Real Time Forecasting Application in Contraband Bayou

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April 3, 2019
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Days Like This…

Flash Flood Watch
Until 7:00 PM Wednesday
Issued Jun 20, 2018 4:23 AM CDT

Flash Flood Warning
Until 11:30 AM

Stormvision HD
Thu 6:28 AM
Often leave us asking - What does this mean to me???

FLOODED ON SABINE

River crests at 31.5 feet
Often leave us asking - What should we do???
And Often Result in Headlines like this

Flash floods sweep through Lake Charles; 500 rescued late Monday to early Tuesday, National Guard says

CPSO and La. National Guard rescue flooded residents in Starks

Flooded roads lead to multiple car rescues

Calcasieu Parish conducting rescues as flood waters continue to rise

At least 400 people rescued in Calcasieu Parish overnight due to flooding
What can a Real Time Forecasting System do?

- Provide an opportunity to learn about potential flooding risks
- Move people to safety and away from risk prone areas
- Establish communications with emergency response teams and community
- Reduce damage costs by removing valuables, vehicles, etc.
How Does A RTF System Work?

**Data Import**
- Observed data and Large scale forecasts
- Delft-FEWS platform

**Numerical model(s)**
- HEC-RAS
- HEC-HMS
- Other

**Model output**
- Maps and Timeseries
- Delft-FEWS platform

WARNING
Forecasting Period

Past

Hindcast Period (7 Days)

Now (Real-time Data)

Future

Forecast Period (7 Days)

Flood Elevation

Time
Data Import
CPPJ Stage and Precipitation Gauges

Operating: 82
Set for Installation: 40
Total Gauges in Network: 122
USGS Stage Gauges
Global Forecast System (GFS) Data
Gridded Rainfall
Lower MS River Real Time Forecasting System
Gridded Rainfall
Northern Gulf of Mexico Operational Forecast System – Coastal Influences
Numerical Models
Numerical Models
Numerical Models

- HEC-HMS sub-basins
- HEC-RAS rivers
- HEC-RAS cross sections
- HEC-RAS storage area
- CPPIJ gauges
Real Time Forecasting Results
Real Time Forecasting Results
Real Time Forecasting Results - Thresholds

Hindcast

Thresholds have been included
Real Time Forecasting Results - Animations
Real Time Forecasting Results – Static Maps

Maximum Water Depth (feet)
May 1, 2016 Event

- None
- < 0.1'
- 0.2' - 0.5'
- 0.5' - 1'
- 1' - 1.5'
- 1.5' - 2'
- 2' - 3'
- 3' - 4'
- > 4'

Water depth estimated from HEC-HMS & HEC-RAS models within the FEWS real-time-forecast system developed as a pilot project for Calcasieu Parish by The Water Institute of the Gulf. The models were provided by the Parish and were not re-validated nor re-calibrated prior to implementation into the FEWS forecast system.

This pilot-location project is a proof-of-concept to demonstrate the utility of real-time-forecasting within Calcasieu Parish. Prior to implementing a fully-operational system, model validation efforts should be undertaken to fully explore and understand locations of model strengths and weaknesses under a variety of rainfall magnitudes.
Real Time Forecasting Results – Fly Throughs

Hindcasted Event – May 2016  

https://youtu.be/D1lgOsQCULg
Live Stream Utilization and Functionality
Utilization

- System has been setup as a Client/Server Setup.

- Multiple people can login to the Server

- Parish Staff have been trained on how to Utilize the System

- Model has been setup to run once every hour
Utilization

• Better Understand the System and how it reacts to certain events

• Find areas where to focus model refinement and future calibration

• Easily identify gauging issues

• Work with Office of Emergency Preparedness during Storm Response
Functionality

- Automatic emails will be sent if:
  - one of the tasks fails
  - data (from CPPJ gauges) or RAS modeled water level exceed one of the alert thresholds
CURRENT AND FUTURE STEPS

• Setup on the Client Server

• CPPJ is utilizing the models to better understand their system

• Utilize in major events

• Engineers are identifying where model refinement/calibration should occur

• Upgrade to a 2D model

• Extend to other watersheds
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