

The Direct Economic Loss to Missouri Farmers from the Missouri River Flooding of 2011

November 2011

Dr. Scott Brown
Assistant Research Professor
215 Mumford Hall
Columbia, MO 65211
(573) 882 – 3861
brownsc@missouri.edu



Agricultural and Applied Economics
College of Agriculture, Food and Natural Resources

The Direct Economic Loss to Missouri Farmers from the Missouri River Flooding of 2011

Many Missouri farmers felt the direct effects of the massive flooding along the Missouri River in 2011. Farmers that had land within the Missouri River bottom saw a complete loss of crops this year in nearly all cases. Water stayed on many of these fields for months, compounding the flooding effects. This has resulted in millions of dollars in lost crop production in 2011.

Completed at the request of Congressman Sam Graves (MO-6th District), this report quantifies the direct 2011 crop losses endured by Missouri farmers from the 2011 Missouri River flooding. This direct agricultural loss represents only a small piece of the overall losses suffered in 2011 by those living near the Missouri River.

This report does not attempt to estimate losses beyond direct agricultural crop losses. The flooding losses from categories such as building destruction, highway loss, railway loss and lost commerce from highway closings are very large and important to determining overall economic effects from the 2011 Missouri River flooding. However, these losses are beyond the scope of this report.

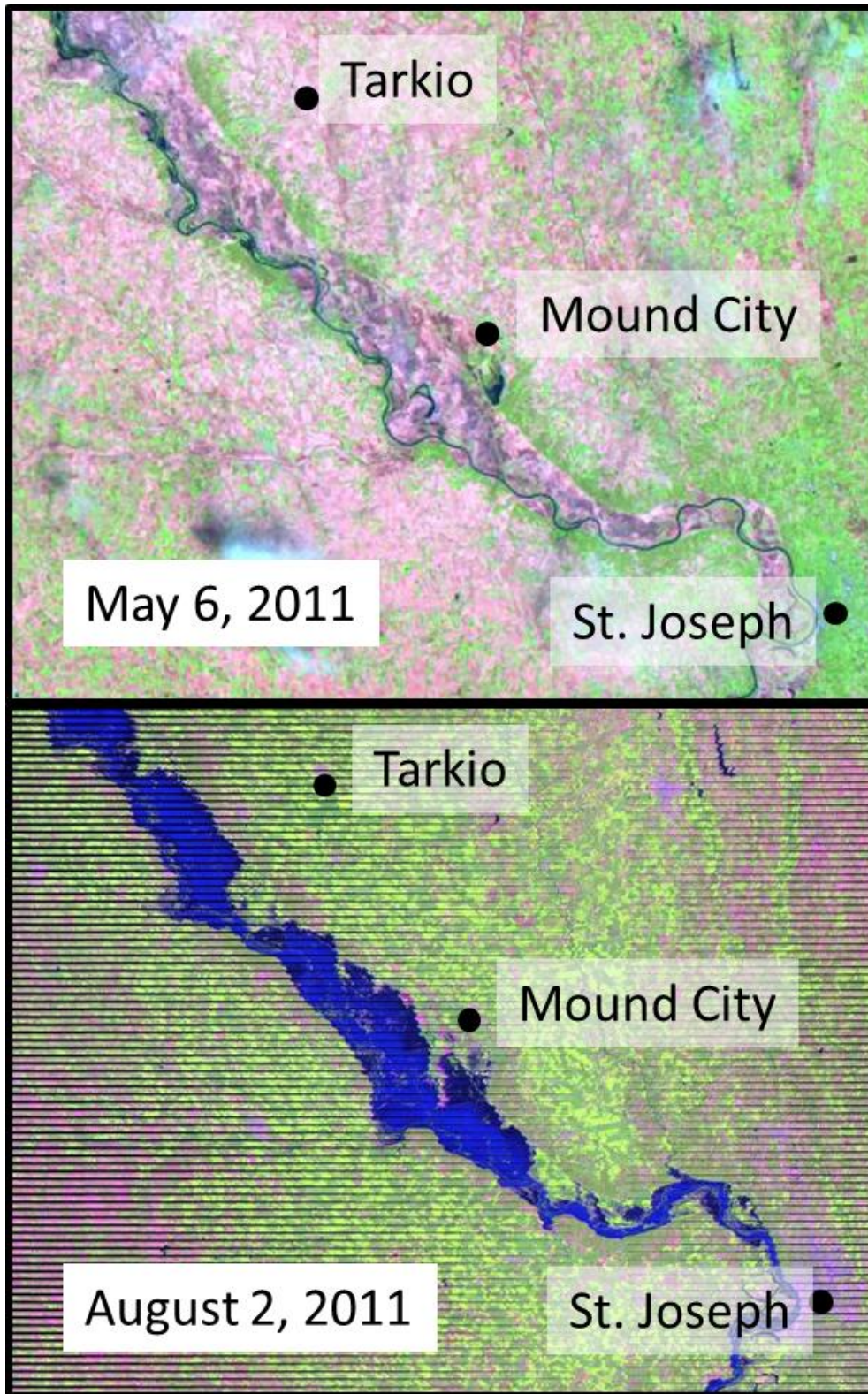
Estimating Cropland Acres Flooded

Deriving the extent of the flooding along the Missouri River in 2011 is a complex exercise. The approach generally followed in this study was to incorporate information from as many sources as possible in determining flooded cropland acres. Available information generated by the individual counties affected by the flooding, satellite imagery available from federal agencies and prevented plantings data available from the Farm Services Agency (FSA) within the U.S. Department of Agriculture (USDA) were all considered.

All of these sources provided a slightly different view of the cropland acres affected by the Missouri River flooding. The primary source used in this report to determine flooded cropland acres along the river was the satellite imagery estimates that were available from different sources within USDA. This data was then compared to prevented planting information and on the ground information from many of the Missouri counties affected to arrive at cropland acres flooded.

Figure one provides a visual observation of the extent of the flooding that occurred in northwest Missouri. Satellite images similar to these were used to help determine acreage impacts discussed in the report. It is important to realize that the use of these satellite images to determine whether an acre

Figure 1. Atchison and Holt Counties Pre and Post Flood Satellite Imagery



Source: <http://glovis.usgs.gov>

is flooded can be difficult, particularly at the edges of the flooded areas. Although land could have a small amount of water on it, vegetation that had grown prior to the flooding could mask that water in a satellite image and allow for undercounting of flooded acres.

The actual level of cropland acres affected by the flooding will continue to be refined over time as further information becomes available. This report provides an estimate of flooded cropland acres using all available information to date.

Estimating Crop Production and Value

The next step in deriving a loss value estimate is the estimation of normal or average crop yields within the flooded area and the price that would have been received for the crops in question. Historical yield information is available from USDA on a county-level basis. However, obtaining yield information within counties is difficult and many of the flooded acres in question represent better than average land within the affected counties.

After examining Missouri county yields contiguous to the Missouri River, this report assumed average corn yields of 160 bushels per acre, average soybean yields of 46 bushels per acre and average wheat yields of 55 bushels per acre across all flooded acres.

Crop prices used in this analysis were the midpoints of the price ranges predicted by USDA's November World Agricultural Supply and Demand Estimates (WASDE) report. The November WASDE report shows a midpoint of \$6.70 per bushel for corn, \$12.60 per bushel for soybeans and \$7.40 for wheat. These U.S. midpoint price estimates were adjusted to reflect a Missouri price received by farmers. These crop price estimates could change substantially depending on how the 2011/12 crop year unfolds in the coming months.

Another factor to incorporate is the normal crop rotation within the flooded areas. In most cases, the historical data available suggested a traditional corn/soybean rotation. There was also some wheat planted within the flooded area. That information was used in determining crop-specific acreages planted within the flooded areas.

In addition to the estimate of the market value of the crop that was flooded, crop insurance and other disaster payments that will be available to affected producers are estimated in this study. Using information on county-level 2011 crop insurance signup, this report estimates the proceeds available to producers based on the coverage level and insurance type they purchased in the counties contiguous to the Missouri River.

Results

Table one provides the estimate of the crop acres flooded, lost market revenue and crop insurance and disaster payments in the Missouri counties along the Missouri River. The first 11 counties that the Missouri River flows through are shown county by county with the remaining 13 counties combined. It is clear that a large portion of the effects are in Atchison and Holt counties as these two counties represent nearly 50 percent of the total acreage flooded in Missouri.

Table 1. Missouri River Cropland Flooded Acres and Lost Crop Value

County	Cropland Flooded (Acres)	Lost Market Revenue (Million Dollars)	Crop Insurance Proceeds and Disaster Payments
Atchison	42,400	\$36.1	\$19.0
Holt	60,000	\$50.9	\$24.0
Andrew	1,700	\$1.4	\$0.5
Buchanan	6,600	\$5.6	\$2.0
Platte	14,700	\$12.5	\$4.7
Clay	1,300	\$1.1	\$0.4
Jackson	2,000	\$1.7	\$0.6
Ray	12,100	\$10.3	\$1.4
Lafayette	6,700	\$5.7	\$2.1
Carroll	28,900	\$24.5	\$4.7
Saline	9,200	\$7.8	\$1.0
Other 13 Counties	21,600	\$18.3	\$5.8
Total	207,200	\$175.9	\$66.3
Loss After Crop Insurance Proceeds and Disaster Payments			\$109.6

This analysis estimates that a total of 207,200 acres of cropland was flooded by the Missouri River in 2011. These acres would have generated nearly \$176 million in revenue had the flood event not occurred. After taking into account the crop insurance and other disaster payments that will become available to producers, there will still be nearly \$110 million in losses as a result of the flood.

Beyond the direct loss of this market revenue, there are spillover effects to the local economies affected by the flooding. The purchase of tractors, trucks, labor and other inputs does have a ripple effect on the

counties. The IMPLAN model is often used to assess the broader economic impacts of a change in the economy (www.implan.com). IMPLAN adds both induced and indirect economic effects to the direct change estimated in Table 1. In this case, IMPLAN would estimate that the \$175.9 million decline in the value of crop production would result in a total economic value decline of \$326.5 million.

Summary

The 2011 flooding from the record rise in the Missouri River has left many communities along the river reeling. There have been many costs borne by those in the flooded areas. The direct loss to farmers is only one of many losses that are apparent from this year's flooding, and the overall costs from the flooding are certainly much larger than the \$176 million of lost crop value estimated here. It will take many years for these flooded areas to recover from the damages they incurred in 2011.

There remains much uncertainty regarding how 2012 will unfold for many farmers within the flooded areas. Water has remained on many of the affected areas for such a long period that it has been impossible to get in and work on many of the repairs that are needed to levees and other infrastructure necessary to produce a crop in 2012. Although this report only estimates the 2011 effects, another repeat of the flooding seen this year in 2012 would lead to an additional burden on the affected counties and farmers.