City/County of Sacramento

“What if”

Mapping and Tools to Support the City/County EAP

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Presented with
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• City of Sacramento Department of Utilities
• County of Sacramento Office of Emergency Service
• County of Sacramento Department of Water Resources
• GEI Data Management Team
Presentation Summary

• Project Background
• Development of Evacuation Maps
• Purpose of the Web-Based Tool
• Agency Coordination
• Challenges
• Demo
• Questions
Local Notes

- Approx. 80 miles of levees protect the City/County urban areas
- Approx. 500,000 residence live behind City/County levees
- Average Levee Height +/-20 feet
- State Capitol/New Kings Arena located behind riverine levees
City/County of Sacramento
Population Protected by Levees

- Natomas
  - 100,000 +/-
City/County of Sacramento
Population Protected by Levees

- Natomas
  - 100,000+
- American River North
  - 40,000+
City/County of Sacramento
Population Protected by Levees

- Natomas
  - 100,000+
- American River North
  - 40,000+
- American River South
  - 230,000+
- South Sacramento Streams
  - 30,000+
- Potential Impacted Residences
  - 500,000+
Hydrology

- **Sacramento River Watershed**
  - Approx. 20% the size of California
- Sacramento System Reservoirs:
  - Shasta
  - Oroville
  - New Bullards Bar
  - Camp Far West
  - Folsom
- Folsom Dam is under $1B Dam Renovation to completed in 2017
Current vs. Future Folsom Operations

Current American River Channel Capacity:
- Top of Levee - Approximately 180,000 cfs
- Freeboard 5’-6’ - Approximately 115,000 cfs

Current Folsom Operations:
- American River Effective 100-Year Flow – 145,000 cfs
- Estimated American River 200-Year Flow – 225,000 cfs

Future Folsom with JFP Improvements:
- Future American River 100-Year Flow – 115,000 cfs
- Future American River 200-Year Flow – 160,000 cfs
Hypothetical Breach Evaluation

• Three Study Areas
• HEC-RAS (1D and 2D); FLO-2D
• 22 Breach Scenarios
• Model Simulation – 7 days
• Breach Opening Width (300’-800’)
  • Based on: 50 x Levee Height (Top of Levee to Landside Toe)
• Evaluation Included:
  • Maximum Flood Depths
  • Time Contours
  • Evacuation Routes
  • Critical Facilities
Natomas Basin
Hypothetical Breach

- Potential Impact to 100,000+ residences in:
  - City of Sacramento
  - Sacramento County
  - Sutter County

- Flood Inundation: 40+ sq. mi.

- Flood Depth could reach 16 feet after 7-days

- Approx. 24 hrs. to travel 13 miles at least one-foot depth
Natomas

Animation

- Main Critical Facilities Include:
  - Sacramento International Airport
  - Urban Areas (100,000+ res.)
  - Pump Stations
  - Three Major Highways
Natomas Rescue Map

• Rescue Area (Shaded Red):
  • Initial 1 foot depth in 2 hours

• Est. Population in Rescue area – 5,000+

• Evacuation Routes:
  • Interstate 80 – 1 to 3 hours
  • Interstate 5 – 1 to 6 hours
  • State Route 99 – 1 to 24 hours
American River North
Hypothetical Breach

- Potential Impact to 40,000+ residences in:
  - City of Sacramento
  - Sacramento County

- Flood Depths could reach up to 16 feet after 4-days

- Approx. 24 hrs. to travel 5.0 miles at least one-foot depth
American River North

Rescue Map

- Rescue Area (Shaded Red):
  - Initial 1 foot depth in 2 hour

- Est. Population in Rescue Area 5,000+

- Evacuation Routes:
  - Hwy 160 – 2 to 3 hours
  - Interstate 80 – 4 to 6 hours
American River South
Hypothetical Breach

• Potential Impact to 230,000+ residences in:
  • City of Sacramento
  • Sacramento County

• Approx. 25 miles of American River and Sacramento River levee

• Flood Depth could reach 16 feet after 7-days

• Approx. 24 hrs. to travel 13 miles at least one-foot depth
American River South
Est. Flood Depths

• Est. Flood Inundation: 20+ sq. mi.

• Main Critical Facilities:
  • Pump Stations
  • Urban Areas
  • Downtown Sacramento
  • State Capitol
  • New Kings Arena
American River South Rescue Map

- Evacuation Routes:
  - Interstate 80 – 2 to 3 hours
  - Highway 99 – 4 to 6 hours
  - Highway 50 – 2 to 4 hours
FERIX Web Tool

(Flood Emergency Response Information Exchange)

• FERIX Data Manager:
  • Snow Data
  • Levee Data Base
  • Real-Time Data
  • Levee Maintenance and Inspections Data
  • Emergency Action Plan Data

• Integrates Information for Flood Emergency Response
• Share and Exchanging Data
• Able to Customize Tool
• Base Station located at DWR
Key Features:

- Goal is to Improve Flood Coordination between:
  - City and County Departments
  - State and Federal Departments
  - Onsite Flood Responders
- Internal Training/Decision Tool
- View CDEC (stream and flow gages)
- View Flood Animations/Evacuation Routes/Critical Facilities
- Data Management Tool for Updating:
  - Critical Facilities
  - Evacuation Routes
Challenges

• Digital vs. Hard Copy Maps
• Security
• Compatible Language (Java)
• Information Updates
• Riverine System vs. Small Stream Flooding
• California is in a severe drought to test application
FERIX Base Station

• Located at the State DWR
• Accessed Data Base with User Name and Password
FERIX Customized Features

- Connected to State (CDEC) Precipitation/Stage Gage and Database
- View Hypothetical Levee Breach Animations (Depths and Inundation)
- City and County Boundaries
- Evacuation Routes
- Critical Facilities
- Population Count
FERIX Animation Tool

- Flood Depths
- Breach Hydrographs
- Population Count
- Travel Times
Demo/Questions