

## Viscous buckling on the grounding line

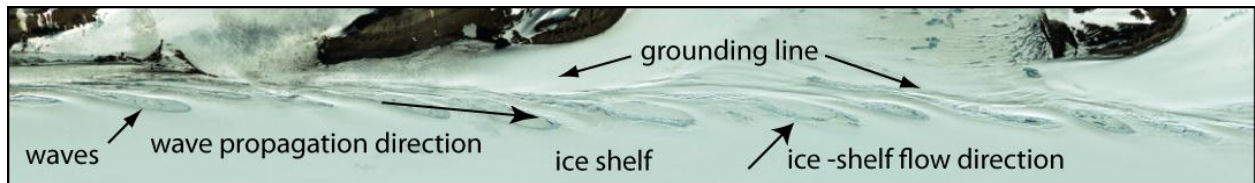
Claire LaBarbera<sup>1</sup> and Douglas MacAyeal<sup>2,\*</sup>

<sup>1</sup>Cornell College, Mt. Vernon, IA

<sup>2</sup>Department of Geophysical Sciences, University of Chicago, Chicago, IL

\*presenting author

There is nothing *a priori* wrong with the idea that ice can flow from sea onto land. We have, in fact, found such a circumstance on the boundary between George VI Ice Shelf and Alexander Island. Satellite imagery of this grounding line reveals propagating waves in the surface topography of a phenomena that defies efforts to explain with simple notions of grounding line dynamics. We speculate that viscous buckling, like what happens when a sheet of honey is poured onto a stack of pancakes, is what twists and warps the ice shelf at this grounding line. Oblique incidence of the ice flow onto the grounding line leads to phase propagation of the buckles. Furthermore, viscous buckling (both sinuous and varicose) appears to organize the location and morphology of surface meltwater ponds both within the grounding zone and elsewhere on the ice shelf. Troughs in the buckles contain exquisite, petal shaped meltwater ponds, the existence of which reinforces the notion that surface-hydrology on ice shelves remains largely unexplored.



Propagating waves on the grounding line of George IV Ice Shelf (DigitalGlobe browse imagery).