More storms expected for warmer Wisconsin

Weather "dice" loaded to increase odds of intense storms

Key Message

Our water and sewer infrastructure were designed under assumptions that no longer hold true. A wetter Wisconsin with more frequent, intense storms will tax that failing infrastructure, increasing the risk of waterborne disease.

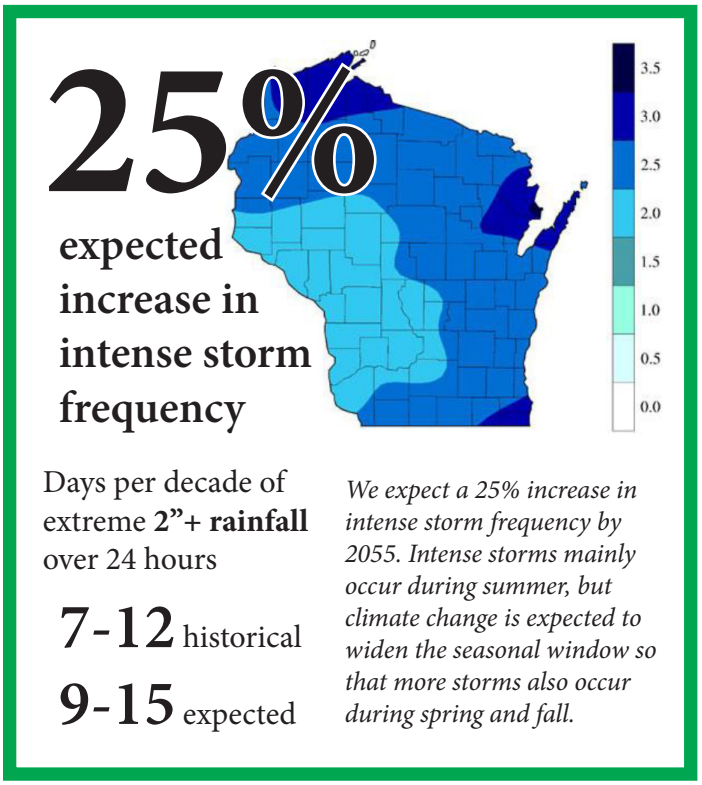
The extreme storms that wreaked catastrophic flooding and historic damage in 2008 and 2010—causing the state to request millions in federal disaster assistance because the deluge overwhelmed our infrastructure—are consistent with the future pattern of climate change predicted for Wisconsin.

Weather is determined by the roll of the dice—climate change loads those dice.

Wisconsin's Loaded Precipitation Dice

Scientists have focused their attention on what those loaded climate dice mean for Wisconsin's future precipitation. They raise three flags.

1. The odds of precipitation increase during fall, spring, and winter. This means our systems will generally be wetter, with more rain when historically we have expected snow.



Policy Recommendation

Comprehensive statewide stormwater design standards should help communities plan for increased flows from more frequent and intense storms.

2. Precipitation intensity is also expected to increase. This means more storms instead of gentler rains. Storms are generally harder for our conveyance systems to handle.

3. The odds dramatically increase for the most extreme storms to be heavier than historic trends. Models project that extremely heavy storms will be 10% to 40% stronger in southern Wisconsin. With current infrastructure, this increases the risk of flooding, sewage overflows, and rain-related disease.

Infrastructure Inadequate for Expected Flows

Engineers use statistics based on historic weather data to design pipe capacities. Most pipes are designed to accommodate a 10-year rain event, which has a 10% chance of occuring in any one year. The historic weather used to define the intensity of those 10-year rain events decades ago was relatively dry when compared to a longer historic record. This increases the likelihood that our existing infrastructure will be inadequate to convey stormwater runoff.

If climate change jacks up the intensity of storms as expected, our design standards will prove even less adequate to meeting actual design goals.

Current risk assessments are based on historic storms and do not account for projected increases in rainfall frequency and intensity. Successful adaptation requires increasing our capacity and revising our thinking. Failure to adapt is a choice that cedes control over our rain-related disease risk to chance.

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This work was partially funded by the Centers for Disease Control and Prevention (CDC) Cooperative Agreement Numbers 1U17EH001043-02, 5U01EH000428-03, and 5U38EH000951-02.

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Map: Patz et al. 2011; WICCI 2011.