CPRA Operations: Preparation for Hurricane Season

CPRA Operations Division
May 19, 2021
Emergency Management

Responsible for flood protection infrastructure and integrated coastal protection projects across the Louisiana Coastal Area

Hazards that have the potential to affect CPRA operations and infrastructure include:

- Hurricanes
- Flooding and High Water Events
- Large Scale Coastal Oil Spills or HazMat Incidents
Emergency Management

CPRA – Prior to an Event

- Maintains an Emergency Operations Plan (EOP) which outlines CPRA’s pre- and post-storm activities
- Coordinates with the United States Army Corps of Engineers (USACE) and the local levee districts within the Coastal Area
- Maintains a list of Levee District items:
  - Emergency Contacts
  - EOPs
  - Flood Fight inventories, supplies and equipment to support emergency response
- Levee Information Management System (LIMS)
  - Monitor closing of gates in advance of an event
- Plan executions of gate closures by monitoring gage readings and coordinating for ADCIRC modeling
Emergency Management

CPRA – During an Event

- Provides staff and capability to support the State’s Emergency Operations Center (EOC). CPRA staffs the EOC’s Emergency Support Function (ESF) 3b infrastructure desk.

- Coordinates with local, State, and Federal entities including Parish Governments, Levee Boards, and other jurisdictions in Louisiana’s Coastal Area.
  - Local requests are made when the requesting jurisdiction has exhausted all resources and no longer has the capability to support themselves. ALL REQUESTS MUST GO THROUGH WEB EOC.
  - Requests generally involve maintaining the integrity of levee and flood control infrastructure in order to save lives and protect property.
  - CPRA relies on emergency contracts through the Office of State Purchasing to procure temporary flood protection measures, de-watering support, etc.
Emergency Management
CPRA – Following an Event

- Performs Damage Assessments:
  - Inspects levee, flood protection, and integrated coastal protection projects throughout coastal Louisiana to protect lives and property as well as to ensure continued suitability of service
- Coordinates inspections with the appropriate local and Federal authorities
- Where issues are found, makes requests to the USACE for Federal assistance
Keys to Tropical Storm Operations:

- Hurricane and Storm Damage Risk Reduction System (HSDRRS)
- Levee Information Management System (LIMS)
- Hurricane Gage Monitoring System (HGMS)
- ADCIRC Surge Guidance System (ASGS)
- Compound Flood Inundation Guidance System (CFIGS)

These tools are intended to help guide CPRA and the levee districts with the necessary information to make operational decisions on coastal floodgate closures as a tropical storm approaches landfall. These operational tools are not intended for evacuation purposes – for this we use the National Weather Service and Local Authorities.
Levee Information Management System (LIMS)

- Log closure structure operations
- Store closure structure info/attributes
- Create closure structure status reports
- Display closure structure status graphically
- Link to document library
  - Contact Directory
  - EOP Manuals
  - Statewide Emergency Contracts
  - Local Flood Fight Asset Inventory
- Public access – separate portal shows map / gate list with status
Levee Information Management System (LIMS)

- New report feature shows changes in gate status by project, levee district, and period of time
New report feature shows rollup of gate status by project and/or levee district at a given time

Levee Information Management System (LIMS)

FLOODGATE STATUS REPORT
5/11/2021 09:53 AM

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>DEFAULT STATUS</th>
<th>STATUS CLOSED</th>
<th>STATUS OPEN</th>
<th>GATES TOTAL</th>
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<tr>
<td>LAKE PONCHARTRAIN &amp; VICINITY</td>
<td>73/64</td>
<td>131/121</td>
<td>6/3</td>
<td>691</td>
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<td>0/10</td>
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<td>MS RIVER &amp; TRIBUTARIES (MR&amp;T)</td>
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<td>237</td>
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<td>Grand Total</td>
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<td>691</td>
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Report Run Date 05/11/2021
Hurricane Gage Monitoring System (HGMS)
Water-level gage data from USACE, USGS, NOAA and Iridium shown spatially
ADCIRC Surge Guidance System (ASGS)

- CPRA works with LSU’s Center for Coastal Resiliency (CCR) team which includes Scimaritan’s Dr. Jason Fleming to implement and maintain the ADCIRC Surge Guidance System (ASGS) for the modeling of storm surge for hurricanes and tropical events.

- ASGS model output provides CPRA and the levee districts with water elevation forecasts to assist with *operational decisions* on coastal floodgate closures as a tropical storm approaches.

- ADCIRC grid is updated each year with the latest bathymetric and topographic data.

- ASGS is tested and validated using historical storm data.

- Automated forecast system is maintained in ready-mode during hurricane season.
Example Hydrograph:
Permanent Canal Closures and Pumps (PCCP-01)

Total Hydrograph slides (28)
- Mississippi River (8)
- Other locations in Coastal Zone (20)

For Operational Use Only – Refer to NWS for evacuation-related forecasts
Compound Flood Inundation Guidance System (CFIGS)

The CFIGS system provides guidance on flooding due to the combined influences of storm surge and precipitation and will be operational for the upcoming 2021 Hurricane Season.

HEC-RAS 2D Model for Lake Pontchartrain and Lake Maurepas Drainage Basin

Official Precipitation Inputs from National Weather Service

Storm Surge Input from ADCIRC Surge Guidance System (ASGS)
The layer is generated by:

Developing digitized Base Flood Elevation Layer (1%) (static layer)

Utilizing the Max Water Surface Elevation generated during an event (generated during every run)

The difference produces a layer in real time which will show areas with highest risk of structural flooding

AUGUST 2016 Event – test case

Lessons Learned:
Difficult to identify the areas of highest risk based solely on inundation mapping
Compound Flood Inundation Guidance System (CFIGS)

CERA Interface

- Inundation Animation (depth of water above ground)
- Hydrographs for water level comparison to model prediction – 50 stations from USGS, USACE, and NWS
Frequently Used Sites

- **CPRA CIMS** [https://cims.coastal.louisiana.gov](https://cims.coastal.louisiana.gov), *(login required for HGMS and LIMS Private)*
  - **HGMS**: Navigate to Protection > HGMS Private > Map Viewer. Displays water level and meteorological data for CPRA, USACE, USGS, and NOAA gages.
  - **LIMS**: Navigate to Protection >
    - Select “LIMS Gate Status”, which is the publicly-accessible open/closed status of gates/closures.
    - Select “LIMS Private”, allows levee districts/authorities to change gate/closure status to open/closed.
- **CERA** [https://cera.coastalrisk.live/](https://cera.coastalrisk.live/)
  - ADCIRC visualization
  - CFIGS – visualize compound flooding between Baton Rouge to Slidell
- **Rivergages website**: [www.rivergages.com](http://www.rivergages.com); backup resource for checking water levels on GOES network; source for pulling data to other sites e.g. CIMS HGMS.
Backup slides
Hydrograph slides

IHNC Surge Barrier East (IHNC-02)
Seabrook Complex (IHNC-01)
Outfall 17th St London Ave Orleans Ave
Lake Pontchartrain at Lakefront Airport
Rigolets near Lake Pontchartrain
Lake Pontchartrain at Mandeville
Bayou Dupre Sector Gate (LPV-144)
Caernarvon Canal Sector Gate
GIWW at West Closure Complex (WBV-90)
Harvey Canal at Boomtown Casino
Barataria Waterway at Lafitte
Bayou Segnette Closure (WBV-16.2)
Bayou Verret / W. Tie-In Sector Gate (WBV-72/74)
Hero Canal Stop-Log Gate (WBV-09b)

Total Hydrograph slides (28)
• Mississippi River (8)
• Other locations in Coastal Zone (20)

Note:
  - HSDRRS Complex Structures in Bold (11)
  - MS River gages in Italics