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Antarctic Larsen C Ice Shelf Calving

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In July 2017, over 10% of the Larsen C ice shelf calved (broke off) from the Antarctic Peninsula, creating a one trillion ton iceberg the size of Delaware and twice the height of the Statue of Liberty.

Antarctic ice shelves are:

- Floating freshwater ice, even when intact
- Barriers to the flow of inland ice from land to the ocean
- Extremely sensitive to climate change

Icebergs calve naturally from floating ice shelves:

- Their breakup alone does not contribute to sea level rise.
- Loss of ice shelves destabilizes inland ice; inland ice flows to the ocean up to 5 times faster after a complete ice shelf collapse.
- Flow of inland ice to the ocean raises sea level.

The new iceberg from Larsen C will break into smaller pieces and may be a hazard to ship navigation from Antarctica north to South Georgia Island and the Falklands for years to come.

The current and future status of the Larsen ice shelf:

- Progressively deteriorating over the last two decades
  - Larsen A complete collapse (1995)
  - Larsen B complete collapse (2002)
  - Larsen C may continue to deterioriate or it may regrow (2017)
- Many smaller, successive ice shelf collapses have occurred close to Larsen A, B, and C.
- The rapid warming of the Antarctic Peninsula since 1950 points to climate change as the driver of previous ice shelf collapses.

Broader implications and future scenarios:

Complete collapse of the Larsen ice shelves and eventual loss of their inland ice:

- Is an important, realistic possibility.
- The timing of a potential Larsen collapse is uncertain, but sea levels would rise 2-4 inches due to loss of inland ice above the Larsen ice shelf.
- Other ice shelves in Antarctic constrain the flow of much much larger ice sheets.

Ice shelf collapse is one of the least understood threats, but one which may play an outsized role in rapid sea level rise.

Monitoring Antarctica's ice shelves is critical to prepare for and mitigate climate change risks.

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