

[HOME](#) [ABOUT](#) [CONTACT](#) [WHISTLEBLOWERS](#) [AWARDS](#) [SUBSCRIBE](#) [DONATE](#) [JOBS](#)[News](#) [Investigations](#) [Topics](#) [Today's Climate](#) [Clean Economy](#)[Documents](#) [Infographics](#) [Membership](#)

A Pulitzer Prize-winning, non-profit, non-partisan news organization dedicated to covering climate change, energy and the environment.

[HOME](#)

Climate Change's Worst-Case Scenario: 200 Feet of Sea Level Rise

1.0k

Burning all of the world's known fossil fuel reserves has a scary result: submerging New York, Tokyo, Shanghai and other cities, new research shows.

BY KATHERINE BAGLEY, INSIDECLIMATE NEWS

SEP 11, 2015

**Subscribe to
InsideClimate News**

FIRST NAME

LAST NAME

EMAIL

SUBSCRIBE

MOST POPULAR



Climate Change
March to Descend
on Washington in



Sheldon Glacier with Mount Barre in the background, Antarctica. A new study estimates that if nations were to burn all their fossil fuel reserves, the Antarctic ice sheet would almost entirely disappear, raising sea levels as much as 200 feet worldwide. Credit: British Antarctic Survey

If you ever wondered what the worst-case scenario for **climate change** would look like, a set of researchers shared your curiosity. Their answer, which they published Friday, is scary: sea levels nearly 200 feet higher than today—enough to submerge an 18-story building—putting some of the world's largest cities under water.

That's what's in store if all available fossil fuel reserves are burned, releasing about 10,000 gigatons of carbon and almost completely melting the Antarctic ice sheet, according to the research published in the peer-reviewed journal Science Advances.

"Global sea level rise of that magnitude is

April

BY MARIANNE LAVELLE



Keystone XL, Dakota Pipelines Will Draw Mass Resistance, Native Groups Promise

BY PHIL MCKENNA



EPA Pick Pruitt Abandoned Environmental Protections in Oklahoma, Lawyers Say

BY GEORGINA GUSTIN



Strangling a Huge Climate Policy Machine Won't Be Easy for Trump

BY JOHN H. CUSHMAN JR.,
LISA SONG, ZAHRA HIRJI

OUR SPONSORS

[View all sponsors](#)

FOLLOW



[FACEBOOK.COM/INSIDECLIMATENews](https://facebook.com/insideclimatenews)



[TWITTER.COM/INSIDECLIMATE](https://twitter.com/insideclimate)

SPECIES ON THE

unprecedented in human civilization," said Ricarda Winkelmann, a climate scientist at the Potsdam Institute for Climate Impact Research in Germany and the lead author of the study. "Dozens of major coastal cities would be threatened, including New York, Tokyo, and Shanghai."

Winkelmann and colleagues found that seas could rise nearly 10 feet each century in the first 1,000 years under this scenario, and would continue to rise for thousands of years after that. Some scientists reviewing the study, though, said researchers may have even underestimated the speed of ice melt and sea level rise.

"We usually think about our generation, maybe the next generation," Winkelmann said. "It is hard for people to think of Earth a thousand years in the future. But what we are doing right now, the CO2 we are emitting into the atmosphere, could change the face of our planet a thousand years from now."

Antarctica has not been ice-free since approximately 100 million years ago, when dinosaurs roamed the earth, Winkelmann said. Until recently, scientists have focused mostly on how the Greenland ice sheet, which is one-eighth the size of its southern neighbor and therefore more susceptible to rapid thawing, will respond to global warming. But **large sections of Antarctica once considered stable have begun melting at an alarming rate in the past few years.**

Scientists estimate that the world has already emitted two-thirds of the greenhouse gases that can be released before global warming exceeds 2 degrees Celsius since the beginning of the Industrial Age. That's the threshold after which

MOVE

Ringed Seal



Ringed seals' lives are tied to Arctic sea ice, which means their future is in peril.

RELATED



Antarctica's Melting Edges Bad News for Sea Level Rise

BY KATHERINE BAGLEY



6 More Feet of Sea Level Rise Possible This Century, NYC Climate Panel Warns

BY KATHERINE BAGLEY



New Study Says Even 2 Degrees of Warming 'Highly Dangerous'

BY KATHERINE BAGLEY

WANT MORE STORIES LIKE THIS ONE?

climate impacts are expected to be catastrophic, and is the target for international climate treaty negotiations in Paris this December.

But with much of the world declining to cut emissions as much or as quickly as scientists say is needed, Winkelmann and colleagues at the Carnegie Institution for Science and the University of California modeled what would happen to the Antarctic ice sheet if nations were to use up all the oil and gas available before completing a transition to renewable energy sources such as wind and solar.

They found that if the world succeeds in limiting emissions to an additional 600 gigatons of carbon, most likely holding warming to 2 degrees, much of Antarctica would remain intact and its contribution to global sea level rise would be just 6 and a half feet.

Burn all 10,000 gigatons of remaining carbon and the outcome is "terribly scary," said Hal Wanless, a climate scientist at the University of Miami. "The results of this study are sobering."

But Wanless said the model Winkelmann and her colleagues used probably underestimated how quickly Antarctica's ice will melt and seas will rise.

"Ice feels change early and it feels it quickly," Wanless said. "When we went from the last ice age to today, there were serious rapid pulses of rise. That's what we should expect now, several feet in a short period of time. Not the millennial time scale shown in the study. There is no way we aren't going to have a major rise this century."

Contribute To
Our Staff

DONATE
NOW

Michael Mann, a climate scientist at Penn State, also said the modeling results seemed too conservative, particularly in the immediate decades and centuries to come.

"The authors show a maximum sea level rise from Antarctic melt of only a small fraction of a meter per century for a 2C warming target," Mann said. "But there is considerable empirical evidence that we are likely already now committed to at least three to four meters of sea level rise from West Antarctic ice loss, due to warming already in the pipeline and the destabilization of the ice shelves."

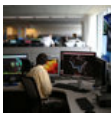
In other words, there might a worse worst-case scenario than even this study predicted.

PUBLISHED UNDER:
CLIMATE SCIENCE
CLIMATE CHANGE

[EMAIL THIS PAGE](#)

[PRINTER-FRIENDLY VERSION](#)

MORE CLIMATE SCIENCE



Climate Scientists Challenge Conservatives' NOAA Suit, Fearing More to Come Under Trump

BY LISA SONG



Research Finds Hope in Slowing Arctic's Climate-Warming Black Carbon

SUBSCRIBE TO INSIDECLIMATE NEWS EMAIL NEWSLETTERS

ARTICLES &
INVESTIGATIONS

TODAY'S
CLIMATE

CLEAN
ECONOMY

MORE FROM THE AUTHOR



Rising Seas Pull Fort Lauderdale, Florida's Building Boomtown, Toward a Bust

BY KATHERINE BAGLEY



Some States Forging Ahead With Emissions Reduction Plans, Despite Supreme Court Ruling

BY KATHERINE BAGLEY

BY SABRINA SHANKMAN



Trump's EPA Is Removing Climate Change Information From Website

BY BRIAN KAHN, CLIMATE CENTRAL

WEEK IN REVIEW

SUBSCRIBE



Climate Data Now Key to Disaster Preparedness, First Responders Say

BY KATHERINE BAGLEY

MORE BY KATHERINE BAGLEY

MORE ON CLIMATE SCIENCE

Whistleblowers Jobs & Freelance Policies & Legal Our E-Books

Keep Environmental Journalism Alive

DONATE NOW

News Investigations Topics Today's Climate Clean Economy Documents
Infographics Membership