

# Enhanced Ventilation in Energetic Regions of the Southern Ocean

Dove, Lilian A., Balwada, D., Thompson, A.F., Gray, A.R. "Enhanced ventilation in energetic regions of the Antarctic Circumpolar Current." *Geophysical Research Letters* 49.13 (2022). <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2021GL097574>

## Scientific Achievement

Identification of Southern Ocean “hotspots” where ventilation, the exchange of heat and carbon between the atmosphere and the deep ocean, occurs at greater rates.

## Significance and Impact

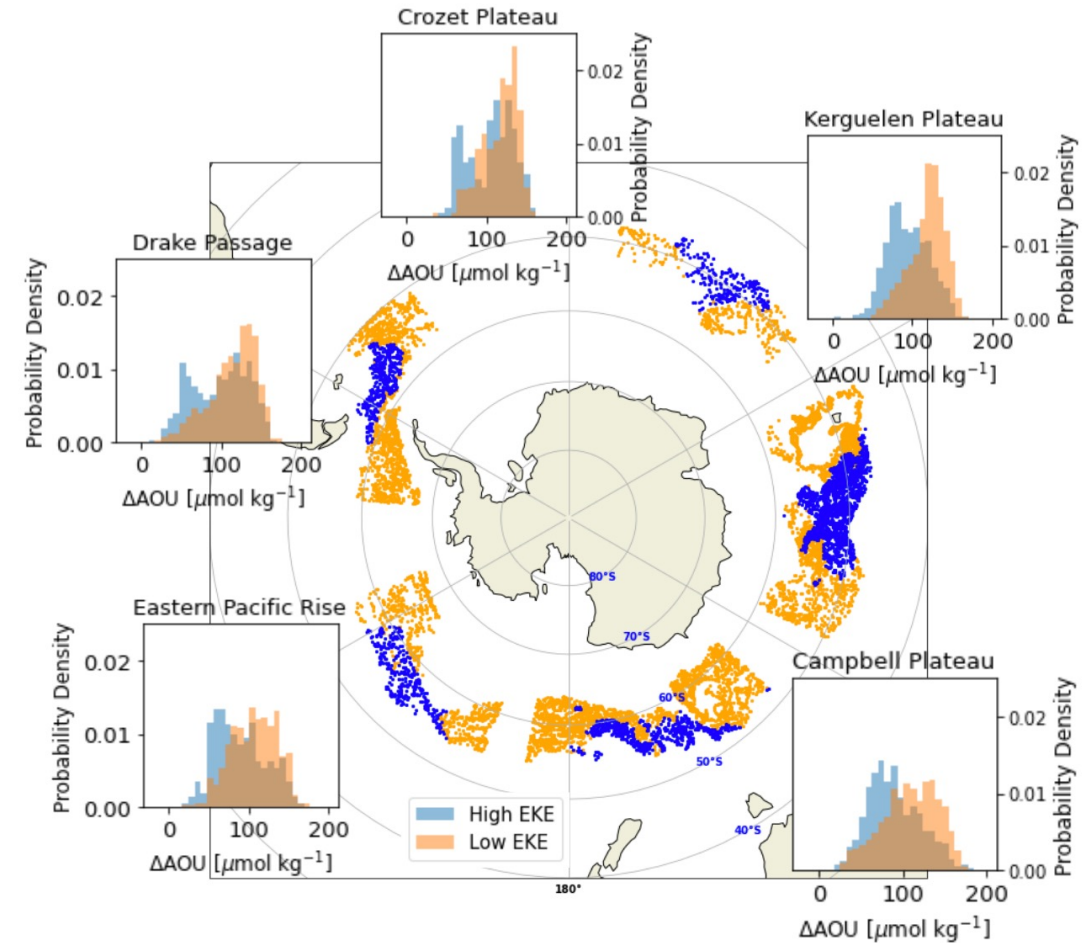
The Southern Ocean is a key region for heat and carbon exchange between the ocean and atmosphere. This study identifies key regions where its response to a warming climate will occur first.

## Technical Details

- Uses observations from over 20,000 vertical profiles by autonomous floats in the Southern Ocean as well as remote sensing estimates of surface currents.
- Demonstrates that processes on scales of 1-10 km can contribute to heat and dissolved gas exchange.



Author Lily Dove with an autonomous Argo float. Over 20,000 profiles from these instruments were used in this study.



Map of the Southern Ocean with the locations of vertical profiles marked by dots. Each subplot corresponds to a ventilation “hotspot,” with profiles from higher and lower energetic regions blue and orange, respectively. Low values of Apparent Oxygen Utilization (AOU) suggest more recent presence at the surface ocean and thus more recent ventilation.