

# The Oxbow

FROM THE NORTH DAKOTA STATE WATER COMMISSION

## Oahe Coming Back to North Dakota

When the U.S. Army Corps of Engineers released their Missouri River system data and predictions on June first, they were predicting only modest bumps in elevation to Lakes Sakakawea and Oahe, and throughout the system for that matter. At that time, Sakakawea and Oahe were at elevations of 1810.2 and 1584.7 feet above mean sea level (amsl), and

the Corps was forecasting that they would reach 1814.8 and 1587.8 feet amsl by the end of June.

But, then the rains came.

In the beginning of June, there was a substantial increase in precipitation in areas throughout the Missouri River basin. And at the time

this article was being written – it was still raining. Many areas from South Dakota to Missouri were experiencing record daily flows on a number of rivers (see map). In fact, except for Kansas City, the Missouri River from Nebraska City to its confluence with the Mississippi was above flood stage. With the increased precipitation and inflow into Lake Oahe, Big Bend, Fort Randall, and Gavins Point, the releases at Oahe were decreased dramatically, and for short periods, were almost completely shut off.

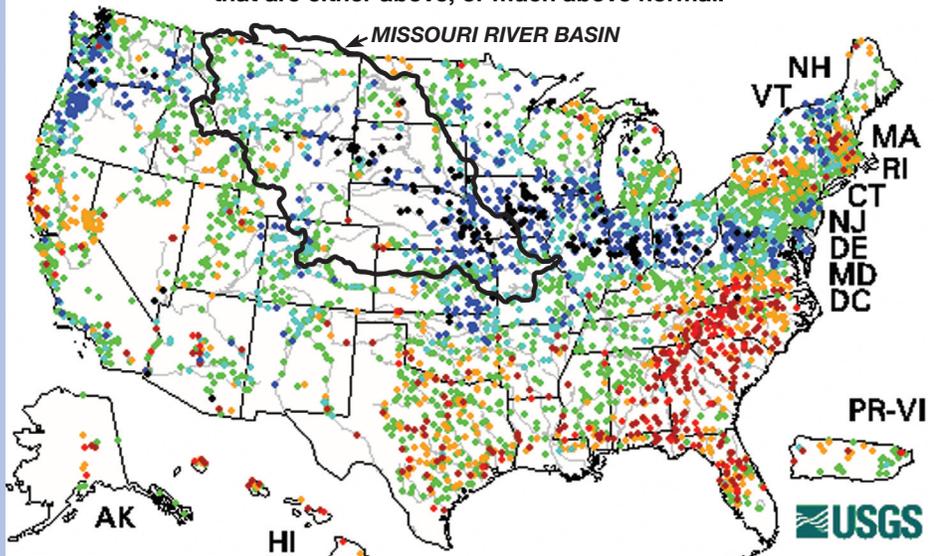
In the first two weeks of June, Lake Sakakawea rose about three and a half feet, and Oahe went up just over five feet. As a result, Oahe surpassed the forecasted peak of 1587.8 feet amsl that was supposed to happen at the end of June by about two feet.

So what does all this mean? Generally speaking, it means that Lake Sakakawea will have gained about seven feet in the month of June. And for several months thereafter, it will be at least three feet higher each month than the Corps' early June estimates.

Lake Oahe, which for years has been at such low elevations that it has been absent from North Dakota altogether, will once again be making its way north – back into the state. More specifically, it is very likely that Oahe will have gained about nine feet of water during the month of June. In addition, it is expected to be at least six feet higher each month, for the next several months, than early June estimates suggested.

For additional information on the Missouri River system reservoirs, visit the Corps' Missouri River region website at <http://www.nwd-mr.usace.army.mil/rcc/index.html>. For current streamflow information, go to the United States Geological Survey website at <http://water.usgs.gov/waterwatch>.

This color-coded map shows conditions at USGS stream gages relative to those that have historically occurred on the same date. The black dots represent the highest recorded flows at those locations for June 6. Blue dots represent flows that are either above, or much above normal.



| Explanation - Percentile classes |                   |              |        |              |                   |      |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|------|
|                                  |                   |              |        |              |                   |      |
| Low                              | <10               | 10-24        | 25-75  | 76-90        | >90               | High |
|                                  | Much below normal | Below normal | Normal | Above normal | Much above normal |      |



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## Devils Lake Considers Flood Protection Options

The U.S. Army Corps of Engineers has begun the process of identifying the next course, or courses of action for the City of Devils Lake, should Devils Lake itself continue to rise. This most recent Devils Lake flood-related evaluation is expected to cost about \$5 million, and is being funded through the Corps as part of the Emergency Supplemental Appropriations Act of 2007.

Initial public meetings were held in the Devils Lake area in early April, and a second round of meetings were held in mid-July at the Spirit Lake Casino, Devils Lake, and Cooperstown. The purpose of the second round of meetings was to present the findings of the alternative screening process including which alternatives are not feasible.

It's been just over two years since Devils Lake reached its peak-recorded elevation of 1449.2 feet above mean sea level (amsl) in May 2006. And since that time, the lake has fluctuated up and down only a few feet as it continued to spill its excess water into Stump Lake. But now that Stump Lake has been filled, and has equalized with Devils Lake, that relief valve is gone – leaving area residents with the troubling prospect of what the big lake might do next. Will the lake go down, or will recent trends continue, pushing the lake to even higher elevations? And if that is the case, how high will it go?

The Army Corps reports that there is a 24 percent chance that Devils Lake will reach 1454 feet amsl by 2040. But the fact remains, no one can definitively say what the lake may, or may not do. We can only try to make the best decisions possible, with the available information. For that reason, the best thing that Devils Lake city leaders, its residents, and state and federal government agencies can do at this time is develop and consider a variety of alterna-

tives that will best ensure the safety of area residents, should the lake continue to rise. Or as the Corps has suggested, “the expected product of this effort is to have a defined implementable plan, including plans and specifications if necessary, that can be instituted once the lake reaches a set trigger elevation with a prediction to rise further.”

Though several alternatives will be considered, one of the key focuses of this current Corps evaluation will be to look at raising the city's current levee embankment. The City of Devils Lake's first levee was constructed by the Corps in the 1980s to an elevation of 1445 feet amsl. And since 1996, the city's levee system has been raised and/or extended three other times in response to rising lake levels, at a cost of about \$53 million. The last three additions to the embankment were completed in 1996, 1997, and 2007, to elevations of 1450, 1457, and most recently, 1460 feet amsl.

The current levee configuration is approximately eight miles long, and it runs along the west, south, and east sides of the city. And with a top elevation of 1460 feet amsl, it is only designed to protect the city to a lake elevation of 1454 feet amsl, with six feet of freeboard.

However, if additions to the current levee system are determined to be the best means of protecting the city from future flood risks, construction would need to start well in advance of the lake reaching 1454 feet amsl. This, according to the Corps, is due to the fact that the next levee raise would be an extensive project, requiring a substantially larger footprint, with a tremendous amount of earthwork to raise the embankment elevation and to tie it into high ground.

Though the possibility of a levee

raise and extension has surfaced as one of the higher profile alternatives, the Corps will also be evaluating a variety of other flood protection options to protect Devils Lake residents including, relocations, upper basin storage, modifications to the lake's natural outlet, or a combination of the aforementioned.

There have been some cost estimates developed for six broad alternatives, but they are based on extrapolations from previous studies and should therefore only be considered for order of magnitude and comparison purposes. The upper basin storage alternative is the least expensive, but also least effective, with an estimated cost of \$54 million. The alternative with the highest price tag would involve the incremental relocation of structures as the lake rises, which has an estimated cost of just over \$400 million. In the middle, as far as project costs go, is the levee raise/extension alternative, which could cost anywhere from \$75 to \$200 million, depending on the alignment and elevation selected for the next interim raise.

Additional information is available on the Corps website at [www.mvp.asace.army.mil](http://www.mvp.asace.army.mil). Click on *Flood Damage Reduction*, and then *Devils Lake Flood Risk Management Project*. Or, you can contact:

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