Transformative Integrated Water Resources Infrastructure Management on America’s Energy Coast

Edmond J. Russo, Jr., PhD, PE, D.CE, D.NE, D.WRE
Deputy District Engineer for Programs and Project Management
USACE, Galveston District (SWG)

Sustainable Sediment Management and Dredging Seminar

28 NOV 2018
USACE: STAYING WORLD CLASS NOW AND INTO THE FUTURE

USACE VISION
Engineering Solution For The Nations Toughest Challenges.

ACHIEVE OUR VISION
Anticipate future conditions; take decisive actions today to always be ready, come what may.

MISSION
Deliver vital engineering solutions, in collaboration with our partners, to secure our Nation, energize our economy, and reduce risk from disaster.

STRENGTHEN THE FOUNDATION
Doing routine tasks, to a high standard, routinely, enables everything else. A strong foundation empowers leaders to think strategically.

DELIVER THE PROGRAM
Our credibility relies on our ability to achieve desired results on time and on budget.

MISSION AREAS
- Military Programs
- Civil Works
- Geospatial Support
- Contingency Operations
- Research and Development
USACE Galveston District (SWG): History and Mission

- First engineer district in Texas, established 1880
- 50,000 square mile district boundary, ~100+ miles inland
- 28 ports handling 538+ M tons of commerce annually (FY 16)
- 1,000+ miles of channels
  - 750 miles shallow draft
  - 270 miles of deep draft
- 367 miles of Gulf coastline
- 30-40 M cubic yards/yr material dredged
- 16 Congressional districts
- 48 Texas counties, 4 Louisiana parishes
- 18 Coastal counties - bays / estuaries
- 9 watersheds
DEC 2015: US Government lifts 40-year crude oil export ban

Texas: Largest Energy Producer in U.S.
(in million barrels per day)

U.S. Onshore Production of Crude Oil

Source: Energy Information Administration
February 2018

Everything in Texas is bigger, including energy production!
Reduced transport costs and higher netback for US crude producers make Europe the optimal market for the US to fill first.

**Destination of US light crude and condensate exports**

**US economic and national security interest**

- Asia-Pacific
- Europe
- Americas

<table>
<thead>
<tr>
<th>Year</th>
<th>Asia-Pacific</th>
<th>Europe</th>
<th>Americas</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2018</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2019</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2020</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2021</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2022</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2023</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Energy Industry at Texas Coastal Ports

~$ 300 B being invested in coastal Texas petrochemical industry capital investments in plant expansions

“Managing every molecule”
Deep Draft Navigation Transportation: Driver for Coastal Development and Risks

Where do decisions on infrastructure have the greatest impact?

Panama Canal, new Agua Clara Locks – Container Shipping

<table>
<thead>
<tr>
<th>TOTAL Tonnage by Region</th>
<th>Region</th>
<th>Tonnage (millions)</th>
<th>Percent of Nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nation</td>
<td>2,523.2</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Gulf Coast</td>
<td>1,210.7</td>
<td>48.0%</td>
<td></td>
</tr>
<tr>
<td>Texas Ports</td>
<td>537.7</td>
<td>21.3%</td>
<td></td>
</tr>
<tr>
<td>Galv-Houston-TX City</td>
<td>299.1</td>
<td>11.9%</td>
<td></td>
</tr>
<tr>
<td>SNWW</td>
<td>119.7</td>
<td>4.7%</td>
<td></td>
</tr>
<tr>
<td>Corpus Christi</td>
<td>82.9</td>
<td>3.2%</td>
<td></td>
</tr>
</tbody>
</table>

Data Source: USACE, Waterborne Commerce Statistics Center – 2016
Implication: Increased river flood and coastal storm damage risks to inhabitation and development.
Managing Integrated Water Resources through a USACE SWG Corporate Strategy

Texas Coast is:
• A resilient community with healthy ecosystem
• Positioned for sustainable economic growth
• Enabled by strategic partnerships that support Non-Federal investment

Maximizing Capital

Lines of Effort

Harvey Recovery
(ESF 3 / NAV Rest / BBA 18)

Improve Navigation
(Deepen / Widen / Safety / Capacity)

Sustain Federal Projects
(NAV / FRM / WQ Mgt / IIS (e.g., CBP BI, EPA Superfund))

Support Non-Fed Investment
(Surge in Reg Permits, RE Outgrants, Partnerships)

Reduce Flood Risks
(CSRM, FRM, Eco Restoration, Levee Certification)

Future

Stakeholder Community

Communication

Organizational Change

Strategic Partnerships

CW Transformation & Process Improvement

Transparency
Enhancing Strategic Partnerships

• Texas coast shared visioning for alignment of agency values toward mutually desired outcomes
  – Vibrant regional and national economy
  – Resilient and sustainable communities
  – Healthy, diverse, and functional ecosystems
• Driving progress through regularly-engaged partnering board
  – Multi-agency participation (Local, State, Federal)
  – Shared vision steering
  – Identifying / resolving barriers to progress
• Team building, collaboration, and unified communications
  – Articulating challenges and successes
  – Building stakeholder awareness and support for action
  – Supporting elected officials with information they need
Texas is the number two state in the nation for waterborne commerce. Texas ports generate over $5 billion in local and state tax revenue, and over $9 billion in federal import tax revenue each year.

- 4 ship channels authorized for improvement
- 1 ship channel authorized for extension
- 2 ship channels under study for improvement
Flood and Coastal Storm Risk Management and Ecosystem Restoration

- Economic damage from coastal storm surge
- Inland shoreline erosion
- Gulf shoreline erosion
- Loss of T&E Critical Habitats (migratory bird habitat, critical T&E habitat, shellfish habitat)
- Loss of Natural Delta Processes
- Disrupted Hydrology

Sabine Pass to Galveston Bay CSRM Project
- Houston Bayou FRM Projects
- Coastal TX Protection and Restoration CSRM / ER Study
- Metro Houston Regional Watershed Assessment
- Buffalo Bayou FRM Resiliency Study
- Brazos River Erosion Management Study
- Jefferson County ER Study
- Resacas ER Study & CAP Project
Bipartisan Budget Act of 2018 (BBA 18)
Legislation and Implementation Guidance

One Hundred Fifteenth Congress of the United States of America
AT THE SECOND SESSION
Began and held at the City of Washington on Wednesday, the third day of January, two thousand and eighteen

An Act
To amend title 4, United States Code, to provide for the flying of the flag at half-staff in the event of the death of a first responder in the line of duty.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.
This Act may be cited as the "Bipartisan Budget Act of 2018".

DIVISION A—HONORING HOMETOWN HEROES ACT

SECTION 1002. SHORT TITLE.
This division may be cited as the "Honoring Hometown Heroes Act".

SEC. 1002. PERMITTING THE FLAG TO BE FLOWN AT HALF-STAFF IN THE EVENT OF THE DEATH OF A FIRST RESPONDER SERVING IN THE LINE OF DUTY.
(a) Amendments.—The sixth sentence of section 7(a) of title 4, United States Code, is amended—
(1) by striking "or" after "possession of the United States" and inserting a semicolon;
(2) by inserting "or the death of a first responder working in any State, territory, or possession who died while serving in the line of duty, other than while serving on active duty, in the District of Columbia," after "death of a line officer of the District of Columbia"; and
(3) by inserting before the period the following: "; and first responders working in the District of Columbia.
(b) First Responder Defined.—Subsection (e)(3)(A), after "serial number of such service" and inserting "; and first responders working in the District of Columbia.";
(c) Effectiveness Date.—The amendments made by this section shall apply with respect to deaths of first responders occurring on or after the date of the enactment of this Act.

• Legislation passed 9 FEB 18
• Implementation Guidance signed 9 AUG 18
• SWG projects funded at $4.5 B
• SWG studies funded at $15.8 M
Title IV - Corps of Engineers

- **Investigations**
  - $75 M (of $135 M total) for States and areas impacted by Harvey, Irma, and Maria
  - Full Federal expense
  - Reduce flood and hurricane risk

- **Construction**
  - $10.425 B (of $15 B total) for States and areas impacted by Harvey, Irma, and Maria
  - NFS cash contribution financed over 30 years post construction completion
  - Construct flood and storm damage reduction projects authorized/Chief’s Reports/studies under investigations

- **Implementation Guidance and Investment Program:**
  https://www.usace.army.mil/Missions/Civil-Works/Budget/

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONSTRUCTION</strong></td>
<td></td>
</tr>
<tr>
<td>Brays Bayou, TX</td>
<td>$75,000,000</td>
</tr>
<tr>
<td>Buffalo Bayou and Tributaries, TX (Phase 1)</td>
<td>$1,454,000</td>
</tr>
<tr>
<td>Clear Creek, TX</td>
<td>$295,165,000</td>
</tr>
<tr>
<td>Hunting Bayou, TX</td>
<td>$65,000,000</td>
</tr>
<tr>
<td>Lower Colorado River Ph 1 (Wharton, TX)</td>
<td>$73,290,000</td>
</tr>
<tr>
<td>Sabine Pass to Galveston Bay, TX</td>
<td>$3,957,134,000</td>
</tr>
<tr>
<td>White Oak Bayou, TX</td>
<td>$45,000,000</td>
</tr>
<tr>
<td><strong>TOTAL CONSTRUCTION</strong></td>
<td>$4,512,043,000</td>
</tr>
</tbody>
</table>

| **GENERAL INVESTIGATION STUDIES**                |              |
| Coastal Texas Protection & Restoration Study, TX | $3,804,000   |
| Buffalo Bayou Resiliency Study, TX               | $6,000,000   |
| Houston Regional Watershed Assessment, TX        | $3,000,000   |
| Brazos River Erosion Management Study, TX        | $3,000,000   |
| **TOTAL STUDIES**                                | $15,804,000  |
SWG Program Execution Strategy

• Purpose – Execute multiple program lines of effort based on currently known facts, assumptions, and constraints
• Scope – Annual Civil Works Baseline, BBA 18, and Border Infrastructure Programs
• Goal – “Move Dirt” and Deliver the Program according to expectations of stakeholders and Higher Authority
• Objectives
  - Operate resource unconstrained via in/outourcing
  - Optimize project lifecycle phase execution timeframes using a suite of acquisition strategies
• **Shared Visioning and Partnering** for a vibrant national/regional economy, resilient coastal communities, and healthy ecosystem that support non-Federal investment

• **Engineering Solutions on America’s Energy Coast** for addressing infrastructure challenges across navigation, flood risk management, and ecosystem restoration business lines

• Addressing authority, policy, resourcing, and business process challenges for **Strengthening the Foundation**

• Leveraging new authorities for studies and projects to derive Value to the Nation in **Delivering the Program**

• Competing strong for sustainable budgets to **Achieve the Vision** of Integrated Water Resources Management
• Identify current and potential future challenges with SWG sediment management sustainability

• Discuss as a group innovations that could evolve how we manage sediments locally and regionally, especially for uses across a wider spectrum of benefits

• Collectively assess and manage the risks of pilot demonstration and mainstreaming sediment management innovations

• Determine the requisite science, engineering, technology, policies, and authorities required now and into the future for realizing pilot demonstration and mainstreaming sediment management innovations

• Shape/advance actions for making advancements on SWG sustainable sediment management
ON FACEBOOK
www.facebook.com/GalvestonDistrict

ON TWITTER
www.twitter.com/USACEgalveston

ON YOUTUBE
www.YouTube.com/GalvestonDistrict

ON DVIDS
www.dvidshub.net/units/USACE-GD

ONLINE
www.swg.usace.army.mil
Sabine Pass to Galveston Bay CSRM Project, Port Arthur-Freeport-Orange, TX:

Chief's Report completed DEC 17. $3.9 B for improvements and additions to existing CSRM systems in Freeport and Port Arthur, TX, to include levee raises and extensions, and replacement of I-walls with T-walls; also includes construction of 27 miles of new levees and flood walls, along with 7 new pump stations, 56 drainage structures, and 32 closure gates, in Orange County, TX.
Lower Colorado River (Wharton), TX:

**Project Features:** $73.3 M in funds to construct Wharton project, a separable element of overall Lower Colorado River Phase I Project, consists of approximately 35,600 feet of levees, 2,300 feet of floodwalls, 7,000 feet of channel modifications, and interior drainage features.
Ongoing Authorized and Funded Houston Bayou FRM Construction Projects

- **Addicks and Barker Reservoir Dam Safety Modification Project, Phase 1:** ($74 M, 4 yrs, complete Fiscal Year (FY) 21; 100% Fed)

- **Greens Bayou FRM Project:** ($26 M, 3 yrs, complete FY 19; cost share 75% Fed/25% non-Fed)

- **Brays Bayou FRM Project:** ($506 M, balance to complete $74M; cost share 75% Fed/25% non-Fed)*

* As modified by BBA 18.
New Start Authorized and Funded
Houston Bayou FRM Construction Projects

- White Oak Bayou FRM Project: ($131 M; cost share 65% Fed/35% non-Fed)*
- Hunting Bayou FRM Project: ($171 M; cost share 65% Fed/35% non-Fed)*
- Clear Creek FRM Project: ($284 M; cost share 65% Fed/35% non-Fed)*
  - $100K for Economic Update (cost share 50%/50%)

* As modified by BBA 18.
USACE and Harris County Flood Control District (HCFCD) Partnered Projects:

- **Greens Bayou Project, Houston, TX**: $4.1 M in FY 18 WP funding to complete construction of channel improvements and detention basin.

- **Brays Bayou Project, Houston, TX Sec 211 (f)**: $75 M for continued construction of detention basins. This project also received $14.7 M in FY 18 WP funding to reimburse HCFCD for past construction. Currently pending audit $10.6 M in invoiced reimbursements, to be provided by SEP 18. Pending Invoices for $14.7 M received in FY 18 WP for audit/reimbursement. Scheduled construction end date FY 21.

- **White Oak Bayou Project, Houston, TX Sec 211 (f)**: $45 M for construction of channel modification and detention basins. Scheduled construction end date FY 21.

- **Hunting Bayou Project, Houston, TX Sec 211 (f)**: $65 M for construction of channel modification and detention basins. Scheduled construction end date FY 21.

- **Clear Creek Project, Houston, TX**: $295 M to perform economics update, design and construct conveyance and in-creek hydraulic detention areas that create a system to reduce flood damages.

Sub-Total = $484.1 M

* 100% FED cost under BBA 18 for Sec 211f project contracts initiated after 9 FEB 18.
Partnered Studies:

- **Brazos River, TX, Erosion Study**: $3 M to investigate FRM measures to reduce erosion losses near City of Richmond, TX.

- **Buffalo Bayou and Tributaries, TX, Resiliency Study**: $6 M to investigate and identify alternatives to reduce flooding in and around reservoir dams during major storm events.

- **Houston, TX, Regional Watershed Assessment**: $3 M to assess interaction of the 22 regional watersheds during flood events, and identify potential measures to improve operations of existing reservoir dams, conveyance channels and detention basins.

* 100% FED cost under BBA 18.
Location: Coast of Texas

Phase: Feasibility Study

Authorized Study Cost: $19.8 M 50-50% FED-Non FED cost share, with additional $3.8 M cost shared via BBA 18

Non-Federal Sponsor: Texas General Land Office

Scope: Coastal Storm Risk Management & Ecosystem Restoration along the Texas Coast

Current Status: Draft Report released for public comment 26 OCT 2018

Est. Study Completion Date: APR 2021

http://coastalstudy.texas.gov/