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**The Value of the 2011 Crop
Production Loss from the Birds Point-
New Madrid Floodway Levee Breach**

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The Value of the 2011 Crop Production Loss from the Birds Point-New Madrid Floodway Levee Breach

The Army Corps of Engineers breached the Birds Point-New Madrid levee system on May 2, 2011 to lower the flood stage on the Mississippi River at and above Cairo, Illinois. This breach allowed the flooding of a little more than 130,000 acres located within the Birds Point-New Madrid floodway. A majority of the acreage located within the floodway is prime Missouri farmland. At the request of U.S. Representative Jo Ann Emerson (MO-08) this FAPRI-MU report provides an economic assessment of the 2011 crop production loss. Only the current year impact of the levee breach and the associated crop loss effects are considered. Residents within the floodway will have many other economic losses beyond the loss of the 2011 crop.

FAPRI convened a group of experts to help address the complexities of creating an economic estimate for losses due to flooding of the Birds Point-New Madrid floodway. FAPRI deeply appreciates the help provided by these experts, but assumes sole responsibility for the contents of this report.

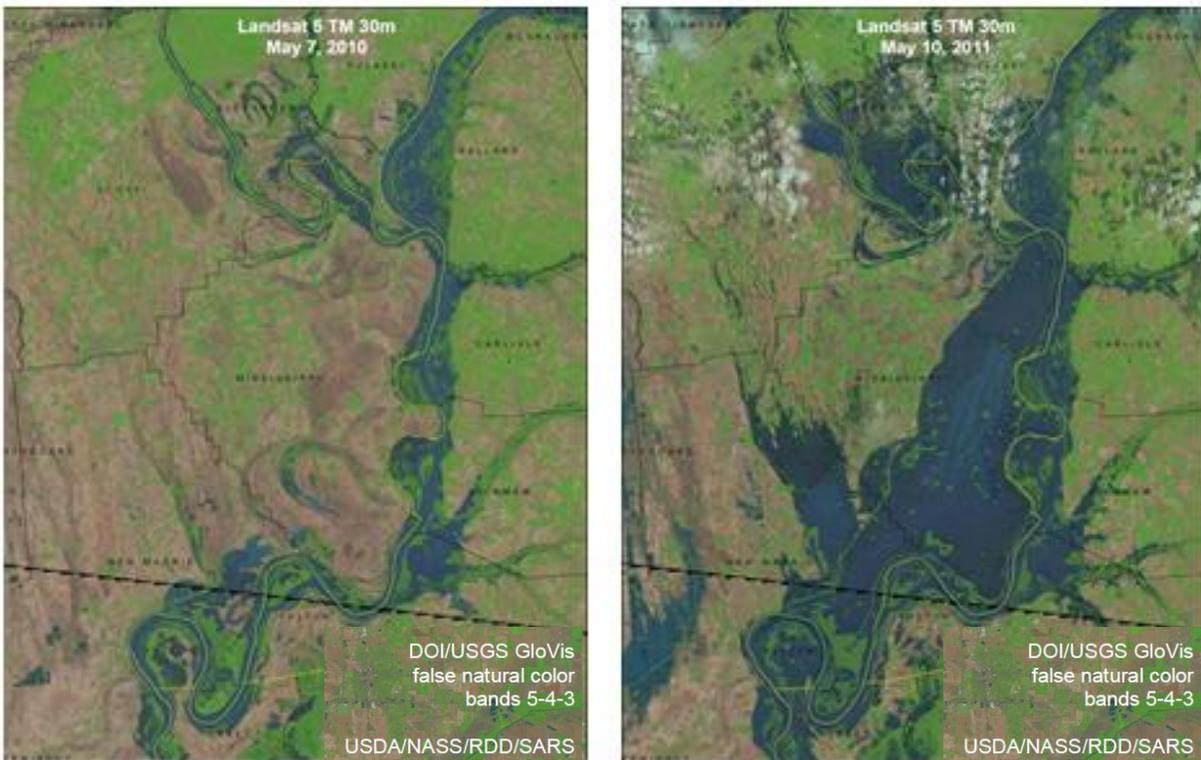
This report was developed in early June 2011. Given the information available at the time of the report, it was assumed that no crop production will occur within the floodway in 2011. Reports are surfacing that some acreage within the floodway is currently being planted and may produce a crop in 2011. Since the levee system has not had any repairs made yet, current plantings may be at risk for additional flooding later in the year. The economic estimates made in the report may need adjustment as the remainder of the crop year unfolds.

The estimates provided here are only for the 2011 crop losses. Other losses such as buildings and other infrastructure damaged by the flood are not included. There are no estimates of the land recovery cost of sand removal and the laser grading of land within the floodway. This report does not account for the value of soil loss or its accompanying productivity factors including tilth, humus, and nutrients. Also, effects on crop production from the operation of the floodway could continue past the 2011 growing season. They would add to the crop losses shown here. Effects beyond 2011 crop losses could add millions of dollars to the total impact of the floodway operation, but are beyond the scope of this report.

Furthermore, this report does not quantify any losses that resulted from seepage or backwater flow that occurred outside the floodway area. Several sources identified that areas outside the floodway have been impacted, but given currently available information these losses remain very difficult to estimate.

Figure one provides just one example of the effect of the Birds Point-New Madrid Floodway operation. The left hand side of the figure shows a satellite image from May 7th, 2010 while the picture on the right is a post-levee break image from May 10th, 2011. The image on the right indicates that the floodway was still fully under water a week after the initial breach in addition to water outside the floodway area associated with seepage and backflow.

Figure 1. Satellite Imagery of the Birds Point-New Madrid Floodway Before and After the Levee Breach



Several factors were examined in determining the economic effects of the levee breach. The first was to derive an estimate of the value of crop production that was lost as a result of the levee breach. This requires an estimate of the size of the crop that would have been produced if the levee had not been breached and prices producers would have received for that production.

The acreage of individual crops grown within the floodway was estimated by using the USDA-NASS GIS CropScape tool (<http://nassgeodata.gmu.edu/CropScape/>) to determine historical plantings within the floodway. 2011 plantings were adjusted based in part on FAPRI's current Missouri state-level acreage estimates for 2011. 2011 yields within the floodway were assumed at trend levels based on historical Mississippi and New Madrid county yields. 2011 corn yields were set at 173 bushels per acre following this process. Crop prices producers within the floodway would have received for the 2011 crop were based on the June 2011 USDA WASDE midpoint price estimates for the 2011/12 crop year, with adjustments given to account for the normal basis level from the U.S. price to a southeast Missouri price. This resulted in a 2011/12 corn price for floodway production of \$6.76 per bushel.

An estimate of the 2011 variable costs of crop production were primarily based upon crop budgets specific to southeast Missouri built by MU extension specialist David Reinbott. These variable cost estimates were subtracted from the calculated value of production to determine the expected 2011 net returns. The second aspect related to variable costs, not including land rental costs, was to derive an estimate of variable expenses that had already been incurred and were lost once the levee breach occurred. Using information on planting progress within Mississippi and New Madrid counties, we

estimated that a little over 50 percent of the corn variable production costs had already occurred prior to the levee breach.

The last factor considered was the level of reimbursement available to producers within the floodway from disaster assistance programs. The primary payout is crop insurance. The analysis used 2010 crop insurance information for Mississippi and New Madrid counties to determine policy types and coverage levels. Although some 2011 crop insurance data was available, it was insufficient to use to derive the expected crop insurance payout from the breach. Other disaster programs, such as Supplemental Revenue Assistance Payments Program (SURE), were included in government payments as well. The timing of these payments is also important to understand. For example, SURE payments will not reach producers until late in 2012.

Table 1 provides the results of FAPRI's analysis of the breach for the following crops: corn, soybeans, wheat, sorghum, cotton and rice. The expected value of production of corn, soybeans, wheat, sorghum, cotton and rice was projected at \$85.2 million for 2011. 2011 net returns within the floodway would have reached \$44.9 million after subtracting variable expenses associated with producing the 2011 crop. This study estimates that inputs applied and other production expenses that occurred before the levee breach nets \$15.7 million. The combination of forgone net returns and incurred production expenses totals \$60.6 million. Once government payments are made for crop insurance claims and other disaster programs, the loss declines to \$42.6 million.

Thus far this report has only focused on the direct effects of the floodway's operation on agricultural producers. There are certainly ripple effects beyond production agriculture that are important. IMPLAN is often used to assess the broader economic impacts of a change in the economy. IMPLAN adds both induced and indirect economic effects to a direct change that occurs by using the crop value of production losses estimated in Table 1, the IMPLAN system provides the larger economic effect to the assessment. In this case, IMPLAN would estimate that the \$85.2 million decline in the value of crop production would result in a total economic value decline of \$156.7 million. This should not be understood as the net effect for the total economy of the levee breach but only represents the decline in aggregate economic activity from the lost value of crop production. Since some crop inputs were applied before the floodway's operation, some downward adjustment to the aggregate economic effect estimated through IMPLAN should be included, but it is difficult to quantify how the size of the reduction. The point is that these broader economic activity estimates highlight that the effect of the levee breach goes well beyond production agriculture.

The results of Table 1 depend heavily on the assumptions chosen for the analysis. If crop prices continue to rise during the remainder of 2011, the value of production calculation will increase. Likewise, if crop prices adjust downward, the value of production estimate will decline. If acreage in the floodway is able to produce a soybean crop this year, the economic losses will be lower than those shown in Table 1. As the effects of the levee breach continue to unfold, FAPRI will update this table as needed.

**Table 1. 2011 Crop Production Losses
From the Birds Point Levee Breach ***

	Total	Per Acre **
Pre-Flood Outcome	(Millions)	
Value of Production	\$85.2	\$629
Variable Production Expenses	\$40.3	\$298
2011 Net Returns	\$44.9	\$332
Variable Costs Incurred Before Flooding	\$15.7	\$116
Lost Net Returns and Applied Inputs	\$60.6	\$447
Government Payments		
Crop Insurance	\$15.8	\$117
Disaster Payments	\$2.2	\$16
2011 Crop Loss Less Government Payments	\$42.6	\$314

* - Crops: Corn Soybeans, Wheat, Cotton, Rice and Sorghum

2011/12 price estimates derived from USDA's June 2011 WASDE Report

** - Includes double cropped acreage