

# Basal Conditions Underneath Thwaites Glacier Using Ice Penetrating Radar

Elena Kosh<sup>1</sup>, Indrani Das<sup>2</sup>

*<sup>1</sup>Barnard College of Columbia University, <sup>2</sup> Lamont-Doherty Earth Observatory of Columbia University*

Thwaites Glacier in the Amundsen Sea Sector of West Antarctica has experienced dramatic, persistent mass loss in recent decades. Previous research documents evidence of warm Circumpolar Deep Water incursion onto the continental shelf, which enhances ocean-driven basal melting and could eventually lead to the unstable retreat of the glacier's grounding line. The presence of liquid water underlying grounded ice likely enhances rapid ice flow and mass loss through basal sliding and deformation of subglacial material, yet recent observations of basal conditions in Thwaites' grounding zone remain limited. Here, we use airborne radar-sounding data from NASA's Operation IceBridge 2012, 2016, and International Thwaites Glacier Collaboration 2018 BAS campaigns to detect basal conditions underneath the grounded ice of Thwaites. Preliminary results show high basal reflectivity near the grounding line for all three observed years, and low reflectivity further upstream of the floating ice tongue. Changes in ice thickness and reflectivity between all three years will be determined through a crossover analysis in order to assess errors. In this work, we will present preliminary basal reflectivity estimates and discussions on the probable conditions at the bed that could influence the dynamics of the Thwaites Glacier.