

Preliminary Flood Damage Assessments: Indiana Flood of 2008

June 10, 2008

Michael J. Hicks, Ph.D. Bureau of Business Research, Ball State University

Mark L. Burton, Ph.D¹. Center for Transportation Research, University of Tennessee

Introduction

This report is designed to provide a very preliminary assessment of flood damages that occurred from June 6, 2008 along the White and Wabash Rivers, and their tributaries in Indiana. Early estimates of flood damages provide an important tool for allocating public and private resources in support of recovery efforts. Thus, they are useful for Federal, state and local leaders, as well as the private sector, as they plan the cleaning, reconstruction and restoration of affected areas. While subsequent estimates may add considerable precision to an evaluation of flood-related damages, preliminary estimates can greatly speed various jurisdictions abilities to respond even as the crisis unfolds.

Estimation of Damages

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.² This model is a multi-

¹ Hicks is Director, Bureau of Business Research at Ball State University. Burton is Director of Transportation Economics, Center for Transportation Research, University of Tennessee. Contact Hicks at <u>mhicks@bsu.edu</u>; 765.285.3398

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

It is clearly too early for a full damage accounting to have been performed, and even such information as potential flood cresting, and speed of flow, along with specific instances of infrastructure damage that might be outside the model (e.g. the replacement cost of the Princes Lake Dam), are not yet available. These estimates may not be available for several months. However, by estimating potential damages resulting from the current flood event using the existing regional flood damage model, we believe we can provide estimates that are sufficiently proximal to actual damages. Accordingly policy-makers will have immediately available information with which to inform the decision-making process.

To simplify the damage estimates, we concentrate on two areas. One affected by flooding on the White River (both forks) and its tributaries; the other affected by flooding on the Wabash River and its tributaries. The counties primarily affected by the Wabash River flooding are Vigo and Parke, while White River floods affect Morgan, Johnson, Monroe, Bartholomew and Owen County. Our model also distinguishes between rural and urban damage estimates, which we will combine for the purposes of the current analysis.

Three issues warrant specific comment in this estimate. First, parts of these affected areas were subject to flooding in recent days. Our estimates include these areas, when in fact the damage may have already occurred. Second, it is not uncommon for critical infrastructure damage to be discovered days or weeks after an event. So, damage to dams or other public infrastructure due to flood damage may not yet be apparent, but could emerge in another weather event. Third, we do not know the extent of damage to agriculture. It is early in a growing season that has already been excessively wet across much of the affected areas. This has delayed planting, and in some cases motivated farmers to alter crop decisions. We still provide agriculture-related estimates, but they should be viewed with special caution. Our Damage estimates for the White River and Wabash River regions appear in Table 1.

² See Burton, Mark L. and Michael J. Hicks <u>Expected Flood Damages to Transportation Infrastructures as a</u> <u>Proportion of Total Event Costs: A Methodological Exploration</u>. *Rahall Appalachian Transportation Institute*. February, 2003.; ² Burton, Mark L. and Michael J. Hicks <u>Comprehensive Flood Damage Estimates of the Upper</u> <u>Mississippi</u>, *Rahall Appalachian Transportation Institute*. July, 2003.; and Michael J. Hicks and Mark L. Burton; "<u>Hurricane Katrina: Preliminary Estimates of Commercial and Public Sector Damages</u>." <u>Marshall University</u>: *Center for Business and Economic Research*. September, 2005.

| Table 1, I Tenninary Flood Damage Estimates |
|---|
|---|

| Damage Category | White River | Wabash River |
|--|--------------|--------------|
| Damages to Residential Structures | \$11,693,000 | \$5,534,000 |
| Damages to Residential Contents | 8,278,000 | 3,920,000 |
| Damages to Commercial Structures | 8,363,000 | 4,150,000 |
| Damages to Commercial Equipment | 11,039,000 | 5,478,000 |
| Commercial Revenue Losses | 775,000 | 384,000 |
| Cleanup and Restoration of Public Facilities | 573,000 | 284,000 |
| Damages to Railroad Properties | 1,746,000 | 866,000 |
| Road and Bridge Damage | 9,820,000 | 4,873,000 |
| Damages to Airports | 840,000 | 417,000 |
| Sewer System Damages | 2,129,000 | 1,056,000 |
| Damages to Electric Utilities | 689,000 | 341,000 |
| Other Utility Damages | 626,000 | 310,000 |
| Other Public Infrastructure | 17,286,000 | 8,578,000 |
| Crop Damage | 14,209,000 | 2,601,000 |
| Total | 88,074,000 | 38,799,000 |

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 damages at roughly \$126 million. Of these damages we estimate roughly \$45.8 are for public infrastructure. This would make 2008 the second most expensive flood year since comprehensive records were started in 1955. Only 2003 saw more damages, with roughly 270 million dollars in damage.

Michael J. Hicks Mark L. Burton