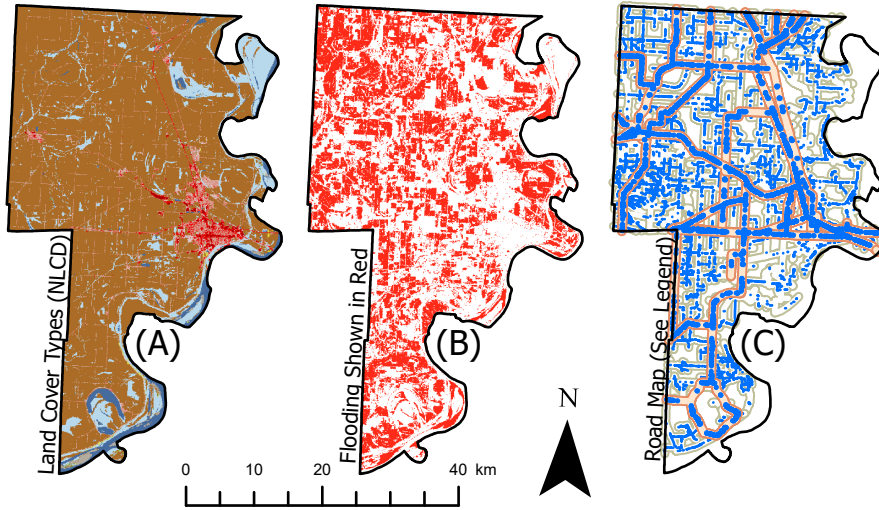


Impact Review for April 2024 Flooding Crittenden County, Arkansas



Crittenden County, AR (along with much of the Mississippi River Delta) experienced significant flooding April 2-5, 2025, causing extensive damage — especially to agricultural land. While this time period was better known for the tornado outbreak that occurred with the same storm system, estimates for flood damages to AR agriculture from this event alone are in the tens of millions of dollars. This report assesses the land cover types and roads that were covered by floodwater as estimated by the HYDRAFloods Python Package.

Areas with greater than 90% occurrence of water was selected in creating a Water Area Mask (see citations) and subtracted from the areas of water detected in April 2025 from the HYDRAFloods dataset to find the areas that were truly flooded.

The National Land Cover Dataset (NLCD) for 2024 (Inset A) was used to estimate land cover types for Crittenden County, AR during the time of the event. Raster flooding datasets were snapped to the NLCD grid using Nearest Neighbor, and all calculations came from this new raster (Inset B).

The first table on the left shows flooding by NLCD Land Cover type. Individual land cover classifications with less than 10 square kilometers in the county are not shown in the table but are included in calculations, though their combined land area is < 1% of the county. Overall, around 670 square kilometers were flooded in Crittenden County during this event, over 40% of the county's area. Over 50% of cultivated crops (which comprise 75% of Crittenden County's land area) were flooded, making up over 95% of the flooding. Around 13 square kilometers of urban area were flooded, comprising of approximately 10% of Crittenden County's urban areas.

Lengths of flooded roads were calculated from this same floodwater raster dataset with 30m resolution, meaning that these calculations numbers may be representative of flooding along the roads rather than on top of them; use the second table with that caveat in mind (Inset B, Inset C).

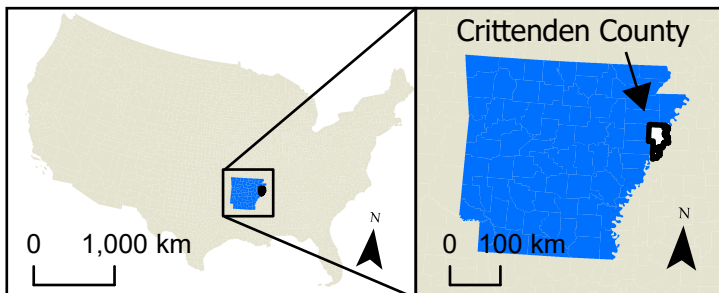
The above calculations indicate that 661 km of roads were flooded, or approximately one fifth of Crittenden County's road system. The smallest roads comprised the vast majority of this length; however, each type of road saw between 6.5% and 35% of its lengths flooded, with most types (including Interstates and State Highways) between 10% and 20%.

NLCD Classifications		Flooded		
Color	Land Cover	Area (km ²)	Percent of Type	Percent of Total
	Open Water	-	-	-
	Developed, Open Space	4.51	13.56%	0.27%
	Developed, Low Intensity	6.92	11.49%	0.41%
	Developed, Medium Intensity	1.13	4.90%	0.07%
	Developed, High Intensity	0.37	5.15%	0.02%
	Cultivated Crops	645.31	50.46%	38.61%
	Woody Wetlands	2.70	1.47%	0.16%
Total		670.50	-	40.12%

Road Legend

- Major Road
- Minor Road
- Flooded Major Road
- Flooded Minor Road

Road	Flooded		
	c. Length (km)	Percent of Type	Percent of Total
Interstate	22	13.9%	0.7%
U.S.	17	16.7%	0.6%
State	45	18.4%	1.5%
County	77	26.5%	2.6%
Common Name	267	18.2%	9.0%
Not specified	232	32.7%	7.8%
Other	1	6.9%	0.0%
Total	661	-	22.2%



Created by John David Goode in ArcGIS Pro on 11/13/25. Updated 12/05/25.
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All maps projected to WGS 1984 UTM Zone 16N
Water Area Mask: Jean-Francois Pekel, Andrew Cottam, Noel Gorelick, Alan S. Belward, High-resolution mapping of global surface water and its long-term changes. *Nature* 540, 418-422 (2016). doi:10.1038/nature20584
Event Floodwater: Markert, K., Bhandari, B., Haag, A., Mayer, T., Poortinga, A., van Verseveld, W., & Soe Thwal, N. (2023). Hydrologic Remote Sensing Analysis for Floods (HYDRAFloods) Zenodo, <https://doi.org/10.5281/zenodo.15841684>
County Borders and Roads: US Census TigerLines
National Land Cover Dataset (NLCD): U.S. Geological Survey (USGS), 2024, Annual NLCD Collection 1 Science Products: U.S. Geological Survey data release, <https://doi.org/10.5066/P94UXNTS>