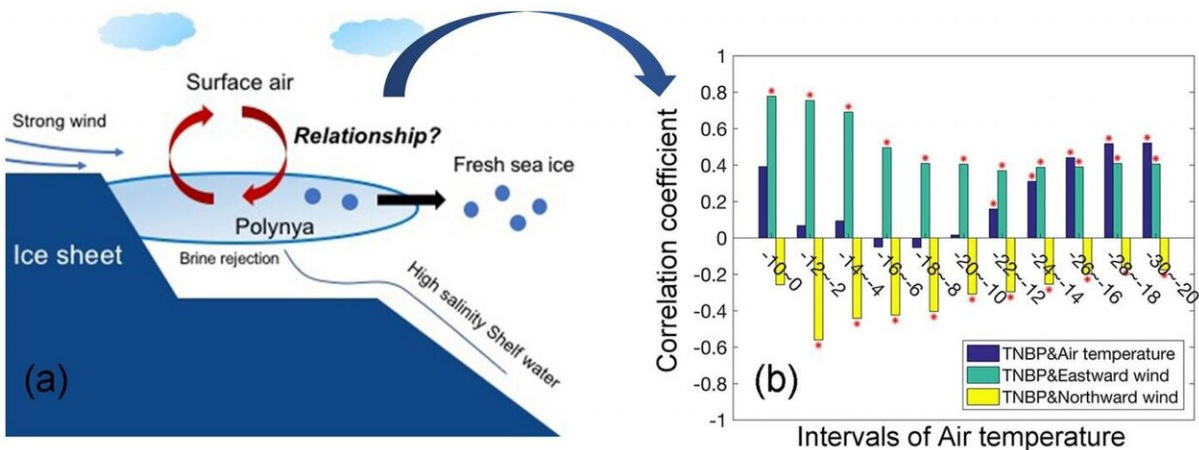


Scientists reveal a close relationship between air temperature and the area of Antarctic polynyas

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(a) mechanism of the polynya; (b) correlations of polynya area with air temperature and wind speed. Credit: Yifan Ding

Polynyas—areas of open water with reduced ice cover that persists—in the Antarctic play an important role in regional atmosphere-ice-ocean interactions and are considered to help generate the global deep ocean conveyor belt. Polynyas therefore have a potential impact on the Earth's climate in terms of the production of sea ice and high-salinity shelf water.

"Previous research has mostly focused on the forcing of winds on the Antarctic coastal polynyas. The relationship between those polynyas and the [air temperature](#) has not been fully investigated," explains Prof. Xiao Cheng from the College of Global Change and Earth System Science, Beijing Normal University.

In a recently published study in *Advances in Atmospheric Sciences*, Cheng and his team combined observations from automatic weather stations with reanalysis data to present a case study of the relationship between the Terra Nova Bay polynya in the Ross Sea and the surface air temperature. Reanalysis and [observational data](#) reveal interactive effects between air temperature and the area of the Terra Nova Bay polynya. Though the underlying mechanism of the relationship between the air temperature and the polynya area is uncertain, lead/lag correlations show that the air temperature seems to have a more significant effect on the polynya area.

The team investigated the specific relationship between the two by controlling the air temperature intervals (Fig. 1b) and found that "the polynya area shows increasing correlation coefficients with air temperature versus wind speed as temperature declines. The relationship of the polynya area with lower air temperature is significantly closer than that with wind speed."

More information: Yifan Ding et al, Specific Relationship between the Surface Air Temperature and the Area of the Terra Nova Bay Polynya, Antarctica, *Advances in Atmospheric Sciences* (2020). [DOI: 10.1007/s00376-020-9146-2](https://doi.org/10.1007/s00376-020-9146-2)

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