

New study on Doomsday glacier

April 12, 2021

In News: Recently, Researchers at Sweden's University of Gothenburg are saying that fears related to Thwaites's melting are worse than previously thought, owing to the supply of warm water flowing underneath at a rate underestimated in the past.

Previous Studies Key Points

- A 2019 study had discovered a fast-growing cavity in the glacier, sized roughly two-thirds the area of Manhattan.
- Water at just two degrees above freezing point at Thwaites's "grounding zone" or "grounding line".
- The grounding line is the place below a glacier at which the ice transitions between resting fully on bedrock and floating on the ocean as an ice shelf. The location of the line is a pointer to the rate of retreat of a glacier.
- When glaciers melt and lose weight, they float off the land where they used to be situated. When this happens, the grounding line retreats.
- That exposes more of a glacier's underside to seawater, increasing the likelihood it will melt faster. This results in the glacier speeding up, stretching out, and thinning, causing the grounding line to retreat ever further.

New Study Key Points

- The submersible called "Ran" measured among other things the strength, temperature, salinity and oxygen content of the ocean currents that go under the glacier.
- Using the results, the researchers have been able to map the ocean currents that flow below Thwaites's floating part.

- The study was “more successful than we had dared to hope,” the press release said.
- Crucially, the researchers have been able to identify three inflows of warm water, among whom the damaging effects of one had been underestimated in the past.
- The study also looked at heat transport in one of the three channels which brings warm water towards the glacier from the north.
- The channels for warm water to access and attack Thwaites weren't known to us before the research. Using sonars on the ship, nested with very high-resolution ocean mapping from R/V OBP-100, we were able to find that there are distinct paths that water takes in and out of the ice shelf cavity, influenced by the geometry of the ocean floor.

Thwaites Glacier

- Thwaites Glacier fast-moving glacier located in Antarctica.
- Contains enough water to raise the world sea level by more than half a metre.
- Its melting already contributes 4% to global sea-level rise each year.
- Estimated that it would collapse into the sea in 200-900 years.
- It is important for Antarctica as it slows the ice behind it from freely flowing into the ocean. Because of the risk it faces – and poses – Thwaites is often called the Doomsday Glacier.