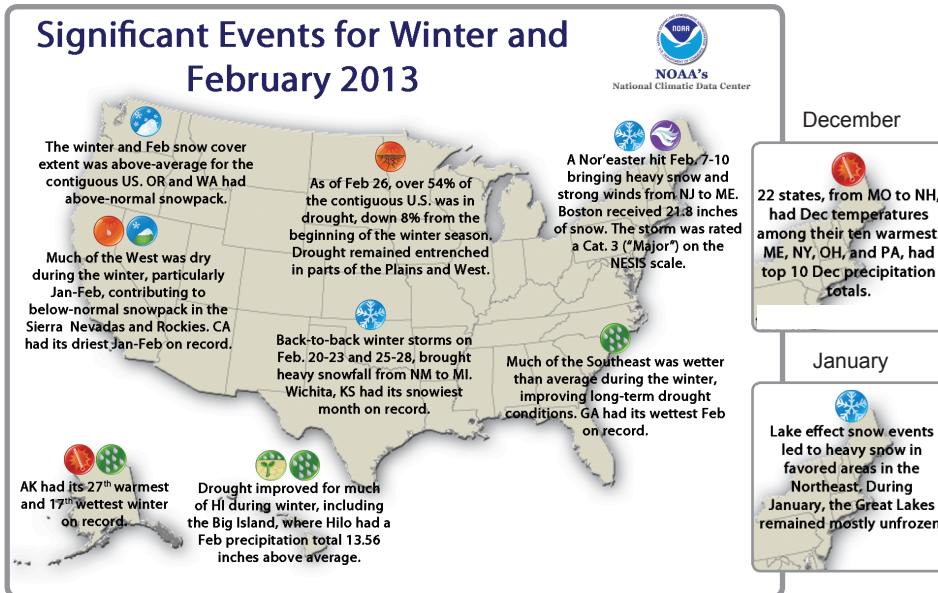


## National - Significant Events for December 2012 - February 2013



### Highlights for the East

December 2012 ranked as one of the top 11 warmest for 15 of the 16 Eastern Region states. The month also ranked among the top 20 wettest in 10 states. The warm December helped 2012 become the warmest year on record in 9 states and rank in the top 6 warmest in the other 7 states.

Warm air in advance of a powerful low pressure system set high temperature records at 21 climate sites from January 30-31. The storm system brought heavy rain, flash flooding, and destructive winds. Two funnel clouds were spotted in South Carolina.

In early February a clipper system and a coastal storm merged along the Northeast coast. The combination storm dropped up to 40" of snow in Connecticut, and wind gusts of 83 mph were measured in Massachusetts. The 2-day snow total ranked in the top 5 greatest at 8 climate sites with 4 of those sites setting new records.

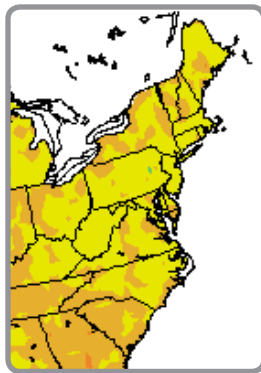
An EF-0 tornado touched down in Johnson County, NC, on February 26. The short-lived storm destroyed a barn and caused damage to several other structures.

The average temperature for the contiguous United States during winter was 34.3°F, making it the 20th warmest winter on record. Winter 2012-13 was 2.1°F cooler than winter 2011-12. Total winter precipitation in the contiguous United States was above normal. The season saw a nationally averaged total of 7.10" of precipitation, becoming the 25th wettest winter in 118 years.

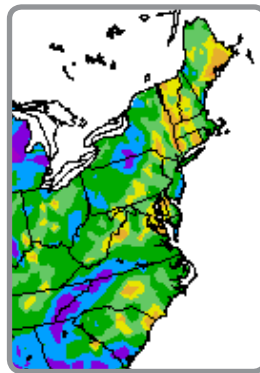
## Regional - Climate Overview for December 2012 - February 2013

### Temperature and Precipitation Anomalies

Departure from Normal Temperature (°F)  
12/1/2012 - 2/28/2013



Percent of Normal Precipitation (%)  
12/1/2012 - 2/28/2013

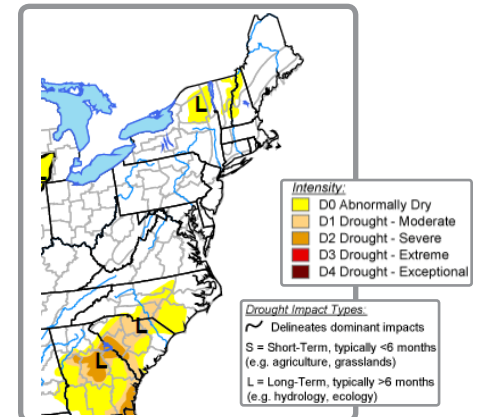


After a cool autumn, winter 2012-13 was warmer than normal. The Eastern Region's average temperature of 34.3°F was 2.6°F above normal. All states ranked this winter as one of their top 25 warmest on record. In terms of departure from normal, Delaware was the warmest state at +3.9°F, making it their 5th warmest winter. Departures for the rest of the states ranged from +2.1°F in Connecticut, their 15th warmest winter, to +3.8°F in Vermont, their 9th warmest.

While dry conditions continued in autumn, winter left the Eastern Region 15% wetter than normal. The season ranked in the top 30 wettest for 9 states, with 12 states being wetter than average. Virginia was the wettest at 22% above normal precipitation, their 19th wettest winter in 118 years. Four states ended this winter drier than normal. Despite record snowfall from the February blizzard, Connecticut was the driest state with 15% less precipitation than normal.

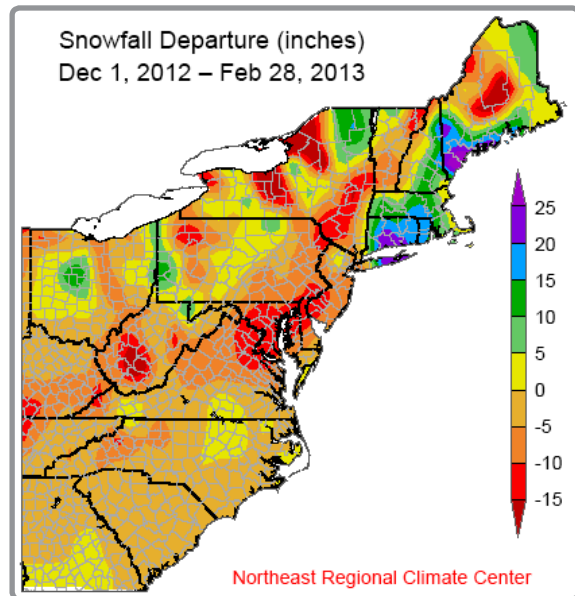
### Drought in the East

U.S. Drought Monitor  
3/19/2013



Widespread D0 and D1 conditions with spotty D2 and D3 conditions persisted for the first half of winter in Virginia and the Carolinas. Much-needed precipitation from late January through February improved conditions by one to two intensity levels in those states. Abnormal dryness in parts of upstate New York and the Connecticut River Valley lingered through winter while drought conditions improved significantly in Ohio.

## Regional - for December 2012 - February 2013



Winter snow totals were above normal in southern/coastal New England due to a Nor'easter in February. While much of the Eastern Region was below average for snowfall during winter 2012-13, most areas did receive more snow this winter than winter 2011-12. In the contiguous U.S., the average snow cover extent of 1.3 million square miles (127,000 square miles above average) was the 15th largest since 1966.

### Marine Ecosystems

A study by NOAA suggests that gray snapper will move northward in response to warming coastal waters. The study is based on research that determined the lower temperature limit at which fish can no longer survive. Scientists equated these limits to estuarine water temperatures, which are closely related to air temperature. Using projections of coastal air temperature, changes in the distribution of temperature limits for juvenile gray snapper were projected. The study also found that the extent of the shift is dependent on the degree of climate change: greater CO<sub>2</sub> emissions resulted in more northward spread. Researchers believe that the study applies to other fishery species as well. (Hare et al., 2013)

### Health and Economy

Heat stress related labor capacity losses will double globally by 2050 according to a new NOAA study. During the peak summer months of heat stress, labor capacity is currently reduced to 90% of full potential, but by 2050 it is predicted to drop to 80%, even with a reduction in greenhouse gases. If greenhouse gases continue to rise under higher projections, labor capacity would be reduced to 39% by 2200. In that scenario, the heat stress levels in Washington, DC, and New York, NY, would exceed that of present-day Bahrain. (Dunne et al., 2013)

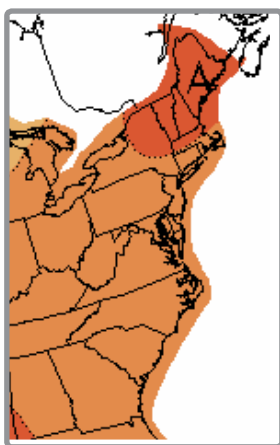
### Climate Change Impacts

A report by NOAA & USGS indicates that climate change impacts along U.S. coasts threaten public health, safety, and the economy. Highly populated, low-lying parts of the Mid-Atlantic are especially vulnerable to sea level rise, erosion, storms, and flooding. A decline in seafood quality, shifts in disease patterns, changes in storm times/locations, heavier precipitation events, increased flooding severity, and ecosystem changes are expected impacts. Also, financial risks associated with hazard insurance are expected to increase significantly. (Burkett & Davidson, 2012)

## Regional Outlook - for Spring 2013

### 3-Month Temperature Outlook

Valid for April - June 2013



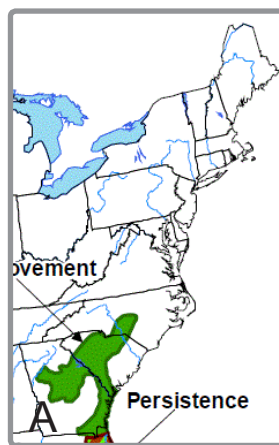
EC: Equal chances of above, near or below normal  
A: Above normal

With the equatorial Pacific water temperatures near average, ENSO (El Niño/Southern Oscillation) neutral conditions

are forecast to continue through Spring 2013. Despite the ENSO-neutral conditions, computer models have consistently agreed on above-average temperatures for the eastern U.S. These model forecasts combined with statistics and past weather trends indicate that the Eastern Region will have an increased chance of above-normal temperatures from April through June.

### U.S. Seasonal Drought Outlook

Drought Tendency from 2/21/2013 - 5/31/2013



**KEY:**  
 ■ Drought to persist or intensify  
 ■ Drought ongoing, some improvement  
 ■ Drought likely to improve, impacts ease  
 ■ Drought development likely

The outlook indicates an increased chance of above-average precipitation in western Ohio, but equal chances for the rest of the Eastern Region.

This means that it's just as likely for the region to experience below average precipitation as it is to have above- or near-average precipitation. Recent above-average precipitation in the Carolinas improved drought conditions by one intensity level. The outlook indicates that drought conditions will continue to improve in that area.

## Eastern Region Partners

National Oceanic and Atmospheric Administration  
[www.noaa.gov](http://www.noaa.gov)

National Climatic Data Center

[www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

National Weather Service - Eastern Region

[www.weather.gov](http://www.weather.gov)

NOAA Fisheries Science Centers and Regional Offices, Northeast and Southeast

[www.nmfs.noaa.gov](http://www.nmfs.noaa.gov)

Coastal Services Center and National Centers for Ocean and Coastal Science

[www.oceanservice.noaa.gov](http://www.oceanservice.noaa.gov)

NOAA Research - Climate Program Office and Geophysical Fluid Dynamics Lab

[www.oar.noaa.gov](http://www.oar.noaa.gov)

NOAA National Sea Grant Office

[www.seagrant.noaa.gov](http://www.seagrant.noaa.gov)

NOAA's North Atlantic, South Atlantic, and Great Lakes Regional Collaboration Teams

[www.regions.noaa.gov](http://www.regions.noaa.gov)

Climate Prediction Center

[www.cpc.noaa.gov](http://www.cpc.noaa.gov)

Northeast Regional Climate Center

[www.nrcc.cornell.edu](http://www.nrcc.cornell.edu)

Southeast Regional Climate Center

[www.sercc.com](http://www.sercc.com)

National Integrated Drought Information System (NIDIS)

[www.drought.gov](http://www.drought.gov)

Carolinas Integrated Sciences and Assessments

[www.cisa.sc.edu](http://www.cisa.sc.edu)

Consortium on Climate Risk in the Urban Northeast

[www.ccrun.org](http://www.ccrun.org)

Cooperative Institute for North Atlantic Research

[www.cinar.org](http://www.cinar.org)

Eastern Region State Climatologists

[www.stateclimate.org](http://www.stateclimate.org)