

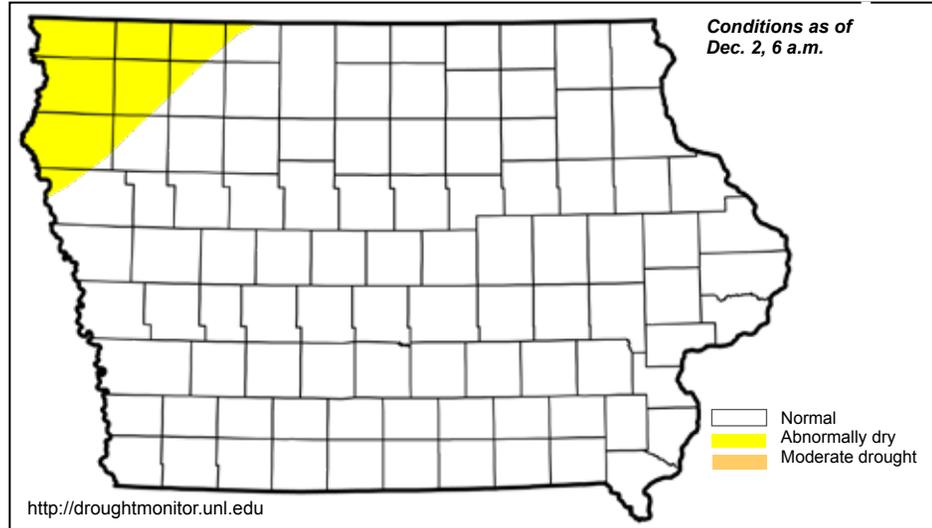
WATER SUMMARY UPDATE

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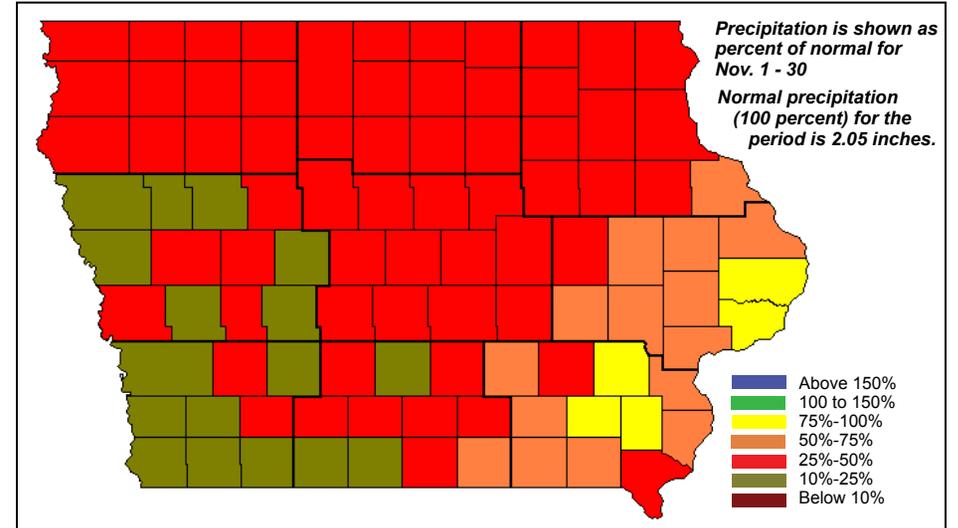
Drought Monitor

National Drought Mitigation Center and partners



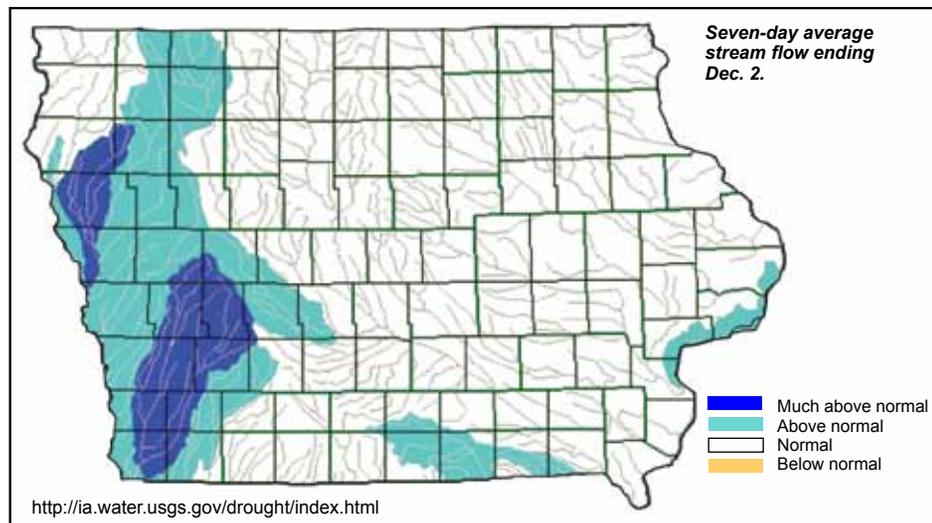
Precipitation

State Climatologist



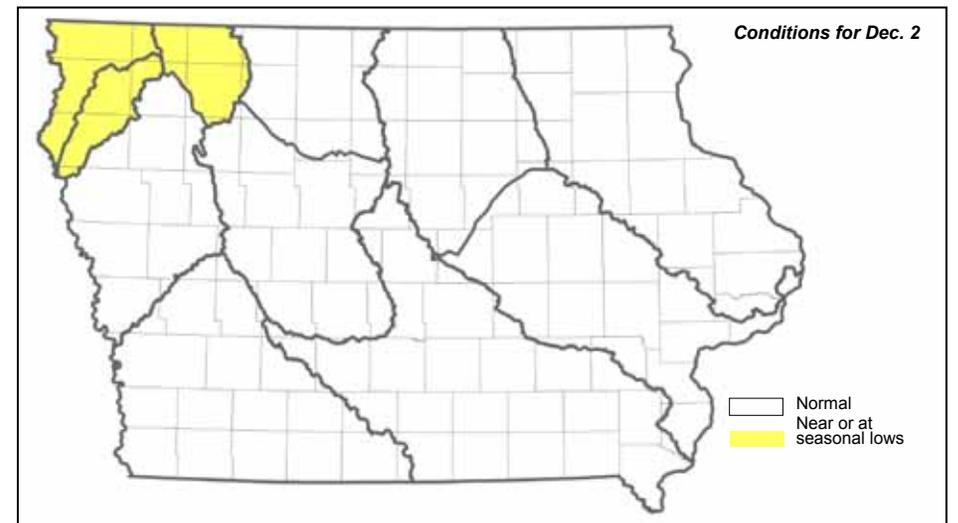
Stream Flow

US Geological Survey



Shallow Groundwater

Iowa DNR and IHR-Hydroscience and Engineering



Recent Developments and Changes

Overall Conditions

November continued the generally favorable hydrologic conditions in the state. Despite a drier than normal month, annual precipitation to date remains above normal for most of Iowa.

To our north, 80 percent of Minnesota is rated as abnormally dry, and that dry area has spread into northwest Iowa. According to the drought monitor, 7 percent of Iowa is abnormally dry.

Streams are generally flowing normally, and aside from the northwest corner of the state, groundwater conditions are normal for this time of year.

Drought Monitor

The drought monitor shows a growing area of abnormally dry conditions in eastern North Dakota, South Dakota and most of Minnesota. Over the last three months this area has grown from less than 10 percent of those three states to nearly 65 percent. This area has moved into Iowa's northwest corner, and now covers part or all of nine counties. While not especially concerning at this point, the trend will be watched over the next several months.

Precipitation

November was a very cold and relatively dry month across Iowa. This was the coldest and snowiest November since 1991; however, total precipitation (rain plus the liquid equivalent of snow) was the least for November since 2007. Year-to-date precipitation remains above normal over most of Iowa, although there are a few scattered locations running small deficits for the year.

Weather Notes for the 2014-2015 Winter

The National Oceanic and Atmospheric Administration (NOAA) evaluates the long-term outlook for temperature and precipitation for the United States. Its projections for December through February indicate that:

- Iowa has equal chances of above, near, or below average temperatures this winter.
- Probabilities lean towards drier than average across eastern Iowa, with the rest of the state having equal chances of being above, near, or below average precipitation.
- Confidence in the winter outlook for Iowa is low at this time – meaning there are no strong trends that indicate a particular outlook for winter.

As winter enters, soil moisture values are above or much above normal across much of Iowa, as well as much of the Mississippi and Missouri River basins above Iowa.

All nine crop reporting districts in Iowa have wetter soils than typical for this time of year with many areas unusually wet. The current subsoil moisture levels in all nine districts are the best for this time of year since at least 2010. In southwest Iowa the percentage short or very short is the smallest since 1993.

Above normal soil moisture tends to increase the risk of spring flooding. Additional factors to consider in determining actual risk of spring flooding include snow pack and late winter stream flows. Heavy rainfall is usually needed to experience significant spring flooding in Iowa.

The cold weather resulted in Iowa soils freezing statewide by Nov. 13, about four weeks earlier than is typical. Brief, but strong, surges of much warmer air on the 22nd, 23rd and 29th of November temporarily thawed soils in some areas and melted most of the snow cover. At month's end, a light snow cover remained only over a portion of north central Iowa centered upon Kossuth County while soils were frozen to a depth of one to five inches across the state.

Stream Flow

Stream flow conditions are in the normal range for most of the state. Since the last Water Summary Update, streamflow conditions across the eastern half of the state have decreased and moved into the normal condition. Some streamflow in the western quarter of the state remain above normal, and in some places, much above normal.

It should be noted that during the winter season, U.S. Geological Survey stream flow data may be impacted by ice formation and backwater. USGS field crews have observed some of the earliest stream flow ice in over 40 years of their experience, with approximately 75 percent of sites affected by some ice.

Shallow Groundwater

Based on the relatively low river stages in northwest Iowa, shallow groundwater along the Rock, Floyd, Ocheyedan, and Upper Little Sioux rivers is classified as being in a slight drought. Shallow groundwater conditions across the rest of Iowa are classified as normal.

Prepared by the Iowa DNR in collaboration with the Iowa Department of Agriculture and Land Stewardship, the U.S. Geological Survey, IHR-Hydroscience and Engineering and The Iowa Homeland Security and Emergency Management Department.

Lake Ice Thickness: Ice thickness on northern Iowa lakes is around six inches. This is one of the earliest ice-on dates on record, but ice thickness has remained surprisingly variable. Big Spirit Lake froze this year on Nov. 16 — the sixth earliest freeze since 1955. As of Dec. 1, West Okoboji Lake was close to being completely frozen.

For perspective, the longest ice duration on Spirit Lake was during the winter of 1955-1956, when the lake was frozen from Nov. 14 to Apr. 16 — 154 days. The shortest ice duration on Spirit Lake was the winter of 2006-2007, when the lake didn't freeze until Jan. 13 and was open by Mar. 29 — 75 days. West Okoboji Lake's ice-on and ice-off dates were the same as Spirit Lake's that winter.

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