

**Galveston Bay Estuary Program**

17041 El Camino Real, Suite 210  
Houston, TX 77058-2646  
Telephone: (281) 218-6461

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January 29, 2018

Dear Galveston Bay Council Members:

The next quarterly meeting of the Galveston Bay Council is scheduled for:

**Wednesday, January 31, 2018**  
**9:30 AM - 12:30 PM**

**Meeting location:**  
**Harris-Galveston Subsidence District**  
1660 West Bay Area Blvd,  
Friendswood, TX 77546-2640  
(281) 486-1105

Information for the January 31, 2018 meeting is attached as noted below.

1. Council Agenda for January 31, 2018
2. Draft October 18, 2017 Council Meeting Minutes

Sincerely,

Sarah P. Bernhardt  
Program Manager

Galveston Bay Estuary Program (GBEP) /Texas Commission on Environmental Quality (TCEQ)



## **GALVESTON BAY COUNCIL (GBC) QUARTERLY MEETING**

**Location:** Harris-Galveston Subsidence District, 1660 West Bay Area Blvd, Friendswood, TX 77546-2640

**AGENDA: Wednesday, January 31, 2018**

- 9:30 A.M.:**        **Call to Order:** Introduction of Members and Delegates  
                         **Action Item:** Approval of October 18, 2017 Meeting Minutes  
                         **Report of the Chair** (Helen Paige)  
                         **Report of the Program** (Sarah Bernhardt)  
                         **Action Item:** Annual conflict of interest form completions – all council members and proxies sign annually  
                         **Action Item:** Approval of nomination of Dr. Pamela Plotkin to represent Sea Grant
- 9:50 A.M.:**        **Presentations & Discussion:** Fiscal 2019 Galveston Bay Estuary Program (GBEP) Work Plan. A series of short presentations by GBEP staff covering the projects and programmatic costs being proposed  
                         **Action Item:** Approval of each item in the proposed work plan
- 11:00 A.M.:**        **Break**
- 11:15 A.M.:**        **Presentation & Discussion:** Comprehensive draft (internal review for GBC and subcommittees) of *Galveston Bay Plan, 2nd Edition* (Houston-Galveston Area Council and GBEP)
- 12:10 P.M.:**        **Council Member Roundtable:** News and Announcements
- 12:25 P.M.:**        **Public comments**
- 12:30 P.M.:**        **Adjourn**

**Upcoming Galveston Bay Council Meeting Dates:** April 18, 2018; July 18, 2018; October 17, 2018. Meetings are held on the third Wednesday of the quarter from 9:30am-12:30pm. If there are known conflicts, Council members are welcome to propose alternate dates to the Council.

**GALVESTON BAY ESTUARY PROGRAM****DRAFT – Galveston Bay Council Meeting Minutes–October 18, 2017****Attendees:****Galveston Bay Council Chair:** Nancy Parra (League of Women Voters)**Galveston Bay Council Vice-Chair:** Helen Paige (Marinas)**Estuary Program Staff Lead:** Sarah Bernhardt, Galveston Bay Estuary Program (GBEP)

The October 18, 2017 quarterly Galveston Bay Council meeting was held at Harris-Galveston Subsidence District, 1660 West Bay Area Blvd., Houston, Texas, from 9:32 AM to 12:22 PM.

**Members Present:** Scott Alford, Bill Baker, Caryn Brooks, Andrea Catanzaro, Glenn Clingenpeel, Phillip Goodwin, Rebecca Hensley, Kelly Holligan, Doug Jacobson, Brian Koch, Kristin Lambrecht, Mike Lee, Garry McMahan, Helen Paige, Nancy Parra, Hanadi Rifai, Caimee Schoenbaechler, Ronnie Schultz, Linda Shead, Bob Stokes

**Members Not Present/Delegates:** Christine Bergren, Andrea Catanzaro, Albert Gonzales, Jace Houston\*, John Huffman, John Jacob, Audrey Kuklenz, Luz Locke, Will Nipper\*, Ana Partin, Russ Poppe\*, Aaron Rice, Taylor Rieck, Kate Saul\*, Jeff Taebel\*, Mary Beth Stengler, Sharron Stewart\*, Rusty Swafford\*, Lori Traweek\*, Chuck Wemple, Kirk Wiles, Tracy Woody

(\*=Member designated a proxy)

**Proxies Present (council member absent/designated proxy):**

Jace Houston/Jordan Austin, Will Nipper/Maria Valdez, Russ Poppe/Glenn Laird, Kate Saul/Mollie Powell, Sharron Stewart/Bruce Bodson, Rusty Swafford/Aaron Chastain, Jeff Taebel/Todd Running, Lori Traweek/Phyllis Frank

**Current Vacancies:** None

**Other Attendees:** Stuart Carlson, Lisa Gonzalez, George Guillen, Deborah January-Bevers, Erin Kinney, Kerry Niemann, Jamie Steichen, Rachel Windham, Lance Wood, Kim Wright, Heather Young

**Additional GBEP Staff present:** Cynthia Clevenger, Bryan Eastham, Lindsey Lippert, Lisa Marshall, Mary Stiles

**Call to Order:**

Introduction of Members and Delegates

**Action Item: Approval of April 19, 2017 Meeting Minutes**

Nancy Parra (Chair) opened the meeting with approval of the April 19, 2017 meeting minutes and opened the floor for questions and comments. A motion was requested for approval of the minutes. Glenn Laird moved to approve the minutes, followed by

Doug Jacobson who seconded the motion. Corrections were noted and minutes were approved.

### **Report of the Chair Report:**

Nancy Parra reported TCEQ Agenda is set for November 15, 2017 in Austin. Anyone will have the opportunity to speak on behalf of GBC and GBEP to the Commissioners. November 21<sup>st</sup> is the anniversary of the establishment of the GBC as an advisory committee (November 21, 1995). The Agenda location: Texas Commission on Environmental Quality, 9:30AM, 12100 Park 35 Circle Room 201S, Bldg. E, Austin, Texas. Coordinate with Nancy to attend. Linda Shead reported she is available to carpool.

Nancy Parra reported there would be three upcoming changes on the Galveston Bay Council, starting in January 2018.

Bill Baker will be leaving NRG in January for early retirement and working with his son in business. He will be stepping down on both position the "Utilities" representative and the vice-chair of the Natural Resources Uses subcommittee. Nominations are welcome to be brought to the chairs or Budget and Priorities subcommittee. Today is Bill Baker's last GBC meeting, we appreciate his contributions and a round of applause from the members.

The Texas Coastal Watershed Program (and in turn John Jacob) will no longer be affiliated with Texas Sea Grant, starting in January 2018 due to funding reallocation. We have reached out to Texas Sea Grant Director Pamela Plotkin to request they appoint their new representative.

Luz Locke has retired and is no longer affiliated with the City of Pasadena and is not currently doing any work that allows her to represent the "Minority" interests on the Council. Nancy asked the members if they know of anyone who would be a good candidate to fill the position.

This is the last meeting for Nancy Parra as "Chair". She stated it was an honor to be a representative to the Galveston Bay Council, it was a privilege to be chair during the Galveston Bay Plan revision accomplishments of Galveston Bay and the council.

Upcoming Galveston Bay Council Meeting Dates: January 17, 2018; April 18, 2018; July 18, 2018 and October 17, 2018. Meetings are held on the third Wednesday of the quarter from 9:30am-12:30pm. If there are known conflicts Council members are welcome to propose alternate dates to the council.

Lastly, Budget and Priority Subcommittee decided the Galveston Bay Symposium will be held January 2020, instead of January 2019 to avoid conflict with the next Texas Legislative session.

### **Report of the Program:**

- Sarah Bernhardt gave an update to the council on the upcoming State of the Bay Report, 4<sup>th</sup> Edition by HARC.
- Rescheduling annual budget discussion until January 2018 due to Hurricane Harvey delays.

- Received 40 applications for the estuary program vacancy. Will be interviewing later this month.
- GBEP anticipates sending out a draft The Galveston Bay Plan, 2<sup>nd</sup> Edition for GBC and subcommittee review later this fall. This will be a word document. After those comments have been incorporated into the draft there will be a Workshop #3, which will present the draft plan for public comment.

Sarah Bernhardt welcomed Lisa Gonzalez.

Lisa Gonzalez reported HARC/GTRI has contracted with the Galveston Bay Estuary Program (GBEP) and Texas Commission on Environmental Quality (TCEQ) to update the report for the 4<sup>th</sup> edition of the State of the Bay report.

HARC worked on previous reports in 2002 the 2<sup>nd</sup> and 3<sup>rd</sup> edition. The 4<sup>th</sup> edition will be an opportunity to change the outline that was used for the 1<sup>st</sup> and 3<sup>rd</sup> editions. The new edition will reflect the new Comprehensive Conservation and Management Plan (CCMP) outline.

Previous editions were hardback and CD, but with new technology the 4<sup>th</sup> edition on be on a PDF web-base, with a PDF there will be a backup document and will be able to handout to as a government document with the executive summary. Lisa reported that a lot of input will be requested from the subcommittees and Galveston Bay Council members to incorporate input of stakeholders to be included in the 4<sup>th</sup> edition.

#### **Action Item: Annual Conflict of Interest Forms Completions**

Nancy Parra reminded members and proxies to complete the annual acknowledgement form conflicts of interest form and submit to the GBEP team. This is required per the bylaws of the GBC. Copies were provided in the handouts via email and additional copies are available at the back table. They can submit via email or form can be fill out during break and submitted after the meeting.

#### **Hurricane Harvey Lightning Round Presentations & Discussions:**

A series of short five minute presentations by numerous Galveston Bay Council member and organizations and partners.

Sarah Bernhardt announced she will introduce each presenter, as well as time each presentation, and informed the presenters they could stand at the podium and give their presentation or provide their verbal update from their seat. Presentations slides attached.

**Subcommittee Reporting: Presentation from the Monitoring and Research subcommittee** (Lisa Marshall). including a presentation on the Galveston Bay Post-Harvey Task Force by subcommittee member Stuart Carlton, Ph.D, Healthy Coastal Ecosystems & Social Science Specialist, Texas Sea Grant College Program

Lisa Marshall reported on the FY 2019 project development process and provided status.

Lisa Marshall reported on recently closed contracts for FY 2017, and gave a report on each subcommittee.

***Monitoring and Research Subcommittee***

- Galveston Bay Estuary Program Status and Trends (S&T) Maintenance Project (TAMUG – Brody)
- Galveston Bay: Changing Land Use Patterns and Nutrient Loading, Causal or Casual Relationship with Water Quality, Quantity, and Patterns (TAMUG – Quigg)
- Mangrove Restoration in Galveston Bay: Ecological Benefits and Effective Restoration Techniques (TAMUG – Armitage)

***Water and Sediment Quality Subcommittee***

- Bacteria Implementation Group's Top Five Most and Top Five Least
- Impaired Water Bodies (H-GAC)

***Natural Resource Uses Subcommittee***

- West Bay Galveston Island Bayside Marsh Restoration (TPWD)
- Conservation Assistance Program (GBF)

***Public Participation and Education Subcommittee***

- Back the Bay (Texas Creative)

Lisa Marshall gave a summary of the project development process for the GBEP. The process has been delayed this year due to Hurricane Harvey. The B&P Subcommittee will approve the budget and projects at a special meeting on November 13, 2017 and the projects and budget will be presented to the GBC during the January 17, 2018 meeting.

Lisa Marshall then introduced Stuart Carleton Ph.D., Healthy Coastal Ecosystems & Social Science Specialist, Texas Sea Grant College Program who reported on the Galveston Bay Post-Harvey Task Force Partnership that is being facilitated by Texas Sea Grant and the Galveston Bay Estuary Program.

- Post-Harvey Task Force Website: [bitly.com/galveston-harvey?](http://bitly.com/galveston-harvey?)
- To sign up for the listserv, which is the primary mode of Task Force communication, send an email to [listserv@listserv.tamu.edu](mailto:listserv@listserv.tamu.edu) and put the following in the email body: SUBSCRIBE galveston-harvey first name last name.
- Stuart Carlton: [stuartcarlton@tamu.edu](mailto:stuartcarlton@tamu.edu)

***Budget and Priorities***

- B&P will meet November 13, 2017

**Council Members Roundtable: News and Announcements:**

**Glenn Clingenpeel** – Trinity River Authority (TRA) recently completed their Phase II Instream Flows Assessment for the Trinity and would be happy to share it upon request

**Caimee Schoenbaechler** – The TWDB has an opening for a senior staff member, and the TWDB is gearing up to write a statewide flood plan

**Glenn Laird** – More education is needed for the public, re: watersheds, flooding in this area.

**Nancy Parra** – Reminder about the Texas Constitutional Amendment, Early Voting October 23 – November 3<sup>rd</sup> 2018, School Board Election also in Harris County

**Mollie Powell** –GLO in La Porte will have an entry level position opening soon

**Brian Koch** – TSSWCB's NPS 319 program closed their annual request for proposals. They received 34 proposals to ID funding recipients.

**Todd Running** – HGAC BIG meeting on October 31<sup>st</sup>, 2017, Bacteria TMDL meetings

**Linda Shead** – BPA Symposium October 19, 2017 at the United Way

**Kerry Niemann** - Regarding RESTORE:

- The public comment period for the draft Multi-Year Implementation Plan (MIP), which includes a draft list of projects, ended on June 30, 2017. Over 1400 comments were received. The comments are being reviewed as the next stage in the on-going evaluation process to determine activities for inclusion, as well as the final determination of what will be applied for funding and ultimately what will receive funding through grant contracts with the TCEQ. Due to ongoing payments into the RESTORE Trust Fund, the total funding available under the Direct Component (Bucket 1) grant program now exceeds the \$56 million originally identified in the Request for Grant Applications.

Regarding the NPS Program:

- The NPS Management Program was approved by the Commission on September 20, 2017. The document incorporates EPA's eight components of an effective program; establishes long- and short-term goals; and provides for the coordination of activities with other partners. In fiscal year 2017, Texas received \$7.6 million dollars in CWA Section 319(h) federal grant funds to utilize and award to sub-grantees across the state.
- The TCEQ and TSSWCB solicit applications for funding eligible activities annually. They then rank and evaluate the applications for EPA Grant Work Plan consideration.

Regarding the 2016 Integrated Report:

- The TCEQ and EPA are coordinating to resolve remaining issues related to the assessment of nutrients in reservoirs. Once these issues are resolved, the IR will be released for public comment.

Regarding the Water Quality Standards:

- Standards are currently under preparation for the 2018 revision. Standards were proposed for public comment to the Commission in August of 2017. The 45 day

formal public comment period closed yesterday on October 17, 2017. It is anticipated that standards will be presented to the Commission for adoption in February 2018.

- Regarding the Clean Rivers Program:

The calendar of upcoming Steering Committee Meeting dates may be accessed from the statewide Coordinated Monitoring Schedule. Meetings occur throughout the year and help to establish monitoring priorities. The 2018 Coordinated Monitoring Schedule has been updated and is available on the TCEQ website.

**Bob Stokes** - GBF will have their annual Bike-Around-the Bay this weekend - 21,000 cyclists have registered.

**Heather Young** - Gulf of Mexico Alliance will have mini grants (two page applications) for post Harvey funding.

**Public comments:**

**Lisa Gonzales** - HARC is hosting Speaker Bill Ritter (former Governor of New Mexico) at MFA Brown Auditorium, who will be talking about new energy economy. Galveston Bay Invasive Field Guides, the new pocket guide will be available at the end of October 2017.

**Adjourn:** Meeting was adjourned at 12:22pm

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# Hurricane Harvey: Lightning Talks

Galveston Bay Council  
Wednesday, October 18, 2017

## HISTORIC RESPONSE

Hurricane Harvey in Texas

**19 TRILLION** GALLONS OF RAIN

**80,000** HOMES HAD NO POWER

**5.359** MILLION PATIENTS CARED FOR

**87** THOUSAND FLOOD INSURANCE CLAIMS

**\$608,000,000** IN FLOOD DAMAGE

**31** FEDERAL EMPLOYEES

**122,331** RESCUES

**300** VOLUNTEER ORGANIZATIONS

**24,000** POUNDS OF WASTE

**25** TONS OF WASTE

**1000** BROWN BELLS & BROWN BELLS ASSOCIATES

**367 MIL** SEA LOAVES

## Michael Lee, U.S. Geological Survey

A total of 178 discharge measurements were made at 113 sites between 8/25/2017 and 9/9/2017

**57 sites had new peaks of record for discharge**

- Sabine River
- Neches River
- Trinity River
- Cedar Bayou
- Cypress Creek
- San Jacinto River
- San Jacinto Bayou
- Buffalo Bayou
- Brays Bayou
- Sims Bayou
- Greens Bayou
- Clear Creek
- Brazos River
- San Bernard River
- Colorado River
- Ties Palacios River
- Navidad River
- Gaudoalpe River

<https://txpub.usgs.gov/twaterdashboard/>

Approximately 3000 High-Water-Marks measured and surveyed at nearly 1400 Sites

**16 Rapid Deployment Storm Surge Sensors**

USGS Flood Event Viewer  
<https://stn.wim.usgs.gov/FEV/#HarveyAug2017>

### Water Quality Sampling

- Nutrients
- Sediment
- Metals
- Herbicides
- Phytoplankton
- Bacteria
- Major ions
- Organic Carbon

#### Urban Response

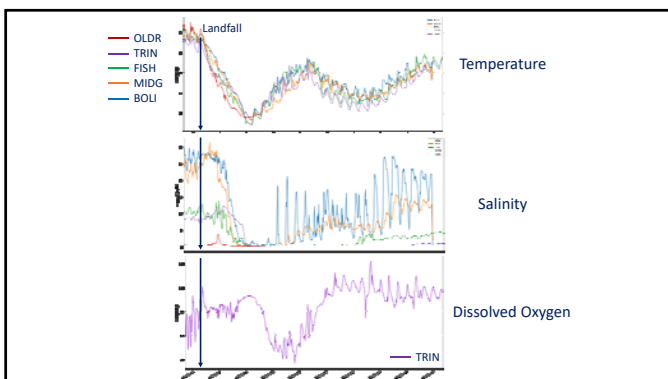
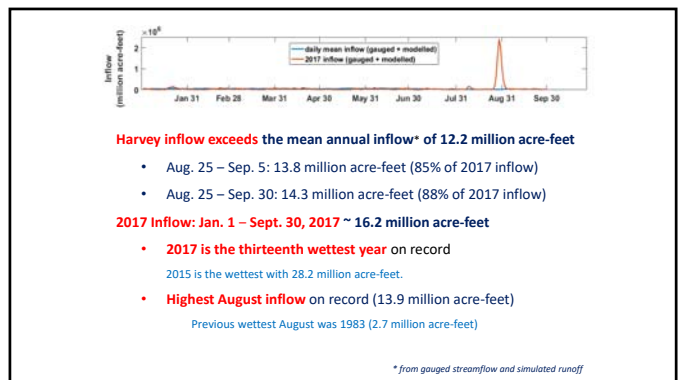
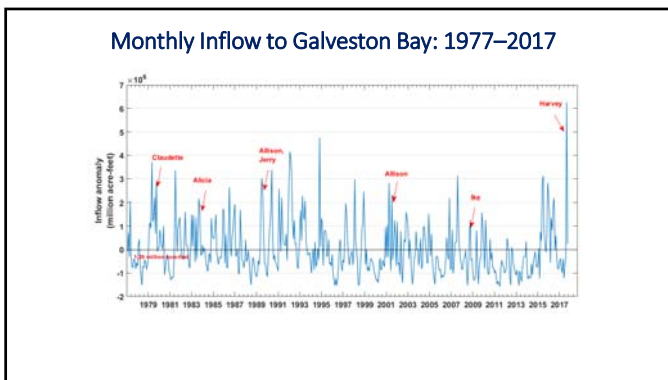
- Wastewater
- Lake Houston
- Reservoir Inflows
- Groundwater
- S.o.O.

#### Coastal Response

- Coastal Monitoring Network
- Enhanced NAWQA
- S.o.O.

<https://www.usgs.gov/special-topic/hurricane-harvey>

Caimee Schoenbaechler, Texas Water Development Board



Kelly Holligan, Texas Commission on Environmental Quality

## TCEQ HURRICANE RESPONSE

Response was focused helping communities assess damage, manage debris, and bring critical water and wastewater services back online

**UNIFIED COMMAND TO OVERSEE ALL EMERGENCY RESPONSE:**

- TCEQ, EPA, GLO, U.S. Coast Guard

**THREE OPERATIONAL BRANCHES:**

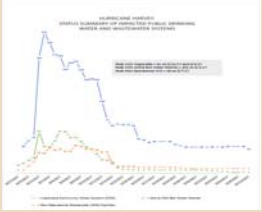
- Corpus Christi, Houston, and Port Arthur
- TCEQ, EPA, GLO, USCG, Texas National Guard, 6<sup>th</sup> Civilian Support Team, Arkansas National Guard, 61<sup>st</sup> Civil Support Team, Oklahoma Task Force 1, Texas State Guard Engineering Group
- Continuously monitoring water a wastewater systems and assessing spills and discharges resulting from the storm

Over 500 TCEQ Employees were actively involved in the agency's response

[www.tceq.texas.gov/response/hurricanes](http://www.tceq.texas.gov/response/hurricanes)

## TCEQ HURRICANE RESPONSE

- >2,200 DWS facilities being tracked
- >1,700 WWTPs being tracked
- Owners of 340 dams contacted
- All 17 State Superfund sites assessed
- 42 Superfund NPL sites assessed
- Collected more than 1,088 orphaned containers
- Approved 178 temporary debris management sites



[www.tceq.texas.gov/response/hurricanes](http://www.tceq.texas.gov/response/hurricanes)


## TCEQ HURRICANE RESPONSE



[www.tceq.texas.gov/response/hurricanes](http://www.tceq.texas.gov/response/hurricanes)

Doug Jacobson, Environmental Protection Agency

### EPA Region 6 Hurricane Harvey Response



- Community Liaisons
  - Providing information
  - Listening to concerns
- Debris Observations
  - Staging and landfill operations
  - Total debris estimated at 30 MCY (9/29/2017)
- Water/Wastewater Plant Visits
  - Assessments conducted early after flooding receded
- Superfund site assessments ongoing

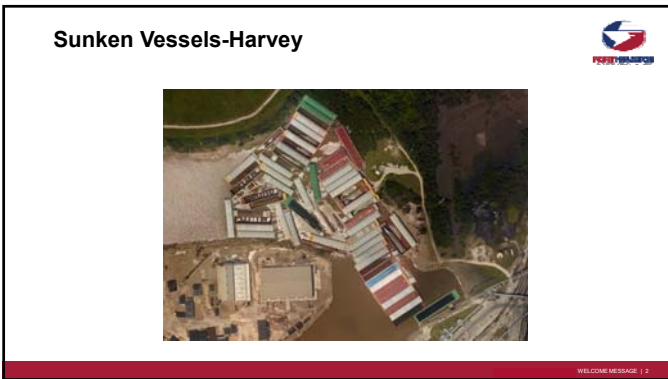
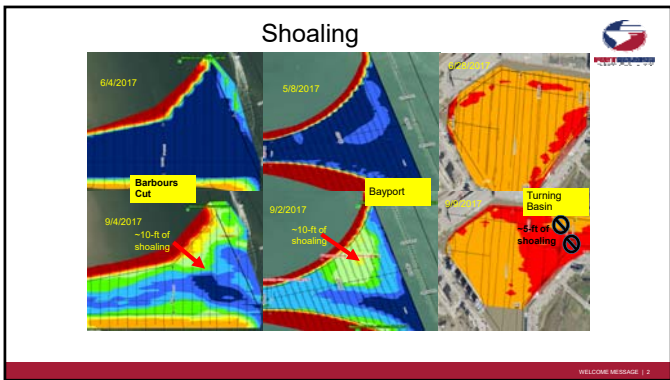
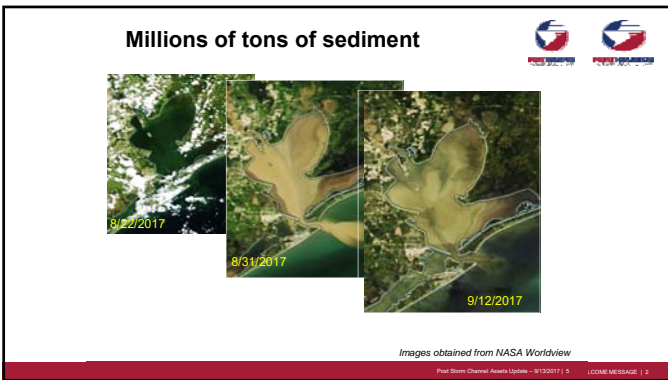
### EPA Region 6 Hurricane Harvey Recovery



- Joint Field Office established in Austin
  - Houses federal agencies/fosters coordination
  - Support local governments/improve access to resources
- EPA Region 6 has received a Mission Assignment from FEMA
  - Provides for Sustainability Advisor at JFO
  - Reaches back to Region/EPA for technical assistance/resources
  - Advocate for sustainable, green, and resilient principles and practices

Bob Stokes, Galveston Bay Foundation

Garry McMahan, Port of Houston Authority



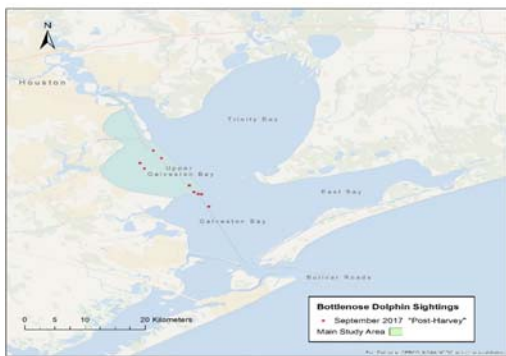
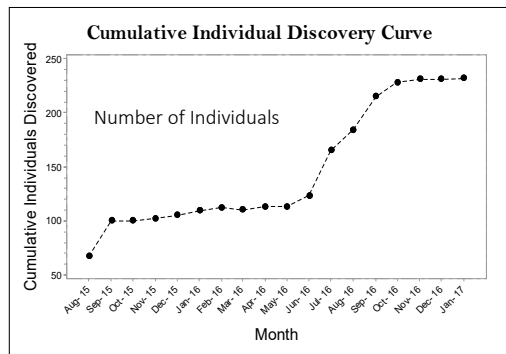
George Guillen, University of Houston, Clear Lake – Environmental Institute of Houston

**UHCL - EIH Activities**  
 George Guillen  
 Galveston Bay Council – 10-18-17

1. Galveston Bay Dolphin Research and Conservation Program – cooperative program with Galveston Bay Foundation
2. Anahuac Wildlife Refuge Wetland Salinity Study – NWF funded
3. Trinity River Delta Salinity Monitoring – NWF funded
4. Terrapin Population Monitoring – EIH funded
5. Saltmarsh Topminnow – TPWD funded
6. Clean Rivers Program Monitoring – HGAC/TCEQ
7. Brazos River Estuary Study – TWDB/BioWest

**Galveston Bay Dolphin Research and Conservation Program**

Kristi Fazioli – EIH  
 Vanessa Mintzer – GBF  
 George Guillen - EIH



**Skin lesions in Galveston Bay Dolphin**

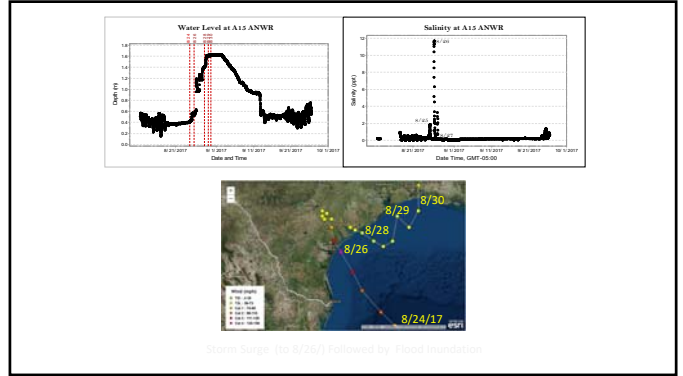


Collected 44 skin/b lubber samples for contaminants and stable isotopes (pre-Harvey)  
 Plan on collecting more samples (post-Harvey)  
 Funding needed to analyze Organic/Dioxin tissue samples

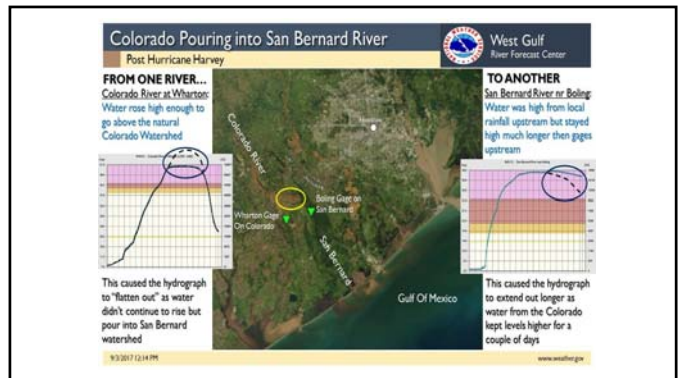
G Bay - June 2016

Also see: Mullin et al. 2015 – L. pontchartrain





Brian Koch, Texas State Soil & Water Conservation Board





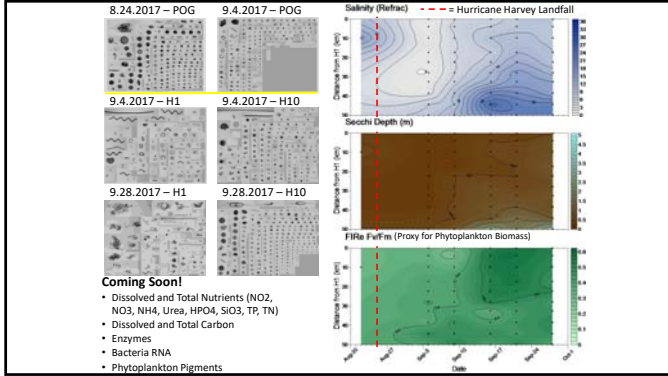
Hanadi Rifai, University of Houston

Rachel Windham, Dr. Antonietta Quigg's laboratory, Texas A&M University, Galveston

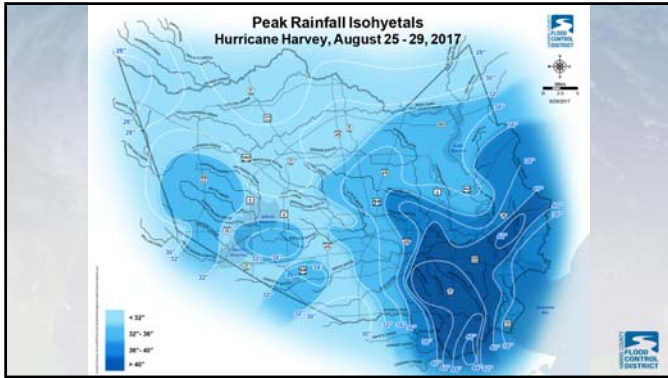
**Hurricane Harvey – TAMUG Rapid Response Sampling of Galveston Bay**

	Sun	Mon	Tue	Wed	Thur	Fri	Sat
August	20	21	22	23	24	25	26
August	27	28	29	30	31	1	2
August	3	4	5	6	7	8	9
September	10	11	12	13	14	15	16
September	17	18	19	20	21	22	23
September	24	25	26	27	28	29	30

- David Hala
  - Pharmaceuticals
- Karl Kaiser
  - Carbon
  - Human Tracers
- Jessica Labonte
  - Viruses
- Hui Liu
  - Zooplankton
- Antonietta Quigg
  - Water Quality
  - Phytoplankton
  - Enzymes
  - Oil
  - Bacteria (RNA)



Glenn Laird for Russ Poppe, Harris County Flood Control District



## Hurricane Harvey

### HCFCD Impacts

- Widespread channel erosion and bank failures
- Massive silt deposition in channels and overbank areas
- Numerous debris piles of felled trees within our channels
- Collapsed storm sewer outfall structures

### Support Opportunities

Public support from organizations and individuals for local, state and federal funding directed to:

- System repairs
- Floodplain buyouts and preservation
- Major Capital Projects to reduce future flood risks

Ronnie Schultz, Galveston County Health District

## Office of Environmental Health Services

- Surveyed the condition of 640 food service establishments in heavily impacted areas of Dickinson, League City and Friendswood. Many asked to voluntarily close down and one food permit suspended. Still working with establishments to get open
- Public drinking water distributors contacted and questioned about any damage assessments. One boil water advisory issued.
- Accepted drinking water samples at our offices from both public drinking water systems and private water wells for pick up and transportation to contracted lab.
- Waste Water Treatment Plant operators contacted and interviewed to assess what if, any damage to plant or collection system. Minor issues reported.

Public Health Services · Emergency Medical Services · Animal Resource Center · Coastal Health & Wellness  
Protecting and promoting the optimal health and well-being of Galveston County.

## Office of Environmental Health Services

- Participated on GCHD operated phone bank to answer citizen concerns.
- Re-established beach water sampling, stream monitoring, and air particulate matter monitoring site
- Worked with Texas Commission on Environmental Quality and Waste Management to assess the condition of the RCRA closed Mc Ginnes Pits located on the Intracoastal Waterway in Galveston County. No liquid overflow from earthen pits, some erosion that will be addressed in October.
- Inserted into GCHD Incident Command System to assist with other Public Health response functions such as temporary human shelters.

Public Health Services · Emergency Medical Services · Animal Resource Center · Coastal Health & Wellness  
Protecting and promoting the optimal health and well-being of Galveston County.



Rebecca Hensley, Texas Parks and Wildlife Department

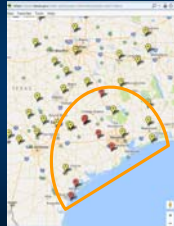
**TPWD- Hurricane Harvey Impacts**

- Extensive wind/flood damage Corpus Christi to Pt Arthur
- Significant personal and state property loss/ damage
- 30+ State Parks, WMAs, hatcheries and offices
- 7 of 10 Coastal Fisheries facilities affected (hatcheries, vessels, boat barns, equipment/storage)
- Impacted area important center for fisheries landings- 99% commercial, 75% recreational
- Businesses associated with above
- High rainfall, low salinities (<2 ppt) in San Antonio Bay to Sabine Lake (impacts to habitats, seagrasses and oysters)

**TPWD- Hurricane Harvey Response-Assessment**

- Deployed >140 water craft in Ft Bend/Houston/Beaumont for rescues
- Opened State Parks to 3,000+ evacuees (free admission)
- Worked with partners for emergency response (e.g., La, Fla)
- Infrastructure assessment and repairs
- Pollution/spill and fish kill events (marine debris)
- Ongoing assessment of impacts to natural resources
  - Aerial surveys
  - Fisheries sampling
  - Restoration sites
- Additional monitoring for oysters- up to 100% mortality in parts GB

**TPWD- Hurricane Harvey Challenges**



- Federal assistance-all repairs not eligible
  - Agency ~\$40 mil all
  - CF ~\$1.5 mil extra
- Operation \$\$ from License sales down (45% from Disaster declaration counties)
- Damage to Recreational and Commercial infrastructure
- Back at work & still working at recovery

State Parks still impacted

Mollie Powell (for Kate Saul), Texas General Land Office



The Texas General Land Office  
George Bush Center

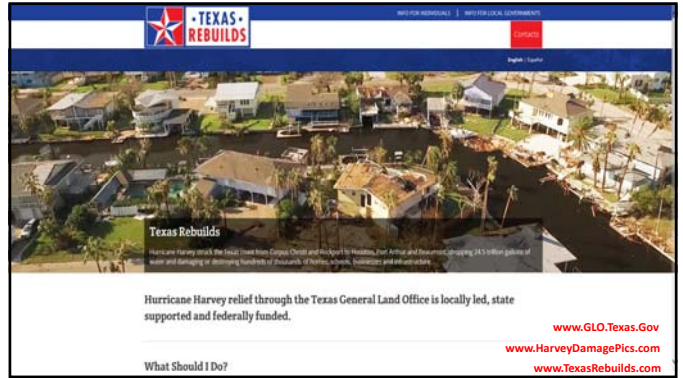
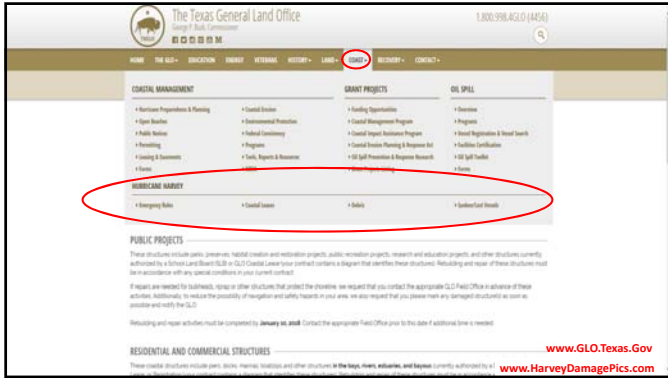
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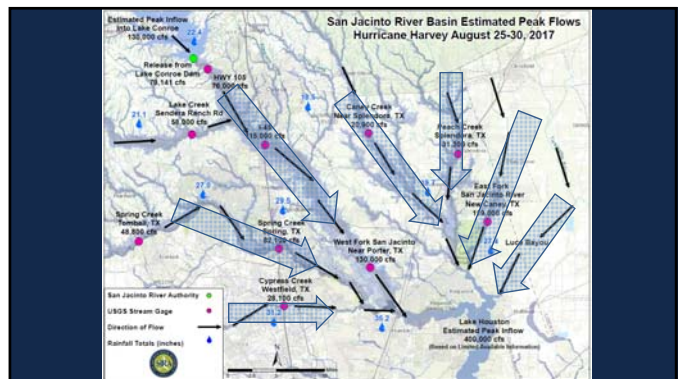
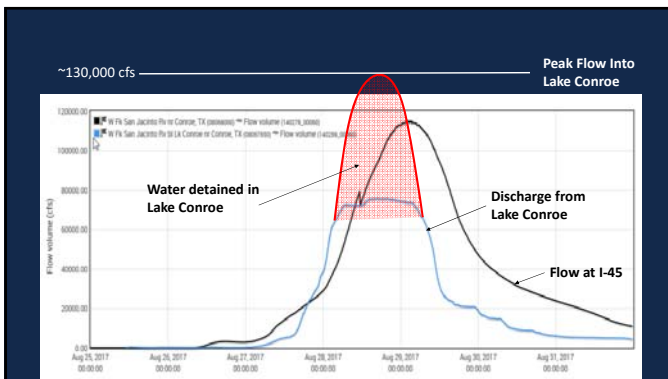
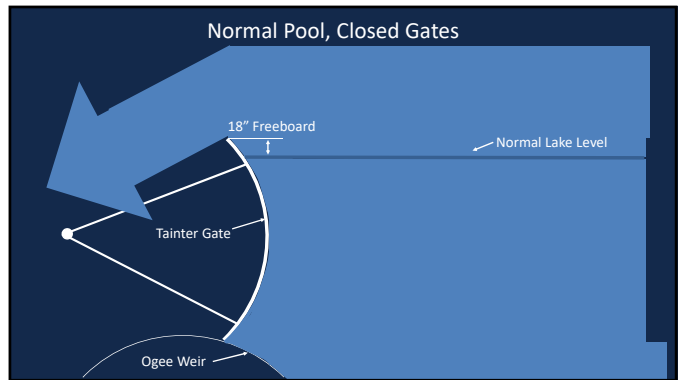
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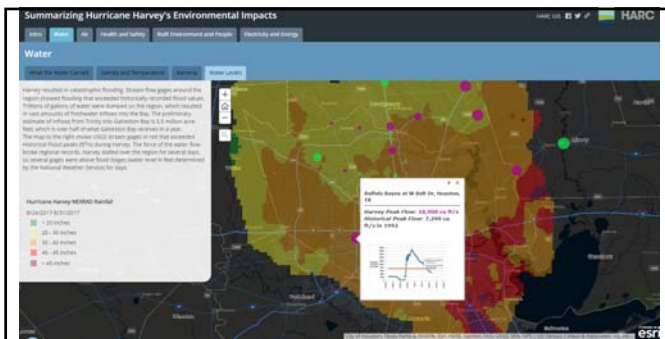
Jordan Austin, (Jace Houston) San Jacinto River Authority



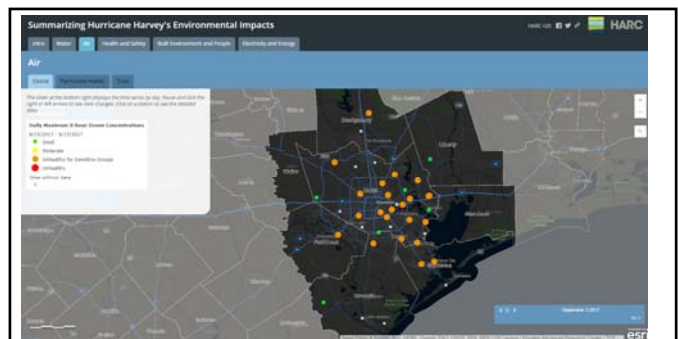
HARC



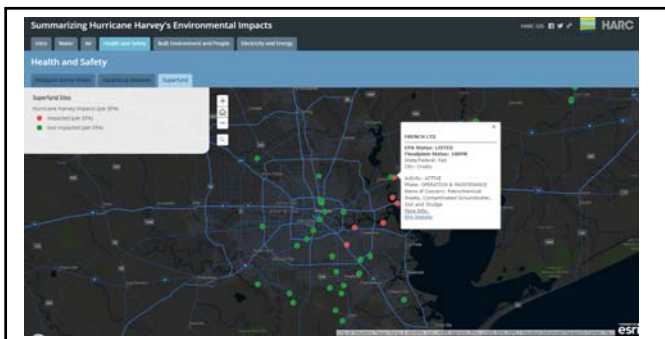
- Draft Opening page – subject tabs shown on top for different data categories



- Draft Water, Water Levels tab – in depth of amount of rainfall received and spotlight on 24 flow gages in the region with consistent data and calculated flood stage



- Draft Air, Ozone tab – Ozone Concentrations by day (scroll through time series on lower right), two weeks before and two weeks after Harvey



- Draft Health and Safety, Superfund tab – locations of regional Superfund sites with those impacted in red; click on site for listing status, floodplain status, and chemicals of concern

**Subcommittee Reporting:**  
 Lisa Marshall, Monitoring and Research Subcommittee Coordinator

## Fiscal Year 2017 Closed Contracts

### *Monitoring and Research Subcommittee*

- ▶ Galveston Bay Estuary Program Status and Trends (S&T) Maintenance Project (TAMUG - Brody)
- ▶ Galveston Bay: Changing Land Use Patterns and Nutrient Loading, Causal or Casual Relationship with Water Quality, Quantity, and Patterns (TAMUG - Quigg)
- ▶ Mangrove Restoration in Galveston Bay: Ecological Benefits and Effective Restoration Techniques (TAMUG - Armitage)

### *Water and Sediment Quality Subcommittee*

- ▶ Bacteria Implementation Group's Top Five Most and Top Five Least Impaired Water Bodies (H-GAC)

## Fiscal Year 17 Closed Contracts

### *Natural Resource Uses Subcommittee*

- ▶ West Bay Galveston Island Bayside Marsh Restoration (TPWD)
- ▶ Conservation Assistance Program (GBF)

### *Public Participation and Education Subcommittee*

- ▶ Back the Bay (Texas Creative)

Subcommittee Reporting continued:  
Post-Harvey Task Force by Stuart Carlton,  
Texas Sea Grant

## Galveston Bay Post-Harvey Task Force

- ▶ Partnership between Texas Sea Grant and the Galveston Bay Estuary Program
- ▶ Post-Harvey Task Force Website: [bitly.com/galveston-harvey?](http://bitly.com/galveston-harvey?)
- ▶ To sign up for the listserv, which is the primary mode of Task Force communication, send an email to [listserv@listserv.tamu.edu](mailto:listserv@listserv.tamu.edu) and put the following in the email body: SUBSCRIBE galveston-harvey firstname lastname.
- ▶ Stuart Carlton: [stuartcarlton@tamu.edu](mailto:stuartcarlton@tamu.edu)

# State of the Bay 4<sup>th</sup> Edition



Lisa Gonzalez, Erin Kinney, Stephanie Glenn




# State of the Bay

- Re-organized around updated Galveston Bay Plan
- Web-based with PDF executive summary for distribution
- Update Status & Trends data through 2017 and acquire the other needed databases
- Incorporate Plan implementation metrics as available (success stories).
- Link to Status & Trends, Back the Bay & other important sites
- Incorporate ESRI story maps to show summarized data, graphics, narratives

## The State of the Bay


A Characterization of the Galveston Bay Ecosystem  
Third Edition




The State of the Bay Report is about the nature and history of the Galveston Bay system, the findings of studies on Galveston Bay and its watershed, and the management actions based on those findings. As in the first and second editions, the scientific information is placed in the context of historical resource use and modern social and economic features of the Galveston Bay watershed.

We hope you agree that protection of Galveston Bay has been enhanced and progress has been made toward restoring the vitality of the bay and its watershed through the efforts of the Galveston Bay Estuary Program and the guidance of *The Galveston Bay Plan*. Everyone who reads this work is in some way connected to the bay and benefits from its resources. We hope that after reading this volume you will have a better appreciation of the complexities and value of Galveston Bay and its watershed.




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Downloaded files can be viewed with Adobe Acrobat Reader.



A PROGRAM OF THE TCEQ

Section	PDF Size
Title Pages & Executive Summary	7.4 MB
Acknowledgements	44 KB
List of Abbreviations	46 KB
List of Linked Data & Maps	181 KB
<b>Chapter 1 - Assessing the State of the Bay</b>	1.3 MB
<b>Chapter 2 - Overview of the Ecosystem</b>	1.5 MB
<b>Chapter 3 - The Human Role Past</b>	2.2 MB
<b>Chapter 4 - The Human Role Present</b>	1.9 MB
<b>Chapter 5 - Physical Form and Processes</b>	1.8 MB
<b>Chapter 6 - Water and Sediment Quality</b>	4.8 MB
<b>Chapter 7 - Key Habitats</b>	2.7 MB
<b>Chapter 8 - The Bay's Living Resources</b>	5.7 MB
<b>Chapter 9 - Impact on Public Health</b>	1.8 MB
<b>Chapter 10 - The Future of Galveston Bay</b>	1.2 MB
Glossary	213 KB
Literature Cited	236 KB

**Data Files:** Many graphs in the chapters are hyperlinked to data sheets in Microsoft Excel 2007 format. Click a hyperlinked graph to open the Excel file. The Excel file contains metadata, data, and a pivot chart. Use the pivot chart tab to query and display data in chart and table form. Pivot table instructions are available via links on the About the Chart tab. Note: Excel 2007 or later version is required to view the data files.

**GeoPDF Maps:** Many maps in the chapters are hyperlinked to Adobe GeoPDF files. Once a map file is opened, click on the Layers icon to the left of the map screen. Expand and collapse layers using the (+) and (-) buttons. Click on the eye icon to turn on and off map layers. Print, save, and e-mail the map as needed. If viewing in a web browser, Internet Explorer or Mozilla Firefox will provide the best functionality. Files can also be saved and viewed with Adobe Acrobat (Reader or full version).

**Suggested citations:**

Full Report: Lester, L. J. and L. A. Gonzalez, Eds. 2011. *The State of the Bay: A Characterization of the Galveston Bay Ecosystem, Third Edition*. Texas Commission on Environmental Quality, Galveston Bay Estuary Program, Houston, Texas, 356 pp.

Chapter 3: Galloway, A. 2011. Chapter 3 The Human Role: Past. In *The State of the Bay: A Characterization of the Galveston Bay Ecosystem, Third Edition*. L. J. Lester and L. A. Gonzalez (Eds.). Texas Commission on Environmental Quality, Galveston Bay Estuary Program, Houston, Texas, 35 pp.



# The Process

- Fall/Winter 2017:
  - QAPP
  - Develop new outline: crosswalk original SotB outline with new Galveston Bay Plan
  - Seek subcommittee input
- Winter/Spring 2018:
  - Update datasets, analyze and draft narrative
- Spring/Summer/Fall 2018:
  - Seek comments and edits from GBEP subcommittees
  - Create website and PDF summary

# Story Map Examples

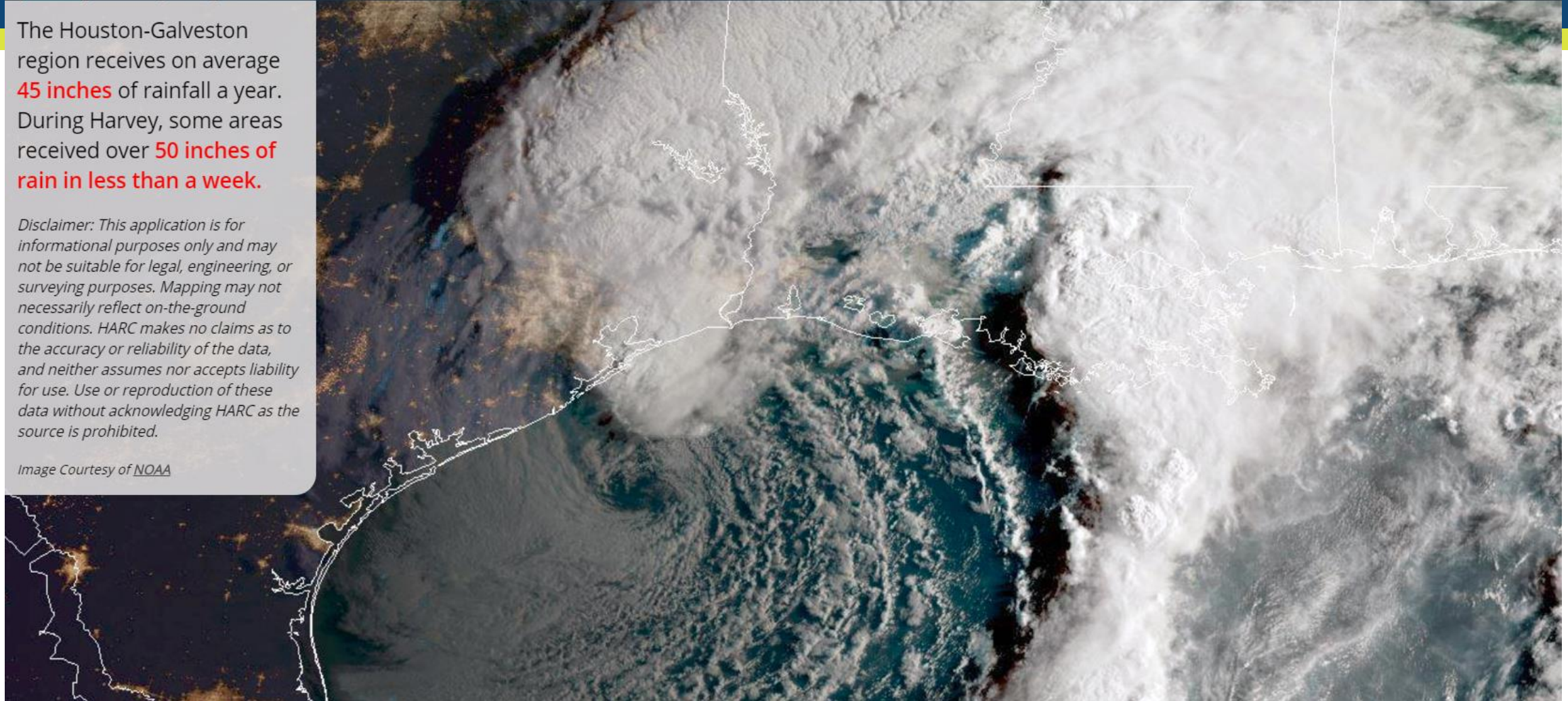


[Intro](#) [Water](#) [Air](#) [Health and Safety](#) [Built Environment and People](#) [Electricity and Energy](#)

The Houston-Galveston region receives on average **45 inches** of rainfall a year. During Harvey, some areas received over **50 inches of rain in less than a week.**

*Disclaimer: This application is for informational purposes only and may not be suitable for legal, engineering, or surveying purposes. Mapping may not necessarily reflect on-the-ground conditions. HARC makes no claims as to the accuracy or reliability of the data, and neither assumes nor accepts liability for use. Use or reproduction of these data without acknowledging HARC as the source is prohibited.*

*Image Courtesy of NOAA*



<http://harveyimpacts.harcresearch.org>



## DRAFT: Partnerships Driving Success

### Infrastructure Investments Reduce Pollution in the Narragansett

In 2003, low levels of oxygen in Narragansett Bay waters caused a large fish kill. This resulted in a public outcry that accelerated plans to reduce the flow of nutrients into the bay.

Significant investments to reduce nutrient loadings have been made to sewage treatment facilities in the Narragansett Bay watershed. Estimated nitrogen loading from treatment plants in 2000 was more than 11,000 pounds per year and in 2015 the total nitrogen loads dropped to more than 4,800 pounds per year. These investments in plant upgrades resulted in nearly a 60% drop in nitrogen loads into the Bay.

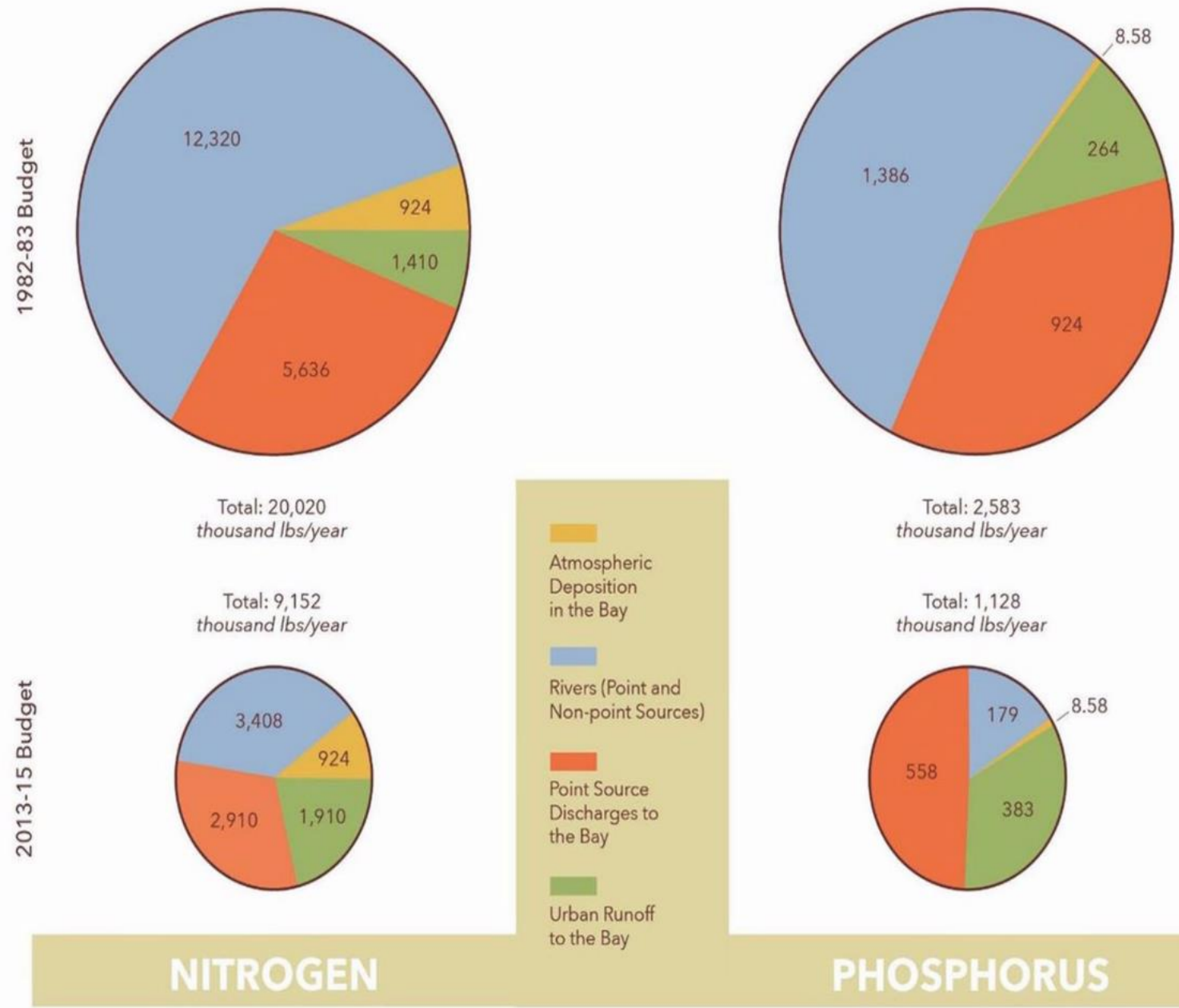
*Photo: Pie charts depict sources of nitrogen and phosphorus runoff into the Narragansett Bay.*

### Municipal Action on Stormwater in New Hampshire

In 2015, the Piscataqua Region Estuaries Partnership provided funding for a grant project in Exeter to improve water quality by amending zoning ordinances.

Amendments to the ordinances restricting fertilizer application in the Shoreland Protection District and Aquifer Protection District were developed with Planning Board staff and were unanimously voted to be included in the 2016 Town Warrant. The Healthy Lawns Clean Water Initiative -- a group of concerned citizens and town staff -- worked to build support in the community through outreach efforts including a lawn care forum and lawn care practices workshop.

In March 2016, voters overwhelmingly supported both amendments. These amendments help protect natural resources by requiring development projects of a certain scale to complete a stormwater management plan.



**NITROGEN**

**PHOSPHORUS**



[Journey Through the Largest Eelgrass...](#)



## Padilla Bay Reserve

### Elevation Loss of 0.25 cm per Year

Beginning in the summer of 2002, Dr. John Rybczyk and his students from Western Washington University installed a network of 23 surface elevation tables (SETs) in Padilla Bay. A SET is a device developed for high precision measurements of surface-elevation change in wetlands. The SETs reveal a bay-wide average loss in elevation of 0.25 cm per year and a pattern of summer accretion and winter erosion.

Click on the points to see elevation of the SETs relative to NAVD88 (note: 99999 represents no data).



Sediment Elevation Table used to measure accretion/erosion rates.



## **Galveston Bay Council Subcommittees' Proposed Projects for Fiscal Year 2019 Galveston Bay Estuary Program (GBEP) Work Plan**

### **GBEP Programmatic Proposed Priorities**

*GBEP proposed programmatic project titles:*

1. Estuary Resilience Assessment (ERA)
2. Mickey Leland Environmental Internship Program (MLEIP)

### **Natural Resources Uses (NRU) Subcommittee Proposed Priorities**

*Proposed NRU project titles:*

1. Conservation Assistance Program
2. Dollar Bay-Moses Lake Wetlands Restoration & Protection
3. GIFT-Anahuac Freshwater Wetland Restoration / Armand Bayou Water Hyacinth Control
4. Clear Creek Riparian Restoration

*Alternate NRU project titles*

Full funding to be restored to the Conservation Assistance Program

### **Public Participation and Education (PPE) Subcommittee Proposed Priorities**

*Proposed PPE project titles*

1. River, Lakes, Bays 'N Bayous Trash Bash
2. Know Your Watershed Educators Summer Institute
3. Blackhawk Park Coastal Prairie Restoration & Education Project
4. Seawall Recycling

### **Water/Sediment Quality (WSQ) Subcommittee Proposed Priorities**

*Proposed WSQ project titles:*

1. Bacterial Source Tracking (BST) on Tributaries of Trinity and Galveston Bays
2. Green Infrastructure For Texas (GIFT) – Stormwater Treatment Wetlands
3. Nutrient and Sediment Monitoring of the Lower San Jacinto River
4. Highland Bayou Watershed Protection Plan

*Alternate WSQ project titles*

5. Designing for Impact: Promoting Low Impact Development (LID) Implementation

### **Monitoring and Research (M&R) Subcommittee Proposed Priorities**

*Proposed M&R project titles:*

1. Seafood Evaluation in a Portion of Galveston Bay
2. Characterization of the Influence of Freshwater Inflow on the Trinity River Delta Indicators
3. Galveston Bay Intertidal Oyster Reef Mapping and Analysis

*Alternate M&R project titles*

#### 4. Monitoring Zooplankton Dynamics for Ecosystem Assessment of Galveston Bay



## GBEP Programmatic Projects

### *Proposed GBEP programmatic project titles*

1. Estuary Resilience Assessment (ERA)
2. Mickey Leland Environmental Internship Program (MLEIP)

### *Proposed GBEP programmatic project summary:*

#### 1.

Project Title: Estuary Resilience Assessment (ERA)

Project Lead: TBD

Proposed Funding: \$ 30,000 (Federal or State)

Project Description: This project will assess the goals, objectives and actions in The Galveston Bay Plan (GBP) against a series of coastal resilience criteria. The final output of the project will be a companion document to the GBP and will provide resiliency adaptation considerations for implementers of the GBP. The document will be developed in coordination with subject matter experts and/or members of the Galveston Bay Council and its committees through workshops or via existing meeting structures. The project will follow the minimum requirements identified in the Environmental Protection Agency's (EPA) National Estuary Program (NEP) Funding Guidance Document.

**Notes: Funding is scalable. Project is a requirement of EPA NEP Funding guidance. Work must be completed in Fiscal 2019 to meet completion requirement of September 30, 2020. \$50,000 requested.**

#### 2.

Project Title: Mickey Leland Environmental Internship Program (MLEIP)

Project Lead: TBD. Texas Commission on Environmental Quality (TCEQ) selected staffing management firm.

Proposed Funding: \$ 7,500 (Federal or State)

Project Description: The GBEP program manager will work with a summer intern for up to 12 weeks to complete a project that implements the Galveston Bay Plan.

The GBEP Mickey Leland Intern for summer 2020 will work directly with the GBEP Program Manager to complete a project that implements the Galveston Bay Plan. The intern will learn about the Clean Water Act Section 320 National Estuary Program (NEP), and the local, stakeholder-based program designed to implement a CCMP and its' strategic action plan. The GBEP program areas, as identified in The Galveston Bay Plan are Water and Sediment Quality (WSQ), Monitoring and Research (M&R), Public Participation and Education (PPE), and Natural Resources (NRU). In addition to interacting with the entities and groups that represent the GBEP's stakeholders, the intern will have the opportunity to participate in summer field site visits, attend GBEP staff meetings, Galveston Bay Council meetings, and subcommittee meetings of the WSQ, M&R, PPE, and NRU dependent upon timing of the internship and the quarterly meetings of the subcommittees. It is anticipated that 90% of the internship will be desk work, with approximately 10% field opportunities, such as boat tours or marsh

planting. The project will result in a short white paper written by the summer intern and at least one power point presentation.

**Notes: Funding provides approximately 12 weeks of full time funding for one university level junior, senior or graduate summer intern.**

**NRU Project Summaries:**

1.

Project Title: Conservation Assistance Program

Project Lead: TBD by RFGA

Proposed Funding: \$100,000 (Federal)

Project Description: This project will provide continued funding of the Conservation Assistance Program to build upon the GBEP's successful land conservation efforts in the lower Galveston Bay watershed. Project objectives include preservation of coastal wetlands and natural areas, facilitation of a conservation workgroup of local stakeholders for project input, and to provide technical, legal, and grant writing assistance for coastal habitat conservation projects.

**Notes: Existing project; funded in FY2018. RFGA is currently under development. \$125,000 requested.**

2.

Project Title: Dollar Bay-Moses Lake Wetlands Restoration & Protection

Project Lead: Texas General Land Office/Galveston Bay Foundation

Proposed Funding: \$125,000 (State)

Project Description: The Dollar Bay-Moses Lake Wetlands Restoration & Protection project intends to protect and restore coastal (estuarine emergent) wetlands within the Moses Lake and Dollar Bay complex, a 2-mile by 4-mile tidally influenced waterbody on the west side of Galveston Bay in Galveston County, Texas. To accomplish this goal, the GLO, Galveston Bay Foundation, and project partners have identified objectives that include 1) protecting up to 7,000 feet of vulnerable shoreline and adjacent habitat along the western shoreline of Moses Lake from continued erosion and habitat conversion adjacent to TNC's Texas City Prairie Preserve property and 2) restoring an estimated 70 acres of degraded estuarine marsh habitat in Dollar Bay to intertidal and high marsh complex.

**Notes: New Project. Previous phases of breakwater construction have been funded by the GBEP. The project leverages significant funding (~\$3.5 million) from GLO's CEPR Program and the NFWF Gulf Environmental Benefit Fund. \$150,000 requested.**

3.

Project Title: GIFT-Anahuac Freshwater Wetland Restoration / Armand Bayou Water Hyacinth Control

Project Lead: Texas AgriLife Extension/Armand Bayou Nature Center

Proposed Funding: \$42,500 (State)

Project Description: The proposed restoration project at Anahuac National Wildlife Refuge includes the restoration of 320 acres of fallow farm field to prime freshwater wet prairie habitat. Phase I of the proposed restoration will include necessary background work (e.g. mapping of site and creating digital overlays) and the initial survey work. Additionally, freshwater invasive species control has been added to the scope of work.



Notes: Existing Project; funded in FY 2018. The proposed amount is what is needed to complete the survey and design work. An additional task of invasive species control and Armand Bayou Nature Center is being added. The project will leverage \$521,000 from Texas Master Naturalists, Texas A&M University System, and Ducks Unlimited. \$42,500 requested.

4.

Project Title: Clear Creek Riparian Restoration

Project Lead: Harris County Precinct 1 / Bayou Preservation Association

Proposed Funding: \$32,500 (State)

Project Description: The objective of the Clear Creek Riparian Restoration project is to restore riparian forested areas along Clear Creek, by removing invasive, exotic species on 34 acres at Challenger Seven Memorial Park, in Harris County. The project would start in the fall of 2018 and be conducted over two years. Challenger Seven Memorial Park has extensive forested habitat (about 50 percent of the park's 326 acres), with much of it experiencing degradation by invasive, exotic species. This project will focus on removal of those invasive exotics within a 34-acre riparian band of about 250 feet of forest along Clear Creek and its back bays.

The project will start and end with a rapid assessment of the status of invasive species (e.g., density or percent cover) in the project area. A "first clearing" of invasive species will be conducted over 40 to 50 event days per year. The "first clearing" will be followed by a "mop-up" at each location, to achieve approximately 90% removal of invasive species in the targeted areas. This habitat restoration work will be led by Bayou Preservation's contractor, EBR Enterprises. Eric Ruckstuhl has approximately 18 years of experience in invasive, exotics removal and habitat restoration in the southeast Texas area, most of it for Bayou Preservation Association.

Notes: New Project. Project proposed to leverage an additional \$76,000 from local government, corporate partners, and volunteers. \$60,000 requested.

## **PPE Subcommittee Proposed Priorities**

### PPE Project Summaries

#### **1.**

Project Title: River, Lakes, Bays 'N Bayous Trash Bash

Project Lead: Houston-Galveston Area Council

Proposed Funding: \$15,000 (Federal or State)

Project Description: Trash Bash is the largest single-day waterway cleanup in the state of Texas, with 15 sites across the region and 4,000–5,000 volunteers annually. The scale and scope of the event requires year-round administration and coordination. GBEP funds would be used to support the event coordinator's position and printing educational materials as well as the development of an interactive game that will be used at each of the sites during the event. Stakeholders and partners will be able to check out the game from the H-GAC throughout the year to further the Trash Bash and litter prevention message.

**Notes: Existing project, new contract.**

#### **2.**

Project Title: Know Your Watershed Educators Summer Institute

Project Lead: University of Houston Clear Lake (UHCL)

Proposed Funding: \$38,341.00 (Federal or State)

Project Description: The goal is to educate the public, including educators and their students, on the importance of watersheds. Through the summer institute and field experiences, teachers will participate in environmental education programs and activities stressing the importance of watersheds benefits, what is a watershed, where is your watershed, and protection. Participants will gain not only an appreciation for their watershed, but will also learn how their actions impact the watershed. This project also aims to provide content and support to administrators which will encourage them to assist classroom teachers in the implementation of environmental and science education. The institute will incorporate site visits, water quality testing, educator workshops, and guest speakers for teachers. Funding will also provide curriculum and training in nationally known curricula known as WOW – the Wonders of Wetlands, Aquatic WILD, and Healthy Water- Healthy People. In addition, Science of Galveston Bay will be provided to each participant. Targeted audience will be grades 5-12 classroom teachers in the Houston-Galveston area with special emphasis on teachers from Dickinson ISD, Clear Creek ISD, and Pasadena ISD. Target number of teachers is 30. In addition, a one-day symposium will be conducted for local administrators that will address such questions as what is Environmental Education (EE), the benefits of incorporating EE into the curriculum, how to support your local educators with the EE efforts, and the connection between Every Student Succeeds Act (ESSA) and EE. Administrators will be introduced to the Superintendent's Environmental Education Collaborative (SEEC). SEEC aims to bring partnerships between superintendents and environmental organizations. Using a survey instrument, the summer institute participants will complete an evaluation at the end of each school semester. The evaluation will focus on the implementation of the various curricula and environmental issues being addressed in the classroom. Dissemination of these results

will be presented at local, state, and national meetings and through publications. Such meetings may include: Texas Association for Environmental Education, North American Association for Environmental Education, Conference for the Advancement of Science Teaching, and the State of the Bay Symposium.

**Notes: New Project. UHCL will partner with the Galveston Bay Foundation on the field experiences. The project will leverage in-kind services from several partners including Armand Bayou Nature Center (ABNC) and area local government entities. Parts of the project are scalable. \$38,341 requested.**

### 3.

Project Title: Blackhawk Park Coastal Prairie Restoration & Education Project

Project Lead: City of Houston Parks and Recreation Department (HPRD)

Proposed Funding: \$53,600 (Federal or State)

Project Description: This project will engage the community in restoring a city park to its historic coastal prairie pothole habitat during two community volunteer events focused on invasive species removal and native plant installation. Currently, much of the proposed project area is overrun by Chinese Tallow (*Triadica sebifera*) and Privets (*Ligustrum spp.*). By incorporating native coastal prairie habitat into the site, the project will increase the resilience of the landscape to natural weather effects, increasing the filtration of stormwater runoff, improving water quality downstream, retaining large amounts of flood waters, and reducing erosion. Another major goal of the project is to reduce sediment/nutrient loading and chemical pollution into Galveston Bay. The city will subcontract with the Student Conservation Association to remove 10 acres of nonnative vegetation. HPRD will host invasive species identification and removal events as well as native species community planting events to train community members on the impacts of non-native vegetation to natural habitats. HPARD will install interpretive signage at the site with information on native prairies and wetlands and their impacts on wildlife and people.

**Notes: New Project. The proposed amount is what is needed to complete the project. The organizations involved are leveraging \$30,800 contributions from private foundations as well as in-kind services from other partners. GBEP has a similar FY18 contract with HPRD, the White Oak Bayou Native Habitat and Restoration. Contract number 581-18-80341. \$53,600 requested.**

### 4. Project Title: Seawall Recycling

Project Lead: Galveston Island Board of Trustees and Artist Boat

Proposed Funding: \$18,420.00 (Federal or State)

Project Description: This project will provide recycling opportunities along approximately 6 miles of Galveston's historic Seawall, which will reduce litter that could become marine debris and increase the reuse of economically viable resources. With this funding, 20 recycling cans will be purchased to place at Seawall bus stops and one, six-compartment recycle station that can be moved based to areas of highest need. The Back the Bay message and logo incorporated on the recycling cans.

**Notes: This is a new project and it is scalable. It was submitted the WSQ and PPE subcommittees. \$18,419.50 was requested. The amount of funding approved will**

determine the number of recycling cans distributed along the seawall. This project leverages \$58,500 of in-kind contributions from the Galveston Parks Board of Trustees.

## WSQ Project Summaries

### 1.

Project Title: Bacterial Source Tracking (BST) on Tributaries of Trinity and Galveston Bays

Project Lead: Texas Water Resources Institute (TWRI)

Proposed Funding: \$80,000 per year for 3 years (Federal)

Project Description: Through this project, a water quality monitoring regime will be employed that will help decisions makers make appropriate recommendations for addressing the bacteria impairments in Buffalo, Double, Cedar, and Dickinson Bayous and Clear Creek. Monthly sampling will be conducted by TWRI at one site on each waterbody for 12 months (5 total sites). Field parameters collected will include pH, temperature, conductivity, and dissolved oxygen. Samples will be delivered to the Texas A&M University (TAMU) Soil and Aquatic Microbiology Laboratory (SAML) where *E. coli* will be prepared for BST analysis. SAML will also conduct library-dependent BST and analyze *E. coli* isolates (4 isolates per sample) using the ERIC-PCR and RiboPrinting combination method. TWRI will collect approximately 75 known source samples from the local watersheds to improve the accuracy of the BST results. Known source sample isolates will be archived in the Texas *E. coli* BST Library. Results of both the known source sampling and BST analysis will be reported in a project final report and presented as necessary.

**Notes: This project was approved last year for \$240,000 for three years of funding. \$80,000 has been allocated annually for FY 18, 19, and 20. Shared again as a courtesy.**

### 2.

Project Title: Green Infrastructure For Texas (GIFT) – Stormwater Treatment Wetlands

Project Lead: Texas Coastal Watershed Program/AgriLife

Proposed Funding: \$37,500 (Federal)

Project Description: The goal of GIFT is to demonstrate a range of green infrastructure techniques focused on water quality and quantity. This project will continue to focus on stormwater treatment wetlands in three areas where partnerships have already been initiated: an 8500-square foot basin on the MD Anderson Cancer Center campus in the Texas Medical Center in Houston, a three and half acre basin on the Brazosport College campus in Lake Jackson, and the wetlands at Exploration Green Recreation Area in Clear Lake City (Phase two of five planned phases).

**Notes: Existing project. Last year, TCWP asked for \$75,000 for two years but had to scale the project down to \$37,500 for one year. Now they are asking for the second year of funding to continue the work that began in FY18.**

### 3.

Project Title: Nutrient and Sediment Monitoring of the Lower San Jacinto River

Project Lead: United States Geological Survey (USGS)

Proposed Funding: \$ 40,000 per year (State)

Project Description: For this project, water-quality samples will continue to be collected in the lower reaches of the San Jacinto River over a range of hydrologic

conditions to evaluate the potential for developing regression models. The added funding will allow the USGS to use an Acoustic Doppler Velocity Meter (ADVM) (rather than surrogates) which measures water velocity and acoustic backscatter parameters, in conjunction with water quality properties, to estimate discharge, nutrient, and sediment concentrations at 15-minute intervals in the San Jacinto River. A second year of funding will also mean the USGS can collect a second year of samples resulting in a more robust dataset.

**Notes: Existing project. USGS asked for \$80,000 for two years but had to scale the project down to \$40,000 for one year. Now they are asking for the second year of funding to continue the work that began in FY18. The project was recommended by M&R also.**

#### 4.

Project Title: Highland Bayou Watershed Protection Plan (WPP)

Project Lead: Texas Coastal Watershed Program/AgriLife

Proposed Funding: \$48,000 (Federal or State)

Project Description: Update the Highland Bayou Watershed Protection Plan to include load reduction estimates which incorporate flow data for bacteria, continue the stakeholder engagement process, and to shepherd the WPP through the TCEQ and EPA Region 6 approval process.

**Notes: Texas Institute for Applied Environmental Research (TIAER) will be conducting an analysis for the TCEQ Total Maximum Daily Load (TMDL) program this year (FY 2018) to develop a way to model flow to determine loads and in turn to be utilized for the bacteria impairments for the draft WPP. If this approach leads to scientifically defensible load reduction estimates, then the project described above will use that data to complete the WPP and submit it to the EPA for review.**

*WSQ Project Summaries (Alternative):*

#### 5.

Project Title: Designing for Impact: Promoting Low Impact Development (LID) Implementation

Project Lead: Houston-Galveston Area Council (H-GAC)

Proposed Funding: \$30,000 (Federal)

Project Description: In partnership with the City of Manvel, City of Mont Belvieu and City of Pearland municipalities, H-GAC will evaluate ordinances, policies, and the development review process to identify regulatory barriers to LID implementation and provide a report offering recommendations for overcoming them. Specifically, H-GAC will: 1. Evaluate building codes, plat requirements, and plat review process to identify regulatory barriers to LID implementation; 2. offer recommendations for making these LID impediments more LID-friendly; and 3. provide guidance on how to implement the recommendations. H-GAC will also hold one technical assistance workshop for partner municipalities to help roll out the recommendations.

**Notes: Existing project. H-GAC asked for \$60,000 for two years but had to scale the project down to \$30,000 for one year. Now they are asking for the second year of**

funding to continue the work that began in FY18. The second year of funding would allow H-GAC to complete their work in all three municipalities.

## M&R Project Summaries

1.

Project Title: Seafood Evaluation in a Portion of Galveston Bay

Project Lead: Department of State Health Services

Proposed Funding: \$ 100,000 (Federal)

Project Description: To evaluate the risk associated with consumption of fish and crabs from a portion of Galveston Bay. The amount of funding is enough to provide data to reassess a portion of the current fish advisories in Galveston Bay. The advisory area below HWY 146 down to a line from Red Bluff Point to Five Mile Pass to Houston Point has not been sampled recently. This area has a consumption advisory for catfish, blue crabs and spotted seatrout due to PCBs and Dioxins. The area is a popular recreational fishing area for spotted seatrout. Fishing occurs regularly in Tabb's and Barnett Bay that are contained in this advisory area. It is important that we select a geographical area that is of a size that will allow an evaluation of tissue concentrations and risk that allows a high degree of confidence so that appropriate regulatory decisions can be made by the Commissioner of Health related to altering an existing fish consumption advisory.

Notes: This project was approved for the full two years last year. \$30,000 was allocated for FY 18 and \$69,375 for FY 19. Shared again as a courtesy.

2.

Project Title: Characterization of the Influence of Freshwater Inflow on the Trinity River Delta Indicators

Project Lead: University of Houston at Clear Lake/Environmental Institute of Houston (EIH)

Proposed Funding: \$ 18,000 (Federal)

Project Description: This study will quantify the influence of freshwater inflow on the Trinity River delta salinity regime and biota including Atlantic Rangia (*Rangia cuneate*) clams and Wild celery (*Vallisneria americana*).

Notes: Existing project. The EIH asked for \$60,000 for two years but had to scale the project down to \$42,000 for one year. Now they are asking for the second year of funding to continue the work that began in FY18. A second year of funding will allow the EIH to collect a second year of samples resulting in a more robust dataset.

3.

Project Title: Galveston Bay Intertidal Oyster Reef Mapping and Analysis

Project Lead: University of Houston (UH)

Proposed Funding: \$ 64,580 (Federal or State)

Project Description: This project seeks to create a complete GIS database of oyster shell reef habitat in Galveston Bay while simultaneously assessing intertidal oyster population dynamics and community structure on selected reefs.

Notes: New project. University of Houston requested \$92,000 total over three years. They have broken down the funding into three year increments based on the tasks



required for each of the years: year 1 - \$43,000; year 2 - \$22,000; year 3 - \$27,000. The commitment from GBEP currently is for two years of funding (\$64,580).

#### M&R project Summaries (Alternatives)

4.

Project Title: Monitoring zooplankton dynamics for ecosystem assessment of Galveston Bay

Project Lead: Texas A&M University at Galveston (TAMUG)

Proposed Funding: \$ 64,021 (Federal or State)

Project Description: This project will sample zooplankton in Galveston Bay to provide data on abundance, species composition and distribution of zooplankton for ecosystem assessments of the bay.

Notes: New project. This project was a high priority for the M&R Subcommittee but the funding was too high to be able to fund and also be able to provide the second year of funding for the projects from FY18.

<b>FY 19 Balanced Budget</b>			
<b>Category</b>	<b>Grantee</b>	<b>State Funding</b>	<b>Federal Funding</b>
<b>Programmatic Costs</b>			
Salaries, Fringe, and Indirect	N/A	\$ -	\$ 644,686.00
General Operational Costs	N/A	\$ 27,324.00	\$ 7,947.00
Website Hosting & Maintenance (3 websites)	Wilkins Group	\$ 4,789.00	\$ -
Estuary Resilience Assessment (ERA) Report	TBD	\$ -	\$ 30,000.00
GBEP Mickey Leland Summer Intern	N/A	\$ -	\$ 7,500.00
<b>NRU</b>			
Conservation Assistance Program	TBD by RFGA	\$ -	\$ 100,000.00
Dollar Bay/Moses Lake Wetland Restoration and Protection	GBF thru GLO or Texas City	\$ 125,000.00	\$ -
GIFT Freshwater Wetland Restoration at USFWS Anahuac / ABNC Hyacinth	Texas Agrilife and ABNC	\$ 42,500.00	\$ -
Clear Creek Riparian Restoration	BPA thru Harris County Pct 1	\$ 32,500.00	\$ -
<b>PPE</b>			
Trash Bash	H-GAC	\$ -	\$ 15,000.00
Know Your Watershed	UHCL	\$ -	\$ 38,341.00
Blackhawk Park Coastal Prairie Restoration & Education Project	City of Houston	\$ -	\$ 53,600.00
Galveston Seawall Recycling	Artist Boat thru Galveston Island Parks Board of Trustees	\$ -	\$ 18,420.00
<b>WSQ</b>			
Bacteria Source Tracking (Previously Approved FY 18-20 Project)	Texas Water Resources Institute	\$ -	\$ 80,000.00
Green Infrastructure For Texas (GIFT) Stormwater Wetlands	Texas AgriLife	\$ -	\$ 37,500.00
Nutrient and Sediment Monitoring of the Lower San Jacinto River	USGS	\$ 40,000.00	\$ -
Highland Bayou Watershed Protection Plan (contingent on NPS project)	Texas AgriLife	\$ -	\$ 48,000.00
<b>M&amp;R</b>			
Seafood Evaluation (Previously Approved FY 18-19 Project)	DSHS	\$ -	\$ 36,426.00
Characterization of the Influence of Freshwater Inflow on the Trinity River Delta Indicators	UHCL	\$ -	\$ 18,000.00
Galveston Bay Intertidal Oyster Reef Mapping and Analysis	UH	\$ -	\$ 64,580.00
<b>FY 2019 Funding Requests</b>		\$ 272,113.00	\$ 1,200,000.00
<b>FY 2018 Funding Allocation</b>		\$ 272,113.00	\$ 1,200,000.00
<b>Difference</b>		\$0.00	\$0.00