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# Sea Ice Formation and Dense Water Formation in the Weddell Sea

Spring 2026
Poster number 338.1
GEOF338 Polar Oceanography

## Why it matters

- Antarctic Bottom Water is one of the densest water masses in the global ocean
- The Weddell Sea is an important region for dense water formation
- Dense water formation contributes to deep ocean circulation and ventilation

## Weddell Sea Map

- The Weddell Sea is in the Southern Ocean
- Dense shelf water forms along the Antarctic continental shelf
- Winter sea ice formation increases salinity and density

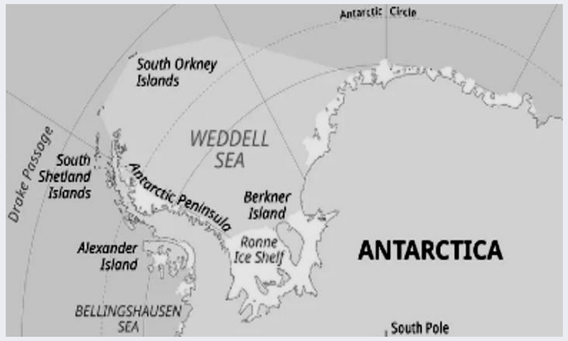


Figure 1: Map of the Weddell Sea

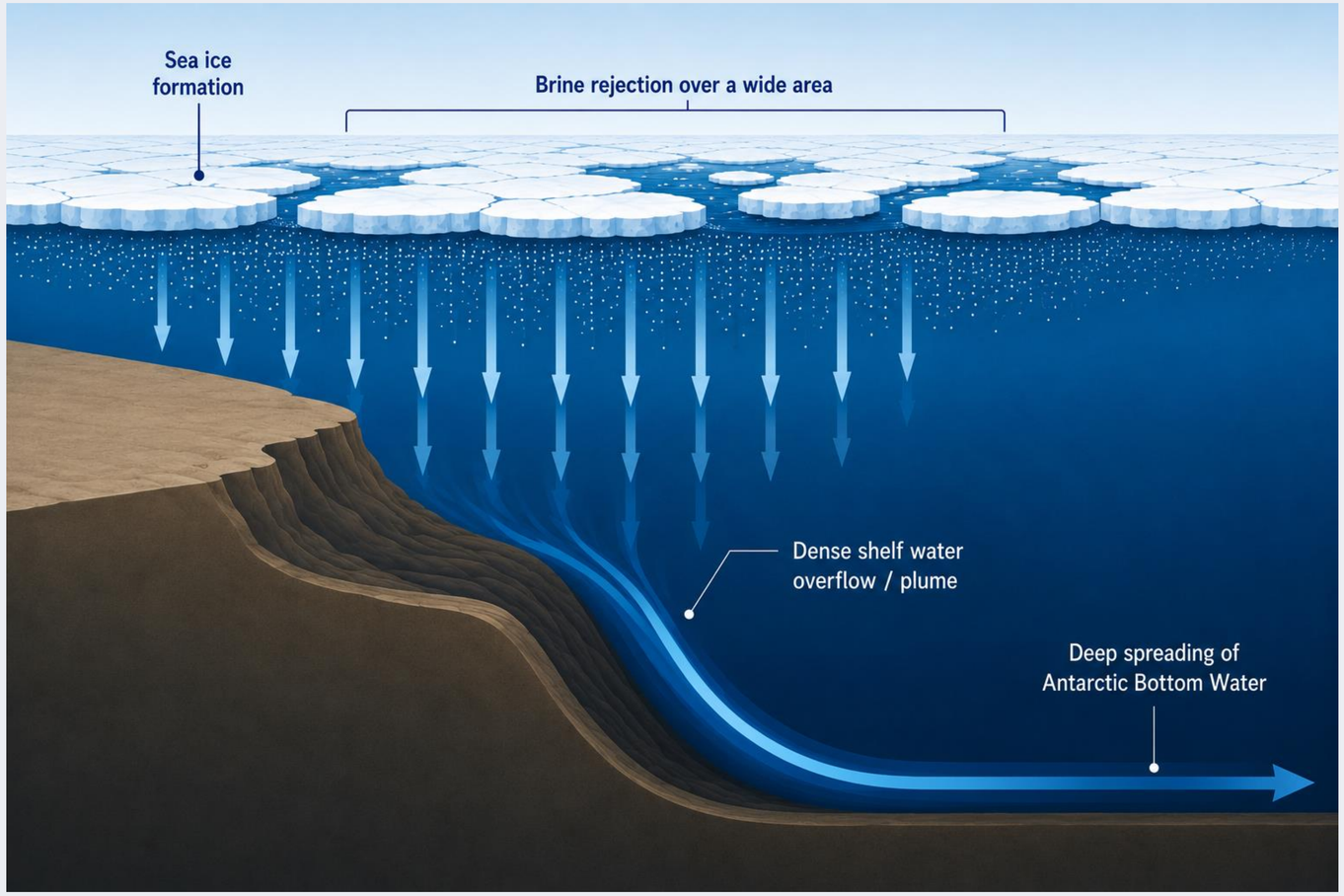


Figure 2: Schematic illustration of sea ice formation, brine rejection, dense shelf water formation, and overflow processes in the Weddell Sea. Generated with AI assistance and manually adapted for this poster.

## Brine Rejection

- Sea ice mainly forms from freshwater
- Most salt is rejected back into the ocean
- Saltier water becomes denser and can sink
- This helps form dense shelf water

## Overflow / Plume

- Dense shelf water sinks and flows downslope
- Dense overflow plumes transport water into the deep ocean
- Mixing can occur during the descent

## Conclusion

- Sea ice formation promotes brine rejection
- Brine rejection increases salinity and density
- Dense water sinks and contributes to Antarctic Bottom Water

## Global Circulation

- Dense water contributes to Antarctic Bottom Water
- Antarctic Bottom Water spreads through the abyssal ocean
- These processes are linked to global overturning circulation

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Orsi, A. H., Johnson, G. C., & Bullister, J. L. (1999). Circulation, mixing, and production of Antarctic Bottom Water.
Figure 1 source: https://www.britannica.com/place/Weddell-Sea#/media/1/638688/289941