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Kenneth Jezek* (jezek.1@osu.edu), 1090 Carmack Road, Columbus, OH 43210. *Polar Ice Sheets: Observations and Models.*

Outlet glaciers around Greenland are thinning, accompanied by substantial acceleration of the surface velocity field. In the Antarctic, large ice streams are behaving in similarly unexpected ways, some apparently in response to changes in the subglacial hydrology. The evidence is clear that the polar ice sheets are changing, but two points remain. First, what is the dominant mechanism forcing change and second, will the changes now being observed lead to irreversible ice sheet retreat. Here, I highlight some recent observations, focusing on the glacier bed. I go onto to suggest how collaborations between the glaciology and mathematical communities could help resolve the points mentioned above. First, I present an analytic model that predicts melt beneath ice stream shear margins but which suffers from simplifying assumptions about the vertical variation of physical parameters. Second, I describe our attempt to develop a Bayesian approach for studying basal processes, which resulted in a highly sophisticated mathematical structure around the simplest possible glaciological model. Finally, I suggest how the quasi-static solution of ice dynamical solutions might be extended to include inertial forces and how that might eventually lead to better predictive modeling. (Received September 15, 2008)