

Global thermohaline circulation (THC):

- Deep sinking in North Atlantic, but not in North Pacific
- Deep horizontal transports concentrated in western boundary currents (DWBCs)
- DWBC observed throughout Atlantic; dense in North Atlantic, buoyant in South Atlantic

Stommel-Arons theory:

- Predicts DWBC; required to avoid conflict between vorticity equation and mass conservation
- Poleward interior flow
- Equator-crossing only in DWBC

High-latitude salinity effects:

- Thermal expansion coefficient small at low temperatures
- Salinity fluctuations influence density more strongly at high latitudes
- Low surface salinity in North Pacific decisive factor in preventing deep convection there

Why is North Pacific so much fresher than North Atlantic?