



National Weather Center  
University of Oklahoma

# FLASH

## FLOODED LOCATIONS & SIMULATED HYDROGRAPHS



Flash flooding is the deadliest and costliest short-fused severe weather hazard on average in the United States. Research efforts conducted at CIWRO are directed toward improving the understanding, prediction, and warning of flash floods and post-wildfire debris flows. These efforts focus around the Flooded Locations and Simulated Hydrographs (FLASH) system.

The FLASH system is developed and maintained by CIWRO and NSSL, and it contains the first fully distributed hydrologic modeling framework to operate at the

flash flood scale in real time across the entire country. New information from three different hydrologic models is available every 10 minutes. Analysis of precipitation to flash flood guidance and known recurrence rates are available every two minutes.

The FLASH system has been operational at the National Weather Service since 2016, after doubling the performance of the legacy flash flood guidance system. Today, NWS forecasters routinely use FLASH products to help with the prediction, warning, and public messaging of flash flooding.





# WATERWAYS & FLASH FLOODS

CIWRO scientists are gaining new insight into the dynamics and impacts of flash flooding. A sensor called StreamScope was developed with the U.S. Geological Survey (USGS) and NSSL, and it can provide a new, cost-effective way of measuring streamflow and the changing shape of the waterway. CIWRO scientists conduct ground and aerial surveys after significant flash flood events to better understand and map flash flood impacts. This effort provides new ways of analyzing and quantifying the severity of flash floods with the Flash Flood Severity Index (FFSI).

2

field campaigns  
since 2021

6

flash flood surveys  
completed in 2024

4

datasets published  
since 2021

14

conference presentations  
since 2021

# POWERING UP FORECASTING

CIWRO scientists consider hydrology, geography, and civil engineering along with weather prediction models to prioritize and advance flash flood prediction for better lead time. Integrating high-resolution and timely precipitation forecasts into the FLASH system will better inform forecasters who rely on clear data. Emerging efforts to couple the FLASH and Warn on Forecast System can provide a new probabilistic way of earlier flash flood prediction, communication, and warning issuance. Further, applying FFSI with geospatial mapping of flash flood post-event surveys is driving new ways for predicting the potential severity of flash floods, and pinpointing where flash floods can impact roadways and other infrastructure. CIWRO research also optimizes predictive capabilities and specialized hydrologic modeling in areas of wild-fire burn scars.



The UNIVERSITY of OKLAHOMA