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Climate Study: Extreme Rain Storms in Midwest Have Doubled in Last 50 Years, Often Leading to Worsened Flooding

Report Details Major Storm/Flooding Trends in 8 States: IL, IN, IA, MI, MN, MO, OH and WI; Midwest Illustrates Growing Concerns About Climate Link Between Big Storms and Flooding.

CHICAGO, IL. – May 16, 2012 – The kind of deluges that in recent years washed out Cedar Rapids, IA, forced the Army Corps of Engineers to intentionally blow up levees to save Cairo, IL, and sent the Missouri River over its banks for hundreds of miles are part of a growing trend, according to a new report released today by the Rocky Mountain Climate Organization (RMCO) and the Natural Resources Defense Council (NRDC). Big storms, leading to big floods, are occurring with increasing frequency in the Midwest, with incidences of the most severe downpours doubling over the last half century, the report finds.

Stephen Saunders, the president of RMCO and the report's lead author, said: "Global studies already show that human-caused climate change is driving more extreme precipitation, and now we've documented how great the increase has been in the Midwest and linked the extreme storms to flooding in the region. A threshold may already have been crossed, so that major floods in the Midwest perhaps now should no longer be considered purely natural disasters but instead mixed natural/unnatural disasters. And if emissions keep going up, the forecast is for more extreme storms in the region."

In addition to region-wide trends, the report presents trends in the eight Midwestern states. For the worst storms (three inches or more of rain in 24 hours) from 1961-2011, the report outlines the following state-level trends: Indiana (+160 percent); Wisconsin (+203 percent); Missouri (+81 percent); Michigan (+180 percent); Minnesota (+104 percent); Illinois (+83 percent); Ohio (+40 percent); and Iowa (+32 percent).

Titled, "*Doubled Trouble: More Midwestern Extreme Storms*," the new NRDC-RMCO report adds several years of data to previous reports tracking the issue of Midwestern storms. Key findings include:

- Since 1961, the Midwest has had an increasing number of large storms. The largest of storms, those of three inches or more of precipitation in a single day, increased the most, with their annual frequency having increased by 103 percent over the roughly half century period through 2011. For storms of at least two inches but less than three inches in a day, the trend was a 81 percent increase; for storms of one to two inches, a 34 percent increase. Smaller storms did not have a significant increase.
- The rates of increase for all large storms accelerated over time, with the last analyzed decade, 2001-2010, showing the greatest jumps. For the largest storms, in 2001-2010 there were 52 percent more storms per year than in the baseline period.
- The frequency of extreme storms has increased so much in recent years that the first 12 years of this century included seven of the nine top years (since 1961) for the most extreme storms in the Midwest.
- With more frequent extreme storms, the average return period between two such storms has become shorter. In 1961-1970, extreme storms averaged once every 3.8 years at an individual location in the Midwest. That is two to four times more frequent than a major hurricane making landfall at a typical location along the U.S. coast from North Carolina to Texas. By 2001-2010, the average return period for Midwestern extreme storms at a single location was down to 2.2 years—or four to eight times more frequent than landfalling major hurricanes.

The report also presents new evidence linking extreme storms in the Midwest to major floods, the region's most costly regularly occurring natural disasters. The new analysis shows that the two worst years in the Midwest for storms of three inches or more per day were 2008 and 1993, the years with the Midwest's

worst floods in some 80 years, which caused \$16 billion and \$33 billion in damages and rank, among the nation's worst natural disasters. The report presents new evidence linking the 2008 flooding to extreme storms, showing that in areas with the worst flooding 48 percent of the local precipitation came from extreme storms.

In 2010, which ranked fourth among years in regional extreme-storm frequency, Iowa alone had \$1 billion in agricultural losses from extreme storms. In 2011, which ranked fifth, Midwestern flooding caused \$2 billion in damages. This shows how the Midwest is increasingly vulnerable to flooding if extreme precipitation continues to increase with human-caused climate change, as scientists consistently project will happen.

Karen Hobbs, senior policy analyst, NRDC, and a former first deputy commissioner for the City of Chicago's Department of the Environment, said: "This report confirms what most of us in the Midwest have known for a while; violent storms are becoming more frequent. And the nation's crumbling water infrastructure just makes the problem worse. Most of our communities were not designed to handle the volume of water dumped by these epic storms. But green infrastructure solutions, such as green roofs, street trees and rain gardens, literally capture rain where it falls, helping prevent flooding and providing communities with greater resiliency to these ferocious storms."

Kevin Shafer, executive director, Milwaukee Metropolitan Sewage District, said: "This study's results highlight real issues that have already caused significant pain and suffering in Milwaukee. We have learned that we can no longer sit on our hands and hope that extreme rainfall events are not going to happen. We need to explore new ways to soften the impacts of these events and to better protect our residents. In Milwaukee, we are adding green infrastructure to our landscape, reinforcing our grey infrastructure, converting to renewable energy for all our wastewater facilities, and educating our public about what they can do be better prepared for flooding. In these tight economic times, it is not a popular message, but, having lived through it, we understand that it is better than the alternatives."

RECOMMENDED ACTION STEPS

According to the report, in order to protect the Midwest from even more severe storms in the long term, the federal government must lead the way, with broad, aggressive actions on several fronts:

- Enacting comprehensive mandatory limits on global warming pollution to reduce emissions by at least 20 percent below current levels by 2020 and 80 percent by 2050;
- Protecting the current Clean Air Act authority of the U.S. Environmental Protection Agency (EPA);
- Overcoming barriers to investment in energy efficiency to lower emission-reduction costs, starting now; and
- Working with state and local governments to ensure that green infrastructure techniques are fully incorporated into infrastructure capital planning projects. Green infrastructure captures rain where it falls, preventing it from flooding storm drains, overwhelming sewer systems, and polluting water sources. To accomplish this, green infrastructure techniques include planted swales around parking lots, rain gardens, rain barrels and cisterns, green roofs, permeable pavement and trees to help soak up or capture water.

ABOUT THE GROUPS

The Natural Resources Defense Council is a national, nonprofit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. Founded in 1970, NRDC has 1.3 million members and online activists, served from offices in New York, Washington, Chicago, Los Angeles, San Francisco and Beijing. More information on NRDC is available at its Web site: <http://www.nrdc.org>.

The Rocky Mountain Climate Organization (RMCO) works to reduce climate disruption and its impacts. Visit <http://www.rockymountainclimate.org> to learn more.

EDITOR'S NOTE: The report, copies of graphics, and a streaming audio replay of the news event are available on the Web at http://www.rockymountainclimate.org/reports_3.htm.