Appendix A
Multi-Jurisdictional Hazard Mitigation Plan Update
Team Meetings and Public Meetings

The Mitigation Planning Team met a total of four times during the plan update process. The following section describes the dates of the meetings, agendas, meeting minutes, and attendees as indicated by the sign-in sheets. These minutes were prepared by Maggie Olivier, Floodplain/CRS Specialist for Jefferson Parish. The proceedings will be described in chronological order.

Mitigation Planning Team (MPT) Meeting #1

The MPT met once before the public meetings and once after. The first meeting was held on July 22, 2014 on the 4th flood or the Joe Yenni Building in Elmwood beginning at 10:30 AM.

As part of the Update, government officials from several jurisdictions were members of the MPT and all jurisdictions were represented as part of the Stakeholders group. The MPT is comprised of the following individuals:

Jefferson Parish Hazard Mitigation Plan, Mitigation Planning Team

Team Member	Job Title	Organization
Ms. Michelle Gonzales	Director of Floodplain Management and Hazard Mitigation	Jefferson Parish
Ms. Maggie Olivier	Floodplain/CRS Specialist	Jefferson Parish
Ms. Danika Gorrondona	Director of Inspections	City of Gretna
Mr. Michael Wesley	IT Manager	City of Gretna
Mr. Jeffrey Charlet	Director of the Regulatory Department	City of Harahan
Ms. Aimee Vallot	Director of Inspection and Code Enforcement	City of Kenner
Ms. Lisa Tapia	CRS Coordinator	City of Westwego
Ms. Nora Combel	Building Official	Town of Grand Isle
Ms. Yvette Crain	Clerk and Floodplain Manager	Town of Jean Lafitte

Jurisdictional Sub-Team

Government officials from several jurisdictions actively participated in the Update. These individuals provided data and insight to the various components of the plan. The Jurisdictional Sub-Team is comprised of the following individuals:

Jefferson Parish Hazard Mitigation Plan, Jurisdictional Sub-Team

Team Member	Job Title	Organization
Mr. Mitch Theriot	Director of Drainage	Jefferson Parish
Mr. Greg Brousse	GIS Manager	Jefferson Parish
Mr. John Piglia	Assistant Director of Inspection and Code Enforcement, CFM	Jefferson Parish
Ms. Tiffany Wilken	Director of Inspection and Code Enforcement	Jefferson Parish
Mr. David Cobb	Assistant Regulatory Manager of Inspection and Code Enforcement, CFM	Jefferson Parish
Mr. Timothy Gautreau	Assistant Director of Emergency Management	Jefferson Parish
Mr. Charles Hudson	Director of Emergency Management	Jefferson Parish
Mr. Ridley Bourdreaux	Director of Management Information Systems	Jefferson Parish
Mr. Kriss Fortunato	Public Information Officer	Jefferson Parish
Mr. Kazem Alikhani	Director of Public Works	Jefferson Parish
Mr. Anthony Francis	Director of General Services	Jefferson Parish
Ms. Danika Gorrondona	Director of Inspections	City of Gretna
Mr. Michael Wesley	IT Manager	City of Gretna
Mr. Jeffrey Charlet	Director of the Regulatory Department	City of Harahan
Ms. Aimee Vallot	Director of Inspection and Code Enforcement	City of Kenner
Ms. Lisa Tapia	CRS Coordinator	City of Westwego
Ms. Nora Combel	Building Official	Town of Grand Isle
Ms. Yvette Crain	Clerk and Floodplain Manager	Town of Jean Lafitte

Stakeholders Group

Early in the update process the Parish determined that a group of interested groups, neighboring communities, businesses, academia and other organizations and individuals with an interest in the Jefferson Parish Plan Update and Project Scoping should be identified. This Stakeholders Group was provided regular updates on the planning process and given the opportunity to review the Plan at key points in its development. Members of the Stakeholders group were also invited to attend and participate in all public meetings. This stakeholder group was identified by the MPT.

Jefferson Parish Hazard Mitigation Plan, Stakeholders Group

Group Member	Title	Organization
Ms. Belinda C. Constant	Mayor	City of Gretna
Mr. Provino "Vinny" Mosca	Mayor	Town of Harahan
Mr. Michael S. Yenni	Mayor	City of Kenner
Mr. John I. Shaddinger, Jr.	Mayor	City of Westwego
Mr. David Carmardelle	Mayor	Town of Grand Isle
Mr. Tim Kerner	Mayor	Town of Jean Lafitte

MPT Meeting 1 Agenda

Jefferson Parish CRS User Group

Monthly Meeting – July 22, 2014
10:30 AM-12:30 PM
Joe Yenni Building

1) Welcome/Sign-In

2) Updates
   a. NFIP – HFIAA Webinar Overview; more viewings on July 24, 29, and 31
   b. Mitigation Grants (Review Status)
   c. Upcoming CRS Webinar-Natural Floodplain Functions (8/20, noon, 1 CEC)

3) Community Self-Assessment
   a. Any questions?

4) PPI Development
   a. Current Public Information Efforts
      i. Review inventory chart
      ii. Collect names for committee

5) Mitigation Plan Update
   a. Hand out current plan
   b. Review MOA and Schedule of Tasks
      i. Tracking time
   c. Fill out Questionnaire and Worksheets

6) Other Business
   a. AgCenter FloodMaps Portal Worksheet
   b. Outreach banner ideas
   c. Next meeting date/location: _____
   d. Meeting goals: _____

Notes:

_____

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MPT Meeting #1 Meeting Minutes
(Note: These minutes only describe agenda item 5-Mitigation Plan Update)

5. Mitigation Plan Update

a. Hand out current plan

Ms. Gonzales stated that each jurisdiction will be updating its own section. Ms. Olivier handed out hard copies of the current plan as well as a CD of the word version so that they can plug in new information rather than retype the whole section.

b. Review Memorandum of Agreement (MOA) Schedule of Tasks

The team reviewed the Memorandum of Agreement (MOA) for a Multi-Jurisdictional Hazard Mitigation Planning Team that Ms. Gonzales drafted. Each municipality will have to submit a resolution approved by their Council stating we are working on this update collectively. We briefly discussed the schedule of tasks. Ms. Olivier is s currently updating the hazard profile section. Our goal is to have the finished draft to GOHSEP by November so they can make suggestions. The updated plan will need to be approved by FEMA before the current one expires in March 2015.

c. Fill out Questionnaire and Worksheets

The team filled out the Hazard Mitigation Plan Review Questionnaire. Need responses to Part 3, #'s 7, 8, and 9 from everyone. The team also reviewed the worksheets GOSHEP distributed at the plan update training in early July. Every jurisdiction will to submit a list of parish/city owned buildings. These items are due to Ms. Olivier by August 5.

MPT Meeting #1 Sign-In Sheet

Sign In Sheet

Name	Title	Community/Organization	Email Address
Suzie Sumpter	Hazard Mitigation Specialist - Contract Manager	HGA Hunt Guillot & Associates	ssumpter@hga-llc.com
Billy Poché	Project Manager	HGA	bpoche@hga-llc.com
DANIEL GERONDANA	Building Official	CITY OF GRETNA	dgerondana@gretnala.com
MICHAEL WESLEY	IT MANAGER	"	mwesley@gretnala.com
LISA TAPIA	CRS	City of Westwego	lisatapia@cityofwestwego.com
Michelle Gonzales	Director Floodplain mgt.	JP	mgonzales@jeffparish.net
Maggie Olivier	Floodplain/CRS Specialist	JP	molivier@jeffparish.Net
Pam Lightfoot	Floodplain Mgmt Program Coor/CRS Specialist for the State	LaDOTD	pam.lightfoot@la.gov
Monica Farris	Director	UNO-CHART	mateets@uno.edu
Jeffrey Charlet	DIRECTOR of Regulatory	City of Harahan	jeff.charlet@ci.harahan.la.us
Yvette Crain	Town Clerk	Town of Jean Lafitte	ycrain@townofjeanlafitte.com

July 22, 2014 JP Hazard Mitigation Plan Update Meeting Yenni Building

*Follow up was conducted with the Town of Grand Isle through phone calls after the meeting.

Public Meetings

These minutes document proceedings from the first and second public meetings related to the development of the 2015 Jefferson Parish Mitigation Plan Update. The public meetings were held at the following locations:

August 19, 2014	10:30 AM, Mel Ott Center, West Bank, 2301 Belle Chasse Highway, Gretna
September 30, 2014	10:30 AM, Jefferson Parish East Bank Regional Library, East Bank, 4747 West Napoleon Ave, Metairie

Copies of the flyers for these meetings are included below. Jefferson Parish and each of the jurisdictions created their own flyers to post. The flyers were posted on the Parish website and in the public library branches at least two weeks prior to each meeting. The jurisdictions also posted the public meeting notices in each of their respective locations. The flyers explained the purpose of the meeting and provided the date, time, and location of the meeting place. The agendas, brief summaries of the discussions from each meeting, and the sign-in sheets are also included.

August 19, 2014

Public Meeting

Hazard Mitigation Plan Update

Date: 08/19/14

Time: 10:30 AM

Location:
Mel Ott Center
2301 Belle Chasse Highway
Gretna, LA 70053

The Jefferson Parish Hazard Mitigation Plan is being updated through a collaborative effort of officials from Jefferson Parish, the cities of Gretna, Harahan, Kenner, Westwego, and the towns of Grand Isle and Jean Lafitte. A public meeting to discuss the Plan Update is scheduled for Tuesday, August 19, 2014 at the Mel Ott Center in Gretna at 10:30 AM.

During the meeting, the public is invited to help identify community assets, describe natural hazard concerns, and assist in prioritizing proposed mitigation actions.

A completed plan will allow the Parish and participating municipalities to apply for federal relief aid to fund mitigation projects prioritized in the plan. The plan is designed to support GOHSEP's statewide Hazard Mitigation Plan and enhance coordination efforts between local, state, and federal agencies during times of disaster.

Contact

Jefferson Parish Department of Floodplain Management and Hazard Mitigation

Phone:
(504) 736-6540

E-mail:
JPfloodplain@jeffparish.net

In accordance with provisions of the American with Disabilities Act Amendments of 2008, as amended, Jefferson Parish shall not discriminate against individuals with disabilities on the basis of disability in its services, programs or activities. If auxiliary aids or devices, or other reasonable accommodation under the Amendments Act, please submit your request to the ADA Coordinator at least eight (48) hours in advance or as soon as practical. A seventy-two (72) hour notice is required to request Certified ASL interpreters.

ADA Coordinator/Office of Citizens with Disabilities

Public Meeting

Contact

City of Kenner Inspection and Code Enforcement

Phone:
(504) 468-6606

E-mail:

August 19, 2014

Public Meeting

Contact

Town of Grand Isle

Phone:
(985) 787-3196

E-mail:
nora_combel@yahoo.com

FEMA/Patsy Lynch

Public Meeting

Contact

City of Gretna Department of Building and Regulatory Inspections

Phone:
(504) 363-1563

E-mail:
dgorrondona@gretnala.com

Public Meeting

Contact

City of Harahan Regulatory Department

Phone:
(504) 737-6765

E-mail:
jeff.charlet@ci.harahan.la.us

Public Meeting

Contact

Town of Jean Lafitte

Phone:
(504) 689-2208

E-mail:
ycrain@townofjeanlafitte.com

August 19, 2014

Public Meeting

Contact

City of Westwego

Phone:
(504) 341-3424

E-mail:
LisaTapia@cityofwestwego.com

FEMA/Patsy Lynch

Example of Posting on City of Gretna's Website

City of Gretna, Louisiana / E...

File Edit View Favorites Tools Help

Suggested Sites | JP Intranet Portal | Jefferson Parish, LA Home | Web Slice Gallery

Page | Safety | Tools

GRETNA HOME | EVENTS CALENDAR | COUNCIL BUSINESS | GRETNA TOURISM | FARMERS MARKET | UTILITY PAYMENTS | RECENT NEWS | PARKS & RECREATION

CITY OF GRETNA LOUISIANA

WE WANT YOU IN GRETNA

HOME | DEPARTMENTS | RESIDENTS | BUSINESS | VISITORS | I WANT TO...

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CONTACT THE CITY

2nd Street and Huey P. Long Ave.
Gretna, LA 70053
Get Directions

Business: (504) 363-1500

Email Address

Personnel Directory

JEFFERSON PARISH HAZARD MITIGATION PLAN UPDATE MEETING

back

EVENT DATE:

Aug 19, 2014 from 10:30 AM - 12:00 PM

EVENT LOCATION:

Mel Ott Recreation Center
2301 Belle Chasse Hwy
Gretna, LA 70053
[Location Details|Map]

EVENT DESCRIPTION:

HAZARD MITIGATION PLAN UPDATE MEETING

The Jefferson Parish Hazard Mitigation Plan is being updated through a collaborative effort of officials from Jefferson Parish, the cities of Gretna, Harahan, Kenner, Westwego, and the towns of Grand Isle and Jean Lafitte. A public meeting to discuss the Plan Update is scheduled for Tuesday, August 19, 2014 at the Mel Ott Center in Gretna at 10:30 AM.

During the meeting, the public is invited to help identify community assets, describe natural hazard concerns, and assist in prioritizing proposed mitigation actions.

A completed plan will allow the Parish and participating municipalities to apply for federal relief aid to fund mitigation projects prioritized in the plan. The plan is designed to support GOHSEP's statewide Hazard Mitigation Plan and enhance coordination efforts between local, state, and federal agencies during times of disaster.

EVENT CONTACT:

Name: Danika Gorrondona
Title: Building Official
Email: dgorrondona@gretnala.com
Phone: 504-363-1563

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4:07 PM
8/8/2014

Public Meeting #1 Agenda

Jefferson Parish Hazard Mitigation Plan Update
&
CRS User Group

Meeting – August 19, 2014
10:30 AM-12:30 PM
Mel Ott Center in Gretna

1) Welcome/Sign-In/Introductions

2) CRS - Program for Public Information (PPI) Development
   a. Add names to committee list
   b. Collect inventory chart on current public information efforts
   c. Vote on U-G name – Jefferson Unified Mitigation Professionals (JUMP)

3) Mitigation Plan Update
   a. Review purpose and Schedule of Tasks
   b. Update on MOA signatures and resolutions
   c. Review natural hazards
      i. Complete survey
      ii. Discuss small-scale hazard events
   d. Fill out required GOHSEP worksheets – Community Capabilities

4) Other Business
   a. Next meeting date/location: _____
   b. Meeting goals: _____

Notes/Comments:

_____
_____
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_____
_____

Plan Update Purpose and Schedule of Tasks

Hazard Mitigation Plan Update

A Hazard Mitigation Plan is a comprehensive document created to develop and implement practical, manageable mitigation strategies that help to reduce a community's risk to natural hazards.

Jefferson Parish is updating its current plan through a collaborative effort of officials from Jefferson Parish, the cities of Gretna, Harahan, Kenner, Westwego, and the towns of Grand Isle and Jean Lafitte. This update occurs every five years.

A completed plan will allow the Parish and participating municipalities to apply for federal relief aid to fund mitigation projects prioritized in the plan.

Schedule of Tasks

	August	September	October	November	December	January	February
Project Tasks							
Organize Resources and Convene Planning Team							
Conduct Risk Assessment							
Identify Mitigation Strategies							
Develop Action Plan for Implementation							
Identify Plan Maintenance Procedures							
Review Final Draft							
Submit Plan to State and FEMA							
Adopt Plan							
Meetings							
Planning Team							
Jurisdictional Sub-team							
Stakeholder/Public Outreach							

Public Meeting #1 Meeting Minutes

1. Welcome/Sign-In/Introductions

Ms. Gonzales introduced herself and representatives from Jefferson Parish and the separate municipalities who were in attendance. Staff and attendees were asked to sign the sign-in sheet that was circulated. The sign-in sheet is included below. Ms. Gonzales gave a ten-minute presentation about mitigation planning and explained that the Parish is presently completing an update to its 2010 plan as well as scoping mitigation projects as part of the planning process.

2. Community Rating System (CRS)-Program for Public Information (PPI) Development

The staff quickly reviewed some old business for the CRS User Group since the CRS coordinators were present.

3. Mitigation Plan Update

a. Review purpose and Schedule of Tasks

Ms. Gonzales explained the purpose of a hazard mitigation plan, the plan update process, who is involved, and the schedule of tasks. She then reintroduced the community officials who make up the Mitigation Planning Team (MPT), which has the responsibility for most of the procedural and technical decisions as the update is developed. The MPT is comprised of officials from the Parish and the six jurisdictions within it. Ms. Gonzales also reviewed the sections of the Parish Mitigation Plan, highlighting the list of goals, objectives and actions from the 2010 version of the plan. She noted how important this part of the plan is because it outlines the Parish's intentions in terms of projects that it will pursue in future grant applications. She explained that the goals, objectives and actions will be updated by the Parish with the input of the MCT and Parish officials.

b. Update on Memorandum of Agreement (MOA) signatures and resolutions

The Memorandum of Agreement (MOA) for a Multi-Jurisdictional Hazard Mitigation Planning Team was sent out to all of the jurisdictions' governing authorities to obtain signatures stating the jurisdictions would work collaboratively on the plan update. The MOA then needed to be passed as a resolution by each Council. Resolutions for the following are approved: Gretna, Kenner, Westwego, and Jean Lafitte. Jefferson Parish, Harahan, and Grand Isle are on their respective Council agendas.

c. Review natural hazards

In accordance with FEMA requirements, the plan only addresses natural hazards. Ms. Gonzales reviewed a list of the hazards that are proposed to be included in the plan – these hazards will be included in the hazard identification. A subset of these hazards will include risk assessments.

i. Complete survey

Using the list of natural hazards, attendees were given a survey (see survey below) and asked to rank them in order of what they considered to be top threats to Jefferson Parish. Top choices included storm surge, hurricanes, and coastal erosion. Timothy Gautreau from Emergency Management said he rated the hazards by which ones are likely to happen more frequently rather than which ones are more dangerous.

ii. Discuss small-scale hazard events

The group had an open discussion about hazards that have occurred in the Parish since 2008. In the last few years, Jefferson Parish has reduced its amount of Severe Repetitive Loss (SRL) properties from 1300 to 700. Ms. Gonzales noted that Jefferson Parish does a lot of mitigation and explained some of the current projects the Parish is undertaking. She asked the attendees to jot down innovative ideas for mitigation at the bottom of their survey that we may be able to incorporate into the mitigation strategies section of the plan. The discussion continued around the ideas volunteered by audience members.

d. Fill out required GOHSEP worksheets-Community Capabilities

The MPT worked through the following GOHSEP worksheets:

1. Critical Facilities Inventory
2. Vulnerable Populations
3. Community Assessments
4. National Flood Insurance Program (NFIP)

The meeting adjourned at 11:45 AM.

Participant Survey

Name: _____

Survey

Identified Hazards in Jefferson Parish

Rank the following natural hazards from 1 to 13 by greatest threat to Jefferson Parish (1 = the highest).

_____ Coastal Erosion
_____ Drought
_____ Earthquakes
_____ Floods
_____ Hail Storms
_____ Hurricanes and Tropical Storms
_____ Land Subsidence
_____ Lightning
_____ Sea Level Rise
_____ Storm Surge
_____ Tornadoes
_____ Wildfires
_____ Winter Storms

Mitigation Actions

Share any mitigation action suggestion(s) you may have on how to lessen the effects of one or more of the hazards listed above.

_____

_____

_____

_____

_____

Sample of Audience Survey Responses

Name: Timmy Gautreau Jr
JP Emergency Management

Survey

Identified Hazards in Jefferson Parish

Rank the following natural hazards from 1 to 13 by greatest threat to Jefferson Parish (1 = the highest).

2 Coastal Erosion
11 Drought
13 Earthquakes
1 Floods
6 Hail Storms
4 Hurricanes and Tropical Storms
8 Land Subsidence
3 Lightning
9 Sea Level Rise
5 Storm Surge
10 Tornadoes
12 Wildfires
7 Winter Storms

Mitigation Actions

Share any mitigation action suggestion(s) you may have on how to lessen the effects of one or more of the hazards listed above.

* Public Awareness + Public Interest
* Fortify CIKR (Critical Infrastructures)
* Improve overall Drainage.
* Improve levees for flood prone areas

Name: Angie Abbrecht

Survey

Identified Hazards in Jefferson Parish

Rank the following natural hazards from 1 to 13 by greatest threat to Jefferson Parish (1 = the highest).

3 Coastal Erosion
11 Drought
12 Earthquakes
1 Floods
8 Hail Storms
2 Hurricanes and Tropical Storms
5 Land Subsidence
10 Lightning
9 Sea Level Rise
4 Storm Surge
9 Tornadoes
13 Wildfires
10 Winter Storms

Mitigation Actions

Share any mitigation action suggestion(s) you may have on how to lessen the effects of one or more of the hazards listed above.

→ Strengthen rules for real estate agents/sellers to disclose flood history + insurance rates
→ educate public on importance of claims for claims history for mitigation dollars
→ more community involvement / education / programs for homeowners regarding storm drain dumping

Name: Mike Stewart

Survey

Identified Hazards in Jefferson Parish

Rank the following natural hazards from 1 to 13 by greatest threat to Jefferson Parish (1 = the highest).

6 Coastal Erosion
12 Drought
13 Earthquakes
1 Floods
7 Hail Storms
2 Hurricanes and Tropical Storms
3 Land Subsidence
9 Lightning → Argument for Frequency
4 Sea Level Rise
5 Storm Surge
8 Tornadoes
10 Wildfires
11 Winter Storms

Mitigation Actions

Share any mitigation action suggestion(s) you may have on how to lessen the effects of one or more of the hazards listed above.

Envs. Circuits, Drainage ← Coastal Restoration; Home Elevations; Drainage Projects to Increase Capacity of System; Pump to Green Space (Berm
Solar Alternative for Municipal Buildings
Stormwater Retention (Rain Barrels!)

Name: Ridley Benedreau

Survey

Identified Hazards in Jefferson Parish

Rank the following natural hazards from 1 to 13 by greatest threat to Jefferson Parish (1 = the highest).

3 Coastal Erosion
10 Drought
12 Earthquakes
2 Floods
7 Hail Storms
1 Hurricanes and Tropical Storms
5 Land Subsidence
9 Lightning
8 Sea Level Rise
4 Storm Surge
6 Tornadoes
13 Wildfires
11 Winter Storms

Share any mitigation action su
effects of one or more of the h
Miss. water discoura
Lessen pipeline re
Fund more erosi
new alternative
Issue fewer permits
Strengthen + enforce

Name: Hilda Loft

Survey

Identified Hazards in Jefferson Parish

Rank the following natural hazards from 1 to 13 by greatest threat to Jefferson Parish (1 = the highest).

1 Coastal Erosion
10 Drought
13 Earthquakes
2 Floods
6 Hail Storms
3 Hurricanes and Tropical Storms
4 Land Subsidence
9 Lightning
5 Sea Level Rise

Mitigation
n suggestion(s)
he hazards liste
w and
the storm
: check f

Name: Vicki Holmes

Survey

Identified Hazards in Jefferson Parish

Rank the following natural hazards from 1 to 13 by greatest threat to Jefferson Parish (1 = the highest).

5 Coastal Erosion
10 Drought
13 Earthquakes
1 Floods → In Metairie, Severn Ave floods every time there's hard rain. Sections are impossable near Lakeside
8 Hail Storms
2 Hurricanes and Tropical Storms
3 Land Subsidence
9 Lightning
7 Sea Level Rise
4 Storm Surge

igation Actions
tion(s) you may have on how to lessen the
ds listed above.
trees to mitigate soil / Coastal erosion
s there any way to expand that
reas) after a big storm or
of a 'recycle' program when
the vegetation on the coast?

Name: Gene Brown
JP GIS Dept.

Survey

Identified Hazards in Jefferson Parish

Rank the following natural hazards from 1 to 13 by greatest threat to Jefferson Parish (1 = the highest).

4 Coastal Erosion
11 Drought
13 Earthquakes
2 Floods
9 Hail Storms
1 Hurricanes and Tropical Storms
6 Land Subsidence
8 Lightning
5 Sea Level Rise
3 Storm Surge
7 Tornadoes
12 Wildfires
10 Winter Storms

Mitigation Actions

Share any mitigation action suggestion(s) you may have on how to lessen the effects of one or more of the hazards listed above.

CONTINUE TO MAINTAIN DRAINAGE UPGRADES. CONSIDER
HAVE FAILSAFE SYSTEMS FOR BOTH BANKS OF RIVER.

Name: MICHAEL WORLEY

Survey

Identified Hazards in Jefferson Parish

Rank the following natural hazards from 1 to 13 by greatest threat to Jefferson Parish (1 = the highest).

2 Coastal Erosion
11 Drought
13 Earthquakes
6 Floods
8 Hail Storms
1 Hurricanes and Tropical Storms
5 Land Subsidence
7 Lightning
4 Sea Level Rise
3 Storm Surge
9 Tornadoes
12 Wildfires
10 Winter Storms

Mitigation Actions

Share any mitigation action suggestion(s) you may have on how to lessen the effects of one or more of the hazards listed above.

Elevations, relocation of critical facilities, generators, co-location of technology/redunda

Public Meeting #1 Sign-In Sheet

Sign In Sheet

Name	Title	Community/Agency	Email Address	Initial
Michelle Gonzales	Director - Floodplain Mgmt	Jefferson Parish	mgonzales@jeffparish.net	MG
Maggie Olivier	Floodplain/CRS Specialist	Jefferson Parish	molivier@jeffparish.net	MLO
Danika Gorrondona	Building Official	City of Gretna	dgorrondona@gretnala.com	DG
Michael Wesley	IT Manager	City of Gretna	mwesley@gretnala.com	MW
Jeff Charlet	Director - Regulatory Dept	City of Harahan	jeff.charlet@ci.harahan.la.us	JC
Aimee Vallot	Director - Inspection/Code	City of Kenner	avallot@kenner.la.us	AV
Dana Fink	Secretary - Inspection/Code	City of Kenner	dfink@kenner.la.us	
Theresa Armstrong	Planner/GIS Specialist	City of Kenner	tarmstrong@kenner.la.us	
Lisa Tapia	CRS Coordinator	City of Westwego	lisatapia@cityofwestwego.com	L.T.
Nora Combel	Building Official	Town of Grand Isle	nora_combel@yahoo.com	
Yvette Crain	Town Clerk	Town of Jean Lafitte	ycrain@townofjeanlafitte.com	YC
Monica Farris	Director	UNO-CHART	mateets@uno.edu	
Jonathan Smith	ISO/CRS Specialist	ISO	jonathan.smith@verisk.com	JS
Suzie Sumpter	Hazard Mitigation Specialist	HGA	ssumpter@hga-llc.com	
Billy Poche	Project Manager	HGA	bpoche@hga-llc.com	
Nicolette English	Hazard Mitigation Planner	GOHSEP	nicolette.english@la.gov	NE

August 19, 2014 JP Hazard Mitigation Plan Update Meeting Mel Ott Center in Gretna

Sign In Sheet

Name	Title	Community/Agency	Email Address
Vicki Holmes			vicki.holmes@cox.net
Kim Reeves			tkreeves@cox.net
Hilda Lott	Grant Admin.	Plang. Pars	hlott@ppgov.net
Gabe Broussard	JP GIS Manager	Jefferson Parish	gabroussard@jeffparish.net
Mike Metcalf	Floodplain Mgr.	Plang. Parish	mmetcalf@ppgov.net
Timmy Gautreau Jr	Jeff Parish Emergency Management		tgautreau@jeffparish.net
Mike Stewart	Proj. Manager	BHA/JP	mstewart@bha-engineers.com
Melonie Ellzey	HM Specialist	HGA	mellzey@hga-llc.com
Brenda Mathews	HM Specialist	HGA	bmathews@hga-llc.com
Ridley Bordreaux	IT Director	Jefferson Parish	rbordreaux@jeffparish.net
Angie Albrecht	Manager	Trigon Associates	aalbrecht@trigonassociates.com

August 19, 2014 JP Hazard Mitigation Plan Update Meeting Mel Ott Center in Gretna

*Follow up was conducted with the Town of Grand Isle through phone calls after the meeting.

Public Meeting #2 Flyer

September 30, 2014

Public Meeting

Hazard Mitigation Plan Update

Date: 09/30/2014

Time: 10:30 AM

Location:

Jefferson Parish Library
4747 West Napoleon Avenue
Metairie, LA 70001

The Jefferson Parish Hazard Mitigat through a collaborative effort of offi the cities of Gretna, Harahan, Kenne of Grand Isle and Jean Lafitte. A pu Plan Update is scheduled for Tuesd the Jefferson Parish East Bank Region

The public is invited to listen to a current risk assessments of floods, storm surge, and tornadoes; current potential mitigation actions to red assist in identifying additional mitigat

A completed plan will allow the municipalities to apply for federal r projects prioritized in the plan. The GOHSEP's statewide Hazard Mitig coordination efforts between local, during times of disaster.

In accordance with provisions of the American Act of 2008, as amended, Jefferson Parish shall with disabilities on the basis of disability in its you require auxiliary aids or devices, or other the ADA Amendments Act, please submit your

Contact

Jefferson Parish
Department of Floodplain Management and Hazard Mitigation

September 30, 2014

Public Meeting

Hazard Mitigation Plan Update

Date: 09/30/2014

Time: 10:30 AM

Location:

Jefferson Parish Library
4747 West Napoleon Avenue
Metairie, LA 70001

The Jefferson Parish Hazard Mitigation Plan is being updated through a collaborative effort of officials from Jefferson Parish, the cities of Gretna, Harahan, Kenner, Westwego, and the towns of Grand Isle and Jean Lafitte. A public meeting to discuss the Plan Update is scheduled for Tuesday, September 30, 2014, at the Jefferson Parish East Bank Regional Library at 10:30 AM.

The public is invited to listen to an overview of the Parish's current risk assessments of floods, hurricanes/tropical storms, storm surge, and tornadoes; current projects for these risks; and potential mitigation actions to reduce these risks as well as assist in identifying additional mitigation actions to consider.

A completed plan will allow the Parish and participating municipalities to apply for federal relief aid to fund mitigation projects prioritized in the plan. The plan is designed to support GOHSEP's statewide Hazard Mitigation Plan and enhance coordination efforts between local, state, and federal agencies during times of disaster.

Contact

Town of Jean Lafitte

Phone:

September 30, 2014

Public Meeting

Hazard Mitigation Plan Update

Date: 09/30/2014

Time: 10:30 AM

Location:

Jefferson Parish Library
4747 West Napoleon Avenue
Metairie, LA 70001

The Jefferson Parish Hazard Mitigation Plan is being updated through a collaborative effort of officials from Jefferson Parish, the cities of Gretna, Harahan, Kenner, Westwego, and the towns of Grand Isle and Jean Lafitte. A public meeting to discuss the Plan Update is scheduled for Tuesday, September 30, 2014, at the Jefferson Parish East Bank Regional Library at 10:30 AM.

The public is invited to listen to an overview of the Parish's current risk assessments of floods, hurricanes/tropical storms, storm surge, and tornadoes; current projects for these risks; and potential mitigation actions to reduce these risks as well as assist in identifying additional mitigation actions to consider.

A completed plan will allow the Parish and participating municipalities to apply for federal relief aid to fund mitigation projects prioritized in the plan. The plan is designed to support GOHSEP's statewide Hazard Mitigation Plan and enhance coordination efforts between local, state, and federal agencies during times of disaster.

Contact

City of Gretna
Department of Building and Regulatory Inspections

Phone:

Public Meeting

Hazard Mitigation

Date: 09/30/2014

Time: 10:30 AM

Location:

Jefferson Parish Library
4747 West Napoleon Avenue
Metairie, LA 70001

The Jefferson Parish Ha through a collaborative the cities of Gretna, Hara of Grand Isle and Jean L Plan Update is schedule the Jefferson Parish East

The public is invited to current risk assessments storm surge, and tornado potential mitigation acti assist in identifying addit

A completed plan will municipalities to apply f projects prioritized in the GOHSEP's statewide H coordination efforts betv during times of disaster.

Contact

Town of Grand Isle

Phone:
(985) 787-3196

E-mail:
nora_combel@yahoo.com

Public Meeting

Hazard Mitigation

Date: 09/30/2014

Time: 10:30 AM

Location:

Jefferson Parish Library
4747 West Napoleon Avenue
Metairie, LA 70001

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The public is invited to li current risk assessments storm surge, and tornadoe potential mitigation actio assist in identifying additio

A completed plan will municipalities to apply for projects prioritized in the GOHSEP's statewide Haz coordination efforts betwe during times of disaster.

Contact

City of Harahan
Regulatory Department

Phone:
(504) 737-6765

E-mail:
jeff.charlet@ci.harahan.la.us

Public Meeting

Hazard Mitigat

Date: 09/30/2014

Time: 10:30 AM

Location:

Jefferson Parish Library
4747 West Napoleon Avenue
Metairie, LA 70001

The Jefferson P through a collal the cities of Gre of Grand Isle ar Plan Update is the Jefferson Pa

The public is in current risk ass storm surge, an potential mitiga assist in identify

A completed municipalities t projects prioriti GOHSEP's state coordination eff during times of

Contact

City of Kenner
Inspection and Code Enforcement

Phone:
(504) 468-6606

E-mail:
avallot@kenner.la.us

September 30, 2014

Public Meeting

Hazard Mitigation Plan Update

Date: 09/30/2014

Time: 10:30 AM

Location:

Jefferson Parish Library
4747 West Napoleon Avenue
Metairie, LA 70001

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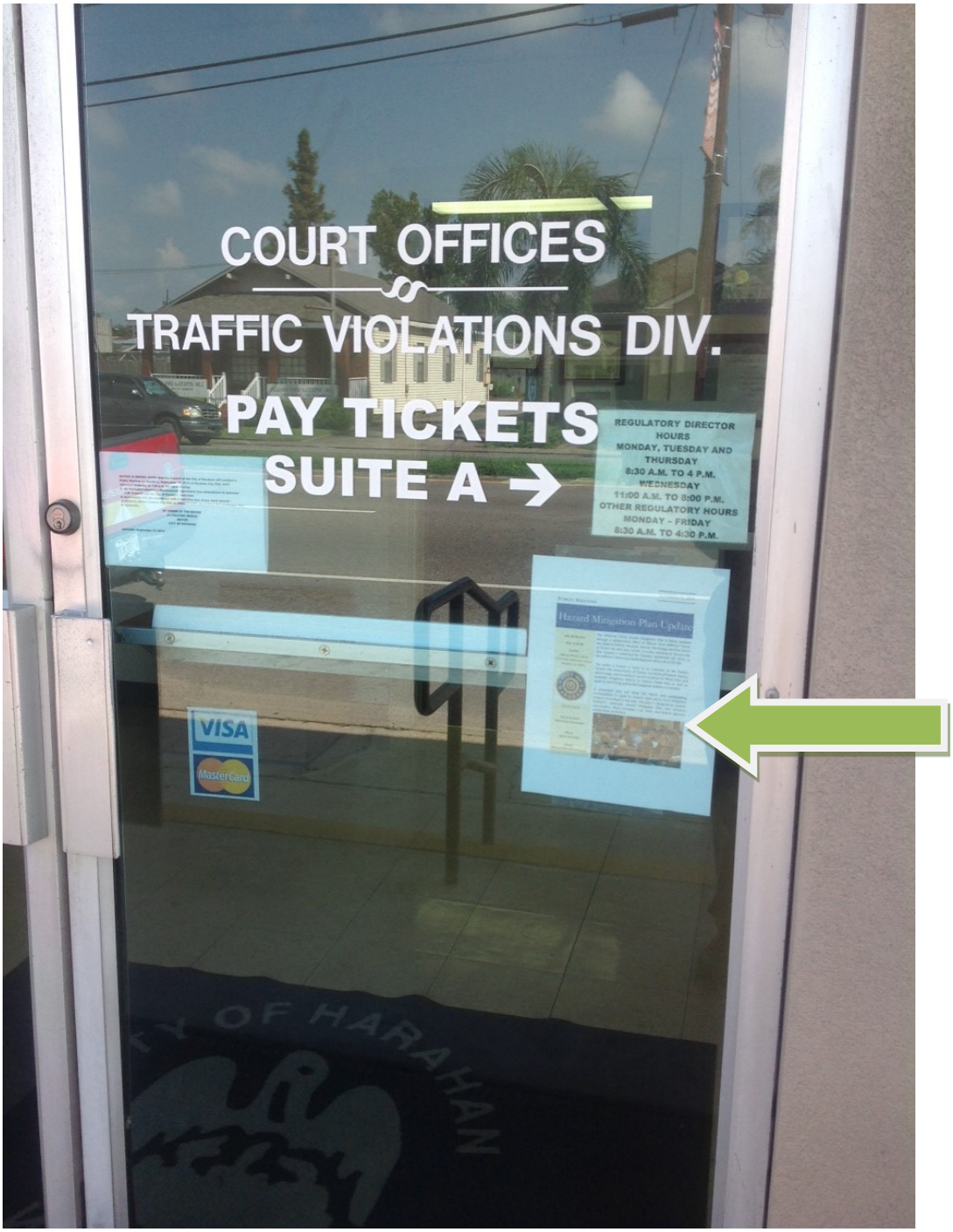
Contact

City of Westwego

Phone:
(504) 341-3424

E-mail:
LisaTapia@cityofwestwego.com

Example of Posting on City of Harahan's City Hall



Public Meeting #2 Agenda

Jefferson Parish Hazard Mitigation Plan Update

Meeting – September 30, 2014
10:30 AM-12:30 PM
Jefferson Parish EB Regional Library

1) Welcome/Sign-In/Introductions

2) Mitigation Plan Update
   a. Review Schedule of Tasks
   b. Discuss Resolutions and Plan Adoption
   c. Review Assessments
      i. View PowerPoint Presentation
      ii. Complete activity
      iii. Discuss hurricane events

3) Other Business
   a. Next meeting date/location: _____
   b. Meeting goals: _____

Notes/Comments:

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Public Meeting #2 Meeting Minutes

1. Welcome/Sign-In/Introductions

Ms. Gonzales welcomed everyone to the meeting and introduced herself and representatives from Jefferson Parish and the separate municipalities who were in attendance. Staff and attendees were asked to sign the sign-in sheet. The sign-in sheet is included below. Ms. Gonzales gave a brief recap on the purpose and process of the Multi-Jurisdictional Hazard Mitigation Plan that Jefferson Parish is in the process of updating.

2. Mitigation Plan Update

a. Review Schedule of Tasks

Ms. Olivier informed the group that the team is finalizing the hazard profiles. She has been sending them one by one to GOHSEP for initial review. This process is going well as it is helpful getting feedback as we update each profile to ensure all the necessary components are included. The team will be shifting focus for the next 3-4 weeks to work on the risk assessments. The goal is to send a draft of the plan update to GOHSEP by early November 2014.

b. Discuss Resolutions and Plan Adoption

All of the resolutions have been approved. Regarding plan adoption, FEMA is asking for at least 10 weeks to review the plan. The team's goal is to have the document to Council as Approval Pending Adoption (APA) by February 2015.

c. Review Assessments

i. View PowerPoint Presentation

In accordance with FEMA requirements, the plan only addresses natural hazards. Ms. Gonzales gave an overview of the hazards to be included in the plan, some of which included flood, hurricanes, tropical storms, lightning, and tornadoes. She explained how some hazards result from other hazards. For instance, storm surge often results from the strong winds of hurricanes and tropical storms. This overlap can make it challenging to assessing the different risks.

ii. Complete activity

The audience was asked to complete an activity where they proposed mitigation actions for the top hazards identified at the first public meeting. With each hazard topic, Ms. Gonzales discussed a few of the mitigation actions completed in recent years in Jefferson Parish. The team reviewed the strategies listed in the 2010 mitigation plan. While the group will continue to work towards those projects not complete, the team would like to incorporate new ideas as we move forward.

iii. Discuss hurricane events

The Mitigation Planning Team led an open discussion with the audience on past hurricane events and what they experienced during those events to help better describe the profile narratives.

Some of the guiding questions included: What was your experience? How deep did the water get? How long were you out of work? Etc...

H. Gustav – Affected mostly Upper Jefferson. Gretna mostly suffered from wind damage.

H. Ike – Mostly affected Lower Jefferson.

T.S. Ida – Caused a lot of beach erosion in Grand Isle.

T.S. Lee – Mostly affected lower Jefferson. Only a few homes flooded in Lafitte as they were able to hold most of the water back.

H. Isaac – The Parish shut down for Isaac. There were extended power outages for over a week; parts of Metairie were out of power for up to seven days and Westwego for four days. Lafitte was issued a mandatory evacuation which was good because they were inundated. The current levee system does not protect Lafitte or Grand Isle from flooding.

The discussion shifted onto mitigation. One audience member pointed out that when you get rid of the water, you get subsidence from drying out the land. She suggested we include permeable landscaping, rain swells and rain gardens in our proposed projects.

The Director of Hazard Mitigation for Orleans Parish shared a success story of their drainage projects. Their drainage improvements have made great impacts on flooding in that they see a lot less flooding now. The City of Gretna also stated how better building codes, drainage projects, and elevation grants have all helped to alleviate the risk of flooding in Gretna. The City of Kenner shared that sentiment as they have a lot of Severe Repetitive Loss (SRL) properties and elevating these homes has significantly helped. They also have been adding in landscaping to slow down runoff in their comprehensive zoning plans.

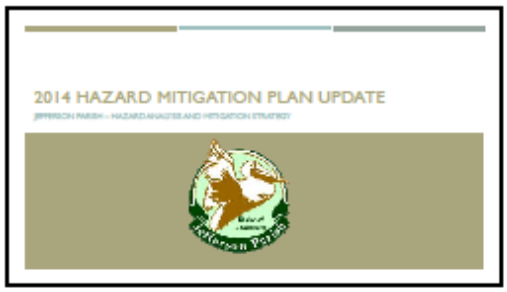
A representative from GOHSEP made the point the mitigation is to protect "life" AND "property". Lightning is a constant risk; one of the highest risk areas in the country. Approximately $50 million in damage has been reported from lightning vs $1 million in damages from wildfires. While elevating homes is an effective strategy for flooding, the mitigation strategy for lightning could be to educate the public to go inside when they see lightning.

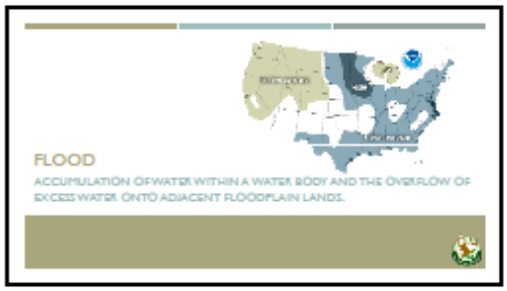
One final topic included tornadoes. Eleven recorded tornadoes have hit Jefferson Parish since 2008. In Westwego, tornadoes often hit one particular neighborhood that is fairly new. Knowing that this neighborhood is a hot spot for tornadoes can help developers look for

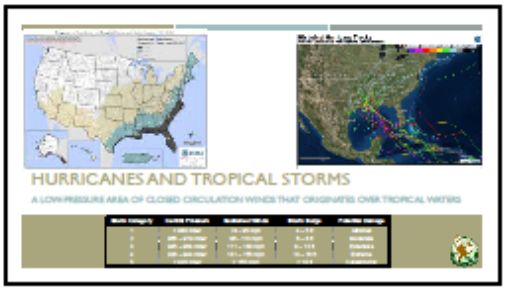
other “problem” areas when looking to expand development. Ms. Gonzales concluded the discussion with this statement: “While we need to try to prevent flooding, we also need to be looking at other hazards.”

The meeting adjourned at 11:55 AM.

PowerPoint Presentation







HURRICANES AND TROPICAL STORMS IN JEFFERSON PARISH

History since 2000

- Aug. 3, 2000 – TS Edouard
- Sept. 1, 2000 – Hurricane Gordon – Category 2
- Sept. 11, 2000 – Hurricane Ike – Category 2
  - Caused substantial damage in lower jefferson in areas such as Lafitte and Grand Isle
    - Flooding from storm surge
    - Trees and Utility Poles knocked down
- Nov. 9, 2009 – TS Ida
  - Beach erosion, losses threatened barrier island degradation
- Sept. 2, 2011 – TS Lee
  - Storm surge and rainfall
- Aug. 28, 2012 – Hurricane Isaac – Category 1
  - 48+ hours of TS force winds
    - Downed trees and power lines, roof damage
  - Storm Surge flooding in coastal areas

LIGHTNING

BUILDUP OF CHARGED IONS IN A THUNDERCLOUD; THE DISCHARGE OF A LIGHTNING BOLD INTERACTS WITH THE BEST CONDUCTING OBJECT OR SURFACE ON THE GROUND

LIGHTNING IN JEFFERSON PARISH

Occurrences since 2000

- April 4, 2012 – struck a home in old jefferson causing a fire
- Strikes occur regularly but no other damage has been documented

TORNADOS

RAPIDLY ROTATING VORTEX OR FUNNEL OF AIR EXTENDING GROUND WARD FROM A CUMULONIMBUS CLOUD

TORNADOS IN JEFFERSON PARISH

Occurrences since 2000

Location	Date	Magnitude	Damage
Reidin	3/19/1998	EF1	13 homes; 1 injury
Waterrage	4/5/2000	EF1	50 no information; damaged; 15 destroyed
Metairie	5/14/2009	EF0	Trees, fences, and the roofs
Waterrage	12/15/2009	EF0	Snapped tree limbs, power poles and lines
Hickam Airport	3/9/2011	EF0	Power poles and fences; trees uprooted; 1 house damaged by fallen tree
Grand Isle	3/13/2011	EF0	Downed power lines and 1 roof damaged
Grand Isle	3/9/2012	EF1	Roof and siding damage
Terrytown	12/30/2012	EF0	Gas station sign and restaurant canopy
Kenner	4/14/2013	EF0	Snapped trees, overturned a car
Hickam Airport	4/14/2013	EF1	Downed power lines, light poles, bits of fences
Grand Isle	6/19/2013	EF0	Power lines snapped, roof damage

MITIGATION ACTIONS

Current Actions

- Round current losses
- Add backup power to lift stations, pump stations, and EJ EMS medical centers
- Promote Flood Insurance
- Increase public awareness
- Sponsor a multi-hazard week
- Pursue elevation and flood proofing of SL and RL
- Possible drainage projects
- Adopt International Building Codes
- Develop subdivisions guidelines help to reduce flooding

Future Actions

- Continued mitigation of SRL and RL properties
  - Elevation
  - Acquisitions
  - Higher building codes
- Continued retrofit of government buildings
  - Windows
  - Roofs
  - Generators
- Retrofit critical infrastructure
- Increased flood and storm surge prevention

CONTACT INFO

Thanks for attending and participating

Audience Activity

Name: _____ HMP Update Public Meeting 2

Activity

Top 5 Identified Hazards in JP	Proposed Mitigation Actions
Floods	
Hurricanes/Tropical Storms	
Storm Surge	
Sea Level Rise	
Coastal Erosion	

Sample of Audience Responses

Name: Vicki Holmes

HMP Update Public Meeting 2

Activity

Top 5 Identified Hazards in JP	Proposed Mitigation Actions
Floods	Elevation ① Floodproofing ② Retention / Detention ponds - use existing parks?
Hurricanes/Tropical Storms	① Harden critical facilities ② Underground power lines
Storm Surge	Offshore barriers
Sea Level Rise	
Coastal Erosion	① Beach restoration ② offshore reefs / barriers / breakers

Name: Dorothea Dell (Mass)

HMP Update Public Meeting 2

Activity

Top 5 Identified Hazards in JP	Proposed Mitigation Actions
Floods	Plant trees, create rain gardens & bioswales to clean water & slow it before it enters the lake. Retention ponds aerated by solar power + Roofs + paving ~~interstitial roads~~ are crucial! Require permeable surfaces. NO slabs - perhaps a cap on amount of paved surfaces.
Hurricanes/Tropical Storms	Evacuate and take your chances.
Storm Surge	
Sea Level Rise	Reduce carbon emissions! Millions of gas operated leaf blowers, mowers, blowers (def unregulated + unlicensed + anything goes). Inefficient gas guzzling SUV's. CONSERVE IN ALL THINGS. Climate Change is real!
Coastal Erosion	Insurance to cover damage cost.

Proposed Mitigation Actions
- Water retention ponds - eco Friendly Bio Swalls - Planting plants/trees/vegitation that soak up & filter water

Name: Rece Hodges

HMP Update Public Meeting 2

Activity

Top 5 Identified Hazards in JP	Proposed Mitigation Actions
Floods	- Do community outreach to educate the public about on-site rain garden & retention ponds - Retrofit pumping stations → what's their current state - How does runoff impact soil & water quality?
Hurricanes/Tropical Storms	- There wasn't much in the presentation on hurricane wind damage. Are their mobile home parks in the area that may be vulnerable? I've seen tie downs / clamps effectively used to mitigate wind damage!
Storm Surge	- Wetland redevelopment
Sea Level Rise	- Long term sustainability outreach for the public regarding the impact of personal actions & Climate change (maybe a long shot, but interesting!)
Hail Storms	- Building codes related to roofing - Mobile Home focused actions

Name: Mike Stewart

HMP Update Public Meeting 2

Activity

Top 5 Identified Hazards in JP	Proposed Mitigation Actions
Floods	W. Metairie Drainage Canal ~~Up~~ Upgrade Reconstruct Streets & Utilities lower essentially reducing crown of street Rain Barrels! Permeable Driveways
Hurricanes/Tropical Storms	Wind Retrofit Education Outreach
Storm Surge	River Diversions Environmental Credits → Alligator Bend Example
Sea Level Rise	Barrier Construction along Bayous to Prevent Erosion => Jean La Fitte Blvd right before Goose Bayou for example
Land Subsidence	SAME as Storm Surge & Sea Level Rise

Public Meeting #2 Sign-In Sheet

Sign In Sheet

Name	Title	Community/Agency	Email Address	Initial
Michelle Gonzales	Director - Floodplain Mgmt	Jefferson Parish	mgonzales@jeffparish.net	MG
Maggie Olivier	Floodplain/CRS Specialist	Jefferson Parish	molivier@jeffparish.net	MLO
Danika Gorrondona	Building Official/Director	City of Gretna	dgorrondona@gretnala.com	DG
Michael Wesley	IT Manager	City of Gretna	mwesley@gretnala.com	
Jeff Charlet	Director - Regulatory Dept	City of Harahan	jeff.charlet@ci.harahan.la.us	JC
Aimee Vallot	Director - Inspection/Code	City of Kenner	avallot@kenner.la.us	
Dana Fink	Secretary - Inspection/Code	City of Kenner	dfink@kenner.la.us	
Theresa Armstrong	Planner/GIS Specialist	City of Kenner	tarmstrong@kenner.la.us	
Lisa Tapia	CRS Coordinator	City of Westwego	lisatapia@cityofwestwego.com	
Nora Combel	Building Official	Town of Grand Isle	nora_combel@yahoo.com	
Yvette Crain	Town Clerk	Town of Jean Lafitte	ycrain@townofjeanlafitte.com	YC.
Nicolette English	Hazard Mitigation Planner	GOHSEP	nicolette.english@la.gov	NE
Jonathan Smith	ISO/CRS Specialist	ISO	jonathan.smith@verisk.com	
Suzie Sumpter	Hazard Mitigation Specialist	HGA	ssumpter@hga-llc.com	
Billy Poche	Project Manager	HGA	bpoche@hga-llc.com	
Melonie Ellzey	Hazard Mitigation Specialist	HGA	mellzey@hga-llc.com	

September 30, 2014 JP Hazard Mitigation Plan Update Meeting 2 Jefferson Parish EB Regional Library - Metairie

Sign In Sheet

Name	Title	Community/Agency	Email address
Vicki Holmes			vicki.holmes@cox.net
Wise Andrews		SDMI, LSU	andrews1@lsu.edu
Grace Barnes	GIS	JP GIS	GBARNES2@JEFFPARISH.NET
Ridley Boudreaux	EIS Director	J.P.	rboudreaux@jeffparish.net
Aimee C. Vallot	Code Enf. Dir.	City of Kenner	avallot@kenner.la.us
Lisa Tapia	CRS	Westwego	lisatapia@cityofwestwego.com
Brad Case	Director of Mitigation City of New Orleans		bwcase@nolaiq.gov
Reece Hodges	Student	Tulane	rhodges3@tulane.edu
Mike Stewart	Proj. Coordinator	ZHA	mstewart@zha-engineers.com
Dorothea Dell	interested citizen		dorotheadell@msn.com

September 30, 2014 JP Hazard Mitigation Plan Update Meeting 2 Jefferson Parish EB Regional Library - Metairie

*Follow up was conducted with the Town of Grand Isle through phone calls after the meeting.

Public Meeting #2 Photo of the Mitigation Planning Team

Mitigation Planning Team (MPT) Meeting #2

The second MPT meeting was held on October 21, 2014 at the Mel Ott Center located at 2301 Belle Chasse Highway in Gretna. The meeting began at 10:30 AM.

MPT Meeting #2 Agenda

Jefferson United Mitigation Professionals (JUMP)

Monthly Meeting – October 21, 2014
10:30 AM-12:30 PM
Mel Ott Center

1) Welcome/Sign-In
2) Mitigation Plan Update
   a. Finalize Worksheets (just a few blanks left)
   b. Discuss Status of Plan Components
3) Outreach Banner
   a. Review Layout Idea
   b. Vote on Slogan
4) PPI Development
   a. Review Public Information Inventory
   b. Collect Additional Names for Committee
   c. Identify Target Audiences
5) Other Business
   a. Upcoming Webinars and Conferences (see handout)
   b. FLOAT Updates?
   c. Next Meeting Date/Location: _____
   d. Meeting Goals: _____

Notes:

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MPT Meeting #2 Meeting Minutes

(Note: These minutes only describe agenda item 2-Mitigation Plan Update)

2. Mitigation Plan Update

a. Finalize Worksheets

Ms. Olivier led the discussion on what was needed to finalize the worksheets that GOHSEP required. Harahan needs to confirm whether or not they have a Capital Improvements Plan, Stormwater Management Plan, Capital Improvements project funding, and the authority to levy taxes for specific purposes. Kenner needs to confirm whether or not they have the capability to do HAZUS Analysis and if they have a natural disaster or safety related school program.

b. Discuss Status of Plan Components

Twelve hazard profiles have been submitted to the state (GOHSEP) for initial review. GOHSEP and FEMA have approved tornadoes, lightning, and hailstorms. Storm surge-a little more data has been added to Hurricane Isaac narrative. Floods-we are awaiting SCADA data to note the rainfall amounts for the highlighted events. Also, with the help of the Jefferson Parish GIS Department, we will be adding FIRM representations separated out by jurisdiction in this section.

Subsidence and coastal erosion will need more extent for the jurisdictions. GOHSEP suggested we use the data in the map packages they created for the state plan but are having challenges with accessing them at this time.

MPT Meeting #2 Sign-In Sheet

Sign In Sheet

Name	Title	Community/Agency	Email Address	Initial
Michelle Gonzales	Director - Floodplain Mgmt	Jefferson Parish	mgonzales@jeffparish.net	
Maggie Olivier	Floodplain/CRS Specialist	Jefferson Parish	molivier@jeffparish.net	MLO
Danika Gorrondona	Building Official/Director	City of Gretna	dgorrondona@gretnala.com	
Michael Wesley	IT Manager	City of Gretna	mwesley@gretnala.com	
Jeff Charlet	Director - Regulatory Dept	City of Harahan	jeff.charlet@ci.harahan.la.us	
Aimee Vallot	Director - Inspection/Code	City of Kenner	avallot@kenner.la.us	
Dana Fink	Secretary - Inspection/Code	City of Kenner	dfink@kenner.la.us	
Theresa Armstrong	Planner/GIS Specialist	City of Kenner	tarmstrong@kenner.la.us	
Lisa Tapia	CRS Coordinator	City of Westwego	lisatapia@cityofwestwego.com	
Yvette Crain	Town Clerk	Town of Jean Lafitte	ycrain@townofjeanlafitte.com	
Jonathan Smith	ISO/CRS Specialist	ISO	jonathan.smith@verisk.com	
Pam Lightfoot	Floodplain Mgmt Program Coord/CRS Specialist for the State	LaDOTD	pam.lightfoot@la.gov	
Monica Farris	Director	UNO-CHART	mateets@uno.edu	MTF
Suzie Sumpter	Hazard Mitigation Specialist	HGA	ssumpter@hga-llc.com	
Melonie Ellzey	Hazard Mitigation Specialist	HGA	mellzey@hga-llc.com	

October 21, 2014 JUMP CRS Meeting Mel Ott Center in Gretna

*Follow up was conducted with the Town of Grand Isle through phone calls after the meeting.

Appendix B
Summary of Changes

As part of the Jefferson Parish 2015 Hazard Mitigation Plan (HMP) Update Process, the updated plan was formatted to comply with the guidelines given in FEMA's Local Mitigation Planning Handbook. In addition to the requirements/suggestions given in this Handbook, the Interim Final Rule (IFR) was utilized and the plan was updated to comply with those rules as well.

The general design of the plan was modified to provide a more "streamlined" approach to the HMP so that it is better used in carrying out the identified strategies. The most notable of these changes is the combining of the Hazard profiles, rankings, and risk assessments into one section. The municipality vulnerability to each hazard is also located within the same section, allowing persons using the HMP to locate all hazard information in one location of the Plan.

Plans Reviewed:

- City of Gretna Flood Hazard Mitigation Plan
- Coastal Wetland Conservation and Restoration Plan
- Comprehensive Drainage Master Plan
- Debris Removal Plan
- FIRMs
- Flood Insurance Study, Jefferson Parish, LA, Incorporated and Unincorporated Areas, November 9, 2012
- Jefferson Parish Comprehensive Plan
- Jefferson Parish Emergency Operations Plan
- Louisiana State Hazard Mitigation Plan 2014
- Southeast Louisiana Hurricane Preparedness Study 1994
- State Coastal 2050 Plan
- State of Louisiana Wetlands Conservation and Restoration Plan
- Stormwater Management Plan
- Wetlands Conservation and Restoration Plan

Appendix C

Memorandum of Agreement for a Multi-Jurisdictional Hazard Mitigation Planning Team Resolutions

and

Adoption Resolutions

Memorandum of Agreement for a Multi-Jurisdictional Hazard Mitigation Planning Team Resolutions

Jefferson Parish

On joint motion of all Councilmembers present, the following resolution was offered:

RESOLUTION NO. 123441

A resolution ratifying a Memorandum of Agreement between the Parish of Jefferson, City of Gretna, Town of Grand Isle, City of Harahan, Town of Jean Lafitte, City of Kenner, and City of Westwego relative to establishing a commitment in the development of the Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan Update 2015. (Parishwide)

WHEREAS, in March of 2014, the Federal Emergency Management Agency (FEMA) notified Jefferson Parish that the current Jefferson Parish Hazard Mitigation Plan will expire in March of 2015; and

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation projects; and

WHEREAS, in July of 2014, the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) provided Jefferson Parish with funding to assist in the development of the Jefferson Parish Hazard Mitigation Plan Update; and

WHEREAS, Jefferson Parish seeks to complete a Multi-Jurisdictional Hazard Mitigation Plan to include all municipalities within Jefferson Parish; and

WHEREAS, it is in the best interest of all parties and the citizens of Jefferson Parish to provide commitment and cooperation in the development this Multi-Jurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED, by the Jefferson Parish Council, the governing authority of said Parish:

SECTION 1. That the Council Chairman does hereby ratify the terms of the Memorandum of Agreement between the Parish of Jefferson City of Gretna, Town of Grand Isle, City of Harahan, Town of Jean Lafitte, City of Kenner, and City of Westwego relative to establishing a commitment in the development of the Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan Update 2015.

SECTION 2. That there shall be no cost for Jefferson Parish pursuant to this agreement.

SECTION 3. That the Chairman of the Jefferson Parish Council, on in his absence the Vice-Chairman, be and is authorized to execute any and all documents necessary to give full force and effect to this resolution.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 6 **NAYS: None** **ABSENT: (1) Roberts**

The resolution was declared to be adopted on this the **27th day of August, 2014.**

THE FOREGOING IS CERTIFIED
TO BE A TRUE & CORRECT COPY

Eula A. Lopez

EULA A. LOPEZ
PARISH CLERK
JEFFERSON PARISH COUNCIL

City of Gretna

On motion by **Councilman Rau** and seconded by **Councilman Crosby,** the following resolution was offered:

RESOLUTION NO. 2014-046

A resolution authorizing Mayor Belinda C. Constant to enter into a Memorandum of Agreement (MOA) for a Multi-Jurisdictional Hazard Mitigation Planning Team on behalf of the City of Gretna, Louisiana.

WHEREAS, "Participating jurisdictions" in this MOA are Parish of Jefferson; Town of Grand Isle; City of Gretna; City of Harahan; Town of Jean Lafitte, City of Kenner and City of Westwego; and

WHEREAS, the purpose of this MOA is to establish commitment from and a cooperative working relationship between all Participating Jurisdictions in the development and implementation of the Jefferson Parish Hazard Mitigation Plan Update 2015; and

WHEREAS, the intent of this MOA is to ensure that the multi-jurisdictional hazard mitigation plan is developed in accordance with Title 44 of the Federal Code of Regulations (CFR) Part 201.6; and

WHEREAS, that the planning process will be conducted in an open manner involving community stakeholders; that will be consistent with each participating jurisdiction's policies, programs and authorities; and will be an accurate reflection of community's values; and

WHEREAS, this MOA sets out the responsibilities of all parties and identifies the work to be performed by each participating jurisdiction.

NOW, THEREFORE, BE IT RESOLVED, by the City Council, acting as legislative authority for the City of Gretna, Louisiana that:

Mayor Belinda C. Constant is hereby authorized to enter into a Memorandum of Agreement (MOA) for a Multi-Jurisdictional Hazard Mitigation Planning Team on behalf of the City of Gretna, Louisiana.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

Yeas: **Council Members Rau, Crosby, Miller, Marino and Berthelot**

Nays: None

Absent: None

ADOPTED: AUGUST 13, 2013

/S/ NORMA-JEAN CRUZ
CITY CLERK
CITY OF GRETNA
STATE OF LOUISIANA

/S/ BELINDA C. CONSTANT
MAYOR
CITY OF GRETNA
STATE OF LOUISIANA

A TRUE COPY:

CITY CLERK
CITY OF GRETNA

City of Harahan

The following resolution was offered unanimously by the Council:

RESOLUTION NO. 2014 - 515

A resolution ratifying a Memorandum of Agreement between the Parish of Jefferson, City of Gretna, Town of Grand Isle, City of Harahan, Town of Jean Lafitte, City of Kenner, and City of Westwego relative to establishing a commitment in the development of the Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan Update 2015. (Parishwide)

WHEREAS, in March of 2014, the Federal Emergency Management Agency (FEMA) notified Jefferson Parish that the current Jefferson Parish Hazard Mitigation Plan will expire in March of 2015;

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation projects;

WHEREAS, in July of 2014, the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) provided Jefferson Parish with funding to assist in the development of the Jefferson Parish Hazard Mitigation Plan Update;

WHEREAS, Jefferson Parish seeks to complete a Multi-Jurisdictional Hazard Mitigation Plan to include all municipalities within Jefferson Parish; and

WHEREAS, it is in the best interest of all parties and the citizens of Jefferson Parish to provide commitment and cooperation in the development of this Multi-Jurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED, by the Harahan City Council, acting as governing authority of said city that:

SECTION 1. The Harahan City Council does hereby commit to the efforts that will result in a Memorandum of Agreement between the Parish of Jefferson, City of Gretna, Town of Grand Isle, City of Harahan, Town of Jean Lafitte, City of Kenner, and City of Westwego relative to establishing a commitment in the development of the Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan Update 2015.

SECTION 2. There shall be no cost for the City of Harahan pursuant to this agreement.

SECTION 3. The Mayor of the City of Harahan, and in his absence, the Mayor Pro Tempore, be and is authorized to execute any and all documents necessary to give full force and effect to this resolution.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: Baudier, Chatelain, Huete, Landry, Murray
NAYS: None
ABSENT: None
ABSTENTION: None

And this resolution was declared adopted on the 21st day of August, 2014.

Provino Mosca
Mayor
City of Harahan

Nicole Lee
City Clerk
City of Harahan

City of Kenner

On motion of Councilmember DeFrancesch, seconded by Councilmember Conley, the following resolution was offered:

RESOLUTION NO. B-16525

A RESOLUTION APPROVING A MEMORANDUM OF AGREEMENT BETWEEN CITY OF KENNER, PARISH OF JEFFERSON, CITY OF GRETNA, TOWN OF GRAND ISLE, CITY OF HARAHAN, TOWN OF JEAN LAFITTE, AND CITY OF WESTWEGO RELATIVE TO ESTABLISHING A COMMITMENT IN THE DEVELOPMENT OF THE JEFFERSON PARISH MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE 2015

WHEREAS, in March of 2014, the Federal Emergency Management Agency (FEMA) notified Jefferson Parish that the current Jefferson Parish Hazard Mitigation Plan will expire in March of 2015; and,

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation projects; and,

WHEREAS, in July of 2014, the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) provided Jefferson Parish with funding to assist in the development of the Jefferson Parish Hazard Mitigation Plan Update; and,

WHEREAS, the City of Kenner desires to coordinate with Jefferson Parish to complete a Multi-Jurisdictional Hazard Mitigation Plan that will include all municipalities within Jefferson Parish; and,

WHEREAS, it is in the best interest of all parties and the citizens of Kenner to provide commitment and cooperation in the development of this Multi-Jurisdictional Hazard Mitigation Plan Update.

THE COUNCIL FOR THE CITY OF KENNER HEREBY RESOLVES:

SECTION ONE: That a Memorandum of Agreement between City of Kenner, Parish of Jefferson, City of Gretna, Town of Grand Isle, City of Harahan, Town of Jean Lafitte, and City of Westwego relative to establishing a commitment in the development of the Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan Update 2015 is hereby approved.

SECTION TWO: That pursuant to Section 3.09 of the Charter for the City of Kenner of 1974, amended, the Mayor of the City of Kenner is authorized to execute all contracts, agreements, instruments of debt and the like for which the City is obligated.

This resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 7
NAYS: 0
ABSENT: 0
ABSTAINED: 0

This resolution was declared adopted on this, the 7th day of August, 2014.

Natalie Hall
CLERK OF THE COUNCIL

Maria C. De Francesch
PRESIDENT OF THE COUNCIL

Michael S. Yenni
MAYOR

City of Westwego

On motion by Councilman Nobles, and seconded by Councilman Toups, the following resolution was introduced:

RESOLUTION 2014-08(B)

A resolution authorizing Mayor John I. Shaddinger, on behalf of the City of Westwego, to execute any and all documents necessary to enter into the Memorandum of Agreement between the Parish of Jefferson, City of Gretna, Town of Grand Isle, City of Harahan, Town of Jean Lafitte, City of Kenner, and City of Westwego relative to establishing a commitment in the development of the Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan Update 2015.

WHEREAS, in March of 2014, the Federal Emergency Management Agency (FEMA) notified Jefferson Parish that the current Jefferson Parish Hazard Mitigation Plan will expire in March of 2015; and

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation projects; and

WHEREAS, in July of 2014, the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) provided Jefferson Parish with funding to assist in the development of the Jefferson Parish Hazard Mitigation Plan Update; and

WHEREAS, Jefferson Parish seeks to complete a Multi-Jurisdictional Hazard Mitigation Plan to include all municipalities within Jefferson Parish; and

WHEREAS, it is in the best interest of all parties and the citizens of Jefferson Parish to provide commitment and cooperation in the development this Multi-Jurisdictional Hazard Mitigation Plan Update.

NOW THEREFORE, IT IS HEREBY RESOLVED, by the Mayor and City Council of the City of Westwego, Louisiana, acting as full governing authority of said City that:

Mayor John I. Shaddinger, Jr. is hereby authorized, on behalf of the City of Westwego, to execute any and all documents necessary to enter into the Memorandum of Agreement between the Parish of Jefferson, City of Gretna, Town of Grand Isle, City of Harahan, Town of Jean Lafitte, City of Kenner, and City of Westwego relative to establishing a commitment in the development of the Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan Update 2015.

The foregoing resolution having been read in full, the roll was called on the adoption thereof, and the resolution was adopted by the following votes:

Yeas: Green, Nobles, Fonseca, Toups, Warino
Nays: None
Abstained: None
Absent: None

Adopted: Monday, August 11, 2014

John I Shaddinger, Jr., Mayor

Michelle A. Norris, City Clerk

Town of Grand Isle

RESOLUTION NO. 2674

A resolution ratifying a Memorandum of Agreement between the Parish of Jefferson, City of Gretna, Town of Grand Isle, City of Harahan, Town of Jean Lafitte, City of Kenner, and City of Westwego relative to establishing a commitment in the development of the Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan Update 2015. (Parish wide)

WHEREAS, in March of 2014, the Federal Emergency Management Agency (FEMA) notified Jefferson Parish that the current Jefferson Parish Hazard Mitigation Plan will expire in March of 2015; and

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation projects; and

WHEREAS, in July of 2014, the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) provided Jefferson Parish with funding to assist in the development of the Jefferson Parish Hazard Mitigation Plan Update; and

WHEREAS, Jefferson Parish seeks to complete a Multi-Jurisdictional Hazard Mitigation Plan to include all municipalities within Jefferson Parish; and

WHEREAS, it is in the best interest of all parties and the citizens of Jefferson Parish to provide commitment and cooperation in the development this Multi-Jurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED, by the Jefferson Parish Council, the governing authority of said Parish:

SECTION 1. That the Council Chairman does hereby ratify the terms of the Memorandum of Agreement between the Parish of Jefferson City of Gretna, Town of Grand Isle, City of Harahan, Town of Jean Lafitte, City of Kenner, and City of Westwego relative to establishing a commitment in the development of the Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan Update 2015.

SECTION 2. That there shall be no cost for Jefferson Parish pursuant to this agreement.

SECTION 3. That the Chairman of the Jefferson Parish Council, on in his absence the Vice-Chairman, be and is authorized to execute any and all documents necessary to give full force and effect to this resolution.

This resolution was offered by Council Member Clifford Santiny, Jr. and seconded by Council Member Lafont.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: Ray Santiny, Lafont, Clifford Santiny, Jr., Bladsacker

NAYS: Resweber

ABSENT: 0

This resolution was declared adopted this 23rd day of September, 2014

David J. Camardelle, Mayor
Town of Grand Isle

ATTESTED:

Ray A. Santiny, Town Clerk
Town of Grand Isle

Town of Jean Lafitte

RESOLUTION #1855

On motion by Councilman Smith and seconded by Councilman Creppel the following resolution was adopted:

> A resolution ratifying a Memorandum of Agreement between the Parish of Jefferson and the Town of Jean Lafitte relative to establishing a commitment in the development of the Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan Update 2015.

WHEREAS, in March of 2014, the Federal Emergency Management Agency (FEMA) notified Jefferson Parish that the current Jefferson Parish Hazard Mitigation Plan will expire in March of 2015; and

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation projects; and

WHEREAS, in July of 2014, the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) provided Jefferson Parish with funding to assist in the development of the Jefferson Parish Hazard Mitigation Plan Update; and

WHEREAS, Jefferson Parish seeks to complete a Multi-Jurisdictional Hazard Mitigation Plan to include all municipalities within Jefferson Parish; and

WHEREAS, it is in the best interest of all parties and the citizens of the Town of Jean Lafitte to provide commitment and cooperation in the development this Multi-Jurisdictional Hazard Mitigation Plan Update.

WHEREAS, the Mayor is authorized to execute any and all documents necessary to give full force and effect to this resolution.

NOW, THEREFORE, BE IT RESOLVED, by the Mayor and Councilmen of the Town of Jean Lafitte a municipal corporation domiciled in the Parish of Jefferson acting as governing authority of said town:

This resolution was submitted to a vote and the vote was thereon as follows:

YEAS: 4
Councilman Bartholomew
Councilman Creppel
Councilman Guillie
Councilman Smith

NAYS: 0

ABSENT: 1
Councilman LeBeau

This resolution was hereby adopted
On this 13th day of August 2014.

Timothy J. Stein
Mayor

Yvette Crain
Town Clerk

Adoption Resolutions

Jefferson Parish

On motion of **Mr. Lagasse**, and seconded by **Mr. Roberts,** present, the following resolution was offered:

RESOLUTION NO. 124846

A resolution authorizing the Jefferson Parish Council to adopt the revised 2015 Multijurisdictional Hazard Mitigation Plan Update prepared and completed by Jefferson Parish Floodplain Management and Hazard Mitigation Department, Jefferson Parish Incorporated Municipalities, and Hunt, Guillot & Associates, LLC (HGA), under contract RP-0311, utilizing funding provided from HMGP Grant #4080-0005-051(3-P). (Parishwide)

WHEREAS, Jefferson Parish previously received approval from the Federal Emergency Management Agency (FEMA) the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010 and said plan is required to be revised every five (5) years; and

WHEREAS, Jefferson Parish recognizes the threat that natural hazards pose to people within Jefferson Parish; and

WHEREAS, Jefferson Parish Floodplain Management and Hazard Mitigation with Jefferson Parish Incorporated Municipalities and HGA has prepared a multi-hazard mitigation plan, hereby known as 2015 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, The 2015 Multijurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Jefferson Parish from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2015 Multijurisdictional Hazard Mitigation Plan Update as of April 15, 2015; and

WHEREAS, Adoption by the Jefferson Parish Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2015 Multijurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED by the Jefferson Parish Council of Jefferson Parish, Louisiana, acting as governing authority of said Parish:

SECTION 1. The adoption of the updated Jefferson Parish Hazard Mitigation Plan 2015, as approved by FEMA, is hereby granted.

SECTION 2. The Chairman of the Jefferson Parish Council or in his absence, the Vice Chairman, is hereby authorized to sign and approve any and all documents necessary to give full force and effect to this resolution.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 7 **NAYS: None** **ABSENT: None**

The resolution was declared to be adopted on this the **29th day of April, 2015.**

THE FOREGOING IS CERTIFIED
TO BE A TRUE & CORRECT COPY

Eula A. Lopez

EULA A. LOPEZ
PARISH CLERK
JEFFERSON PARISH COUNCIL

City of Gretna

On motion of **Councilman Rau** and seconded by **Councilman Crosby,** the following resolution was offered:

RESOLUTION NO. 2015-029

A resolution authorizing the City of Gretna Council to adopt the revised 2015 Multi-Jurisdictional Hazard Mitigation Plan Update prepared and completed by City of Gretna, Jefferson Parish Floodplain Management and Hazard Mitigation Department and Hunt, Guillot & Associates, LLC (HGA), utilizing funding provided from HMGP Grant #4080-0005-051(3-P). (Parishwide)

WHEREAS, City of Gretna previously received approval from the Federal Emergency Management Agency (FEMA) the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010 and said plan is required to be revised every five (5) years; and

WHEREAS, City of Gretna recognizes the threat that natural hazards pose to people within Jefferson Parish; and

WHEREAS, City of Gretna, Jefferson Parish Floodplain Management and Hazard Mitigation with HGA has prepared a multi-hazard mitigation plan, hereby known as 2015 Multi-Jurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, The 2015 Multi-Jurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Gretna from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2015 Multi-Jurisdictional Hazard Mitigation Plan Update as of April 15, 2015; and

WHEREAS, adoption by the Gretna City Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2015 Multi-Jurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED, by the City Council of the City of Gretna, acting as legislative authority of said City, that:

SECTION 1. The adoption of the updated Jefferson Parish Hazard Mitigation Plan 2015, as approved by FEMA, is hereby granted.

SECTION 2. Mayor Belinda C. Constant is hereby authorized to sign and approve any and all documents necessary to give full force and effect to this resolution.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

Yeas: **Councilmen Rau, Crosby, Marino, Miller and Berthelot**

Nays: None

Absent: None

ADOPTED: MAY 13, 2015

/S/ NORMA J. CRUZ
CITY CLERK
CITY OF GRETNA
STATE OF LOUISIANA

/S/ BELINDA C. CONSTANT
MAYOR
CITY OF GRETNA
STATE OF LOUISIANA

A TRUE AND CORRECT COPY:

Norma J. Cruz

CITY CLERK
CITY OF GRETNA

City of Harahan

The following Resolution was offered unanimously by the Council of the City of Harahan.

RESOLUTION NO. 2015 - 531

A resolution authorizing the City of Harahan Council to adopt the revised Multijurisdictional Hazard Mitigation Plan Update prepared and completed by the City of Harahan, Jefferson Parish Floodplain Management and Hazard Mitigation Department and Hunt, Guillot & Associates, LLC, utilizing funding provided from HMGP Grant #4080-0005-051(3-P).

WHEREAS, the City of Harahan previously received approval from the Federal Emergency Management Agency (FEMA) the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010, and said plan is required to be revised every five (5) years; and

WHEREAS, the City of Harahan recognizes the threat that natural hazards pose to people within the Parish of Jefferson; and

WHEREAS, the City of Harahan, Jefferson Parish Floodplain Management and Hazard Mitigation with HGA has prepared a multi-hazard mitigation plan, hereby known as 2015 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the 2015 Multijurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Harahan from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2015 Multijurisdictional Hazard Mitigation Plan Update as of April 15, 2015; and

WHEREAS, Adoption by the City of Harahan Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2015 Multijurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED by the Harahan City Council acting as the governing authority of said city that:

SECTION 1. The adoption of the updated Jefferson Parish Hazard Mitigation Plan 2015, as approved by FEMA, be granted.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: Baudier, Benton, Huete, Johnston, Wheeler
NAYS: None
ABSENT: None
ABSTENTION: None

And this resolution was declared adopted on this 21st day of May, 2015.

Nicole Lee

Nicole Lee
City Clerk

City of Kenner

On motion of Councilmember Conley, seconded by Councilmember DeFrancesch, the following resolution was offered:

RESOLUTION NO. B-16607

A RESOLUTION ADOPTING THE REVISED 2015 MULTIJURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PREPARED AND COMPLETED BY THE CITY OF KENNER, JEFFERSON PARISH FLOODPLAIN MANAGEMENT AND HAZARD MITIGATION DEPARTMENT, AND HUNT, GUILLOT & ASSOCIATES, LLC, UTILIZING FUNDING PROVIDED BY HMGP GRANT #4080-0005-051(3-P)

WHEREAS, the City of Kenner previously received approval from the Federal Emergency Management Agency (FEMA) of the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010 and said plan is required to be revised every five (5) years; and,

WHEREAS, the City of Kenner recognizes the threat that natural hazards pose to people within Jefferson Parish; and,

WHEREAS, the City of Kenner, Jefferson Parish Floodplain Management and Hazard Mitigation with HGA has prepared a multi-hazard mitigation plan, hereby known as 2015 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and,

WHEREAS, the 2015 Multijurisdictional Hazard Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Kenner from the impacts of future hazards and disaster; and,

WHEREAS, FEMA has reviewed and approved the 2015 Multijurisdictional Hazard Mitigation Plan Update as of April 15, 2015; and,

WHEREAS, adoption by the City of Kenner demonstrates commitment to hazard mitigation and achieving the goals outlined in the 2015 Multijurisdictional Hazard Mitigation Plan Update.

THE COUNCIL FOR THE CITY OF KENNER HEREBY RESOLVES:

SECTION ONE: That the updated Jefferson Parish Hazard Mitigation Plan 2015, as approved by the Federal Emergency Management Agency, is hereby adopted.

SECTION TWO: That the Mayor of the City of Kenner, in his executive capacity, is authorized to sign and approve any and all documents necessary to give full force and effect to this resolution.

This resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 7
NAYS: 0
ABSENT: 0
ABSTAINED: 0

This resolution was declared adopted on this, the 21st day of May, 2015.

Natalie Hall
CLERK OF THE COUNCIL

Keith McRaymond
PRESIDENT OF THE COUNCIL

Michael S. Yenni
MAYOR

City of Westwego

On motion by, and seconded by, All Councilmen, the following resolution was offered:

RESOLUTION 2015-05(B)

A resolution authorizing the City of Westwego to adopt the revised 2015 Multijurisdictional Hazard Mitigation Plan Update prepared and completed by Westwego, Jefferson Parish Floodplain Management and Hazard Mitigation Department and Hunt, Guillot & Associates, LLC, utilizing funding provided from HMGP Grant #4080-0005-051(3-P). (Parish wide)

WHEREAS, the City of Westwego previously received approval from the Federal Emergency Management Agency (FEMA) for the initial Hazard Mitigation Plan (HMP) on September 16, 2005 and the HMP update on March 11, 2010, and said plan is required to be revised every five (5) years; and

WHEREAS, the City of Westwego recognizes the threat that natural hazards pose to people within Jefferson Parish; and

WHEREAS, the City of Westwego, Jefferson Parish Floodplain Management, and Hazard Mitigation with HGA has prepared a multi-hazard mitigation plan, hereby known as 2015 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the 2015 Multijurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in City of Westwego from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2015 Multijurisdictional Hazard Mitigation Plan Update as of April 15, 2015; and

WHEREAS, adoption by the City of Westwego Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2015 Multijurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Westwego, Louisiana, acting as governing authority of said city, that:

SECTION 1. The adoption of the updated Jefferson Parish Hazard Mitigation Plan 2015, as approved by FEMA, is hereby granted.

SECTION 2. The Mayor of the City of Westwego or in his absence, the Mayor Pro Tempore, is hereby authorized to sign and approve any and all documents necessary to give full force and effect to this resolution.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

Yeas: Green, Nobles, Fonseca, Toups, Warino
Nays: None
Absent: None
Abstained: None

Adopted: Monday, May 11, 2015

John I. Shaddinger Jr., Mayor

Maurice T. Bourgeois, Jr., Interim City Clerk

Town of Grand Isle

RESOLUTION NO. 2685

A resolution authorizing the Town of Grand Isle Town Council to adopt the revised 2015 Multijurisdictional Hazard Mitigation Plan update prepared and completed by The Town of Grand Isle, Jefferson Parish Floodplain Management and hazard Mitigation Department and Hunt, Guillot & Associates, LLC. utilizing funding provided from HMGP #4080-0005-051(3-P). (Parishwide).

WHEREAS, The Town of Grand Isle previously received approval form the Federal Emergency Management Agency (FEMA) the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010 and said plan is required to be revised every five (5) years; and

WHEREAS, The Town of Grand Isle recognizes the threat that natural hazards pose to people within Jefferson Parish; and

WHEREAS, The Town of Grand Isle, Jefferson Parish Floodplain Management and Hazard Mitigation with HGA has prepared a multi-hazard mitigation plan, hereby known as 2015 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, The 2015 Multijurisdictional Hazard Mitigation Plan Updated identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Grand isle from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2015 Multijurisdictional Hazard Mitigation Plan Update as of April 15, 2015; and

WHEREAS, Adoption by The Town of Grand isle Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2015 Multijurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOVED BY the Town Council of the Town of Grand Isle, Jefferson Parish, Louisiana that:

SECTION 1. The adoption of the updated Jefferson Parish Hazard Mitigation Plan 2015, as approved by FEMA, be granted.

SECTION 2. the Mayor of the Town of Grand isle or in his absence, the Mayor Pro-Tempore, is hereby authorized to sign and approve any and all documents necessary to give full force and effect to this resolution.

This resolution was offered by Council Member Lafont and seconded by Council Member Ray Santiny.

Vote thereon as follows:

YEAS: Ray Santiny, Jay Lafont, Clifford Santiny, Jr.
NAYS: Stephen Resweber, Leoda Bladsacker
ABSENT: 0

This resolution was declared adopted this 9th day of June, 2015.

David J. Camardelle, Mayor
Town of Grand Isle

ATTESTED:

Ray A. Santiny, Town Clerk

Town of Jean Lafitte

RESOLUTION # 1894

On motion of Councilman Guillie and seconded by Councilman Bartholomew the following resolution was adopted:

> A resolution authorizing the Town of Jean Lafitte to adopt the revised 2015 Multijurisdictional Hazard Mitigation Plan Update prepared and completed by Town of Jean Lafitte, Jefferson Parish Floodplain Management and Hazard Mitigation Department and Hunt, Guillot & Associates, LLC, utilizing funding provided from HMGP Grant #4080-0005-051(3-P). (Parish wide)

WHEREAS, Town of Jean Lafitte previously received approval from the Federal Emergency Management Agency (FEMA) the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010 and said plan is required to be revised every five (5) years; and

WHEREAS, Town of Jean Lafitte recognizes the threat that natural hazards pose to people within Jefferson Parish; and

WHEREAS, Town of Jean Lafitte, Jefferson Parish Floodplain Management and Hazard Mitigation with HGA has prepared a multi-hazard mitigation plan, hereby known as 2015 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, The 2015 Multijurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Town of Jean Lafitte from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2015 Multijurisdictional Hazard Mitigation Plan Update as of April 15, 2015; and

WHEREAS, Adoption by the Town of Jean Lafitte demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2015 Multijurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED by the Councilman of the Town of Jean Lafitte acting as governing authority of said town:

SECTION 1. The adoption of the updated Jefferson Parish Hazard Mitigation Plan 2015, as approved by FEMA, be granted.

SECTION 2. The Mayor of the Town of Jean Lafitte, is hereby authorized to sign and approve any and all documents necessary to give full force and effect to this resolution.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 5 **NAYS: 0** **ABSENT: 0**

Councilman Bartholomew
Councilman Creppel
Councilman Guillie
Councilman LeBeau
Councilman Smith

The resolution was declared to be adopted on this 8th day of May, 2015.

Timothy J. Creppel
Mayor

Olivette Crain
Town Clerk

Appendix D

The following is a general description for each of the hazards listed below. The complete profile for each hazard can be found in Section 6.3 of the 2008 Hazard Mitigation Plan (HMP) Update.

General descriptions completed for the following natural hazards;

1. Floods
2. Hurricanes and Tropical Storms
3. Storm Surge
4. Tornadoes
5. Coastal Erosion
6. Subsidence
7. Hailstorms
8. Winter Storms
9. Lightning
10. Drought
11. Wildfires
12. Earthquakes

1. Floods

Definition of Flood Hazard

Flooding is the accumulation of water within a water body (e.g., stream, river, lake, or reservoir) and the overflow of excess water onto adjacent floodplains. As illustrated in Figure A-1, floodplains are usually lowlands adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected. Nationwide, hundreds of floods occur each year, making them one of the most common hazards in the U.S. (FEMA, 1997). There are a number of categories of floods in the U.S., including the following:

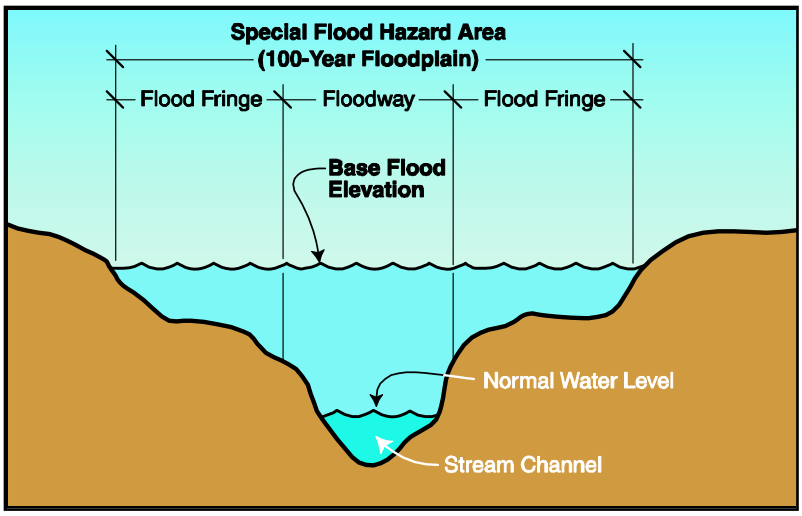
- Riverine flooding, (river channel, flash floods, alluvial fan floods, ice-jam floods, dam breaks)
- Local drainage or high groundwater levels
- Fluctuating lake levels
- Coastal flooding, including storm surges
- Debris flows
- Subsidence

Characteristics of Floods

While there is no sharp distinction between riverine floods, flash floods, alluvial fan floods, ice jam floods, and dam-break floods, these types of floods are widely recognized and may be helpful in considering the range of flood risk and appropriate responses.

The most common kind of flooding event is riverine flooding, also known as overbank flooding. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions, to wide, flat areas in plains and coastal regions. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. In steep valleys, flooding is usually rapid and deep, but of short duration, while flooding in flat areas is typically slow, relatively shallow, and may last for long periods of time.

Figure A-1
Floodplain Definition
Source: FEMA, August 2001



Flash floods involve a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes the tearing out of trees, undermining of buildings and bridges, and scouring new channels. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas, and configuration of the streambed and floodplain. Dam failure and ice jams may also lead to flash flooding.

Alluvial fan floods occur in the deposits of rock and soil that have eroded from mountainsides and accumulated on valley floors in the pattern of a fan. Alluvial fan floods often cause greater damage than overbank flooding due to the high velocity of the flow, amount of debris, and broad area affected. Human activities may exacerbate flooding and erosion on alluvial fans via increased velocity along roadways acting as temporary drainage channels or changes to natural drainage channels from fill, grading, and structures.

Ice jam flood occur when an upstream part of a river thaws first (possibly because it flows away from the equator), and the ice gets carried downstream into the still-frozen part. Masses of ice can become lodged under bridges and other wiers, causing an ice dam, flooding areas upstream of the jam. After the ice dam breaks apart, the sudden surge of water that breaks through the dam can then flood areas downstream of the jam. While this usually occurs in spring, it can happen as winter sets in when the downstream part becomes frozen first. Dam-break floods may occur due to structural failures (e.g., progressive erosion), overtopping or breach from flooding, or earthquakes.

Local drainage floods may occur outside of recognized drainage channels or delineated floodplains for a variety of reasons, including concentrated local precipitation, a lack of infiltration, inadequate facilities for drainage and stormwater conveyance, and/or increased surface runoff. Such events often occur in flat areas, particularly during winter and spring where the ground is frozen. Drainage floods are found also in urbanized areas with large impermeable surfaces. High groundwater flooding is a seasonal occurrence in some areas, but may occur in other areas after prolonged periods of above-average precipitation.

2. Hurricanes and Tropical Storms

Definition of Hurricanes and Tropical Storms

Hurricanes, tropical storms, and typhoons, collectively known as tropical cyclones, are among the most devastating naturally occurring hazards in the United States. They present flooding, storm surge, and high wind hazards to the communities that they impact.

A hurricane is defined as a low-pressure area of closed circulation winds that originates over tropical waters. A hurricane begins as a tropical depression with wind speeds below 39 mph. As it intensifies, it may develop into a tropical storm, with further development producing a hurricane. Table A-1 below identifies the criteria for each stage of development.

Table A-1
Classification of Hurricanes

Stage of Development	Criteria
Tropical Depression (development)	Maximum sustained surface wind speed is < 39 mph
Tropical Storm	Maximum sustained wind speed ranges 39 - <74 mph
Hurricane	Maximum sustained surface wind speed 74 mph+
Tropical Depression (dissipation)	Decaying stages of a cyclone in which maximum sustained surface wind speed has dropped below 39 mph

Hurricane winds blow in a large spiral around a relative calm center known as the "eye." The "eye", the storms core, is an area of low barometric pressure and is generally 20 to 30 miles wide. The storm may extend outward 100 - 400 miles in diameter. As a hurricane approaches, the skies will begin to darken and winds will grow in strength. As a hurricane nears land, it can bring torrential rains, high winds, storm surges, and severe flooding.

As shown in Table A-2, the Saffir / Simpson Hurricane Scale is used to classify storms by numbered categories. Hurricanes are classified as Categories 1 through 5 based on central pressure, wind speed, storm surge height, and damage potential.

Table A-2
Saffir/Simpson Hurricane Scale

Storm Category	Central Pressure	Sustained Winds	Storm Surge	Potential Damage
1	> 980 mbar	74 - 95 mph	4 – 5 ft	Minimal
2	965 – 979 mbar	96 - 110 mph	6 – 8 ft	Moderate
3	945 – 964 mbar	111 – 130 mph	9 – 12 ft	Extensive
4	920 – 944 mbar	131 – 155 mph	13 – 18 ft	Extreme
5	< 920 mbar	> 155 mph	> 18 ft	Catastrophic

A single hurricane can last for more than two weeks over open waters and can run a path across the entire length of the eastern seaboard. August and September are peak months during the hurricane season that lasts from June 1 through November 30.

Characteristics of Hurricanes and Tropical Storms

Hurricanes and Tropical Storms are categorized based on their wind speed. Both bring strong winds and are characterized by torrential rain that often results in widespread damage. Hurricanes can produce both extreme high winds and heavy rains. Tropical storms are most often associated with heavy rains that have the potential to produce severe flooding.

High winds from Hurricanes and Tropical Storms are capable of imposing large lateral (horizontal) and uplift (vertical) forces on buildings. Residential buildings can suffer extensive wind damage when they are improperly designed and constructed and when wind speeds exceed design levels. The effects of high winds on a building will depend on several factors:

- Wind speed (sustained and gusts) and duration of high winds
- Height of building above the ground
- Exposure or shielding of the building (by topography, vegetation, or other buildings) relative to wind direction
- Strength of the structural frame, connections, and envelope (walls and roof)
- Shape of building and building components
- Number, size, location, and strength of openings (windows, doors, vents)
- Presence and strength of shutters or opening protection
- Type, quantity, velocity of windborne debris

Proper design and construction of residential structures, particularly those close to water or near the coast, demand that every factor mentioned above be addressed. Failure to do so may result in building damage or destruction by wind. See Appendix M for recommended Stability System Design Tables for wind loads.

3. Storm Surge

Definition of Storm Surge Hazard

Storm surges occur when the water level of a tidally influenced body of water increases above the normal high tide. Storm surges occur with coastal storms caused by massive low-pressure systems with cyclonic flows that are typical of hurricanes.

Changes in the earth's surface also contribute to the effects of surges. Rising seas and erosion have led to the deterioration of the state's barrier islands and marsh, important shields against storm surge. Furthermore, erosion has caused the entire delta to sink, meaning homes, businesses and highways are becoming more susceptible to surges. New Orleans actually has pumps to keep rising seawaters from inundating the entire city, but they would hold little power in the face of a powerful hurricane.

Characteristics of Storm Surge

Storm surges are characterized by several factors that allow the displacement of water from oceans, bays or rivers to travel so far inland. A combination of relatively flat terrain and an extensive system of bayous and tidal lakes allow the surge to flow easily northward. Shallow water off the coast also adds to the problem, contributing to a higher storm surge than would occur in a location that has deeper coastal water.

Because of our coastal marshes and barrier islands, Louisiana's commercial and recreational fisheries are among the most abundant in America, providing 25 to 35 percent of the nation's total catch. Louisiana is first in the annual harvest of oysters, crabs and menhaden, and is a top producer of shrimp. Some of the best recreational saltwater fishing in North America exists off Louisiana's coast. The reason for this abundance is that our coastal marshes provide the nursery for young fish and shellfish.

Wetlands create friction and reduce high winds when hurricanes hit. They also absorb hurricane storm surges. Scientists estimate that every 2.7 miles of wetlands absorbs one foot of storm surge. The 3.5 million acres of wetlands that line Louisiana's coast today have storm protection values of $728 million to $3.1 billion.

4. Tornadoes

Definition of Tornado Hazard

A tornado is a rapidly rotating funnel (or vortex) of air that extends toward the ground from a cumulonimbus cloud. Most tornadoes do not touch the ground, but when the lower tip of a tornado touches the earth, it can cause extensive damage. Tornadoes often form in convective cells such as thunderstorms or at the front of hurricanes. Tornadoes may also result from earthquake induced fires, wildfires, or atomic bombs (FEMA, 1997). The formation of tornadoes from thunderstorms is explained in Figure A-3.

Characteristics of Tornadoes

Tornadoes in the dissipating stage can appear like narrow tubes, or ropes, twisting into all manner of curls, twists, and s-shapes. These tornadoes, such as the one pictured above, are *roping out*, or becoming a *rope tornado*. Multiple-vortex tornadoes can appear as a family of swirls circling a common center, or may be completely obscured by condensation, dust, and debris, appearing to be a single funnel. In addition to these appearances, tornadoes may be obscured completely by rain or dust. These tornadoes are especially dangerous, as even experienced meteorologists might not spot them.

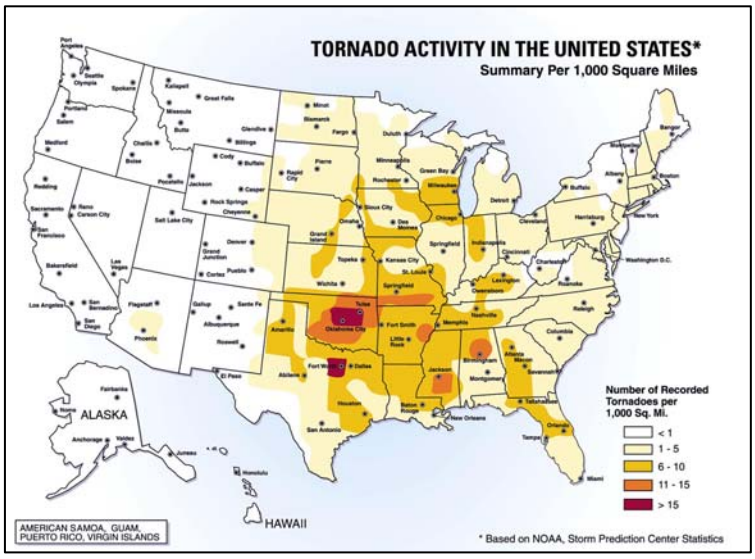
As shown in the following table, tornadoes are measured by the Fujita Scale, an empirical system that determines the severity by observed damages (last column).

Table A-3
The Fujita Tornado Scale
(Source: FEMA 1997)

Category	Wind Speed	Description of Damage
F0	40-72 mph	Light damage. Some damage to chimneys; break branches off trees; push over shallow-rooted trees; damage to sign boards.
F1	73-112 mph	Moderate damage. The lower limit is the beginning of hurricane speed. Roof surfaces peeled off; mobile homes pushed off foundations or overturned; moving autos pushed off roads.
F2	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
F3	158-206 mph	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.
F4	207-260 mph	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	261-318 mph	Incredible damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100-yards; trees debarked.

Figure A-4 illustrates the frequency of tornado strikes in the U.S. per 1,000 square miles. While tornadoes can occur in any month and at all hours of the day or night, they occur with greatest frequency during the late spring and early summer months during late afternoon and early evening hours.

Figure A-4
Historic Tornado Activity in the United States,
Summary per 1,000 Square Miles



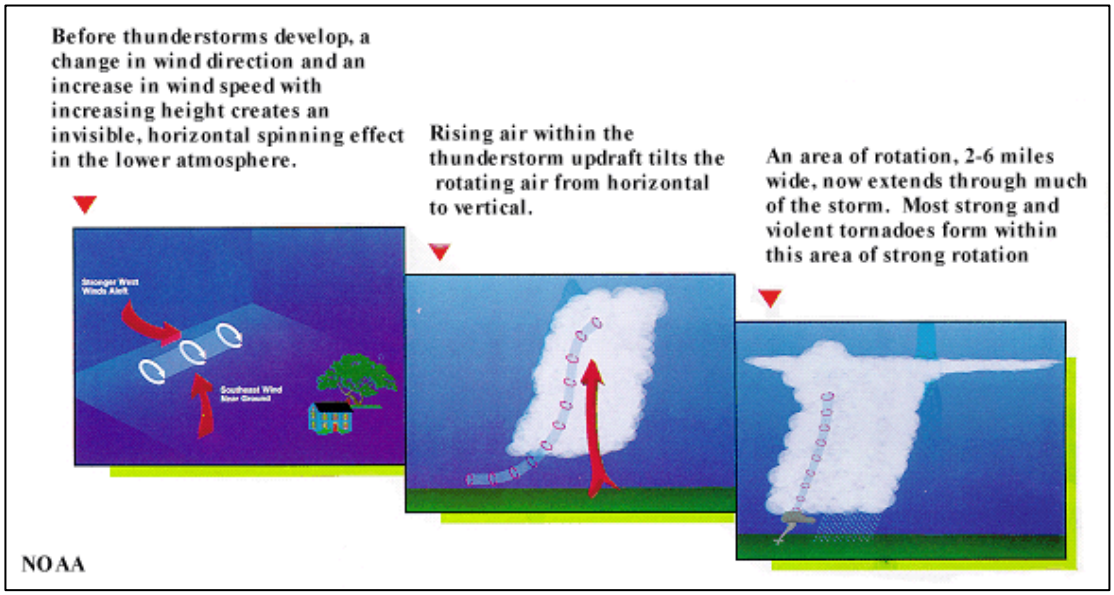
The severity and duration of tornadoes is a function of several factors, including weather conditions, topography and the F class of the event. As noted earlier, tornado severity is measured with the Fujita scale, an empirical system that classifies events after they occur. In some cases there are anomalous patterns for various reasons (including the reliability and completeness of reporting), but generally speaking smaller events are more probable, larger (more severe) ones are less likely.

Tornado duration is usually relatively short, varying from a matter of seconds to several minutes on the ground, although in rare cases they can last significantly longer. The path width of a single tornado generally is less than 0.6 miles. The path length of a single tornado can range from a few hundred yards to miles. A tornado typically moves at speeds between 30 and 125 mph and can generate internal winds exceeding 300 mph.

Figure A-5
Strong Wind Effects
Source: FEMA

Most tornadoes take on the traditional appearance of a narrow funnel, a few hundred yards across, with a small cloud of debris near the ground. Tornadoes can appear, however, in all manner of shapes and sizes.

Figure A-6
Formation of Tornadoes



Small, relatively weak landspouts might only be visible as a small swirl of dust on the ground. While the condensation funnel may not extend all the way to the ground, if associated surface winds are greater than 40 mph (64 km/h), it is considered a tornado. Large single-vortex twisters, often violent, can look like a large wedge stuck into the ground, and are known as *wedge tornadoes* or *wedges*. Wedges can be so wide that they appear to be a block of dark clouds. Even experienced storm observers may not be able to tell the difference between a low-hanging cloud and a wedge tornado from a distance.

5. Coastal Erosion

Definition of Coastal Erosion

Coastal erosion is the wearing away of land or the removal of beach or dune sediments by wave action, tidal currents, wave currents, wind, or drainage.

Characteristics of Coastal Erosion

Coastal erosion is a dynamic process that is constantly occurring at varying rates along the coasts and shorelines of the U.S. Numerous factors can influence the severity and rate of coastal erosion including human activities, tides, the possibility of rising sea levels, and the frequency and intensity of hurricanes. Strong storms and hurricanes can erode large sections of coastline with a single event. The process of coastal erosion results in permanent changes to the shape and structure of the coastline. Human activities such as poor land use practices and boating activities can also accelerate the process of coastal erosion.

Billions of dollars of economic development are potentially threatened by the impacts of coastal erosion. In a report to Congress in the year 2000 FEMA estimated that erosion may cost property owners along the coast $500 million a year in structural damages and loss of land. The report also stated as many as 87,000 residential homes may be at risk of eroding into the oceans or Great Lakes over the next 60 years.

Coastal erosion is a significant problem along the entire Louisiana Gulf Coast. The barrier islands and marshes of Louisiana provide protection for inland development during hurricanes. These islands act as a buffer and help to reduce the intensity of hurricanes as they make landfall prior to reaching more densely populated areas such as New Orleans. Tides and strong storms moving onshore from the Gulf of Mexico are eroding Louisiana's marshy coastline at an alarming rate. Erosion of several of the barrier islands, which lie offshore of the estuaries and wetlands that buffer and protect these important ecosystems from the open marine environment, exceeds 20 meters/year.

On the west coast powerful winter storms during El Nino years can cause considerable erosion along sections of the Pacific coastline. El Nino winters can include more frequent storms, large waves, and extreme high tides. Along the pacific coastline, erosion can lead to flooding, collapsed bluffs, destroyed houses and closed roads.

Figure A-8
Coastal Erosion in Pacifica, California
During El Nino Year in 1998
Source; USGS

6. Subsidence

Definition of Subsidence Hazard

Land subsidence is the loss of surface elevation due to the removal of subsurface support, ranges from broad, regional lowering of the land surface to localized collapse. In geology, engineering, and surveying, subsidence is the motion of a surface (usually, the Earth's surface) as it shifts downward relative to a datum such as sea-level. The opposite of subsidence is uplift, which results in an increase in elevation. The inhabitation of lowlands, such as coastal or delta plains, requires drainage. The resulting aeration of the soil leads to the oxidation of its organic components, such as peat, and this decomposition process may cause significant land subsidence. This applies especially when ground water levels are periodically adapted to subsidence, in order to maintain desired unsaturated zone depths, exposing more and more peat to oxygen. In addition to this, drained soils compact as result of pore-tension reduction. In this way, land subsidence has the potential of becoming self-perpetuating, collapsing at rates up to 5 cm/yr. Water management used to be tuned primarily to factors such as crop optimization but, to varying extent, avoiding subsidence has come to be taken into account as well.

If natural gas is extracted from a natural gas field the initial pressure (up to 600 bar) in the field will drop over the years. The gas pressure also supports the soil layers above the field. If the pressure drops, then the soil pressure increases and this leads to subsidence at the ground level. This type of subsidence can similarly be caused by extraction of other resources, e.g., ground water, petroleum, or rock salt.

Characteristics of Subsidence

The term subsidence commonly involves a gradual sinking, but it also refers to an instantaneous or catastrophic collapse. Subsidence is caused by a diverse set of human activities and natural processes. Different types of subsidence are address below:

- Collapse into Voids – Collapse of surficial materials into underground voids is the most dramatic form of subsidence. Most of the subsidence-related voids in the United States were created by coal mining.

- Sediment Compaction – Sediment compaction typically causes broad regional subsidence. Rates of subsidence usually are low, ranging from a few millimeters to centimeters per year, but total subsidence may reach several meters over decades. Sediment compaction results from underground fluid withdrawal, natural compaction, and hydrocompaction. Underground fluid withdrawal is one of the major causes of sediment compaction in the U.S. When fluids are withdrawn, fluid pressures decline and support of the overburden is transferred to the solid skeleton. If the reservoir soil is compressible, sediment compaction and subsidence occurs.

- Another type of sediment compaction occurs naturally as older sediment is buried by younger sediment. Natural subsidence is occurring most rapidly in the Mississippi River Delta area of southern Louisiana where approximately 1,500 mi^2 of land are subsiding.

Estimating average rates of subsidence range from 0.3 to 0.4 inches per century. Maximum rates measured by geodetic surveys are approximately 0.5 inches per year.

- Drainage of Organic Soils – Drainage of organic soils, particularly peat and muck, induces a series of processes that reduces the volume of soil. These processes include biological oxidation, compaction, and desiccation. Biological oxidation usually dominates in warm climates. The principal areas of organic soil subsidence in the United States are in the greater New Orleans and Jefferson Parish area.

- Tides and heavy storms in the Gulf are eroding Louisiana's marshy coastline at an alarming rate. Coastlines in southern Jefferson Parish are sinking or eroding away with incoming water eating at the marshes and wetlands that buffer and drain the higher drier land. Parts of Jefferson Parish's coastal evacuation routes are indeed vulnerable to storm flooding due to land subsidence. One such place is along Louisiana Highway 1.

A "triggering mechanism" can cause a change in the local environment that affects the soil mass causing subsidence. Water is the main factor affecting the local environment that causes subsidence. The main triggering mechanisms for subsidence follow.

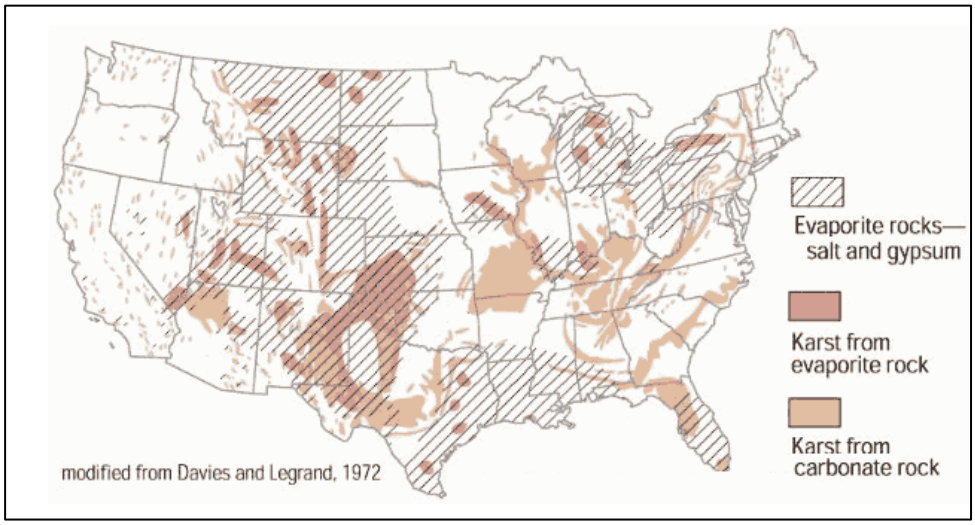
- Water level decline
- Changes in groundwater flow
- Increased loading
- Deterioration (abandoned coalmines)

Water level decline can happen naturally or be human induced. Main factors in water decline are:

- Pumping of water from wells
- Localized drainage from construction
- Dewatering
- Drought

Changes in the groundwater flow include an increase in the velocity of groundwater movement, increase in the frequency of water table fluctuations, and increased or reduced recharge.

Figure A-7
Rock Types Susceptible to Dissolution in Water
Source: USGS



7. Hailstorms

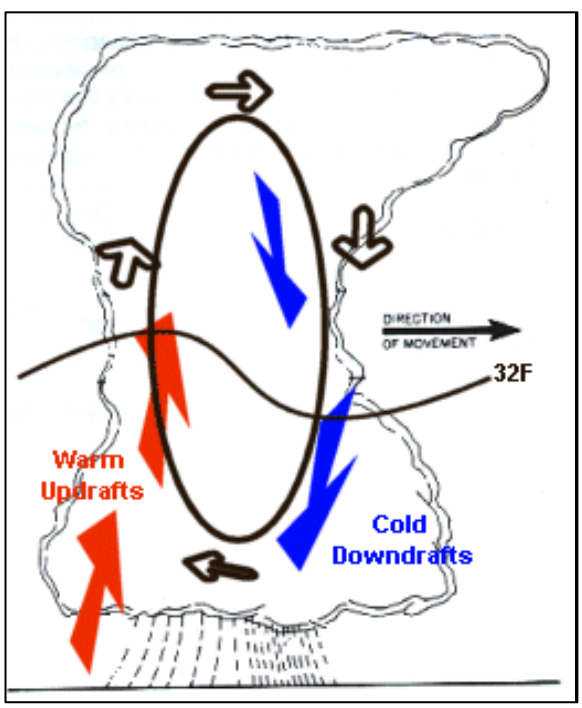
Definition of Hailstorm Hazard

Hail is defined as balls or pieces of ice falling as precipitation from a thunderstorm. Known as hailstones, these ice balls typically range from 5 mm–50 mm in diameter on average, with much larger hailstones forming in severe thunderstorms. The size of hailstones is a direct function of the severity and size of the storm.

Characteristics of Hail

Hail is an outgrowth of severe thunderstorms and develops within a low-pressure front as warm air rises rapidly in to the upper atmosphere and is subsequently cooled, as shown in Figure 6-13, leading to the formation of ice crystals. These are bounced about by high-velocity updraft winds and accumulate into frozen droplets, falling as precipitation after developing enough weight (FEMA, 1997). The National Weather Service (NWS) defines severe thunderstorms as those with downdraft winds in excess of 58 miles an hour and/or hail at least 3/4 inches in diameter. While only about 10 percent of thunderstorms are classified as severe, all thunderstorms are dangerous because they produce numerous dangerous conditions, including one or more of the following: hail, strong winds, lightning, tornadoes, and flash flooding.

Figure A-9
How Hail Is Formed



Hailstorms occur most frequently during the late spring and early summer. During this period, extreme temperature changes occur from the surface up to the jet stream, resulting in the strong updrafts required for hail formation.

The size of hailstones varies and is related to the severity and size of the thunderstorm that produced it. The higher the temperatures at the Earth's surface, the greater the strength of the updrafts, and the greater the amount of time the hailstones are suspended, giving the hailstones more time to increase in size. Hailstones vary widely in size, as shown in Table A-2. Note that penny size (3/4 inches in diameter) or larger hail is considered severe.

Table A-4
Estimating Hail Size

Size	Inches in Diameter
Pea	1/4 inch
Marble/mothball	1/2 inch
Dime/Penny	3/4 inch
Nickel	7/8 inch
Quarter	1 inch
Ping-Pong Ball	1 1/2 inch
Golf Ball	1 3/4 inches
Tennis Ball	2 1/2 inches
Baseball	2 3/4 inches
Tea Cup	3 inches
Grapefruit	4 inches
Softball	4 1/2 inches

Figure A-10
Large Hailstone
Source: NOAA

8. Winter Storms

Definition of Winter Storm Hazards

A winter storm is a type of precipitation in which the dominant varieties of precipitation are forms that only occur at cold temperatures, such as snow or sleet, or a rainstorm where ground temperatures are cold enough to allow ice to form (i.e. freezing rain). In temperate continental climates, these storms are not restricted to the winter season, and may occur in the late autumn and early spring. Also, there are very rare occasions when they form in summer, although it would have to be an abnormally cold summer, such as the summer of 1816 in the Northeast U.S. In many locations in the Northern Hemisphere, the most powerful winter storms usually occur in March and, in regions where temperatures are cold enough, April.

Figure A-11
Split Tree Caused by Ice Storm
Source: FEMA

Characteristics of Winter Storms

Winter storms typically form along a front generally following the meandering path of the jet stream. These storms, called mid-latitude cyclones or extra-tropical cyclones, differ from hurricanes, in that they move from west to east as opposed to east to west. These weather patterns carry cold air from Canada and the Rockies into the southern U.S. The origins of the weather patterns that cause winter storms in Louisiana are affected by differences in temperature and pressure, moisture availability, and wind direction as well as weather systems in the Atlantic Ocean and Gulf of Mexico.

Winter storms vary in size and strength and include heavy snowstorms, blizzards, freezing rain, sleet, ice storms and blowing and drifting snow conditions. Extremely cold temperatures accompanied by strong winds can result in wind chills that cause bodily injury such as frostbite and

death. Severe winter and ice storms can cause unusually heavy rain or snowfall, high winds, extreme cold, and ice storms throughout the continental United States.

NOAA describes the jet streams that carry storm systems across the United States as narrow bands of strong wind in the upper atmosphere that follow the boundaries between hot and cold air masses. These boundaries are most pronounced during the winter months, when the jet streams travel to their southernmost position over the United States and surrounding water.

In the last 11 winters, no region in the United States has escaped flooding during the winter months. The Southeastern and Gulf Coast states (regularly hit by autumn hurricanes) experience damaging floods in the winter months, too. No region is immune. Global warming threatens to disrupt weather patterns around the world and may increase the frequency of winter flooding.

Another weather phenomenon, El Niño, can have a significant effect on precipitation in the United States. Named by Peruvian fishermen who noticed the periodic appearance of warming surface temperatures in the Pacific Ocean around Christmas, El Niño is now understood to be the warm phase of a temperature oscillation in the Pacific Basin's water and atmosphere. The cool phase of the oscillation is nicknamed La Niña. During the warm phase, heat and moisture are released into the upper atmosphere, creating precipitation. El Niño alters the course of the jet stream - pushing it farther south than usual.

According to NOAA, El Niño winters tend to be wetter than normal in the Southeastern United States, as well, and contribute to flooding along the Gulf Coast. Storms that spin up in the Gulf of Mexico typically track northeast on the southern jet stream, bringing rain as well as ice and even snow to the Gulf states.

Winter storm occurrences tend to be very disruptive to transportation and commerce. Trees, cars, roads, and other surfaces develop a coating or glaze of ice, making even small accumulations of ice extremely hazardous to motorists and pedestrians. The most prevalent impacts of heavy accumulations of ice are slippery roads and walkways that lead to vehicle and pedestrian accidents; collapsed roofs from fallen trees and limbs and heavy ice and snow loads; and felled trees, telephone poles and lines, electrical wires, and communication towers. As a result of severe ice storms, telecommunications and power can be disrupted for days. Such storms can also cause exceptionally high rainfall that persists for days, resulting in heavy flooding.

9. Lightning

Definition of Lightning

Lightning is a powerful natural electrostatic discharge produced during a thunderstorm. This abrupt electric discharge is accompanied by the emission of visible light and other forms of electromagnetic radiation. The electric current passing through the discharge channels rapidly heats and expands the air into plasma producing acoustic shock waves (thunder) in the atmosphere.

Lightning, which occurs during all thunderstorms, can strike anywhere. Generated by the buildup of charged ions in a thundercloud, the discharge of a lightning bolt interacts with the best conducting object or surface on the ground. The air in the channel of a lightning strike reaches temperatures higher than 50,000 degrees F. The rapid heating and cooling of the air near the channel causes a shock wave, which produces thunder.

Characteristics of Lightning

Lightning typically occurs as a by-product of a thunderstorm. The action of rising and descending air in a thunderstorm separates positive and negative charges, with lightning the result of the buildup and discharge of energy between positive and negative charge areas. Water and ice particles may also affect the distribution of the electrical charge. In only a few millionths of a second, the air near a lightning strike is heated to 50,000°F, a temperature hotter than the surface of the sun. Thunder is the result of the very rapid heating and cooling of air near the lightning that causes a shock wave.

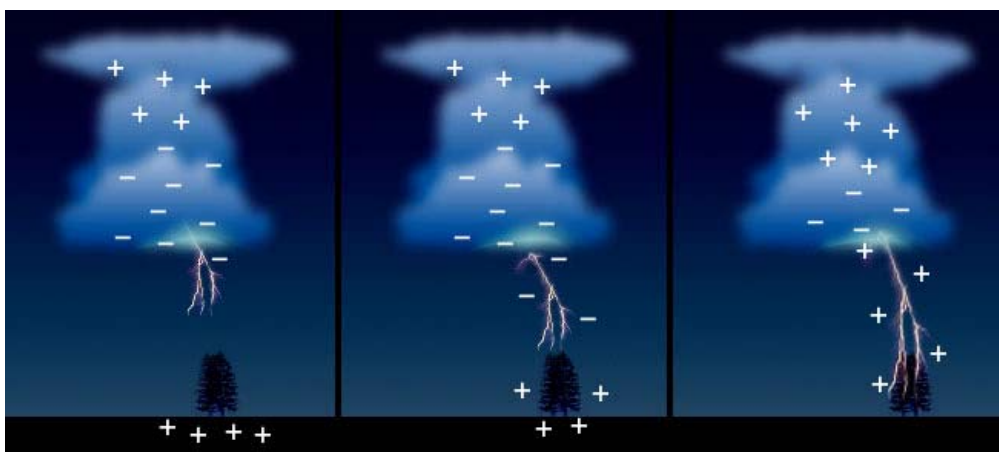


Figure A-2

Formation of Lightning
Source: University Corporation for Atmospheric Research (UCAR)

The hazard posed by lightning is significantly underrated. High winds, rainfall, and a darkening cloud cover are the warning signs for possible cloud-to-ground lightning strikes. While many lightning casualties happen at the beginning of an approaching storm, more than half of lightning deaths occur after a thunderstorm has passed. The lightning threat diminishes after the last sound of thunder, but may persist for more than 30 minutes. When thunderstorms are in the area, but not

overhead, the lightning threat continues to exist. Lightning has been known to strike more than 10 miles from the storm in an area with clear sky above.

Lightning is the most dangerous and frequently encountered weather hazard that most people in the United States experience annually. Lightning is the second most frequent killer in the U.S., behind floods and flash floods, with nearly 100 deaths and 500 injuries annually. These numbers are likely to underestimate the actual number of casualties because of the under reporting of suspected lightning deaths and injuries. Cloud-to-ground lightning can kill or injure people by either direct or indirect means.

According to the National Oceanic and Atmospheric Administration (NOAA), an average of 20 million cloud-to-ground flashes has been detected every year in the continental United States. About half of all flashes have more than one ground strike point, so at least 30 million points on the ground are struck on average each year. In addition, there are roughly 5 to 10 times as many cloud-to-cloud flashes as there are to cloud-to-ground flashes (NOAA, July 7, 2003).

Figure A-3
Lightning Bolt in Night Sky
Source: FEMA

Cloud-to-ground lightning is nearly always associated with thunderstorms and related weather phenomena. Thunderstorms occur in most warm and hot months, and occasionally at other times as well. The entire planning area is subject to the lightning hazard. While the duration of individual lightning strikes is only milliseconds, the duration of thunderstorms that create the lightning ranges from very short periods (15 minutes or less) to long periods when the storms are relatively stationary.

Damages from lightning hazards are generally limited to those related to power surges and contact with electrical equipment. In some cases ungrounded structures are hit by lightning and experience damage, either as a direct result of the lightning or via fires secondary to the hazard. There are also reports of brushfires being started by lightning, although these are usually relatively small and quickly contained. No reliable database or information exists to determine the cost of recovery from lightning.

10. Drought

Definition of Drought Hazard

A drought is an extended dry climate condition when there is not enough water to support urban, agricultural, human, or environmental water needs. It usually refers to a period of below-normal rainfall, but can also be caused by drying bores or lakes, or anything that reduces the amount of liquid water available. Drought is a recurring feature of nearly all the world's climatic regions.

Drought is the result of a decline in the expected precipitation over an extended period of time, typically one or more seasons in length. Meteorological drought is defined solely on the degree of dryness, expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales. Hydrological drought is related to the effects of precipitation shortfalls on streamflows and reservoir, lake, and groundwater levels. Agricultural drought is defined principally in terms of soil moisture deficiencies relative to water demands of plant life, usually crops. Socioeconomic drought associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of weather-related supply shortfall. This may also be called a water management drought.

Figure A-12
Boy Wheeling Water during Drought
Source: FEMA

Characteristics of Drought

Drought produces a complex web of impacts that spans many sectors of the economy and reaches well beyond the area experiencing physical drought. This complexity exists because water is integral to our ability to produce goods and provide services. Impacts are commonly referred to as direct or indirect. Reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat are a few examples of direct impacts. The consequences of these impacts illustrate indirect

impacts. For example, a reduction in crop, rangeland, and forest productivity may result in reduced income for farmers and agribusiness, increased prices for food and timber, unemployment, reduced tax revenues because of reduced expenditures, increased crime, foreclosures on bank loans to farmers and businesses, migration, and disaster relief programs.

Drought is a normal part of virtually every climate on the planet, including areas of both high and low normal rainfall. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity (FEMA, 1997). A drought's severity depends on numerous factors, including duration, intensity, and geographic extent as well as regional water supply demands by humans and vegetation. Due to its multi-dimensional nature, drought is difficult to define in exact terms and also poses difficulties in terms of comprehensive risk assessments.

Drought differs from other natural hazards in three ways. First, the onset and end of a drought are difficult to determine due to the slow accumulation and lingering effects of an event. Second, the lack of an exact and universally accepted definition adds to the confusion of its existence and severity. Third, in contrast with other natural hazards, the impact of drought is less obvious and may be spread over a larger geographic area. These characteristics have hindered the preparation of drought contingency or mitigation plans by many governments.

Droughts may cause a shortage of water for human and industrial consumption and cause a decrease in hydroelectric power. Water quality may also decline while the number and severity of wildfires may increase. Severe droughts may result in the loss of agricultural crops and forest products, undernourished wildlife and livestock, lower land values, and higher unemployment.

11. Wildfires

Definition of Wildfire Hazard

A wildfire, also known as a forest fire, vegetation fire, grass fire, brush fire, or hill fire, is an uncontrolled fire often occurring in wildland areas, which can also consume houses or agricultural resources. Common causes include lightning, human carelessness, and arson.

Wildfires are fueled by naturally occurring or non-native species of trees, brush, and grasses. Topography, fuel, and weather are the three principal factors that impact wildfire hazards and behavior.

Figure A-13
Warehouse Fire
Source: FEMA

Characteristics of Wildfires Interface

Wildfires often begin unnoticed, spread quickly, and are usually signaled by dense smoke that may fill the area for miles around. As mentioned, wildfires can be human-caused through acts such as arson or campfires, or can be caused by natural events such as lightning. Wildfires can be categorized into three types:

1. Wildland fires occur in very rural areas and are fueled primarily by natural vegetation.
2. Interface fires occur in areas where homes or other structures are endangered by the wildfires. The fires are fueled by both natural vegetation and man-made structures. These are often referred to as Wildland Urban Interface fires.

3. Firestorms occur during extreme weather (e.g., high temperatures, low humidity, and high winds) with such intensity that fire suppression is virtually impossible. These events typically burn until the conditions change or the fuel is exhausted.

The following three factors contribute significantly to wildfire behavior:

Fuel: The type of fuel and the fuel loading (measured in tons of vegetative matter per acre) have a direct impact on fire behavior. Fuel types vary from light fuels (grass) to moderate fuels (Southern Rough) to heavy fuels (slash). The type of fuel and the fuel load determines the potential intensity of the wildfire and how much effort must be expended to contain and control it.

Weather: The most variable factor affecting wildfire behavior is weather. Important weather variables are precipitation, humidity, and wind. Weather events ranging in scale from localized thunderstorms to large cold fronts can have major effects on wildfire occurrence and behavior. Extreme weather, such as extended drought and low humidity can lead to extreme wildfire activity.

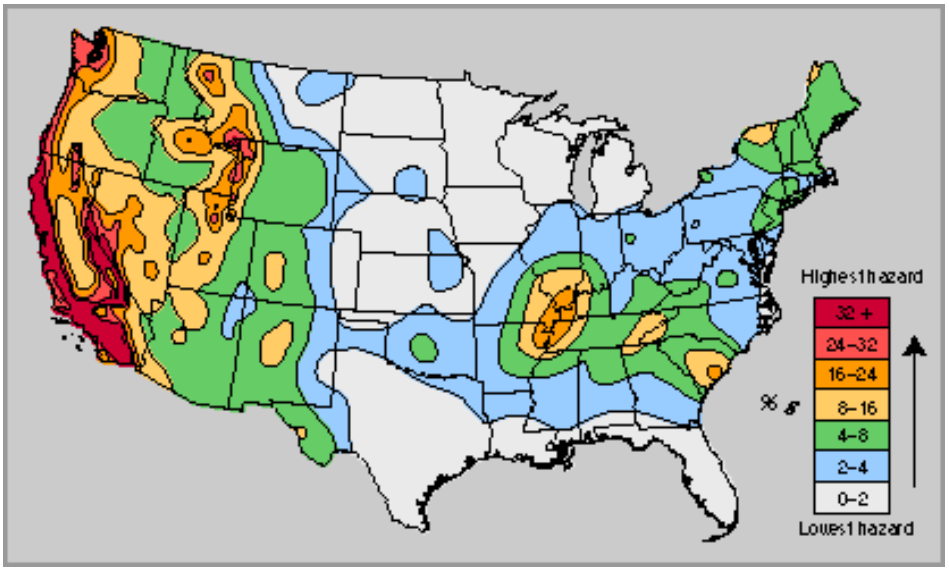
Topography; Topography can have a powerful influence on wildfire behavior. The movement of air over the terrain tends to direct a fire's course.

12. Earthquakes

Definition of Earthquake Hazard

An earthquake is "…a sudden motion or trembling caused by an abrupt release of accumulated strain in the tectonic plates that comprise the earth's crust." These rigid plates, known as tectonic plates, are some 50 to 60 miles in thickness and move slowly and continuously over the earth's interior. The plates meet along their edges, where they move away from or pass under each other at rates varying from less than a fraction of an inch up to five inches per year. While this sounds small, at a rate of two inches per year, a distance of 30 miles would be covered in approximately one million years (FEMA, 1997). Figure A-7 shows a USGS seismic probability map for the continental U.S.

Figure A-14
United States Earthquake Zones



Characteristics of Earthquakes

The vibration or shaking of the ground during an earthquake is described by ground motion. Severity of ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. Ground motion causes waves in the earth's interior, also known as seismic waves, and along the earth's surface, known as surface waves. The following are the two kinds of seismic waves:

- P (primary) waves are longitudinal or compressional waves similar in character to sound waves that cause back-and-forth oscillation along the direction of travel (vertical motion), with particle motion in the same direction as wave travel. They move through the earth at approximately 15,000 mph.

- S (secondary) waves, also known as shear waves, are slower than P waves and cause structures to vibrate from side-to-side (horizontal motion) due to particle motion at right-angles to the direction of wave travel. Unreinforced buildings are more easily damaged by S waves.
- Earthquakes are often relatively short duration, but there may be aftershocks and other effects (such as liquefaction) that prolong and exacerbate their effects. The potential for either of these effects depends on local conditions and other technical factors that are not discussed in this Plan.

There is some potential for seismic activity virtually anywhere on the earth. Locations that are close to tectonic faults, however, are much more likely to be impacted by earthquakes than other places. The United States Geologic Survey and other organizations develop maps to indicate the relatively probability of earthquakes in particular areas.

Figure A-15
Earthquake Damage
Source: FEMA