

2009 BASIN HIGHLIGHTS REPORT

How's the Water?



Houston-Galveston Area Council

prepared in cooperation with the
Texas Commission on Environmental Quality (TCEQ)

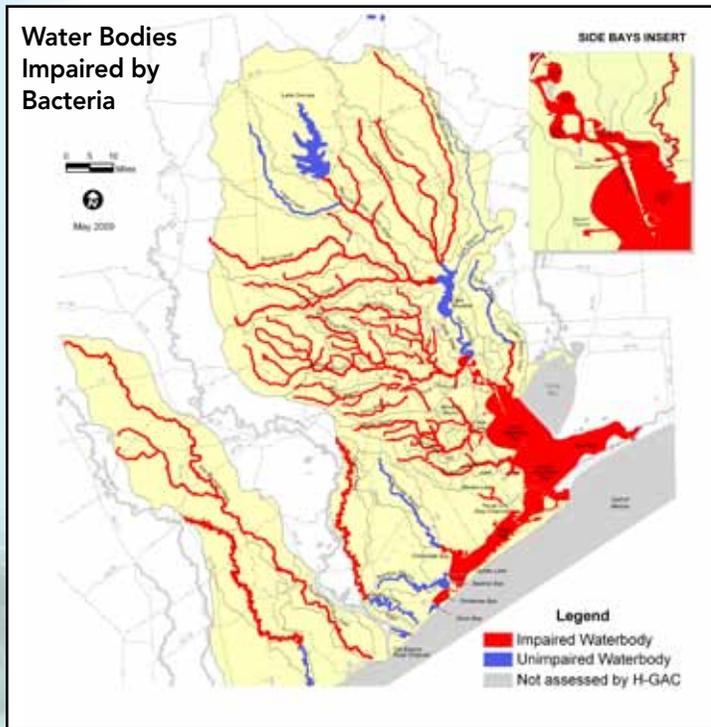
H-GAC Clean Rivers Program

The Clean Rivers Program (CRP) goal is to protect, maintain and improve the quality of water in Texas rivers and coastal basins.

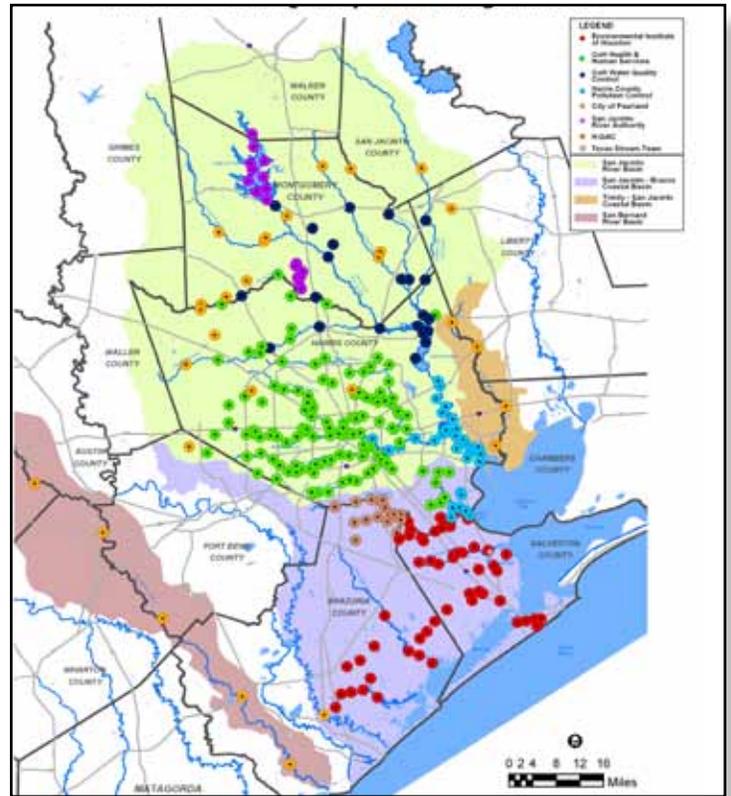
H-GAC partners with seven local agencies and the TCEQ to collect samples at 300+ locations.

Clean Rivers has developed a coordinated system of specialists, scientists and volunteers to sample and evaluate local water quality. H-GAC has expanded its geographic coverage of water quality monitoring sites almost every year.

All data is provided to the TCEQ for inclusion in the statewide water quality database and is used to determine the quality of our rivers, lakes and streams in the H-GAC area.



Assessment Basins and Monitoring Stations



Regional Concerns

#1 - Bacteria

Over half of our waterways are impaired due to elevated levels of bacteria. (Elevated levels of bacteria impact our ability to swim and harvest shellfish).

#2 - Elevated Levels of Nutrients

Over 30% of the region's waterways have elevated levels of nutrients. (High nutrient levels can impact water clarity, cause bad tasting drinking water and lead to low dissolved oxygen problems).

#3 - Impact from Hurricane Ike

In 2008, Hurricane Ike caused wastewater treatment plants to go off-line. Raw sewage was dumped into local streams, along with decaying tree and plant material. Overall regional water quality was very poor for several weeks.



NEW Methods

Habitat Assessments

We're trying to obtain richer information on the areas surrounding our waterways.

- What kind of aquatic life is it able to support?
- What is the area next to the body like? Is it forested? Is there tree cover? Or, is it exposed?
- What kind of land use or land cover exists directly upstream from the monitoring location?

Examples of things we're looking for are forestation, ground cover, impervious surface, etc. This will enable us to:

- Identify land use factors that may contribute to pollution
- Directly identify pollution sources

HABITAT ASSESSMENT: PILOT PROJECT

H-GAC is working with the City of Houston to perform habitat assessments at 60 sites on tributaries of the Houston Ship Channel.

- Each site is located in an area with decreased dissolved oxygen levels and in some cases high levels of bacteria.
- City of Houston investigators are examining areas of the watershed immediately upstream of the sampling site to find visible sources of bacteria or pollutants.
- Any pollutant sources discovered during fieldwork are reported to the appropriate city department for further investigation and correction.

Handling of Pollutant Sources

Examples of pollutant sources include:

- *Greywater from washing machines in the Little White Oak Bayou Watershed.*
- *Raw sewage from a business discharged directly onto the banks of Halls Bayou.*

Follow-Up

- All cases were reported and follow-up was handled by the City of Houston and Harris County.
- Removing these pollutant sources will help reduce the elevated bacteria and nutrient levels in area watersheds.
- A final report for the habitat assessment will be available August 2009.



Land Cover Analysis

2002 Land Cover in H-GAC Region

Nine Land Cover Classes

In 2002, H-GAC classified the region's landscape into nine land cover classes.

1. High Intensity Developed
2. Medium Intensity Developed
3. Cultivated Land
4. Grassland/Shrubs
5. Forest
6. Woody Wetlands
7. Herbaceous Wetland
8. Bare Land
9. Open Water

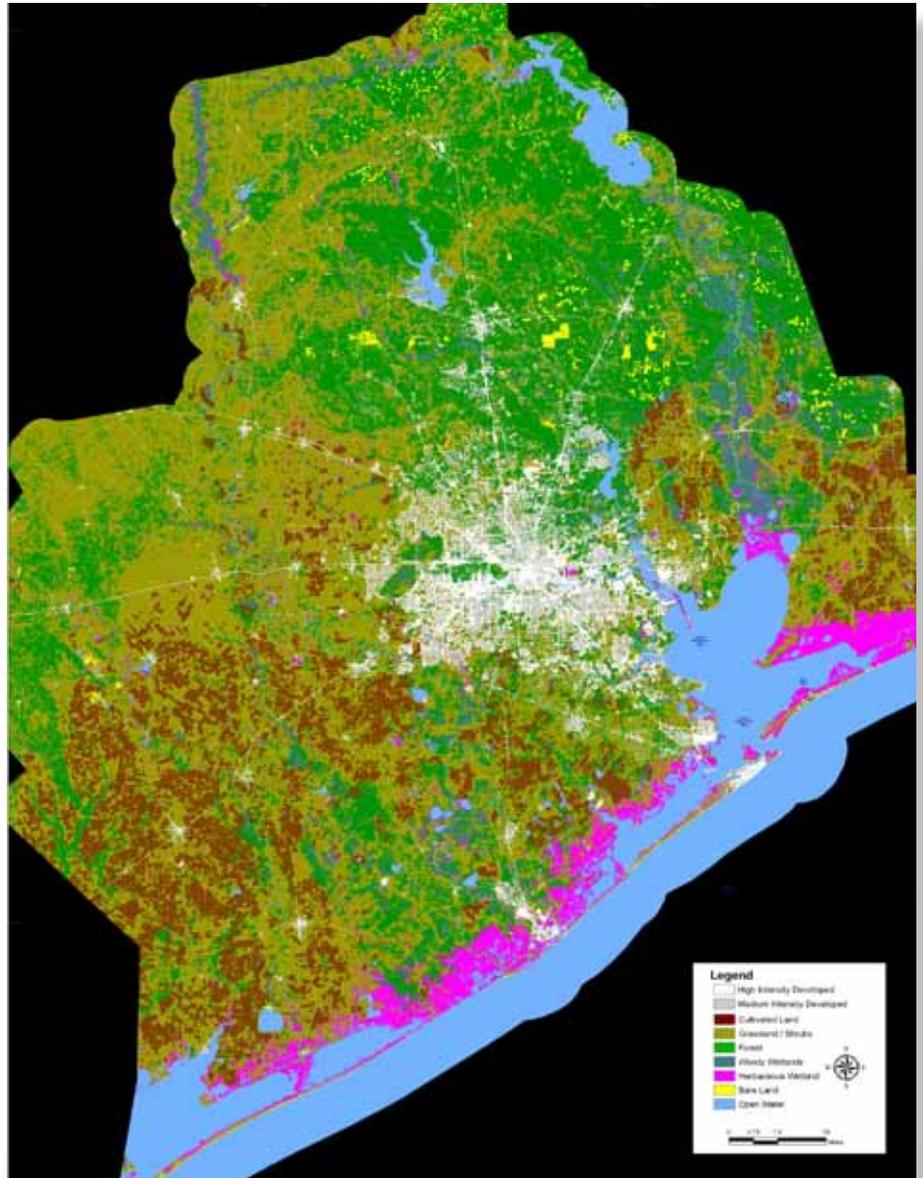
High Level Data

The process to produce the data involved satellite imagery useful for high level planning such as:

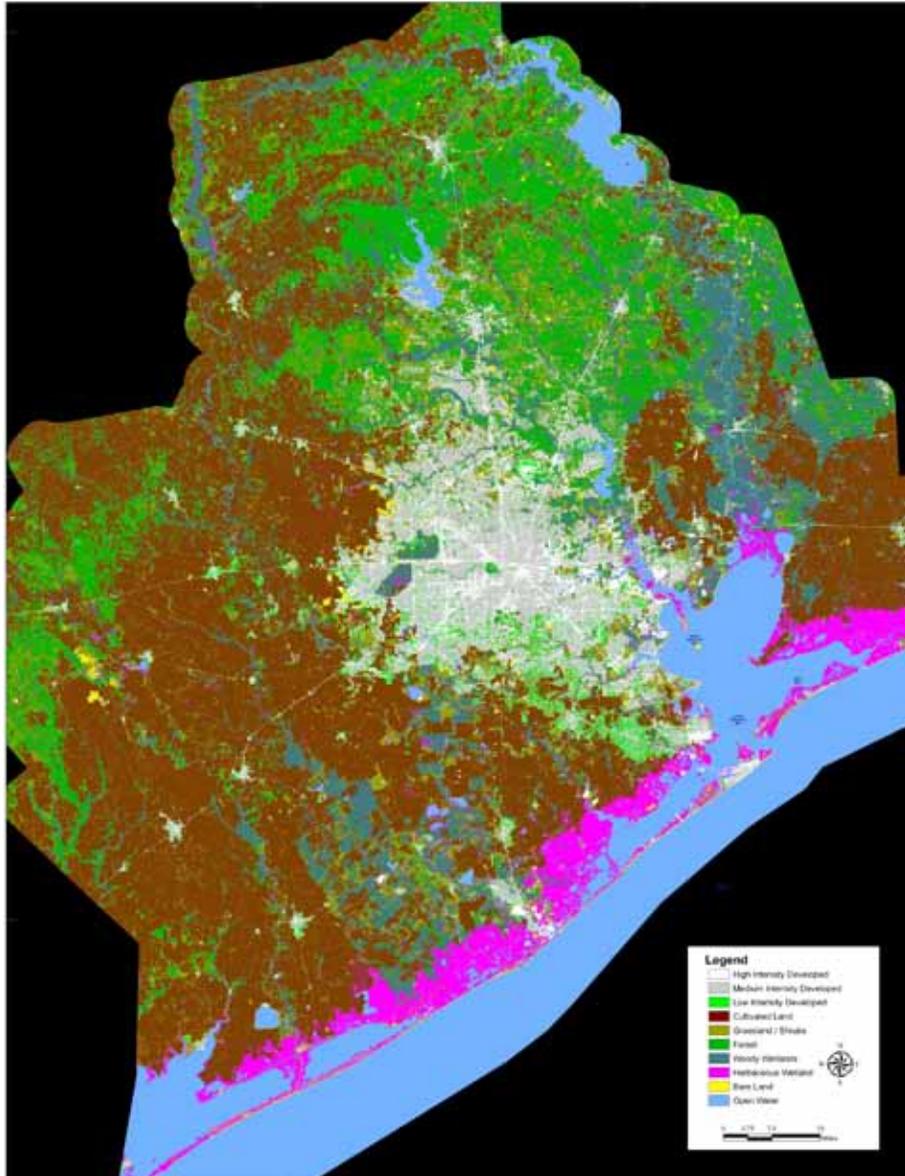
- Assessing potential storm water runoff.
- Developing conservation priorities.
- Promoting public awareness of the region's natural resources and urban footprint.

Project History

- The project included the 13-county H-GAC region, and parts of San Jacinto and Grimes Counties, that make up the four assessment basins in the Clean Rivers Program region.
- The total area covers nearly 17,000 square miles.
- The sensor used to collect imagery was Landsat's Thematic Mapper (TM).



2008 Land Cover in H-GAC Region



New 2008 Land Cover Analysis and Classification

Understanding land cover change allows for better, more accurate modeling, and will help water quality managers see how and where new development is impacting water quality.

- A new land cover classification was completed spring 2009 for the rapidly changing H-GAC region.
- The classification was performed in a manner consistent with the previous classification to determine the extent of change in the region.

Land cover classifications from 2002 and 2008 are available at:

http://www.h-gac.com/rds/Land_Use/default.aspx#





Land Cover Analysis

The 13-county Houston-Galveston region contains a broad range of land cover types. The low-cost, broad view data sets can be used in our area for a variety of water quality and environmental planning purposes.

Correct Use of this Data:

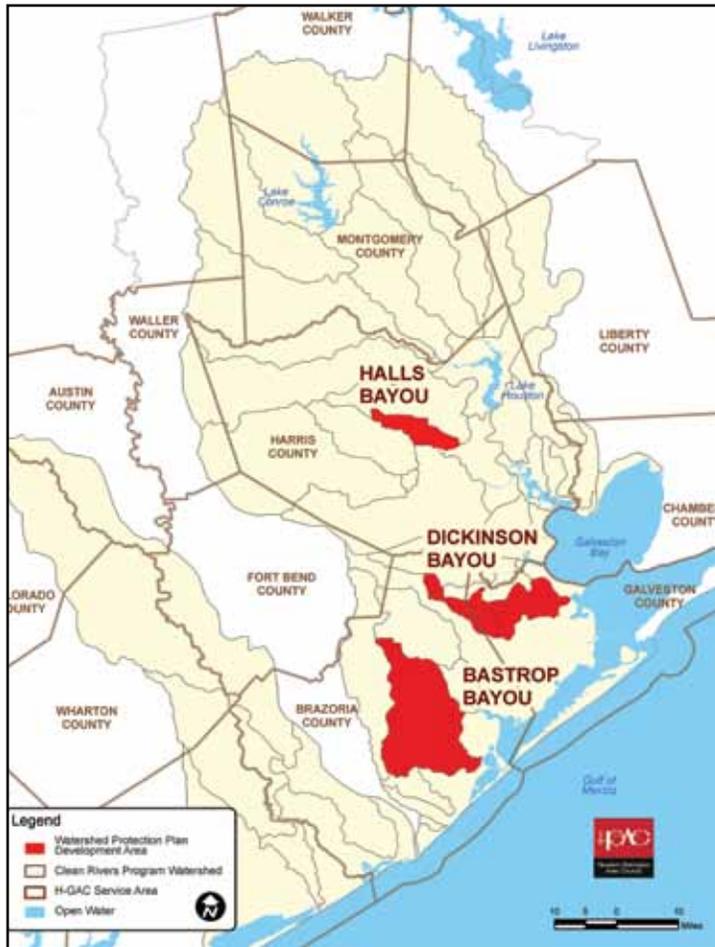
- Regional planning.
- Large area resource management planning.
- Education for students and citizens.
- Regional or county level watershed analysis.
- Basic research on county or regional distribution of land cover to determine specific areas for monitoring or management focus.
- Change detection and time series analysis.
- Impervious surface calculations /NPS loadings.

This data should not be used for small area classification like wetlands delineation.



Watershed Planning

Watershed Protection Plan Development Areas



Watershed Protection Planning

Watershed Protection Plans (WPPs) are developed by local stakeholders to determine water quality problems and sources. WPPs provide a framework that helps to prioritize measures that improve and protect water quality in specific watersheds.

H-GAC's Clean Rivers Program and local partners are conducting water quality monitoring in the Dickinson, Bastrop and Halls Bayou watersheds to support the development and implementation of three WPPs to lower the high bacteria and nutrient level problems. The cost of the monitoring fieldwork and laboratory analysis is being matched with federal and local funds used to develop plans and monitor the impacts of Best Management Practices (BMPs) that are being implemented.

For watershed plan information, visit H-GAC's web page: www.h-gac.com/community/water/watershed_protection/default.aspx

Best Management Practices (BMPs)

Best Management Practices (BMPs) are being used within WPPs to reduce pollutant levels:

- Repair malfunctioning septic systems.
- Provide cattle with alternative water sources.
- Educate general public to pick-up pet waste.
- Teach citizens how to correctly apply fertilizers and pesticides.
- Provide local entities tools to reduce impacts of storm water runoff.

Total Maximum Daily Load (TMDL) Implementation Plans

When a body of water exhibits long term pollution problems, it is placed on the state's Impaired Waters List. For example, if a body of water used for contact recreation is impaired by high levels of bacteria and may not be safe for swimming, it is placed on the list.

A TMDL determines how much pollutant reduction is needed to improve the health of the water body. An implementation plan (I-Plan) is then produced that outlines the steps needed to make those improvements. I-Plans are developed through a collaborative stakeholder process and public engagement strategy.

H-GAC's CRP contributes to the I-plan process by:

- Attending meetings to ensure that stakeholders are aware of data available from the Clean Rivers Program.
- Helping to establish a water quality monitoring strategy that shows if the I-plan is working.
- Reaching out to the public through the Texas Stream Team Program by training new volunteers to monitor water quality in impaired water bodies.

To get involved in the I-plan process, visit: www.h-gac.com/tmdl

Get Involved!

H-GAC encourages public and stakeholder participation in the Clean Rivers Program. Your input and involvement is important. We need everyone to be involved to solve water quality problems and protect our incredible resources.



How to Get Involved



- Join the Texas Stream Team, a statewide group that helps to train volunteers to monitor water quality. H-GAC CRP staff is involving volunteers in areas where Watershed Protection Plans and TMDL implementation plans are being developed.
 - This provides more frequent data collection and observation in impaired watersheds.
 - It opens an additional line of communication with the public to help foster stewardship in their watershed.
 - Texas Stream Team is a great opportunity for schools and civic organizations to study and protect waterways. For information: www.h-gac.com/texasstreamteam
- Attend CRP Steering Committee meetings: www.h-gac.com/crp
- Be active in a Watershed Protection Planning stakeholder group: www.h-gac.com/community/water/watershed_protection/default.aspx
- Check out water quality data on H-GAC's CRP web pages: www.h-gac.com/rds/water_quality/default.aspx

H-GAC's CRP Accomplishments – Year in Review

- Increased Texas Stream Team monitoring network by 20+ volunteers.
 - H-GAC has 77 active volunteers at 68 monitoring sites around the region.
 - H-GAC added bacteria monitoring to the list of testing parameters.
 - In February 2009, H-GAC trained 8 long-time volunteers to test for bacteria and 14 new Stream Team volunteers.
- All local monitoring agency laboratories have NELAC accreditation.
- Began ground breaking habitat assessments in tributaries of the Houston Ship Channel.
- Completed new land cover classification for 17,000 square mile area.
- Expanded geographic coverage of water quality monitoring stations.
- Initiated "Total Suspended Solids" study on the West Fork of the San Jacinto River.
- Extensive update to H-GAC's CRP web pages: www.h-gac.com/community/water/rivers/default.aspx
 - Up-to-date water quality information for the H-GAC region.
 - Interactive maps of water quality monitoring sites.
 - Water quality data over a 15+ year period.
 - Information about Total Maximum Daily Load (TMDL) and other related water quality programs.
 - Publications and reports for all H-GAC past and current "Special Studies".