March Heat, April Freezes

Introduction

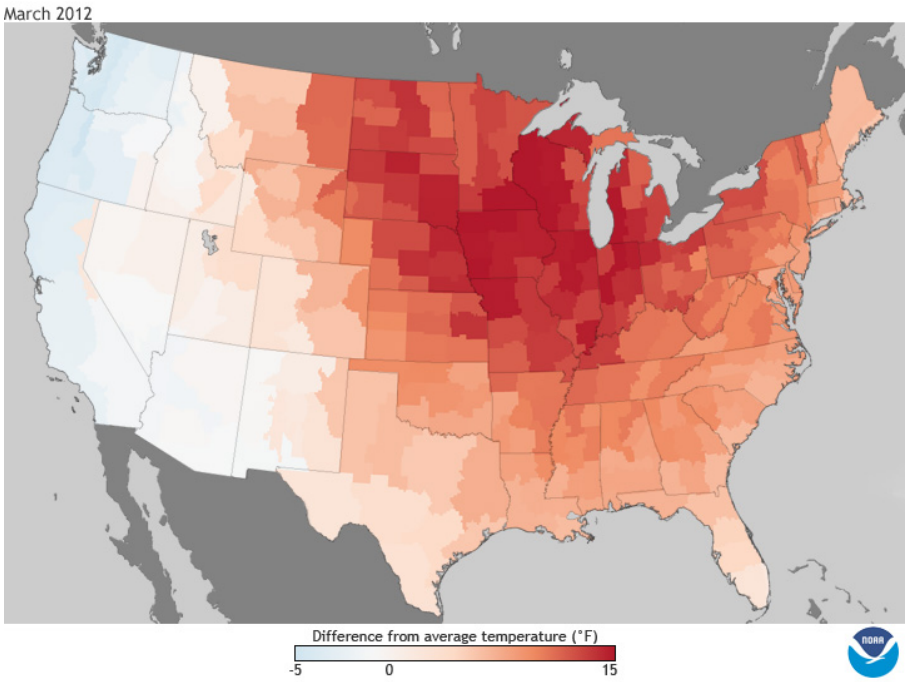
A strong and persistent ridge of high pressure across the eastern two-thirds of the country resulted in record and near-record breaking temperatures during the month of March. The entire Central Region experienced an exceptionally warm March, with the highest departures from normal found in an area extending from Missouri to North Dakota and from Kentucky north through Michigan. The earlier than normal extreme warmth promoted early development of flowering bulbs and budding of trees and shrubs. In many areas this development occurred up to a month earlier than normal.

With the weather returning somewhat closer to normal in April, the fear in the agricultural community was that any hard freeze could potentially result in widespread damage to fruit trees and other horticulture, as well as to early-planted corn. The median date of the last spring freeze (32°F) across the main growing areas of the region ranges from the first week of April in the far south to the last 10 days of May from the Arrowhead of Minnesota eastward to northern lower Michigan. Therefore, the likelihood of freezing weather in April was high.

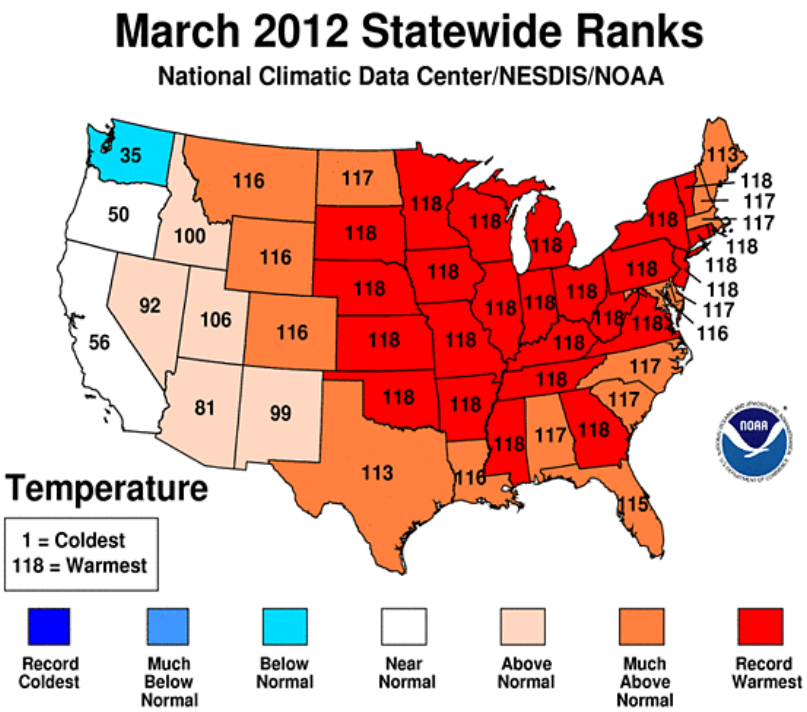
Growers' worst fears came true in the central Midwest. After a warm first week of April, several incursions of cold air made their way through the central U.S. the remainder of the month and into May.

Record Warm March

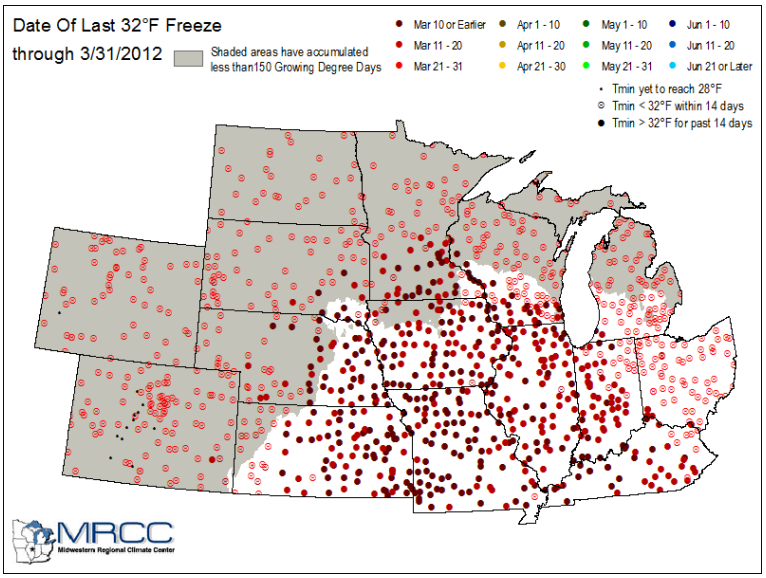
This was the warmest March on record for 25 states east of the Rockies, and for 15 other states this March ranked among the ten warmest. The warmth started at the beginning of the month and peaked during the second and third weeks. Daily high temperature and high minimum temperature records were shattered in many locations. During the middle of March maximum temperatures were



averaging 40 degrees F above normal. Maximum temperatures regularly reached the low and mid 80s well north into Wisconsin. Many locations broke daily records by more than 20 degrees F.



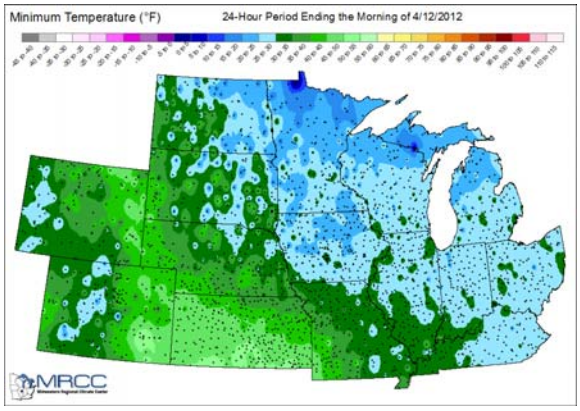
The persistent record warmth promoted early and rapid development of plants and foliage in the Central U.S. By the end of March at least 150 growing degree days (GDDs) had accumulated as far north southeastern Minnesota, southern Wisconsin, and the southern half of lower Michigan and many locations had not recorded freezing temperatures in more than two weeks. Normally at the end of March there has been no significant accumulation of GDD in the region.



April Cooler than March with Several Freezes

April 2012 was warmer than normal in the western half of the region, but near normal in the eastern half. Despite a large portion of the Midwest experiencing above average temperatures during April, many stations across the region experienced cooler temperatures in April than they did in March.

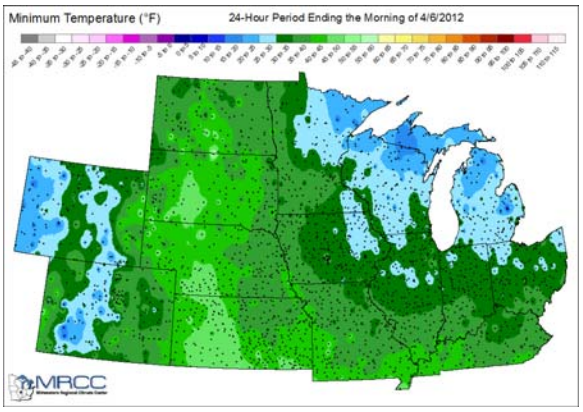
It is typical to have frequent incursions of cold air into the central U.S. during April. During April 2012 there were at least three significant cold air masses that spilled into the Midwest and produced freezing temperatures.

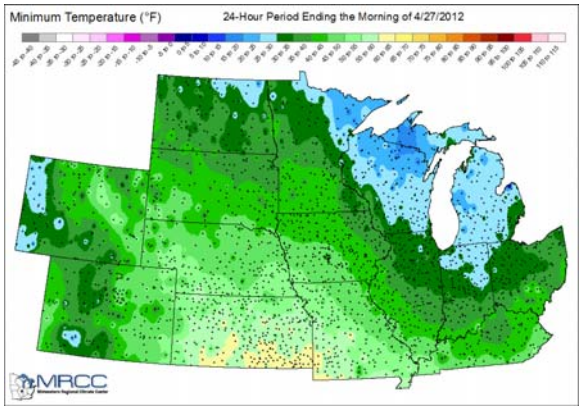


The first of these occurred April 5-7. Low temperatures on the morning of April 6 were below freezing as far south as central Illinois, Indiana, and Ohio. Low temperatures were in the teens and low 20s in northeastern Minnesota, northern Wisconsin, and the Michigan U.P.

Six days later another and more expansive surge of cold air plunged south. On the morning of April 12 low temperatures were below freezing as far south as the Ohio River and southeastern Missouri. Low temperatures <= 28degrees F were widespread across most of the region.

The third cold outbreak came near the end of the month and affected mostly the eastern third of the region. Low temperatures on April 27 were in the mid-teens to low 20s from the Arrowhead of Minnesota across Wisconsin and most of Michigan, while freezing temperatures were observed from central Illinois eastward through central Ohio.





Impacts

The one-two punch of an abnormally warm March, which promoted rapid plant development, and the normal occurrence of freezing temperatures in April had negative impacts on agriculture and horticulture. Here are impacts gathered from news outlets, extension, and other sources as of June 2012. Some impacts may not be known until later in the growing season.

Iowa

- News reports of the freeze damage include a 50% destruction of the grape crop in the state and near 90% damage to the apple and fruit tree blossoms.
- Thousands of acres of corn may need to be replanted in the northern part of the state, and other crops were hurt.
- Gail Nonnecke, a horticulture professor at Iowa State University in Ames, estimates Iowa strawberry production will be reduced 20 percent or less. Not all strawberries were blooming when the below-freezing temperatures hit. Overhead irrigation used by many larger producers helped insulate plants, Nonnecke said, and secondary blossoms have bloomed.
- Grape vines also suffered damage to emerged shoots, but dormant, secondary buds will replace injured shoots. There is a potential for a near-normal crop. Vegetable production won't be affected.
- Emerged asparagus shoots were damaged and thus were unharvestable. Several sweet corn growers planted mid to late March. There was damage but how much is not known. Damage was highly variable on strawberries across the state depending on when growers removed mulch and if they had overhead irrigation or not. Growers who removed the mulch early had severe injury to flower buds. Those without sufficient irrigation for frost protection also had severe injury to flower buds.
- Alfalfa was planted early and took up fast (ahead 2-3 weeks of typical crop calendar). The first cutting had yield down 10-15% and many farmers attributed the reduced yield to cool April temperatures, though the dry conditions the previous summer could also have been important.
- If lower yield occurs in the second cutting (possible due to dry May/June), animal producers will need to look to other sources to supplement feed.
- There are reports to Iowa DNR of turkeys nesting earlier.
- Low stream levels and high temperature are cited in isolated early spring fish kills. Low oxygen levels and high water temperature mean fish are more vulnerable to pollutants.
  Insect populations are generally 3 weeks ahead of expected development.

Illinois

- Orchard owner in Piatt County (east-central Illinois) reported that 2012 apple crop was a total loss due to freeze on April 11.
- Strawberry grower in Vermilion County (east-central Illinois) reported cold temperatures affected plants and slowed ripening process. Damage was done -frozen fruit and lost blossoms. "It's a year they want to forget"

- Sweet corn grower in Vermilion County planted sweet corn on March 19. Plants were up a couple of leaves when back-to-back freezes hit (26F and 27F), reducing stand by 5,000 plants per acre.
- Sleepy Creek Vineyard in Vermilion County reported earliest budding grapevines had 100 percent damage, and others had 80 percent damage. They expect a 50 to 75 percent crop.

Michigan

- Thousands of acres of this year's grape crop have been lost across southwest lower Michigan.
- "A surveyor for National Grape Cooperative, better known as Welch's Foods, said he went through hundreds of acres before even finding a live bud. John Jasper estimates more than 10,000 acres were destroyed April 12, mostly in Berrien, Cass and Van Buren counties. Grape farmers in Berrien, Cass and Van Buren counties collected $24 million in 2011, but Jasper said they would be lucky to net $2 million this year. He said Welch's gets about 17 percent of its grapes from Southwest Michigan."
- Many apple, peach, cherry and blueberry orchards have also had substantial losses across northern Indiana and southern Lower Michigan. No estimates have been obtained yet on how amounts from these losses.
- The Michigan Governor has requested federal disaster assistance for farmers across Michigan in 72 of 83 counties who are facing substantial crop losses because of extreme weather conditions. Crop losses currently are estimated at $223.5 million.

Wisconsin

- Cherry growers in Door County, WI, anticipate losses of 70% as a result of the early spring warmth followed by the freezes in late March and early April, per USDA National Ag Statistics Service. Full impact won't be known until harvest begins. No estimates of dollar losses available at this time.

Kentucky

- Frost on the mornings of April 11th and 12th affected apples, peaches, pears, plums, blackberries, blueberries, strawberries, and grapes to varying degrees across the state. Temperatures ranging from 31°F to 25°F in central and eastern Kentucky led to damage that ranged from light to severe, depending on orchard location. Areas in northern Kentucky were less advanced in bud and fruit development, thus helping to limit damage. Warmer temperatures toward the south and west reduced impacts in those portions of the state, though low plants, particularly strawberries that were not covered, may have experienced damage. Some areas experienced no adverse effects.

- Wheat harvest began two weeks early in Kentucky due to warm weather, but warm temperatures, and then a brief cold snap, have wreaked havoc on the crop's yield, which some farmers say has been cut nearly in half. Some farmers are getting 12 bu/acre, compared to a normal of 80 bu/acre.

Kansas

- Kansas had its earliest wheat harvest on record, three to four weeks ahead of normal.

This summary was prepared by the Central Region Climate Response Team, a joint effort of NOAA and its climate services partners in the Central Region.

Contact Information

Midwestern Regional Climate Center
Mike Timlin, Regional Climatologist
217-333-8506
mtimlin@illinois.edu

High Plains Regional Climate Center
Natalie Umphlett, Regional Climatologist
402-472-6709
numphlett2@unl.edu

Dr. Martha Shulski, Director
402-472-6709
MShulski@unlnotes.unl.edu

American Association of State Climatologists
Dr. Dennis Todey
South Dakota State Climatologist
605-688-5678
dennis.todey@sdstate.edu

National Weather Service Central Region
John Eise, Deputy Chief, Science Services Division, Climate Program Manager
816-268-3144
john.eise@noaa.gov

Iowa State University
Dr. Christopher Anderson
Assistant Director, Climate Science Program
515-294-9870
cjames@iastate.edu