

Thwaites Antarctic Glacier Impending Collapse to Increase Rate of Global Sea Level Rise Flooding About 10 Times

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INTRODUCTION

Persistent sea level rise presents protection risks to society with expected costs in the trillions of dollars. Public officials often base their assessments of that risk and what they deem the appropriate level of protection based upon model estimates of how much and how quickly sea levels will rise in the decades ahead. Scientists are observing many accelerating ice melt phenomena for the first time and cannot know the precise timeframes. However, if ice melts faster than model estimates, we won't know until it's too late to take action. Given the costs of being wrong about the accelerating melt, and new risks from destabilization of the Thwaites Glacier, here's a key question: *is the financial and social risk to society too great to NOT be protected for 2 feet minimum of rise by 2030?*

New data about Thwaites Antarctic Glacier demonstrates such a case. Sea levels could rise precipitously as shown in the Thwaites Glacial Collapse Schematic based on actual data: <https://www.capitalmarketpartnership.com/resilience>. Thwaites Antarctic Glacier is the greatest contributor of global sea level rise flooding, currently at 2%. Thwaites, part of the West Antarctic Ice Sheet, is under irreversible collapse due to accelerating melting and regional geomorphology, as shown in the NASA JPL video in Reference 1 of the Thwaites Impending Collapse Schematic at the preceding link. This NASA video was released at a 2014 press conference with a companion *National Geographic* article. The Schematic is by Chuck Carter, who prepares NASA graphic art.

Ice-penetrating aerial imagery and other key actual data (not model estimates) document Thwaites impending collapse, which will increase global sea level about 10 times to about 20% of the global contribution. IPCC states that sea level rise flooding estimates need to be recalibrated based on such substantial melt changes in Antarctica (Schematic Reference 8). Historical data indicate Thwaites collapsed previously during warming periods (Schematic Reference 11).

RESULTS

NASA JPL documented "explosive & disturbing" large-scale melt of nine miles at Thwaites grounding line (ocean, ice, bedrock interface) by ice-penetrating aerial imagery of a large cavity in 2015-2017 (Schematic Reference 2).

Ocean temperatures at Thwaites grounding line have been measured at 3.6°F above freezing (2020) with plenty of energy to keep melting the glacier (Schematic Reference 5).

Thwaites grounding line is approaching an inward steep slope that may very likely trigger an acceleration of Thwaites' inward collapse and melt based on satellite radar observations. The grounding line is moving inland across the submerged ridge at about 1.6 km. per year, 3 km. away from the steep slope, where Thwaites may then very likely plunge deeper inland triggering a 10 times more rapid retreat and melt (Schematic Reference 4 and grounding line retreat map at this link at page bottom: <https://www.capitalmarketpartnership.com/resilience>).

U.S. protection costs are in the trillions of dollars. Based on RELi SPECIAL REPORTS of calculated protection costs using actual cost data for sea level rise flooding of \$326 billion for Massachusetts and \$1.9 billion for Pennsylvania, total U.S. protection costs for two feet of rise are around \$5 trillion.

Minimum sea level rise flooding protections are proposed for 2 feet of rise by 2030 to preserve commerce and national security with a margin of safety by the 3.0 RELi national consensus resilience standard for buildings, homes, and infrastructure. The building industry has been governed by such voluntary consensus standards since the 1850's.

Fortunately, many tens of trillions of investor funding are available by private sector Higher-Rated Green + Resilient Building Bonds for individual building and regional government protections including building owners. This financing is being covered at the Higher-Rated Green + Resilient Building Bond CEO Summit, and RELi 3.0 Resilience Standard Aug. 25, 2022 National Public Meeting.