FEMA Explores Automation, AI to Update Flood Risk Maps

As weather patterns change rapidly, the federal agency looks to update data for its flood analysis more quickly and efficiently.

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Advances in digital technologies are allowing FEMA to revamp its flood risk maps to improve accuracy about flood risk across America.
As part of its Federal Insurance & Mitigation Administration, FEMA is responsible for managing programs before a natural disaster or other emergency, such as floods, hurricanes, storms and earthquakes. Through its National Flood Insurance Program, the agency ensures such insurance is available for homeowners in areas that are susceptible to flooding and partners with state, local and tribal governments to collect and provide flood hazard and risk data to guide mitigation efforts.

Last month the First Street Foundation created an online calculator suggesting FEMA’s Flood Insurance Rate Maps (FIRMs) missed 14.6 million properties at risk of flooding across the U.S. The non-profit research group claims its estimate is higher than FEMA’s because it accounts for recent increased rainfall and climate change. The federal agency said it is actively adding increased rainfall and climate to its hazard analyses through its Future of Flood Risk Data initiative.

“FEMA aims to provide a more comprehensive picture of the country’s flood hazards through a Graduated Risk Analysis,” a FEMA spokesperson told GovernmentCIO Media & Research.

Federal law requires FEMA to update its flood insurance rate map (FIRM) every five years, but the recent unpredictability of weather patterns also requires discretion when evaluating changes to them.

“Keeping pace with these changes is important and failing to do so could lead to unwise land-use decisions and construction standards, thereby putting homeowners at increased risk while providing a false sense of security,” the spokesperson said in an email to GovernmentCIO Media & Research. “Conversely, overstated hazards can result in potentially unnecessary construction costs and incorrect insurance rating decisions.”

Due to new technologies like lidar (light detection and ranging), FEMA expects to accelerate updates to FIRMs in the near future.
“Continuously decreasing costs for wide-area lidar collection, along with a coordinated national strategy for complete lidar coverage through the 3D Elevation program has increased the availability of accurate digital elevation data and allowed FEMA to transform flood hazard modeling and mapping for the National Flood Insurance Program,” the spokesperson said. “Instead of making piecemeal engineering updates, FEMA has been able to transition to large-scale automated analysis. These expanded abilities support a base-level engineering strategy to provide widespread coverage of reliable flood hazard information that previously was not possible.”

Automation, in particular, will help FEMA cut costs and improve data accuracy and consistency. The agency plans to explore use cases for artificial intelligence as well.

“FEMA is exploring the use of custom-developed applications to automatically generate FIRM panels from the FIRM database to help ease the load of [Geographic Information Systems] professionals quality-inspecting the panels to meet cartographic specifications,” the spokesperson said. “This automation will improve mapping by going completely digital and eliminating the need for handcrafted FIRM panels.”

A FEMA spokesperson also told The New York Times that the agency “welcomes” the First Street Foundation’s flood mapping work, and considers it “complementary” to FEMA’s FIRMs.

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Lidar collection
Standard