

Flood Hazard Identification and Risk Assessment to Increase Community Resilience



Minimizing flood risk by identification and assessment of hazards.

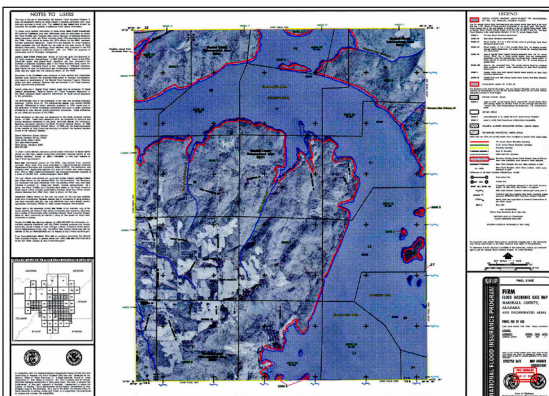
Areas of Expertise

- Hydrologic and Hydraulic Analyses
- Flood Insurance Study/Flood Insurance Rate Map Production
- Flood Risk Communication
- Flood Warning Systems/Inundation Mapping
- Coastal Flood Studies

More Information

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AECOM has conducted or reviewed flood studies in more than 1,000 counties nationwide, in every FEMA region, and has produced more than 40,000 FIRM panels.
Map source: <https://msc.fema.gov/portal>.

Overview

Floods cause more damage globally than any other natural disaster. At AECOM, our engineers, scientists, GIS specialists, and technical experts provide solutions to mitigate the loss of life and property in communities nationwide. AECOM has been performing floodplain mapping for Federal Emergency Management Agency (FEMA), state, and local agencies throughout the U.S. for more than 30 years. As a FEMA contractor, we have continuously improved our production processes and tools to produce floodplain studies and FIRM updates better, faster, and more cost-effectively.

We address challenges by creatively researching the situation, developing the right approach and delivering projects to benefit our clients' vision.

- **The Recurring Cost to Update Flood Hazard Information Across the Nation Needs to be Effectively Managed.** AECOM delivers innovative tools and approaches to assess and map flood hazards. For more than a decade, our teams have delivered hydrologic and hydraulic models using smart metadata tracking tools that allow us to update studies in the future for 75-80% less effort. This functionality provides long-term cost savings for our clients.
- **Climate Change and Sea Level Rise Impact on Flood Hazard Information is an Important Unknown that Must be Addressed.** AECOM led a nationwide study for FEMA to predict the impact of climate change on the National Flood Insurance Program (NFIP). This included an assessment of climate-change related impacts to riverine and coastal flood hazards through the year 2100. Key findings include: by 2100, floodplains are likely to be >45% larger and average loss per policy will increase nearly 45%.
- **A Significant Portion of Flood Hazards in the United States are Unmapped or only Identified on Hard Copy Maps.** AECOM advances technologies related to performing broad area flood hazard analysis and mapping at low costs. Our highly efficient SwiftMap tools were



developed to allow cost-effective analysis and mapping of lower risk areas using traditional 1-dimensional assessment techniques. Over the past 10 years, these tools have been applied to flood modeling and mapping efforts for 75,000+ miles of stream in more than 20 states to develop regulatory floodplain boundaries for publication on Flood Insurance Rate Maps. These tools continue to evolve as AECOM delivers broad scale automated engineering and mapping solutions that also work with 2-dimensional models such as HEC-RAS 5.0.

- **Changing Flood Hazards are an Important Consideration in Long-Term Risk Reduction Efforts.**

Because of its foundational basis in flood insurance, typically FEMA's Flood Insurance Rate Maps considered only current conditions when assessing flood hazards. However, for effective land use planning, future conditions, based on land use changes and climatological changes must be considered. AECOM developed the first published FIRM to include future conditions flood hazard boundaries and flood elevations for Charlotte-Mecklenburg, North Carolina over 10 years ago. It is estimated that the implementation of more restrictive future conditions flood regulations will result in more than \$150 million in savings in a single 1% annual chance flood event.

Areas of Expertise

- **Hydrologic and Hydraulic Analyses.** AECOM regularly provides a wide range of hydrologic and hydraulic (H&H) modeling including 1D, unsteady flow, 2D, alluvial fan, sediment transport, ice jam, among other services throughout across North America. We have performed H&H modeling covering 150,000+ square miles of land area and 75,000+ miles of stream, as well as 2,000+ miles of coastal shoreline.



- **Flood Insurance Study/Flood Insurance Rate Map Production.** For more than 30 years AECOM has been developing studies to support the NFIP and ensure communities can participate in the program and have access to federal flood insurance.
- **Flood Risk Communication.** To present risk information in a way that facilitates targeted response and maximum usability, AECOM has developed risk assessment tools that leverage existing data, regulatory and non-regulatory, at the community, property or structure levels and interprets risk information in a way that ultimately leads stakeholders to prioritize actions.
- **Flood Warning Systems/Inundation Mapping.** The ability to convey flood warning and alert information in a spatial manner is critically important to communicating the potential impacts to affected citizens and to allow for timely action to protect life and property. We support the development and assessment of flood warning systems from gage placement and installation, modeling to support warning and alert protocols, platform development for user interface as well as communication and messaging for flood warning notifications. We also prepare post-event inundation mapping to support recovery and reconstruction efforts in the aftermath of large events like Hurricane Katrina, Superstorm Sandy and others.
- **Coastal Flood Studies.** We understand the complex challenges that impact our coasts such as natural disasters, flooding, erosion, winds, waves, tides, climate change, and several level rise. Nationwide, AECOM's coastal experts have been producing FEMA coastal Flood Insurance Studies and Flood Insurance Rate Maps for 30+ years. This has involved advanced storm surge modeling, statistical analyses, overland wave modeling, wave setup and runup, erosion analysis, and flood zone boundary mapping.