

E Antarctic Ice Unstable, 200ft Sea Level Rise Possible - DK Greenroots

by **FishOutOfWater**

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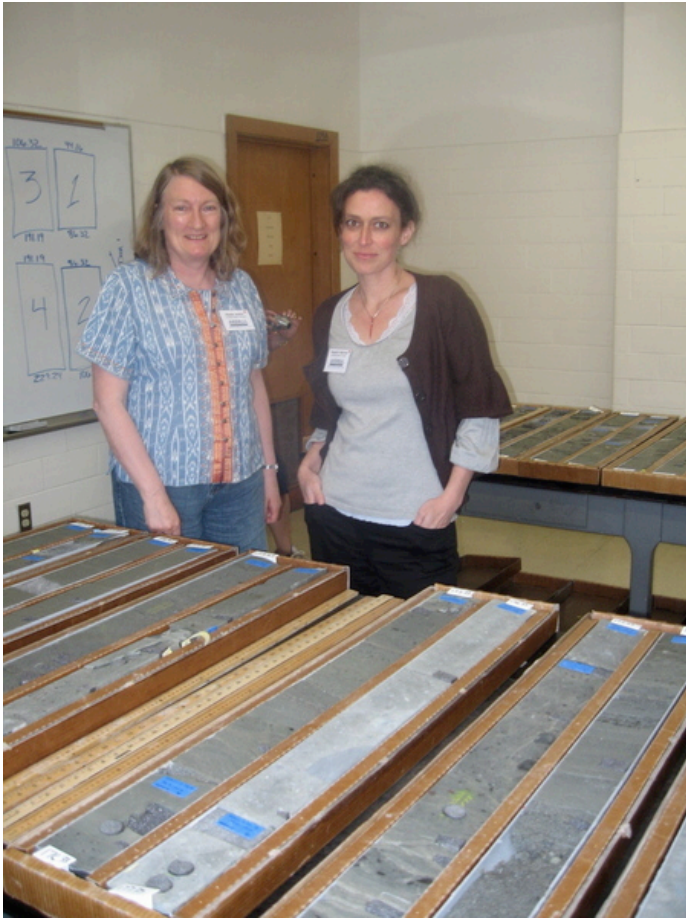
The last time CO2 levels were this high (14 - 20 million years ago), ice advanced and retreated 74 times across the whole continent of Antarctica, causing wild oscillations of global sea level. **Drill cores show that the east Antarctic ice sheet, which was previously thought to be stable under global warming scenarios, is apparently unstable.** Complete melting of ice in Antarctica and Greenland, over a period of centuries, could raise sea level over 200 feet.

Modeler and geologist Robert DeConto of the University of Massachusetts, Amherst, says the policy implications are grim. "Our models may be dramatically underestimating how much worse it's going to get... we're seeing ice retreat faster and more dramatically than any model predicts."

FishOutOfWater's diary :: ::

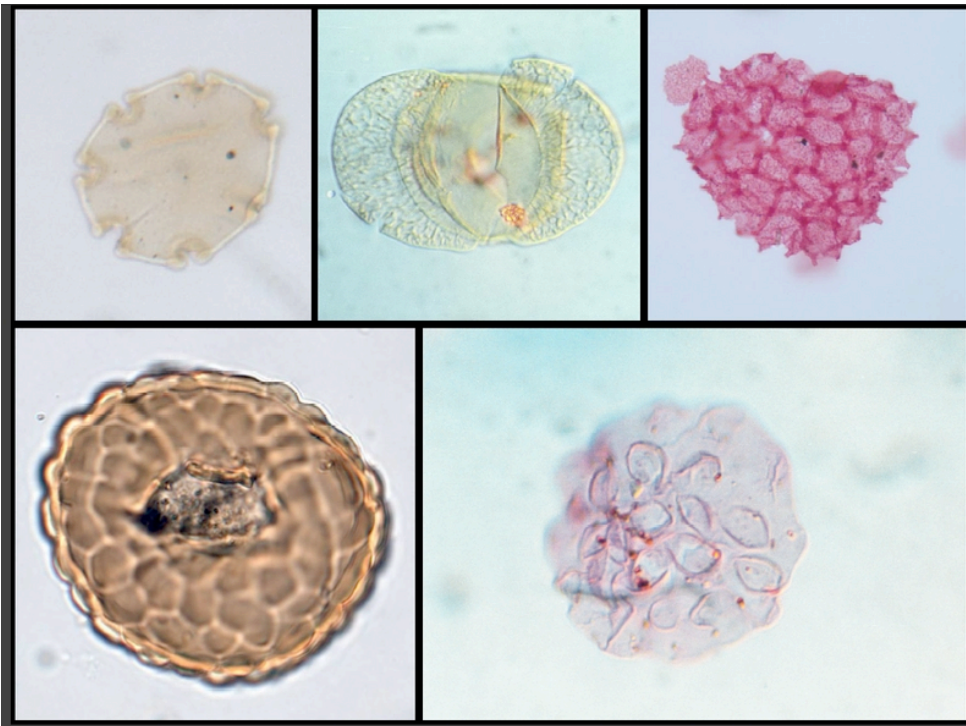
Dr. Sophie Warny was so surprised when she saw microscopic evidence of a balmy Antarctic climate in 15.7 million year old sediments, **she thought she was looking at a sample from another continent.**

Dr Warny, in the center, curates & studies Antarctic core samples at Louisiana State University. Rosie Askin, on left assisted her with the research.



A 3,734ft. long core of the seabed was drilled in 2007 in southern McMurdo Sound, near Antarctica's Ross Island. This core confirmed the observations of many cycles in Antarctica's ice extent seen in the first core drilled from the McMurdo Ice Shelf.

Dr. Warny saw beech pollen consistent with summer temperatures of 10 Celsius (50 degrees F). She saw fossils of marine algae that grow in 11.5 Celsius (53 degrees F) water.



Pollen of beech bushes - *Nothofagus* Photo by Sophie Warny Freshwater algae - *Pediastrum* Photo by Sophie Warny Podocarp pollen by Rosie Askin Fresh water algae Zygosporangium of Zygnemataceae Photo by Rosie Askin Spore of *Coptospora*(moss)Photo by Ian Raine

"First I thought it was a mistake, that it was a sample from another location, not Antarctica, because of the unusual abundance in microscopic fossil cysts of marine algae called dinoflagellates. But it turned out not to be a mistake, it was just an amazingly rich layer," said Warny, assistant professor of geology and geophysics at LSU and curator of the LSU Museum of Natural Science.

She alerted the senior project leaders who confirmed her discovery. She had discovered that Antarctica was warm in the mid-Miocene, 15 million years ago, **the last time CO2 levels were as high as they are today, when sea levels were 25 to 40 meters higher than they are today.**

"We all analyzed the new samples and saw a 2,000-fold increase in two species of fossil dinoflagellate cysts, a five-fold increase in freshwater algae and up to an 80-fold increase in terrestrial pollen," said Warny. "Together, these shifts in the microfossil assemblages represent a relatively short period of time during which Antarctica became abruptly much warmer.

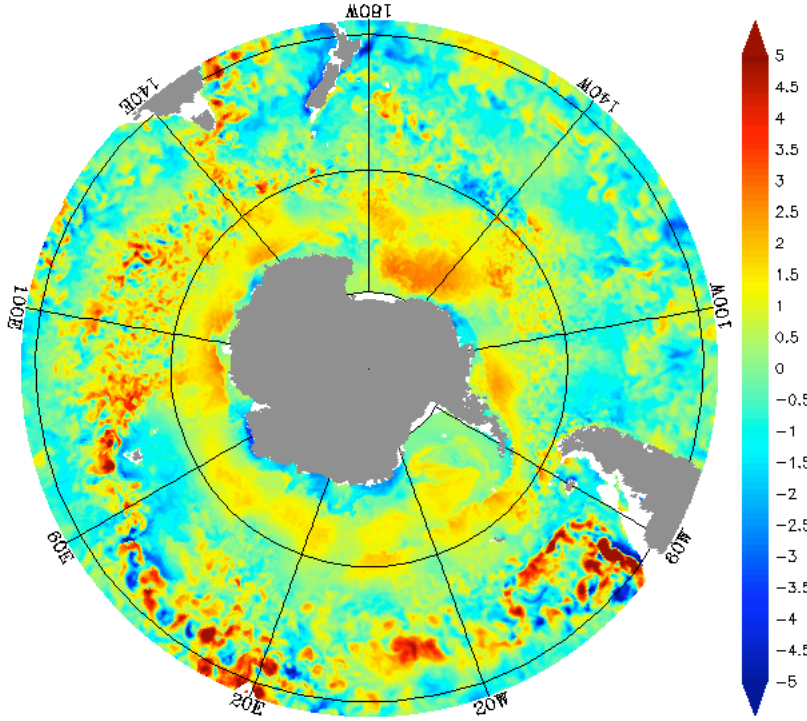
After extensive study of the new core from Mc Murdo sound the principal investigator reached a stunning conclusion. The models that predicted east Antarctic's ice is stable under warming conditions similar to today's are wrong. **The east Antarctic ice sheet is not stable.**

Contrary to what climate simulations suggest, David Harwood, the program's co-chief scientist, says, "nature seems to give us a record that the ice sheets are coming and going."

Models of Antarctic ice stability may be underestimating the destabilizing effect of warm water below sea level on the ice caps.

Warmer than normal water surrounds Antarctica at 100m depth.

Mercator_Ocean_PSY3V2 1/4 deg
Antarctic



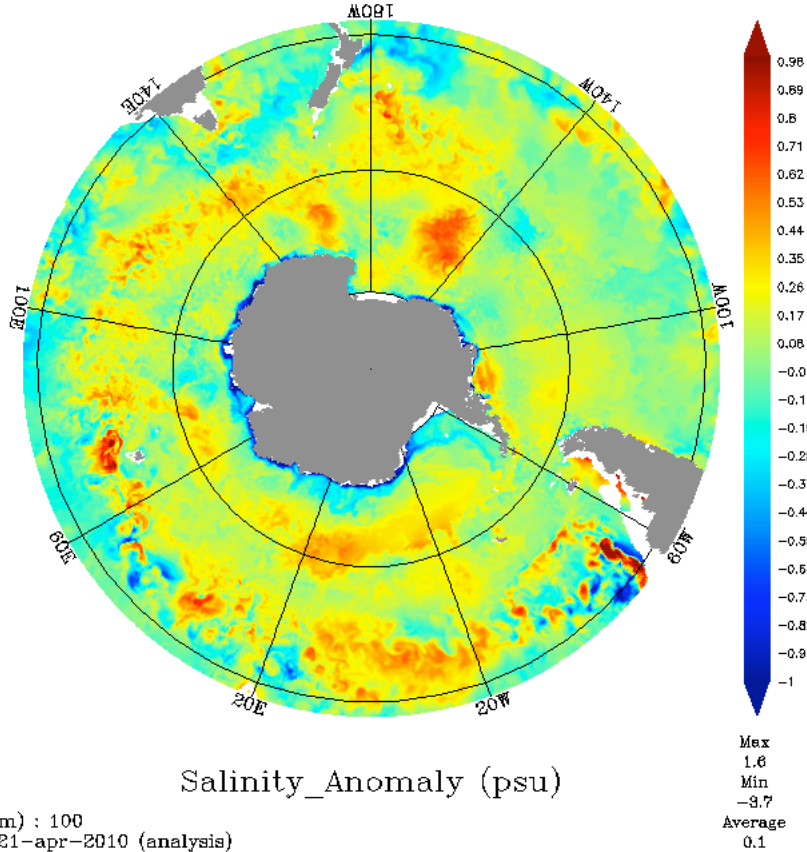
Temperature_Anomaly (degC)

Depth (m) : 100
Time : 21-apr-2010 (analysis)

Max
11.2
Min
-9.8
Average
0.3

Ice shelf melting at 100m depth creates a narrow ring of fresh water around Antarctica.

Mercator_Ocean_PSY3V2 1/4 deg
Antarctic



DeConto's collaborator, climate modeler David Pollard of Pennsylvania State University, says the answer to the puzzling disparity between model predictions and the core data could lie in an erroneous assumption about Antarctica itself. For example, Pollard says, some parts of the land underlying the East ice sheet might be much lower than currently believed. In that case, if warming oceans strip away the surrounding ice shelves, significant chunks of the ice sheet could slide into the ocean. Subglacial lakes, which form as glaciers slide over depressions, may have an under-appreciated role, he added.

A third core from another side of Antarctica will be drilled to reconfirm the results from the first 2 cores that the rapid deglaciation affected the whole continent. New models that incorporate realistic processes of rapid deglaciation will be developed. However, the research will take years. Uncertainty in the rate and extent of Antarctica's ice sheets is a reason for strong action, not delay. Damage from rising sea levels will be felt quickly in low lying coastal areas including south Florida, southern Louisiana, the Sacramento River delta and San Francisco bay. New Orleans was not able to withstand Katrina because sea level rise and delta subsidence left it unprotected from the storm surge.

There is already sufficient evidence to support strong legislation to rapidly cut greenhouse gas emissions and to preserve forests and ecosystems that naturally sequester carbon.

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