

Galveston Bay Estuary Program

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July 11, 2017

Dear Galveston Bay Council Members:

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

Wednesday, July 19, 2017

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 July 19, 2017 meeting is attached as noted below.

1. Council Agenda for July 19, 2017
2. Draft April 19, 2017 Council Meeting Minutes

Sincerely,

Sarah P. Bernhardt

Program Manager

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



A PROGRAM OF THE TCEQ

GALVESTON BAY COUNCIL QUARTERLY MEETING

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

AGENDA: Wednesday, July 19, 2017

- 9:30 A.M.:** **Call to Order:** Introduction of Members and Delegates
 Action Item: Approval of April 19, 2017 Meeting Minutes
 Report of the Chair (Nancy Parra, Chair)
 Action Items: Approval of roster of member nominations for 2017-2021 terms and other changes, including nomination of a new vice-chair and chair for 2018-2019.
 Report of the Program (Sarah Bernhardt, Galveston Bay Estuary Program (GBEP))
- 10:15 A.M.:** **Presentation and Discussion:** Galveston Bay: Changing Land Use Patterns and Nutrient Loading: Causal or Casual Relationship with Water Quality, Quantity, and Patterns (Dr. Antonietta Quigg, Texas A&M University, Galveston)
- 11:00 A.M.:** **Break**
- 11:20 A.M.:** **Presentation and Discussion:** Preview of the main actions in the draft Galveston Bay Plan, 2nd Edition, the CCMP Revision (Sarah Bernhardt, GBEP)
- 11:40 A.M.:** **Presentation and Discussion:** Back the Bay Campaign Update - Summer 2017: What Happens in Houston Ends Up in Galveston Bay, and other Public Participation and Education subcommittee accomplishments (Cynthia Clevenger, GBEP)
- 12:00 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: October 18, 2017; January 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– April 19, 2017

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 April 19, 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 12:25 PM.

Members Present: Scott Alford, Caryn Brooks, Rebecca Hensley, Kelly Holligan, John Huffman, Brian Koch, Kristin Lambrecht, Mike Lee, Helen Paige, Nancy Parra, Helen Paige, Hanadi Rifai, Ronnie Schultz, Linda Shead, Matthew Still, Bob Stokes, Chuck Wemple, Kirk Wiles, Kate Zultner

Members Not Present/Delegates: Bill Baker*, Andrea Catanzaro*, Glenn Clingenpeel, Mark Fisher, Albert Gonzales, Phillip Goodwin*, Carla Guthrie*, James Harcourt*, Jace Houston*, John Jacob*, Doug Jacobson, Luz Locke, Garry McMahan*, Ana Partin, Russ Poppe*, Aaron Rice, Mary Beth Stengler, Sharron Stewart, Rusty Swafford, Jeff Taebel* Lori Traweek

(*=Member designated a proxy)

Proxies Present (council member absent/designated proxy): Bill Baker/Scott Alford, Andrea Catanzaro/Jennifer Morgan, Phillip Goodwin/Richard Chapin, Carla G. Guthrie/Caimee Schoenbaechler, James Harcourt/Audrey Kuklenz, Jace Houston/Jordan Austin, /Mary John Jacob/Carol Edwards, Garry McMahan/Jacqueline Munoz, Russ Poppe/Glenn Laird, Jeff Taebel/Todd Running, Rusty Swafford, Kate Zultner/Mollie Powell

Current Vacancies: None

Other Attendees: Stefanie Simpson (Restore America's Estuaries), Mark McCollum (Rail Road Commission)

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

Call to Order: Introduction of Members and Delegates

Action Item: Approval of January 18, 2016 Meeting Minutes

Nancy Parra (Chair) opened the meeting with approval of the January 18, 2017 meeting minutes and opened the floor for questions and comments. A motion was requested for approval of the minutes. John Huffman motioned to approve the minutes, followed by Brian Koch who seconded the motion. The minutes were approved with no changes.

Chair Report:

Nancy Parra reported upcoming mid-term nominations and the process of the chair. Nancy Parra asked everyone to review the council listing (P.17 of their handouts), and reported the positions highlighted in yellow have terms that will end in November 2017. Those members need to be

nominated by their organizations or by GBC to take on a new term (2017-2021) or a new nominee/appointee needs to be identified to fill the position in November 2017.

Sarah Bernhardt reported one nomination from Great Houston Partnership Will Nipper, Dow, replacing Jarod Davis, Dow. Sarah reported approval of the newly appointed Railroad Commission member Audrey Kuklenz. Linda Shead suggested the agenda be modified followed by nomination approval vote. Modify the agenda by adding the action for the July council agenda, as well as adding the action item to the Texas Register Open Meeting Agenda and will check Robert's Rules.

Nancy Parra motioned for nomination approval from the council, Bob Stokes motioned for approval, Kirk Wiles second motion for approval. Federal agency representatives abstained:

Scott Alford	John Huffman
Mike Lee	Doug Jacobson
Army Corp	NOAA

Nancy read to the council a letter of support (handout) to Dr. Steven Penning, Director, UH Coastal Center. Nancy reported briefly to the council the support letter states the University of Houston Coastal Center is actively involved in performing the research and education and the services activities related to the coastal prairies. Nancy reported on legislative notices and if anyone like to receive email alerts members can provide their email address to create a list for future notices.

Report of the Program:

Sarah Bernhardt reported to the council budget changes due for Fiscal year 2017 (FY 17) (see handout). She reported GBEP gave up \$36,000 state FY 17 funding to TCEQ due to statewide budget shortfall.

Linda Shead commented that she had issues with the process changes that happened on the Galveston Bay Action Network (GBAN) project, GBAN was approved by the Council, but later removed from the work plan due to concerns from the TCEQ about the project being duplicative of TCEQ's own complaint reporting system.

Linda Shead moved to approve the FY 2018 work plan changes, seconded by Brian Koch. Rebecca Hensley, Kirk Wiles, and Bob Stokes abstained due to involvement in projects selected in the work plan.

Nancy Parra introduced the first presenter to the council, Stefanie Simpson with Restore America's Estuaries.

Presentation: Presenting the status of and opportunities for Blue Carbon in Galveston Bay, Stefanie Simpson, Restore America's Estuaries

Stefanie Simpson provided the following presentation notes:

Restore America's Estuaries (RAE) works nationally and with our member organizations (e.g. Galveston Bay Foundation) and other partners to advance coastal wetland restoration and conservation. We do this through recognition of the many ecosystem services these habitats provide, including shoreline stabilization, resiliency to storms and flooding, key marine habitat, improved water quality, and carbon storage.

What is Blue Carbon?

Blue Carbon refers to the greenhouse gases (GHG) stored in, captured (sequestered) by and released by tidal wetlands, including seagrass, marsh, mangrove and other tidal wetlands. We are interested in this ecosystem service as a way to enhance the management of and public/private investment in coastal restoration and conservation efforts.

Blue Carbon Science

Coastal ecosystems capture carbon by 1) photosynthesis, 2) sediment transport, and 3) the buildup of dead/decaying vegetation. Coastal habitats accumulate carbon in the ground at rates 10 times more efficient than terrestrial forests. Coastal habitats store the majority of their carbon in the soil, where it can remain locked up indefinitely as long as the habitat remains intact.

When coastal habitats are drained or degraded, the stored carbon can re-oxidize, releasing what can be 100s of years of stored carbon back into the atmosphere in a matter of decades. Globally, an estimated half a billion tons of CO₂ is released every year due to coastal degradation – this is equivalent to the emissions of a country like Japan or Great Britain.

Market Opportunity

In the carbon market, businesses, governments and individuals can reduce their carbon footprint through the purchase of carbon offsets. One carbon offset is equal to one metric ton of CO₂ equivalents (other GHGs are converted to units of CO₂ for consistency). The purchase of carbon offsets goes to support projects that prevent or reduce atmospheric GHGs.

Activities in tidal wetlands that can result in a climate benefit and therefore generate carbon offsets include 1) wetland restoration, which increases carbon sequestration (via vegetative photosynthesis) and halting the emission of CO₂ from drained/degraded wetlands; and 2) wetland conservation, which protects the existing carbon stored beneath wetlands from being disturbed and emitted.

Galveston Bay Blue Carbon Study (ongoing)

With funding from Accenture, and through a partnership with Galveston Bay Foundation and Texas A&M University-Galveston, RAE is leading a blue carbon study to gather carbon data for restored and natural marsh in Galveston Bay. 12 sites were identified with the help of GBF, Galveston Bay Estuary Program, and TAMUG that include restored marsh of varying ages as well as 3 reference (natural) marsh sites.

The study approach includes collecting soil carbon cores to determine carbon storage and sequestration rates, and plant biomass + leaf carbon content to determine vegetative carbon storage.

Initial results show restored marsh vegetation stores as much if not more carbon as natural marsh, and soil carbon accumulation increases after restoration. Data is still be processed. There will be a final report to be presented in GB summer 2017. In addition, data from this study will be used in marketing materials to gauge interest from local industry groups to invest in coastal restoration projects for their carbon benefit, and RAE will be using the data to update ecosystem service reports for Galveston Bay to include carbon storage services and therefore valuing coastal wetlands for the full suite of ecosystem services they provide.

For more information, or to sign up for RAE's monthly Blue Carbon Buzz e-newsletter to keep up to date on blue carbon events, publications, webinars, resources and more, visit www.estuaries.org/bluecarbon or email Stefanie at ssimpson@estuaries.org.

Questions & Comments

Mary Carol Edwards commented on restored wetlands accumulating carbon at rates higher than undisturbed wetlands. Anna Armitage's theory is that the plants used in restoration could be hybrids, and the genetic composition could be more robust than the native grasses. Bob Stokes commented that it was the same with forests (higher on new forests versus existing).

Nancy Parra asked how you actually buy credits in the voluntary market, to which Stefanie replied that there are protocols in place to ensure carbon offsets are legitimate.

Kate Zultner question on whether this information supports restoring wetlands versus preserving wetlands.

Presentation: Status of the Galveston Bay Plan Revision and feedback on Workshop Two by Sarah Bernhardt

Sarah Bernhardt reported the following information:

- Workshop #2 was held on March 1, 2017 from 2:00pm – 4:00pm in La Marque, Texas.
- Purpose of Workshop #2 was to vet the prioritized framework and action plans with a focus on implementation feasibility.
- Fifty-Four stakeholders, including GBEP and Houston-Galveston Area Council (H-GAC) staff, attended.
- Digital Workshop #2 Questionnaires (12 in total) were provided to Galveston Bay Council and Subcommittee members unable to attend Workshop #2
- Open March 23, 2017 – April 5, 2017
- Feedback is being calculated; however will work on getting some type of status or cool graphics from Exercise #3 (grid).

As concluding points (based on review of the graph and end data), some corresponding stats were presented.

General: All of the specific objectives advance the program mission, 73% (29/40) strongly supported mission.

WSQ: Specific objectives contained the most variability between “Ease” and “Mission”, 63% (10/16) were considered easy to very easy to implement and 56% (9/16) strongly support mission implementation.

NRU: 63% (5/8) of NRU were considered easy to very easy to implement. Notable that Land Acquisition and Invasive Species Control were considered very difficult to implement, (75% (6/8) were considered strongly in support of the mission.

M&R: 100% (10/10) M&R objectives were considered strongly supporting, but only 40% (4/10) were considered easy to implement.

PPE: PPE clustered the most with three objectives, 50% considered easy to implement and three considered difficult, though only slightly. Nearly all 67% (4/6) were considered as strongly implementing the mission.

With regards to how these percentages were calculated and the purpose of Exercise #3, focused on implementation feasibility.

Discussion: Roles of the Galveston Bay Council Members and Vision for meetings.

Sarah Bernhardt reported the Council is an advisory committee to the TCEQ and Galveston Bay Estuary Program (GBEP). The Council will perform the following functions.

- Provide a forum for technical and stakeholder group review and input during Galveston Bay Plan implementation.
- Advise the TCEQ staff during preparation of progress reports, evaluations, and Plan updates.
- Authorize and make appointments to subcommittees as necessary.
- Assess the success of action plan and initiate revisions.
- Address legislative issues and make recommendations to the Texas Legislature
- Advise the TCEQ as to annual priorities for implementation of action plans
- Monitor the effectiveness of action taken pursuant to the Plan
- Review all federal financial assistance programs and federal development projects in accordance with Section 320 of the Clean Water Act.

Sarah informed the GBC members a follow up email or Survey Monkey will be in the works to ask each GBC member what they think the role of the members are on the Galveston Bay Council. There will be non-attributed responses that we can revisit. If responses indicate, the GBC could form a task force and that could be described in the plan revision. Sarah asked council members if they had any suggestions on how we orient the Council meeting. Is there interest allocating some time to working group? Program updates? Topical presentations?

Considering following up with a survey:

Are the meetings productive?

Would they like to get together in work group? Eg. Form an advocacy workgroup.

Do they feel the subcommittee and the GBC communicate enough? Do they need more information from the subcommittees?

John Huffman and Hanadi Rifai commented that the format of GBC meetings are fine, but a working meeting for the Plan review and budget changes should be held for the July meeting.

Discussion: Revisiting the goals of the Galveston Bay Regional Monitoring Program

Sarah Bernhardt reminded the group that there was a Regional Monitoring Workgroup Meeting on February 23, 2017. Some of topics that were discussed at the meeting include: indicators that have been included in the status and trends database, how often should they be reviewed, the State of the

Bay Report, the State of the Bay Symposium, a schedule for GBEP programmatic projects, the structure of the subcommittees and their interaction with the Council, etc. Some of the ideas will be incorporated into the new monitoring plan and some may be revisited as part of the adaptive management of the new monitoring plan.

The one topic Sarah hoped to discuss during this Council meeting was whether or not additional goals should be added to the new monitoring plan. For those that were not able to attend the meeting, she mentioned the two goals of the current monitoring program are: 1.) Are the goals and objectives set forth in the Galveston Bay Plan (GBP) being met? 2.) Is the health of the ecosystem changing?

Linda Shead suggested that we should look at how to provide support and more information to make our projects more effective.

John Huffman mentioned that there is a group at the Gulf of Mexico level that is discussing the standardization of monitoring protocols for restoration efforts. Maybe the M&R Subcommittee should be in contact with them.

If anyone has anything they would like to discuss concerning the regional monitoring plan, please contact Lisa Marshall.

Subcommittee Reports: (Subcommittee Handouts included in Packets if available)

Monitoring and Research (M&R) – The M&R subcommittee did not meet due to The Regional Monitoring Plan Workgroup met on February 23, 2017 in place of the M&R Subcommittee.

Public Participation and Education (PPE) – The Subcommittee meeting was held on March 23. The HERE (Houston Environmental Resources for Educators) project was discussed. There will be a small group working on populating the HERE website for the Galveston Bay page. There has been some interest in having an education workshop/session at the next State of the Bay Symposium in 2019, and a small workgroup will be formed to head up this effort. Trash and plastic pollution continues to be a priority focus area for the subcommittee. Some groups are participating in the Trash Summit held at the Houston Zoo in May. Cynthia participates in the Public Pollution Prevention (P3) Partnership as well as Bayou Preservation Associations Nonpoint Source Pollution Prevention Committee. These groups are focusing on trash and plastic pollution. Bayou Preservation Association will be working on developing a white paper on trash and litter problems in the Houston area.

Water/Sediment Quality (WSQ) – The WSQ Subcommittee discussed the projects that subcommittee members are currently working on and challenges they are facing with those projects; the other subcommittee coordinators gave an update of projects that are being funded from their subcommittees.

Natural Resource Uses (NRU) – The NRU subcommittee would be having a joint meeting with Houston Wilderness on May 11, 2017 at the Estuary Program office. The purpose would be to discuss NRU overlaps with the Galveston Bay Oyster and Migratory Bird (GBOMB) Initiative, to attempt to better collaborate on our shared goals and priorities, while also taking into consideration the valuable time of our many stakeholders involved in both groups. In addition to improved collaboration, the meeting will help to inform implementation of the NRU Habitat and Species Conservation Action Plans currently under revision, provide information and direction to the subcommittee and Galveston Bay Council, and improve future conservation projects.

Budget and Priorities Subcommittee – Sarah Bernhardt reported that B&P met on April 4th and provided a summary during the report of the program.

Council Members Roundtable: News and Announcements:

Mary Carol Edwards (Proxy for John Jacob) – **Exploration Green** Wetland Planting Days April 15, 2017, May 13th and 17th, 2017. GBEP funded the nursery at Exploration Green.

Todd Running – **Basin Highlights Report will be available on May 15th**. Trash Bash Event held March 23, 2017, there were 538 tires total at all the sites

John Huffman – Fish and Wildlife Service will have their 33rd Annual Crawfish Boil, May 11th, 2017 at Challenger 7 Park, please RSVP by May 1, 2017.

Brian Koch – Texas State Soil and Water Conservation Board Stewardship the Importance of Voluntary Land Stewardship Week of April 20th through May 7th, 2017 the focus this year is “No Land No Water.”

Bob Stokes – Marsh Mania April 22, 2017, GBF Annual Meeting April 19, 2017, Bay Day May 13, 2017,

Mike Lee – USGS will have the Wallisville Gauge report online

Sarah Bernhardt – Thanked GBEP staff for their hard work with the Galveston Bay Plan and workshops

Nancy Parra – Announced to council members invitation to lunch

Linda Shead – The BPA annual awards luncheon will present Debra January Bevers with an award.

Caimee Schoenbaechler (Proxy for Carla Guthrie) – Positions open hiring until May 1, 2017

Glen Laird (Proxy for Russ Poppe) – Fund project 127 acres

Kelly Holligan – Regarding RESTORE:

- In consultation with the Governor’s Office, Commissioner Baker has completed his review of the proposals submitted for RESTORE Bucket 1 (direct component) funding and has developed a list of draft projects. The draft list does not guarantee funding but is a significant step forward in the Texas’ RESTORE process. Texas will now develop a multi-year implementation plan that will include the draft projects list before publishing for public comment in the Texas Register. Public comments received will be considered before a final implementation plan with projects will be submitted to the US Treasury for approval before making individual awards. At this point there is no timetable for development of the implementation plan or treasury approval. Roughly \$66 million is available under the 2016 Request for Grants Application.

Regarding the TMDL Program:

- The Tres Palacios Watershed Protection Plan was submitted to EPA for review and approval on 3/21/17.
- The Tres Palacios TMDL and Implementation-Plan and Jarbo Bayou TMDL are scheduled to go to agenda for release for public comment on July 7th, 2017.

Regarding the NPS Program:

- The draft Texas NPS Management Program update is scheduled to go to agenda for release for public comment on April 26, 2017. The update is due to EPA in 2017.

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 2017 revision. It is anticipated that standards will be proposed for public comment to the Commission in late summer of 2017.

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 2017 Coordinated Monitoring Schedule has been updated and is available on the TCEQ website.

Kate Zultner – ECO Teachers... The Texas Coastal Resiliency Master Plan is complete and available online. Adopt a Beach will be held from 9 a.m. to 12 p.m. on April 22, 2017

Audrey Kuklenz (RRC) – reported on the bay and offshore well monitoring, stating 75-80 of 300 wells had been inspected.

Public comments: No public comments were received.

Adjourn: Meeting was adjourned at 12:25pm

Upcoming Galveston Bay Council Meeting Dates: July 19, 2017, October 28, 2017. If there are known conflicts, Council members are encouraged to propose alternate dates to the Council. Proposed dates are all third Wednesday of each quarter from 9:30am to 12:30pm.



**Blue Carbon Ecosystem Services
in Galveston Bay**

Stefanie Simpson
Galveston Bay Council Meeting
April 19, 2017

RESTORE AMERICA'S ESTUARIES
www.estuaries.org

Who we are



Restore America's Estuaries is dedicated to the protection and restoration of bays and estuaries as essential resources for our nation.

www.estuaries.org

Tidal Wetland Ecosystem Services

- ✓ Increased resilience
- ✓ Key marine habitat
- ✓ Improved water quality
- ✓ Shoreline protection
- ✓ Carbon Storage



What Is Blue Carbon?

"Blue Carbon"

The greenhouse gases (GHGs) stored in, sequestered by, and released from coastal marine ecosystems such as seagrasses, mangroves, salt marsh and other tidal wetlands.

Goal:

Enhance management of, and increase public and private investment in coastal habitat restoration and conservation



RAE Blue Carbon Strategy

Introduction into Carbon Markets

- VCS Requirements
- Restoration Methodology
- Conservation Methodology
- Demonstration projects

Support Science

- Snohomish Estuary Assessment
- Tampa Assessment


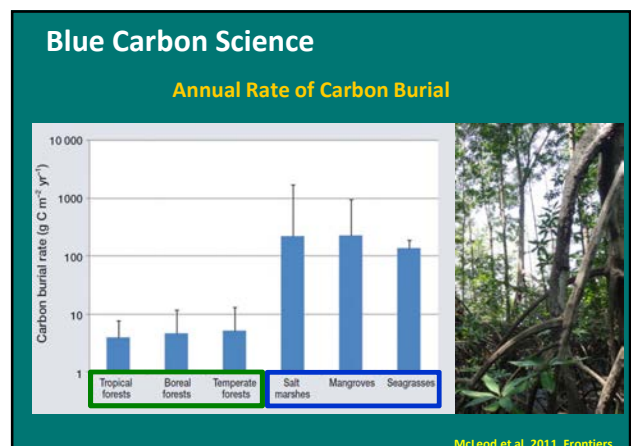
Explore Policy and Regulatory Options

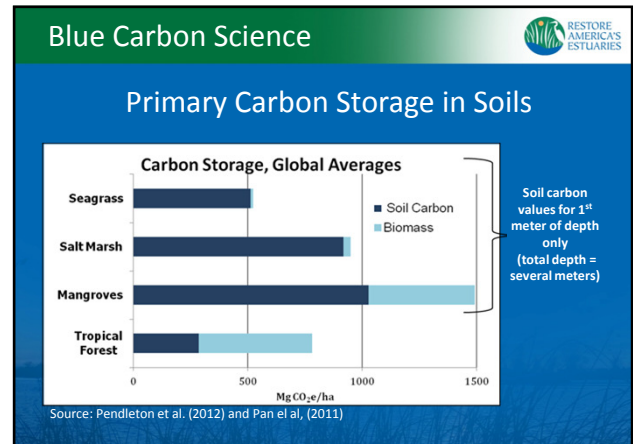
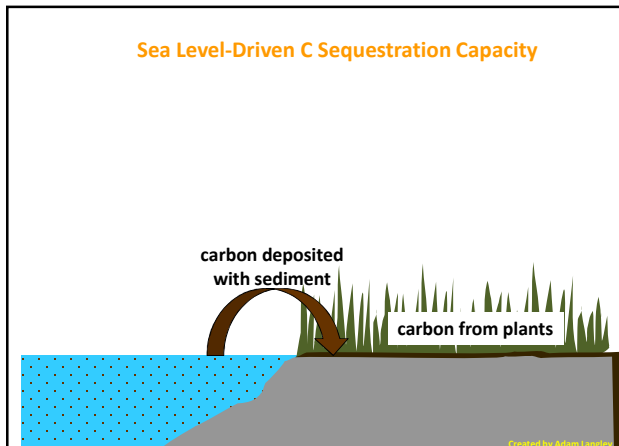
- e.g. 'Carbon reserves'

Coordinate Blue Carbon Initiatives

- e.g. National/Regional Working Groups

Raise Awareness and Build Capacity



Global Habitat Loss

- Global habitat loss 0.7-7% per year (E. Pidgeon, 2009)
- U.S. habitat loss ave 80,000 acres/year (2013 Status and Trends Report, NOAA/FWS)
- Half a billion tons CO₂ released annually (Pendleton et al. 2012)

Snohomish Estuary Assessment

What is the blue carbon benefit of estuary restoration?

Snohomish Estuary, Puget Sound, WA

- Forested, scrub-shrub and emergent tidal wetlands
- Historic clearing and draining
- High resilience to SLR

Study Approach

- Soil C stocks from 12 sites natural and drained
- Soil C accumulation rates at 5 natural and restored sites

Snohomish Estuary Assessment

Results

Current restoration plans of 3,300 acres:

- 2.55 million tons CO₂
- 1-year emissions 500,000 cars

Full restoration 11,600 acres:

- 8.9 million tons CO₂
- 1-year emission 1.7 million cars

Executive summary and Full report available at: www.estuaries.org/bluecarbon-science

Coastal Blue Carbon Assessment for the Snohomish Estuary: The Climate Benefits of Estuary Restoration

Tampa Bay Assessment

What is the climate mitigation potential of Tampa Bay habitats? Opportunities for enhanced management?

Tampa Bay, FL

- Highly urbanized area
- SLR

Study Approach:

- Quantify C in mangrove, seagrass, marsh
- Include SLR projections
- Identify most vulnerable areas
- Management recommendations

Tampa Bay Assessment



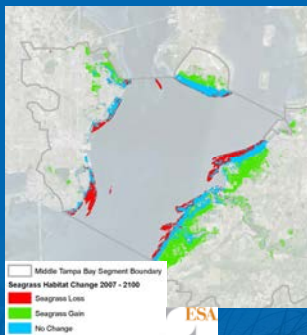
Results

Over next 100 years:

- 74 mil metric tons = 160,000 cars/year
- Intertidal habitats likely to decrease with SLR
- Seagrass likely to expand

Management recommendations:

- Allow habitat to accrete
- Conserve upland
- Prioritize vulnerable areas
- Maintain water quality



Blue Carbon Finance Considerations



Motives are two-fold:

1. Achieve real, additional and measurable GHG emission reductions or removals (in support of any other overall purpose, ecological, social or other)
2. Tap into additional funding
 - Voluntary Carbon Market
 - Using carbon to provide additional value and reach new partners

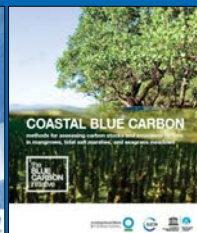
Blue Carbon Toolbox



Restoration Methodology



Project Guidebook



Field Manual

These resources and more at
www.estuaries.org/bluecarbon-resources

Carbon Offsets



Carbon Offsets

Offsets represent emission reductions that have been achieved outside of the capped sector.



1 Carbon Offset = 1 ton CO₂eq

Tidal Wetland Activities with Climate Benefit



Restoring Wetland Ecosystems

(RWE) – reducing emissions and/or inc sequestration in a degraded wetland

Conservation of Intact Wetlands

(CIW) – reduce GHGs by avoiding degradation/conversion



Voluntary Carbon Market



- 84 mil tonnes offset in 2015 = \$278 mil
- Most supply/demand of any country originated from US
- 98% offsets sold to private-sector buyers – energy, transportation, finance/insurance, events/entertainment and service sectors relations)



Rising Ambition: State of Voluntary Carbon Markets 2016. Ecosystem Marketplace.

Voluntary Carbon Market



- Top reasons cited for offsetting:

BUYER MOTIVATION

Climate change affects business model
Supply chain volatility

Demonstrate climate leadership

Pursuit of GHG targets Customer/client engagement

- Preliminary outreach to GB area corporations: Interested but need to know the numbers!

Rising Ambition: State of Voluntary Carbon Markets 2016. Ecosystem Marketplace.

Blue carbon in restored salt marshes in Galveston Bay

Prepared by:
Anna Armitage
TAMUG










Will marsh restoration offset carbon loss?

- 12 study sites

Site name	Status	Year planted (if applicable)	Age category (years)
Terra Mar	Restored	2010	< 10
Isla del Sol	Restored	2010	< 10
McAllis Point	Restored	2011	< 10
Snake Island Cove	Restored	2006	10-15
Reitan – near shelter	Restored	2002	10-15
Reitan North of I45	Restored	2003	10-15
Dalehite	Restored	2000	> 15
Reitan	Restored	2000	> 15
Moses Lake	Restored	1995	> 15
Sunset Cove	Reference		
Indian Beach	Reference		
Christmas Bay	Reference		

Approach

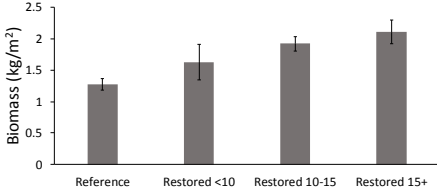
- Soil cores:
 - Bulk density
 - Total carbon
 - Radiometric dating (subset)
- Plants:
 - Biomass
 - Leaf carbon content

Sample analyses still in progress

Vegetative carbon

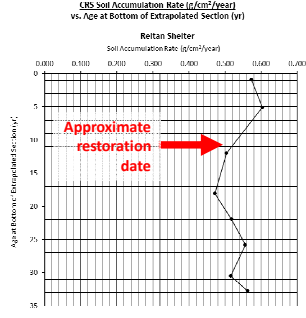
- Plant biomass higher in restored sites



- Vegetative carbon scaled to biomass → more vegetative carbon in restored sites

Soil carbon

- Soil accumulation rates somewhat higher after restoration
- Data subset from one mid-range restored site (10-15 yo)



Conclusions

- Restoration may partially offset vegetative carbon losses
- Restoration may increase soil accumulation rates

Scale of restoration << Scale of loss
Habitat protection + restoration

Galveston Bay Blue Carbon



How will this data be used?

- Final report on the carbon storage and sequestration rates of restored vs natural marshes in GB
- Marketing materials on the blue carbon potential for restoring marsh in GB
- Ecosystem valuation report supported by U.S. FWS



Offsets on Public lands



- Precedent transactions on public lands by several state DNRs and USFWS in southeast.
- 80k acres of ag land restored to bottomland hardwood forests with C funding.
- Agencies can accept donations that are conditional on donor claiming C rights.



....if donation is compatible with the agency's mission.

Next Steps



- Increasing local data – C stock, sequestration, emission factors
- Piloting market approach in various restoration scenarios and habitats
- Incorporating blue carbon within full suite of ecosystem services in outreach and management strategies
 - ES reports to be updated for Galveston Bay



+



Recognition and Opportunities



Existing Networks:

- U.S. National Working Group – led by RAE, NOAA
- Blue Carbon Initiative (International policy and science wg) – led by Conservation International, International Union for Conserv of Nature, Intergovernmental Oceanographic Commission
- N. American CEC – Blue Carbon Working Group
- Global Blue Carbon Network and Database – CI, USGS, SERC
- RAE Blue Carbon Community list serve – Buzz newsletter



Blue Carbon National Working Group – May 2015 Meeting

Thank you!



Stefanie Simpson
Blue Carbon Program Manager
ssimpson@estuaries.org

www.estuaries.org/bluecarbon

Galveston Bay Council Meeting

Wednesday, April 19, 2017
Harris-Galveston Subsidence District

Report of the Chair

Nancy Parra, Chair
Galveston Bay Council
Representing League of Women Voters

Report of the Program

Sarah Bernhardt, Program Manager
Galveston Bay Estuary Program,
A Program of the Texas Commission on Environmental Quality

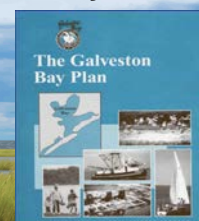
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Status of the Galveston Bay Plan Revision and feedback on Workshop Two

Sarah Bernhardt, Program Manager
Galveston Bay Estuary Program,
A Program of the Texas Commission on
Environmental Quality

The Galveston Bay Plan

- Approved in 1995
- Comprehensive Conservation and Management Plan (CCMP)
- A plan guiding the work of all stakeholders in the Galveston Bay estuary and watershed since 1995



The Galveston Bay Plan

The Revision will:

- Update the language of *The Galveston Bay Plan* to better reflect current challenges and priorities
- Be updated and/or revised every 5-10 years
- Intended as a plan for comprehensive conservation and management of Galveston Bay



Steps toward a revision

Moving Forward:
Plan Revision

Formalize revision process:
October 2016 GBC approves
H-GAC to facilitate revision

Summer 2016: Internal review
of other NEP CCMP priorities.

September 2016 to Fall 2017:
GBC will revise CCMP with H-
GAC facilitation

January 2018 Final CCMP
presented to GBC

2018: Final plan is submitted
to TCEQ and EPA

We're here

The Galveston Bay Plan Revision Workshop #2:

- Welcome
- Presentations by the four subject area committees
- At-Your-Own-Pace exercises
- Digital questionnaire

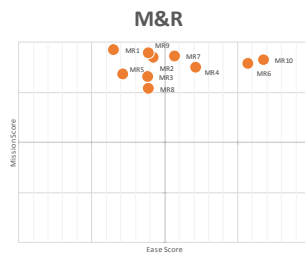


Galveston Bay Plan Revision – Workshop 2

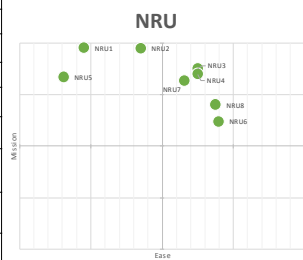
Preliminary results from Exercise 3

- Note: results do not include digital questionnaire input

Monitoring and Research Plan Area			
Action	Specific Objective	Rate of Implementation	Support of GBC Mission
MRS1	Conduct Biological Stressor Monitoring and Research	0.00	0.85
MRS2	Conduct Geochemical Stressor Monitoring and Research	0.00	0.88
MRS3	Conduct Physical Stressor Monitoring and Research	0.25	0.75
MRS4	Conduct Monitoring and Research to Address Limits to Current Recreation	0.00	0.5
MRS5	Conduct Monitoring and Research to Address Limits to Wetland Colonization	0.00	0.88
MRS6	Conduct Red Management Practices (Bays Demonstration Projects)	0.00	0.7
MRS7	Conduct Research on Ecosystem Services and Economic Viability of Bay Wetlands	0.00	0.75
MRS8	Conduct Coastal Resilience and Adaptation Studies	0.25	0.87
MRS9	Support Tracking the Status and Trends of Socioeconomic and Pressure Indicators of Galveston Bay Ecosystem Health	0.25	0.75
MRS10	Support the Dissemination of Data to Better Galveston Bay Monitoring and Research	0.50	0.84



Natural Resource Use Plan Area			
Action	Specific Objective	Rate of Implementation	Support of GBC Mission
NRU1	Land Acquisition	0.0	0.5
NRU2	Natural Preservation	0.1	0.5
NRU3	Natural Enhancement	0.5	0.5
NRU4	Natural Resource Management	0.5	0.5
NRU5	Resource Specific Studies	0.50	0.50
NRU6	Encourage public and other stakeholder participation in natural resource planning process and the development of protection policies that ensure ecologically significant components of the system are protected	0.75	0.87
NRU7	Support further research to understand the natural and cultural resources within the Galveston Bay, in order to facilitate the development of protection policies that ensure ecologically significant components of the system are protected	0.80	0.88
NRU8	Develop or support outreach initiatives that promote water conservation and educate the public on the value and importance of freshwater resources	0.75	0.8



Public Participation and Education Plan Area			
Action	Specific Objective	Ease of Implementation	Support of GBEP Mission
PP1	Develop New and Support Existing Stewardship Programs & Volunteer Opportunities for Stakeholders	0.8	1.56
PP2	Support and Promote Workshops and Events that Facilitate Stakeholder & Partner Involvement	1.15	1.12
PP3	Ensure that Local governments are knowledgeable about key estuary issues, common interests, and new information as it becomes available.	-0.27	0.88
PP4	Continue to Expand and Support the Bay Camp Campaign and Other Regional Initiatives.	0.85	1.23
PP5	Develop New and Support Existing Programs in Galveston Bay to Engage the Public in a Dialogue About Key Issues.	-0.2	1.12
PP6	Develop New and Support Existing 8-12 Galveston Bay Estuary-Related Curricular Materials for Regional Use. Find Opportunities to "Train the Trainers."	-0.23	0.96

PPE

Ease

Mission

PP1

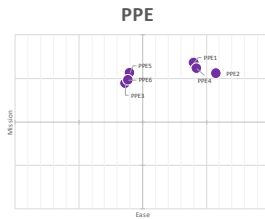
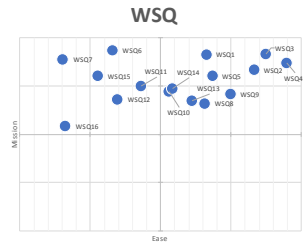
PP2

PP3

PP4

PP5

PP6

[illegible]A scenic view of a coastal wetland, likely Galveston Bay, featuring tall grasses and water under a cloudy sky. The text "Discussion: Roles of the Galveston Bay Council members and vision for meetings" is overlaid in the center.

Discussion: Roles of the Galveston Bay Council members and vision for meetings



Who We Are: Galveston Bay Estuary Program

- **Established in 1989** to provide comprehensive ecosystem-based management for this economically valuable resource.
- **Mission:** To preserve and protect Galveston Bay for generations to come.
- **Purpose:** To provide comprehensive ecosystem management through collaborative partnerships and to ensure preservation of the bay's multiple uses.
- **Non-regulatory, voluntary partnership**
- **A Program of TCEQ and EPA**

Who We Are: Stakeholder Involvement

- Addressing multiple bay uses requires collaboration.
- **The Council:** 41 members
- **The subcommittees:**
 1. Water & Sediment Quality - WSQ
 2. Natural Resources Uses - NRU
 3. Public Participation and Education - PPE
 4. Monitoring and Research - M&R
 5. Budget & Priorities - B&P



Galveston Bay Council – Bylaws

ARTICLE III. PURPOSE AND FUNCTIONS

The Council is an advisory committee to the TCEQ and Galveston Bay Estuary Program (GBEP). The Council will perform the following functions:

- Provide a forum for technical and stakeholder group review and input during *Galveston Bay Plan* implementation.
- Advise the TCEQ staff during preparation of progress reports, evaluations, and *Plan* updates.
- Authorize and make appointments to subcommittees as necessary.
- Assess the success of action plans and initiate revisions.
- Address legislative issues and make recommendations to the Texas Legislature.
- Advise the TCEQ as to annual priorities for implementation of action plans.
- Monitor the effectiveness of actions taken pursuant to the *Plan*.
- Review all federal financial assistance programs and federal development projects in accordance with Section 320 of the Clean Water Act.

Discussion: Revisiting the goals of the Galveston Bay Regional Monitoring Program

Regional Monitoring Program For The Galveston Bay Plan (1994)

- GBNEP-45, November 1994 "Green book"
- Primary objectives/goals of the monitoring plan:
 - Programmatic monitoring**
 - To measure the effectiveness of The Galveston Bay Plan actions and objectives
 - Environmental monitoring**
 - To provide essential information that can be used to redirect and focus the CCMP during implementation

Goals of the Galveston Bay Regional Monitoring Program

- Are the goals and objectives set forth in *The Plan* being met?
 - Are the regulatory agencies and regulated community fulfilling their commitments to *The Plan*?
 - Are actions in *The Plan* being implemented?
- Is the health of the ecosystem changing, either for the better or the worse? To answer this type of question, information from the monitoring plan may be used to:
 - Improve our understanding of the Galveston Bay system
 - Assist in setting environmental standards
 - Support the development of predictive tools
- **Are we missing any goals?**

Current Related Activities

Programmatic

- Five year implementation reviews with EPA
- Revisions to CCMP / strategic action plans

Environmental

- Status and Trends Database (updated every 2-3 years)
- State of the Bay Reports (3)
- State of the Bay Symposium (10)
- Monitoring and Research Subcommittee (quarterly)
- Funding numerous research projects, studies
- Website
- Other groups (eg. Galveston Bay Report Card)

Attachment A: Galveston Bay Council (GBC) Member Terms

Shading identifies nominees with positions which denote a change in representation for a 2015-2019 term or the beginning of a 2017-2021 term.

Individuals denoted with * are new to the GBC, i.e., have not served prior terms on the GBC. GBC members serve a four-year staggered term such that approximately half the terms will expire biennially in November. Mid-term nominees will serve the remainder of the term they are appointed/nominated to fill.

Category 1, named entities, are nominated by their respective agency or organization as listed in *The Galveston Bay Plan* and are in regular font. If a vacancy exists under Category 1, the representative nominated by that respective entity may begin serving prior to confirmation by the Texas Commission on Environmental Quality (commission).

Category 2, named interests, are nominated by existing members of the GBC, County Judges, and other Galveston Bay partners at large, as applicable, and are in *italic font*. Category 2 nominees cannot begin serving until approved by the commission.

Type Of Organization	Interest Represented	Appointee/Nominee	Term
Federal Agencies	U.S. Coast Guard	Aaron Rice, MSTC	2015-2019
	U.S. Geological Survey	Michael T. Lee	2015-2019
	National Marine Fisheries Service	Rusty Swafford* (Heather Young-changed agencies 4/2016)	2015-2019
	U.S. Department of Agriculture, Natural Resource Conservation Service	Scott Alford	2015-2019
	U.S. Army Corps of Engineers	Andrea Catanzaro* (Carolyn Murphy-retired 10/2016)	2017-2021
	U.S. Environmental Protection Agency	J. Douglas Jacobson	2017-2021
	U.S. Fish and Wildlife Service	John Huffman	2017-2021
State Agencies	Texas Department of Agriculture	Kristin Lambrecht	2015-2019
	Texas General Land Office	Kate Saul (Formerly known as Kate Zultner)	2015-2019
	Texas Department of State Health Services	Kirk Wiles	2015-2019
	Texas Commission on Environmental Quality	Kelly Holligan	2015-2019
	Texas Parks & Wildlife Department	Rebecca Hensley	2015-2019
	Texas Railroad Commission	Audrey Kuklenz* (James Harcourt changed positions)	2017-2021

	Texas Department of Transportation	Christine Bergren* (Agency appointed change Mark Fisher)	2017-2021
	Texas State Soil & Water Conservation Board	Brian Koch	2017-2021
	Texas Water Development Board	Caimee Schoenbaechler* (Carla Guthrie-changed position)	2017-2021
Regional/Local Governments	Gulf Coast Authority Formerly known as Gulf Coast Waste Disposal Authority	Lori Traweek	2015-2019
	Houston-Galveston Area Council	Jeff Taebel	2015-2019
	City of Houston	Phillip Goodwin	2015-2019
	<i>Medium Local Governments - pop 25K-500K</i> (Galveston County Health District)	<i>Ronnie Schultz</i>	2015-2019
	<i>Small Local Governments - pop <25,000</i> (Chambers County)	<i>Mary Beth Stengler</i>	2015-2019
	Trinity River Authority	Glenn Clingenpeel ²	2015-2019
	Port of Houston Authority	Garry McMahan	2017-2021
	<i>Large Local Governments - pop >500K</i> (Harris County Flood Control District)	<i>Russ Poppe*</i> (<i>Michael D. Talbott-retired 8/2016</i>)	2017-2021
	San Jacinto River Authority	Jace Houston	2017-2021
Environmental/ Citizen's Groups	Galveston Bay Foundation	Bob Stokes	2017-2021
	<i>Citizens-at-Large</i> (Brazoria County)	<i>Sharron L. Stewart</i>	2015-2019
	<i>Minority Community Representative</i>	<i>Luz Locke</i>	2015-2019
	League of Women Voters	Nancy Parra	2015-2019
	Coastal Conservation Association	Taylor Rieck* (Matt Still changed position)	2017-2021
	<i>Low-income Community Representative</i> (Harris County Small Business Owner)	<i>Albert Gonzales</i>	2017-2021
	<i>Other Conservation Organizations</i> (Texas Coastal Partners)	<i>Linda Shead</i>	2017-2021
Private Sector	Galveston County Chambers of Commerce (Gulf Coast Economic Development)	Charles Wemple	2015-2019
	Greater Houston Partnership (Dow Chemical)	Will Nipper* (Jarod D. Davis changed position)	2017-2021
	<i>Utilities</i> (NRG Energy, Inc.)	<i>William J. Baker, Jr.</i>	2017-2021

	<i>Industry</i> (Natural Land Management)	<i>Caryn Brooks*</i> <i>(Gregory Biddinger-retired 04/2016)</i>	2017-2021
	<i>Marinas</i> (Marina Bay Harbor Yacht Club in Clear Lake Shores)	<i>Helen Paige¹</i>	2017-2021
	<i>Commercial Fisheries</i> (Oysterman-Manager of Jeri's Seafood)	<i>Tracy Woody</i>	2017-2021
	East Harris County Manufacturer's Association	Ana Partin	2017-2021
Research/ Academia	<i>Major Universities</i> (University of Houston)	<i>Hanadi Rafai</i>	2015-2019
	Texas Sea Grant Program	John Jacob	2017-2021

¹Galveston Bay Council Chair, effective November 2017²Galveston Bay Council Vice-Chair, effective November 2017

Attachment B: Biographical Information for Nominees in Attachment A

Individuals denoted with * are new to the Galveston Bay Council (GBC), i.e., have not served prior terms on the GBC. GBC members serve a four-year staggered term such that approximately half the terms will expire biennially in November.

Category 1, named entities, are nominated by their respective agency or organization as listed in *The Galveston Bay Plan* and are in regular font. If a vacancy exists under Category 1, the representative nominated by that respective entity may begin serving prior to confirmation by the Texas Commission on Environmental Quality (commission).

Category 2, named interests, are nominated by existing members of the GBC, County Judges, and other Galveston Bay partners at large, as applicable, and are in *italic font*. Category 2 nominees cannot begin serving until approved by the commission.

Category 1 Entities:

Andrea Catanzaro*
Representing United States Army Corps of Engineers (USACE)
Education/Certifications: Texas A&M University, Bachelor of Science (B.S.), Marine Biology; Texas A&M University, Master of Science (M.S.), Rangeland Ecology and Management
Experience/Responsibilities: Ms. Catanzaro has over 22 years of experience working for the USACE, Southwest-Galveston District. For much of her career, she worked as a biologist in the Planning, Environmental, and Regulatory Division, focusing on evaluating and keeping the District's projects in compliance with the National Environmental Policy Act. She has led field investigations, performed habitat modeling, and prepared analyses and reports to support National Environmental Policy Act compliance on Flood Risk Management, Deep Draft and Shallow Draft Navigation and Coastal Ecosystem Restoration studies. Currently, Ms. Catanzaro works as a Project Manager responsible for planning, designing, and construction projects for the Houston Ship Channel and the Galveston Harbor and Channel. Her current duties include the efficient and effective coordination and management of the planning, resourcing and funding, design, and construction of these major projects of Galveston's Civil Works Program.
Program Involvement: Ms. Catanzaro was appointed by the USACE in 2016 to fill a mid-term vacancy and nominated by the GBC to represent USACE.

Christine Bergren*
Representing Texas Department of Transportation
Education/Certifications: Placeholder text pending submission
Experience/Responsibilities: Ms. Bergren is the Environmental Supervisor for the Houston Texas Department of Transportation (TxDOT) district and brings considerable knowledge of the various TxDOT's activities in the Galveston Bay region.
Program Involvement: Ms. Bergren was appointed by the TxDOT in 2017 and is nominated to represent the TxDOT.

Jace Houston
Representing San Jacinto River Authority
Education/Certifications: University of Texas at Austin, B.S., Civil Engineering; University of

Texas School of Law, J.D.

Experience/Responsibilities: Currently serves as General Manager for the San Jacinto River Authority (SJRA), a public agency created by the legislature in 1937 for the purpose of developing, conserving, and protecting the water resources of the San Jacinto River basin. Prior to his appointment as General Manager, Mr. Houston was one of the Authority's two deputy general managers and was responsible for overseeing the administrative functions of the river authority including legal, finance and accounting, information technology, risk management, and human resources. He was also responsible for the authority's legislative and public relations programs. Prior to coming to the river authority, Jace served as General Counsel for the Harris-Galveston Subsidence District, which is charged with the responsibility of regulating groundwater withdrawals in Harris and Galveston counties in order to control subsidence. He has also served as a staff attorney and policy analyst at the Texas Natural Resource Conservation Commission, providing support on state and federal legislative matters and also assisting in the development of regulations and policy positions in the areas of municipal and industrial solid waste and hazardous waste. Prior to this, Jace worked for State Representative Robert Saunders in the Texas House of Representatives, where he served as General Counsel for the Land and Resource Management Committee.

Program Involvement: Mr. Houston was appointed to represent the SJRA in 2012 and is being nominated to continue serving.

John Huffman

Representing United States Fish and Wildlife Service

Education/Certifications: University of Houston at Clear Lake, B.S., M.S., Environmental Science

Experience/Responsibilities: Gulf Restoration Program Supervisor for the United States Fish and Wildlife Service's (USFWS) Southwest Region. Responsible for coordinating across programs and field stations to support the USFWS' Gulf restoration efforts. He and his team collaborate with partner organizations to develop and implement habitat protection and restoration projects along the entire Texas Gulf Coast. He has been with USFWS for 18 years working on coastal issues and has previous experience working for a private consulting firm, the Texas General Land Office and Galveston Bay Foundation.

Program Involvement: Mr. Huffman was appointed by the USFWS in 2004 and is nominated to continue to represent the USFWS.

John Jacob

Representing Texas Sea Grant Program

Education/Certifications: Texas Tech University, B.S. & M.S.; Texas A&M University, Ph.D.

Experience/Responsibilities: Director, Texas Coastal Watershed Program, which provides education and outreach to local governments and citizens about the impact of land use on watershed health and water quality. Professor, Texas A&M, Department of Recreation, Park, and Tourism Sciences.

Program Involvement: Dr. Jacob was appointed by the Texas Sea Grant Program in 2008 and is nominated to continue to represent the Texas Sea Grant Program.

J. Douglas Jacobson

Representing Environmental Protection Agency

Education/Certifications: University of Texas, B.A.; St. Mary's University, J.D.
Experience/Responsibilities: EPA Region 6 National Estuary Program Manager and Gulf of Mexico Coordinator, Texas NRDA Representative, and works on other coastal policy issues. Prior to EPA, he was a lobbyist for the National Cattlemen's Beef Association and a legislative assistant for U.S. Senator Phil Gramm.
Program Involvement: Mr. Jacobson was appointed by the EPA in 1998 and is nominated to continue to represent the EPA. Mr. Jacobson has served on the Budget and Priorities, Water and Sediment Quality, Public Participation and Education, and Natural Resources Uses Subcommittees for the Galveston Bay Estuary Program.

Brian Koch
Representing Texas State Soil and Water Conservation Board
Education/Certifications: Texas A & M University-Kingsville, B.S., Range and Wildlife Management
Experience/Responsibilities: After a short stint in the commercial nursery business, Mr. Koch joined the Texas State Soil and Water Conservation Board in 2005 as the Regional Watershed Coordinator serving TSSWCBs Wharton Regional Office service area covering 47 counties in Southeast and South Central Texas. As Regional Watershed Coordinator, Mr. Koch has aided in the development and implementation of several WPPs and TMDL I-plans, including; Plum Creek, Geronimo Creek, Mill Creek, Cedar Bayou, Double Bayou, Bacteria Implementation Group, Mission and Aransas Rivers, and Upper San Antonio River, and is currently assisting and has assisted in development and implementation of several more. Mr. Koch also represents the agency on the Coastal Coordination Advisory Council, and Coastal Bend Bays and Estuaries Program, and assists with the TSSWCB's Water Quality Management Plan Program.
Program Involvement: Mr. Koch was appointed by the TSSWCB in 2007 and is being nominated to continue representing the TSSWCB.

Audrey Kuklenz*
Representing Texas Railroad Commission
Education/Certifications: Finance, B.B.A., Sam Houston State University, University of Texas at Austin, B.S., Petroleum Engineering
Experience/Responsibilities: Assists the public and operators by providing technical expertise for the drilling, producing, and plugging of oil and gas wells; as the task relates to compliance with State rules and regulations. Provides support to our state managed cleanup and plugging staff for activities on abandoned oil and gas sites.
Program Involvement: Ms. Kuklenz was appointed by the Texas Railroad Commission in 2017 and is being nominated to represent the Texas Railroad Commission.

Garry McMahan
Representing Port of Houston Authority
Education/Certifications: Marine Biology, B.S., Southwest Texas State University
Experience/Responsibilities: Mr. McMahan is currently Program Manager for License and Permits at the Port of Houston Authority (PHA) where he manages submerged lands, railroad and terminal encroachments and real estate transactions. His employment at the Port follows an 11 year career with the Texas General Land Office (GLO) where he served as Director of the Upper

Coast Field Office for 8 of those years. Mr. McMahan's interest in Galveston Bay covers his whole life; from fishing Christmas Bay as a youngster, to restoring seagrass in West Bay while working at National Marine Fisheries Service and managing submerged lands at GLO and the Port.

Program Involvement: Mr. McMahan was appointed by the PHA in 2009, and is being nominated to continue representing the PHA.

Will Nipper*

Representing Greater Houston Partnership

Education/Certifications: Louisiana Tech University, B.S., Chemical Engineering

Experience/Responsibilities: Mr. Nipper acts as the Regulatory Affairs Leader for The Dow Chemical Company's Texas assets along with leading the North America Operations Regulatory Services Team. Mr. Nipper is responsible for leading a team of subject matter experts who implement new or changing regulatory requirements in the U.S. Mr. Nipper's responsibilities also include advocacy for Texas regulations, supporting permit approvals, and ensuring site support for various regulatory changes specific to Texas.

Mr. Nipper has served Dow in many critical roles. He began his career with Dow in 2007 as a Site Air Permitting Specialist in Plaquemine, Louisiana. He has served as a Subject Matter Expert on Dow's North America Operations Regulatory Services Team and as a Global Product Leader for Dow's Energy, Ethylene Glycol, Ethylene Oxide, Feedstocks, and Hydrocarbons businesses. Most recently, Mr. Nipper served as the Regulatory Affairs Leader for Dow's Louisiana assets before assuming his current role at the beginning of 2017. Prior to working for Dow, Mr. Nipper worked five years for Weyerhaeuser Company as a process engineer and environmental engineer near Natchitoches, Louisiana.

Program Involvement: Mr. Nipper was appointed by Greater Houston Partnership in 2017 and is nominated to represent the Greater Houston Partnership.

Ana Partin

Representing East Harris County Manufacturing Association

Education/Certifications: Texas A & I University, B.S., Chemical Engineering, University of Houston-Clear Lake, M.S., Mathematics

Experience/Responsibilities: Environmental Manager of INEOS Phenol responsible for environmental compliance at the Pasadena facility. Ms. Partin has been with INEOS since 1995 and works on air, waste and wastewater issues. From 1988 to 1995, Ms. Partin worked as a process, design and environmental engineer for Exxon Mobil. She currently serves on the Texas Chemical Council's Air Conservation and Water and Waste Management committees. She is also the Treasurer for Clean Channel Association and is an advisor to the UHCL College of Science and Engineering.

Program Involvement: Ms. Partin was appointed to represent East Harris County Manufacturing Association on the Galveston Bay Council in 2005. Currently serving a 2009-2013 term, and being nominated to continue to serve.

Taylor Rieck*

Representing Coastal Conservation Association

Education/Certifications: B.B.A., Sam Houston State University with a minor in Professional Golf Management.

Experience/Responsibilities: Currently an Assistant Director for the Coastal Conservation Association (CCA) of Texas. Responsibilities include assisting and guiding local chapter development and fundraising events, increase membership-development opportunities at local chapter levels, creating schedules and budgets for fundraising events, and maintaining advocacy and communication efforts with chapter volunteers.

Program Involvement: Mr. Rieck was appointed by the CCA in 2008 and is nominated to represent the CCA.

Caimee Schoenbaechler*

Representing Texas Water Development Board

Education/Certifications: The University of Texas at Austin, B.S., Ecology, Evolution, Conservation, and B.A., Spanish; Duke University, M.E.M., Master of Environmental Management: Ecosystem Science and Conservation.

Experience/Responsibilities: Manager for the Bays and Estuaries Program in the Surface Water Division of the Texas Water Development Board (TWDB). Responsibilities include supervising program staff, as well as managing and coordinating studies addressing the environmental flow needs of estuarine systems in Texas. She participates in the Texas General Land Office Coastal Management Program and Long-term Planning subcommittees, Water and Sediment Quality Implementation Team of the Coastal Bend Bays and Estuaries Program, the Senate Bill 3 process for environmental flows, and Lower Laguna Madre estuary program efforts. She is a Certified Ecologist accredited by the Ecological Society of America and a Certified Texas Contract Manager accredited by the Texas Comptroller of Public Accounts.

Program Involvement: Ms. Schoenbaechler was appointed by the TWDB in 2017 and is nominated to represent the TWDB.

Bob Stokes

Representing Galveston Bay Foundation

Education/Certifications: Yale University, Bachelors; University of Texas School of Law, J.D.

Experience/Responsibilities: President of the Galveston Bay Foundation (GBF). GBF's mission is to preserve, protect, and enhance the natural resources of Galveston Bay and its tributaries. It has programs in advocacy, conservation, education, and research. Bob had served on the board of the Foundation for five years prior to taking over as President and had served as the board's chair for the previous two years. He began his legal career with the firm of Blackburn & Carter, an environmental law firm in Houston. At Blackburn & Carter his practice consisted of both civil and administrative matters, mainly on behalf of community groups. In February of 1997, Bob moved to the Harris County Attorney's Office where he began practicing in the Environmental Division. His practice consisted primarily of civil enforcement matters, but he also had an active administrative practice, both in opposition to and in pursuit of, state environmental permits in front of the Texas Commission on Environmental Quality. In June 2004, Bob left the County Attorney's Office to become President of the Galveston Bay Foundation. Bob has also served on the Board of Directors for Restore America's Estuaries since 2004 and on the Governing Board of EarthShare of Texas since 2007, serving as the board chair of EarthShare of Texas from January 2012 to the present. He was awarded the "Environmental Professional of the Year" award in 2011 by the Texas Association of Environmental Professionals.

Program Involvement: Appointed by the Galveston Bay Foundation in 2013 and is being nominated to continue serving.

Rusty Swafford

Representing National Marine Fisheries (NMFS)

Education/Certifications: Texas A&M University, B.S., Marine Biology

Experience/Responsibilities: Mr. Swafford is Supervisor of the NMFS Southeast Region Habitat Conservation Division's Gulf of Mexico Branch and has been working on habitat conservation issues in the Galveston Bay watershed for over 32 years. In the early 1990's he was heavily involved in the numerous subcommittees that developed the Comprehensive Conservation and Management Plan (CCMP) for the Galveston Bay Estuary Program, as well as the Coastal Bend Bays and Estuaries Program. In total, there are seven National Estuary Programs in the Gulf of Mexico that Mr. Swafford and his staff participate in. Mr. Swafford also actively participates as a founding member of the Port of Houston's Beneficial Uses Group, which has developed over 4,000 acres of marsh in Galveston Bay, as well as a new bird rookery island and a recreational boater destination at Redfish Island. Mr. Swafford is also an active participant in numerous USACE-sponsored Interagency Coordination Teams across the Gulf of Mexico that are working to implement beneficial uses of dredged material for federal navigation channels and regional sediment management plans. He has also worked with state and federal agencies, non-governmental organizations, and private partners in the Galveston Bay area to plan and implement local and regional coastal habitat protection and restoration initiatives and on-the-ground habitat projects. He is also heavily involved in Deepwater Horizon Spill recovery planning. Mr. Swafford has spent his career reviewing proposed federal water development, flood control, and storm damage reduction projects, coastal development projects, providing technical guidance, and making recommendations to protect and conserve marine fishery habitats and associated living marine resources. Mr. Swafford is the NMFS representative on the Executive Steering Committee of the 14 state Southeast Aquatic Resources Partnership, where he serves as the co-chair of the Coastal Subcommittee and is an active steering committee member in the Gulf of Mexico Alliance's Habitat Conservation Resources Team.

Program Involvement: 1989 to present. Worked on the development of the CCMP. Served as NMFS representative to the GBC from 1995-2003. Provided oversight and guidance to staff after delegating his GBC duties in 2003. Appointed by NMFS in 2016 to fill a mid-term vacancy and nominated to represent NMFS.

Category 2 Entities:

William B. Baker, Jr.

Representing *Utilities*

Education/Certifications: Texas A&M University, B.S., Wildlife & Fisheries Biology; University of Houston Clear Lake, M.S., Environmental Science

Experience/Responsibilities: Currently Senior Manager of Ecology & Natural Resources, Environmental Department for NRG Energy. Prior to his 35 years in ecological resource management for the Environmental Dept. at NRG Energy and its predecessor companies, he worked 6 years as a Marine Biologist with the Texas Parks & Wildlife Department. As Senior Manager of Ecology & Natural Resources, he is responsible for implementation of NRG Energy's habitat management and ecological programs across the U.S., with a focus on renewable energy resources in the western U.S. He provides guidance to NRG Energy land managers across the U.S. to encourage habitat enhancement and preservation of ecological resources, being active in the restoration of both estuarine and freshwater wetlands, prairies, forests, and reef habitats across the U.S., providing corporate guidance for threatened or endangered species, and sensitive habitat issues across the U.S., and managing the company's carbon sequestration assets and work with partners to develop new opportunities. He has been actively involved in community groups since the early 1990s. Affiliations include past Chairman of the Texas Habitat Protection

Advisory Panel for the Gulf of Mexico Fisheries Management Council, Member of the Harte Research Institute for Gulf of Mexico Studies Advisory Council, Member of the Advisory Board for Gulf Coast Bird Observatory, Member of California Central Region Kelp Consortium, Member of Galveston Bay Foundation Advisory Board, and Member of the Environmental Institute of Houston Advisory Board Member.

Program Involvement: Member of Natural Resource Uses Subcommittee for the Galveston Bay Estuary Program since 1995 and current Vice Chair. Nominated to continue representing Utilities.

Caryn Brooks*

Representing *Industry*

Education/Certifications: B.S. degree in Chemical Engineering from Virginia Tech and an Associate of Science (A.S.) degree in Natural Science from Cabrillo College

Experience/Responsibilities: Ms. Brooks is a Principal Environmental Engineer for LyondellBasell's La Porte, Texas complex. She has worked for Lyondell and LyondellBasell Industries since 2002 and has held various roles, with a primary focus on water, waste, and wastewater issues management. Prior to LyondellBasell, she was the Western Regional Health, Safety, Environment Manager for General Chemical; Senior Environmental Engineer for the Hazardous Materials Division of Contra Costa County Health Services Department; and a Senior Project and Environmental Engineer for the Clorox Company. Ms. Brooks is the Water Representative on East Harris County Manufacturing Association's Environmental Committee, and is currently serving as the Vice Chair of the Water and Waste Management Committee for the Texas Chemistry Council.

Program Involvement: Ms. Brooks was nominated by the GBC to fill a mid-term industry vacancy in 2016. Ms. Brooks is nominated to continue to represent industry.

Albert Gonzales

Representing *Low-Income Community Representatives*

Education/Certifications: San Jacinto College, A.A., Business Administration

Experience/Responsibilities: Local small business owner (self-employed management consultant). Currently a member of the Pasadena Citizens Advisory Council since 1992 and a current member of the National Association of Parliamentarians.

Program Involvement: Mr. Gonzales has served on the Galveston Bay Council since 1999 and is being nominated to continue representing low income communities. Also participated on the Public Participation and Education Subcommittee, the Natural Resource Uses Subcommittee, the Water and Sediment Quality Subcommittee, and the Invasive Species Workgroup for the Galveston Bay Estuary Program.

Helen Paige

Representing *Marinas*

Education/Certifications: Texas A&M University, B.S., Recreation, Parks and Tourism Science with a specialization in Wildlife Ecology and Management

Experience/Responsibilities: Manager of Marina Bay Harbor Yacht Club in Clear Lake Shores since 2002. She earned the Club certification under Clean Marina Program. She has a Galveston Bay Master Naturalist Certification and volunteers with the Galveston Bay Foundation (GBF) and

the Clear Creek Environmental Foundation. She is a past Advisory Board Member for the Marina Association of Texas (MAT) and is a member of the Clear Lake Marina Association. She has worked on the Boater Waste Education Campaign since 2007 with GBF and is currently working on the committee for the Upper Gulf Coast Oyster waters TMDL Implementation Plan.

Program Involvement: Ms. Paige was nominated by the GBC in 2007 and is nominated to continue to represent marinas.

Russ Poppe*

Representing *Large Local Governments Population Greater than 500,000*

Education/Certifications: Brazosport Junior College, A.S., 1996; Texas A&M University, B.S. Civil Engineering, 1999; Licensed Professional Engineer in State of Texas

Experience/Responsibilities: Mr. Poppe started his professional career in private consulting, working for almost 6 years performing drainage studies, program management, and producing plans and specifications for infrastructure projects before joining Harris County in late 2005. In the last 11 plus years, Mr. Poppe has worked in various county departments leading a variety of functions from storm water quality, roadway and building design, federal (USACE) flood risk reduction projects, and managing day to day operations for multi-million projects. In his current role as executive director of the Harris County Flood Control District, he is responsible for over 300 staff and a \$120 million annual budget to operate and maintain over 2,500 miles of channels, hundreds of detention basins, a wetland mitigation bank, as well as developing and implementing an annual capital program to reduce flood risks in Harris County, the third most populous county in the United States.

Program Involvement: Nominated by the GBC to fill a mid-term vacancy representing Large Local Governments Population Greater than 500,000 in 2016. Mr. Poppe is nominated to continue to represent large local governments population greater than 500,000.

Linda Shead

Representing *Other Conservation Organizations*

Education/Certifications: University of Texas at Austin, B.A., Zoology, B.E.S., Environmental Engineering, and certification of P.E.

Experience/Responsibilities: Founding member of Texas Coastal Partners, a non-profit organization focused on preserving and enhancing natural resources of the Texas Coast, she serves as the Program Chair. Ms. Shead is also owner of Shead Conservation Solutions, established in summer 2009. She consults with local and national nonprofit organizations, which has included providing grant writing and transaction assistance for Artist Boat, Inc., to secure approximately \$8 million and conserve more than 600 acres of barrier island habitat on Galveston Island. From 2002-2009, she was Program Director of the Coastal & Southeast Texas Office of the Trust for Public Land, providing strategic direction and overseeing conservation visioning, conservation transactions, conservation finance, and conservation outreach for the Houston-Galveston area and throughout the Texas coast. She implemented the Saving Our Coastal Heritage Program and the Southeast Texas Program to assist local governments in increasing public access to Galveston Bay, its tributaries, and other conservation lands, for public enjoyment, water quality protection, and wildlife. From 1989 to 2002, she was executive director of the Galveston Bay Foundation, a widely recognized organization working for the Bay. In addition to the Galveston Bay Council, Ms. Shead has represented bay interests on a variety of local, state, and federal committees, including the Galveston Bay Freshwater Inflows Group, the Outer Continental Shelf Policy Committee of the

Minerals Management Service, the Citizens Advisory Committee of the Gulf of Mexico Program, the Federal Advisory Committee on Total Maximum Daily Loads, and the Natural Resources Advisory Committee of the Houston-Galveston Area Council.

Program Involvement: Has served on the Council since 2006 and been a member on the Natural Resource Uses Committee since 2000. Ms. Shead previously served as a Galveston Bay Council Chairperson. Ms. Shead is being nominated to continue to represent other conservation organizations.

Tracy Woody

Representing Commercial Fisheries

Education: 37 years on the job training as an Oyster Farmer

Responsibilities: Commercial Oysterman. Currently serves as President of Jeri's Seafood. He is also a member of the Trinity and San Jacinto Rivers and Galveston Bay and Basin Stakeholder Committee. He has served as Justice of the Peace in Chambers County since 1995.

Program Involvement: Served since 2009, and being nominated to continue to serve.