

Gulf Coast Community Protection and Recovery District Storm Surge Suppression Study October 9, 2014



Purpose

To investigate the feasibility of reducing the vulnerability of the upper Texas coast to hurricane surge and flood damages through the study of an integrated flood protection system that relies on natural or nature-based features, non-structural and structural interventions.

Method

To define flood risk management and surge suppression requirements within the region through a technical analysis of potential alternatives.

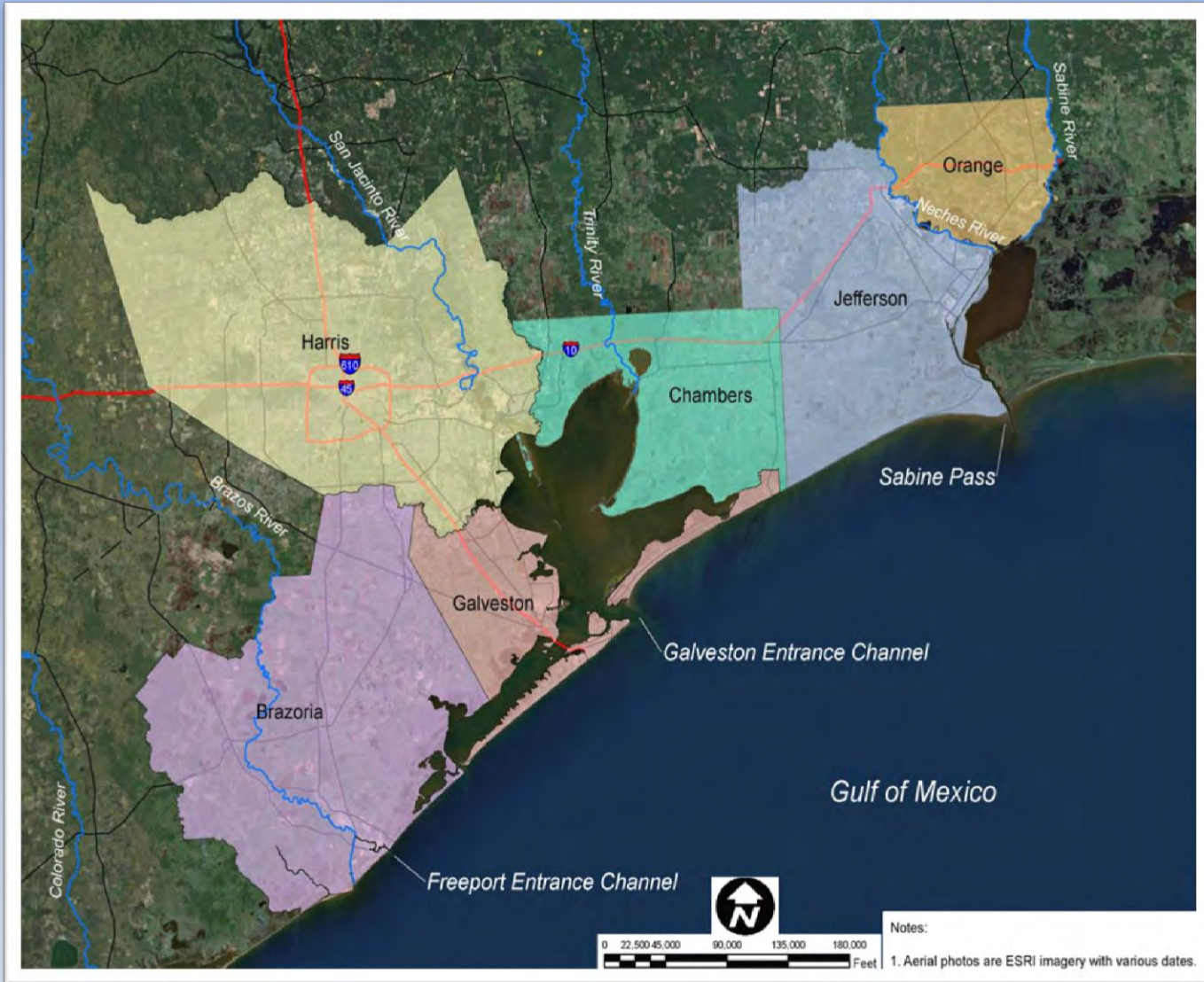
Answer the following questions:

- **What is the threat?**
 - Defined by modeling the physics and hydraulic loads
 - Models: ADCIRC, SLOSH, HEC-RAS
- **What needs to be protected?**
 - Defines the level of safety for people, industry and the environment
 - Models: regional economic model, environmental impacts
- **How will we protect?**
 - Integrate surge and flood defense system
 - Develop and evaluate technical structural and nonstructural alternatives
 - Compare cost of technical solutions to economic losses prevented to determine the Benefit-to-Cost Ratio (BCR) for alternatives
- **How do we finance the final project?**
 - Federal, state, local funds
 - Private investment
 - Public-private-partnership

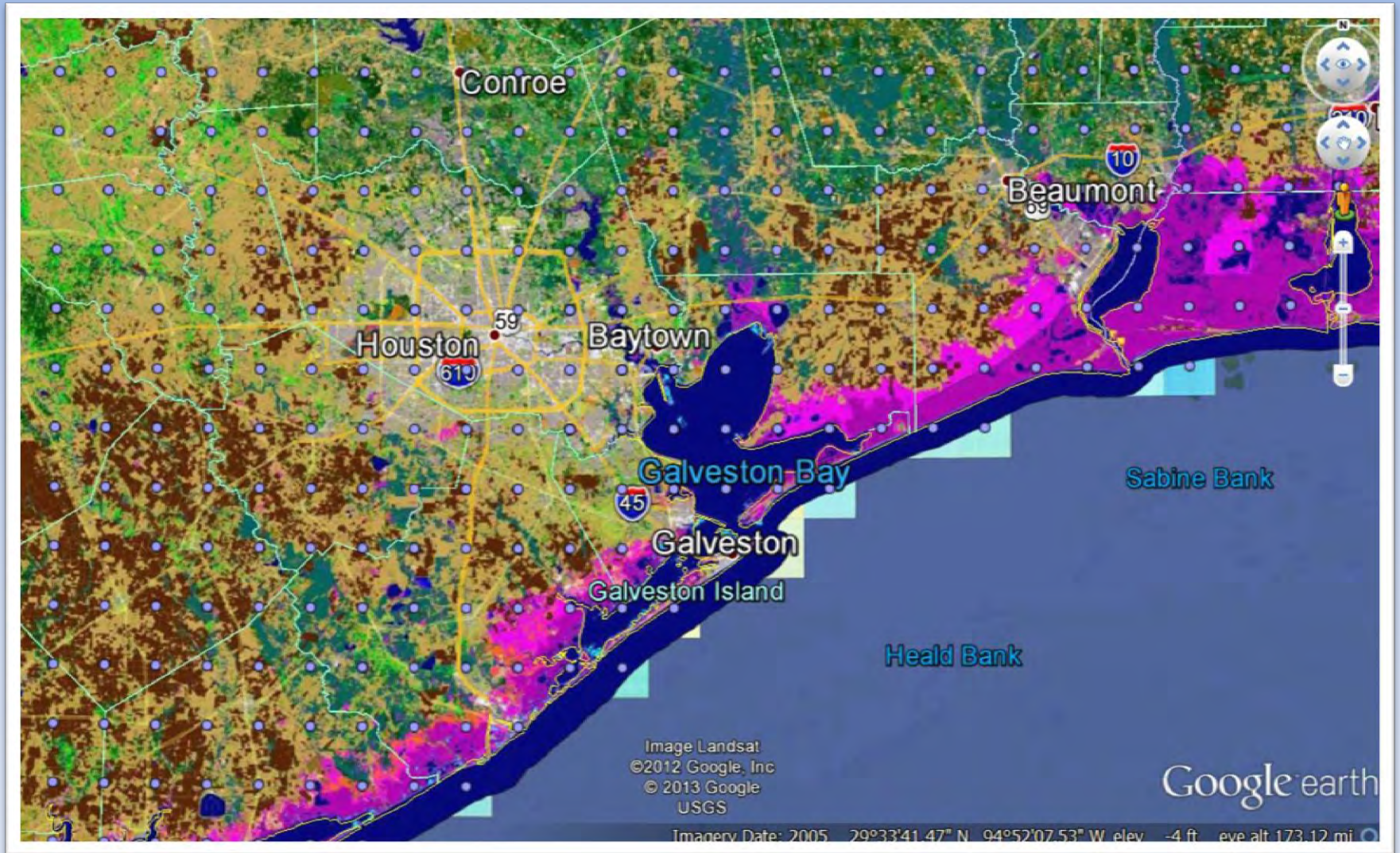
End State

A defined suite of alternatives based on sound technical and economic analysis that creates an integrated protection system that reduces risk to the public, the economy and the environment within the six county study region.

Study Area



NOAA Coastal Map



Study Area Facts

- Population of over 5 million people and growing
- America's largest concentration of energy, petrochemical and refining industries
 - 25% of the nation's petroleum refining capability
 - 40% of the nation's capacity for downstream chemical production
 - Fastest growing LNG industry in the nation
- Contains the following ports: (national ranking in 2012)
 - Houston (2)
 - Beaumont (4)
 - Texas City (10)
 - Port Arthur (25)
 - Freeport (27)
 - Galveston (41)
 - Orange
- Home to NASA
- Booming fisheries and tourism industry
- A coastal estuary system of national significance
- A regional economy linked to all of Texas, the national economy and to national security



Scope of Work

The scope of the GCCPRD Coastal Protection Study includes all the planning activities associated with the development of viable long-term plans and strategies to protect coastal communities region-wide from storm surge and flooding caused by natural disasters. The study region consists of coastal areas that could be impacted by storm surges in or around Brazoria, Chambers, Galveston, Harris, Jefferson and Orange Counties, Texas.

Methodology:

- Identify the threat to the region by modeling the physics and hydraulic loads associated with historical storms (determine storm of highest probability).
- Develop a regional economics baseline for life, safety, health, industry outputs and national security.
- Develop structural and non-structural alternatives to limit damage and evaluate their impacts to the environment.
- Compare final costs of alternatives to benefits to determine BCR's.
- Develop financing solutions.



Phase 1: Data Collection

Tasks:

- Collect and analyze existing studies, reports, concepts and background data pertinent to the region.
 1. Existing topographic and GIS data pertinent to the six county areas and the Gulf of Mexico
 2. Data documentation collected by universities and planning agencies (Houston-Galveston Area Council, Jefferson and Orange County Councils of Government, Rice, Texas A&M and the University of Houston)
 3. Data and documentation collected by the Federal Emergency Management Agency, the US Army Corps of Engineers and respective drainage districts
- Develop and coordinate data related to the economic and potential national security impacts of a severe storm along the six county areas.
- Review and analyze information regarding international solutions to prevent or mitigate flooding damage resulting from extreme storms surges and repetitive water events.
- Prepare an organized library of data gathered throughout the study for use by GCCPRD, the GLO, other government entities and the public.

Phase 1 Deliverables:

- An organized library
- A final written report of all the data gathered during Phase 1. The report findings and recommendations for Phase 1 will be presented to the GCCPRD board and the GLO. After review and acceptance by the GLO, the report findings will be disseminated to the public via the GCCPRD planning website.

Phase 1 Schedule:

- Phase 1 is to be completed by Feb 2015.



Phase 2: Mitigation Technical Study

Phase 2 consists of a major technical study to further refine the recommendations from Phase 1 and the direction purposed by the GLO. The technical study will be used to develop and confirm the optimal solutions and plans for adoption by the GLO.

Tasks:

- Further refine the scope of the study through stakeholder interviews and public scoping meetings.
- Identify and report technical and construction requirements and needs.
- Evaluate protection methodologies and impacts on the environment, cities, industry and shore line improvements.
- Confirm and implement computer models to evaluate effects of storm magnitudes and location within the study area.
- Develop a cost/benefit analysis of economic, housing, national security, refinery, pipeline and other industrial impacts.

Phase 2 Deliverables:

- A mitigation technical study report encompassing all Phase 2 tasks outlined above.
- The mitigation technical study report and recommendations for Phase 3 will be presented to the GCCPRD board and the GLO. After review, the report will also be presented to the public for comment via the GCCPRD website and any other pertinent public forums.

Phase 2 Schedule:

- Phase 2 will be completed Jan 2016.



Phase 3: Final Report and Recommendations

Tasks:

- Once the mitigation technical study is completed, a final report will be developed. The final report shall include, but is not limited to the following elements:
 - Mitigation and design strategies, and
 - Recommendations of resources necessary to move forward with the results. This would include local, state and national resources as well as corporate partners to see that the chosen solutions are implemented. (Financial Plan)
- Present the final report to the GCCPRD board and the GLO for review and comment. After review and acceptance by the GLO, the report will be made available to the public via the GCCPRD website and any other pertinent public forums.

Phase 3 Deliverables:

- A final report and recommendation as described above.

Phase 3 Schedule:

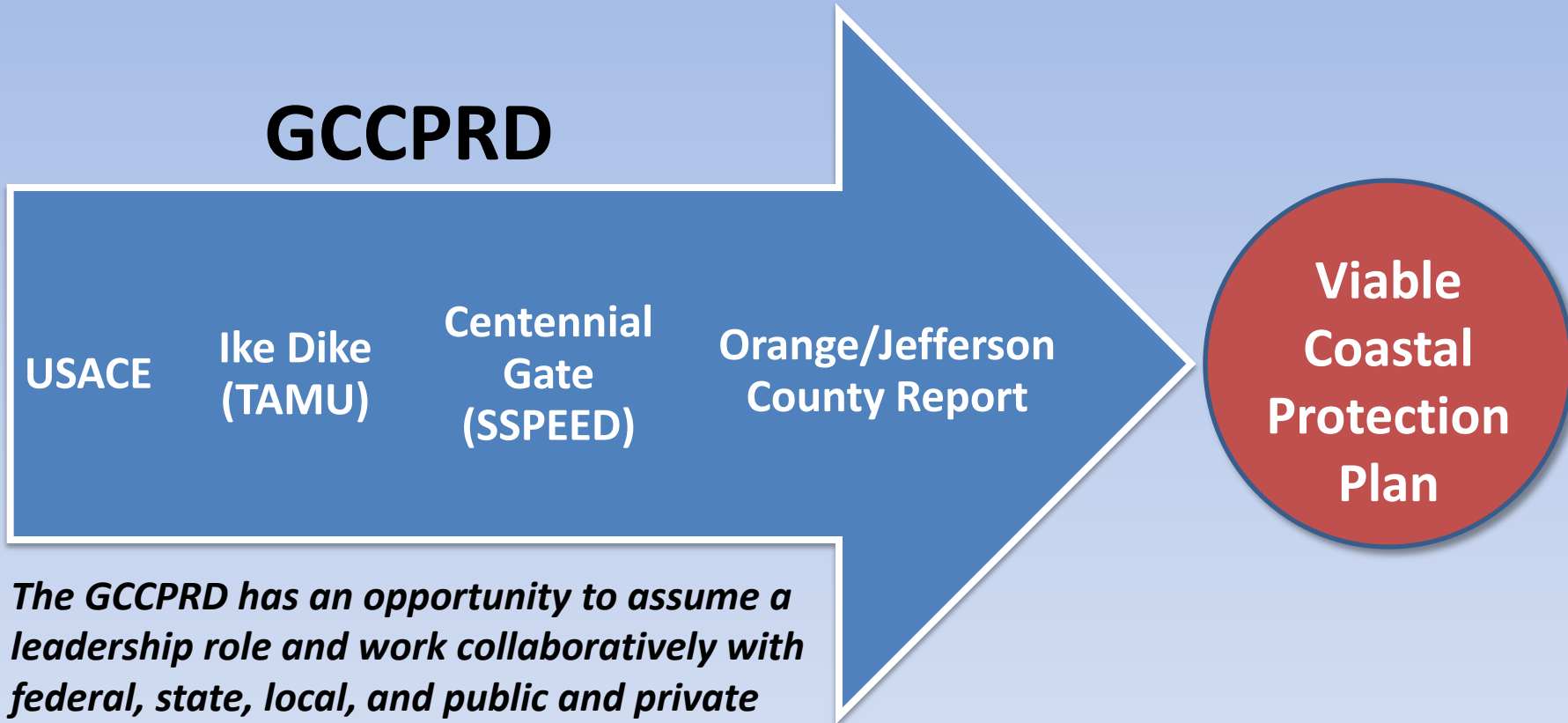
- Phase 3 is estimated to be completed by July 2016.



Planning Activities



A Leadership Role



The GCCPRD has an opportunity to assume a leadership role and work collaboratively with federal, state, local, and public and private institutions to develop a comprehensive coastal protection plan that meets the needs of the region and the nation.

Questions???

