Louisiana Watershed Initiative

Sustainability and resilience through science, engineering and objective decision making

Objective

Develop a common understanding of known flood risks, vulnerabilities and priorities in Region 4

Building on previous efforts

Region 4 planning and policy professionals have worked with LWI to identify these four priorities based on their region's flood risk and mitigation needs.

Agenda

* Region 4 flood risk assessment
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Agenda

1. Region 4 flood risk assessment
2. Break
3. Group mapping exercise
4. Report out
5. Public comment

Flood risk assessment

Each watershed region throughout Louisiana faces unique flood risks. To understand these risks and to prioritize solutions, we must accomplish the following:
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Flood risk assessment

Each watershed region throughout Louisiana faces unique flood risks. To understand these risks and to prioritize solutions, we must accomplish the following:

1. Build a common vocabulary
2. Consider various risk factors
3. Work with nature

- Enable watershed-to-watershed interoperability
- Allow locals to guide planning
- Identify who is in greatest need of risk reduction
- Prioritize project purpose in selection
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Parishes in Region 4

Working together to address risk at the watershed scale

- Caddo Parish
- DeSoto Parish
- Sabine Parish
- Natchitoches Parish
- Union Parish
Flood Risk in Louisiana

Louisiana Watershed Initiative

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Region 4 watersheds

Hydrology: a science that deals with the properties, distribution and circulation of water on and below Earth's surface and in the atmosphere.

Types of flood risk
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Types of flood risk

We must consider all types of flood risk to effectively manage flood risk within Region 4 watersheds:

- Coastal floods: surge and tidal
- Fluvial floods: river floods
- Pluvial floods: rainfall-induced flash floods and urban flooding

Coastal floods: surge and tidal

Storm surge from the winds and waves of tropical storms and hurricanes causes coastal floods. The changing tides also have a compounding impact on these types of floods.

Future flood risk: coastal surge floods
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Future flood risk: coastal surge floods

Future flood risk is understood in terms of how severe future events may be and how often they will occur. This is reflected as a probability:

- 1% annual chance event: 26% chance of at least one event in any 30-year period (commonly known as a 100-year event)
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Future flood risk is understood in terms of how severe future events may be and how often they will occur. This is reflected as a probability:

- 1% annual chance event: 25% chance of at least one event in any 30-year period (commonly known as a 100-year event)
- 0.2% annual chance event: more severe and less likely to happen (commonly known as a 500-year event)

Source: 2017 Coastal Master Plan modeling analysis, Coastal Louisiana Risk Assessment model grid

Let’s take a break

Questions? (Three minutes)

Extreme rainfall or precipitation
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Louisiana has some of the highest rainfall rates in the country on an average statewide basis and often experiences high water levels in its major riverine systems.

Because of our flat landscape and interconnected waterways, the impact of a rainfall event in one part of the state is often felt far beyond the boundaries of where the rain falls.

Sabine and Calcasieu River Basin rainfall total
March 7 - 14, 2016

EARNED TOTAL RAINFALL: 12.00
1% and 0.2% Flood Depths
1% Annual Chance on Left, 0.2% Annual Chance on the Right

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[Map or image showing flood depth data]
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<tr>
<td></td>
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Fluvial floods
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Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.
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Some record crests during the 2016 floods:
- Sabine River east of Bon Wier, Texas
- Sabine River east of Burkburnett, Texas
- Sabine River at Deweyville, Texas

Fluvial floods

The Calcasieu River also exceeded its capacity as a result of relentless rainfall in March 2016, tying its second-highest crest level on record near Glenmora and hitting its fifth-highest crest near Oberlin. Several nearby structures, roads and homes flooded as a result.
- Glenmora
- Oberlin

Pluvial floods

Pluvial, or rainfall-induced, floods result from intense rain that causes surface, flash or urban flooding. These events are independent, not caused by an overflowing body of water.
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Flood Risk in Louisiana
Louisiana Watershed Initiative

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Let’s take another break

Questions? (Three minutes)

Traditional gaps in understanding flood risk

The Federal Emergency Management Agency is responsible for mapping the nation's hazardous flood areas.

FEMA Special Flood Hazard Areas:
Fluvial floods

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- Provide a basis for flood insurance rates and floodplain management regulations nationwide
- Inform mapped communities about their flood vulnerability
- Impact development of the built environment

Region 4: 40% is located in a SFA and is subject to flooding.

Traditional gaps in understanding flood risk
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A Zones (shown in light blue)
Special Flood Hazard Areas – High Risk
Special Flood Hazard Areas represent the area subject to inundation by a 1% annual chance flood. Structures located within SFHA have a 26% chance of flooding during the life of a standard 30-year mortgage. Federal floodplain management regulations and mandatory flood insurance requirements apply in these zones.
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Case study: March and August 2016 floods
Communities are not required to build structures to withstand the 1% chance event which made headlines in 2016.
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Case study: March and August 2016 floods

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FEMA Repetitive and Severe Repetitive Loss data

R\textit{epetitive Loss Structure} is an NFIP-Insured structure that has had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978.

\textit{Severe Repetitive Loss} is an NFIP-insured structure:
- That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $200,000; or
- For which at least two separate claim payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

Case study: March and August 2016 floods

Communities are not required to build structures to withstand the 0.2% chance event, which makes structures in and outside of SFHAs unprepared for these more intense events altogether.

1,172 homes impacted in Region 4
35\% of structures impacted located within a SFHA
65\% of structures impacted located outside of a SFHA

2016 Floods
Case study: March and August 2016 floods

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Best practice: working with nature

Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and floodwaters. Trees, root mats and other wetland vegetation also slow the speed of floodwaters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion.

The holding capacity of wetlands helps control floods and prevents waterlogging of crops. Preserving and restoring wetlands together with other water retention efforts can often provide the same level of flood control otherwise provided by expensive dredge operations and levees.
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CDC Social Vulnerability Index

Natural disasters disproportionately impact socially vulnerable populations. Understanding and addressing vulnerability can help mitigate suffering and recovery costs.

Social vulnerability is based on the following factors:
- Socioeconomic status
- Household composition and disability
- Minority status and language
- Housing and transportation

Lake Charles area

Break
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Break

10-minute break

Recap

Putting it all together
- Three types of flood risk
- Future coastal surge flood risk
- Special Flood Hazard Areas, A zones and V zones
- Impacts of the 2016 floods
- Wetland areas
- Social Vulnerability Index

Mapping exercise
Flood Risk in Louisiana

Louisiana Watershed Initiative

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Mapping exercise
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Mapping exercise

Now we will examine risk more closely by combining these datasets and dividing Region 4 into northern, central, and coastal subregions. Please locate your packets.

Legend

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<th>FEMA Individual Assistance - Damage Category</th>
<th>CDC Social Vulnerability</th>
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Report out and next steps

Mapping exercise discussion
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Legend

- FEMA Individual Assistance - Damage Category
  - Severe
  - Major
  - Minor
- CDC Social Vulnerability
  - High
  - Med-High
  - Med-Low
  - Low

Let’s Get Started!
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Report out and next steps

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<thead>
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<th>CDC Social Vulnerability</th>
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<tr>
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Mapping exercise discussion
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Mapping exercise discussion
Public comment

For additional comments or questions, you can call 504.556.9727 or email watershed@la.gov. The deadline to provide input is June 29.

This presentation recording will be available after the meeting on the LWI website.