



Tides in the Amery Ice Shelf/Prydz Bay region, East Antarctica

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Here we present two models that have been used to simulate the tides in the Amery Ice Shelf cavity and Prydz Bay region of East Antarctica. The Amery Ice Shelf is the 3rd largest embayed shelf in Antarctica and drains the grounded ice from the interior of the Lambert Glacier drainage basin, which covers an area of 16% of the East Antarctic ice sheet. The two models used are: ROMS, a three-dimensional high resolution hydrodynamic ocean model; and, HUGO, a purely barotropic high resolution model. The models are used to adjust the largely unknown water column thickness in the southern region of the Amery Ice Shelf, which is important for mixing studies in the 3-D melt/freeze simulations. The two models show generally good agreement with each other and with tide gauge and GPS observations. By comparing the models with each other and observations we can better understand the response of the Amery Ice Shelf to ocean forcing, ocean mixing processes and energy dissipation in the shelf flexure zone. These processes are particularly important in the southern part of the Amery Ice Shelf where the majority of the melt is thought to occur. Results will lead to improved estimates of energy and freshwater budgets.