Congaree River LAMP Pilot Project
Update and Lessons Learned

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Agenda

- Project Overview
- Local Stakeholder Group
- The LAMP Process
- Lessons Learned
- Future Best Practices
- Questions
The Congaree River Watershed

[Map of the Congaree River Watershed showing major cities and landmarks such as Charlotte, Greenville, Columbia, Lake Norman, Lake Wylie, Lake Murray, and Charleston.]
Project Overview

- Project area consists of several levee systems just downstream of the Piedmont and Sandhill geographic region fall line in Columbia, SC
- The watershed drains over 7,000 square miles
- Most of the agricultural levee system was built in the 60s and 70s
- National Levee Standards were formalized in the 1980s
- Main Levee never overtopped - did breach in 1976
- It is a non-accredited levee
Project Overview (cont.)

• One of 25 National FEMA pilot projects
• LAMP better defines non-accredited levees
• Accreditation = Section 65.10 of the NFIP
• If a levee meets 65.10, it can be shown as providing complete protection from the 1% flood
• 65.10 includes adequate design systems as well as operation and maintenance plans
• Difficult to meet 65.10, roughly 70% of levees in the U.S. are not accredited
• LAMP allows display of some protection from non-accredited levees
LAMP Process Pros & Cons

Pros

• New guidance provides more flexibility
• Levee system can be divided into independent reaches - can be modeled and mapped individually
• Allows display of some protection from the levee
• Establish open dialogue with the local communities
• Stakeholder group established to obtain local perspective
• Group directly involved with the hydrology, hydraulic, and mapping analyses
LAMP Process Pros & Cons (cont.)

Cons

• Entire process can be expensive
• Funding and Cost sharing need to be addressed in Discovery, can make Discovery more expensive
• Project team needs to perform serious background work in order to be prepared for Discovery
• Modeling can be difficult; unsteady and 2D are almost a must
• Will take a considerable amount of time
• LLPT = more difficult and time-consuming process
Congaree River Levee System

- Main Levee
- Ring Levee
- Farm Levee
Areas of Interest

- Riverland Park
- Main Levee
- Heathwood Hall School
- Interstate 77
- City of Columbia WWTP
Project Overview

- City of Columbia built sewer plant in 1960s
- Heathwood Hall School built in 1960’s
- Both rely on the levee for protection
- Accurate modeling is essential
- A 1D unsteady HEC-RAS model was used as the main hydraulic model
- FLO-2D was used to provide insight into establishing storage and ineffective areas for input to the unsteady RAS model
Hydrology

• Flood Frequency Analysis (Bulletin 17B)
• USGS gage station Congaree River at Columbia (02169500)
• Used entire available period of record (1892-2011) – unregulated and regulated flow conditions
• Adjustments made to account for effects of regulation on unregulated flows (Lake Murray)
• 1% annual peak discharge: 286,000 cfs
• 0.2% annual peak discharge: 414,500 cfs
Hydraulics

- Natural Valley Model
- Levee Analysis Model
- Both used unsteady state RAS model
- 2D modeling for storage and ineffective areas
- Floodways based on equal conveyance using a steady-state simulation of the levee analysis model
- Imported steady-state floodways into unsteady model and optimized
Mapping

- Natural Valley Procedure established SFHA behind the levee
- Area behind the levee mapped as an AE Zone
- No D Zones
- Floodway calculated from RAS model
LAMP Stakeholder Meetings

- Established before FEMA guidance finalized
- Included all stakeholders
- Goal was to engage community and reach a modeling/mapping consensus
- Additional goal - to prevent lengthy appeals of new mapping
- Held 5 meetings over 20 months
Project Stakeholders
Local Levee Partnership Team (LLPT)

SCDNR
Richland County
City of Columbia
Lexington County
City of Cayce
Congaree Riverkeeper
Heathwood Hall School
Columbia Ventures
Mr. Deas Manning
FEMA
USACE
Stakeholder Details

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Details</th>
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<tbody>
<tr>
<td>SCDNR</td>
<td>FEMA CTP leading the effort</td>
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<tr>
<td>Richland County</td>
<td>Directly impacted</td>
</tr>
<tr>
<td>Lexington County</td>
<td>Directly impacted</td>
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<tr>
<td>City of Columbia</td>
<td>Direct impacts, own the WWTP</td>
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<tr>
<td>City of Cayce</td>
<td>Direct impacts, levee in jurisdiction</td>
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<tr>
<td>Congaree Riverkeeper</td>
<td>Environmental concerns</td>
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<tr>
<td>Heathwood Hall</td>
<td>Directly behind levee; no D zones</td>
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<tr>
<td>Columbia Ventures</td>
<td>Owns levee and property in vicinity</td>
</tr>
<tr>
<td>Mr. Deas Manning</td>
<td>Family built levee and is still involved with CV partnership</td>
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Stakeholder Details (cont.)

FEMA  Mapped the levee several times including current study

USACE  Invited participant
Project Progress

- Initial Accreditation Evaluation
- Levee Data Collection and Stakeholder Engagement
- Local Levee Partnership Team
- Levee Analysis and Mapping Plan
- Flood Hazard Analysis and Mapping
- Integrate into the Mapping Process
- Documenting Lesson Learned
Lessons Learned

- **Establish / maintain open discussion**
  - All Stakeholders must contribute for group to be productive / achieve goals
  - Each stakeholder must state their goals
  - Reach consensus among stakeholders before moving forward

- **Establish control over information flow**
  - Helps process be productive without distractions
  - Keep information out of media until final decisions are made
  - Be ready to address information leaks

- **Ensure all stakeholders understand technical aspects of study**
  - Use illustrations to aid in explanation of H&H studies

- **Site visit was paramount**
  - Get on site as often as possible and take lots of pictures
Future Best Practices

• Establish open communication early in process
• Maintain contact – CTP must lead this
• Consider monthly conference calls to keep communication open
• Constant communication could open up additional data opportunities
• Gather and assess all data
Questions?
For More Information

- [http://www.dnr.sc.gov/](http://www.dnr.sc.gov/)
- [www.fema.gov](http://www.fema.gov)
- [https://hazards.fema.gov/wps/portal](https://hazards.fema.gov/wps/portal)