Change in Antarctica
What Does it Mean to Us?

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May 4, 2018
Climate Change and Sea Level Rise

- Ice 1.0 - Types of Ice and Impacts
- Evidence for Ice Sheet Change
- How Does Sea Level Rise – Not Just Ice
- Improving our Projections – Weather Models
Components of the Global Ice System

The Unquiet Ice, Scientific American Bell, Feb. 2008

Ice Sheet 1.0
There is Less Arctic Sea Ice in the Summer
Components of the Global Ice System

The Unquiet Ice, Scientific American Bell, Feb. 2008

Ice Sheet 1.0
How to Put Water in the Ocean

Lamont-Doherty Earth Observatory
Columbia University
3 Signals of Change in the Ice Sheets

- Moving Faster
- Getting Lower
- Losing Weight
Ile de Goree
Senegal
Mean Sea Level Trend
8518750 The Battery, New York

8518750 The Battery, New York  2.84 +/- 0.09 mm/yr

- Linear Mean Sea Level Trend
- Upper 95% Confidence Interval
- Lower 95% Confidence Interval
- Monthly mean sea level with the average seasonal cycle removed

Meters
But the Ocean is not a Bathtub
Gravitational Attraction of Ice Sheets
Greenland influences Miami less than New York
Gravitational Attraction of Ice Sheets West Antarctica influences New York more than Greenland.

National Climate Assessment Vol 1
Yes Sandy Made Us Rebuild Differently Stony Point, NY
Not Just Ice
Land Sinks or Bounces

Lamont-Doherty Earth Observatory
Columbia University
Range of Sea Level Predictions for next 82 years

Kopp et al 2017
The Unquiet Ice, Scientific American Bell, Feb. 2008
Water Triggers Ice Shelf Collapse
2014

Surface River Drains Ponds— No Collapse
As We Look to the Future

Looking to the Future Requires Answers to Questions:
  Improving our Projections
  Satellite let us know Change is Happening

For Scientists Only Way to Get These Answers is
  To Get Up Close and Personal

Much Left to Discover

The Poles Matter for Our Communities