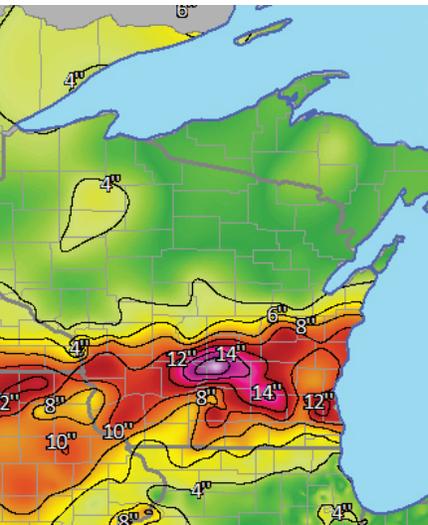


# TranStorm: A Tool to Help Communities Prepare for Extreme Rainfall

Funded by the Northeast Climate Science Center and NOAA-SARP NA12OAR4310098

NE CSC Principal Investigator Ken Potter and Affiliated Investigator David S. Liebl at the University of Wisconsin at Madison have developed a tool that **allows communities to identify vulnerability to high runoff flows and flooding from extreme rainfall events**, before damage occurs.



## Designing for the Future

Climate scientists project heavier and more frequent extreme rainstorms for the Great Lakes region in the future. While these rare events carry the risk of damage and injury, most municipalities use actual experience from past large storms to design or modify their infrastructure. Along with NE CSC Fellows Nicholas Hayden, Zachary Schuster, and Pearl May, and with initial funding from NOAA's Sectoral Applications Research Program, Potter and Liebl found a way to use the rainfall

record from a "real" extreme storm, one that contaminated 2,500 wells and caused over \$34M in damage in Wisconsin, to assess risk in a community that had never experienced it. The research team digitally "transposed" the 2008 storm over other watersheds, so that runoff, stream flows, and lake levels could be modeled as if the rain had fallen over those locations, to discover both unforeseen vulnerabilities and mitigation opportunities.

## Who's Interested?

American Water Resources Association, WI Chapter; Association of Clean Water Administrators; Central States Water and Environment Association; City of Madison, WI; City of Middleton, WI; City of Monona, WI; City of Verona, WI; Dane County, WI: Board of Supervisors, Department Heads; Iowa County; North American Lake Management Society; North East-North Central Cooperative Extension Dean's and Directors; United States Geological Survey-WI Water Sciences Center; University of Wisconsin Risk Management; Wisconsin Association of Floodplain Stormwater and Coastal Management; Wisconsin League of Municipalities; Wisconsin Legislature



Rock Springs, WI - 2008 storm

Photo: Michael Kienitz

*"We need to be using large storms as standards for design, understanding vulnerability and retrofitting high risk areas..."*



Reedsburg, WI - 2008 storm

Photo: WIDNR

*... We need to raise awareness about potential impacts before they occur."*

- Stormwater Management Design Engineer



Highway 33, WI - 2008 storm

Photo: WIDNR



### What would happen if the 2008 storm had occurred over the Yahara watershed?

Overland flows and urban runoff would swell streams to new heights. Lake Mendota would overflow its banks, closing the regional airport. The City of Madison would be split in half by floodwaters that could remain standing for as long as ten days.

### How are local governments in the Yahara River watershed preparing for extreme rainfall?

- Evaluating the ability to detain water in natural depressions upstream from Madison.
- Improving monitoring of rainfall and stream flows.
- Updating Lake Mendota water level management scenarios to increase downstream discharges prior to heavy rainfall.
- Budgeting for more sandbags and emergency response capacity.
- Identifying infrastructure at greater risk of flooding.
- Discussing new controls on stormwater runoff from urbanized areas.

### A Tool for Resilience

As a result of this project, communities are now able to use NOAA NEXRAD rainfall data from recent extreme rainfall events to demonstrate what would happen if that event had occurred over their location, and identify stormwater vulnerabilities and options for building resilience.

Using the storm transposition tools requires specific technical skills. Ultimately, the developers envision an interactive online tool. Currently, however, the tools are used primarily by engineering consultants or regional planning commission staff. To inquire about using the tool for new locations, interested individuals can contact Kenneth Potter <kwpotter@wisc.edu> and/or David S. Liebl <david.liebl@wisc.edu>.



Lake Delton, WI - 2008 storm

Photo: WIDNR

*How would a storm like that impact our community?*

### Lake Mendota, Madison, WI



Figure: Daniel Fletcher

The map above shows Lake Mendota water levels for (a) a normal summer, (b) a 100-year flood, and (c) the projected level if a June 2008 storm system that occurred over the Baraboo River watershed had instead occurred over the Yahara River watershed.



Photo: WI State Journal

**Improving the way climate science informs management** The Northeast Climate Science Center (NE CSC) was created to provide scientific information, tools, and techniques that managers and other parties interested in land, water, fish, wildlife and cultural resources can use to anticipate, monitor, and adapt to climate change in the Northeast and Midwest region.

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