



## Abstract View

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## Atlantic Ocean Upper Layer Salinity Budget

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### ABSTRACT

Production of North Atlantic Deep Water (NADW) transfers upper-layer thermocline water into abyssal depths. Export of NADW across 35°S in the Atlantic Ocean into the Indian and Pacific Oceans by the Antarctic Circumpolar Current (ACC) requires a compensating flow of upper-layer water from the circumpolar zone of the Southern Ocean into the Atlantic. This water, enroute to the NADW production regions, becomes saltier because evaporation exceeds precipitation and continental runoff. This process is responsible for a relatively salty Atlantic Ocean. Using estimates of the net freshwater flux, the increase of upper-layer salinity versus latitude is calculated for two NADW production rates:  $15 \times 10^6$  and  $20 \times 10^6 \text{ m}^3 \text{ s}^{-1}$ . The  $20 \times 10^6 \text{ m}^3 \text{ s}^{-1}$  production rate provides the best relationship with the linear trend in salinity as determined from hydrographic data. It is suggested that a contributing factor to the establishment of a salty Atlantic Ocean, and possibly of NADW formation, is the removal of freshwater from the Atlantic Ocean by the ACC.

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