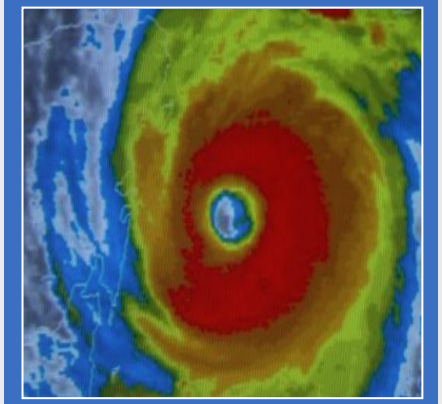



March 29, 2011

Risk and Vulnerability Workshop

Houston-Galveston Area Council

Introductions

- **Amy Boyers,** Houston-Galveston Area Council
- **John Buri,** SAIC, BDR Division
- **Bob Harriss,** Houston Advanced Research Center
- **Jeff Sjostrom,** Galveston Economic Development Partnership
- **Francisco Sanchez,** Harris County, Office of Emergency Management
- **Chuck Wemple,** Houston-Galveston Area Council

Agenda

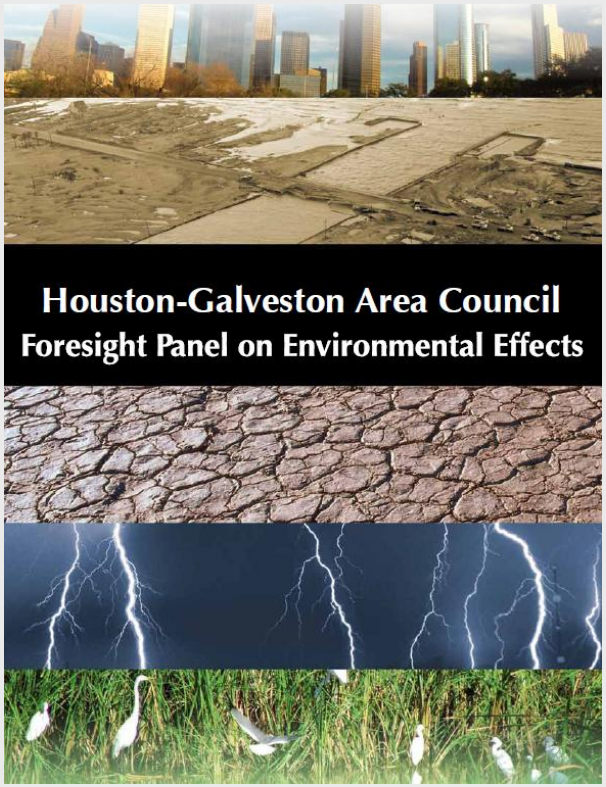
- Welcome and opening remarks
- Importance of understanding risks and vulnerabilities within the region
- Assessing organizational risks
- Impacts of risks on economic recovery
- Impacts of risk on public health and safety, government, and the environment
- Risk mitigation opportunities
- Closing remarks and speaker panel discussion

Opening Remarks

Amy Boyers – H-GAC

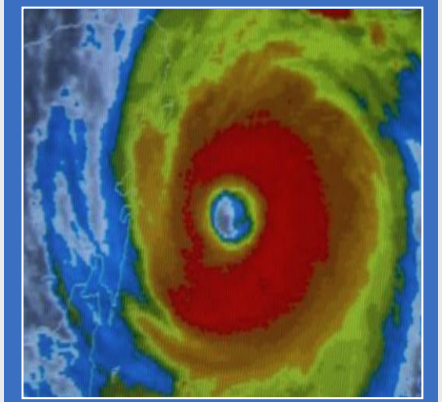
Foresight Panel on Environmental Effects Report

- Established by the H-GAC Board of Directors in 2007
- Comprised of experts in climate change and local infrastructure planning
- Recommends strategies for adaptation to climate change



Regional Adaptation Recommendations

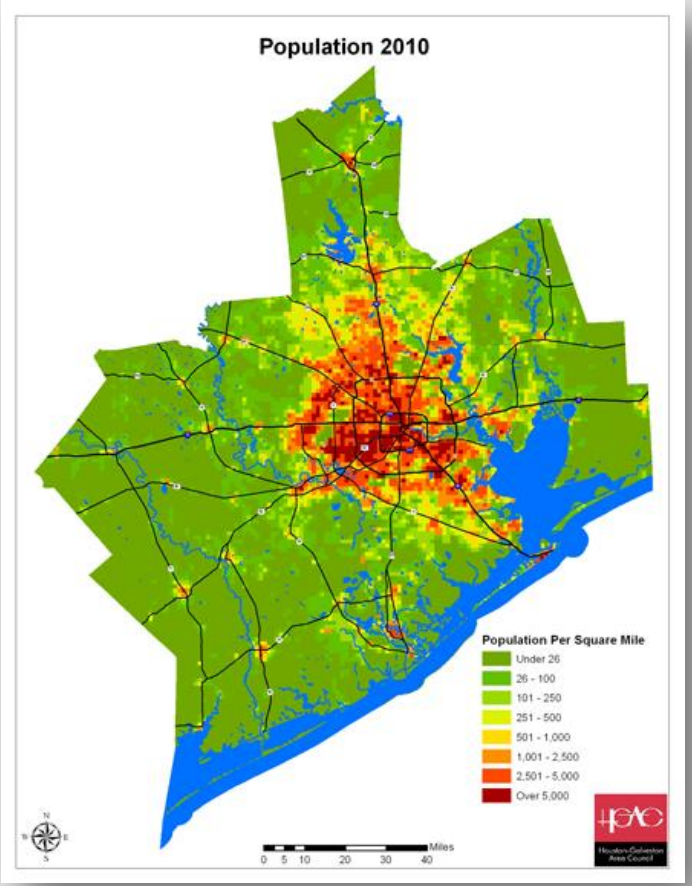
- Enhance coordination of evacuation plans and communication systems
- Review and strengthen mutual aid agreements
- Prepare for increase in wildfires due to prolonged periods without rain and higher temperatures
- Avoid construction in areas subject to sea level rise
- Advocate hurricane resistant building standards as the minimum building code for high risk areas




Importance of Understanding Risks and Vulnerabilities Within the Region

Regional Profile

- 13 counties
- 12,500 square miles
- 6,087,133 estimated population in 2010
- 26% population growth since 2000
- With continued growth, disaster events will have greater exposure and impact



Regional Profile

- Tenth largest port in the world
- 220 million tons of cargo transported each year
- Major center for oil and petrochemical industries
- Heightened vulnerability to hazardous materials incidents and acts of terrorism

Disaster Profile

FEMA

Declared Disasters by Year or State

By Year:

Year	Number of Disaster Declarations
2010	78
2009	59
2008	75
2007	63
2006	52
2005	48
2004	68
2003	56
2002	49
2001	45
2000	45
1999	50
1998	
1997	
1996	
1995	
1994	

By State:

	State	Number of disaster declared
1	Texas	84
2	California	76
3	Oklahoma	66
4	Florida	63
5	New York	61
6	Louisiana	56
7	Alabama	54
8	Kentucky	53
9	Arkansas	51
10	Missouri	50
11	Illinois	49
12	Mississippi	48

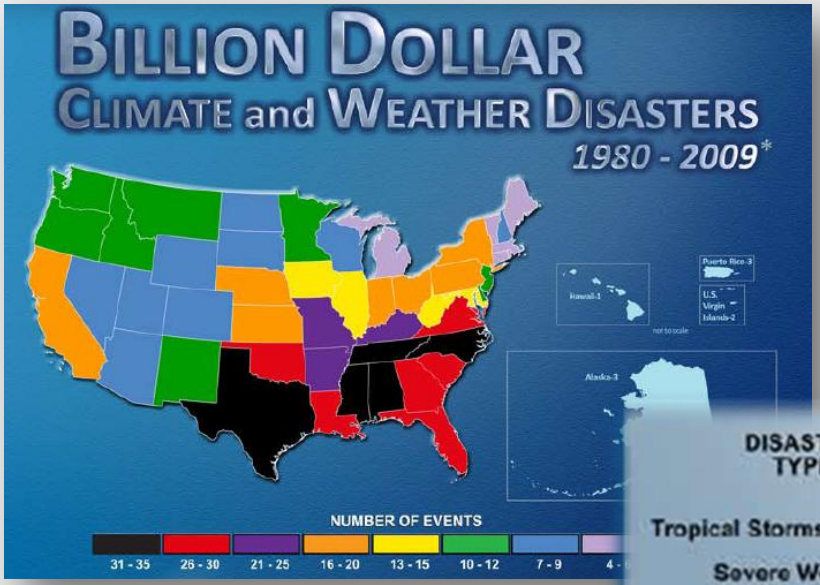
- Fires
- Tropical Storms
- Hurricanes
- Floods

By State:

	State	Number of disaster declared
1	Texas	84
2	California	76
3	Oklahoma	66

Source: Federal Emergency Management Agency

Disaster Profile



DISASTER TYPE	NUMBER OF EVENTS	PERCENT FREQUENCY	NORMALIZED DAMAGES (Billions of Dollars)	PERCENT DAMAGE
Tropical Storms/Hurricanes	27	28.1%	367.3	51.1%
Severe Weather	20	20.8%	38.4	5.3%
Heatwaves/Droughts	15	15.6%	185.2	25.7%
Non-Tropical Floods	13	13.6%	70.5	9.8%
Fires	10	10.4%	19.2	2.7%
Freezes	6	6.3%	18.6	2.6%
Blizzards	2	2.1%	11.9	1.7%
Ice Storms	2	2.1%	5.9	~0.8%
Noreaster	1	1.0%	2.2	~0.3%
	96		719.2	

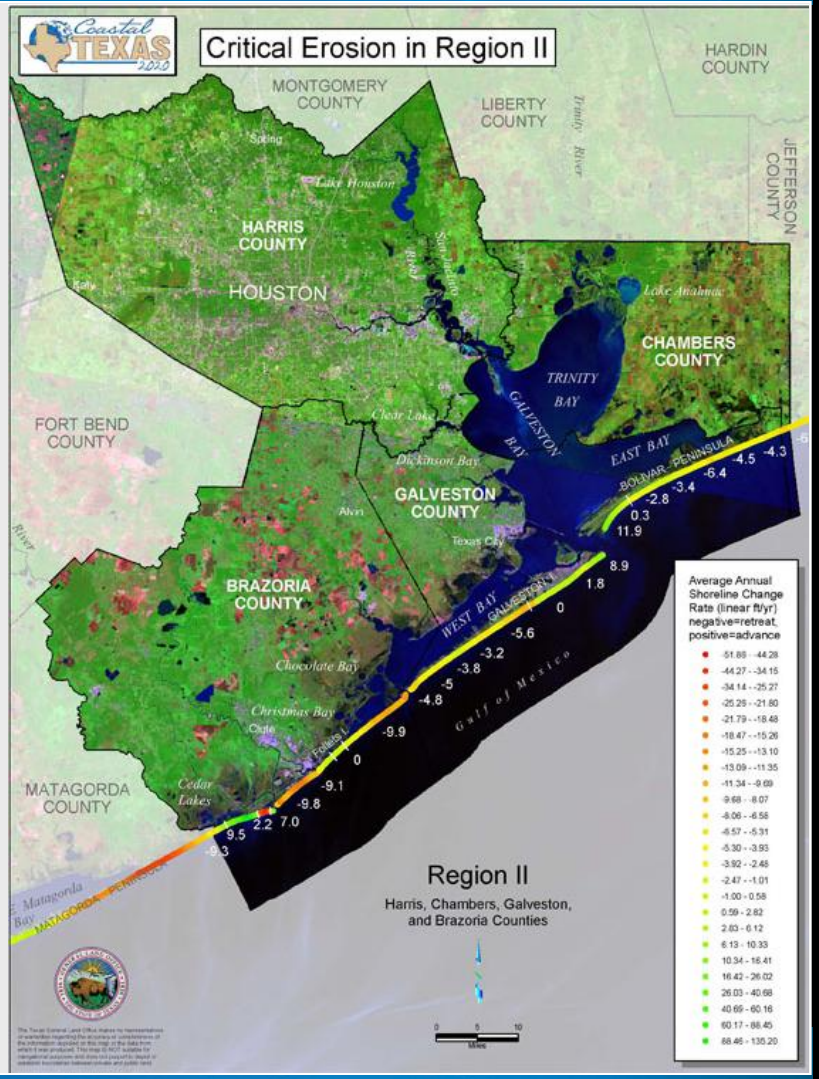
Source: National Climatic Data Center

Hazards Likely to Affect the H-GAC Region

- Flood (Riverine and Coastal)
- Hurricanes and Tropical Storms
- Severe Thunderstorms
- Tornadoes

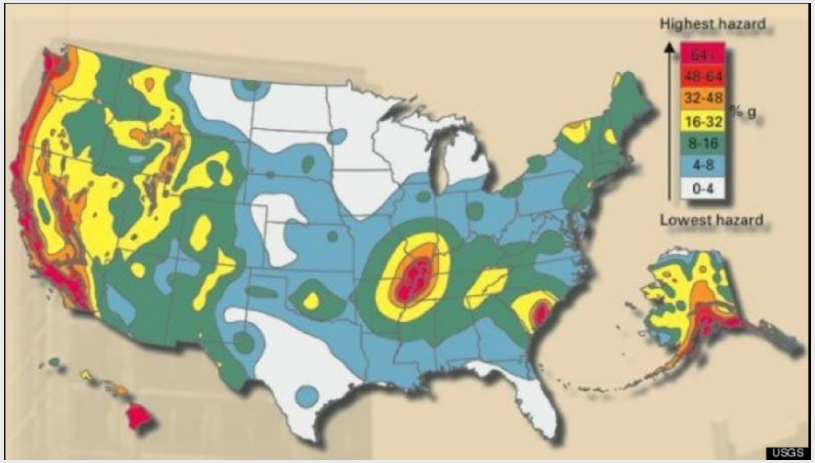
Hazards Likely to Affect the H-GAC Region

- Wildfire
- Drought
- Excessive Heat
- Winter Storms
- Hail
- Coastal Erosion



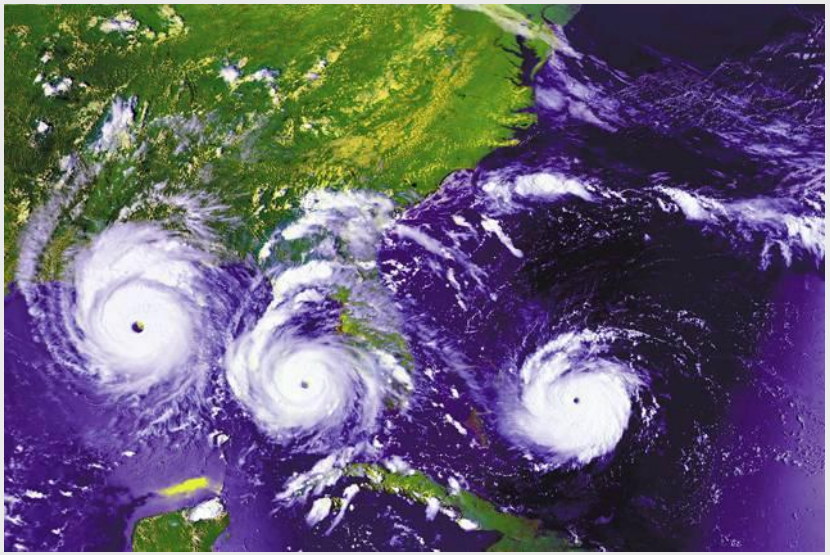
Hazards Likely to Affect the H-GAC Region

- Infrastructure failure
- Dam/Levee Failure
- Earthquakes
- Sinkholes
- Subsidence
- Tsunami



What is Climate Change?

- **Climate change** refers to major changes in temperature, rainfall, snow, or wind patterns lasting for decades or longer. Both human-made and natural factors contribute to climate change:
  - Human causes include burning fossil fuels, cutting down forests, and developing land for farms, cities, and roads. These activities all release greenhouse gases into the atmosphere.
  - Natural causes include changes in the Earth's orbit, the sun's intensity, the circulation of the ocean and the atmosphere, and volcanic activity.



Source: U.S. Environmental Protection Agency

Impact of Climate Change on Disasters

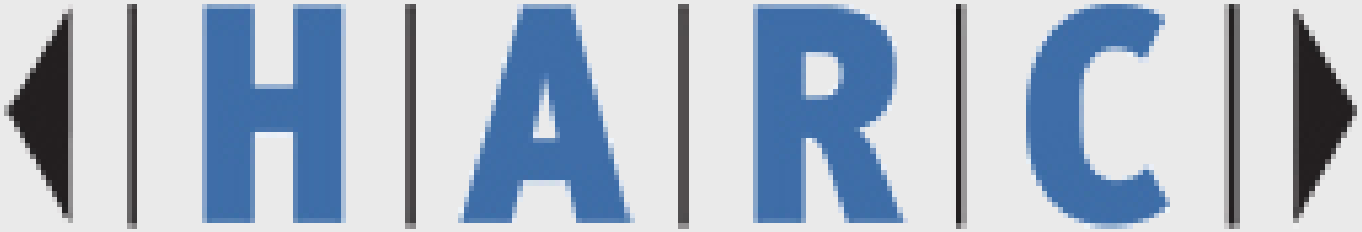
- Sea level rise
  - 100 year events, like floods, are occurring more often
  - Storms will be more severe, increasing the probability of urban flooding and storm damage
  - Amplified storm surge increases the risk of loss of life and property
- Average temperature rise
  - Heat waves are expected to occur more frequently, last for longer periods of time, and with greater intensity
  - Models suggest that for each 1 C increase in tropical sea surface temperatures, hurricane surface wind speeds will increase by 1 to 8% and core rainfall rates by 6 to 18%.

Impact of Climate Change on Disasters

- The effects of climate change are still being defined. As impacts continue to occur, there will be an increased need for adaptation and resilience.
  - **Adaptation** is defined by the Intergovernmental Panel on Climate Change as “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities”
  - **Resilience** is defined as “the capacity of a system to absorb disturbance and still retain its basic function and structure”

Guest Speaker

Dr. Bob Harriss – Houston Advanced Research Center



Risk Assessments

- A **risk assessment** identifies:
  - What are our threats and vulnerabilities
  - What needs to be protected
  - What are the implications of loss or damage
  - What is the value to the organization
  - What can be done to minimize exposure
- Risk assessments can be conducted with internal or external resources

Risk Assessments

- Traditional risk assessments involve:
  - Identifying hazards
  - Profiling hazard events
  - Assessing vulnerability
    - Inventorying assets
    - Estimating losses
    - Risks to the population

Hazard Identification

- Review state, regional and local hazard mitigation plans, reports, flood ordinances, and land use regulations
- Talk to local experts
- Review past events and declared disasters
- Search historical records, newspapers, and the internet
- Interview long-term residents or historical societies

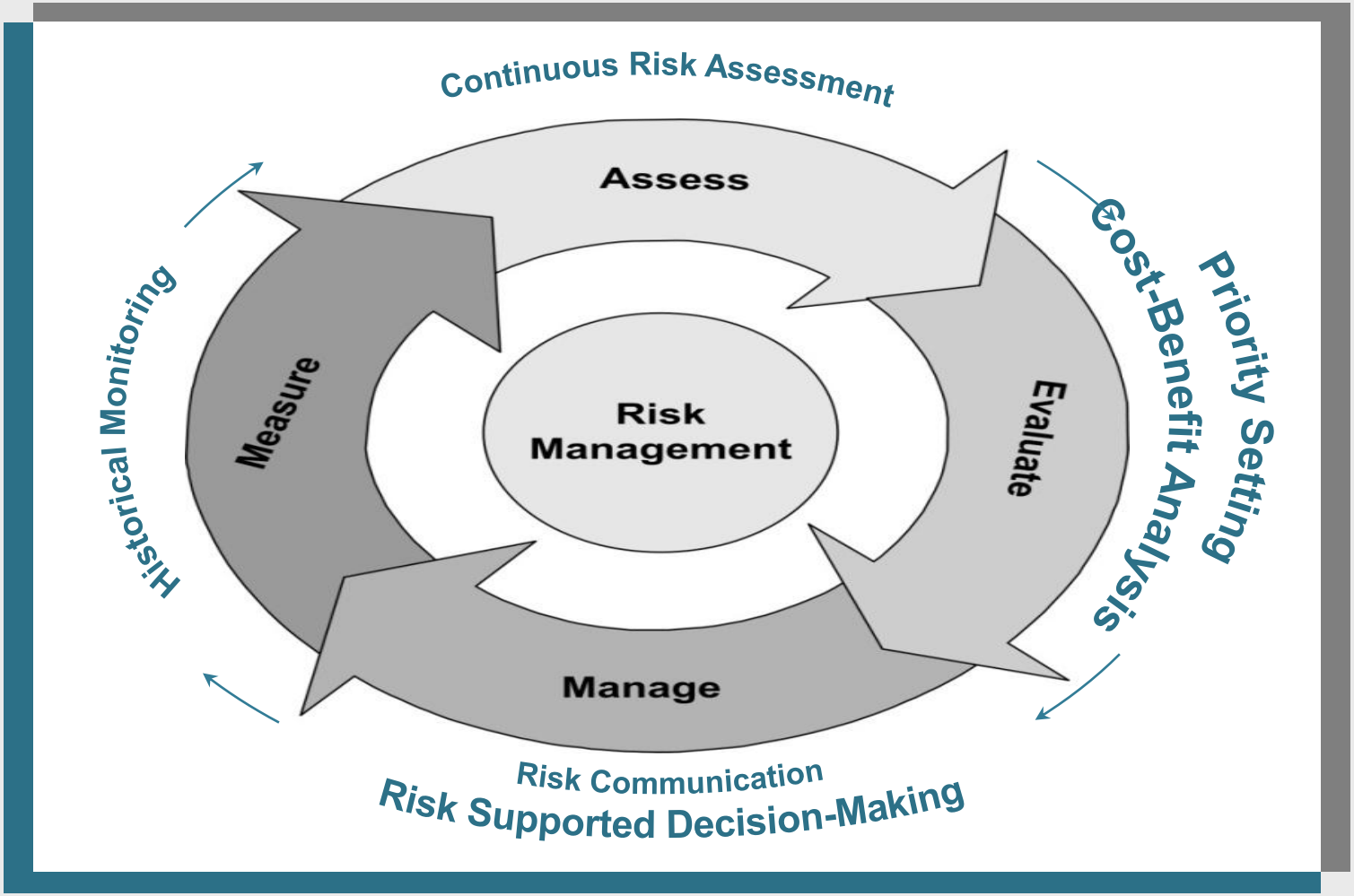
Profiling Hazards

- Describe the **location** or areas most likely to be affected.
  - Keep in mind that the some hazards affect will be more specific (like floods) and some will be more unpredictable (like tornadoes)
- Define the **extent** (also called magnitude or severity) of each hazard with a range of possible impacts
  - Flood depth in inches or feet, wind speeds in miles per hour, inches of rain, etc.
- Discuss the **probability** of the hazard to occur in the area
- Provide research on the **past occurrences** of each hazards in and around the area
  - Locations, dates, recorded intensity, damages and associated costs

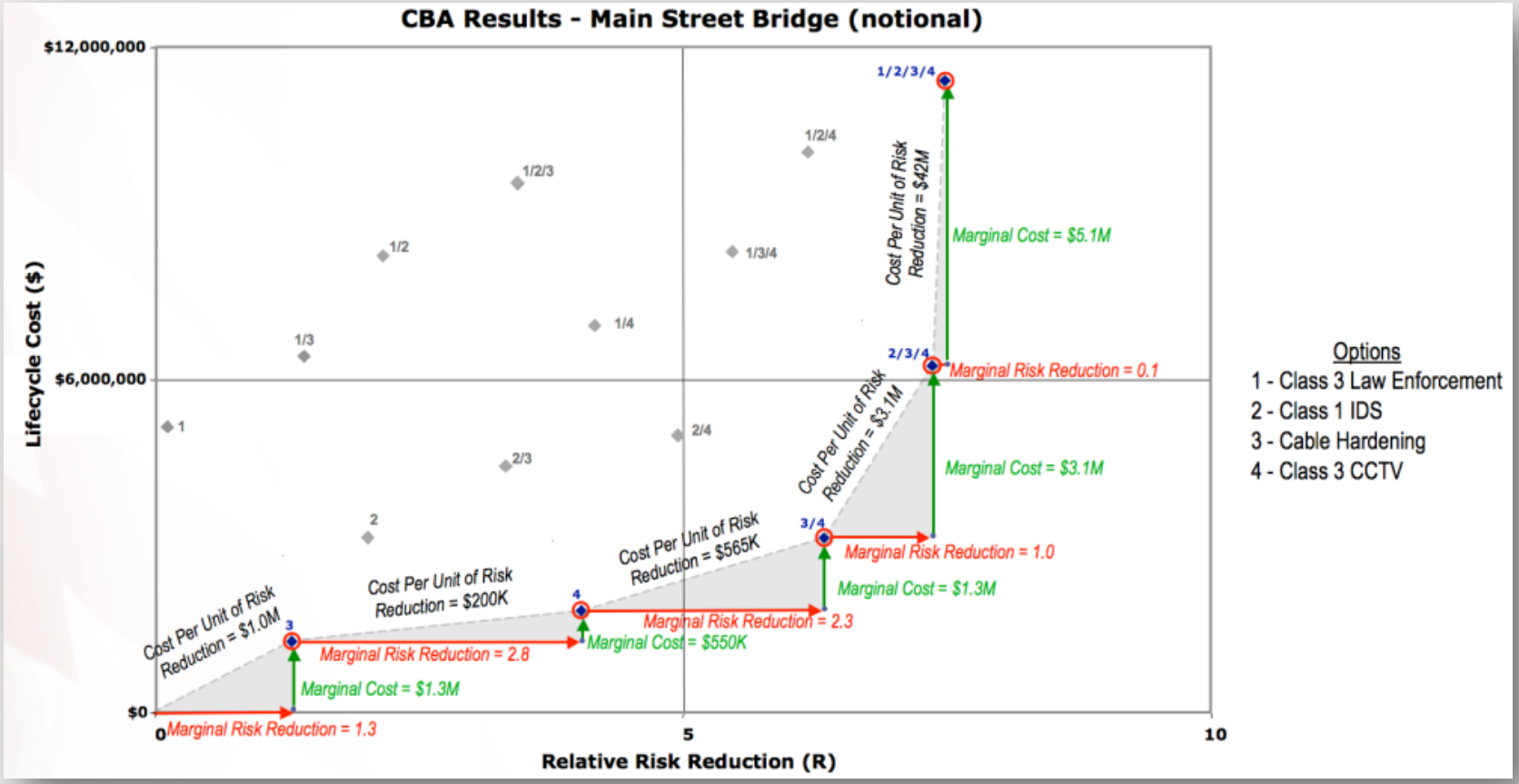
Assessing Vulnerability

- Describe the types of structures affected by the hazards and their construction characteristics
  - Buildings – residential, commercial, institutional
  - Infrastructure – transportation systems, lifeline utility systems, communications systems
  - Critical facilities – hospitals, schools, public works facilities
- Anticipate the hazards' impact to vulnerable structures
- Summarize vulnerability in dollar values or percentages of anticipated damage

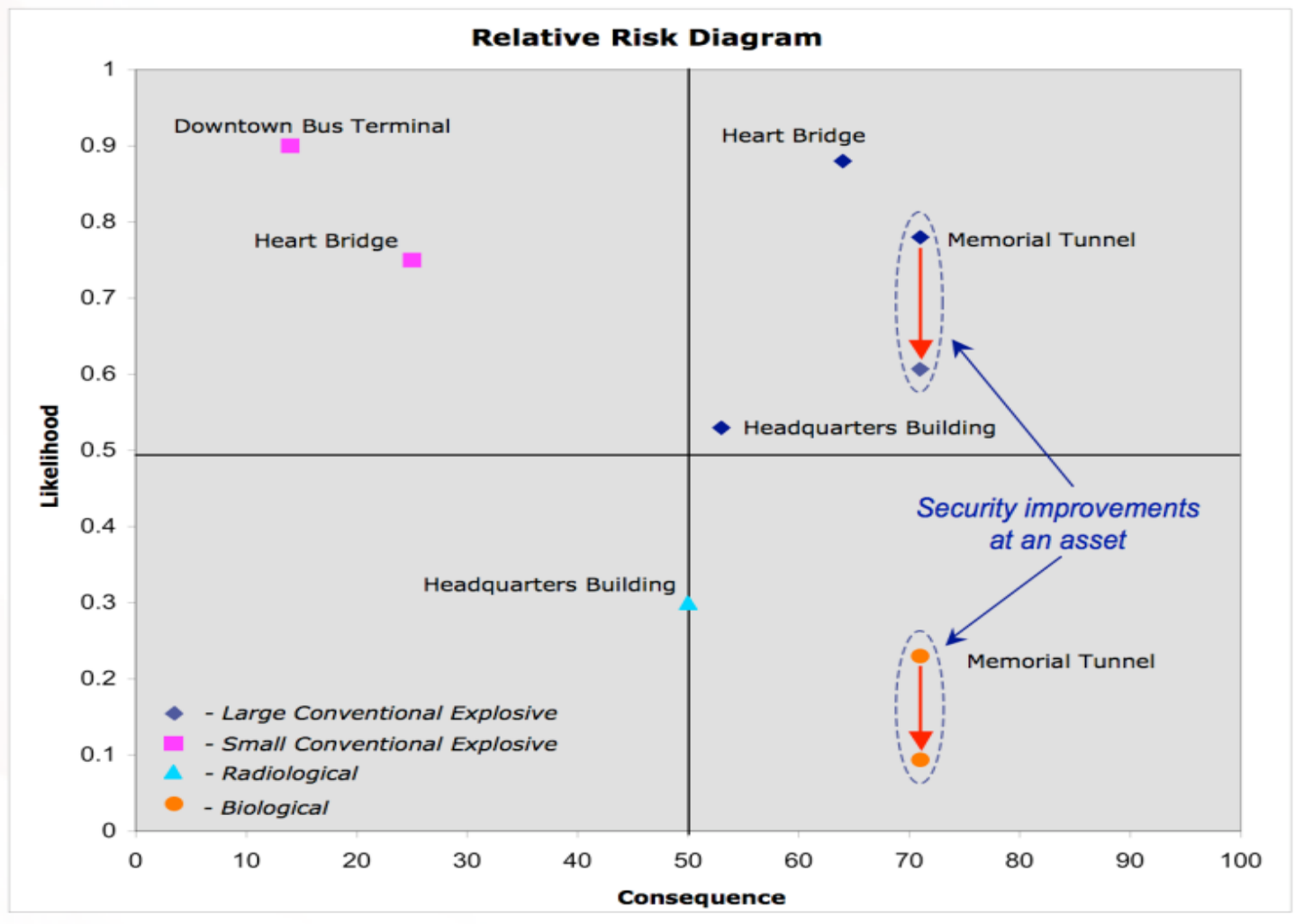
Assessing Vulnerability



Assessing Vulnerability

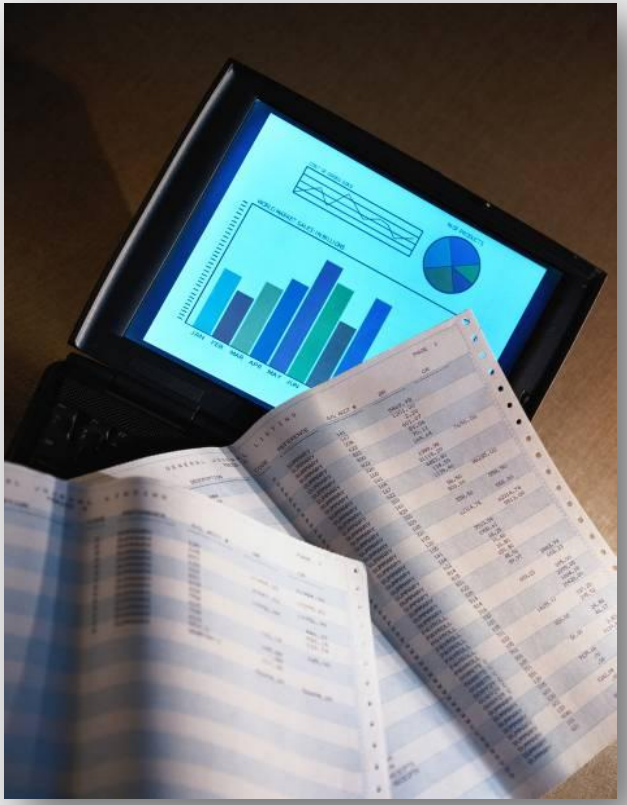


Assessing Vulnerability



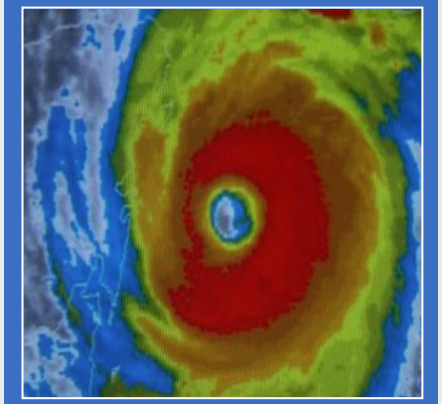
Disaster Specific: Hurricane Ike Related Risks

- 49 declared counties
- $1.3 billion in Public Assistance grants
- $396 million for Category A debris operations
- 26 million cubic yards of eligible debris removed
- Over 150 permitted debris management sites



Disaster Specific: Hurricane Ike Related Risks

- Category 2 at landfall
- 110 mile per hour winds
- 19-22 foot storm surge
  - Set the record for greatest storm surge associated with a category 2
- Rainfall exceeded 20 inches in some areas
- 3 million + without power




Assessing Organizational Risks and Continuity Planning

Organizational Risks

- Organizational risks are internal risks that have the potential to disrupt normal operations. Potential operational risks include:
  - External threats and hazards
  - Process threats and hazards
  - Internal threats and hazards

Organizational Risks

- External threats and hazards
  - Natural disasters
  - Cyber attack
  - Economic catastrophe
  - Civil unrest
  - Labor dispute, strike

Organizational Risks

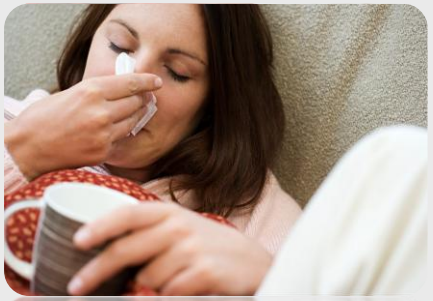
- Process threats and hazards
  - Inadequate critical supply
  - Failure of a partner or supplier
  - Poor process design

Organizational Risks

- Internal threats and hazards
  - Sabotage
  - Inadequate training and cross training
  - Information technology systems failure
  - Inadequate continuity planning

Operational Disruptions

- There are several types of disruptions that can impact your organization's operations:
  - Denial of access to a facility
  - Denial of service due to a reduced workforce
  - Denial of service due to equipment or systems failure



Interactive Discussion

- How would your organization address:
  - Building damage caused by a fire?
  - Reduced workforce due to pandemic flu?
  - IT systems failure?

Continuity Planning

- Operational risks are mitigated by developing a viable continuity plan.
- Continuity planning involves the following major components:
  - Identifying mission essential functions
  - Determining the critical resources required to maintain those functions
  - Identifying the risks that have the potential to disrupt mission essential functions

Critical Elements of Continuity Planning

- Orders of succession
- Delegations of authority
- Mission essential functions
- Critical resources
- Continuity facilities
- Interoperable communications
- Vital records management
- Devolution of command and control
- Human capital management
- Risk management
- Plan implementation phases
- Training and exercise program
- Plan maintenance strategy

Mission Essential Functions

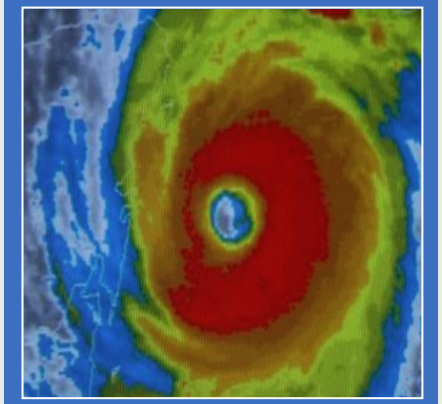
- Continuity plans are designed to ensure the execution of mission essential functions
- Mission essential functions are the organization's business functions that must continue with no or minimal disruption.
- Essential functions enable an organization to:
  - Provide vital services
  - Exercise civil authority
  - Maintain the safety of the public
  - Sustain the industrial and economic base
  - Meet regulatory/statutory requirements

Business Impact Analysis

- Business Impact Analysis is a method to identify the effects of failing to perform a mission essential function.
  - Identify potential threats and hazards
  - Identify threat and hazard characteristics
  - Estimate likelihood of occurrence
  - Evaluate mission essential function to each threat or hazard
  - Estimate overall impact if mission essential function failure occurs

Continuity Locations

- Planning considerations to identify continuity locations:
  - **Location –** Risk-free environment; geographically dispersed
  - **Construction** – Safe from high-risk areas
  - **Space** – Space for personnel, equipment, and systems
  - **Transportation** – Consider public access, public transportation, and proximity to hotels and restaurants
  - **Communications** – Support data and telephone communication requirements
  - **Security** – Controlled access
  - **Life Sustaining** – Access to life-sustaining essentials such as food, water, and lodging
  - **Site Preparation Requirements** – Time, effort, and cost required to make facility ready
  - **Maintenance** – Degree of maintenance required to keep facility ready




Impacts of Risks on Economic Recovery

What are Economic Risks?

- Hurricanes
  - Utility failure
  - Transportation infrastructure damage
  - Increased fuel costs
- Drought and excessive heat
  - Agricultural losses
- Coastal erosion
  - Loss of tourism revenue

Economic and Financial Impacts of Disasters

- Post event financial resource gaps reduce future growth
- Can lower credit rating
- Increase interest rates on external borrowing
- Dampen investment and reduce long term growth

Economic and Financial Impacts of Disasters

- Increase debt stocks
- Hampers investment in basic infrastructure
- Climatic hazards occur more frequently than geophysical hazards, therefore it is advantageous to adapt proactive measures
- Possible net declines in imports and exports, resulting in direct and indirect reductions in tax revenue

Economic and Financial Impacts of Disasters

- Positive impacts of disasters:
  - Post event investment can result in high levels of economic activity
  - Rehabilitation and reconstruction provide opportunities for repairs that may have been neglected

Cost of Disasters

- Estimated insured losses from disasters worldwide:
  - 2010: **$110 billion**
  - 2009: **$22 billion**
  - 2008: **$44 billion**

Post Event Recovery

- Natural disasters have impacted more than 30% of all small businesses in the country
- Survival rate for companies without a disaster recovery plan is less than 10%
- Around 70% of all successful attacks on computer networks are carried out by employees and insiders

Hurricane Ike Economic Impacts

- 20% of the nation's oil refining capacity shut down
- UTMB John Sealy Hospital lost approximately $160 million in revenue from lack of capacity due to flood damage
- Over $300 million in losses to the seafood industry
- 11,000 + filed unemployment insurance claims with the Texas Workforce Commission

Reducing Economic Impacts

- Work with local chambers of commerce on business continuity efforts
- Engage in long term community recovery planning
- Participate in revitalization programs that may include grant funding
- Encourage local businesses to seek disaster recovery assistance from the Small Business Administration
- Provide for sustainable redevelopment opportunities
- Take advantage of tax incentives available through the Department of Energy

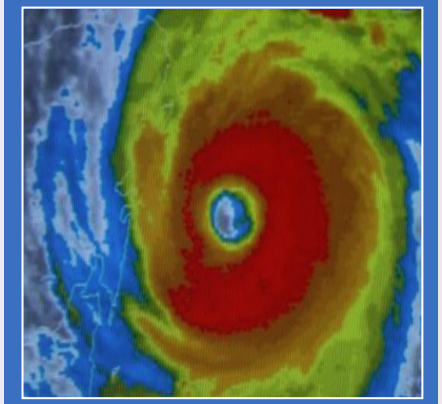
Guest Speaker

Mr. Jeff Sjostrom - Galveston Economic Development Partnership

GEDP

Supporting business and community

GALVESTON ECONOMIC DEVELOPMENT PARTNERSHIP




Impacts of Risks on Public Health and Safety, Government, and the Environment

Potential Impacts

- Flood
  - Significant threat to life and property, and public health concerns after the fact
  - Water inundated homes, businesses, and infrastructure
  - Loss of livestock and agriculture
  - Vector control issues and the spread of disease

Potential Impacts

- Hurricanes and Tropical Storms
  - Potentially devastating storm surge and wind damage
  - Heavy debris generation
  - Loss of essential utilities and associated infrastructure
  - Temporary suspension of essential government services

Importance of Debris Management Planning

- 40–50 percent of all disaster-related costs are associated with debris management
- Impacts landfills in region
- Wear and tear on roads and bridges
- Imminent threat to public health and safety
- Cleanup and documentation put additional strain on staff
- Staff unfamiliar with large-scale debris operations
- Federal regulations that must be followed:
  - 44 CFR, 36 CFR
  - FEMA 325, PA Pilot Program

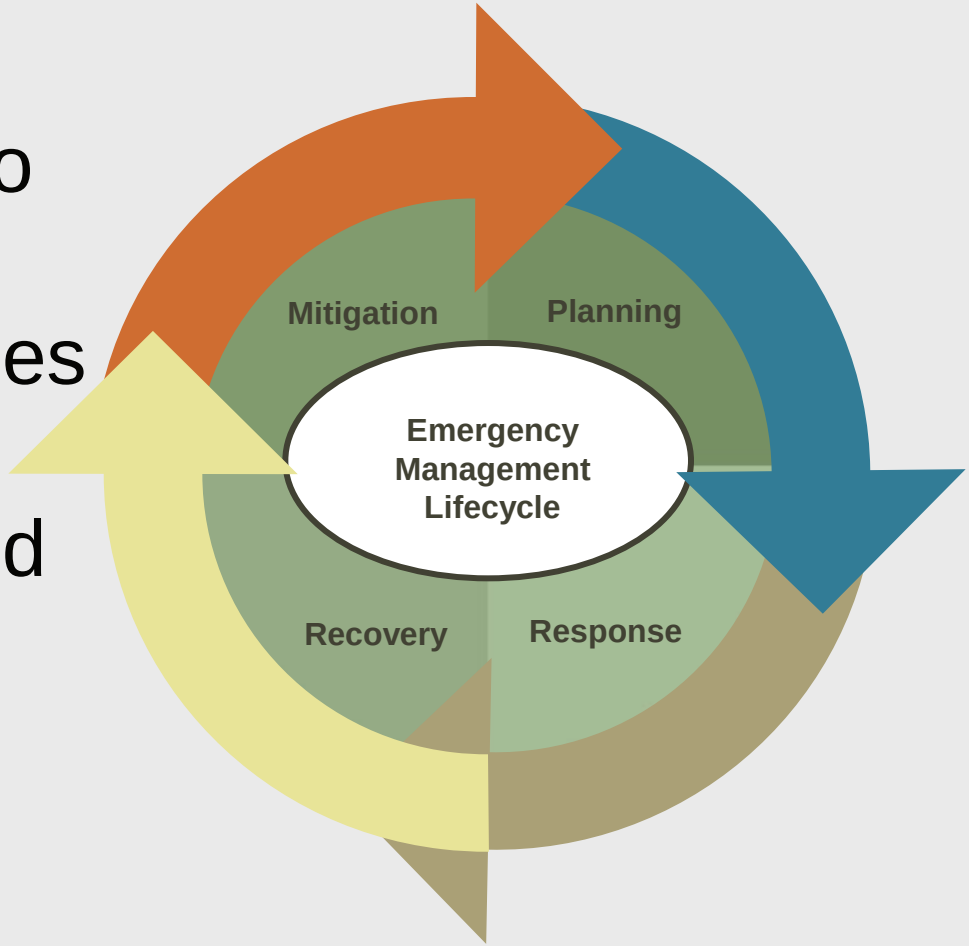
Debris Management Planning Activities

- Identification of roles and responsibilities
- Development of debris estimates
- Debris management site identification
- Review of statutory and legal requirements
- Plan development and finalization

Primary responsibility for debris management planning lies with the local jurisdiction

Importance of Emergency Management

- Emergency management seeks to promote safer, less vulnerable communities with the capacity to cope with hazards and disasters



Principles of Emergency Management

- Comprehensive
  - All hazards, all phases, all impacts all stakeholders
- Progressive
  - Anticipate future disasters and mitigate
- Risk Driven
  - Hazard identification, risk analysis, impact analysis
- Integrated
  - Ensure unity throughout all levels of community, vertical and horizontal

Principles of Emergency Management

- Collaborative
  - Encourage trust and advocate on team atmosphere, build consensus and communication
- Coordinated
  - Synchronized activities of all stakeholders
- Flexible
  - Adaptive, improvise, creative and innovative solutions to solve problems
- Professional
  - Both art and science, knowledge learning, education, public stewardship

Types of Emergency Management Planning

- Emergency operations
- Warning and notification
- Communications
- Shelter and mass care
- Radiological protection
- Evacuation
- Firefighting
- Mass care

Types of Emergency Management Planning

- Law enforcement
- Health and medical services
- Emergency public information
- Recovery
- Public works and engineering
- Utilities
- Resource management
- Direction and control

Types of Emergency Management Planning

- Human services
- Hazard mitigation
- Hazardous materials and oil spill response
- Search and rescue
- Transportation
- Volunteer and donations management
- Legal
- Terrorist incident response

After Action Reports

- An **after action report** presents observations and recommendations based on data collection and analysis following an exercise or disaster event
  - Record observations
  - Assess against defined plans and procedures
  - Determine the root cause of any deviations from plans and procedures
  - Identify the consequences of the variation in actions
  - Document the lesson learned
  - Make recommendations for improvement

Understanding the National Incident Management System (NIMS)

- **NIMS** is a comprehensive, national approach to incident management that is applicable at all jurisdictional levels and across functional disciplines. It is intended to:
  - Be applicable across a full spectrum of potential incidents, hazards, and impacts, regardless of size, location or complexity.
  - Improve coordination and cooperation between public and private entities in a variety of incident management activities.
  - Provide a common standard for overall incident management

Preparedness Resources and Programs

- www.ready.gov
- www.citizencorps.gov
- www.fema.gov
- www.sba.gov
- www.h-gac.com
- www.txdps.state.tx.us/dem

Get Involved - Citizen Corps

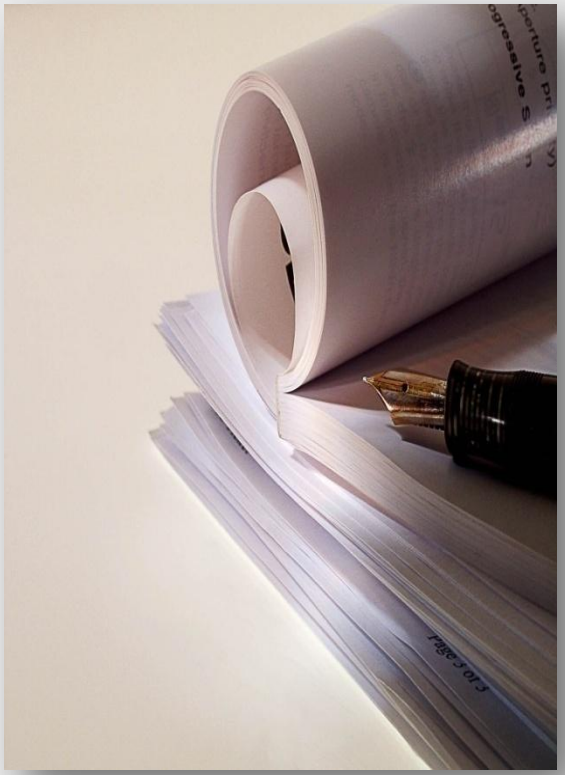
- **Community Emergency Response Teams (CERT)**
  - Provides training in disaster preparedness, basic disaster medical operations, fire safety, light search and rescue, and other essential topics enabling trainees to take a more active role in personal and public safety.
- **Medical Reserve Corps (MRC)**
  - Coordinates the skills of practicing and retired physicians, nurses and other health professionals who are willing to volunteer during emergency situations and assist with public health matters.

Get Involved – Citizen Corps

- **Fire Corps**
  - Actively involves citizens in public education, training, and volunteer efforts focused on fire prevention and safety.
- **Volunteers in Police Service (VIPS)**
  - Enhances the capabilities of state and local law enforcement by utilizing volunteers.
- **Neighborhood Watch**
  - Works to provide information, training and resources to citizens and law enforcement agencies throughout the country.

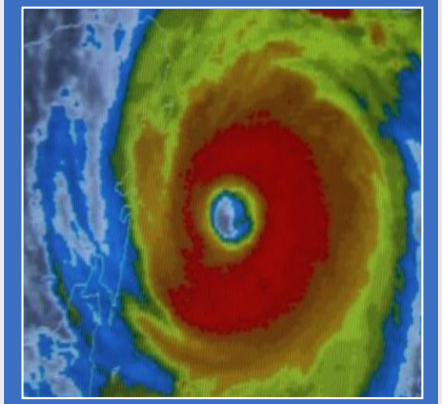
Training Recommendations

- Available at **www.training.fema.gov**
  - IS 100 – Introduction to Incident Command System (ICS)
  - IS 200 – ICS for Single Resources and Initial Action Incidents
  - IS 235 – Emergency Planning
  - IS 700 – National Incident Management System (NIMS), An Introduction
  - IS 800 – National Response Framework, An Introduction



Guest Speaker

Francisco Sanchez – Harris County OHSEM




Risk Mitigation Opportunities

Need for Risk Mitigation

- Human Built Risks
  - 52% percent of the United States' population resides within 50 miles of the U.S. coast
  - Most building codes and ordinances only minimally restrict coastal construction
  - Category 5 building standards and properly elevated structures are not always encouraged
  - Proximity to floodplain poses serious risks to life and property

Hazard Mitigation Planning

- **Resource Organization:** Identify and organize interested members of the community and subject matter experts.
- **Risk Assessment:** Identify characteristics and potential consequences of hazards. Understanding how much of the community can be affected by hazards and the impacts to community assets is paramount.
- **Plan Development:** Determine priorities based on risks posed by hazards and explore ways to minimize undesired effects.
- **Plan Implementation and Monitoring:** Implementation can include initiation of mitigation projects to changes in everyday organizational operations. Monitor, evaluate, and update the plan on a consistent basis.

Mitigation Grant Programs

FEMA

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Repetitive Flood Claims (RFC)
- Severe Repetitive Loss (SRL)

HUD

- Community Development Block Grant (CDBG)

Mitigation Opportunities

- Infrastructure upgrades – water, sewer, drainage
- Floodwater retention – use of public space
- Housing buyouts and elevations
- Flood proofing
- Electrical power and transmission techniques

Pre-Disaster Preparation

- **Proper pre-disaster documentation = increased likelihood of post-disaster funding**
  - Document and photograph condition of hazard-prone structures, including buildings, roads, bridges, etc.
  - Maintain historical damage records
  - Maintain maintenance report history
  - Include prioritized potential mitigation projects in Hazard Mitigation Plan
  - Identify vulnerable groups such as the elderly, those with special needs and low to moderate income populations

Pre-Disaster Preparation

- **Standards for Development**
  - Update building codes in high-risk areas
    - Elevated Structures
    - Increased rigidity standards
  - Encourage responsible development
    - Demonstrate awareness and effective use of drainage and retention areas (holding water vs. immediate transport)
    - Ensure hazard studies are incorporated into local zoning ordinances

Residential Mitigation

- Home Elevations
- Property Acquisition
- Flood proofing
- Public outreach and prevention/protection campaigns
  - Where are planned “safe” facilities
  - Hazards kit
  - Create awareness now, not only in time of need

Infrastructure Mitigation

- Identify critical facilities for all systems (roadways, wastewater, sewer, drainage, electrical, etc.)
- Determine what equipment would be needed for varying levels of damage
  - Generators for critical lift stations
  - Signage for evacuation
  - Diesel/natural gas for maintaining equipment

Guest Speaker

Chuck Wemple – Houston-Galveston Area Council

Thank You – Questions?

Foresight Panel on Environmental Effects

Amy Boyers, Houston-Galveston Area Council



H-GAC Foresight Panel on Environmental Effects

Dr. Philip Bedient
Herman and George R. Brown
Professor of Civil Engineering
Rice University

Dr. Peter Bishop
Professor of Future Studies
University of Houston

Alan Clark
Director, Transportation Planning
Houston-Galveston Area Council

Dr. Robert Harriss
President and CEO
Houston Advanced Research Center

Dr. Neal Lane
Malcolm Gillis University Professor &
Professor of Physics
Senior Fellow, Baker Institute
Rice University

Dr. Barry Lefer
Assistant Professor, Department of Geosciences
University of Houston

Dr. Eugene Leong
Consultant

Mike Talbott, P.E.
Director, Harris County Flood Control District
Harris County Public Infrastructure Department

Dr. Arnold Vedlitz
Professor, Bob Bullock Chair in Government
and Public Policy
Director of the Institute for Science, Technology,
and Public Policy
Texas A&M University

Report available for download:
http://www.h-gac.com/go/EnvironmentalEffects

Future Climate Scenario

- Temperature rise of 2-7º F
- Sea level rise of 2-5 feet
- Longer dry periods but heavier rainfall events
- Increased frequency and intensity of hurricanes and tropical storms

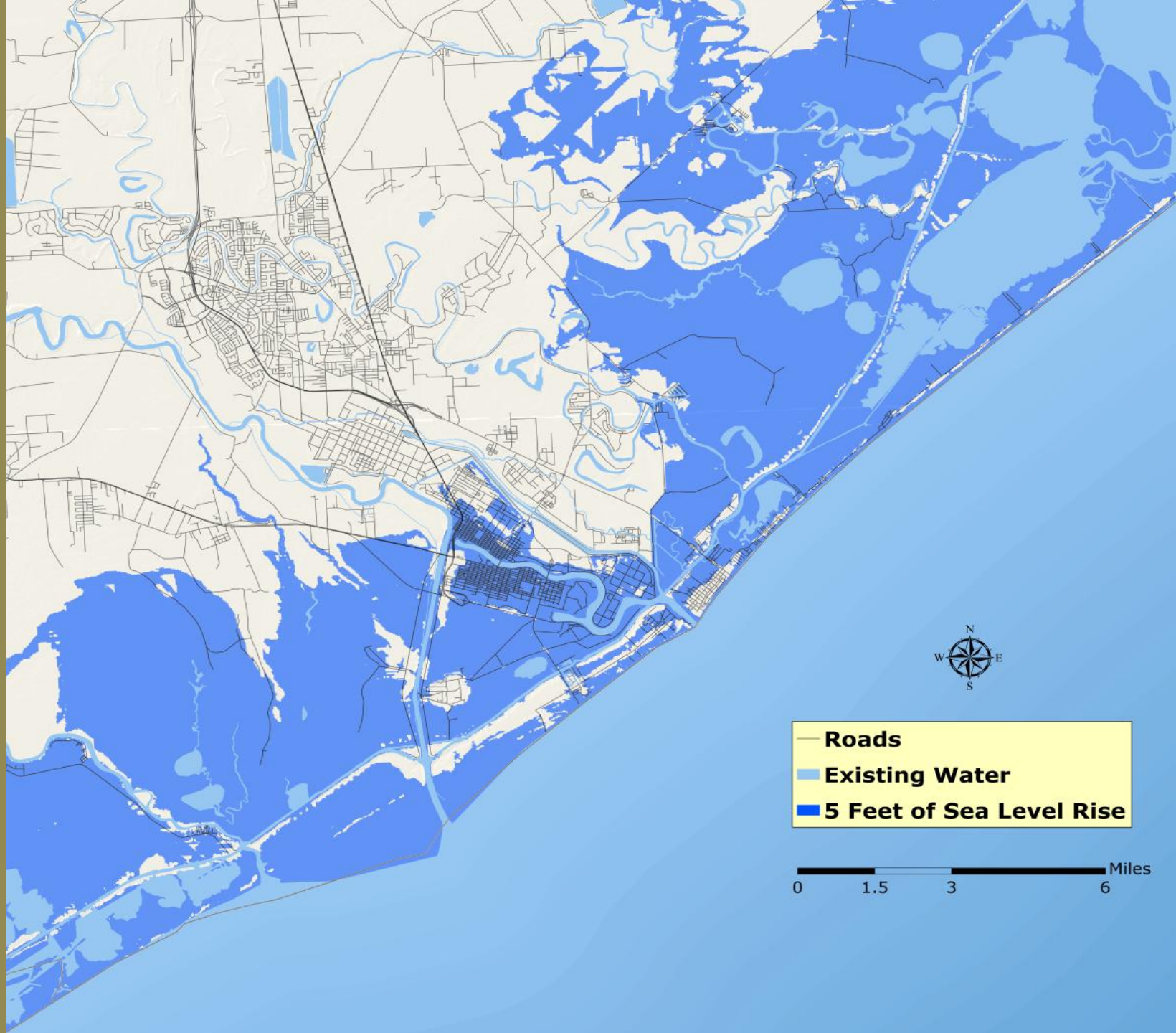
Impacts

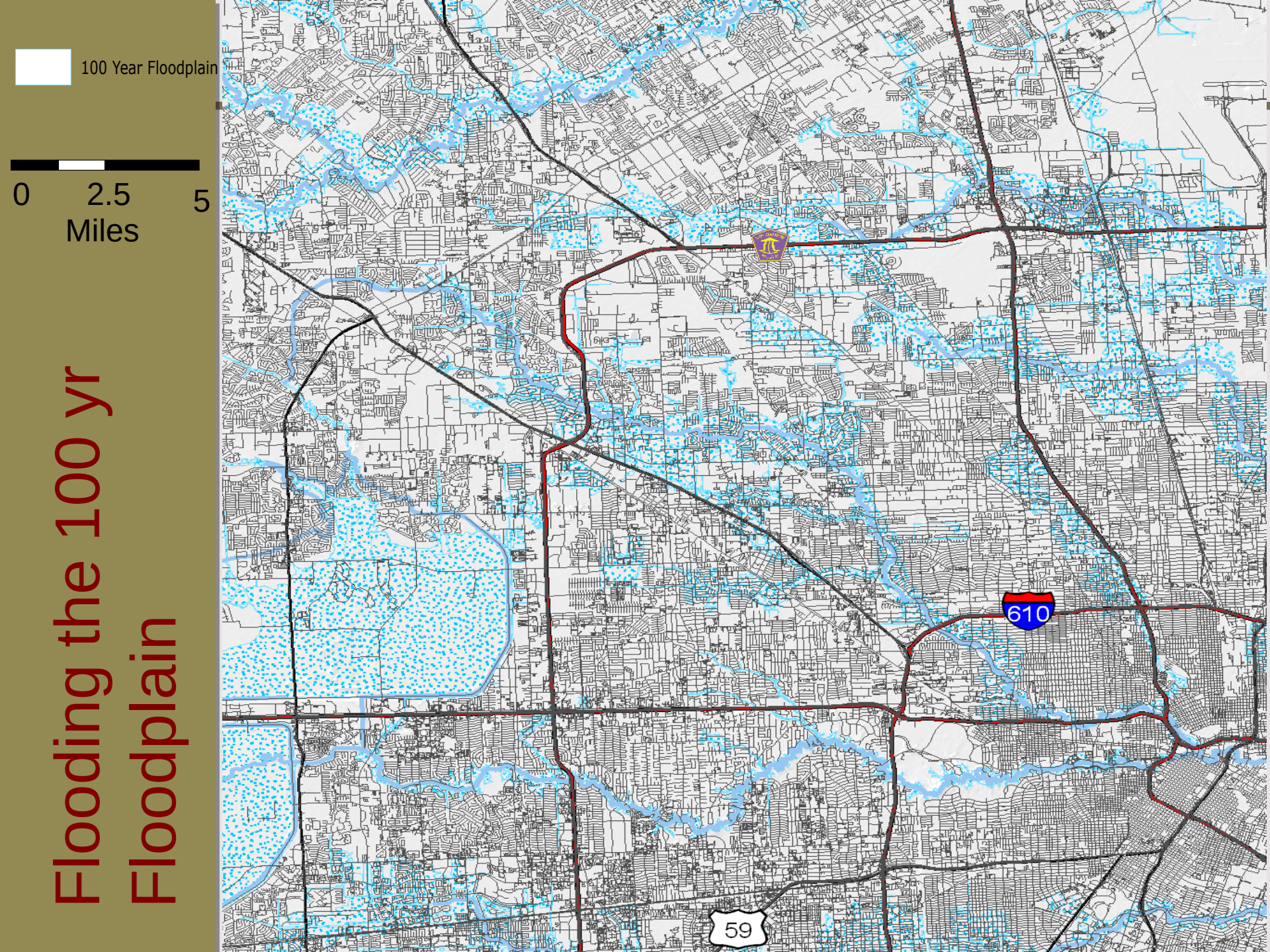
- Human

- Built

- Natural

Inundation from 5′ Sea Level Rise




100 Year Floodplain
0
2.5
5
Miles
Flooding the 100 yr Floodplain
610
59

Recommendations

- Management → Strengthen mutual aid agreements
- Growth → Building in resilience
- Investment → Consider longer term view of infrastructure needs
- Recovery and Reconstruction → New financing mechanisms

2009 Capstone Project

- Texas A&M University Bush School of Government and Public Service
- Examine public infrastructure's resiliency
  - Climate change
  - Adaptation
- Examine responsiveness to Foresight Panel report

Recommendations

- Rebrand how climate change is perceived
- Focus on constituent education
- Offer workshops and other support opportunities to involve and educate stakeholders
  - Risk and vulnerability assessments

Thank you

Amy Boyers
Sr. Environmental Planner
Houston-Galveston Area Council
713-993-2441
amy.boyers@h-gac.com

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Managing Risks and Uncertainties in an Era of Increasing Catastrophes

Robert Harriss
Houston Advanced Research Center
www.harc.edu
www.texasclimatenews.org

Houston-Galveston Area Council
March 29, 2011

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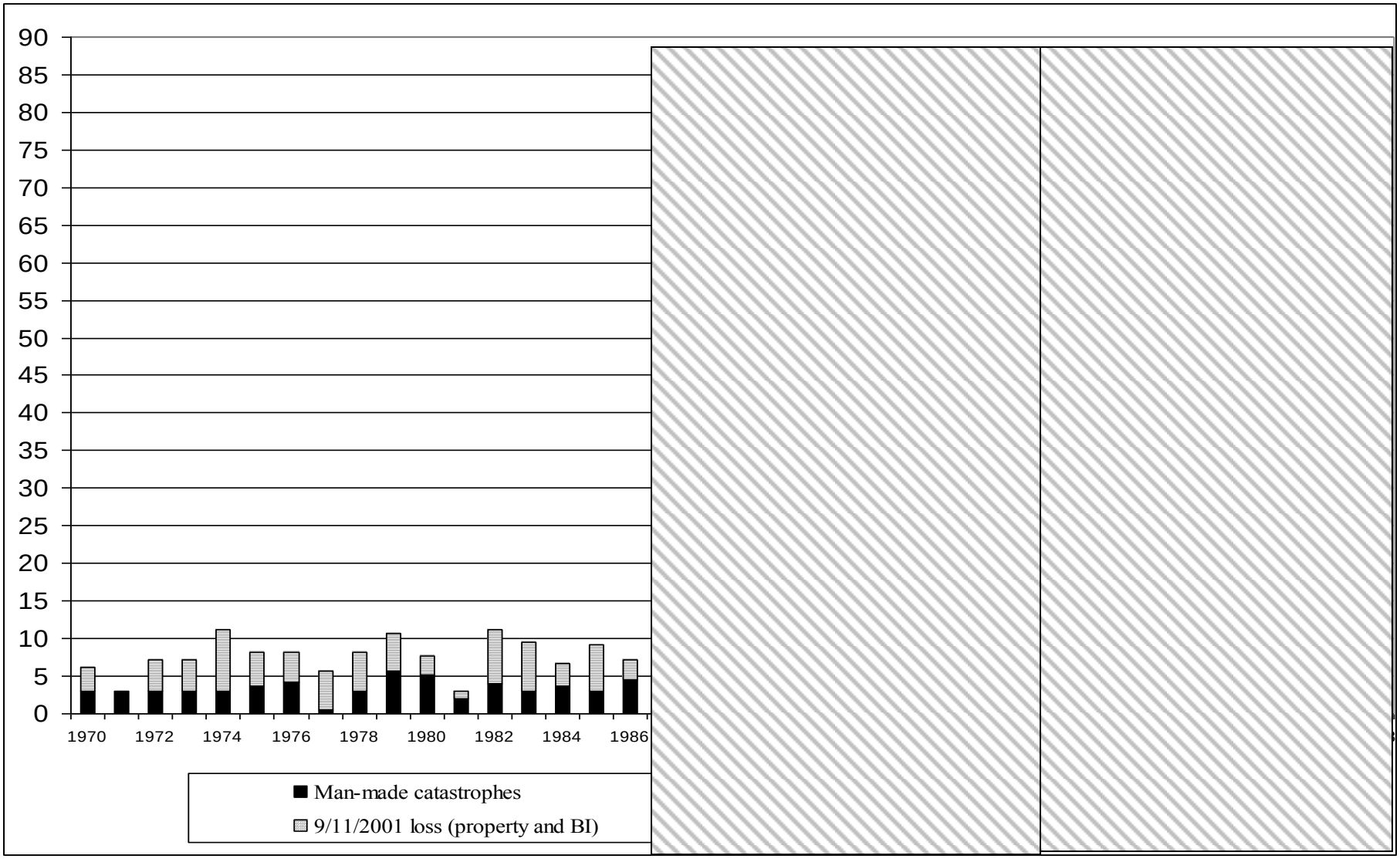

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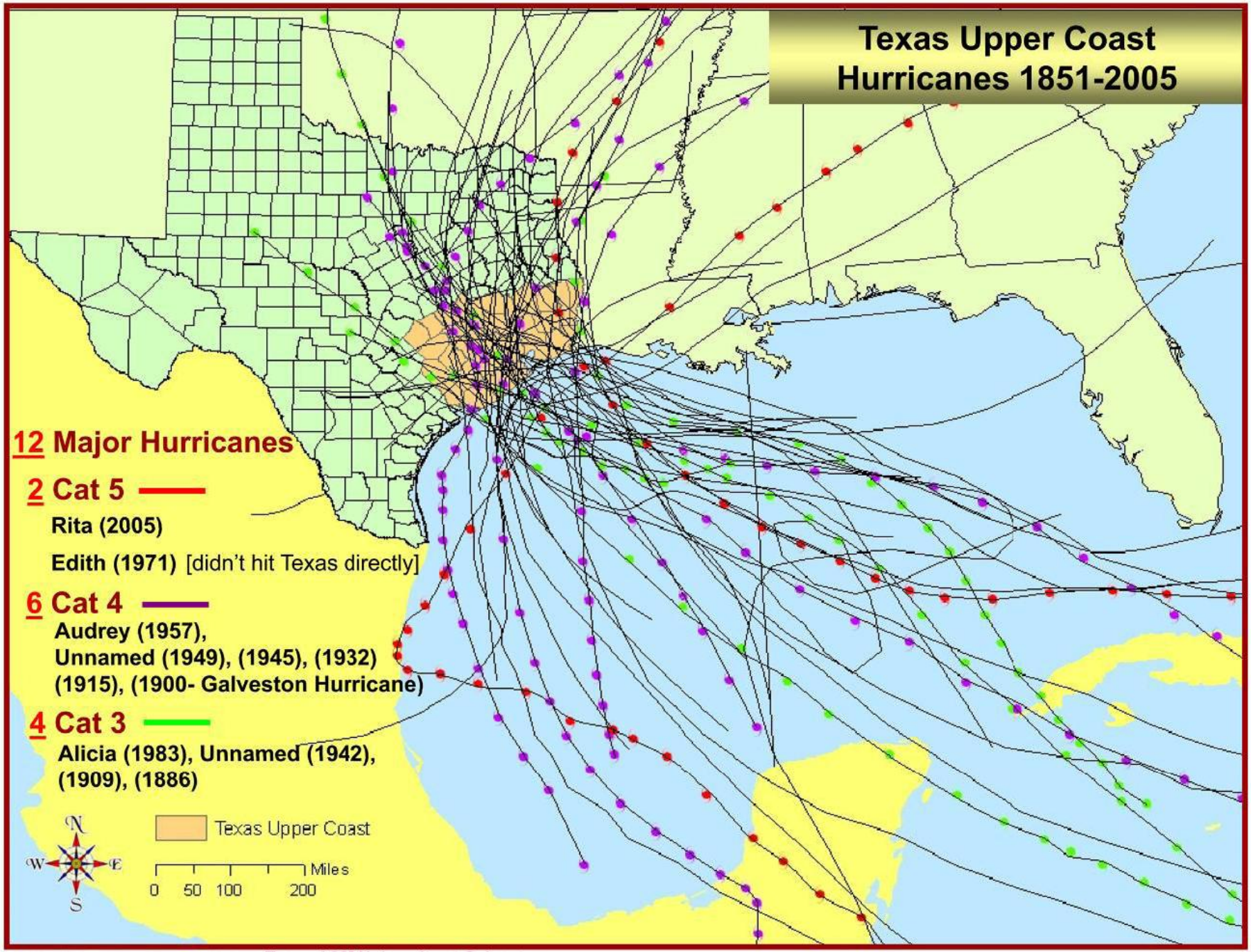
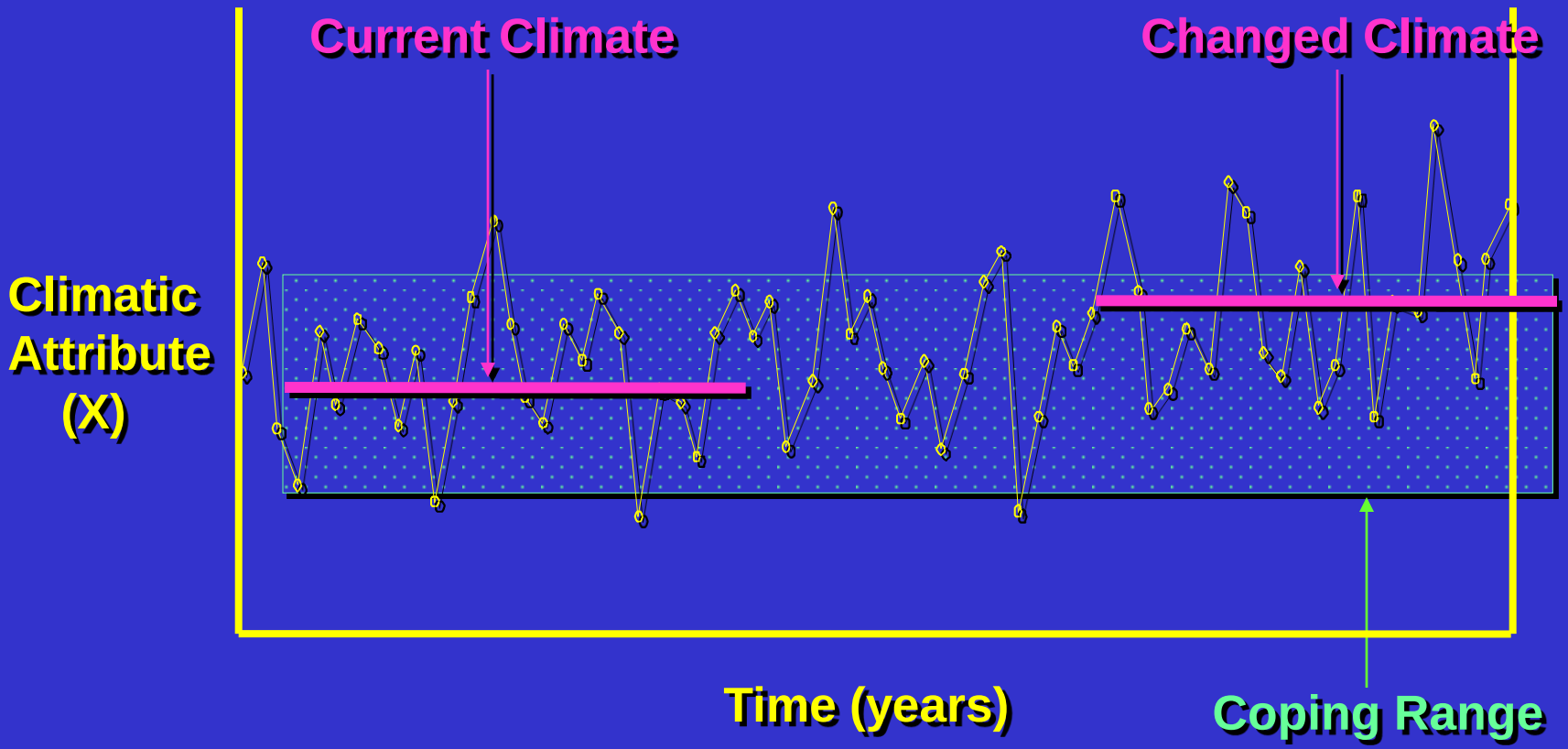
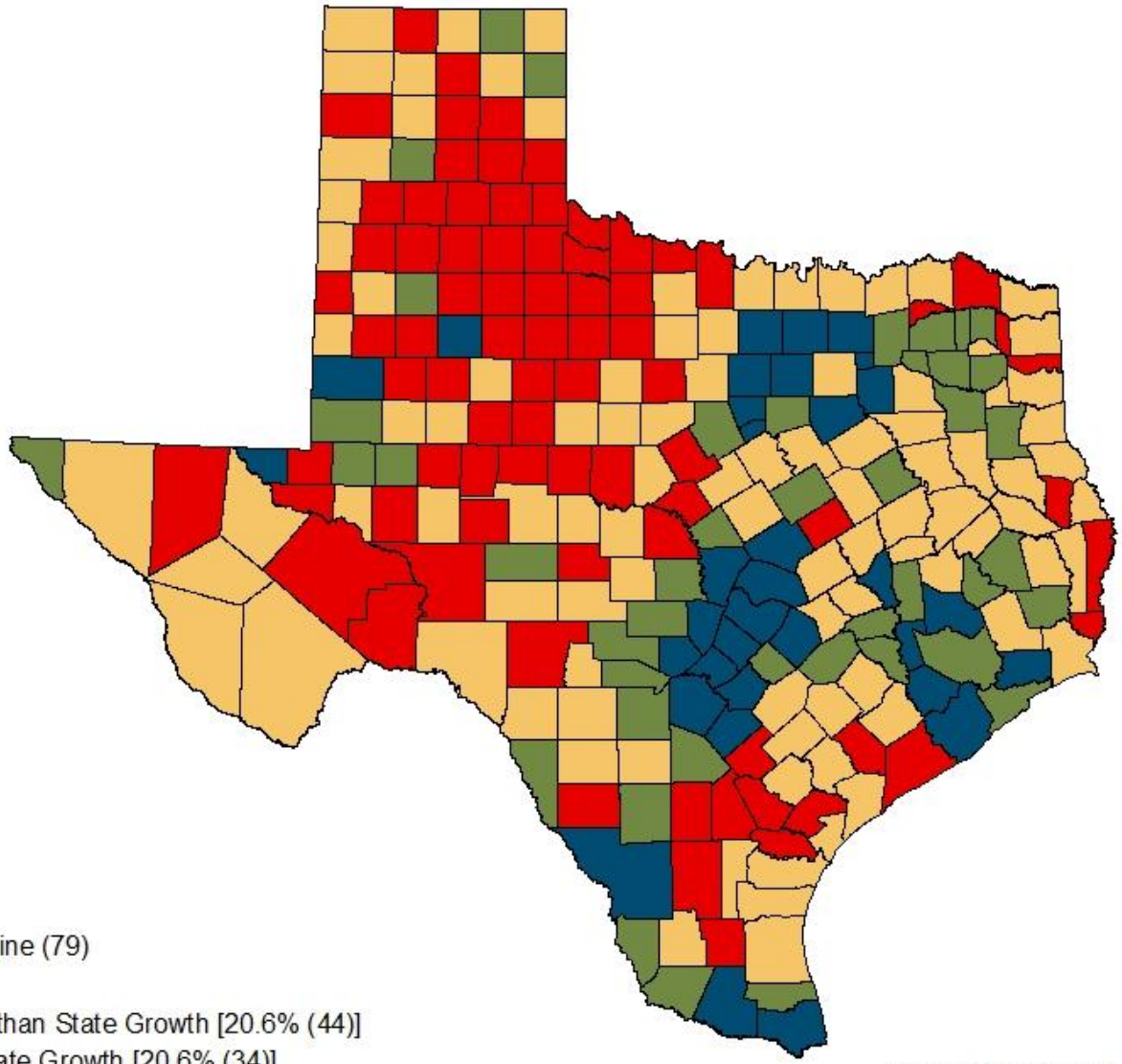


Climate Variability and Extremes



Population Change in Texas Counties, 2000-2010



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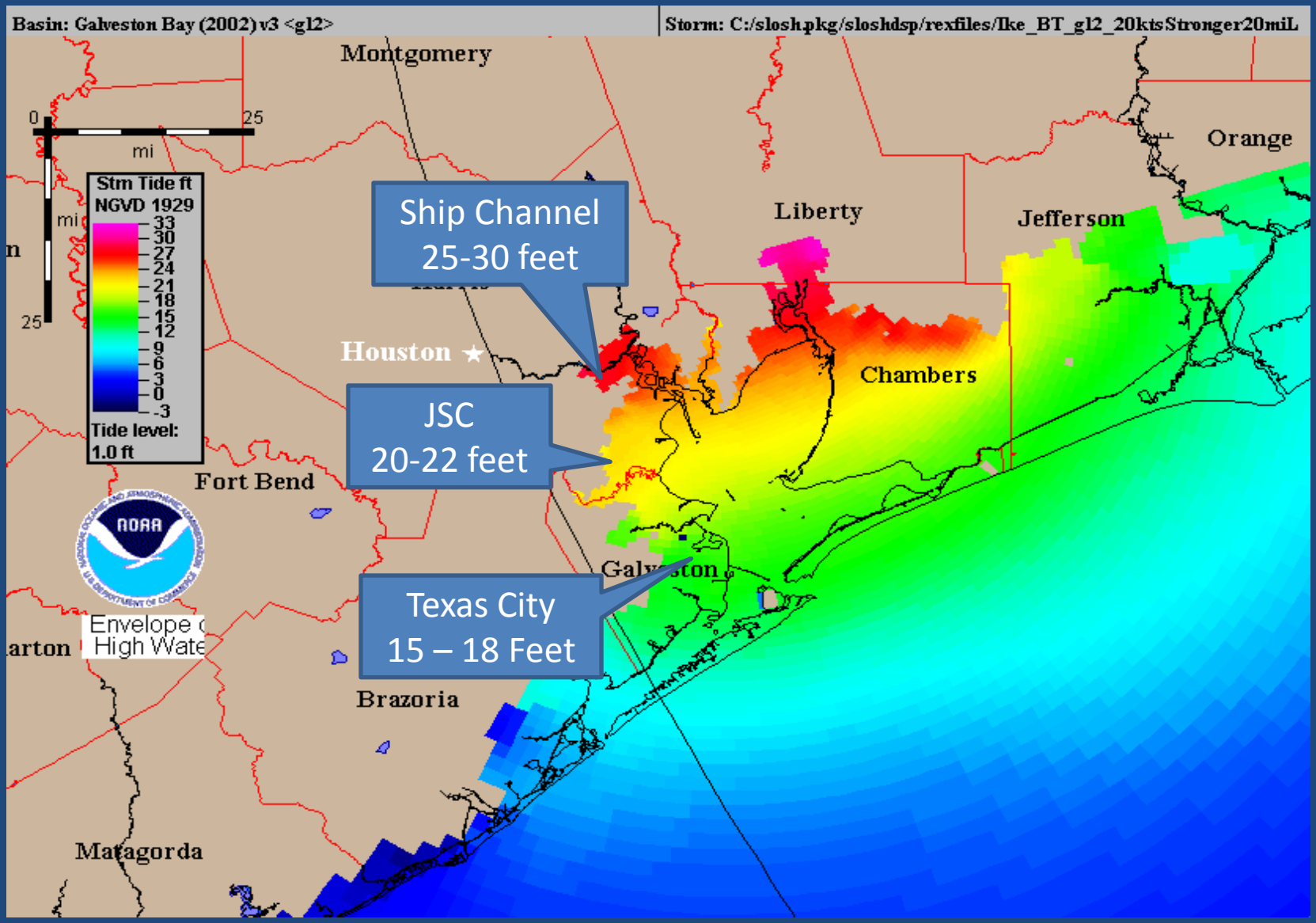

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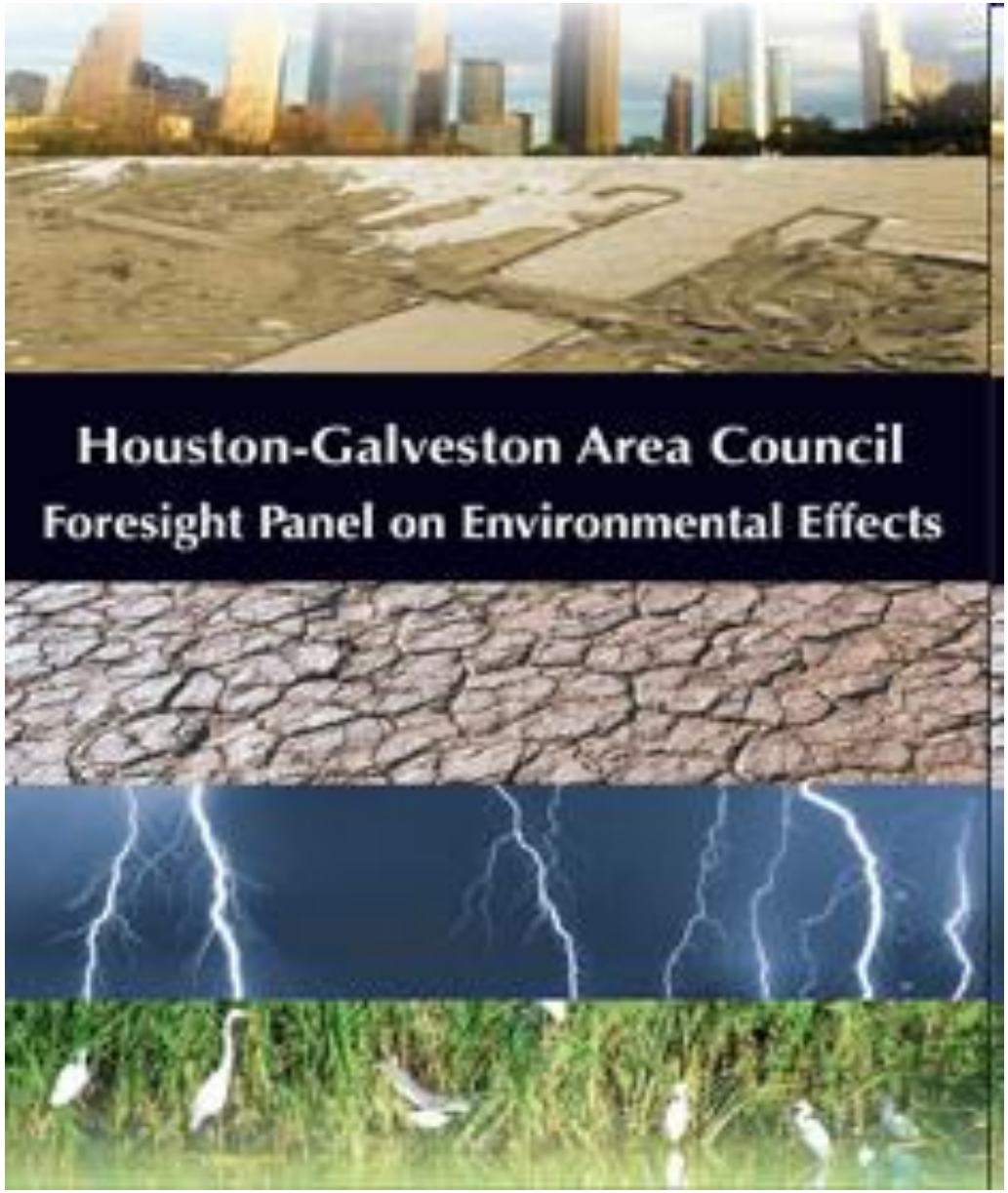
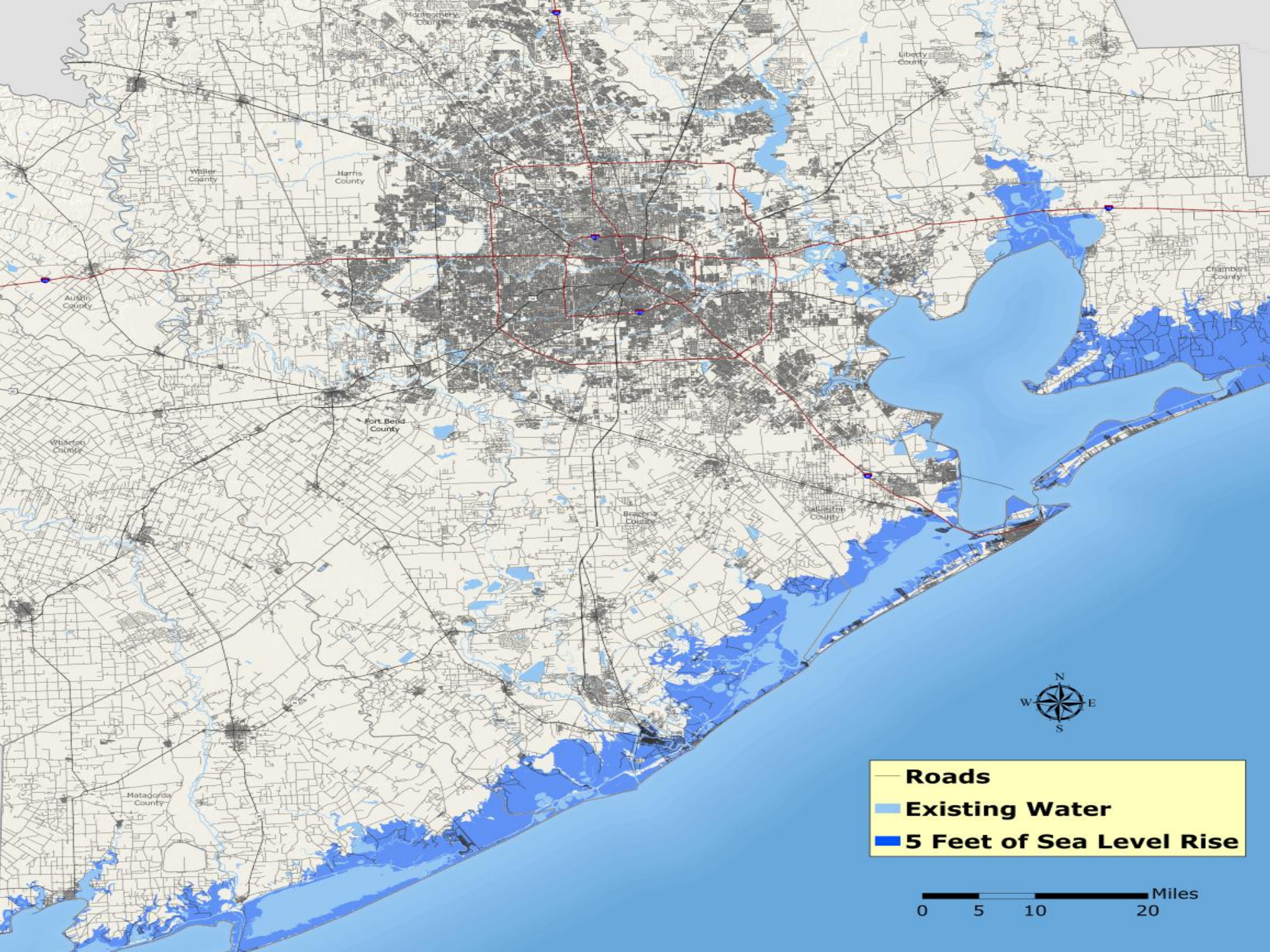
H-GAC Foresight Panel on Environmental Effects




Montgomery County
Liberty County
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Galveston County
Matagorda County
N
W
E
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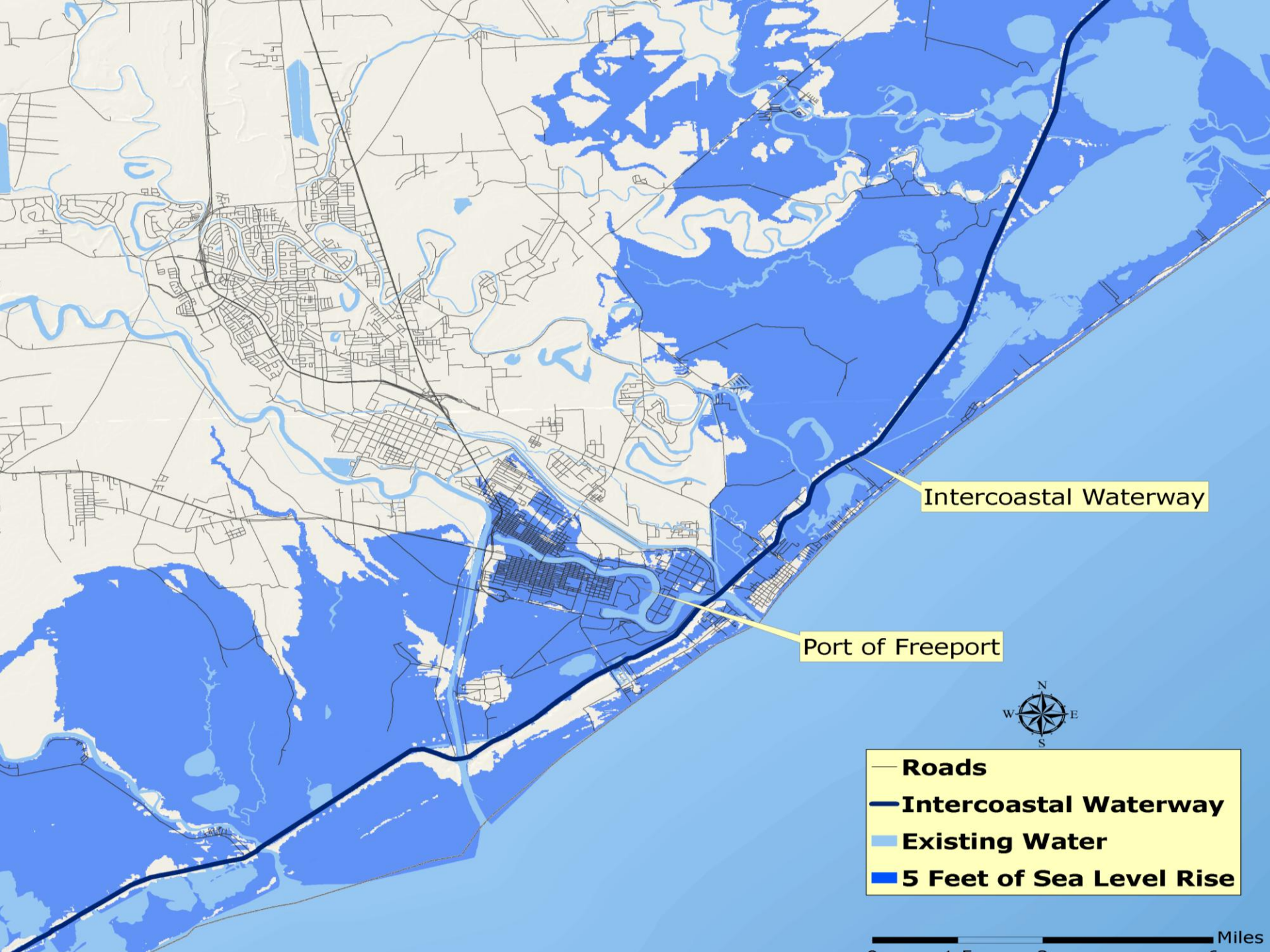
Roads
Existing Water
5 Feet of Sea Level Rise
Miles
0
5
10
20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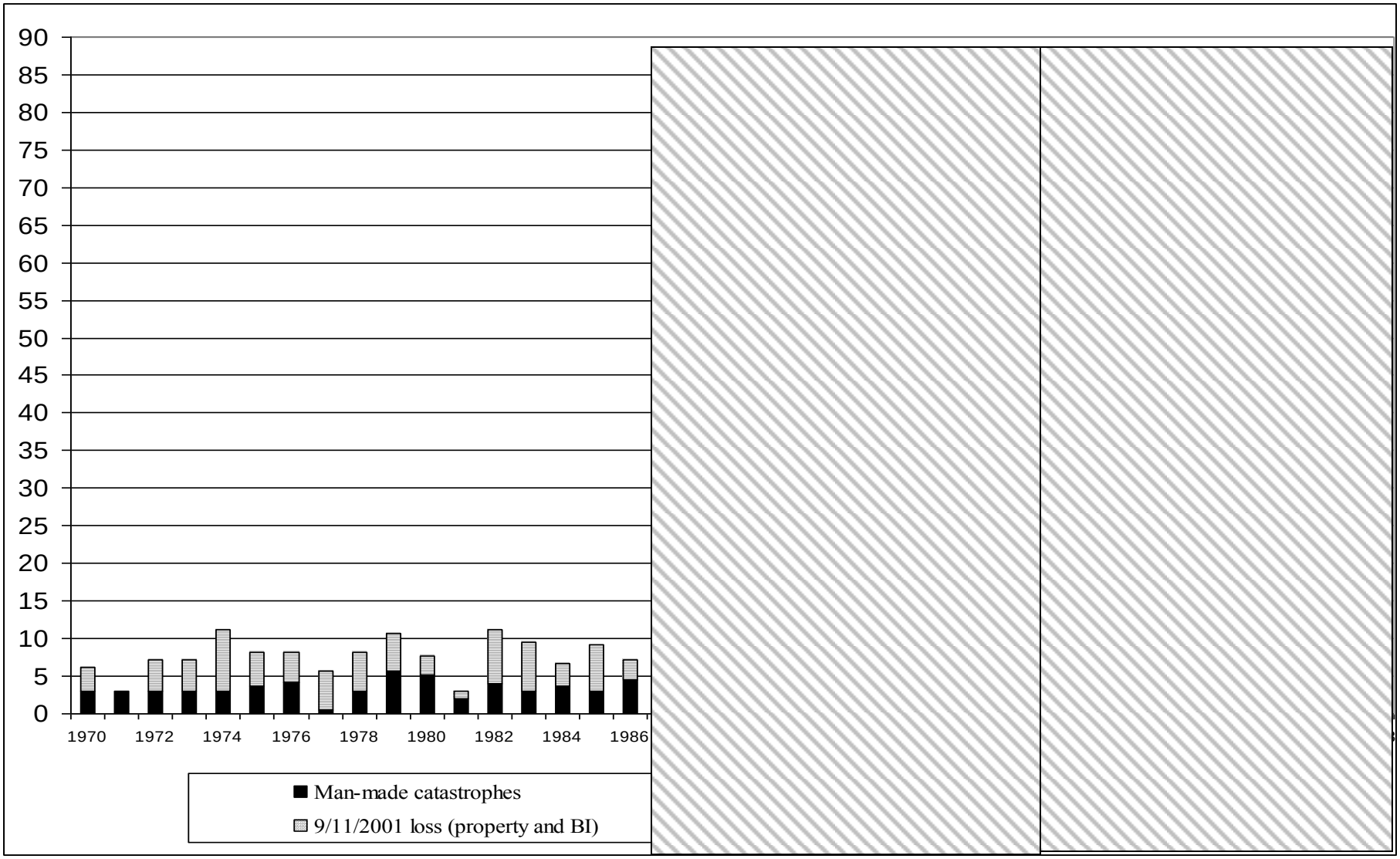

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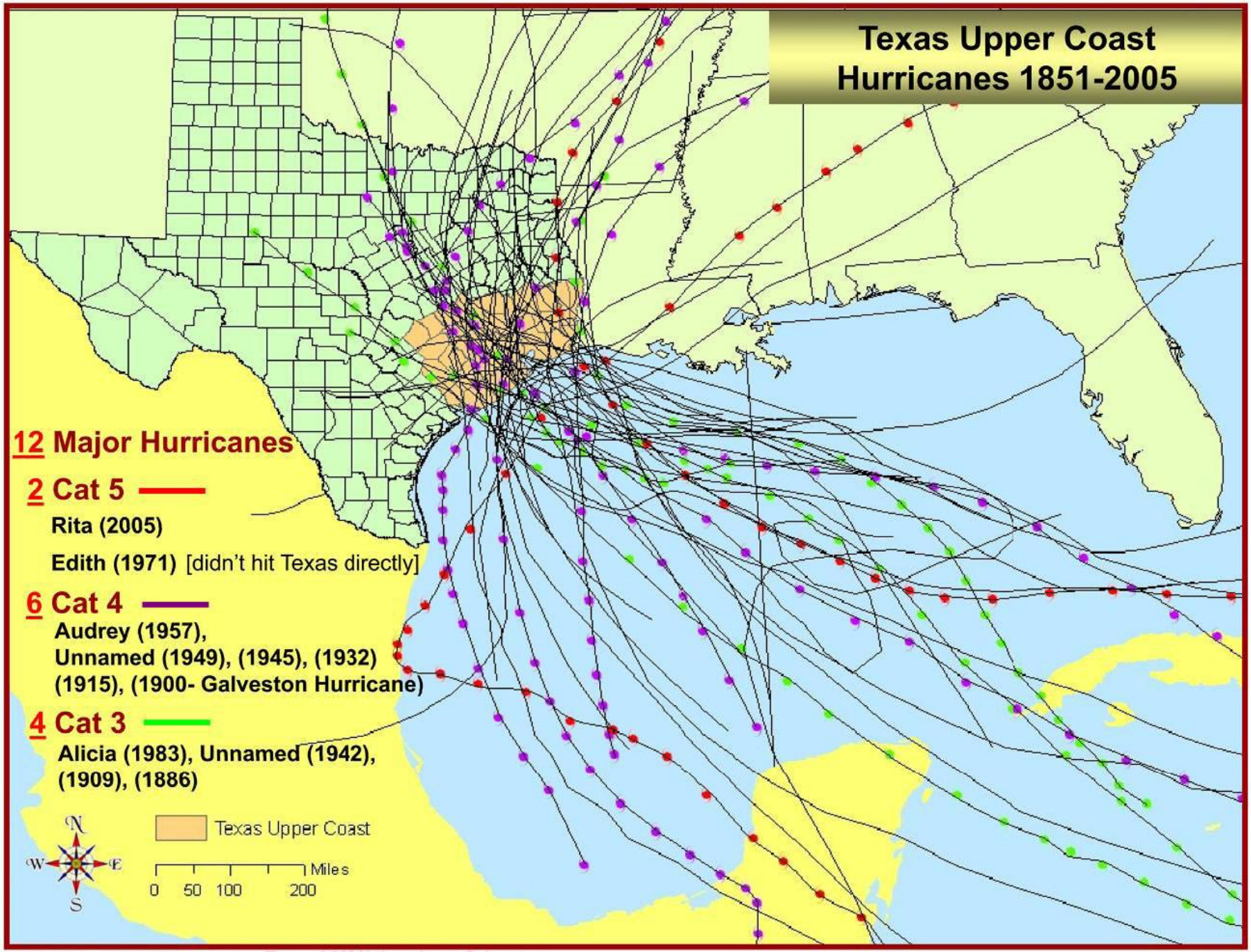

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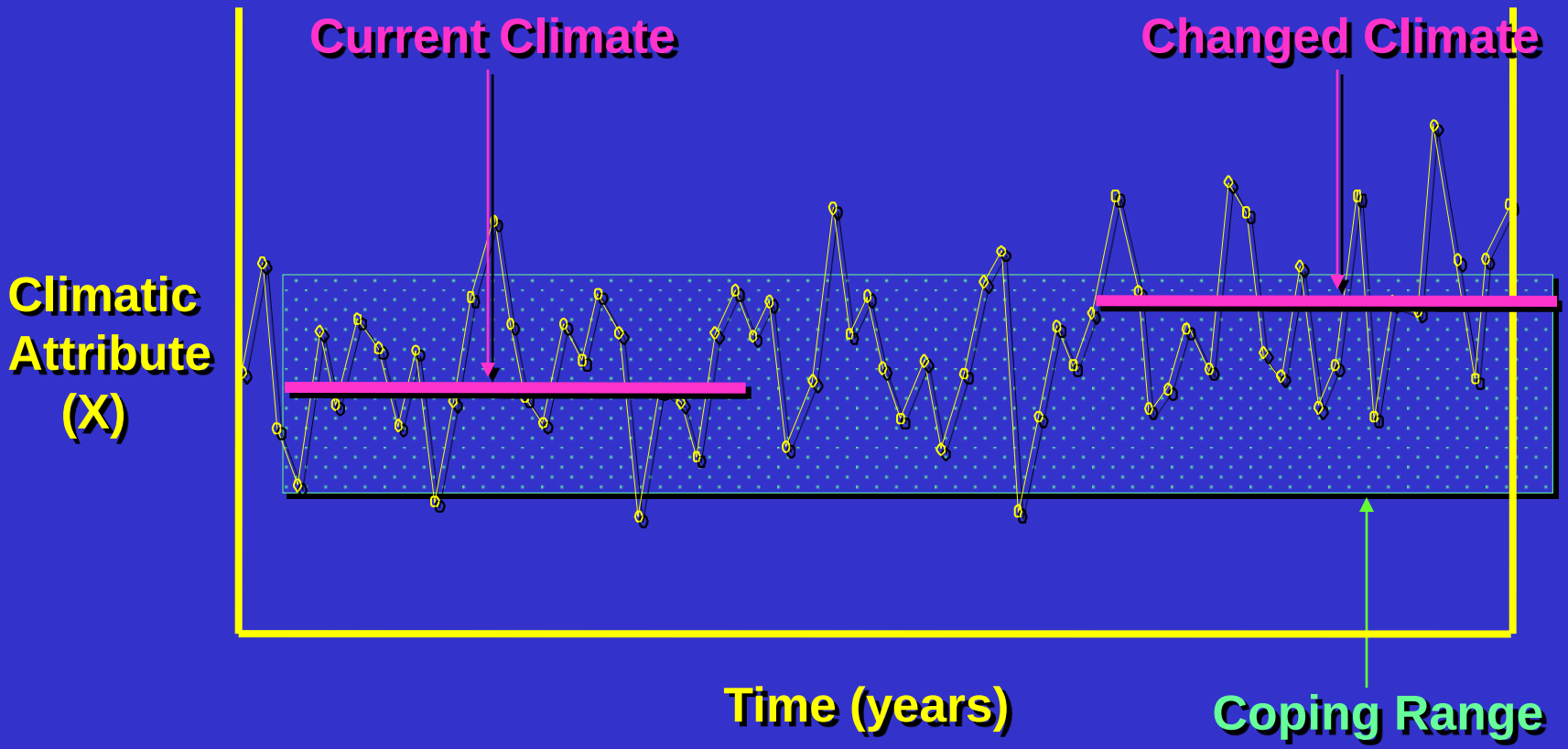

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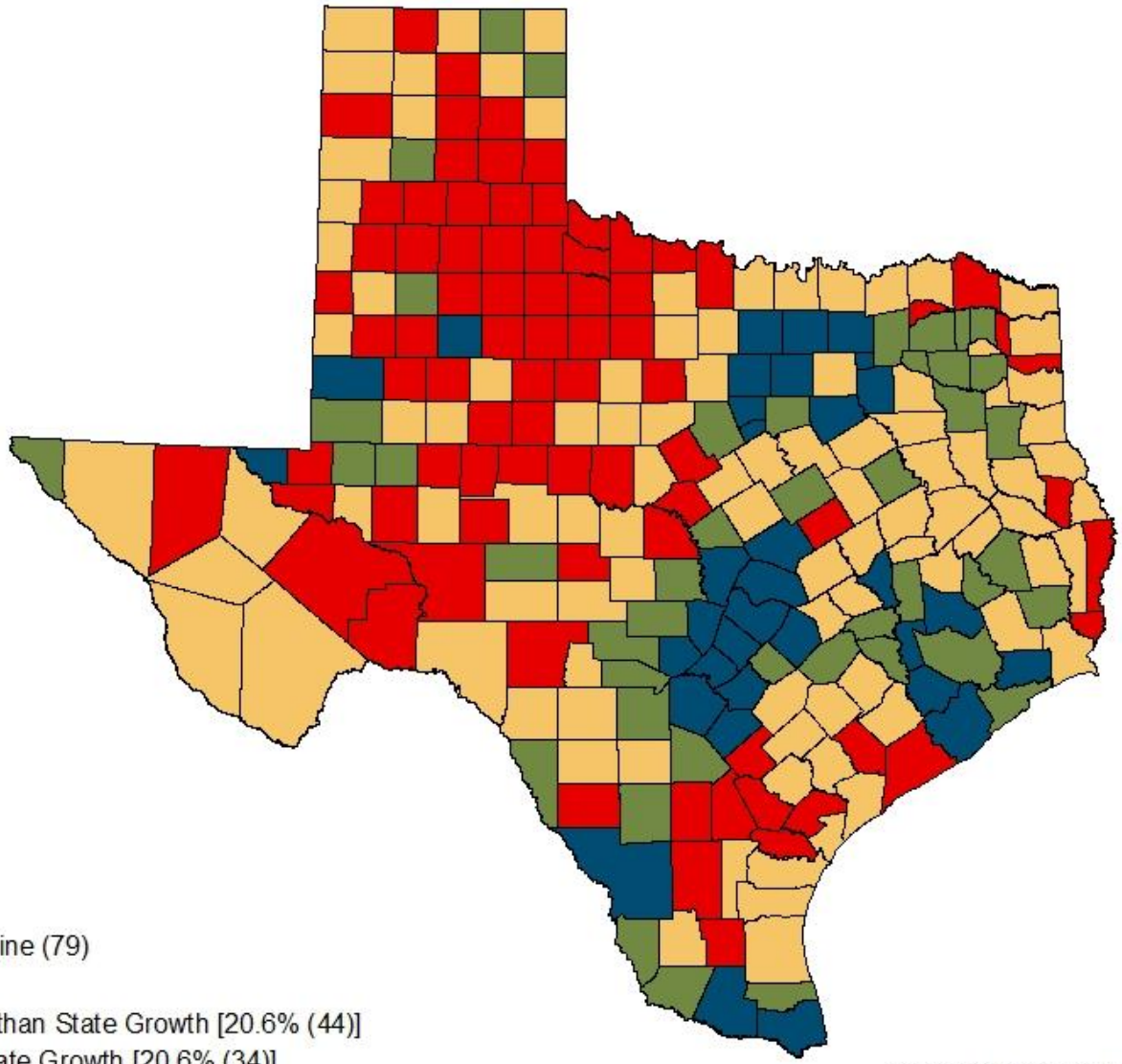

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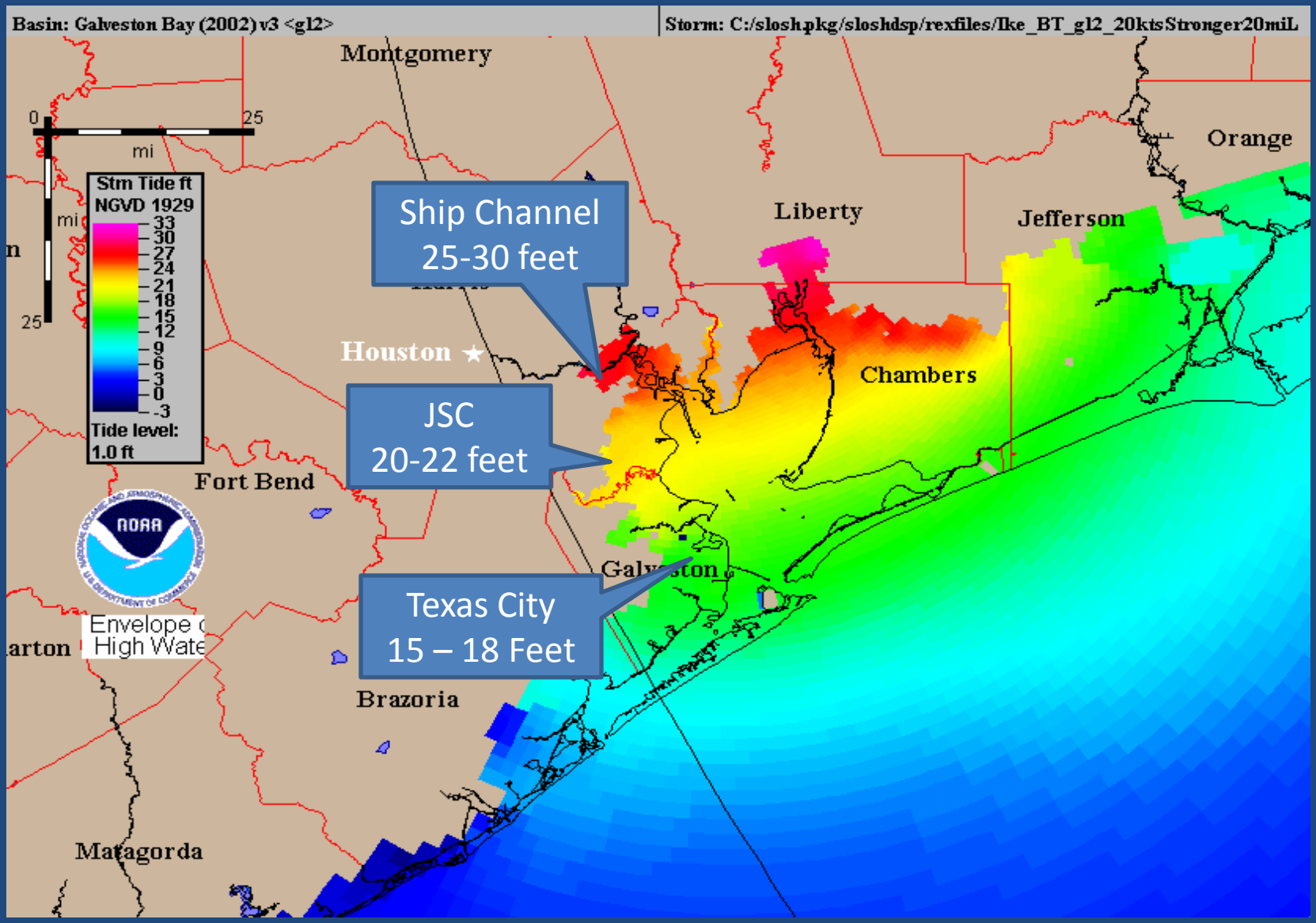

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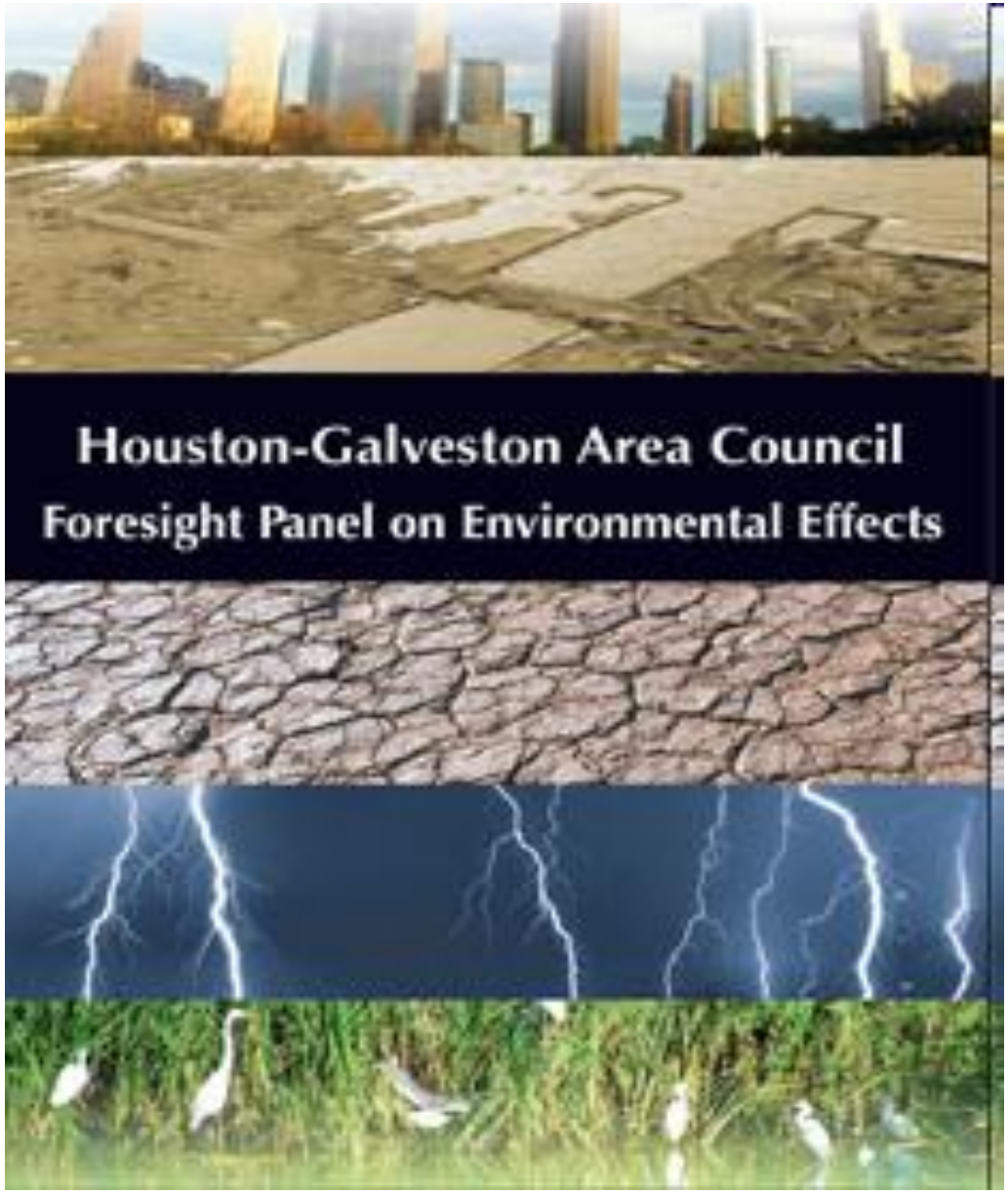

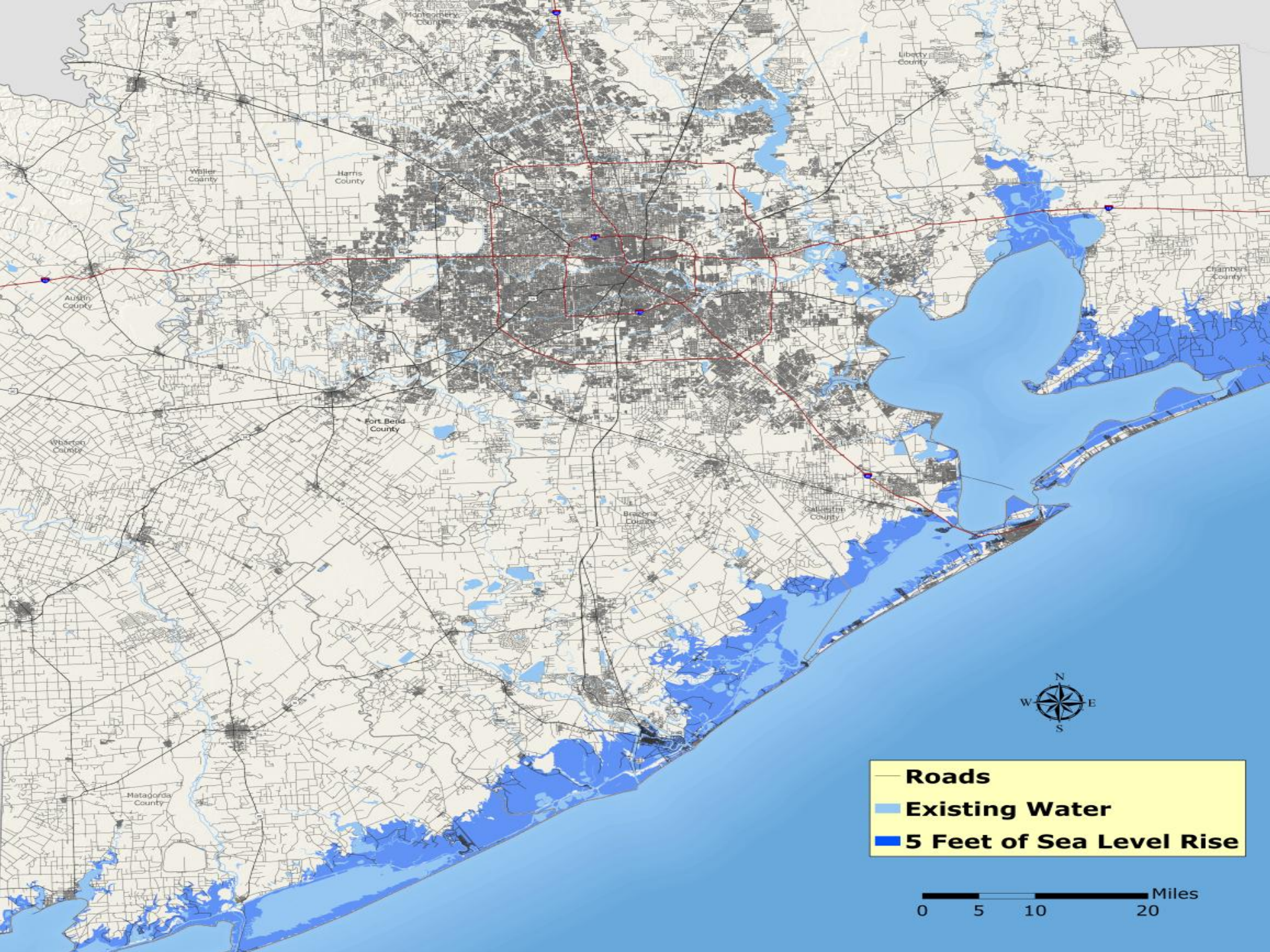
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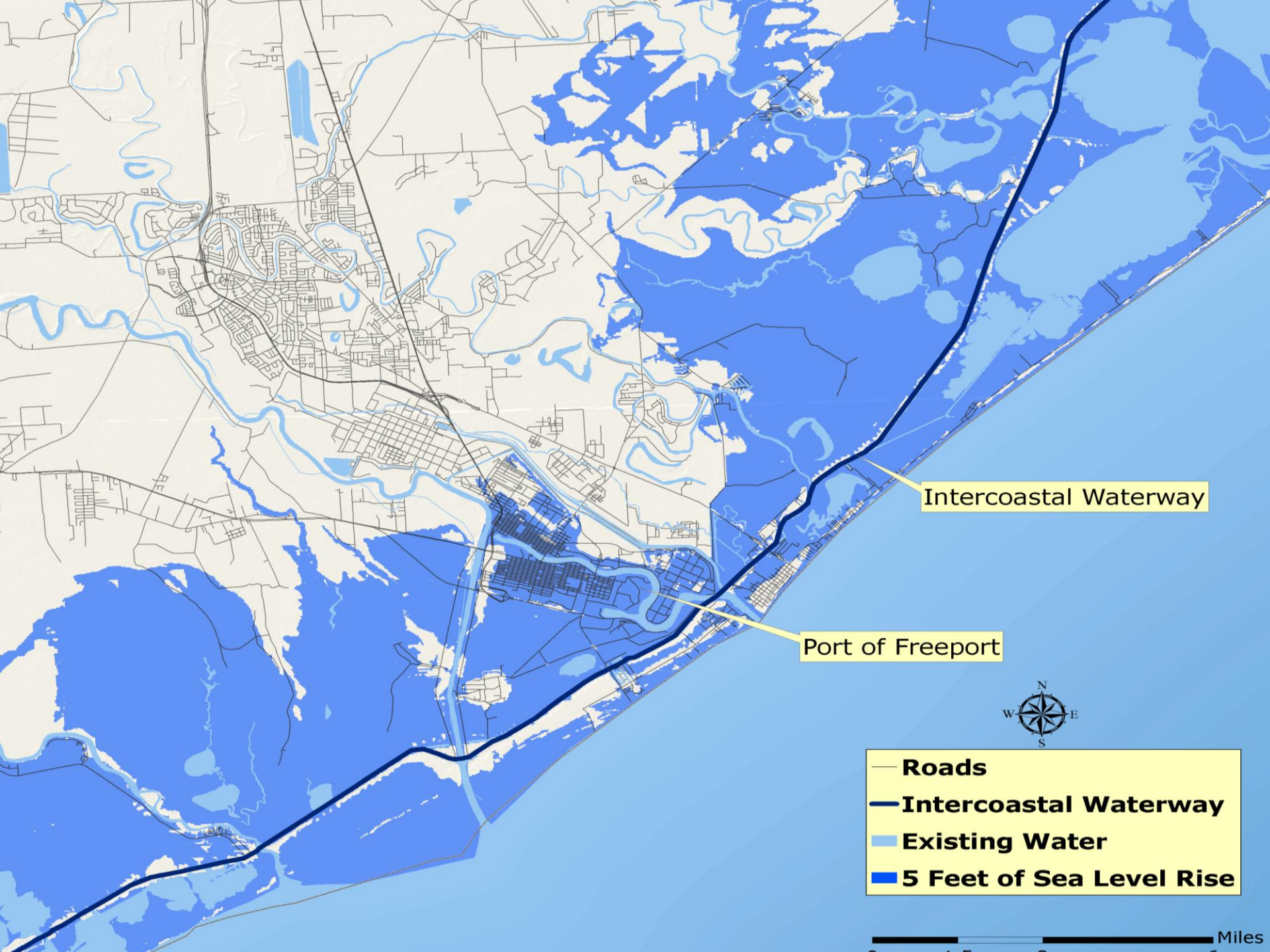
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Communications & Community Preparedness as Mitigation

HARRIS COUNTY
HOMELAND SECURITY & EMERGENCY MANAGEMENT
TEXAS

COUNTY JUDGE ED EMMETT
DIRECTOR

Mitigation

Hazard Mitigation is sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects.

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT

DIRECTOR

Harris County

- 1777 square miles
- 4 million people (larger than 24 states)
- 2nd largest port based on exports
- 3rd largest county in U.S. by population
- 34 cities
- 54 fire departments
- Over 125 law enforcement agencies
- 22 major watershed's
- Over 1200 MUDs & PUDs
- 8800 miles of pipeline
- 35 presidential declarations of disaster

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT

DIRECTOR

The Region Ranks #1 -

- U.S. manufacturing cities
- Top Texas tourist destination
- Healthiest housing market
- Largest IT service economy
- Highest population growth in the nation

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT
DIRECTOR

Key Industries

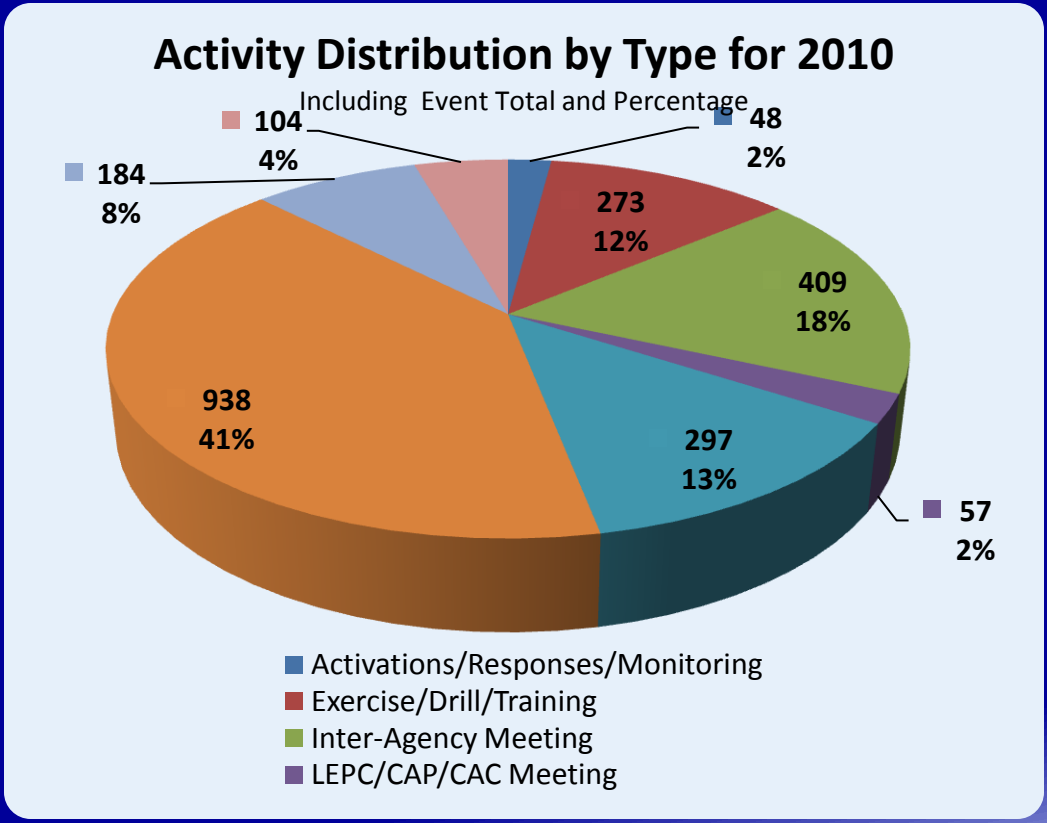
- Information Technology
- Nanotechnology
- Energy
- Aerospace
- Health Care

COUNTY JUDGE ED EMMETT
DIRECTOR

Potential Hazards

- Hurricane
- Tornado
- Flood/Flash Flood
- Winter Storm
- Power Outage
- Water Shortage
- Wildfire
- Mass Fatality
- HazMat or Chemical
- Terrorist Act
- Civil Disturbance
- Earthquake
- Oil Spill
- Economic Loss
- Communications
- Urban Fire
- Building Collapse
- Subsidence
- Utility Outages
- Drought
- Disease
- Rail Accident

2010 in numbers



HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT
DIRECTOR

Preparedness

Harris County Citizen Corps:

Community Emergency Response Teams

Volunteers in Police Service

Medical Reserve Corps

USA on Watch

Fire Corps

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT

DIRECTOR

The Need to be Ready

<u>In 95% of all emergencies,</u>

Bystanders or victims themselves are the first to provide emergency assistance or to perform a rescue

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT
DIRECTOR

First Responders Per Capita

1 firefighter for every 280 people

1 million firefighters – 750,00 volunteer

1 sworn officer for every 385 people

436,000 sworn law enforcement personnel

291,00 sworn sheriff's office personnel

1 EMT/paramedic for every 325 people

860,000 all levels of pre-hospital services:

Basic EMT, intermediate EMT, paramedic

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT
DIRECTOR

Citizen Corps Mission

Every American can participate through:

- **Personal responsibility:** preparedness plans and disaster supplies kits – home health and safety practices- disaster mitigation measures – crime prevention and reporting
- **Training:** emergency preparedness – response capabilities – first aid – fire suppression – search and rescue procedures – public health and safety
- **Volunteer service:** law enforcement – fire – emergency medical services – community public health – emergency management – disaster relief & community safety organizations

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT
DIRECTOR

Harris County Citizen Corps

HARRIS COUNTY
HOMELAND SECURITY & EMERGENCY MANAGEMENT
TEXAS

COUNTY JUDGE ED EMMETT
DIRECTOR

Citizen Corps Community Benefits

- Greater sense of security, responsibility, and personal control
- Builds community pride, unity and patriotism
- Promotes risk reduction, mitigation, and preparedness practices
- Prepares us all for helping others in a crisis

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT
DIRECTOR

Citizen Corps Community Benefits

Benefits for First Responders:

- Year round support through volunteer programs
- Reduces burden on first responder services by promoting mitigation and preparedness measures
- Creates well trained, better informed, and better prepared citizens to take care of themselves and others during times of crisis – allowing first responders to address the most crucial needs

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT
DIRECTOR

Additional CERT Training Opportunities

- Shelter management
- Community relations
- Donations management
- Functional and needs concerns
- Debris removal
- Utilities control
- Advanced first aid
- Automated External Defibrillator use
- CPR Skills

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT

DIRECTOR

Course Preview

The Scope of this course includes:

- Fire safety.
- Disaster medical operations.
- Light search and rescue.
- Cert organization.
- Disaster psychology.
- CERTS and terrorism.
- Review & CERT Drill.

COUNTY JUDGE ED EMMETT
DIRECTOR

Public Education & Outreach

More than 184 outreach events

Over 100 tours of the EOC

297 Media inquiries

25,000 Ready DVDs

144,000 disaster preparedness wheels

Total: 938 Communications Products

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT

DIRECTOR

Communications

Goal:

To be the most timely and accurate source of information

Audiences:

Decision makers, stakeholders & the public

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT

DIRECTOR

Joint Information Center

HARRIS COUNTY HOMELAND SECURITY & EMERGENCY MANAGEMENT TEXAS

COUNTY JUDGE ED EMMETT

DIRECTOR

Q & A

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COUNTY JUDGE ED EMMETT
DIRECTOR

The Role of Hazard Mitigation in Sustainable Communities Regional Planning




Houston-Galveston Area Council

H-GAC Region

- 125+ local governments
- 5.7 million people
- 150+ miles of coastline
- Flat
- Urban
- Suburban
- Rural
- Coastal
- Forecast 8 million 2035

Overview

- Recent Experience with Natural Disasters
- Aftermath of Hurricane Ike
- Increased Awareness of Vulnerability & Mitigation
- Sustainable Communities Regional Planning
- Thoughts on Housing

Flooding

Flooding

Drought

MATAGORD

HOME NEWS SP

County Bloodline:

Photo by Adriana Acosta

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By Adriana Acosta • *Originally published September 30, 2010 at 4:17 p.m., updated September 30, 2010 at 4:17 p.m.*

A bloodline flows through Matagorda County.

No, it's not just generations of families, but 300 miles of canals that keep the heart of the county beating.

Water flows through streams that feed the land in abundance, helping the growth of a new beginning – the first crop of rice farming.

Rice farmers understand the importance of water.

Texas size drought taking toll on farmers, ranchers

Story Comments

0 tweet

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Posted: Tuesday, July 7, 2009 12:00 am | Updated: 12:21 pm, Mon Oct 25, 2010.

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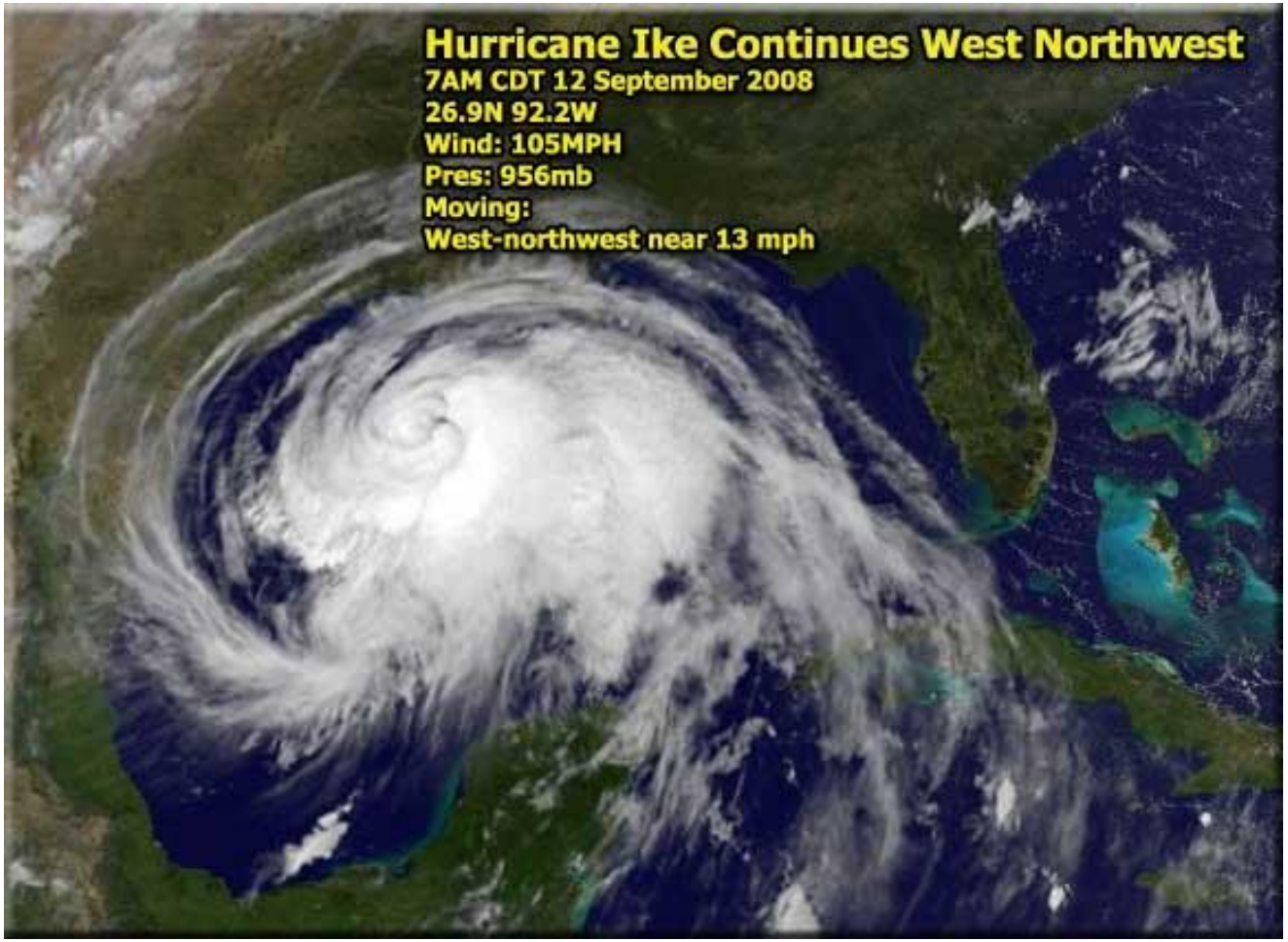
By ASHLEY TOMPKINS, Managing Editor | 0 comments

Parched land, scorching triple-digit temperatures and a lack of significant rainfall are leaving farmers and ranchers along the Gulf Coast high and dry this summer as they face a new kind of storm.

Many are still recovering from Hurricane Ike, and are now facing a new kind of storm resulting in drought-like conditions that have many pleading for any kind of rain they can get.

Wildfire Threat – Wildland Urban Interface

Ike Approaches



Hurricane Ike- Evacuation Area

Households

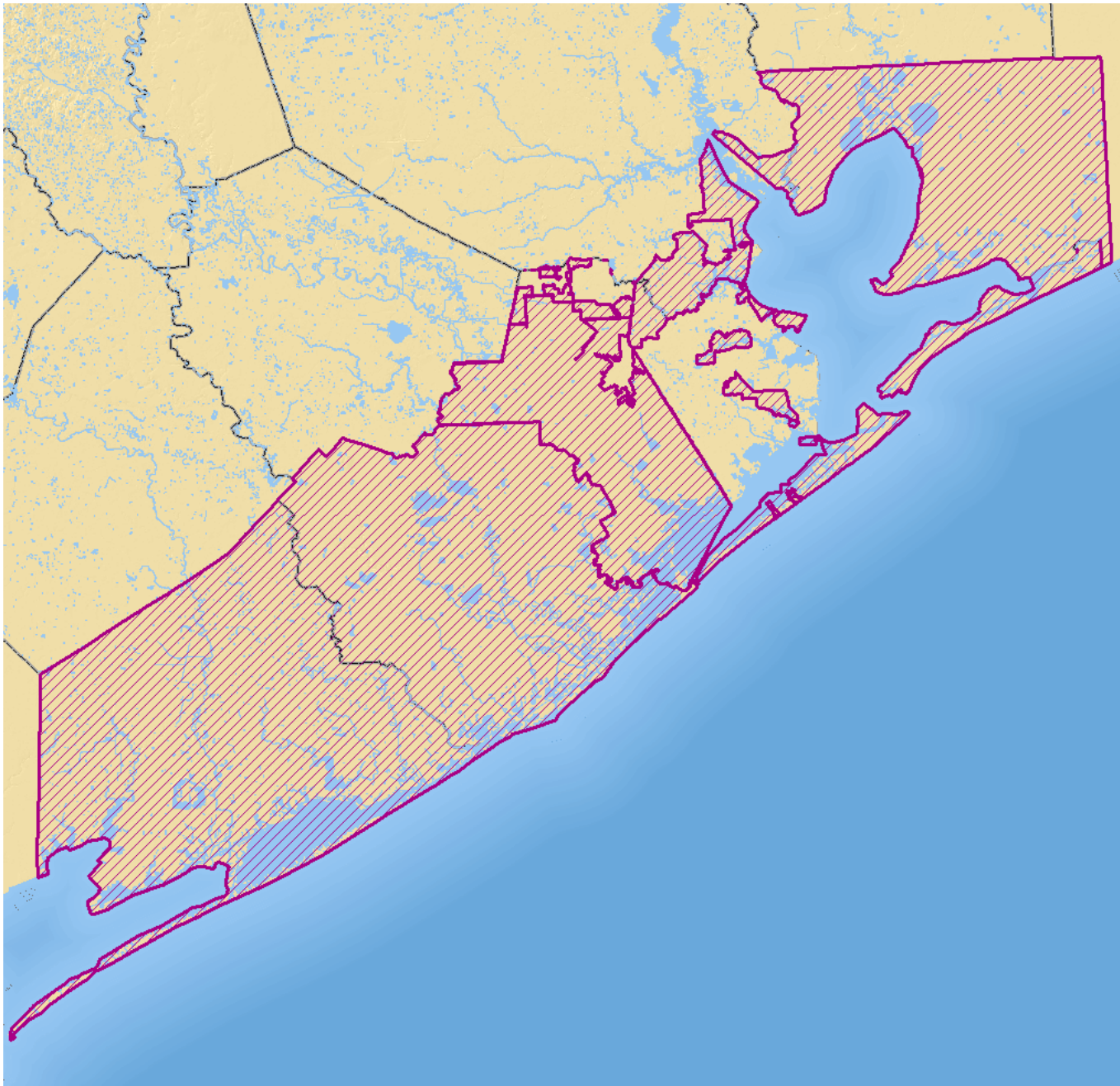
No.	Pop
228K	606K

Businesses

No.	Jobs
>15K	256K

Special Needs

	No.
Households w/out Cars	14K
Disabled Individuals	96K

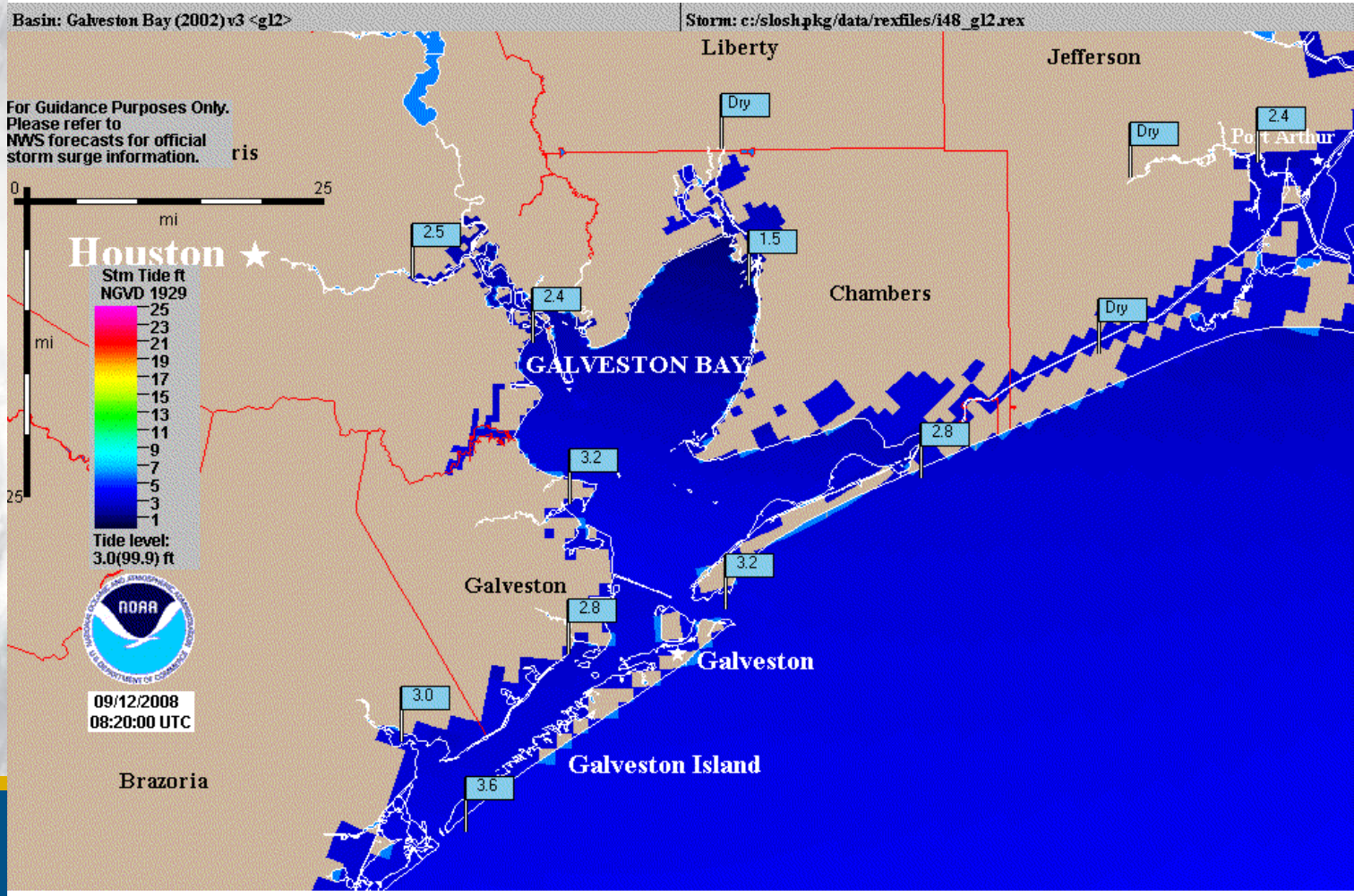


Pre-Landfall

Pre-Landfall

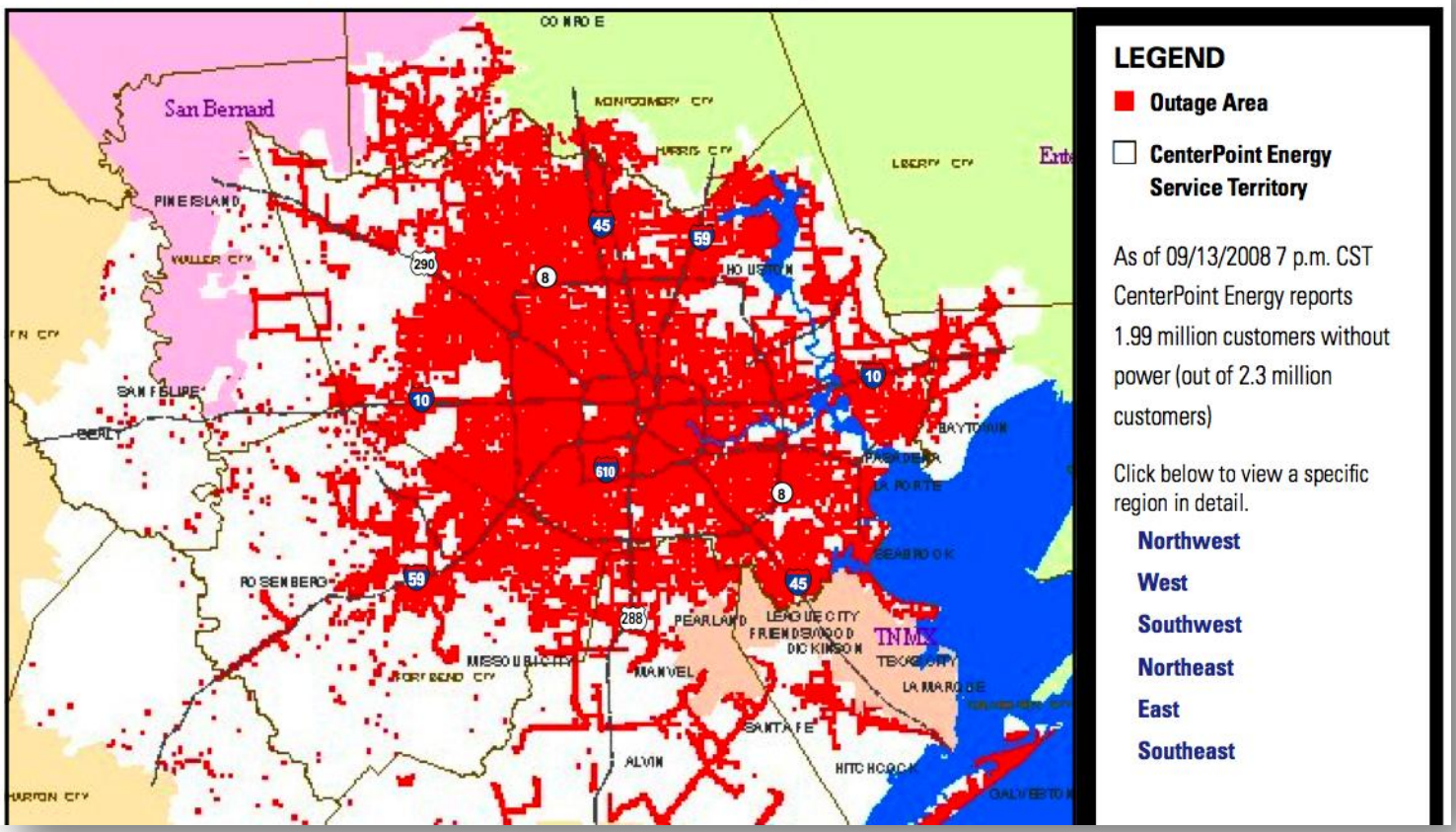
Pre-Landfall

Hurricane Ike- NOAA SLOSH Model (Estimated Storm Surge)



Over 2 Million without Power

CenterPoint Energy Outage and Restoration Map



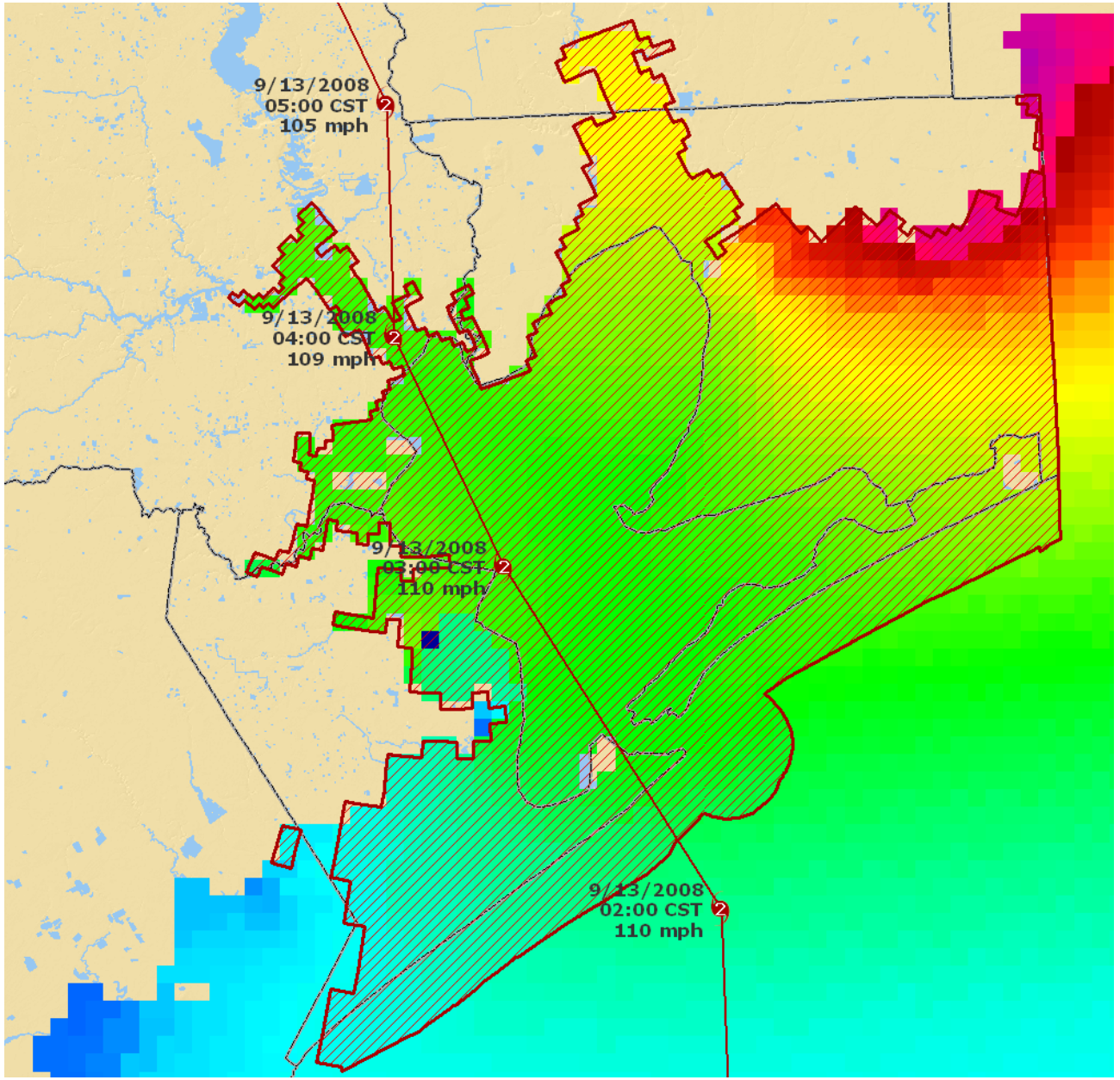
Roads Impassable

Destruction


September 15, 2008
USGS

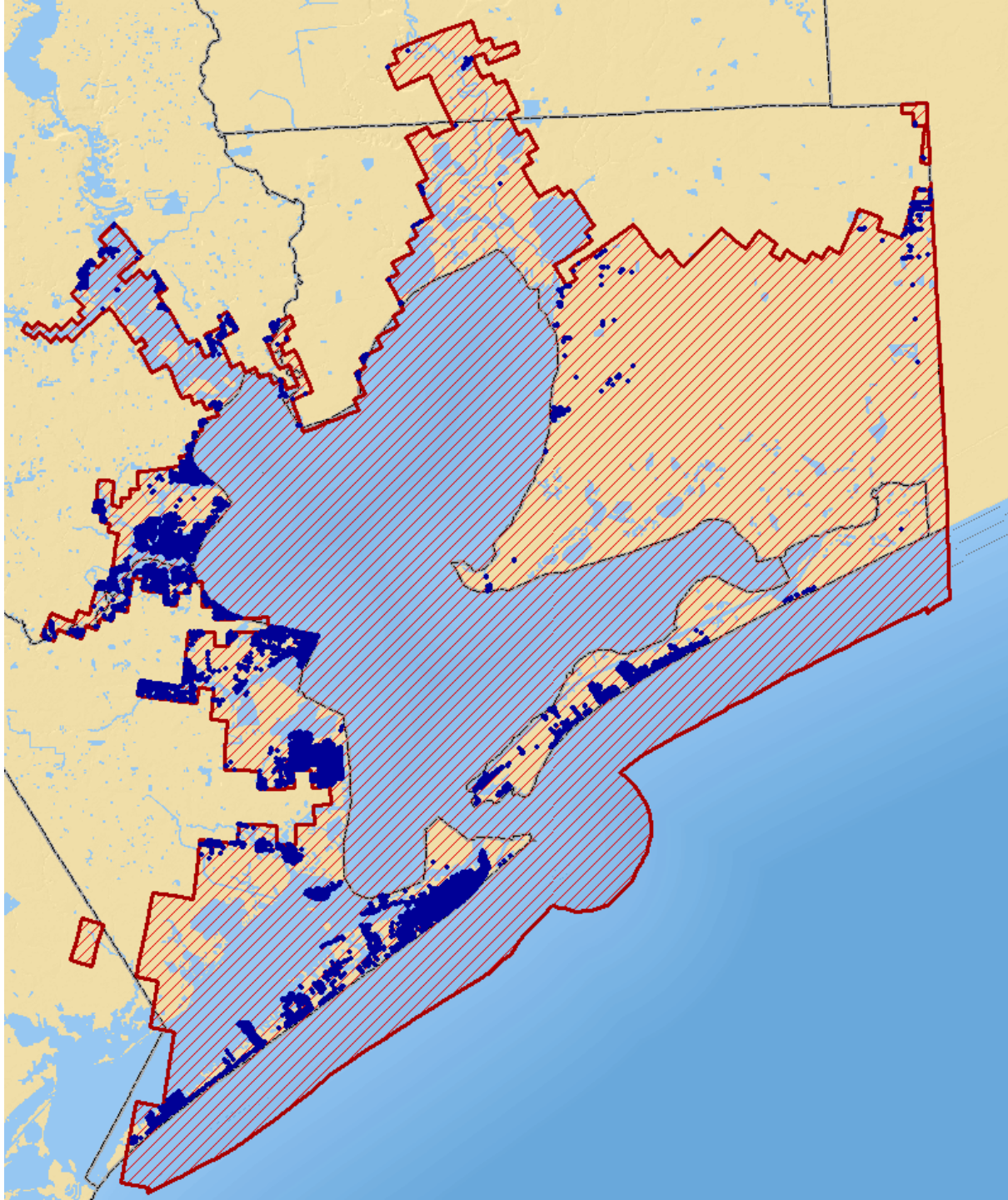
Residents and Workers Displaced

Focused on Immediate Needs


9/13/2008
05:00 CST
105 mph
9/13/2008
04:00 CST
109 mph
9/13/2008
03:00 CST
110 mph
9/13/2008
02:00 CST
110 mph

Hurricane Ike- Storm Surge Zone Potential Impacts

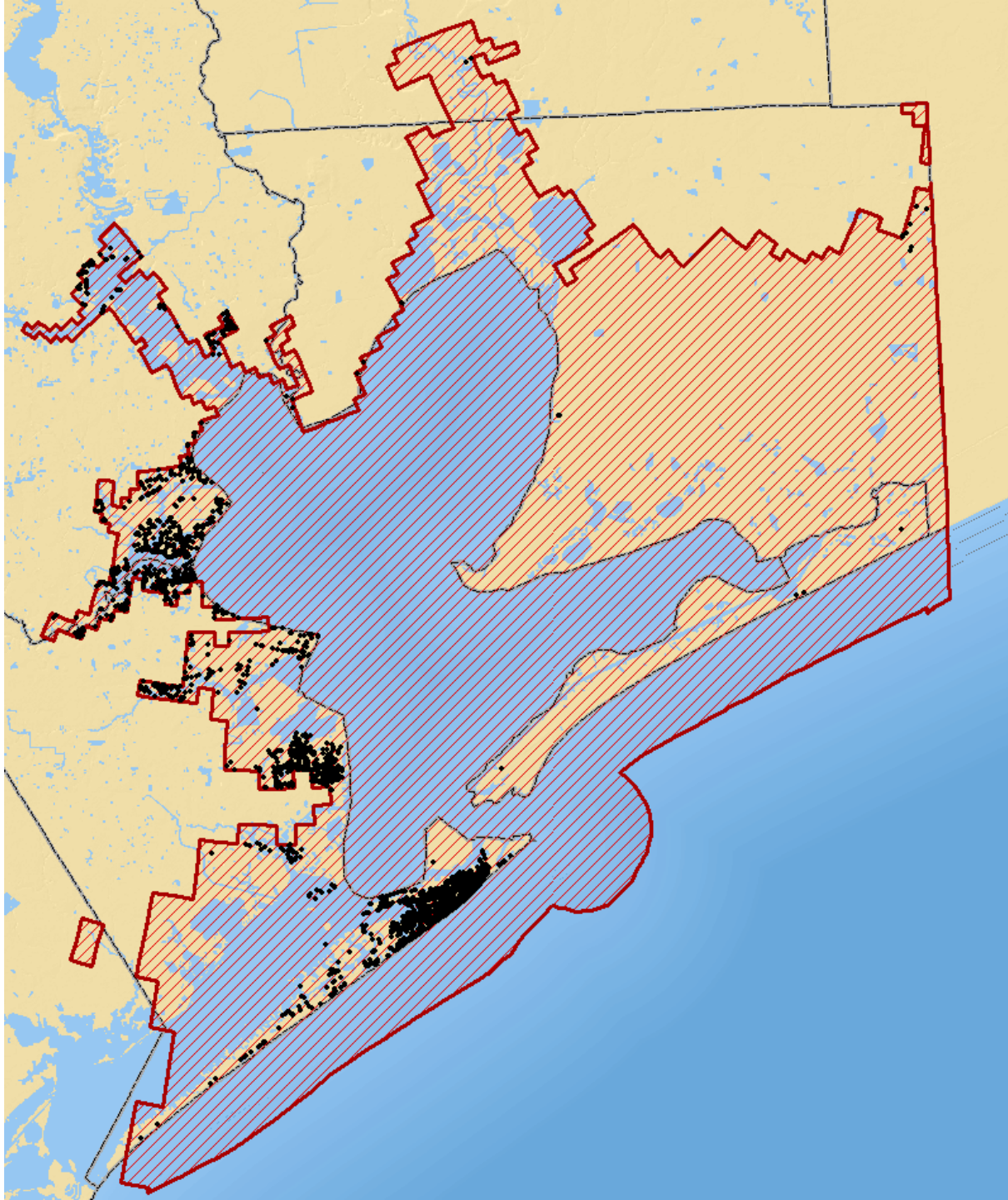
	No.	Pop
Households	81K	205K



Hurricane Ike- Storm Surge Zone Potential Impacts

	No.	Pop
Households	81K	205K

	No.	Jobs
Businesses	>5K	99K



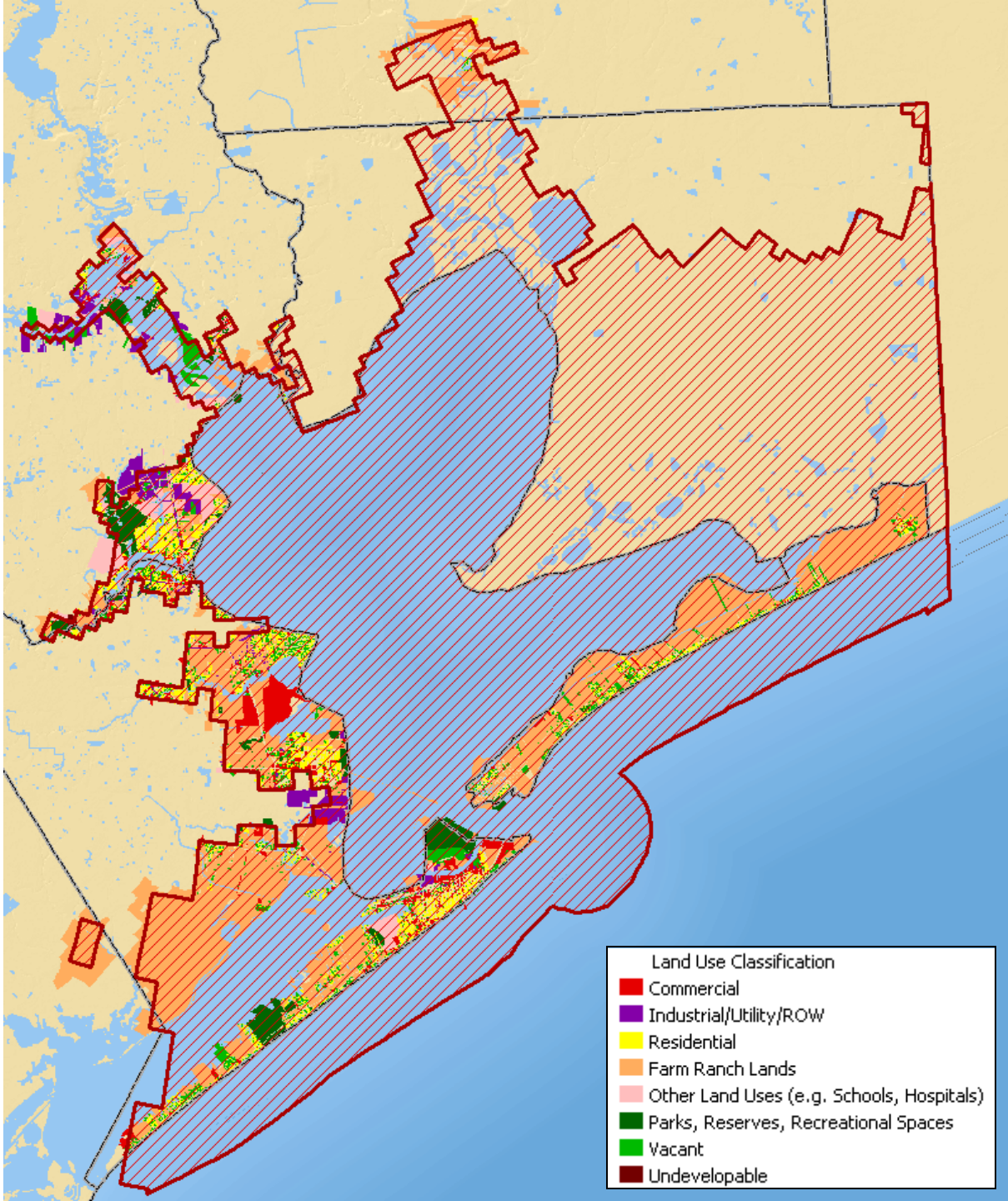
Hurricane Ike- Storm Surge Zone Potential Impacts

	No.	Pop
Households	81K	205K

	No.	Jobs
Businesses	>5K	99K

Property*	Parcels	Impr. Value
Residential	60K	$6.9B
Commercial	5K	$3.7B
Other	32K	$191M

*Galveston, Liberty, Harris, and Brazoria Counties



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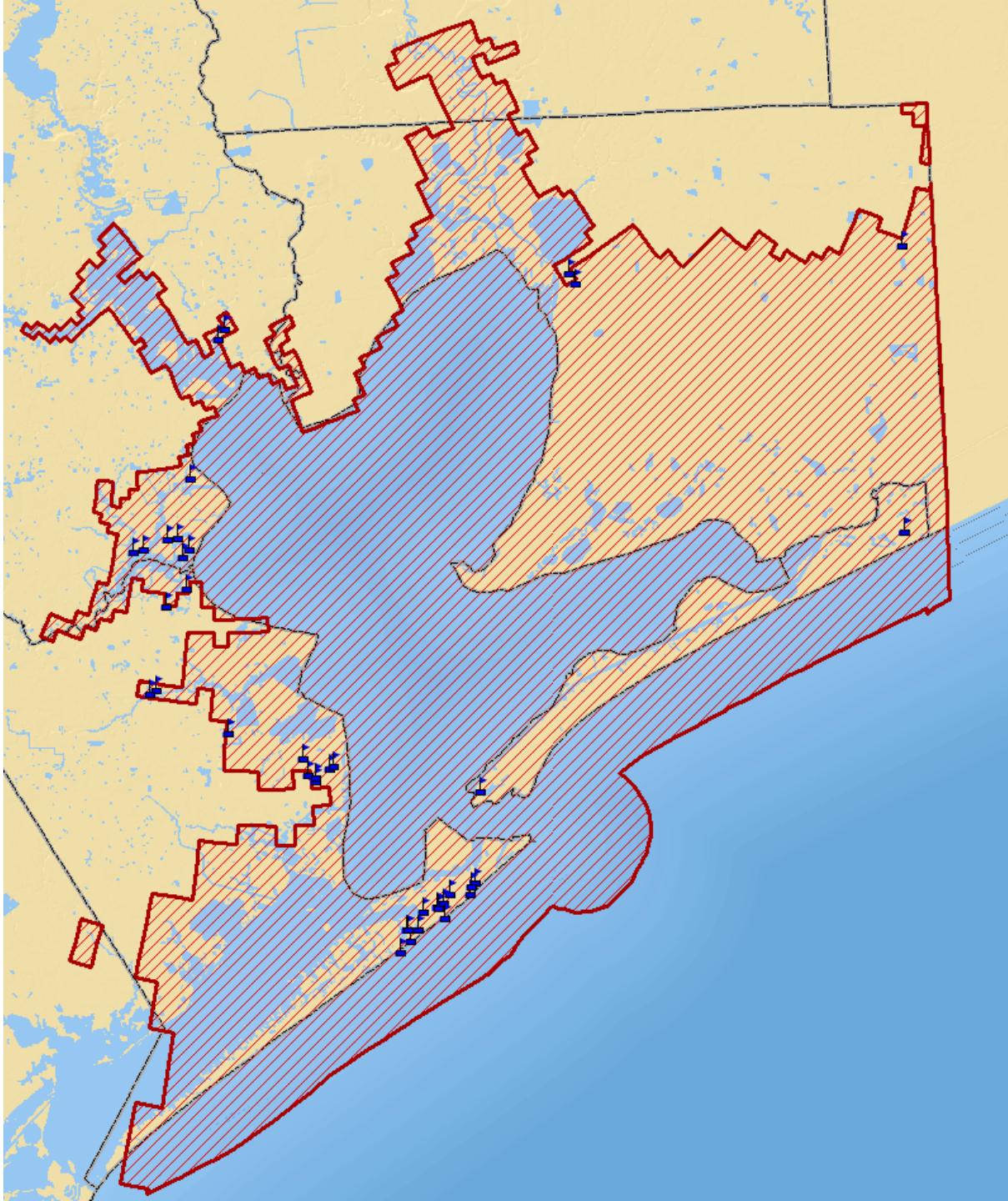
Infrastructure	No.
Schools (K-12)	42



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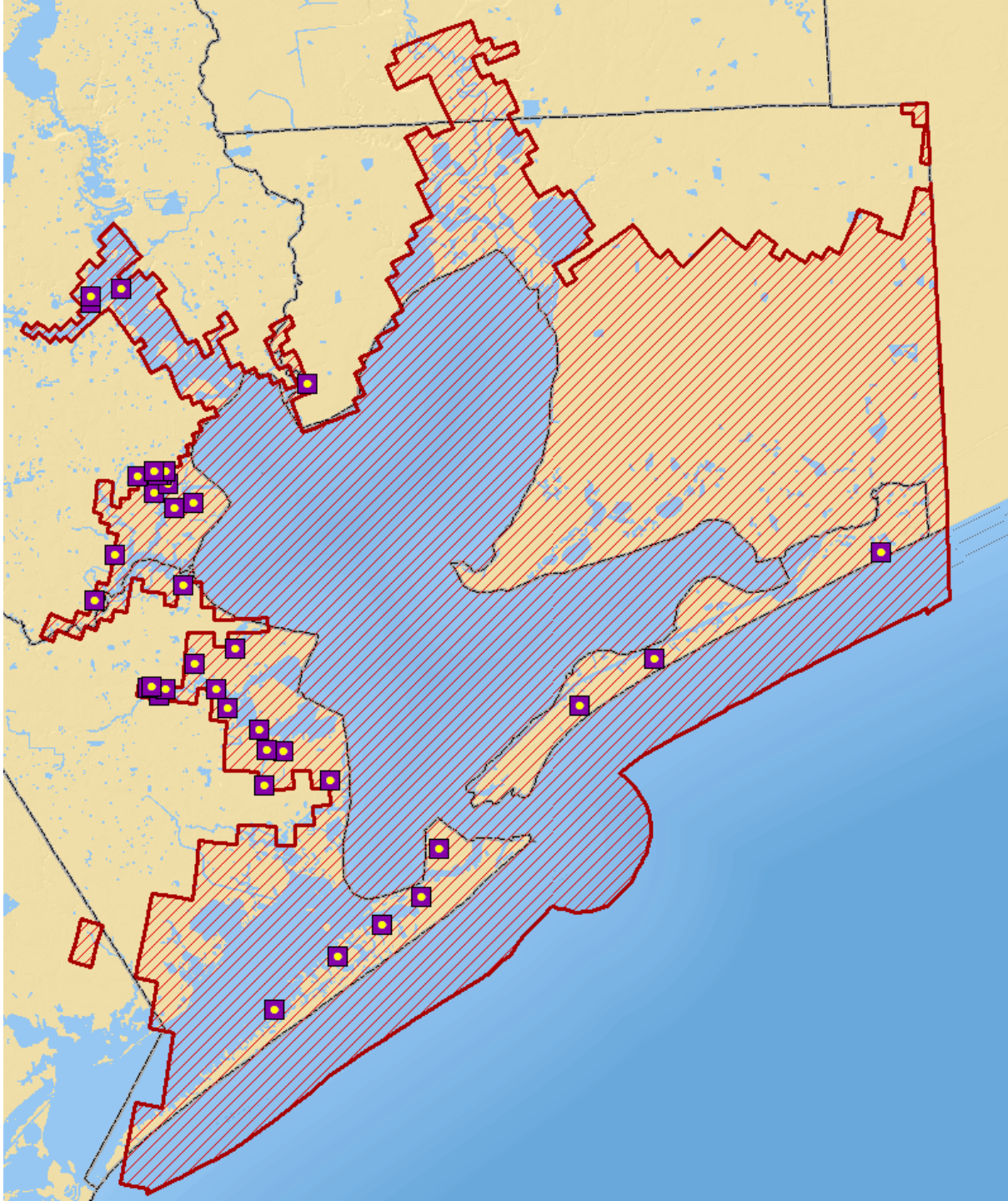

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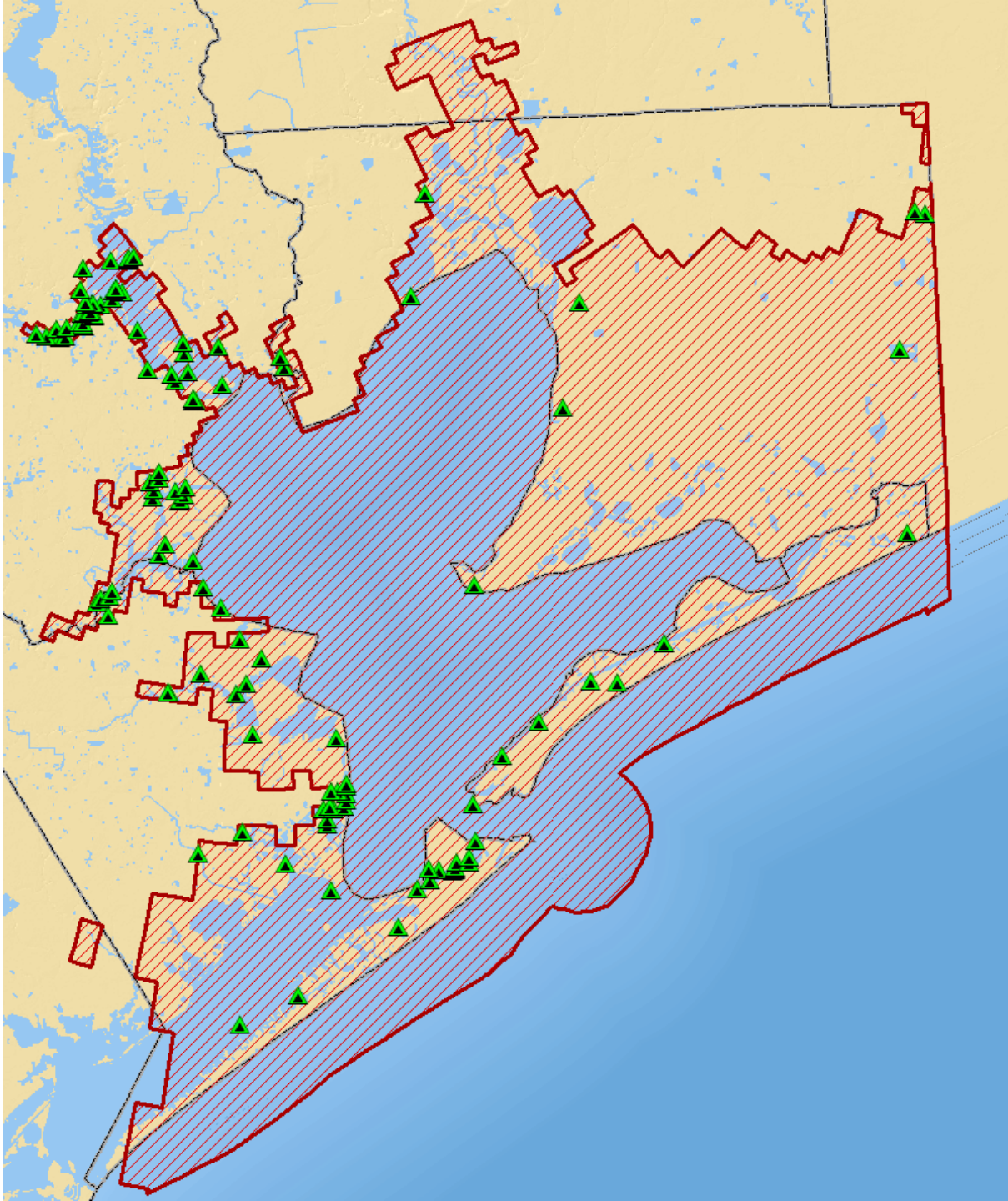
Infrastructure	No.
Schools (K-12)	42
Sub-Stations	41
Waste Water Treatment Plants	131



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Waste Water Treatment Plants	131
Hospitals	13

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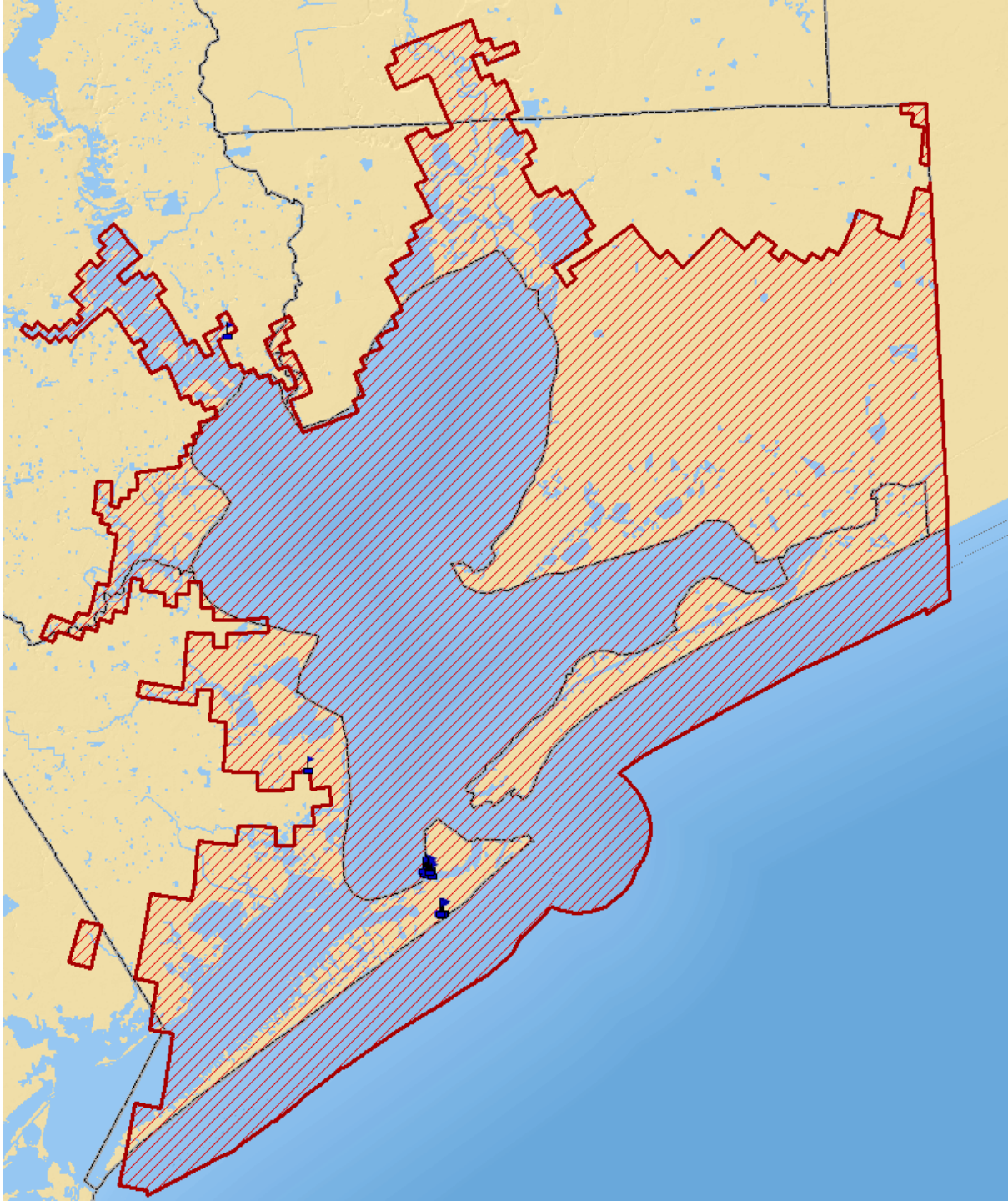
Infrastructure	No.
Schools (K-12)	42
Sub-Stations	41
Waste Water Treatment Plants	131
Hospitals	13
Universities	4



H-GAC Assistance

- Debris removal contracts
- Workforce services
- Economic development grants
- HMGP Grant Eligibility
- Administration of loan programs
- Social Services Block Grants
- Allocation of $2 billion CDBG DR

Chronic Impacts – Seafood & Ecotourism

chron | Hurricane Central: Ike

NEWS SPORTS BUSINESS ENTERTAINMENT LIFE TRAVEL BLOGS JOBS

11 Comments 4 Recommend Recommend

Ike's salty floods leach ranches of life

Crops and cattle suffer where storm surge left barren fields

By CINDY HORSWELL
Copyright 2008 Houston Chronicle
March 8, 2009, 1:14AM

1 2

Mayra Beltran Chronicle

Six miles from the Gulf, dead crabs lie on the salt-crusted soil. They were left behind when the water receded.

WINNIE — The two brothers are the family to oversee one of the state's o 1819.

But Steven and Bill White could neve 60,000-acre spread in Chambers Co does, today.

Patches of salt encrust the soil where planted this month. Most of the pastu 2,500 head of cattle, is so dead that t when they walk across it.

"Look at that," said Bill White, squatti crabs. Further proof, he noted, that fo Ike's surge, their ranch became part

The water has receded eight miles ba behind a salty residue that continues

USA TODAY Home News Travel Money Sports Life Tech

News » Nation Census Troops at Risk Lotteries

Tim Cooper inspects the remain
By Therese B. Shea for USA T

Ike destroys wildlife 'truck stop'

Updated 9/22/2008 12:59 PM | Comments 44 | Recommend 34

By Marisol Bello, USA TODAY

ANAHUAC, Texas — For hundreds of species of migratory birds h Anahuac National Wildlife Refuge is the last place they can fill up o the 600-mile trek across the Gulf of Mexico.

They may not be able to do that this year, after Hurricane Ike decir watchers around the country for the array of migratory and coastal

"It's like a truck stop," says Matt Whitbeck, the refuge's wildlife biol stop will be closed. That's what I'm afraid of."

chron | Hurricane Central: Ike

NEWS SPORTS BUSINESS ENTERTAINMENT LIFE TRAVEL BLOGS JOBS HOMES

44 Comments 23 Recommend Recommend

Vietnamese crabbers starting over — again

Oak Island residents whose lives were devastated by Ike are no strangers to hardship

By CINDY HORSWELL
Copyright 2008 Houston Chronicle
Nov. 15, 2008, 11:08PM

1 2 3

BILLY SMITH II PHOTOS CHRONICLE

Lam Huynh ties down empty crab traps to the back of his fishing boat on Trinity Bay earlier this month. Huynh's business was devastated by Hurricane Ike.

OAK ISLAND — What little is left of Lam Huynh's Bay can no longer hold back the chilly winds, pou deluge of mosquitoes.

The Vietnamese fisherman, his wife and sons, ag now forced to sleep in tents. They cook their food bath water over the red glow of a small propane d

Worn down by more than two months of a rugged existence, Huynh's wife cried on a recent day as h trudged through mud, splintered wood, rusty nails used to be their peaceful fishing community in Ch

Hurricane Ike devastated Oak Island on Sept. 13, nothing inhabitable, where the Huynhs and 25 oth families once eked out a living catching crabs fro bay.

Not only are their homes gone, but so are most o

chron | Bay Area News

NEWS SPORTS BUSINESS ENTERTAINMENT LIFE TRAVEL BLOGS JOBS

39 Comments 0 Recommend Recommend

Wildlife refuges, state parks slammed by Ike

By CINDY HORSWELL
Copyright 2008 Houston Chronicle
Oct. 12, 2008, 11:19PM

1 2

Karen Warren Chronicle

Parts of Anahuac National Wildlife Refuge remain submerged weeks after Hurricane Ike made landfall.

It may take several years and more than damage Hurricane Ike did to the state pa refuges along the Gulf Coast that once a million tourists a year.

The storm eroded beaches, washed awa destroyed wildlife habitats in the three re parks between Sabine Pass and Galvest

Sea Rim State Park and Galveston State attracted 250,000 tourists a year, suffere Ironically, Sea Rim had been on the verg being closed for three years to make $70 after Hurricane Rita.

Now, Texas Parks and Wildlife's regional expects it to take at least three to five ye

"After Rita, we still had a park left at Se This time we don't. Ike has destroyed ev

Chronic Impacts – Seafood & Ecotourism

chron | Houston & Texas News

NEWS SPORTS BUSINESS ENTERTAINMENT LIFE TRAVEL BLOGS JOBS HOMES CARS CLAS

27 Comments 6 Recommend Recommend

The state of the bay

Oysters may be the hardest-working creatures in the water, filters for an ocean's lifeblood. And their massive loss from Ike threatens the entire ecosystem.

By SHANNON TOMPKINS
HOUSTON CHRONICLE
Aug. 24, 2009, 12:49AM

1 2 3

James Nielsen Chronicle

Javier Zendejas works aboard Jeri's Seafood's oyster boat, Miss Britney, on a reef in Galveston's East Bay, where 80 percent of the oysters lie dead, smothered by the blanket of sediment Hurricane Ike washed in.

Galveston Bay's oysters, crucial to the health of Texas' largest estuary ecosystem and the $675 million-a-year recreational and commercial fishing industry it supports, have survived more than century of human indignities, including avaricious gnawing by sh dredgers, burial under spoil from channel dredging and drastic changes in the bay's hydrology.

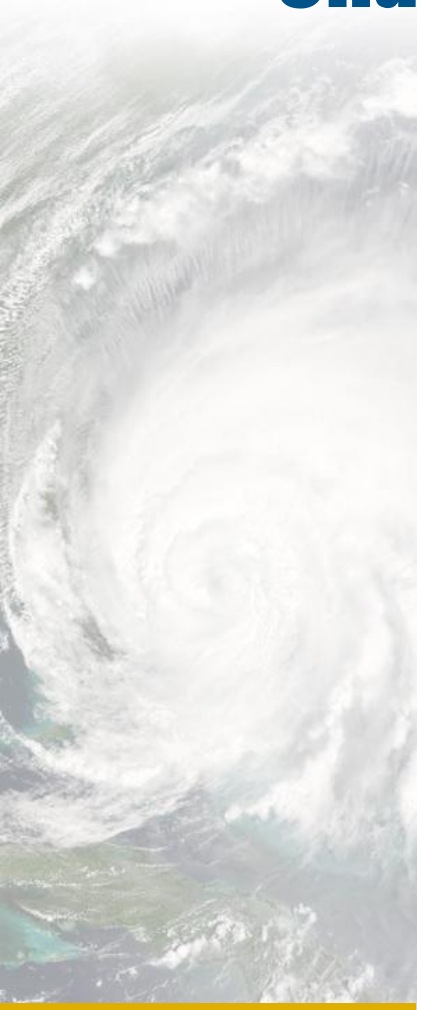
But many of the remaining patches of the bay's still-vibrant oyst reefs couldn't survive September.

As Hurricane Ike's win Peninsula and Galvest soil and vegetation co the bay.

This mix of soil, sand, floor, carpeting much

Approximately 60 perc

Challenges with Economic Recovery

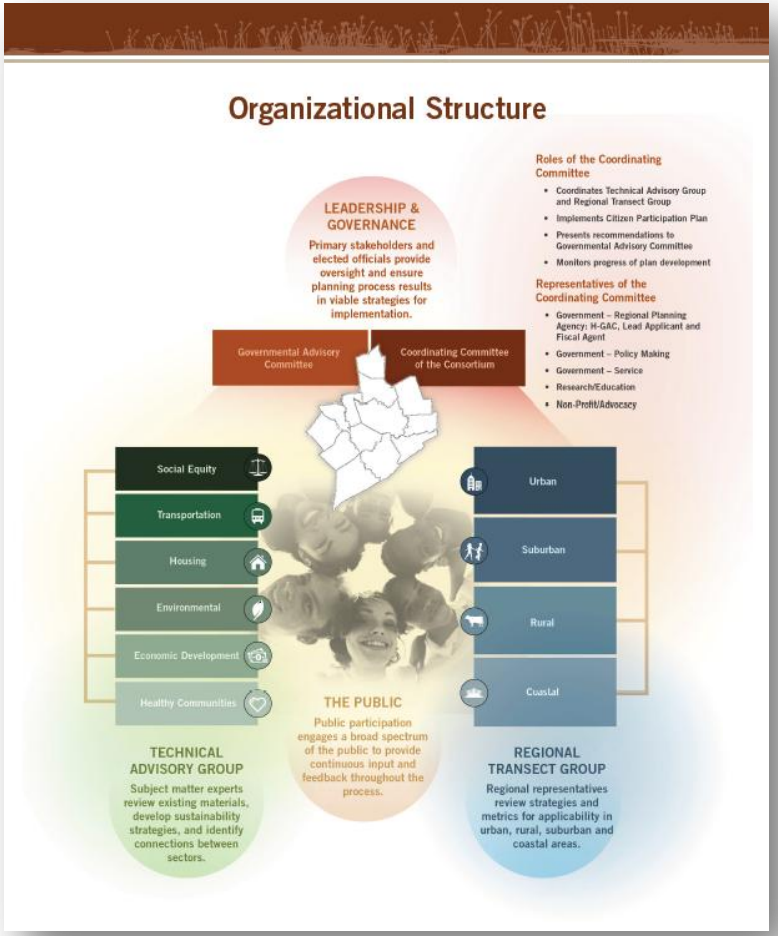


- Local Governments
  - Tight Budgets and tough decisions
  - Economically Vulnerable
  - Infrastructure needs
  - Potential loss of major employers
  - Displaced citizens & workers

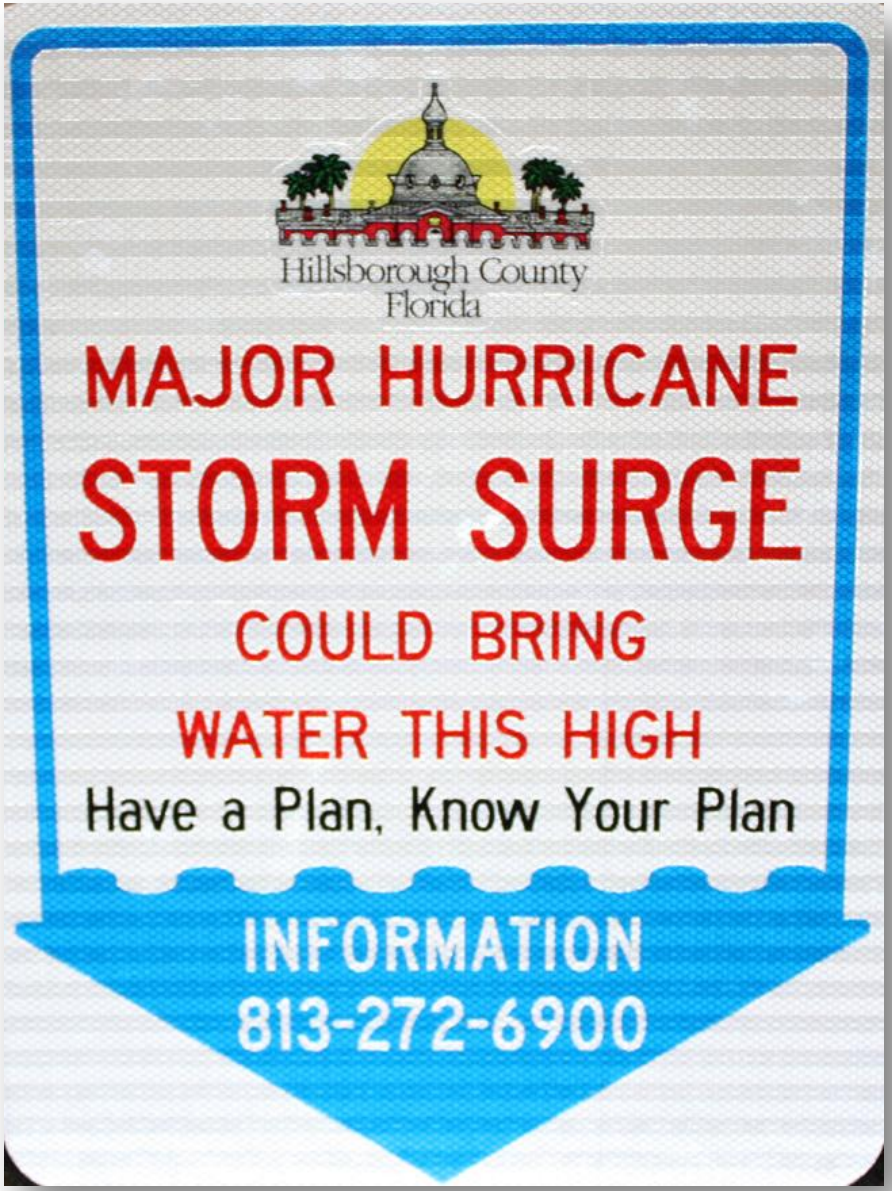
Long Term Recovery


Habitat
Houston-Galveston Area Council
January 17, 2006
Prepared By:
PBS&J
Houston-Galveston Area Council
Council of Governments
Regional Hazard Mitigation Plan
Volume I
Regional Hazard Mitigation Plan
anagement
Handbook
EGIONAL FLOOD MANAGEMENT COUNCIL
Houston-Galveston Area Council | July 2009

Sustainable Communities Regional Planning



- Inclusive
- Representative
- Comprehensive
- Integrated
- Weaves community fabric
- Uniquely linked to natural disasters & hazard mitigation


Hillsborough County
Florida
MAJOR HURRICANE
STORM SURGE
COULD BRING
WATER THIS HIGH
Have a Plan, Know Your Plan
INFORMATION
813-272-6900

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January 2010

FEMA
Perma

Francis X.
Analyst in

Septembe

CRS
Prepar

GA

Natural Disaster Housing Reconstruction Plan

As required by HB2450, 81st Legislative Session
Submitted by the Natural Disaster Housing Reconstruction Advisory Committee
November 30th, 2010

e Viable Disaster
ase Study of the
tive Housing Program

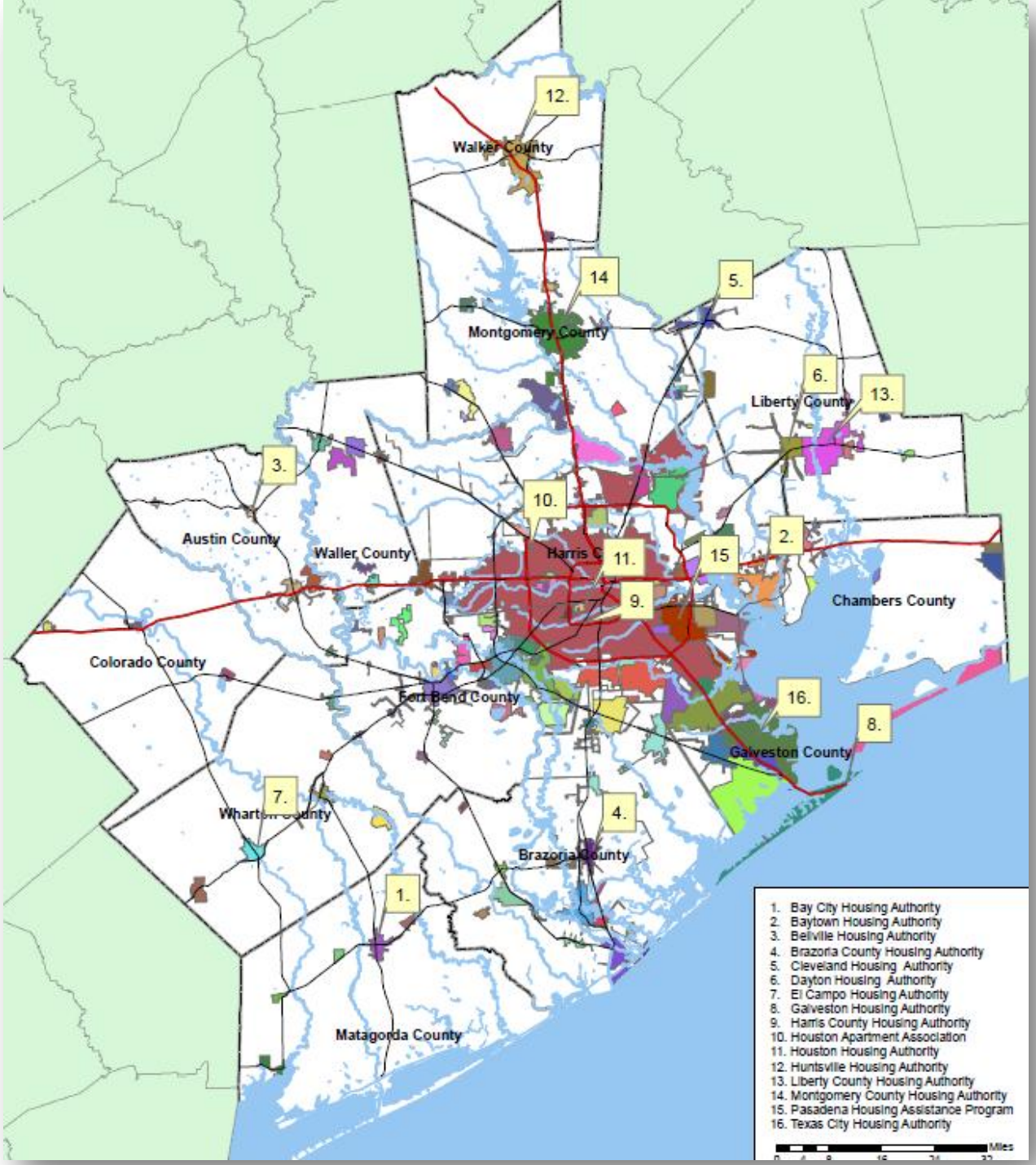
for:
ent of Housing and Urban Development
Policy Development & Research

nergency Management Agency
ssistance Directorate
Housing Pilot Program

Marianne Cusato

Steve Mouzon


BED 1
12'-6" x 8'-8"
16'-0"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Walker County
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Montgomery County
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Chambers County
Colorado County
Fort Bend County
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Galveston County
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4.
Brazoria County
1.
Matagorda County
1. Bay City Housing Authority
2. Baytown Housing Authority
3. Bellville Housing Authority
4. Brazoria County Housing Authority
5. Cleveland Housing Authority
6. Dayton Housing Authority
7. El Campo Housing Authority
8. Galveston Housing Authority
9. Harris County Housing Authority
10. Houston Apartment Association
11. Houston Housing Authority
12. Huntsville Housing Authority
13. Liberty County Housing Authority
14. Montgomery County Housing Authority
15. Pasadena Housing Assistance Program
16. Texas City Housing Authority
Miles

Local Officials
for Coastal Co

Design Considerations, Regulato
Best Practices for Coastal Comm

FEMA P-762 / February 2009

FEMA

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y for
Buildings

Home Builder's Guide to Construction in Wildfire Zones

Technical Fact Sheet Series

FEMA P-737 / September 2008

FEMA

Federal Emergency Management Agency
U.S. Department of Homeland Security
500 C Street, Southwest
Washington, DC 20472

FEMA

Mitigation Plays A Key Role

Questions?




Houston-Galveston Area Council