

## Why has it been so warm lately? And how long will it continue?

By Barb Mayes Boustead, Meteorologist and Climate Program Manager

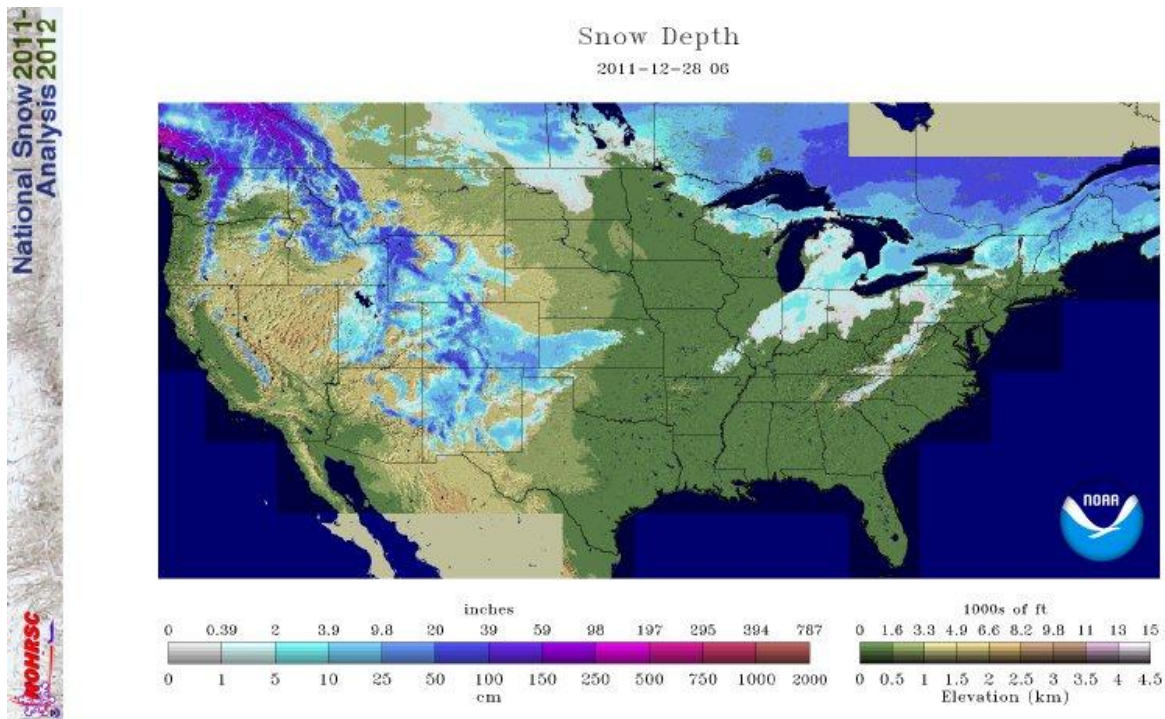
28 December 2011

Mid to late December has been unusually warm across much of the central Plains. The average December temperature so far has been nearly 4 degrees warmer than normal at Topeka, and almost 3 degrees warmer than normal at Concordia. In addition, since October 1<sup>st</sup>, 71% of Topeka's high temperatures have been above normal.

### Why has it been so warm lately?

A number of factors are combining to create the warmer than usual weather in eastern Kansas.

1. There is virtually no snowpack across the Plains and Midwest, except for a ribbon of snow from southwest to central Kansas. When there is snow covering the ground, it reflects some of the sun's energy, and more of the sun's energy is used to work on melting the snow. Without the snow covering the ground, the sun's energy can go into heating the ground and the air. Also, when the winds blow in from the north and northwest, they aren't blowing over a snowpack and cooling down.

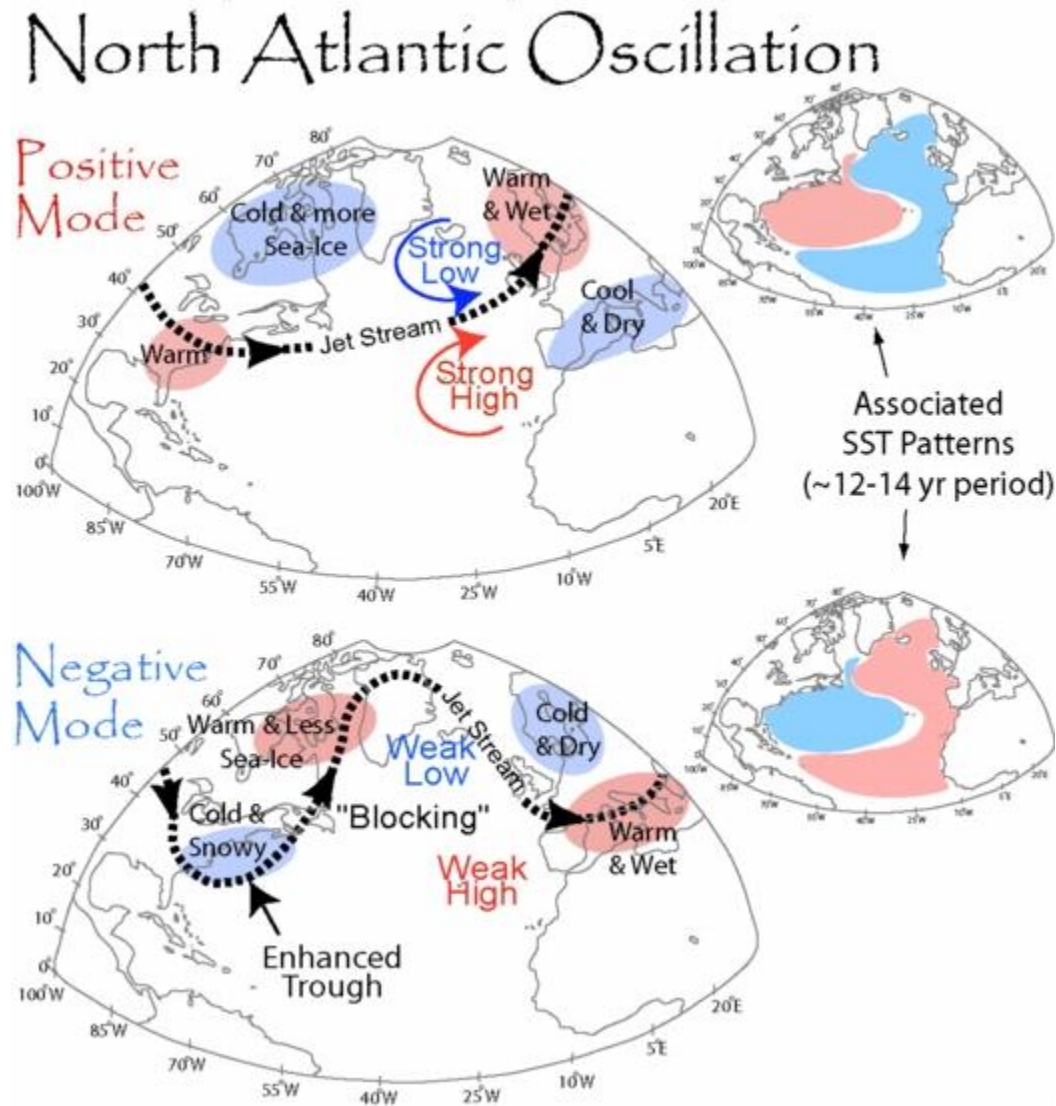


2. The North Atlantic Oscillation, or NAO, (and its sister, the Arctic Oscillation, or AO) have been positive since late November. We hear a lot about the cycle between La Niña (which we are currently in) and El Niño, which together make up the ENSO cycle. The NAO is another type of climate cycle, this time centered in the Atlantic Ocean. When the NAO is negative (like it was in 2009-10 and 2010-11), the area east of the Rockies tends to be colder than normal. When the NAO is positive, as it has been so far this winter, the area east of the Rockies tends to be warmer than normal. Unlike ENSO, which stays in one direction throughout the course of a winter, the NAO can bounce between positive and negative phases. But when it's pretty strong in one direction, it tends to linger there. So far, that has been the case this

winter. The NAO is powerful enough that its temperature signals can override the ENSO effect. (We saw this in 2009-10, when a very strongly negative NAO combined with a moderate El Niño. El Niño is often associated with warmer than usual temperatures in the northern Plains into the northern Great Lakes, but the negative NAO overruled it, creating colder and snowier than normal weather instead.)

Another difference between ENSO and NAO is how far in advance each one can be predicted. The ENSO cycle is pretty well understood, and it can be forecast with reasonable accuracy months in advance. Much of the reason for that is because ENSO is linked to sea-surface temperatures, which don't fluctuate up and down very much during a season. NAO, by contrast, is an atmospheric signal, depending on surface pressure differences between the north and tropical Atlantic Ocean. It isn't quite as stable as ENSO, and it can only be predicted about 10-14 days in advance with reasonable accuracy. Some research has been done recently to look for precursors to negative or positive NAO signals, but the work is still young.

NAO and its impact on weather patterns in the central and eastern U.S.:



More information about NAO:

<http://airmap.unh.edu/background/nao.html>

Follow the forecast for NAO here:

[http://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily\\_ao\\_index/teleconnections.shtml](http://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily_ao_index/teleconnections.shtml)

3. The random nature of weather patterns always influences the weather that we ultimately get in our backyards, and that can't be left out of the picture here.

### How long will the warm weather continue?

Temperatures are forecast to remain above normal through the end of December. In fact, temperatures may approach near-record readings on New Year's Eve (December 31), with record highs of 63 at Topeka and 60 at Concordia (both initially set in 1891) in danger. After a brief cool-down for the first few days of January to near-normal temperatures, the weather is again expected to creep toward the mild side. The most recent 8- to 14-day outlook indicates about a 60% chance for temperatures to be in the warmest third compared to climatology (1981-2010), with about a 40% chance for the weather to be in the driest third compared to climatology.

For the latest forecast information, head to the NWS Topeka page:

<http://www.crh.noaa.gov/top/>

The latest 8- to 14-day outlook from the NWS Climate Prediction Center:

<http://www.cpc.ncep.noaa.gov/products/predictions/814day/index.php>

