GALVESTON BAY REPORT CARD
Using Science to Connect People to Their Estuary

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Restore America’s Estuaries 8th National Summit, Dec 13th 2016, New Orleans
The Galveston Bay Watershed

~24,000 square miles

~Half of Texas’ 27.5M population

San Jacinto River
28% of inflows

Trinity River
54% of inflows

Coastal bayous
18% of inflows

1U.S. Census, July 2015
2Texas Water Development Board
Population Growth

Projected % Change in Population 1990 to 2040

Data Source: U.S. Census, July 2015
Galveston Bay Report Card

2016

A citizen-driven, scientific analysis of the health of Galveston Bay

As Texas’ largest estuary, Galveston Bay is the heart of the state’s habitat for wildlife, as well as commercial and recreational activities that shape the region’s economic growth.

Goals:

Promote conservation of Galveston Bay natural resources

Increase public awareness and participation in management strategies

Provide the public with basic measures used to assess Bay health

Take action for a straight "A" bay! Learn more at www.galvbaygrade.org.
About the Report Card

The first easy-to-understand grading system to communicate the health of the Bay to the public.

We use public interest to help shape the report each year.
Water Quality

<table>
<thead>
<tr>
<th></th>
<th>Bay</th>
<th>Rivers &amp; Bayous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>A</td>
<td>A</td>
</tr>
</tbody>
</table>

Data Source: TCEQ; TPWD
Habitat

Bay

<table>
<thead>
<tr>
<th>Saltwater Wetlands</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater Wetlands</td>
<td>D</td>
</tr>
<tr>
<td>Seagrass</td>
<td>D</td>
</tr>
<tr>
<td>Oyster reefs</td>
<td>I</td>
</tr>
</tbody>
</table>

- Historic oyster shell dredging
- 2008 Hurricane Ike = 60% of reefs covered by sediment
- 2010-2011 drought
- Commercial fishing pressure

Data Source: NOAA C-CAP; USACE; TPWD
Habitat

Freshwater Wetlands

Estuarine Wetlands
## Fish & Wildlife

<table>
<thead>
<tr>
<th></th>
<th>Bay</th>
<th>Rivers &amp; Bayous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shellfish</td>
<td>D</td>
<td>-</td>
</tr>
<tr>
<td>Finfish</td>
<td>C</td>
<td>-</td>
</tr>
<tr>
<td>Birds</td>
<td>C</td>
<td>-</td>
</tr>
<tr>
<td>Invasive Species</td>
<td>B</td>
<td>D</td>
</tr>
</tbody>
</table>

97 invasives species reported in watershed

### INVASIVES TO WATCH

- **Water Hyacinth**
  - **OFFENSE:** clogs waterways, reduces oxygen in waterways, shades out native plants
  - **ALIAS:** common or floating water hyacinth

- **Chinese Tallow**
  - **OFFENSE:** quickly takes over forests and prairies, crowding out native habitat. Berries and sap are toxic to humans and animals
  - **ALIAS:** popcorn tree

- **Exotic vs. Invasive**
  - **OFFENSE:** out-compete native fish for food, reproduce rapidly
  - **ALIAS:** white amur

- **Grass Carp**
  - **OFFENSE:** disrupt food chain, reproduce rapidly
  - **ALIAS:** none

- **Zebra Mussel**
  - **OFFENSE:** disrupt native fish eggs, burrows destabilize stream banks, no natural predators
  - **ALIAS:** pleco, suckerfish, algae eater

- **Armored Catfish**
  - **OFFENSE:**

**Data Source:** TPWD, FWS, NPS, TGLO, Audubon, TNC, USGS, LBJWC
Pollution Events & Sources

<table>
<thead>
<tr>
<th>Pollution Type</th>
<th>Bay</th>
<th>Houston Ship Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metals in Sediments</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Organics in Sediments</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td>Dioxin in Sediments</td>
<td>I</td>
<td>D</td>
</tr>
</tbody>
</table>

**Inorganic Metals**

2001-2015

- Mercury: 31%
- Zinc: 9%
- Nickel: 4%
- Chromium: 2%
- Lead: 2%
- Arsenic: 1%
- Silver: 1%
- Copper: 1%
- Cadmium: 0%

**Organic Toxics**

2000-2014

- Pyrene: 27%
- Acenaphthylene: 20%
- Phenanthrene: 19%
- Acenaphthene: 13%
- Fluoranthen: 11%
- Fluorene: 9%
- Chrysene: 9%
- Dibenzothiophene: 8%
- Anthracene: 8%
- Benzo-a-Pyrene: 8%
- Naphthalene: 8%
- DDT: 18%
- Lindane: 13%
- Chlor dane: 10%
- Dieldrin: 7%
- PCBs: 13%

Data Source: TCEQ; EPA
Pollution Events & Sources

<table>
<thead>
<tr>
<th>Bay</th>
<th>Oil Spills (Number / Volume)</th>
<th>C / B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Litter &amp; Trash</td>
<td>I</td>
</tr>
</tbody>
</table>

Data Source: TGLO; TCEQ; GCWDA
### Human Health Risk

#### Legacy Pollutants:
- PCB’s
- Dioxin
- Organochlorine pesticides

<table>
<thead>
<tr>
<th></th>
<th>Bay</th>
<th>Rivers &amp; Bayous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seafood Safety</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>Recreation Safety</td>
<td>A</td>
<td>C</td>
</tr>
</tbody>
</table>

Data Source: TCEQ; TGLO; TDSHS; GBF
## Coastal Change

<table>
<thead>
<tr>
<th>Factor</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater Inflows</td>
<td>C</td>
</tr>
<tr>
<td>Sea Level Rise</td>
<td>F</td>
</tr>
<tr>
<td>Winter Water Temperature</td>
<td>A</td>
</tr>
<tr>
<td>Water pH</td>
<td>A</td>
</tr>
</tbody>
</table>

### Data Source

TWDB; USGS; NOAA; TCEQ; TPWD
Knowledge to Action

WHAT YOU CAN DO

1. Follow these tips for organic lawn care on the upper Texas coast. Going organic can save you money and keeps toxic chemicals out of the environment and out of our waterways.
2. Slow your runoff by reducing paved areas and installing rain barrels.
3. Pick up after your pets and properly dispose of pet waste.
4. Plant a rain garden that collects rainwater and allows it to soak into the ground.
5. Use phosphate-free or phosphate-reduced laundry, dish, and car-washing soaps.
6. Incorporate landscaping techniques that require less fertilizer, like growing a garden with native plants.
7. Control erosion. Phosphorus attached to soil particles, making erosion a contributor to phosphorus pollution.
8. Help preserve and create habitats that help promote high oxygen levels, like forests and wetlands.
GALVESTON BAY
IS TEXAS’ LARGEST ESTUARY – A COASTAL BODY OF WATER WITH A FREE CONNECTION WITH THE OPEN SEA – AND IT STARTS IN YOUR BACKYARD.
QUESTIONS?

FOR MORE INFORMATION CONTACT

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• Lisa Gonzalez
  lgonzalez@HARCresearch.org

GALVESTON BAY FOUNDATION

• www.galvbay.org
• Become a member
• Volunteer
• Join our events
• Get out and enjoy Galveston Bay!

HOUSTON ADVANCED RESEARCH CENTER

• www.HARCresearch.org
• Learn more about research on local air, energy and water topics
• Focused on building a sustainable future.
• Helping people thrive & nature flourish.