

A South Carolina Dam Safety Collaborative Technical Assistance Case Study: Using GIS to Integrate Community Profile Analysis, Critical Infrastructure Information, and Inundation Mapping to Support Consequence Analysis and Dam-Related Planning Activities

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Dam incidents can occur without notice, as in the case of a catastrophic failure of a dam's infrastructure, or over time, such as overtopping from a sustained rainfall event. Jurisdictions have access to detailed data describing the potential reach and extent of flooding impacts resulting from various dam incidents, using modeling tools like Decision Support System for Water Infrastructure Security (DSS-WISE). Jurisdictions also need to understand the communities downstream of a dam to ensure effective emergency planning and informed decision making. Conducting a risk- and data-informed community analysis can help jurisdictions gain a greater understanding of the unique population and location characteristics within their inundation area.

FEMA offers a Dam Safety Collaborative Technical Assistance (CTA) series to help communities at risk of dam-related flooding to better understand their risk landscape and the potential consequences of dam-related emergencies. Participants engage in a facilitated planning process with community stakeholders to build relationships, develop plans, and collaborate with whole community partners to achieve the goal of increased preparedness to dam-related hazards.

Currently, South Carolina is involved in a year-long CTA series wherein the utilization of GIS-based mapping has been a cornerstone of their efforts. This capability has been used to visualize a modeled inundation area, along with a broad range of population and community characteristics, such as demographics, economics, social factors, and critical infrastructure (e.g. fire stations, hospitals, etc.). Moreover, it has provided South Carolina an easily understandable tool for emergency planners and dam owners and operators in the community to identify and explore the areas with the greatest risk.

Insights gained from integrating and analyzing inundation modeling, community, and infrastructure data together in a single GIS mapping product can help planners gain a better understanding of the consequences their community partners may face and establish context for assessing the potential impacts of an operational action or dam-related incident, which is critical to making modeling results actionable. The visual nature of this type of product can also facilitate communication with decision makers and support outreach to community partners.

This session will walk attendees through case studies of how South Carolina and other communities have utilized GIS-based mapping to integrate and analyze inundation modeling, community, and infrastructure data in a single product; enabling them to gain a better understanding of the consequences their community may face and establish context for assessing the potential impacts of a dam-related incident.