TERREBONNE PARISH
HAZARD MITIGATION PLAN UPDATE

PUBLIC MEETING
NOVEMBER 12, 2019
Bayou Terrebonne Waterlife Museum
Presented by: Jennifer C. Gerbasi
I. INTRODUCTIONS AND WELCOME

II. PURPOSE, NEED, AND EXPECTATIONS

III. PLANNING PROCESS

IV. PLAN REVIEW
   A. HAZARD IDENTIFICATION
   B. DATA SURVEY TO BEGIN RISK ASSESSMENT

V. PROJECT UPDATE

VI. FUNDING AVAILABILITY

VII. CONCLUSION
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What is Hazard Mitigation Planning?

Planning for any sustained action(s) taken to reduce or eliminate the long-term risk to human life and property from hazards.

Mitigation = Prevention

Pointe au Chenes outside the floodgates during Barry. Photos care of Chanel 4WWL CBS news.

Barry levee overtopping only at unfinished section in Dularge. Construction complete for future storms.
- **Hazard**—a source of *potential* danger

- **Vulnerability**—Degree of *exposure* or susceptibility to damage of an asset

- **Vulnerability Assessment**—The extent of damage that may result from a hazard event of a given intensity (50, 100 yr. flood; Cat. 1, 2, …5 hurricane)

- **Risk**—The *estimated impact* that a hazard would have on people, services, facilities, and structures—quantifiable

- **Risk Assessment**—Process of measuring the potential loss of life, personal injury, economic injury, and property damage
Why “plan”?—State approach—parishes to state

- Establish vision and mission
- Establish common goals
- Incorporate the “big picture”
- Bring many stakeholders together
- Establish community connectivity… coordination and communications
- Look at resource allocation (time, money...)
- Ensure ability to implement, monitor, evaluate, and modify
Eligibility for mitigation grant project funding
Any changes in hazard identification
Vulnerability analyses
Local mitigation capabilities
Progress made during the past five years to prevent or reduce future losses from natural hazards
• **Past:** Federal legislation funded disaster relief, recovery, and some mitigation planning
  
  - Standard codes and planning were linked in same law

• **Present:** Disaster Mitigation Act of 2000 (DMA 2000)
  
  – Reinforces importance of mitigation **planning before hazards occur** “… to reduce the nation’s disaster losses …” (FEMA Interim Final Rule)
  
  – Establishes a **predisaster** hazard mitigation program
  
  – Creates new **requirements for** national **post-disaster Hazard Mitigation Grant Program** (HMGP)
  
  – Requires states and communities to have an approved mitigation plan in place prior to receiving post-disaster HMGP funds
The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements.

- As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS:
  
  • Reduce flood damage to insurable property;
  • Strengthen and support the insurance aspects of the NFIP, and
  • Encourage a comprehensive approach to floodplain management.

http://www.fema.gov/national-flood-insurance-program-community-rating-system
PHLANING PROCESS

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**Review**
- Organize and Convene Community
- Research and Review of Data

**Revise**
- Update Risk Assessment
- Assess the Potential Losses

**Reset**
- Set Goals – Standard for Protection
- Update Mitigation Strategy
III. PLANNING PROCESS (contd.)

- **Write**
  - Draft Updated Plan – Vet Publicly
  - Submit to State and FEMA

- **Ratify**
  - Revise as Necessary
  - Adopt through Council

- **Revisit**
  - Yearly Maintenance
Bayou Board of Realtors
Bayou Grace
Biloxi-Chitimacha Confederation of Muskogees
Biloxi-Chitimacha Island Road Band
Consolidated Waterworks District
GIS Engineering
Houma Chamber of Commerce
Louisiana Dept. of Health and Human Services
R.J. Shaw, Inc.
Restore or Retreat
South Central Industrial Association
South Louisiana Bank
Southeast LA Homebuilders Association
Terrebonne Parish School Board
Terrebonne Parish Assessor’s Office
United Houma Nation

City of Houma Fire Department
Houma Police Department
Terrebonne Sheriff’s Office
Terrebonne Levee and Conservation District
Terrebonne Parish Consolidated Government
Terrebonne Office of Homeland Security and Emergency Preparedness
Terrebonne Parish Sheriff’s Office
Terrebonne Regulatory Planning Commission
Terrebonne Parish Council
NFIP Coordinator
III. PLANNING PROCESS (contd.)
PRODUCTS - DELIVERABLES

- Repetitive Loss Risk Reduction Strategy
  - Repetitive Loss Area Analysis of Bayou Black
- Updated Risk Assessment and Strategy
- Project List of Prioritized Activities
- Updated Maps for Public Education
- Adopted Plan for Grant Eligibility
III. PLANNING PROCESS (contd.)

PARTICIPATION STRATEGY

- **Steering Committee meetings on each step**
  - Open to the public
  - Available on line for public access
- **Public meetings in the evening to provide access**
- **Collection of documentation at Government Tower**
- **Website with all documentation posted**
- **Online comment form**
- **Considering any and all input in writing**
IV. PLAN REVIEW

A. HAZARD IDENTIFICATION

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VII. CONCLUSION
Other Plans Relevant to this Process
- Repetitive Loss Studies
- Vision 2030 Comprehensive Plan
- OEP Flood Response Plan
- LA SAFE Terrebonne Strategy

These documents and more are available on the website at the link provided to you, or following the banner link on the homepage of www.tpcg.org.
REVIEW AND UPDATE:

- **THE PLANNING PROCESS**
  - Involvement in the planning process
  - Incorporate appropriate existing plans
  - Public comment

- **PLAN CONTENT**
  - Documentation of the planning process
  - Risk Assessment
    - Type, location, extent of all natural hazards that affect the jurisdiction
    - Jurisdiction vulnerability to the hazards, summary of each hazard and its impact on the community
      - Describe vulnerability of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas
      - Estimate the level of risk and potential dollar losses
  - Update goals, maps, and projects and solutions based on current assessment
REVIEW AND UPDATE:

- **HAZARD MITIGATION STRATEGIES**
  - Goals
  - Specific mitigation actions and projects
  - Action plan with prioritization and cost estimates

- **PLAN MAINTENANCE PROCEDURES**
  - Method and schedule of monitoring, evaluating, and updating the plan
  - Process by which local government can incorporate the requirements of the mitigation plan into other planning mechanisms (comprehensive or capital improvement plans) when appropriate
  - Discussion of how community will continue public participation and plan maintenance
GOAL 1  Identify and pursue preventive measures that will reduce future damages from hazards.

GOAL 2  Enhance public awareness and understanding of disaster preparedness.

GOAL 3  Reduce repetitive flood losses in the parish.

GOAL 4  Facilitate sound development in the parish to reduce or eliminate the potential impact of hazards.

These are the same overarching goals that were expressed in 2009. Discussion on refining these may be better reserved for the strategy phase.
(1) IDENTIFY HAZARDS
“What kind of natural hazards can affect our region?”
--FIRST MEETING--

(2) PROFILE HAZARD EVENTS
“How bad can it get?”

(3) INVENTORY ASSETS
“What will be affected by these hazards?”

(4) ESTIMATE LOSSES
“How will these hazards affect our community?”

FOUR TASKS OF RISK ASSESSMENT
HAZARD IDENTIFICATION

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RISK ASSESSMENT: IDENTIFY HAZARDS

- Update hazards which might affect the community
- Narrow the list to hazards that are most likely to impact
- Keep records of information gathered
  - Newspapers and other unofficial accounts
  - Federal and state data base info
  - Community expert and parish/municipal data.
RISK ASSESSMENT: HAZARDS IDENTIFIED

Coastal Erosion
Coastal (Tropical) Storm
Levee (Dam) Failure
Drought
Flood
Hurricane
Land Subsidence
Saltwater Intrusion
Tornado
Thunderstorms
Lightning
High Winds
Sinkholes
New Hazards?
V. HAZARD EVENT PROFILES
National Climatic Data Center

- **Drought**
  - Can adversely effect every jurisdiction in Louisiana
  - No fatalities, no injuries, no property damage in last 25 years
  - 6 occurrences in last 56 years (1957-2013) with damages totaling $4.4 million

- **Hailstorm**
  - 20 major hail storm instances reported by NCDC in last 56 years
  - $0 losses according to NCDC

- **Tornadoes**
  - 30 tornadoes reported by NCDC
  - Losses total $13 million

- **Winter Storms**
  - 7 cold/winter storm events reported by NCDC in last 56 years
  - $100,000 total damages
V. HAZARD EVENT PROFILES
Non-NCDC Reported Hazard Events

- Land Subsidence
  - Worsened by Levee Construction and Pumping Stations that inhibit alluvial sedimentary deposits along ridges and wetlands in a deltaic region

- Sea Level Rise
  - Combined with subsidence, sea level rise will cause the Louisiana Coastline to disappear into the gulf
  - USGS ranks Terrebonne Parish at a “very high” risk to land loss due to sea level rise

- Coastal Erosion
  - Worsened by Hurricane Events
  - Terrebonne Parish and the State of Louisiana has comprehensive list of coastal restoration and protection projects
Coastal Land Loss

Source: USGS
Sea Level Rise
1.28 cm/yr

Source:
Faulting, Subsidence, and Land Loss in Coastal Louisiana
Sea Level Rise

Source: Faulting, Subsidence, and Land Loss In Coastal Louisiana
Source: Faulting, Subsidence, and Land Loss In Coastal Louisiana

Subsidence Rates (ft/century)
- Stable
- Stable/Low
- Low 0 - 1'
- Low/Intermediate 0 - 2'
- Intermediate 1.1' - 2'
- High 2.1' - 3.5'
- Very High >3.5'
V. HAZARD EVENT PROFILES
Non-NCDC Reported Hazard Events - Responses:

- **Saltwater Intrusion**
  - Alternative backup water intakes
  - Lock system to stop storm and tidal surges

- **Sinkholes**
  - The sinkhole in Bayou Corne, Assumption Parish brought to light the significance of this hazard. Assess an Study Risk

Source: USGS
PLAN REVIEW: CRITICAL FACILITIES

- Hospitals/Healthcare Providers
- Schools
- Police and Fire Stations
- Pump Stations
- Powerplants
- Sewer
- Potable Water
- Emergency Operations Center
- Government Offices
Has your neighborhood suffered losses during past storm events due to flooding or wind that could have been prevented?

Do you foresee a future scenario where your community might be susceptible to losses as a result of a storm event?

Obtain and create base maps

Obtain hazard event profile information.

Record the hazard event profile.

Current Plan:

- Hurricane Betsy
- Hurricane Juan
- Hurricane Andrew
- Tropical Storm Allison
- Hurricane Lili
- Hurricane Rita
- Hurricane Gustav
- Hurricane Ike
- Hurricane Isaac
- Tropical Storm Lee
Table 4-1: NOAA National Climatic Data Center Recorded Climatic Events in Terrebonne Parish, 1957 - 2013

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Number of Events</th>
<th>Events/Year</th>
<th>Probability</th>
<th>Property Damage</th>
<th>Crop Damage</th>
<th>Damage/Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood</td>
<td>35</td>
<td>0.63</td>
<td>63%</td>
<td>$295,718,000</td>
<td>$-</td>
<td>$8,449,086</td>
</tr>
<tr>
<td>Flash Flood</td>
<td>15</td>
<td>0.27</td>
<td>27%</td>
<td>$1,445,000</td>
<td>$-</td>
<td>$96,333</td>
</tr>
<tr>
<td>Coastal Flood</td>
<td>4</td>
<td>0.07</td>
<td>7%</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td>Flood</td>
<td>2</td>
<td>0.04</td>
<td>4%</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td>Storm Surge</td>
<td>13</td>
<td>0.23</td>
<td>23%</td>
<td>$294,273,000</td>
<td>$22,636,385</td>
<td>$22,636,385</td>
</tr>
<tr>
<td>Heavy Rain</td>
<td>1</td>
<td>0.02</td>
<td>2%</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td><strong>Cold</strong></td>
<td><strong>8</strong></td>
<td><strong>0.13</strong></td>
<td><strong>13%</strong></td>
<td><strong>$100,000</strong></td>
<td><strong>$20,000</strong></td>
<td><strong>$20,000</strong></td>
</tr>
<tr>
<td>Cold/Wind Chill</td>
<td>5</td>
<td>0.09</td>
<td>9%</td>
<td>$-</td>
<td>$100,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>2</td>
<td>0.04</td>
<td>4%</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td>Heavy Snow</td>
<td>1</td>
<td>0.02</td>
<td>2%</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td><strong>121</strong></td>
<td><strong>2.16</strong></td>
<td><strong>216%</strong></td>
<td><strong>$13,201,500</strong></td>
<td><strong>$109,103</strong></td>
<td><strong>$109,103</strong></td>
</tr>
<tr>
<td>Funnel Cloud</td>
<td>10</td>
<td>0.18</td>
<td>18%</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td>High Wind</td>
<td>2</td>
<td>0.04</td>
<td>4%</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td>Thunderstorm Wind</td>
<td>76</td>
<td>1.36</td>
<td>136%</td>
<td>$402,000</td>
<td>$-</td>
<td>$5,289</td>
</tr>
<tr>
<td>Tornado</td>
<td>31</td>
<td>0.55</td>
<td>55%</td>
<td>$12,779,500</td>
<td>$-</td>
<td>$412,242</td>
</tr>
<tr>
<td>Waterspout</td>
<td>2</td>
<td>0.04</td>
<td>4%</td>
<td>$20,000</td>
<td>$-</td>
<td>$10,000</td>
</tr>
<tr>
<td>Excessive Heat</td>
<td>2</td>
<td>0.04</td>
<td>4%</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td>Drought</td>
<td>6</td>
<td>0.11</td>
<td>11%</td>
<td>$-</td>
<td>$4,390,000</td>
<td>$731,667</td>
</tr>
<tr>
<td>Hail</td>
<td>21</td>
<td>0.38</td>
<td>38%</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td>Hurricane/Tropical Storm/Tropical Depression</td>
<td>37</td>
<td>0.66</td>
<td>66%</td>
<td>$137,087,000</td>
<td>$-</td>
<td>$3,705,054</td>
</tr>
<tr>
<td>Lightning</td>
<td>15</td>
<td>0.27</td>
<td>27%</td>
<td>$677,500</td>
<td>$-</td>
<td>$45,167</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>245</strong></td>
<td><strong>4.36</strong></td>
<td><strong>436%</strong></td>
<td><strong>$446,684,000</strong></td>
<td><strong>$4,490,000</strong></td>
<td><strong>$13,060,076</strong></td>
</tr>
</tbody>
</table>
### III. DATA REVIEW

**FEMA WORKSHEET #3A—Inventory Assets**

<table>
<thead>
<tr>
<th>Number of Structures</th>
<th>Value of Structures</th>
<th>Number of People</th>
</tr>
</thead>
<tbody>
<tr>
<td># in Community</td>
<td># in Hazard Area</td>
<td>% in Hazard Area</td>
</tr>
<tr>
<td>Total</td>
<td>42,560</td>
<td>26,373</td>
</tr>
<tr>
<td></td>
<td>104,503</td>
<td>64,961</td>
</tr>
</tbody>
</table>
FEMA Worksheet 4

- Replacement Value of Critical Facilities
  - $1.3 Billion

- Contents Value
  - $1.7 Billion

- Composite Risk Loss Estimate
  - $1.8 Billion
REPETITIVE LOSS STRUCTURES REPORT

- 514 structures identified
- Total amount of claims by these structures = $50M
- Average claim amount = $36,500
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DATA REVIEW
DATA REVIEW

Legend
- Fire Station
- 100 Year Flood Zone
- Community
- Municipality
- Transportation
  - US Highway
  - State/Parish Highway
  - Railroad

Map ID | Name
--- | ---
1 | Bayou Black VFD - Sta 46
2 | Bayou Black VFD - Station 2
3 | Bayou Blue Fire Department
4 | Bayou Blue VFC - Station 2
5 | Bayou Blue VFC - Station 3
6 | Bayou Canot Fire District
7 | Bayou Canot VFD-Hollywood Station
8 | Bayou Canot VFD-Gsteam Station
9 | Bayou Canot VFD-W Park Station
10 | Bayou Dugas VFD - Station 1
11 | Bayou Dugas VFD - Station 2
12 | Bayou Dugas VFD - Station 4
13 | Billy VFD
14 | Cotes VA
15 | Cotes VFD
16 | Cotes VFD
17 | Grand Caillou Fire Department #4A
18 | Grand Caillou Fire Department #4B
19 | Grand Caillou VFD - Boktown Station
20 | Grand Caillou VFD - Bodoren Sub Sta
21 | Grand Caillou VFD - Dolce Fire Station
22 | Grand Caillou VFD - Dolce Sub Station
23 | Houma FD - Belchase Station 4
24 | Houma FD - East Houma Station 3
25 | Houma FD - East Park Station
26 | Houma FD - North Houma Station 2
27 | Houma FD - South Houma Station 1
28 | Houma Fire Department
29 | Little Caillou VFD - Lower Station 3
30 | Little Caillou VFD - Upper Station 1
31 | Little Caillou/Chanute Fire #7
32 | Little Caillou/Chanute Fire #7
33 | Montegut District #9 - Station 2
34 | Montegut - Station 2
35 | Montegut - Station 3
36 | Montegut - Station 4
37 |Schriever VFD - Central Schriever Sta.
38 | Schriever VFD - Elbeau Station
39 | Schriever VFD - Gray Station
40 | Schriever Volunteer Fire Dept
41 | Village East VFD - Central Station
42 | West Terrebonne FRR (Stations on Earth)
43 | West Terrebonne FRR - LPGO Dowl/Ea
44 | West Terrebonne Fire & Rescue (LPGO)
DATA REVIEW

Map ID | Name
--- | ---
1 | Acadian Ambulance Service
2 | Acadian Angels Homecare
3 | Bayou Home Care
4 | Bonnie Terra Village
5 | Landrace Clinic of the South
6 | Chabert Medical Center
7 | Chateau Terrebonne Health Care
8 | Gulf States LAC of Houma
9 | Heritage Manor
10 | Homestead Assisted Living
11 | Hospice of South Louisiana
12 | Journey Hospice of the Bayous
13 | Lafayette ARC
14 | Lafayette ARC - Main Office
15 | Louis Inlet Crisis Center
16 | MacDonald Methodist Children's Services
17 | Memeran De Ville Nursing Home
18 | Medical Team, Inc.
19 | Oaks of Houma
20 | Physicians Surgery Specialty Hospital
21 | Gillies At Sugar Mill Plant
22 | Synergy Home Care
23 | FRC
24 | Terrebonne General Medical Center
25 | Terrebonne Home Care, Inc
26 | Terrebonne House
27 | Terrebonne Mental Health Center
28 | Terrebonne Parish Health Unit
29 | Total Pharmacy Services
### DATA REVIEW

#### Map ID Name

<table>
<thead>
<tr>
<th>Map ID</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Houma Water Plant</td>
</tr>
<tr>
<td>2</td>
<td>Schieffer Water Plant</td>
</tr>
<tr>
<td>3</td>
<td>Harson SG</td>
</tr>
<tr>
<td>4</td>
<td>Texaco Master Meter</td>
</tr>
<tr>
<td>5</td>
<td>Corrletter Tank</td>
</tr>
<tr>
<td>6</td>
<td>Robinson Canal Pump Station</td>
</tr>
<tr>
<td>7</td>
<td>Robinson Canal Tank</td>
</tr>
<tr>
<td>8</td>
<td>Lower Dulac Tank</td>
</tr>
<tr>
<td>9</td>
<td>Broussard Canal Pump Station</td>
</tr>
<tr>
<td>10</td>
<td>Dulac Pump Station</td>
</tr>
<tr>
<td>11</td>
<td>Dulac Tank</td>
</tr>
<tr>
<td>12</td>
<td>Bayou Oulgue Tank</td>
</tr>
<tr>
<td>13</td>
<td>Grand Calais Tank</td>
</tr>
<tr>
<td>14</td>
<td>Theriot Tank</td>
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<td>15</td>
<td>Chauvin Tank</td>
</tr>
<tr>
<td>16</td>
<td>Mermentau Tank</td>
</tr>
<tr>
<td>17</td>
<td>Benoit Pump Station</td>
</tr>
<tr>
<td>18</td>
<td>Ptatiaux-Chesnes Tank</td>
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<tr>
<td>19</td>
<td>Ptatiaux-Chesnes Pump Station</td>
</tr>
<tr>
<td>20</td>
<td>Kidekeke Tank</td>
</tr>
<tr>
<td>21</td>
<td>Waterproof RWPS</td>
</tr>
<tr>
<td>22</td>
<td>Moos 92</td>
</tr>
<tr>
<td>23</td>
<td>Priscoke Isle PS</td>
</tr>
<tr>
<td>24</td>
<td>Intracoastal RWPS Pump Station</td>
</tr>
<tr>
<td>25</td>
<td>Bayou Black RW Pump Station</td>
</tr>
<tr>
<td>26</td>
<td>Houma Plant 1</td>
</tr>
<tr>
<td>27</td>
<td>Monroe PS</td>
</tr>
<tr>
<td>28</td>
<td>Houma GS 1</td>
</tr>
<tr>
<td>29</td>
<td>Houma GS 2</td>
</tr>
<tr>
<td>30</td>
<td>Houma Plant High Service</td>
</tr>
<tr>
<td>31</td>
<td>Houma GP 63</td>
</tr>
<tr>
<td>32</td>
<td>Dumas Tank</td>
</tr>
<tr>
<td>33</td>
<td>South Terrebonne Sandpipe</td>
</tr>
<tr>
<td>34</td>
<td>South Terrebonne PS</td>
</tr>
<tr>
<td>35</td>
<td>Main Office</td>
</tr>
<tr>
<td>36</td>
<td>League Building</td>
</tr>
<tr>
<td>37</td>
<td>Bayou Black Tank</td>
</tr>
<tr>
<td>38</td>
<td>Williams Street PS</td>
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<tr>
<td>39</td>
<td>E St. Jones</td>
</tr>
<tr>
<td>40</td>
<td>Srd PS</td>
</tr>
<tr>
<td>41</td>
<td>North Terrebonne Sandpipe</td>
</tr>
<tr>
<td>42</td>
<td>West Gibson Tank</td>
</tr>
<tr>
<td>43</td>
<td>Gibson Tank</td>
</tr>
<tr>
<td>44</td>
<td>Black Lab</td>
</tr>
<tr>
<td>45</td>
<td>Schieffer Plant</td>
</tr>
<tr>
<td>46</td>
<td>Redwine Rice Regulator</td>
</tr>
<tr>
<td>47</td>
<td>Schieffer 552</td>
</tr>
<tr>
<td>48</td>
<td>Sludge Press Building</td>
</tr>
<tr>
<td>49</td>
<td>Schieffer 501</td>
</tr>
<tr>
<td>50</td>
<td>Lafourche RWPS</td>
</tr>
<tr>
<td>51</td>
<td>Schieffer Tank</td>
</tr>
<tr>
<td>52</td>
<td>Bldg Base PS</td>
</tr>
</tbody>
</table>
1,734 flood claims
$23M paid in claims
1,776 flood claims
$24M paid in claims
DATA REVIEW

171 flood claims
$2M paid in claims
535 flood claims
$7.8M paid in claims
DATA REVIEW

Katrina
378 flood claims
$7.6M paid in claims

2,459 flood claims
$102.5M paid in claims
III. DATA INVENTORY AND MAPS PRESENTATION

Hurricane Gustav

- Mandatory Evacuation
- 100% of Parish experienced loss of electrical service
- Drinking water system damaged
  - required a boil water advisory,
  - affected the opening of two major hospital systems within Terrebonne Parish
- Parish experienced Category 2 hurricane force winds
- Major structural damage widespread throughout the Parish
- Jail flooded
- Hospital parking lot flooded (couldn’t get to Chabert)
III. DATA INVENTORY AND MAPS PRESENTATION

Hurricane Gustav - Response

- Mandatory Evacuation of
- 100% of Parish experienced loss of electrical service – **Redundant power systems throughout parish**
- Drinking water system damaged
  - required a boil water advisory,
  - affected the opening of two major hospital systems within Terrebonne Parish – **Dedicated line to TGMC**
- Parish experienced Category 2 hurricane force winds
- Major structural damage widespread throughout the Parish
- **Jail flooded ~Levee**
- Hospital parking lot flooded (couldn’t get to **Chabert**) ~Levee
2,804 flood claims
$96M paid in claims
- Major storm surge flooding throughout Terrebonne Parish, mostly south of the Intracoastal Waterway. Storm surge flooding also noted in western end of Parish.
- Storm surge was approximately 7 to 8 feet.
- Levee breached and overtopped from storm surges.
- Damage to drainage pump stations.
- Shelters opened to house residents affected by storm surge flooding.
Major storm surge flooding throughout Terrebonne Parish, mostly south of the Intracoastal Waterway. Storm surge flooding also noted in western end of Parish.

Storm surge was approximately 7 to 8 feet.

Levee breached and overtopped from storm surges - Raised

Damage to drainage pump stations – Raised/Redundant Power

Shelters opened to house residents affected by storm surge flooding.
III. DATA INVENTORY AND MAPS PRESENTATION

• **Flood of May 2011 (Atchafalaya High Water Event)**
  o No flooding
• Prepped pumps
• Levees built in time to prevent damages
• Tiger Tubes, Sheetpile, Hesco baskets Placed
• If barge in Bayou Chene hadn’t been successful, new levees wouldn’t have held

Construction 2020
St. Mary Parish Levee Board
DATA REVIEW
Unmitigated Substantially Damaged Structures
LA Flooding May 10, 2019 - July 24, 2019
Public Assistance Available

FEMA-4462-DR, Louisiana Disaster Declaration as of 10/17/2019

Designated Counties:
- No Designation
- Public Assistance (Categories A - G)

Data Sources:
FEMA, ESRI;
Initial Declaration: 09/19/2019
Disaster Federal Registry Notice:
Amendment #1: 10/17/2019
Datum: North American 1983
Projection: Lambert Conformal Conic

MapID: 106c874d0310191015553cgood
Tropical Storm/ Hurricane Barry
Public Assistance Available
## Hurricane Barry Flood Reports

<table>
<thead>
<tr>
<th># of people in home</th>
<th>Flooding</th>
<th>Loss of Electricity</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Y - 18 inches in home</td>
<td>Yes -- loss of food</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Yes -- still not able to return</td>
<td>Yes -- loss of food</td>
<td>Lost generator</td>
</tr>
<tr>
<td>3</td>
<td>Y-3-6 inches in home</td>
<td>Yes -- loss of food</td>
<td>Hot water heater</td>
</tr>
<tr>
<td>4</td>
<td>Y - 18 inches in home</td>
<td>Yes -- loss of food</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Y - 18 inches in home</td>
<td>Yes -- loss of food</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Y - 12 inches</td>
<td>Yes -- loss of food</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Y -- 2-3&quot; in back room</td>
<td>Had generator</td>
<td>Lost push mower</td>
</tr>
<tr>
<td>3</td>
<td>Yes -- back room flooded</td>
<td>Yes -- loss of food</td>
<td>debris -- had boards to raise home</td>
</tr>
<tr>
<td>3</td>
<td>Y -- 7-8 inches in home</td>
<td>Yes -- loss of food</td>
<td>debris</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes --</td>
<td>removed items from home</td>
</tr>
<tr>
<td>2</td>
<td>Y -- 1-2&quot;</td>
<td>Had generator</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Y -- 1&quot; in one room</td>
<td>Had generator</td>
<td></td>
</tr>
</tbody>
</table>
FEMA-4277-DR, Louisiana Disaster Declaration as of 09/02/2016

Data Layer/Map Description:
The types of assistance that have been designated for selected areas in the State of Louisiana.
All designated areas in the State of Louisiana are eligible to apply for assistance under the Hazard Mitigation Grant Program.

Designated Counties:
- No Designation
- Individual Assistance and Public Assistance (Categories A - G)
- Public Assistance (Categories A - G)

Data Sources:
FEMA, ESRI;
Initial Declaration: 08/14/2016
Disaster Federal Registry Notice:
Amendment #5 - 09/02/2016
Datum: North American 1983
Projection: Lambert Conformal Conic
DATA REVIEW
I. INTRODUCTIONS AND WELCOME

II. PURPOSE, NEED, AND EXPECTATIONS

III. PLANNING PROCESS

IV. PLAN REVIEW
   A. HAZARD IDENTIFICATION
   B. DATA SURVEY TO BEGIN RISK ASSESSMENT

V. PROJECT UPDATE

VI. FUNDING AVAILABILITY

VII. CONCLUSION
What assets have been protected since the 2015 plan was adopted?

What is our current risk?

What are our current targets?
What assets have been protected since the 2015 plan was adopted?

What projects have been completed?

Refer to Handout for Details
– 53 projects completed
– 23 in construction or ongoing
– 6 in design or engineering funded
– 10 funded
- 31 Automated (Remote) Pump Stations
  - Telemetry and SCADA (Supervisor Control and Data Acquisition) – Supervisor controls pump station remotely
- 192 Sluice Gates – 60” – 24”
- 18 More Pump Stations by December 2019
  – 90 Total with 200 Pumps
- Backup Generators: 21 Pump Stations;
- 2 Rake Systems;
- All pumps brought up to electrical code
PROJECT LIST – PUBLIC WORKS IMPROVEMENTS

- **Sand Bag Program**
  - 60,000 ready for use,
  - 4 year lifetime

- **6 Safer Concrete Bridges**
  - 4 repaired
  - 2 replaced
ELIGIBLE HAZARD MITIGATION PROJECTS
FEMA has historically provided grant funding for the following mitigation project types:

- Property acquisition and structure demolition/relocation
- Structure elevation
- Mitigation reconstruction
- Dry floodproofing of historic residential structures
- Dry floodproofing of non-residential structures
- Localized flood risk reduction projects
- Non-localized flood risk reduction projects
- Structural retrofitting of existing buildings
- Non-structural retrofitting of existing buildings/facilities
- Safe room construction
- Wind retrofit for one-and two-family residences
- Infrastructure retrofit
- Soil stabilization
- Wildfire mitigation
- Advance assistance
- Generators
ELIGIBLE HAZARD MITIGATION PROJECTS

FEMA has provided Terrebonne Parish grant funding for the following mitigation project types:

- Property acquisition and structure demolition
- Structure elevation
- Mitigation reconstruction
- Dry floodproofing of historic residential structures
- **Dry floodproofing** of non-residential structures
- Localized flood risk reduction projects
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- Structural retrofitting of existing buildings
- Nonstructural retrofitting of existing buildings/facilities
- Safe room construction
- Wind retrofit for one-and two-family residences
- Infrastructure retrofit
- Soil stabilization
- Wildfire mitigation
- Advance assistance
- Generators
HARDBERING OF CRITICAL FACILITIES

- Government Tower
- Generating Station
- Courthouse Annex
- Houma Fire Department
- No structures elevated for Lili flooded again.
ELIGIBLE HAZARD MITIGATION PROJECTS (contd.)

- SAFE ROOMS
  - Houma Fire Department
  - Emergency Preparedness

- GENERATORS (5% initiative)
  - Government Tower
  - 6 lift span bridges
  - 2 Volunteer Fire Depts.
  - 20 pump stations
  - Utilities Barrow Street
ELIGIBLE HAZARD MITIGATION PROJECTS (cont'd.)
Disaster Recovery Reform Act (DRRA)
Building Resilient Infrastructure and Communities

- Predisaster Mitigation Program will end in 2020
- Building Resilient Infrastructure and Communities (BRIC) will replace it.
- Still under development
- Is to serve the purposes of the PDM grant
- Will include seven (7) lifelines in addition
- Consistent allocation of 6% of disaster mitigation funding yearly for grants.
- First year is projected to be about $130M
- Proposed to be $300 - $500 Million per year
A lifeline enables the continuous operation of government functions and critical business, and is essential to human health and safety or economic security.

- Lifelines are designed to highlight priority areas and interdependencies, focus attention on actions being taken, communicate coordination efforts towards stabilization, and integrate information
  - Each lifeline is comprised of multiple components and essential elements of information needed to stabilize the incident.
Community Lifeline Components

1. Safety and Security
   - Law Enforcement/Security
   - Search and Rescue
   - Fire Services
   - Government Service
   - Responder Safety
   - Imminent Hazard Mitigation

2. Food, Water, Sheltering
   - Evacuations
   - Food/Potable Water
   - Shelter
   - Durable Goods
   - Water Infrastructure
   - Agriculture

3. Health and Medical
   - Medical Care
   - Patient Movement
   - Public Health
   - Fatality Management
   - Health Care Supply Chain

4. Energy
   - Power (Grid)
   - Temporary Power
   - Fuel

5. Communications
   - Infrastructure
   - Alerts, Warnings, Messages
   - 911 and Dispatch
   - Responder Communications
   - Financial Services

6. Transportation
   - Highway/Roadway
   - Mass Transit
   - Railway
   - Aviation
   - Maritime
   - Pipeline

7. Hazardous Material
   - Facilities
   - Hazardous Debris, Pollutants, Contaminants

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**ROOT CAUSE ANALYSIS**

- **Status**: “What?”
- **Impact**: “So What?”
- **Actions**: “Now What?”

And any Limiting Factors?
I. INTRODUCTIONS AND WELCOME

II. PURPOSE, NEED, AND EXPECTATIONS

III. PLANNING PROCESS

IV. PLAN REVIEW
   A. HAZARD IDENTIFICATION
   B. DATA SURVEY TO BEGIN RISK ASSESSMENT

V. PROJECT UPDATE

VI. FUNDING AVAILABILITY

VII. CONCLUSION
- **FEMA**
  - Flood Mitigation Assistance - yearly
  - Predisaster Mitigation Assistance/BRIC - yearly
  - Hazard Mitigation Grant Programs (disaster ~7% PA)
  - Public Assistance (disaster)
- **HUD** - Community Development Block Grant
- **STATE**
  - Watershed Initiative - $1.2B
  - Coastal Protection and Restoration Authority
  - CWPPRA
- **RESTORE**
FUNDING
Flood Insurance

- Terrebonne Parish
  - 11,048 policies
  - $8M in premiums
  - 10,189 claims
  - $274M paid
  - $26M ICC

- Houma
  - 4,561 policies
  - $2.8M in premiums
  - 1,016 claims
  - $19.5M paid
  - $298k ICC

- Flood Insurance helps Businesses and Individuals Recover
- 40 percent of small businesses damaged by floods never reopen
I. INTRODUCTIONS AND WELCOME

II. PURPOSE, NEED, AND EXPECTATIONS

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IV. PLAN REVIEW

   I. HAZARD IDENTIFICATION
      II. DATA SURVEY TO BEGIN RISK ASSESSMENT

V. PROJECT UPDATE

VI. FUNDING AVAILABILITY

VII. CONCLUSION
I. Meeting Summary  
A. Purpose, Need, and Expectations  
B. Plan Process and Review  
C. Hazard Identification  
D. Data Survey and Risk Assessment  
E. Funding  

II. Next Steps  
A. Continue Risk Assessment  
B. Run Modeling of Risks  
   1. Dollar value of potential losses  
   2. Probability of events/losses  

III. Draft and Review the Plan Update
CONTACT INFORMATION

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Recovery Assistance and Mitigation Planning
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jgerbasi@tpcg.org