An Oceanic Heat Transport Pathway to the Amundsen Sea Embayment

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The Amundsen Sea Embayment (ASE) on the West Antarctic coastline has been identified as a region of accelerated glacial melting. A Southern Ocean State Estimate (SOSE) is analyzed over the 2005-2010 time period in the ASE region. The SOSE oceanic heat budget reveals that advection and local air-sea heat flux both contribute significantly to the heat content of the ASE waters, while the contribution of parameterized small-scale mixing is negligible. Above the permanent pycnocline the local air-sea flux dominates the heat budget and is controlled by seasonal changes in sea ice coverage. Overall, between 2005 and 2010, the model shows a net heating of the ASE in the layer above the pycnocline by 8.2×10^{19} J. Sea water below the permanent pycnocline is isolated from the influence of air-sea heat fluxes, and thus, the divergence of heat advection is the major contributor to increased oceanic heat content of these waters, with a total net heat content increase of 1.7×10^{19} J. Heat transport across the continental shelf slope in the layer below the pycnocline is strongest in the eastern sector of the embayment. Here, the oceanic transport of mass and heat is primarily geostrophic, sustained by the local wind-stress curl.

- Ice-ocean interaction *(Surfin' USA)*
    - Amundsen Sea (*West Coast Blues)*