**Missouri**

**MO River Flood Event Simulation Mapping (FESM) Process**

### Project Description
- Enable a mapping process that during a flood event can account for levee breaches and overtopping and update maps of expected flooding in less than eight hours
- Use newly available mapping and hydraulic modeling tools on the Missouri River to enhance risk communication during events
- Leverage tools from joint efforts of the NOAA National Weather Service (NWS) and USACE Mapping Modeling and Consequence (MMC) Center
- Produces event maps for over 500 miles of the river, helping Missouri to communicate future risks and manage floodplains

### Flood Risk Reduction Outcomes
- "Operationalizes" risk awareness during flood events
- Addresses past goals of the Missouri River Flood Task Force’s Floodplain Committee
- Provides two test maps for state to communicate to public to improve understanding of risks prior to investing in the floodplain
- Enables actionable risk reduction, including evacuation and emergency response routes in advance of flooding
- Prevents needless flood fighting efforts which reduces costs
- Meets intent of the Integrated Water Resources Science and Services (IWRSS) memorandum of understanding

### Challenges Overcome / Continuing Challenges
- Collecting historical forecast data from past flood events needed for the process to be successful
- Developing techniques for choosing flow input data will require trial and error to decide best way to refine models and produce useful outputs
- Developing techniques to input levee breaches and other near-real time geometry changes

### Partners and Project Cost

<table>
<thead>
<tr>
<th>Agency</th>
<th>Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>USACE</td>
<td>$150k</td>
</tr>
<tr>
<td>NOAA NWS FESM process</td>
<td>$15k In-kind</td>
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<tr>
<td>NOAA NWS new model</td>
<td>~$400k In-kind</td>
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<tr>
<td>USACE MMC models</td>
<td>~$400k</td>
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<tr>
<td>USACE MMC LiDAR</td>
<td>$2M</td>
</tr>
<tr>
<td>USACE MMC IWRSS</td>
<td>$10k / yr (past 3 yrs)</td>
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<tr>
<td>USGS and FEMA</td>
<td>~$500k In-kind</td>
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<tr>
<td>Missouri SEMA</td>
<td>Minimal In-kind</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>Over $3.5 M</strong></td>
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### Successes/Best Practices
- Address past Interagency Levee Task Force goals
- Develop protocol for using this tool during real events, maintaining and communicating forward models and process
- Establish and document a consistent and repeatable process for future users
- Test the process and the test maps in a flood event exercise

**USACE Project Point of Contact**
Brian Rast and Jason Sheeley
Kansas City District
Some communities that value their viewshed of the river need reliable flood maps to flood fight, like the setup of portadams.

What if you could account for levee breaches and overtopping and update maps of expected flooding in less than a day?

The federal partners realized they could do this in December 2014, resulting in this project. The project provides the needed tools and also presents a couple of useful flood maps for Missouri SEMA.