

# Preliminary Flood Damage Estimates for the Memphis, Tennessee, MSA

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## Background

The Memphis, Tennessee, metropolitan statistical area (MSA) is currently experiencing a significant flooding event that will also impact areas along the Mississippi and its tributaries for the coming weeks. In order to better understand the impact of this flooding on commerce, residential and commercial structures, their contents and public infrastructure we here report the results of a preliminary damage estimate.

Our preliminary damage estimates is drawn from a flood damages model developed to simulate flood damages along the Mississippi and Tennessee waterways over the past decade. These models have been used to estimate flood damages in these regions in 2003 and 2004, Hurricane Katrina in 2005, flood damages in Indiana, Illinois and Iowa in 2008 and floods in Pakistan in 2010.<sup>2</sup>

## The Damages

Preliminary estimates of damages to the Memphis MSA are derived from our model using historical data from the upper Mississippi Floods of 1993. It relies on economic, geographic and flood specific data to estimate aggregate damages, and damages in selected sub-categories. Estimates from this model are reported in the table below.

### Damages to Memphis, MSA

<b>Category</b>	<b>Estimate</b>
Commercial Structures	\$122,000,000
Commercial Equipment	\$50,000,000
Residential Structures	\$181,000,000
Residential Contents	\$87,000,000
Other Damages	\$313,000,000
<b>Total</b>	<b>\$753,000,000</b>

These damages represent total, not merely insured damages and so will likely differ from estimates provided by insurance underwriters and their consultancies. Structures include loss to physical structures that are immobile. Commercial equipment and residential contents damages includes machinery, equipment, furniture, appliances, clothing and similar items.

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<sup>2</sup> See [www.bsu.edu/cber](http://www.bsu.edu/cber) for these studies.

Damages to other items include public infrastructure repair costs, damages to utilities such as electricity lines, sewer and water services, telecommunications and the like. This area also includes crop damages, which are highly uncertain due to the timing of the flood as well as costs associated with emergency response and local flood damage mitigation efforts.

The model is designed to provide damage estimates from aggregate data in the region. It has proven accurate in estimating aggregate damages, but typically performs less well in capturing specific large infrastructure items (e.g. a large sports arena or hospital placed in a flood prone area). Also, we characterize these as preliminary damage estimates because the Army Corps of Engineers has undertaken significant flood mitigation efforts which, at this stage appear to have lessened damages.

### **Selected References**

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