

Flood Inundation Mapping Cadre Process and Procedures by the USACE's Modeling, Mapping, and Consequence Production Center (MMC)

Wesley Crosby, P.E., Modeling Technical Coordinator, U.S. Army Corps of Engineers,
Vicksburg, MS, Wesley.A.Crosby@usace.army.mil

Abstract

The USACE Modeling Mapping and Consequences Production Center (MMC) provides hydraulic modeling, mapping and consequence analysis for USACE dams and Levees in support of the USACE Dam & Levee Safety and Critical Infrastructure Protection and Resilience (CIPR) Programs. The MMC has developed processes, tools and standards for creating dam and levee breach hydraulic models for use in emergency action plans (EAP), during real-time flood events, and in support of the Corps Dam & Levee Safety and Security programs. As a result of this experience, the MMC also provides Flood Inundation Modeling support during real-time flood events with its Flood Inundation Mapping Cadre (FIM). The mission of the FIM Cadre is to assist districts and other government agencies when called upon to run real-time hydraulic models, prepare forecast inundation maps, and develop consequence estimates for significant flood events. Since supporting the flooding efforts during the 2011 flood of record on the Mississippi River and the 2011 flood on the Missouri River, the FIM Cadre has been called in to support multiple flood events across the nation, including support during some hurricanes. To date the MMC FIM Cadre has supported at least 14 flood events since 2011, including 7 Hurricane Events.

This presentation will provide information on the purpose, processes, and procedures for production of inundation mapping products within the USACE. The use of mapping during extreme events (floods, droughts, hurricanes, etc.) has provided, and continues to provide, critical situational, and real-time information for emergency responders, decision makers, and key stakeholders. This information is helpful not only to USACE, but also to federal, state, local, and emergency responder partners. This presentation will discuss the modeling, mapping, consequence products produced during a flood event. In addition, this presentation will provide case studies where the MMC FIM Cadre has supported flood inundation modeling during flood events. Over the years, the MMC FIM Cadre has supported 19 districts, multiple states, and FEMA.

Since the passage of the Flood Control Act of 1917, USACE has played a significant role in managing flood risk nationwide. After supporting the 2011 Mississippi River flood, the MMC worked to develop a national FIM Cadre team that could assist districts with producing hydraulic models, inundation maps, and consequence estimates for flood events across the nation. These products during an extreme flood event, provide critical situational and real-time information that can be used by decision makers, emergency responders, and other key stakeholders. In order to provide consistent products across all USACE districts, the MMC has developed a Standard Operation Procedure (SOP) for Flood Inundation Mapping. The initial draft was created in 2016 and the latest version was finalized in early 2018. Some of the information provided in the SOP is the FIM Cadre Team structure, roles and responsibilities for

team members, planning and coordination between members and districts/divisions/HQ, data collection, model and software selection, typical model scenarios, typical mapping products, data standards, mapping standards, upward reporting, product release, data management etc. In addition, the MMC has worked with the Hydrologic Engineering Center to develop ways to communicate model quality/confidence and uncertainties within our models on our map products.

References

U.S. Army Corps of Engineers, MMC Flood Inundation Mapping SOP, 2018.