

# The Impacts of 2011 Induced Levee Breaches on Agricultural Lands of Mississippi River Valley

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# Problem

- Ohio River had reached the 40 ft flood stage on the gauge at Cairo, IL in early April of 2011. By late April the floodwaters on the earthen levee and seawall were forecast to reach a predicted peak above 60 ft in early May) which could have resulted in the US Army Corps of Engineers blasting open the fuse plug on the Birds Point levee to let floodwaters pass through the New Madrid Floodway to reduce the pressure on the seawall and levee system protecting Cairo, IL from flooding.

# Problem continued

- The Missouri Attorney General's appeal in late April of 2011 to protect the Missouri citizens and property including the land owners in the Floodway law suit filed in late April in federal court to prevent the Corps of Engineers from opening the New Madrid Floodway was rejected on May 1<sup>st</sup>.
- On May 2<sup>nd</sup>, the Corps of Engineers placed the 265 tons of TNT in the Birds Point fuse plug blew it up on May 2, 2011. Even with 1/4<sup>th</sup> of the entire Lower Mississippi River flow passing through the Floodway the peak on Cairo gauge was not recorded until hours later (May 3<sup>rd</sup>) when it reached 61.72 ft.



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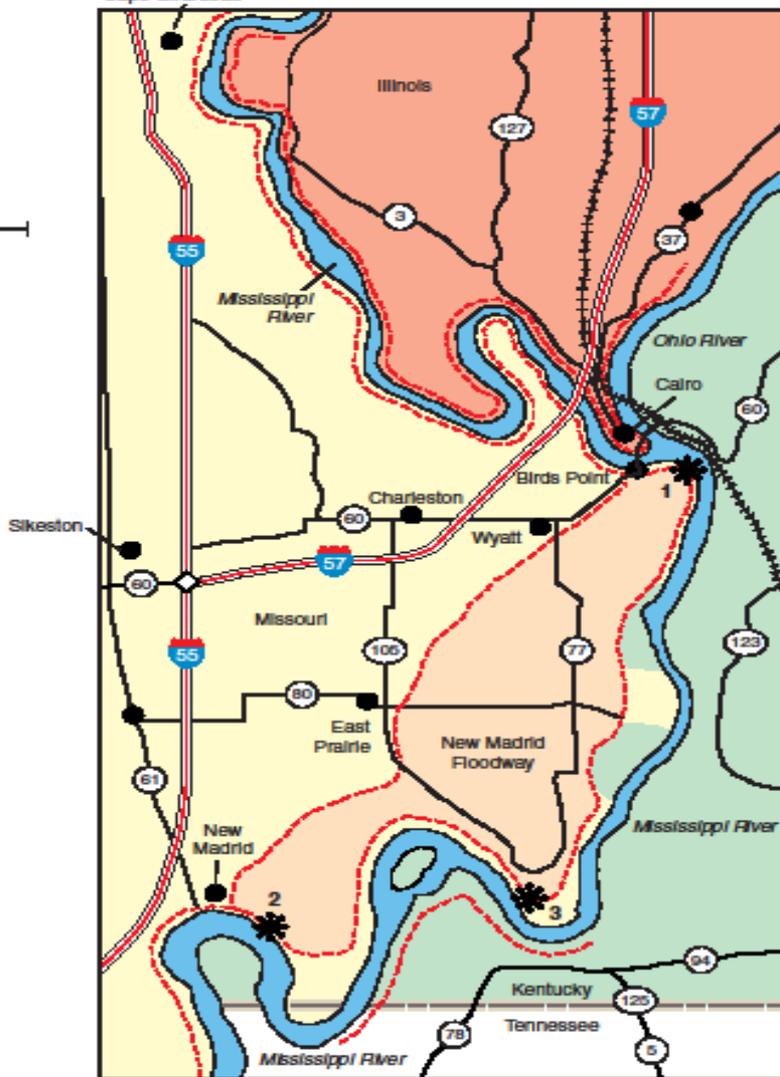
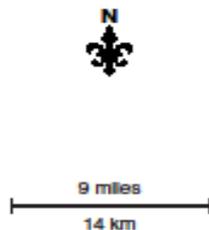
Image USDA Farm Service Agency

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# New Madrid Floodway

- The New Madrid Floodway was built in 1928 after the Great Flood of 1927. The land area is bottomland and part of a natural levee system created by the Mississippi River overflowing its banks.
- The New Madrid Floodway covers 133,000 ac and is surrounded by levees. The area is between 4 and 10 miles wide and between 33 and 36 miles in length. The Floodway is totally in Missouri.

Cape Girardeau



- |                             |            |
|-----------------------------|------------|
| Roads local                 | State line |
| Interstate Highway          | Missouri   |
| Levee blown up in 3 places  | Illinois   |
| Railroads                   | Kentucky   |
| Levee or Seawall            | Tennessee  |
| New Madrid Floodway (MO)    |            |
| Mississippi and Ohio Rivers |            |

# Modification of the New Madrid Floodway plan

- In 1983 United States court of Appeals for the Eighth Circuit reversed all of the MO District Court rulings (Story vs. Marsh) and permitted the U.S. Army, Corps of Engineers to artificially crevasse both fuse plugs and frontline levee without the need for the escrow deposit.
- This case became the legal precedent used by the Federal court system in 2011 to decide a last minute appeal by Missouri Attorney General in an effort to protect Missouri citizens and property including those Floodway and prevent the blowing-up the levee and passing water through the New Madrid Floodway.

# Modification of the New Madrid Floodway plan

- On May 1, 2011 (a Sunday) the Supreme Court rejected the MO AG appeal which affirmed the U.S. Army, Corps of Engineers right to operate the floodway including the blow-up the fuse plugs and frontline levee to pass water into and through the 133,000 ac of the New Madrid Floodway.

# Flooding of the New Madrid Floodway

- On May 2, 2011 the Major General Walsh ordered the Birds Point fuse plug levee to be blown-up using 265 English tons of dynamite (TNT).
- For the first time in over 70 years the Floodway was open and a wall of water approximately 10 to 12 foot high went rushing into the Floodway at the rate of 396,000 cubic ft/sec or nearly 1/4<sup>th</sup> of the entire Mississippi River flow.

# Flooding of the New Madrid Floodway

- The Mississippi River went from 61.72 ft to 59 ft and dropping in 48 hours. Flood levels in Paducah, KY on the Ohio River dropped 3 ft and the Mississippi River at Cape Girardeau, MO dropped 1.9 ft in the same time period.





2011 DGGlenn





# Damages

- Six crater lakes were created in agricultural land near the Birds Point and 1.2 miles of the fuse plug and front line levee.
- More than 200 structures, including grain bins, barns, sheds, silos, and residences were damaged by the 10 ft deep water as it entered and surrounded the structures.
- Irrigation equipment was turned over and destroyed.









# Damages

- The 20,000 to 30,000 ac wheat crop planted in the fall of 2010 drowned.
- Little corn was planted in 2011 since the water did not drain off and the fields dry out, even on the higher elevations, until the 2<sup>nd</sup> week of June 2011.
- However, 90,000 ac were planted to soybeans in June and July.

# Damages

- The 20,000 to 30,000 ac of low lying and clayey soils remained ponded in July of 2011. Even if planted in fall of 2011 to winter wheat would still be no harvested crop in 2012.
- The lack of income from these low areas in 2011 as a result of either the lack of a crop in 2011 or from the loss of the wheat crop planted in fall of 2011 reduced farm income by 40%. Crop insurance may have covered some of the potential loss.

# Damages

- Loss of farm income which was partially offset by Crop Insurance.
- The man-induced breaches were considered a natural flooding event in a federal declaration and a total of \$50 million was paid for the loss of the 2011 wheat, and the damaged areas adjacent to the levees that could not be planted in 2011 and the cropland too wet for crop production in 2011.











# Structure Damage

- There were approximately 200 structures damaged by flooding including the rapidly moving water and water retained in the Floodway.
- The floodway was capable of 10 to 12 ft of floodwaters or 1.3 to 1.6 million acre-ft.
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# Damages

- All of the drainage ditches were filled with sediment and 30 excavators were required to open the channels and drainage ditches.
- Hundreds of acres of sand deltas were created with the largest being near Big Oak Tree State Park and the site of the frontline levee blast.









06.16.2011



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# Damages

- The fuse plugs and frontline levee need to be repaired
- The crater lakes filled in.
- The gully fields reclaimed.

# Conclusions

- Corps of Engineers 1986 plan to open the Floodway when there was a forecast of a peak on the Cairo gauge of 60 ft or more was delayed 4 days or until the Supreme Court rejected the Missouri appeal. The Corps of Engineers induced levee breach at Birds Point levee (MO) the next day (May 2, 2011). The use of the New Madrid Floodway to reduce the pressure on the Cairo seawall and levee.
- The flood levels dropped significantly and there was no loss of life or property in Cairo, Future City or Urbandale, IL.

# Conclusions

- The impact of the Corps of Engineers opening of the Floodway at 61 ft flood stage resulted in an extra 3 to 4 ft of water in addition to the planned for 6 to 8 ft wall of water that moved rapidly into the Floodway through the 1.2 mile wide levee breach. This extra depth of water appears to have contributed to the creation of hundreds of acres of gully fields many miles from the blown- up levee.
- This resulted expensive re-grading of these fields, loss of crop for years until reclaimed and in the case of O'Brien Ridge the permanent loss of agricultural land.

