

# COASTAL TEXAS STUDY



## Community Work Group Fact Sheet

Version 1.4, Updated July 19, 2019

### Key Study Facts:

These key talking points are expanded on in the following pages.

- 1) The Coastal Texas Protection and Restoration Feasibility Study, also known as the Coastal Texas Study, involves engineering, economic, and environmental analyses on large-scale projects.
- 2) The purpose of the Coastal Texas Study is to identify coastal storm risk management (CSRМ) and ecosystem restoration measures (ER) that would protect the health and safety of Texas coastal communities, reduce the risk of storm damage to industries and businesses critical to the Nation’s economy, and address critical coastal ecosystems in need of restoration.
- 3) The goal of the Coastal Texas Study is to form a system of resilient, robust, and adaptable projects that will work in conjunction with each of the specific areas of the Texas coast.
- 4) The Coastal Texas Study’s history began in 2001 with the U.S. Army Corps of Engineers (USACE) Sabine Pass to Galveston Study.
- 5) The Coastal Texas Study team is comprised of the USACE and Texas General Land Office (GLO) and their engineering, environmental, and public outreach consultants.
- 6) The Coastal Texas Study is approximately halfway through a 5.5-year study process.
- 7) The Tentatively Selected Plan (TSP) is not a final plan.
- 8) The Coastal Texas Study area encompasses 18 coastal counties.
- 9) Prior and ongoing studies are being considered during the Coastal Texas Study process.
- 10) The Coastal Texas Study is the only federal study of its kind to truly examine what can be done to restore ecological habitats in the study area.
- 11) The Coastal Texas Study has already begun considering the feedback received during the public review and comment period for the Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR-EIS) that concluded on February 8, 2019.
- 12) The total cost for the projects proposed in the TSP is approximately \$23 to \$32 billion.
- 13) Over 600 storms that could potentially impact the Texas coast were modeled and analyzed with the purpose of informing the placement and design of the coastal storm risk management alternatives and ecosystem restoration measures proposed through the Tentatively Selected Plan.
- 14) The Coastal Texas Study investigated five CSRМ Alternatives for the Upper Texas Coast.
- 15) The Coastal Texas Study utilizes a “multiple lines of defense” approach/strategy.
- 16) Public comments are accepted throughout the life of the study.

## Expanded Study Facts:

**1) *The Coastal Texas Protection and Restoration Feasibility Study, also known as the Coastal Texas Study, involves engineering, economic, and environmental analyses on large-scale projects.***

a. The Coastal Texas Study is comprised of two key parts: An Environmental Impact Statement, which studies what impacts the proposed projects might have on the environment and wildlife, and a draft proposal for what preventive, actionable projects we can build to protect the coast and its inhabitants. The Coastal Texas Study currently recommends both man-made and natural barriers to help prevent storm surge from causing extensive damages to our coastline. The preference is to use as many natural barriers as possible.

b. Several key problems have been identified during the creation of the Coastal Texas Study:

- i. Costly damage from coastal storm surge;
- ii. Inland shoreline erosion;
- iii. Gulf shoreline erosion;
- iv. Loss of threatened and endangered critical habitats; and
- v. The disrupted flow of water systems.

**2) *The purpose of the Coastal Texas Study is to identify coastal storm risk management and ecosystem restoration measures that would protect the health and safety of Texas coastal communities, reduce the risk of storm damage to industries and businesses critical to the Nation's economy, and address critical coastal ecosystems in need of restoration.***

a. The Texas coast is subject to coastal erosion, relative sea level rise, coastal storm surge, habitat loss, and water quality degradation. These coastal hazards are placing the environmental and economic health of the coast at risk, which can negatively impact the state and national economy. In addition, events such as Hurricane Rita, Hurricane Ike, and Hurricane Dolly cause further ecological and economic devastation to the Texas coast, and emphasize the need for enhanced protection of the coast to prevent future damage and loss.

b. This study is a critical effort with regional and national significance because the risk of flood, hurricane, and storm damage in the study area generate impacts that extend farther than the Texas Gulf Coast.

c. As a powerful economic engine and an invaluable environmental treasure, the Texas coast is vital to the success of the State and the Nation. Its natural resources such as beaches, dunes, wetlands, oyster reefs, and rookery islands play a critical role in protecting coastal communities from storm surge and flooding.

d. These natural resources also contribute to the state and national economies by safeguarding and supporting industries such as petroleum refining, petrochemical, chemical and plastics manufacturing, waterborne commerce through the expansive network of Texas ports, commercial and recreational fishing, and tourism.

**3) *The goal of the Coastal Texas Study is to form a system of resilient, robust, and adaptable projects that will work in conjunction with each of the specific areas of the Texas coast.***

a. Coastal Storm Risk Management (CSRM) – Develop and evaluate coastal storm risk reduction measures for coastal Texas residents, industries, and businesses which are critical to the nation's economy.

b. Ecosystem Restoration (ER) – Increase the net quantity and quality of coastal ecosystem resources by maintaining, protecting, and restoring coastal Texas ecosystems and fish and wildlife habitat.

c. Study objectives include:

- i. Reduce economic damage
- ii. Reduce risk to critical infrastructure

- iii. Reduce risk to public health and safety
- iv. Increase coastal resilience
- v. Enhance and restore coastal landforms
- vi. Improve hydrologic connectivity
- vii. Improve and sustain coastal marshes and bay shorelines

**4) *The Coastal Texas Study's history began in 2001 with the U.S. Army Corps of Engineers (USACE) Sabine Pass to Galveston Study.***

- a. In 2001, the Sabine Pass to Galveston Study was authorized by Congress and focused on shoreline erosion and ecosystem restoration in Galveston and Jefferson Counties.
- b. In 2007, Congress authorized the USACE to begin the CSRM/ER Coastal Texas Study.
- c. In 2008, the impacts from Hurricane Ike required the Coastal Texas Study to be put on hold.
- d. In 2011, the GLO became the non-Federal Sponsor for the Coastal Texas Study, and the study's scope was altered to include the six-county area of the Upper Texas Coast (Brazoria, Chambers, Galveston, Harris, Jefferson, and Orange Counties).
- e. In 2013, the Sabine Pass to Galveston Study's scope was reduced to Port Arthur/Orange and Freeport.
- f. In 2014, Congress appropriated funds for the USACE and GLO to undertake a reconnaissance study for the Coastal Texas Study. Four public scoping meetings were held in four separate coastal communities (Corpus Christi, League City, Palacios, and South Padre Island) at this time.
- g. In 2015, the USACE, in partnership with the GLO, began an examination of the feasibility of constructing projects for coastal storm risk management and ecosystem restoration along the Texas coast.
- h. In 2016, the Coastal Texas Study kicked off, encompassing 18 Texas coastal counties.
- i. In 2018, seven public meetings were held along the Texas coast (Clear Lake, Corpus Christi, Crystal Beach, Galveston, Port Isabel, Port Lavaca, and Winnie).

**5) *The Coastal Texas Study team is comprised of the USACE and Texas General Land Office (GLO), and their public outreach consultants.***

- a. The USACE is the Federal Sponsor and the lead agency of the DIFR-EIS.
- b. The GLO is the non-Federal Sponsor for the study. The GLO has actively participated in the development and evaluation of problems, opportunities, and alternatives.

**6) *The Coastal Texas Study is approximately half way through a 5.5-year study process.***

- a. Following the release of the DIFR-EIS in fall 2018, the Study team sought public comments on the DIFR-EIS, and on the TSP, at seven public meetings along the Texas coast and through mail and email comments to the Study team. In addition to considering comments from the public, the Study team sought input from Federal, State, and local agencies and Tribal Nations, and through an Independent External Peer Review.
- b. The Study team has been reviewing and addressing comments following the end of the DIFR-EIS comment period on February 8, 2019.
- c. In the next phase, the Study team will work to minimize and avoid impacts that are identified in the public comments received during the public review and comment period for the DIFR-EIS. Once the details of a proposal that reduces impacts are available, it will be provided for public review and comments again during summer 2020. The USACE and the GLO will then take this second round of comments and study those before finalizing the report. At that point, it will be submitted to the U.S. Congress for approval and funding for detailed design and construction.

d. Congress typically approves a reauthorization of the Water Resource Development Act (WRDA) every two years, though sometimes WRDA is not reauthorized every two-year interval. Most likely, the first opportunity for Congress to authorize the proposal will be WRDA 2022. But that is just the first step Congress must take. Following Congressional authorization of the Coastal Texas Study, Congress must then vote to fund the study's proposed projects. The current estimated cost for all the projects is anywhere from \$23 to \$32 billion. It is highly unlikely that Congress will appropriate all these funds in one bill. It is much more likely that they break the construction funding down into phases of \$3 billion to \$5 billion.

**7) *The Tentatively Selected Plan (TSP) is not a final plan.***

a. A Tentatively Selected Plan is a draft proposal that represents the USACE's current recommendation at this stage in the study process. It is not in any way a final plan. At this stage in the study, the USACE presents its finding to the public to solicit comment on its recommendation. It will later, in conjunction with the GLO, consider the publicly made comments and study the suggestions to adjust the proposal to better meet the needs of the locally impacted area.

**8) *The Coastal Texas Study area encompasses 18 coastal counties.***

a. The study area consists of the entire Texas Gulf Coast from the mouth of the Sabine River to the mouth of the Rio Grande, and includes the Gulf and tidal waters, barrier islands, estuaries, coastal wetlands, rivers and streams, borrow sources, and adjacent areas that make up the interrelated ecosystems along the coast of Texas.

b. For study purposes, these coastal counties have been divided into four sections:

- i. Upper Texas Coast: encompasses the Sabine Pass to Galveston Bay area and includes Orange, Jefferson, Chambers, Harris, Galveston, and Brazoria counties
- ii. Mid to Upper Texas Coast: comprised of the Matagorda Bay area and includes Matagorda, Jackson, Victoria, and Calhoun counties
- iii. Mid Texas Coast: encompasses the Aransas Bay, Copano Bay, Corpus Christi Bay and Baffin Bay areas and includes Aransas, Refugio, San Patricio, Nueces, and Kleberg counties
- iv. Lower Texas Coast: encompasses the Lower Laguna Madre and South Padre Island area and includes Kenedy, Willacy, and Cameron counties

**9) *Prior and ongoing studies are being considered during the Coastal Texas Study process.***

a. Several study proposals were carefully considered, and many ideas were used to craft the Coastal Texas Study TSP:

- i. Rice University's Severe Storm Prediction and Evacuation from Disasters (SSPEED) Center
- ii. The Gulf Coast Community Protection and Recovery District (GCCPRD)
- iii. Texas A&M University at Galveston Ike Dike Study
- iv. The GLO's Coastal Resiliency Master Plan
- v. The USACE and GLO Sabine Pass to Galveston Bay Study

b. Consideration of similar studies is required by the Water Infrastructure Improvements for the Nation Act of 2016.

**10) *The Coastal Texas Study is the only federal study of its kind to truly examine what can be done to restore ecological habitats in the study area.***

a. Unlike the studies by Texas A&M University Galveston and the Rice University SSPEED Center, the Coastal Texas Study is the only study to include a National Environmental Policy Act (NEPA)-compliant Environmental Impact Statement. This federal requirement allows us to consider the effects the potential projects might have

on the wildlife of the coast and the environment. National security interests are also researched during the environmental study.

b. The Coastal Texas Study is unique in this respect, as it is the only study of its kind to truly examine what we can do to restore the ecological habitats in surrounding areas. As storms continue to confront the Texas coastline, specific impacts, such as continual erosion, affect our wildlife areas, wetlands and barrier islands. Future forecasts project increased coastal flooding, shoreline erosion, saltwater intrusion and loss of wetland habitats. The Coastal Texas Study can give us a roadmap on how to withstand these forces, so our coast will continue to thrive into future generations.

c. The proposed ecosystem restoration measures of the Coastal Texas Study include large scale projects that protect critical geological features through restoration, enhancement and creation of marsh, islands, dunes, beaches, and oyster reefs along the Texas coast.

d. While it is virtually impossible to construct anything in Galveston Bay without at least some temporary impacts to water quality, the Study team is working with experts from around the world to minimize and hopefully avoid long term impacts to water quality in Galveston Bay. Habitat restoration projects, separate from the ecosystem restoration projects, will be implemented with the intention of offsetting any adverse impacts.

**11) *The Coastal Texas Study has already begun considering the feedback received during the comment period for the Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR-EIS) that concluded on February 8, 2019.***

a. Based on the feedback received during the public review and comment period for the DIFR-EIS, the Study team is:

- i. Providing a second public review and comment period that is anticipated to be held during summer 2020.
- ii. Dropping the barrier levee along Bolivar Peninsula and Galveston Island from the study completely and investigating a dune-and-beach system along the beach of Bolivar Peninsula.
- iii. Re-aligning the Galveston Ring Barrier
- iv. Evaluating non-structural measures on the west side of upper Galveston Bay
- v. Exploring the utility of gates at Clear Creek and Dickinson Bayou
- vi. Continuing to meet with Rice University's SSPEED Center and Texas A&M at Galveston to understand the differences between their proposals
- vii. Hosting and International Storm Surge Gate Design Workshop
- viii. Establishing GLO-led Community Work Groups

**12) *The total cost for the projects proposed in the TSP is approximately \$23 to \$32 billion.***

a. This total cost estimate includes:

- i. Storm surge barrier system in the upper coast (\$14.2 to \$19.9 billion)
- ii. Ecosystem restoration throughout the coast (\$8.9 to \$11.9 billion)
- iii. Storm surge protection for South Padre Island (\$71.6 to \$83.1 million)

b. Operations and maintenance costs are not included in the total estimated cost. It is estimated that approximately \$110 to \$150 million per year would be required for operations and maintenance. This estimate could be either reduced or increased as the proposal is refined in the next study phase.

c. Operations and maintenance are a non-federal responsibility which means it will be the state or a not yet identified local entity that will take on this responsibility. The Texas Legislature will determine which entity will be the non-federal sponsor for operations and maintenance of the proposed structures once the projects proposed by the Study are authorized for funding by Congress.

**13) Over 600 storms that could potentially impact the Texas coast were modeled and analyzed** with the purpose of informing the placement and design of the coastal storm risk management alternatives and ecosystem restoration measures proposed through the Tentatively Selected Plan.

a. These possible tropical storms include the entire range of storm factors, such as storm intensity, storm size, forward speed and angle of approach on top of the landfall locations along the entire Texas coast. The storms range from very weak and small tropical storm events all the way to catastrophically strong and large Category 5 storms and beyond. Based on this data, a sample of 170 storms was taken through the Advanced Circulation model (ADCIRC – Certified by the Federal Emergency Management Agency (FEMA) for use in performing storm surge analyses) to determine storm surge heights with and without the barrier systems. The storms that were selected were the most destructive scenarios for storm surge and wave conditions.

b. Additional storm modeling is currently being conducted to optimize the plan.

**14) The Coastal Texas Study investigated five CSRM Alternatives for the Upper Texas Coast.**

a. To investigate CSRM for the Galveston Bay area, the Study team developed alternatives based on the vulnerabilities facing the upper coast region and the opportunities to reduce storm surge damage to the area. Measures were combined to form five CSRM Alternatives described in the DIFR-EIS. All Alternatives also include a ring barrier around the City of Galveston to reduce risk from back bay flooding due to tropical storms. For all Alternatives, the Study team also investigated the nexuses between ER features and CSRM features by reviewing the beach and dune restoration features along Bolivar Peninsula and Galveston Island. The ER features should also increase the resiliency of the CSRM features. The five CSRM Alternatives investigate include:

- i. Alternative A: Coastal Storm Surge Barrier
- ii. Alternative B: Coastal Storm Surge Barrier (Modified)
- iii. Alternative C: Mid Bay Storm Surge Barrier
- iv. Alternative D1: Upper Bay Storm Surge Barrier (146 alignment)
- v. Alternative D2: Galveston Bay Rim Storm Surge Barrier

b. Alternative A: Coastal Storm Surge Barrier is the alternative identified in the TSP.

**15) The Coastal Texas Study utilizes a “multiple lines of defense” approach/strategy.**

a. Employing three primary strategies – avoid, accommodate, and preserve – coastal communities should consider a system of comprehensive, resilient, and sustainable coastal storm risk management solutions. The system would include a combination of measures (structural, natural and nature-based features, and non-structural) to form resilient, redundant, robust, and adaptable strategies that promote life safety based on local site conditions and societal values. To achieve a multiple lines of defense approach, the Coastal Texas Study evaluates the following coastal problems:

- i. Economic damage from coastal storm surge;
- ii. Inland shoreline erosion;
- iii. Gulf shoreline erosion;
- iv. Loss of threatened and endangered critical habitats; and
- v. Disrupted hydrology.

b. The Coastal Texas Study identifies nationally significant environmental restoration strategies along the entire Texas coast. These restoration projects are evaluated based on long-term benefits, costs, feasibility, and resiliency. Objectives for ecosystem restoration focus on:

- i. Restoring fish and wildlife habitat;
- ii. Improving hydrologic connectivity;
- iii. Reducing erosion to shorelines;
- iv. Creating/Restoring oyster reefs; and

- v. Implementing sediment management.

**16) Public comments are accepted throughout the life the study.**

a. Although the comment period for the DIFR-EIS ended on February 8, 2019, comments will continue to be accepted and can be directed to USACE, Galveston District, Attn: Ms. Jennifer Morgan, Environmental Compliance Branch, Regional Planning and Environmental Center, P.O. Box 1229, Galveston, TX 77553-1229, or via email to: CoastalTexas@usace.army.mil.

## **Study Misconceptions:**

- **Misconception: The public review and comment period that closed on February 8, 2019 will be the final opportunity for the public to review and provide comments to the Coastal Texas Study proposal.**
  - Correction: The Study Team encourages public feedback and participation. A second public review and comment period is anticipated to be held during summer 2020. Comments will be accepted throughout the life of the study and can be directed to USACE, Galveston District, Attn: Ms. Jennifer Morgan, Environmental Compliance Branch, Regional Planning and Environmental Center, P.O. Box 1229, Galveston, TX 77553-1229, or via email to: CoastalTexas@usace.army.mil.
- **Misconception: The proposed Galveston Ring Barrier would create a “bathtub effect” on Galveston Island, trapping water within the barrier on the island and creating a severe flooding threat.**
  - Correction: Any features proposed by the study are not permitted to worsen any existing conditions (i.e. the risk of flooding from a rain event cannot be increased with the implementation of the proposed ring barrier). Pump stations would also be implemented to expedite the release of water back into Galveston Bay and the Study team is working with the City of Galveston to determine potential solutions for the City’s drainage system.
- **Misconception: The proposed barrier along Bolivar Peninsula and Galveston Island would have required the acquisition and demolition of property, as well as caused obstruction to beach access and viewing for those that live, work, and play along Galveston Island and Bolivar Peninsula.**
  - Correction: The barrier solution along Galveston Island and Bolivar Peninsula has been dropped completely. The Study team is investigating a dune-and-beach system along the front of Bolivar Peninsula and west of the Galveston seawall.
- **Misconception: The study would use eminent domain to acquire and demolish any property along the proposed barrier alignment.**
  - Correction: The non-federal sponsor will have the responsibility of acquiring all necessary real estate interests for the project and ensuring that relocation of utilities and facilities is accomplished. Where necessary, voluntary relocations and acquisitions will be pursued, and eminent domain would only be used as a last resort.
- **Misconception: The Coastal Texas Study is only being proposed to protect the industrial facilities in the Houston-Galveston area.**
  - Correction: The proposed features reduce risk to a larger community than the concentration of industrial facilities in Houston. Surrounding areas are filled with residences, as well as railways and port facilities that serve Houston, Galveston and the nation. Comprehensive risk reduction in the region requires a combined effort of federal, state, and private agencies increasing the area’s ability to prepare for, withstand, respond and adapt to coastal risk. Industries in the Houston area will contribute to risk reduction through investments in their own facilities that contribute to the success of the larger features.
- **Misconception: Simply building a wall or barrier is not going to help protect the Texas coast.**

- Correction: The Coastal Texas Study utilizes a "multiple lines of defense" approach/strategy that includes a combination of other structural and non-structural measures, as well as natural and nature-based features to form resilient, redundant, robust, and adaptable strategies that promote life safety. The specific measures proposed through the Study will be based on local site conditions and societal values.

- **Misconception: The Coastal Texas Study is only considering past, historical flood events**

- Correction: Over 600 storms that could potentially impact the Texas coast were modeled and analyzed. These possible tropical storms include the entire range of storm factors, such as storm intensity, storm size, forward speed and angle of approach on top of the landfall locations along the entire Texas coast. The storms range from very weak and small tropical storm events all the way to catastrophically strong and large Category 5 storms and beyond.

Based on this data, a sample of 170 storms was taken through the Advanced Circulation model (ADCIRC - Certified by the Federal Emergency Management Agency (FEMA) for use in performing storm surge analyses) to determine storm surge heights with and without the barrier systems. The storms that were selected were the most destructive scenarios for storm surge and wave conditions. Additional storm modeling is currently being conducted to optimize the plan.

- **Misconception: The proposed plan would protect only highly populated areas and not all parts of the Texas coastline that have been impacted by past weather events.**

- Correction: The Coastal Texas Study area encompasses 18 coastal counties and consists of the entire Texas Gulf Coast from the mouth of the Sabine River to the mouth of the Rio Grande, and includes the Gulf and tidal waters, barrier islands, estuaries, coastal wetlands, rivers and streams, borrow sources, and adjacent areas that make up the interrelated ecosystems along the coast of Texas.

- **Misconception: The proposed gate structures at Galveston Bay would severely impact the water quality and ecosystem in the bay.**

- Correction: The USACE Engineer Research and Development Center (ERDC) conducted quantitative analyses using 3D Adaptive Hydraulics (AdH) model to simulate hydrodynamics, salinity, and sediment transport to understand potential environmental impacts. This modeling characterized the changes to the Galveston Bay System with the storm surge gates across Bolivar Roads in the open condition (which represents the non-storm condition or "everyday" operations of the gate structures) to compare to the without barrier condition (present). All modeling was conducted using a tentative gate configuration across Bolivar inlet that would reduce the flow conveyance roughly by 27.5 percent.

This would change the salinity as Gulf water inflow is somewhat restricted by the structure, and freshwater exit from the bay to the Gulf is similarly affected. The modeling so far indicates that the salinity of the bay would not be at levels that endanger fish and oyster populations.

- **Misconception: Storm modeling was not analyzed, and protection features were not considered for San Luis Pass.**

- Correction: The anticipated risk reduction benefits for protective features at San Luis Pass do not outweigh the potential negative environmental impacts of closing off the last remaining natural pass along the Texas coast. Many of the structures and assets that would be protected as a result of the closure are already elevated above surge heights or are at a ground elevation that limits surge impact.

There is also limited surge risk when factoring in the full probability of potential storm directions. The pass and the adjoining West Bay are very shallow and constitute only to 10 to 12 percent of the water exchange between West Bay and the larger area of Galveston Bay. This condition minimizes the risk of surge being transmitted to the large area of Galveston Bay where there is a greater number of structures and assets at risk from storm surge.



## Acronyms Related to the Study:

AAHU – average annual habitat units	FCSA – feasibility cost share agreement
ACHP – Advisory Council on Historic Preservation	FONSI – Finding of No Significant Impact
ADCIR – Advanced Circulation (ADCIRC) model	FRM – Flood Risk Management
AdH – adaptive hydraulics	FWOP – Future Without Project
ADM – Agency Decision Milestone	FWP – Future with Project
ALARP – As Low As Reasonably Practicable	GCCPRD – Gulf Coast Community Protection and Recovery District
ALL – Annualized Life Loss	GOMESA – Gulf of Mexico Energy Security Act
APF – Annual Probability of Failure	HFP – Hurricane Flood Protection
ASA(CW) – Assistant Secretary of the Army, Civil Works	HFPS – Port Arthur Hurricane Flood Protection System
ATR – Agency Technical Review	H-GAPS – Houston-Galveston Area Protection System
BCR – Benefit to Cost Ratio	HQ – Headquarters
BUDM – beneficial use of dredged material	HSC – Houston Ship Channel
CAP – Continuing Authorities Programs	HTRW – Hazardous Toxic Radioactive Waste
CBRA – Coastal Barrier Resources System Act	IDC – Interest During Construction
CE/ICA – Cost Effectiveness and Incremental Cost Analyses	IEPR – Independent External Peer Review
CELRD – Corps of Engineers, Great Lakes and Ohio River Division	IPR – In Progress Review
CELRH – Corps of Engineers, Great Lakes and Ohio River Division, Huntington District	IRC – Issue Resolution Conference
CEPRA – Coastal Erosion Planning and Response Act	IRRM – Interim Risk Reduction Measures
CEQ – Council on Environmental Quality	IWR – Institute for Water Resources
CIAP – Coastal Impact Assistance Program	LERRD – Land, Easements, Rights of Way, Relocations and Disposal
Coastal Texas – Coastal Texas Ecosystem Protection and Restoration, Texas	LRD – Great Lakes and Ohio River Division - Cincinnati
CSRSM – Coastal Storm Risk Management	LRH – Huntington District – 1 District within LRD
CT – Coastal Texas study (my acronym for it)	LST – levee screening tool
CWA – Clean Water Act	MACOM – Major Command - HQ
CWL – Construction Work Limits	MCACES – Micro-Computer Aided Cost Estimating System
DA – Department of the Army	MEOW – maximum envelope of water
DE – District Engineer (District Commander)	MFR – Memorandum for Record
DIFR-EIS – Draft Integrated Feasibility Report and Environmental Impact Statement	MLOD – multiple lines of defense
DMP – decision management plan	MOA – Memorandum for Agreement
DQC – District Quality Control	MOU – Memorandum of Understanding
DSA – Dam Safety Assurance	MRR – Major Rehabilitation Report
DSMR – Dam Safety Modification Report	MSC – Major Subordinate Command- LRD
DSO – Dam Safety Officer	MUR – Muskingum Flood Control Basin
EA – Environmental Assessment	MWCD – Muskingum Watershed Conservancy District
EC – Engineering Circular	NED – National Economic Development
Eco-PCX – USACE National Ecosystem Planning Center of Expertise	NEPA – National Environmental Policy Act
EIS – Environmental Impact Statement	NER – National Ecosystem Restoration
EO – Executive Order	NFS – non-Federal sponsor
EPA – Environmental Protection Agency	NHL – National Historic Landmark
ER – Ecosystem Restoration	NHPA – National Historic Preservation Act
ERDC – Engineer Research and Development Center	NNBF – nature and nature-based features
FCA – Flood Control Act	NOA – Notice of Availability
	NRHP – National Register of Historic Places
	NTP – Notice to Proceed
	O&M – Operations and Maintenance

OC – Office of Council  
ODNR – Ohio Department of Natural Resources  
OEPA – Ohio Environmental Protection Agency  
OHPO – Ohio Historic Preservation Office  
OHS – Ohio Historical Society  
OMB – Office of Management and Budget  
OMRRR – Operation, Maintenance, Repair,  
Replacement and Rehabilitation  
OSE – Other Social Effects  
P&G – Planning Guidance Notebook  
PAL – Planning Aid Letter  
PAS – Planning Assistance to States  
PCX – Planning Centers of Expertise  
PDT – Project Delivery Team  
PED – preconstruction, engineering, and design  
PMF – Probable Maximum Flood  
POA – period of analysis  
PPA – Project Partnership Agreement  
PTM – particle tracking model  
QA – Quality Assurance  
QCC – Quality Control and Consistency  
RESTORE – Resources and Ecosystems Sustainability,  
Tourist Opportunities, and Revived Economies  
RMC – Risk Management Center  
ROD – Record of Decision  
ROM – relative order of magnitude  
RSLR – relative sea level rise  
RSM – regional sediment management  
S2G – Sabine Pass to Galveston Feasibility Study  
SHPO – State Historic Preservation Office  
SLOSH – NOAA Sea, Lake and Overland Surges from  
Hurricanes Model  
SMART – Specific Measurable Attainable Risk Informed  
Timely  
SOG – Senior Oversight Group  
SPI – South Padre Island  
SSPEED – Severe Storm Prediction, Education, and  
Evacuation for Disasters  
TSP – tentatively selected plan  
USACE – U.S. Army Corps of Engineers  
USFWS – U.S. Fish & Wildlife Service  
VT – Vertical Team  
WRDA – Water Resources Development Act