

Transient Temperatures and Redoubtable Reticence in the Amundsen

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To account for an apparent negative ice sheet imbalance in the Amundsen sector, a current hypothesis is that a warming ocean is thinning its ice shelves, which in turn permit faster ice stream flow, contributing to sea level rise. Documented ocean warmth in this sector exceeds that in most other Antarctic coastal regions, but evidence for a warming trend has been lacking. We will review subsurface temperature measurements in and near the Amundsen Sea over recent years. The relevant data now include repeat late summer vertical profiles and transects at 1-7 year intervals from 1994, and several year-long near-bottom records. Deep ocean temperatures in and west of Pine Island Bay (PIB) are highly variable in space and time, and dominated more by tidal than seasonal cycles. Change over periods from months to several years may relate to postulated and modeled variability in Circumpolar Deep Water inflow. Late summer temperature profiles below 300m in greater PIB were colder in 2000 than in 1994, and warmest in 2007, with a 13-year range of $\sim 1.5^{\circ}\text{C}$ above 600m and 0.3°C below 800m. While cavity shape, basal slope, and seawater velocity, density and mixing will influence the delivery of oceanic heat to the local fringing ice shelves, this observed thermal variability alone could drive large short-term changes in their basal melt rates.

“Reticence is fine for the IPCC.....Do we not know enough to say more?” J Hansen, 2007