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Capital Weather Gang

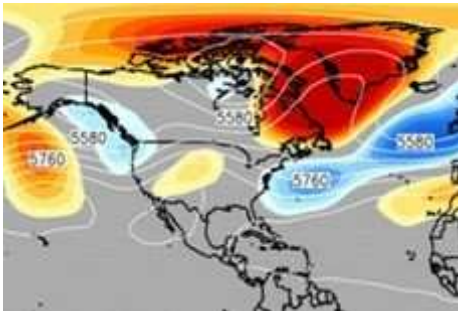
The inside scoop on weather in the D.C. area and beyond

Jason Samenow | 7.25.12

Since [NASA announced](#) the Greenland ice sheet recently experienced “unprecedented” (in 30+ years of satellite measurements) ice sheet surface melt, countless [news reports](#), commentaries and critiques have attempted to explain what it means.

Many have suggested the melting observed over 97 percent of Greenland’s ice sheet surface is of great significance, while others aren’t as convinced. Considering the range of perspectives on this event, let’s try to synthesize them and perhaps get a weigh-in on the gravity of this meltdown.

It’s been unusually warm in Greenland



Heat dome over Greenland averaged over June (as represented by much higher than average pressure at upper levels of the atmosphere) (NOAA)

Large ridges of high pressure, or heat domes, have passed over Greenland one after another since June.

“Each successive ridge has been stronger than the previous one,” Thomas Mote, a climatologist at the University of Georgia, told NASA.

Meteorologist Jeff Masters at wunderground published the most thorough account of recent temperatures in Greenland. [Masters wrote](#):

Temperatures at the top of the Greenland Ice Sheet, 10,552 feet (3207 meters) above sea level, and 415 miles (670 km) north of the Arctic Circle, had risen above the freezing mark four times in the 12-year span 2000 - 2011. But in mid-July 2012, temperatures eclipsed the freezing mark on five days, including four days in a row from July 11 - 14.

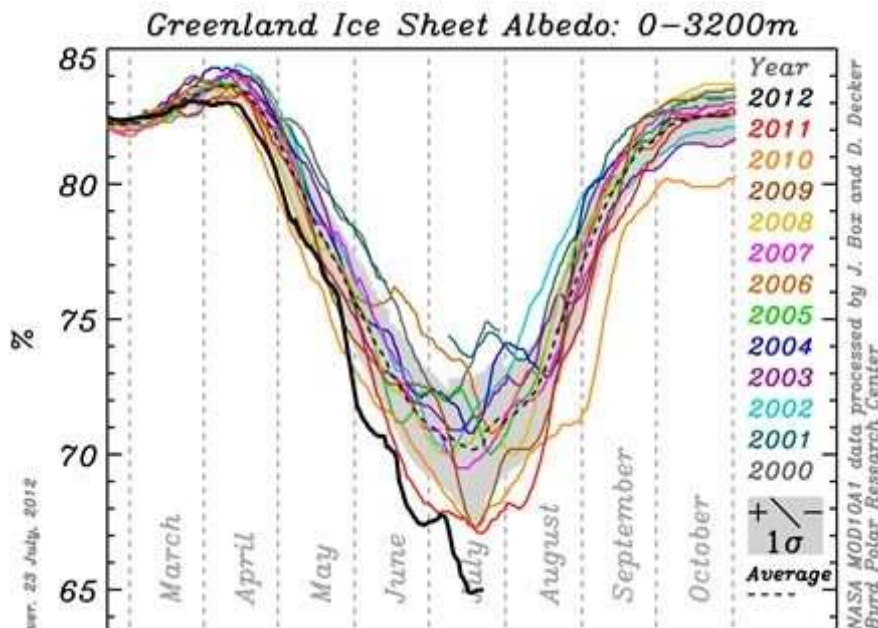
More heat is coming Masters says:

[A]bove-freezing temperatures [are forecast] to return again by Saturday through Tuesday, with a high of 41F (5C) on Sunday. This would break the record warm temperature at Summit of 3.6C set just two weeks ago.

The ice sheet is presently much darker than any point in the last 12 years

Jason Box, a polar climate researcher at Ohio State University, has developed a dataset of albedo - a measure of how reflective or “white” the Greenland Ice Sheet is. The albedo has plunged almost off the chart as the ice sheet is now less reflective, or “darker” than any time in 12 years of measurements due to melting. On Box’s blog the [MeltFactor](#), he describes this statistical anomaly:

Averaged over the whole of the ice sheet, for nearly 2 months now, the ice sheet albedo has been ~2 standard deviations below the 2000-2012 average.



Albedo or surface reflectance of Greenland ice sheet from 2000-2012 (NASA/Jason Box)

A similar melting event occurred in 1889 tied to similar atmospheric flow patterns

As warm as it’s been in Greenland and as much melting that has occurred, NASA says such an event happened about 125 years ago, in 1889.

Interestingly, the U.S. experienced very warm temperatures for at least a part of 1889 as well - just as it has this year ([warmest on record in Lower 48 year-to-date](#) based on data from 1895-2012).

A [Science Daily article](#) discussed the similarities, based on research by Anthony Lupo of the University of Missouri. [Excerpt](#):

This past March was the second warmest winter month ever recorded in the Midwest, with temperatures 15 degrees above average. The only other winter month that was warmer was December of 1889, during which temperatures were 18 degrees above average. Now, MU researchers may have discovered why the weather patterns during these two winter months, separated by 123 years, were so similar.

In both years the researchers found La Nina patterns built up large heat ridges over the central U.S. And just as a large heat dome established itself over Greenland this summer, it's reasonable to project it did so in 1889 given the circumstances.

There exist a range of 1) beliefs about the melting's link to manmade climate change and 2) future melting projections

Some researchers have been more cautious than others in linking this event to manmade global warming and projecting the future. But most agree the more these record temperatures and melting events occur, the more likely there is a connection.

Consider this viewpoint of a NASA scientist conveyed in [Juliet Eilperin's article](#) in today's Washington Post:

If satellites document the same degree of melting in August and next summer, said Dorothy Hall, a senior scientist at NASA's Goddard Space Flight Center, "then we're going to start to think it is related to global warming, but at this point we can't say."

On the other hand, William Colgan, a research associate at the Cooperative Institute for Research in Environmental Sciences at the University of Colorado, told [Climate Central's Andrew Freedman](#) we can connect the dots now:

"I think it is clear that entire ice sheet melt events are now increasing in frequency as a result of anthropogenic [manmade] climate change, rather than natural variability in solar insolation," Colgan said.

But Colgan was more reluctant to project the future. From [Freedman's piece](#):

"In terms of the importance and significance of an entire ice sheet melt event: Obviously it gets you thinking the future of the Greenland Ice Sheet," Colgan said in an email conversation. "But since we are looking at a record event, rather than a trend, it is not really possible to directly translate this into a projection of future ice sheet behavior."

Taking the opposite position, Ohio State's Jason Box believes these ice sheet changes validate his own aggressive projections about the future. [He blogged](#):

In my recently accepted albedo paper ([Box et al. 2012, ACCEPTED VERSION](#)) ... the statement: "it is reasonable to expect 100% melt area over the ice sheet within another similar decade of warming." may be coming true already.

Claims: NASA and some media have been fast and loose in their reporting

Leading voices among those unconvinced manmade climate change is a major problem have criticized some of the reporting about this event.

Though widely cited, [NASA's press release](#) contains a contradiction says Pat Michaels, a senior scholar at the libertarian Cato Institute. On the one hand, NASA headlines the melting as "unprecedented" but deeper down discusses the similar melting event of 1889.

Michaels jumped on this contradiction in his [World Climate Report blog](#).

"...apparently, when it comes to hyping anthropogenic global warming (or at least the inference thereto), redefining English words [unprecedented] in order to garner more attention is a perfectly acceptable practice," Michaels said.

In NASA's defense, it wrote [bold text indicates added emphasis]: "**Satellites See Unprecedented Greenland Ice Sheet Surface Melt**" which is literally true in the 30+ years of satellite observations. But someone not reading carefully could be misled...

In another alleged example of overstatement, Colorado State University's Roger Pielke Sr., a professor of atmospheric science, offered a sharp critique of the Associated Press headline: "[NASA: Sudden Massive Melt in Greenland](#)".

Pielke Sr. [wrote on his blog](#):

The news headline, in particular, is an example of media hype. There was no "massive melt". The term "massive" implies that the melt involved large masses of the Greenland icecap. They could have written "Sudden Extensive, Short-Term Surface Melting On the Greenland Icecap" but instead chose to overstate what is a short-term weather event.

Another not unfair critique, but borderline nit-picking, in my view...

Bottom line: A major surface ice sheet melting event occurred in Greenland coupled with highly unusual temperatures. A similar event occurred in 1889 and, thus, links to manmade climate change are not yet conclusive. On the other hand, a pattern of pronounced warming in the Arctic in recent decades and other indicators such as [melting sea ice](#), glacier melt, etc. suggest manmade climate change increased the likelihood of an event of this magnitude