



Preliminary Flood Damage Estimates for Iowa: Great Flood of 2008

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Introduction

While in total magnitude the current flood events in the Midwest may not equal or exceed the catastrophe of 1993, they certainly are reminiscent of some very dark days and for many communities in Wisconsin, Iowa, Illinois, and Indiana represent the harshest flood conditions on record.

The lessons learned after the 1993 floods and after Hurricane Katrina, while gloomy, allow us to anticipate both the extent of the damages attributable to the current flood event and the need for governmental intervention.

What follows is a preliminary estimate of probable damages, based on an econometric model developed after the 1993 floods and verified through experience with Hurricane Katrina. We hope, for policy-makers, this provides a starting-point for what will be a lengthy recovery and, for the effected communities, we hope for God's speed and some good luck.

Damage Estimation

The estimates of flood damages contained in this report are based on existing flood damage models that have been applied in a number of public policy settings.¹ This model is a multi-equation econometric estimate of flood damages based on flood characteristics (depth and speed of flow) and regional characteristics (population, level and scope of economic activity and inventory of public and private infrastructure). This model was designed to permit analysis of flood damages for areas without the need for comprehensive survey information or exhaustive facility inventories. It also serves as a means of simulating potential damages to aid in infrastructure planning and decision-making

We have simplified the approach here in three ways. First, we report only a subset of damages, leaving the impact on commercial revenues for discussion. Second, we move outside the model in estimating the impact on agriculture by including the increase in grain prices realized by farmers today, and scaling our estimates to account for this recent increase in prices. Third, since we do not have estimates of depth or water speed, we use the 1993 flows as a proxy for the current hydrological conditions.

We caveat our estimates in two ways. First, it is not clear how response to the 1993 Flood have altered residential and commercial location decisions to lessen the impact. Second, it is common for critical infrastructure damage due to flooding to be apparent only after detailed inspection. These estimates are reported before the water has fully receded, and so major damage of some specific sites may yet emerge. We report three types of damages. Table 1 discusses infrastructure and contents damages, while we discuss impacts to commercial revenues and agriculture in the text.

¹ See Burton, Mark L. and Michael J. Hicks Expected Flood Damages to Transportation Infrastructures as a Proportion of Total Event Costs: A Methodological Exploration. *Rahall Appalachian Transportation Institute*. February, 2003.; ¹ Burton, Mark L. and Michael J. Hicks Comprehensive Flood Damage Estimates of the Upper Mississippi, *Rahall Appalachian Transportation Institute*. July, 2003.; and Michael J. Hicks and Mark L. Burton; "Hurricane Katrina: Preliminary Estimates of Commercial and Public Sector Damages." *Marshall University: Center for Business and Economic Research*. September, 2005.

Table 1, Estimated Infrastructure Damages in Iowa

Damage Type	Estimated Cost
Commercial Structure	\$20,793,000
Commercial Equipment	20,652,000
Residential Structure Damages	53,625,000
Residential Contents	16,197,000
Electricity Damages	501,000
Highway Damages	9,544,000
Sewer Damages	1,672,000
Water Damages	1,916,000
Rail Damages	3,785,000
Federal Building Damages	20,209,000
Public Buildings	10,999,000
Total	\$159,898,00

In extrapolating the experiences of the 1993 flood in Iowa to today, we were also able to estimate the impact of business revenues in three broad areas (rail, electricity and other commercial production). In that flood, which was of much longer duration than the current experience, and therefore more damaging to overall revenues, we found a ratio of roughly 48 cents of lost revenue for each dollar of infrastructure damage. If the same ratio holds, we could expect loss of business in Iowa to roughly exceed \$20 million this year.

These estimates are daunting, yet they do not include the agriculture impact. In the 1993 flood, the reported damages to agriculture were roughly \$978 million throughout Iowa. The duration of the 1993 flood extended throughout much of June, and so no significant planting was possible. We believe that circumstances are roughly similar now, with flooding occurring into the third week of June. Also, the rapid increase in prices for grains suggests the impact would be much larger. Employing the same level of crop damages for 1993, and adjusting it by the USDA's May farm price index, we would expect crop damages in the range of \$2.7 billion dollars for Iowa alone.

Summary

These preliminary estimates are designed to provide immediate information for policy-makers and the private sector as they deploy resources to mitigate the effects of this flood. It is based on methods calibrated on the Mississippi Flood of 1993, and tested after Hurricane Katrina. We estimate total infrastructure damages at roughly \$159 million. Revenue losses could exceed another \$20 million. Agriculture losses we anticipate to be in the \$2.7 billion range for Iowa.

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