

# ***Final Report***

*WaterSmart Landscaping for the Upper Texas Gulf Coast*  
Contract #05-020

*Submitted by*  
*Texas Cooperative Extension*  
*Christina LaChance, Program Coordinator*

A report of the Coastal Coordination Council pursuant to  
National Oceanic and Atmospheric Administration Award No.  
NA04NOS4190058



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## Introduction

WaterSmart Landscaping for the Upper Texas Gulf Coast successfully focused attention on the impact landscapes have on our water quality and water conservation. The citizens of the Galveston Bay area now have the opportunity to see watersmart principles in practice by being able to visit five demonstration landscapes. With their signage and plant identification tags, the landscapes are educational resources allowing residents to choose the “right plant for the right place” and to incorporate these native and adapted plants into aesthetically pleasing and functional landscape designs. As an added feature, these same landscapes offer critical habitat for wildlife. Above all, residents are able to see that their landscapes can use less water, be free of chemical fertilizers, pesticides, and herbicides while not sacrificing their beauty. By their very nature, the demonstration landscapes point to the resiliency of the plant material and the versatility of the landscape designs in situations where regular maintenance is dependent on minimal attention.

The brochures and the population of the WaterSmart website extend the educational outreach. With the location of each demonstration site visible at the website, anyone may take a self-guided garden tour.

The greatest challenge for the landscape projects was the necessity to accomplish installation during relatively small windows of opportunity in early spring and late fall to allow for the highest survival rate for plants. Choosing the optimum planting times has been instrumental in the overall success of the projects.

Each demonstration landscape brought with it unique opportunities for community involvement, connection, and commitment. It was through the close partnerships formed with countless groups mentioned in the project descriptions that created a template for successful relationships for future collaborations.

An especially rewarding aspect of the Coastal Management Program grant, has been the involvement of students in the landscape installation process and in the use of the landscapes as educational tools. The students, from elementary through high school, were and are able to take away the message of personal responsibility for protecting water resources by making positive choices in the landscape. This message is taken home and out into the community, creating environmental stewards for the future.



### ***Task # 1—Install a minimum of five WaterSmart Demonstration Landscapes***

Five demonstration landscapes highlighting environmentally friendly landscape practices were installed in the Galveston Bay area. In each instance, formation of partnerships with participating entities was critical in maximizing funding, expanding educational opportunities to the community, and continued maintenance of the sites.

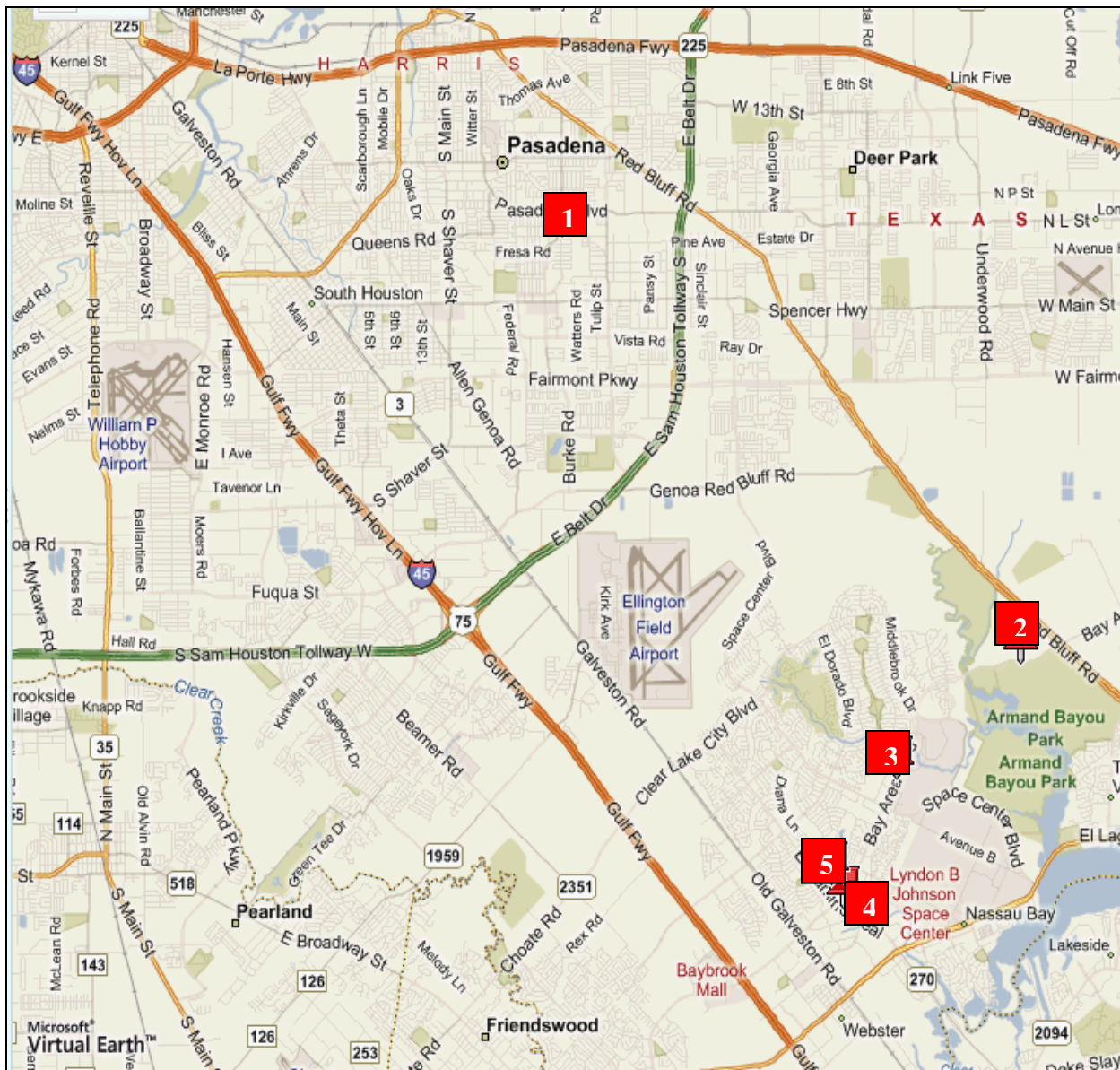
The landscapes serve as reference for the public by visually communicating that such landscapes are not only beautiful but are non-polluting and resource efficient. As a positive consequence, these same landscapes have proved to be havens for wildlife with their being free of chemical fertilizers and pesticides, incorporating native plants, and providing basic habitat needs.

Informational signage plus plant identification tags are included in the installation.

The bulk of the labor force for site preparation, installation, and maintenance of the landscapes was/is comprised of volunteers from several organizations which will be identified as each landscape is described. In addition, as a means of providing a consistent troop of volunteers, the WaterSmart Dirt Crew was created and has proved to be an invaluable resource. To date, more than twelve hundred forty-two hours have been logged by the combined groups. The estimated market value of this volunteer labor force is \$20,556.

A description highlighting the unique qualities of each landscape follows.

# WaterSmart Demonstration Landscape Locations

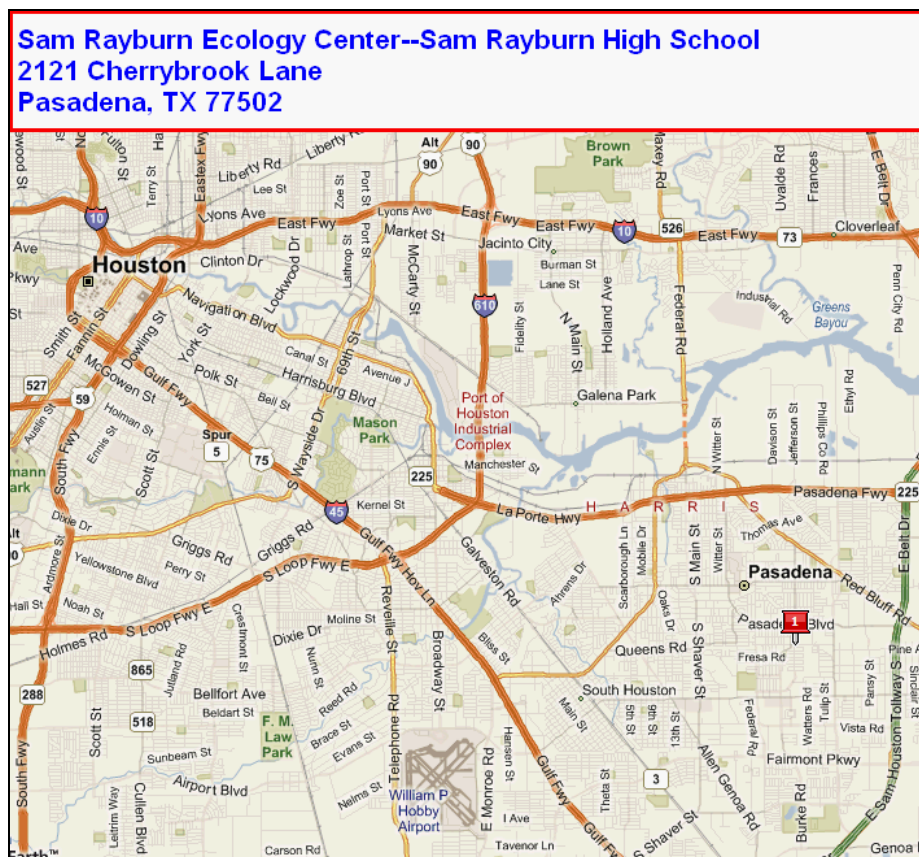


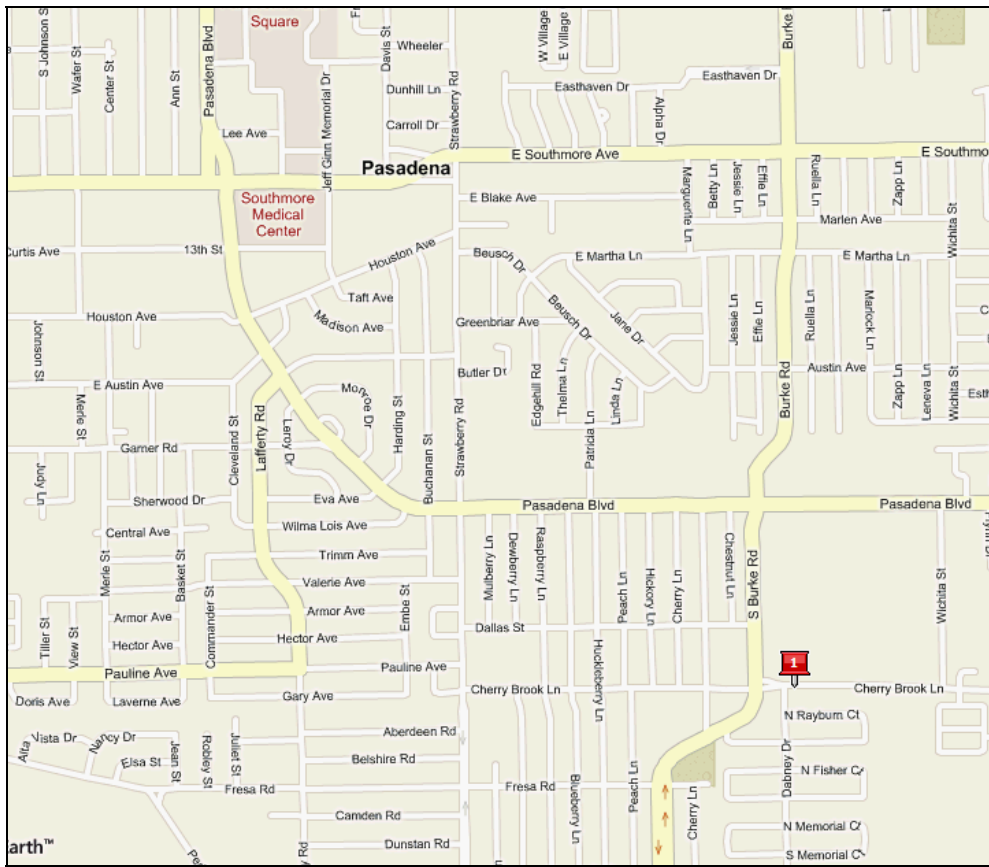
1. Sam Rayburn High School Ecology Center's WaterSmart Landscape  
2121 Cherrybrook Lane, Pasadena, 77502
2. WaterSmart Habitat Landscape, Armand Bayou Nature Center  
8500 Bay Area Blvd, Pasadena, 77507
3. WaterSmart Demonstration School Habitat Lab  
Environmental Institute of Houston, University of Houston at Clear Lake  
2700 Bay Area Blvd, Houston, 77058
4. TX Coastal Watershed Program WaterSmart Landscape  
17000 El Camino Real, Houston, 77058
5. WaterSmart Rain Garden, Bay Area Courthouse Annex  
16603 Buccaneer Lane, Houston, 77062

# 1. Sam Rayburn High School Ecology Center, Pasadena

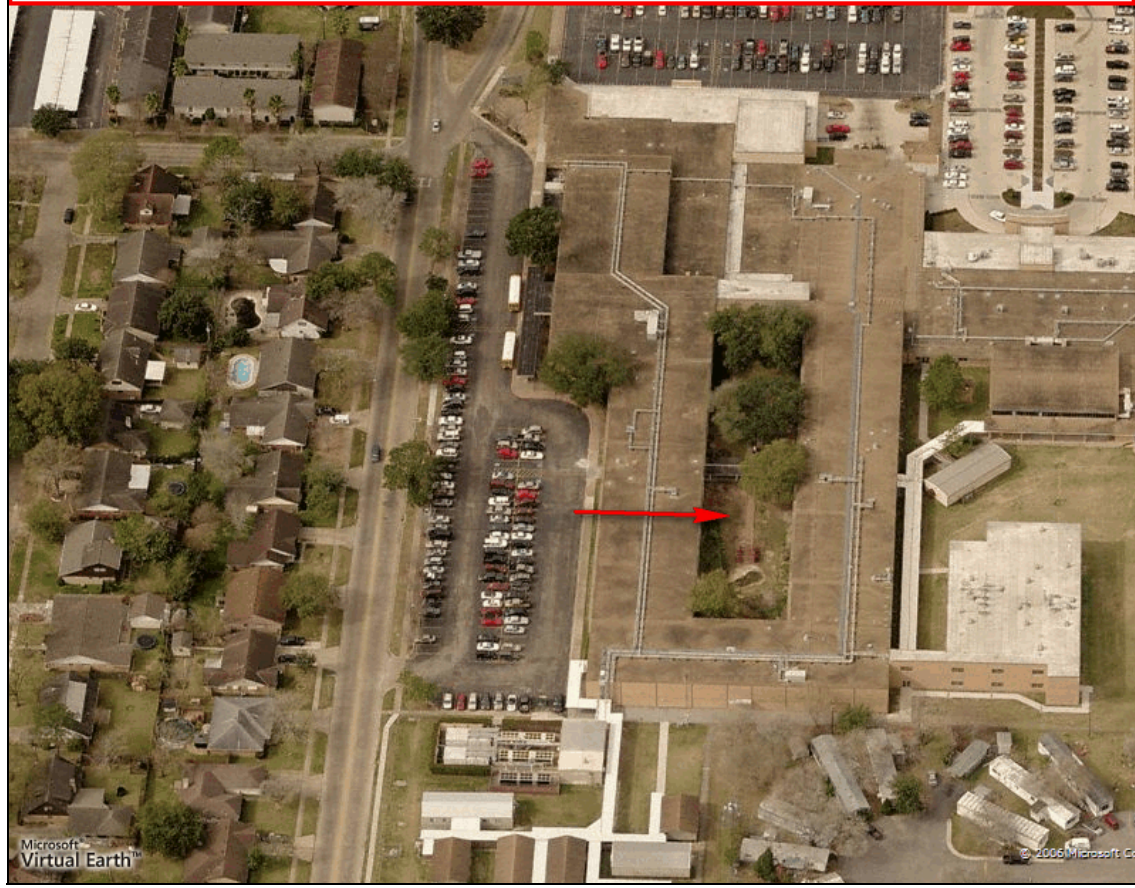
The WaterSmart Program, working with Sam Rayburn High School and the City of Pasadena, created a WaterSmart landscape and outdoor classroom. Students and teachers are able to incorporate their experiences on the site into the school curriculum at all levels and in all disciplines. In a school where most of the students qualify for free lunches and where sixty percent of the student population is Hispanic, being able to bring nature to them is more than a novel idea. Lessons learned in the Ecology Center are brought home by the students. In commercial and residential areas, citizens of the community can use the site as reference when choosing landscape designs, appropriate plants, and proper maintenance techniques that are both resource efficient and provide habitat for wildlife. A unique feature of this landscape was the use of “eco-turf” as an example of an alternative to a lawn. The St. Augustine lawn was removed through a “solarization” process using heavy clear plastic sheeting to “cook” the grass and weed seeds. The area was then planted with wildflower seeds resulting in a swath of continuous blooms from spring through early winter where only St. Augustine grass once grew.

Volunteers for the project included Texas Cooperative Extension Master Gardeners and Master Naturalists, City of Pasadena employees, Sam Rayburn faculty, and students from the basketball and football teams, the Honor Society, the Ecology Club, Health Occupations Club.





**Sam Rayburn High School Ecology Center  
Pasadena**





Preparing the site for wildflower seed sowing after “solarization” of the lawn area  
(Clear plastic sheeting is shown covering lawn area)



Sowing wildflower seeds to create “eco-turf” to replace St. Augustine grass  
Fall 2005





Students preparing the site for planting of shrubs and perennials



Student planting the shade garden



One of several groups of student and Extension Master Naturalist volunteers participating in the project.



Students enjoying the new “eco-turf”  
Spring 2006

# SAM RAYBURN HIGH SCHOOL ECOLOGY CENTER

## A WaterSmart Landscape

This WaterSmart Landscape uses native and non-invasive adapted plants to create a teaching lab and outdoor classroom for students, teachers and the community.

For teachers and students, the landscape provides a safe, accessible area to study and experience the wonders of nature. For the community, it highlights environmentally friendly landscaping practices that can be used in the home landscape.

WaterSmart landscapes are beautiful, low maintenance, and help protect our natural world.

To learn more, go to: [www.watersmart.cc](http://www.watersmart.cc)



### DON'T RUNOFF!

*During a heavy rain or when we over-water, the excess water, or runoff, from our yards, roofs, and parking lots carries pollutants through the stormdrain system and out to Galveston Bay without being cleaned.*

### CONSERVE WATER!

*50% of our water supply goes to lawn and garden watering.*

### WHAT YOU CAN DO

- Choose native and non-invasive adapted plants. They are well-suited to our climate and soil.
- Avoid chemical fertilizers, herbicides, and pesticides. They pollute our waterways and harm wildlife.
- Conserve water. Water early in the day and use mulches to help prevent evaporation.
- Build healthy soil. Use compost—it adds nutrients and holds in moisture.
- Mow high and often, using a mulching mower. Leave clippings on the lawn to decompose and add nutrients to the soil.



To learn more about Butterfly Enthusiasts of Southeast Texas, go to: [www.best-naba.org](http://www.best-naba.org)

## 2. The WaterSmart Habitat Landscape at Armand Bayou Nature Center

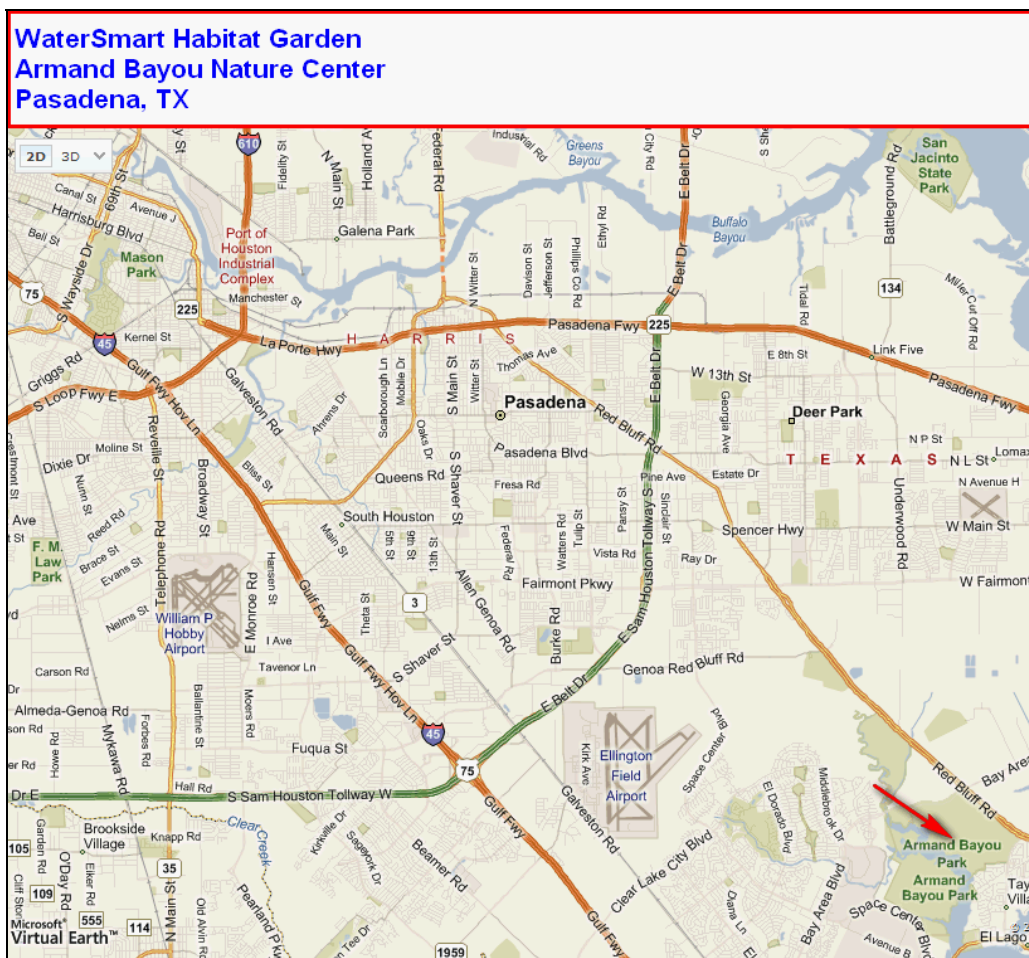
The small cottage which houses the education offices at Armand Bayou Nature Center was the perfect backdrop for a home habitat landscape demonstration landscape. As an Eagle Project, a Boy Scout and fellow scouts from a local troop helped prepare the site by removing the turf grass, laying pathways, and adding soil to the planting beds. Another Eagle Scout Project provided compost bins and benches. To keep unwanted animals out of the landscape, a picket fence was built around the landscape by nature center volunteers.

On Earth Day in April of 2006, eighteen volunteers including Texas Extension Master Gardeners and Master Naturalists, Nature Center volunteers, and members of the WaterSmart Dirt Crew installed plants and mulched the site. Visitors to the center that day were able to view the entire process.

Installation of a micro-irrigation system shows a cost and water-efficient alternative to traditional in-ground irrigation or to attempting hand-watering.

Sources of additional funding and support were donations from Harris County Precinct 2, members of the Armand Bayou Nature Center Board of Trustees and a volunteer matching grant from ExxonMobil.

**Related WaterSmart Habitat Landscape articles: See Appendix A**





**WaterSmart Habitat Garden  
Armand Bayou Nature Center  
Pasadena**





Heiman House—housing education offices--(before photo)



Boy Scout Eagle Project—preparing the landscape site  
February 2006



Boy Scouts and Extension Master Naturalists preparing the site.  
February 2006



Planting Day—April 22, 2006  
Earth Day



Volunteers installing low volume irrigation



Earth Day Volunteer Crew—April 2006





April 2007



April 2007

# WELCOME TO A WATERSMART HABITAT LANDSCAPE

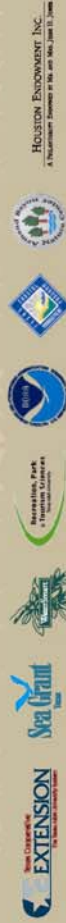
Natural areas that provide necessary habitat for wildlife are continuing to disappear due to sprawling development. When you create a landscape to attract wildlife in your yard, school or community, you provide basic survival needs for many species and a place to view the wonders of nature.

As you explore this WaterSmart Habitat Landscape, notice how the diversity of the plants reflects the abundance and diversity of the wildlife.

To learn more, go to [www.watersmart.cc](http://www.watersmart.cc)

## HABITAT LANDSCAPE BASICS:

- Provide food, water, breeding and nesting space, and shelter for wildlife.
- Choose native and non-invasive adapted plants. They are well-suited to our climate and soil conditions.
- Plant a diversity of plants to attract a diversity of wildlife.
- Do not use chemical fertilizers or pesticides — they pollute our waterways and harm wildlife.



To learn more about Butterfly Enthusiasts of Southeast Texas, go to: [www.best-naba.org](http://www.best-naba.org)

### **3. The WaterSmart Demonstration School Habitat Lab**

As a means of creating a habitat for wildlife that also functions as an instructional lab for teachers, students and the community, a WaterSmart Demonstration School Habitat Lab was installed at the Environmental Institute of Houston (EIH) on the campus of the University of Houston at Clear Lake. Incorporated into the design are a pond, rain garden, arbor covering a seating area, songbird garden, butterfly garden, children's vegetable garden, and a wildlife tracking station.

For teachers and students, the landscape provides a safe, accessible area to experience hands-on environmental education. For the community, it highlights environmentally friendly landscaping practices that incorporate landscaping for wildlife and can be used in residential and commercial locations. Consequently, this landscape is the scene for many workshops, classes, and field trips. During the school year, Clear Creek Independent School District has sent students from their Advanced Placement Program for weekly studies.

The volunteer groups working on the installation were composed of Texas Extension Master Gardeners and Master Naturalists, University faculty and student volunteers, the WaterSmart Dirt Crew, and Lyondell Chemical Company employees. Lyondell chose the landscape as the location of their Global Care Day bringing sixty-two employee volunteers who helped complete a large portion of the task over the course of this day long event.

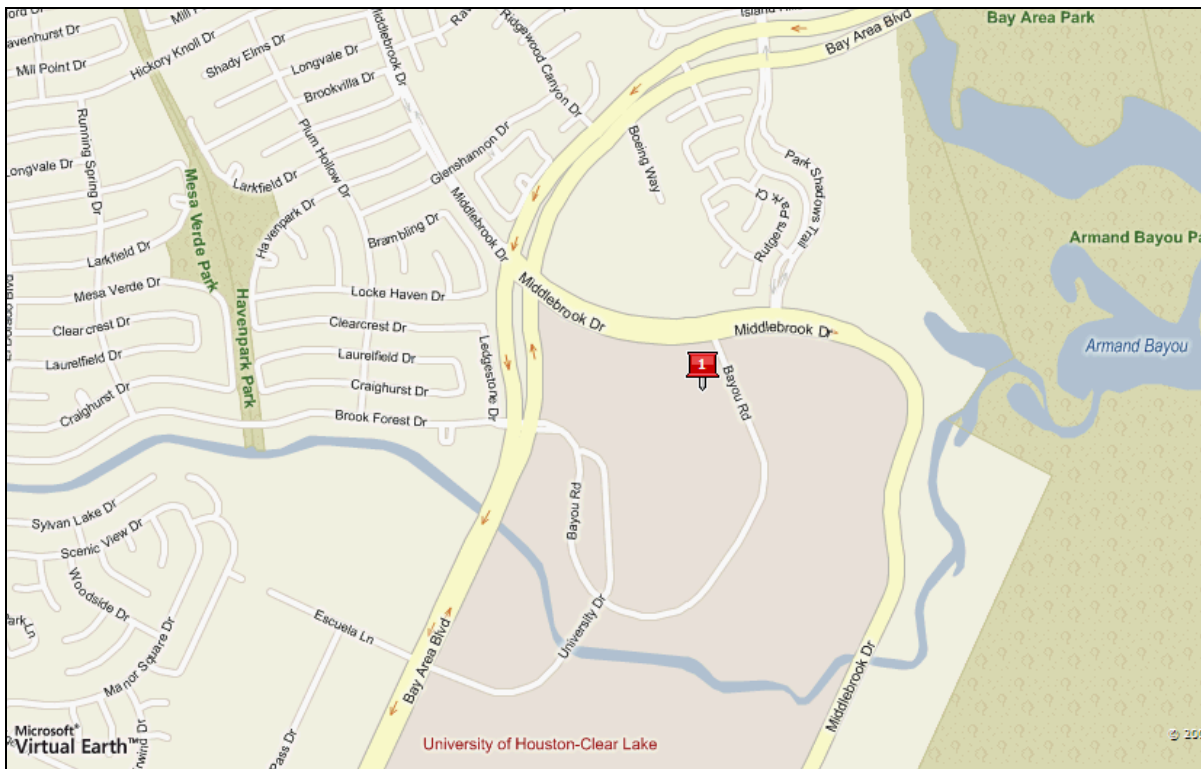
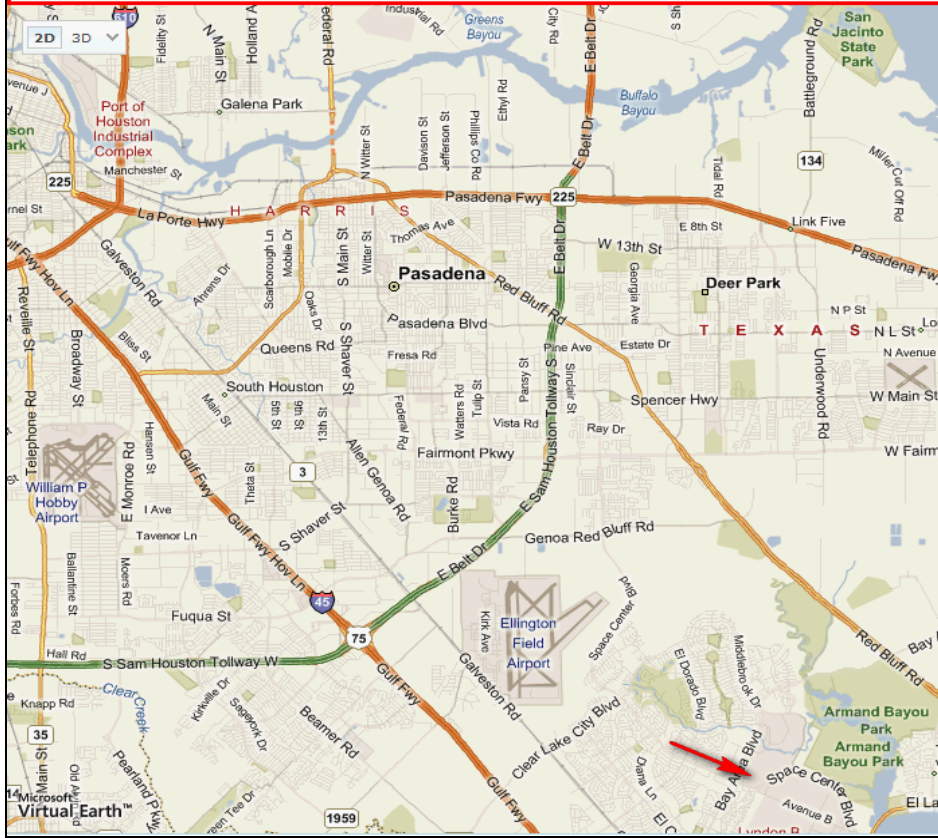
Additional funding, donations, and support came from the Environmental Institute of Houston (University of Houston at Clear Lake), Meadows Foundation, Project Learning Tree's GreenWorks!, U.S. Fish and Wildlife Service, Houston Products Processing, and Bay Area Trees. The value of contributions to the project was \$15,660.

#### **WaterSmart Demonstration School Habitat Lab related articles---See Appendix B**

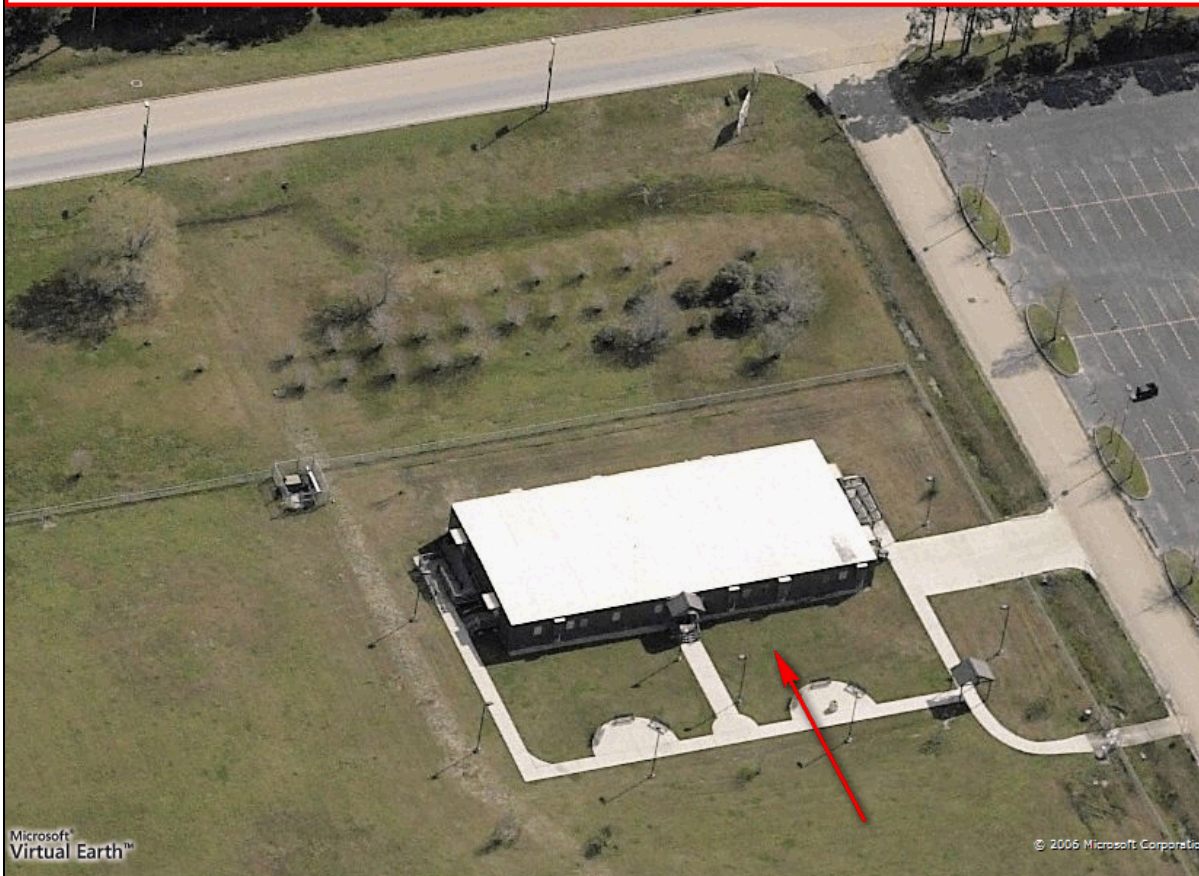


Student planting herbs in the "pizza garden"

**WaterSmart Demonstration School Habitat Lab  
Environmental Institute of Houston  
University of Houston at Clear Lake**



**WaterSmart Demonstration School Habitat Lab  
University of Houston at Clear Lake**



Environmental Institute of Houston, University of Houston, Clear Lake  
March 2006 (before)



Volunteers preparing the site for the WaterSmart Demonstration Habitat School Lab—April 2006



Lyondell Global Care Day, May 6, 2006



June 2006



Students involved in pond life studies at the WaterSmart demonstration landscape lab



Clear Creek ISD Advanced Placement science class



Clear Creek ISD student recording observations while in the Habitat School Lab



# WATERSMART DEMONSTRATION SCHOOL HABITAT LAB

This WaterSmart Landscape uses native and non-invasive adapted plants to create a habitat for wildlife and serves as a teaching lab for teachers, students and the community. It also functions as a rain garden by passively harvesting and putting to use excess rainwater in a manner that helps minimize area flooding and non-point source or runoff pollution.

For teachers and students, the landscape provides a safe, accessible area to experience environmental education. For the community, it highlights environmentally friendly landscaping practices that can be used in the home landscape.

Natural areas that provide necessary habitat for wildlife are rapidly disappearing in our area. When you create a landscape to attract wildlife in your yard, school, or community, you provide basic survival needs for many species and a place to view the wonders of nature.

WaterSmart Landscapes are beautiful, low maintenance, and help protect our natural world.

To learn more, go to: [www.watersmart.cc](http://www.watersmart.cc)

## HABITAT LANDSCAPE BASICS:

- Provide food, water, breeding and nesting space, and shelter for wildlife.
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- Plant a diversity of plants to attract a diversity of wildlife.
- Do not use chemical fertilizers or pesticides — they pollute our waterways and harm wildlife.



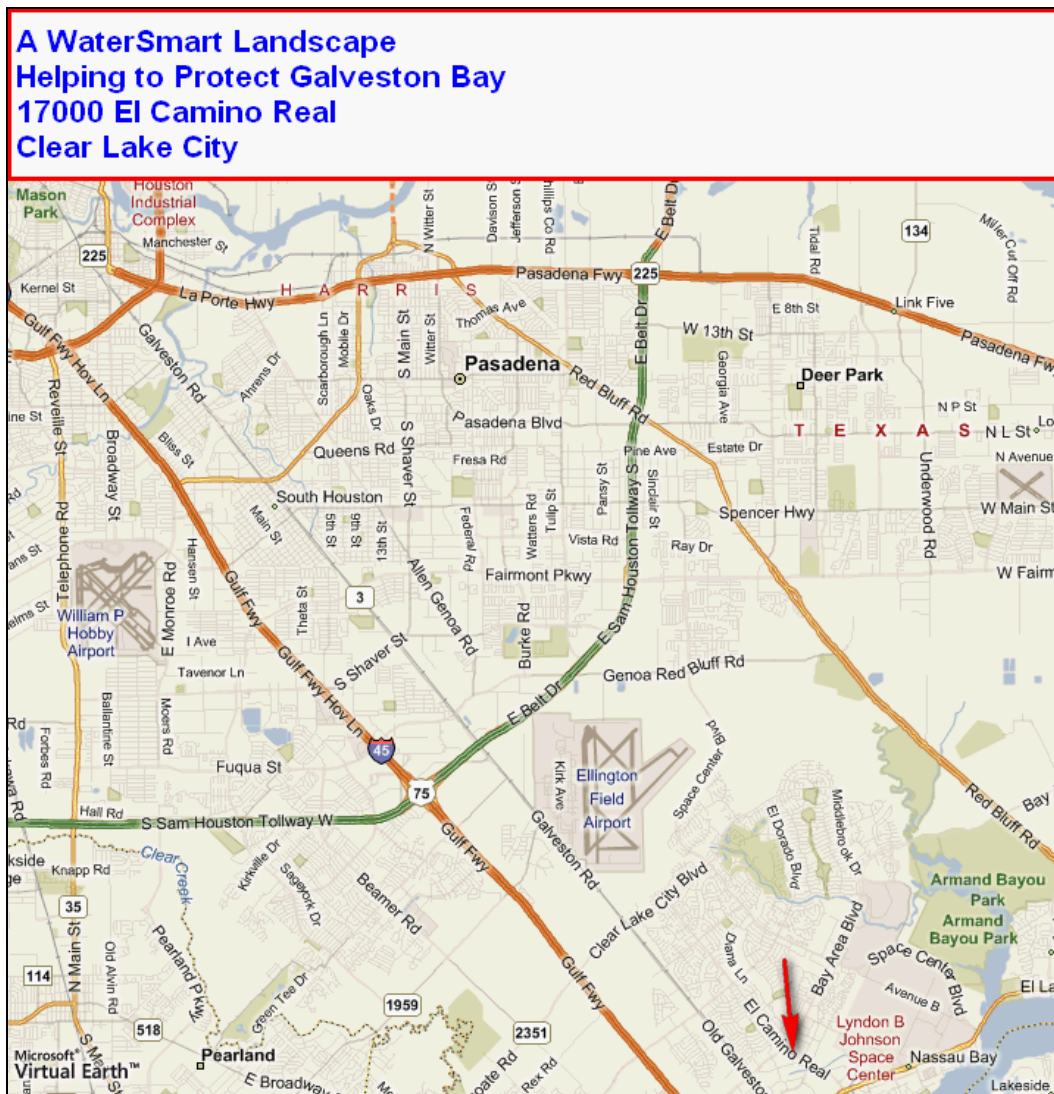
To learn more about Butterfly Enthusiasts of Southeast Texas, go to: [www.best-naba.org](http://www.best-naba.org)

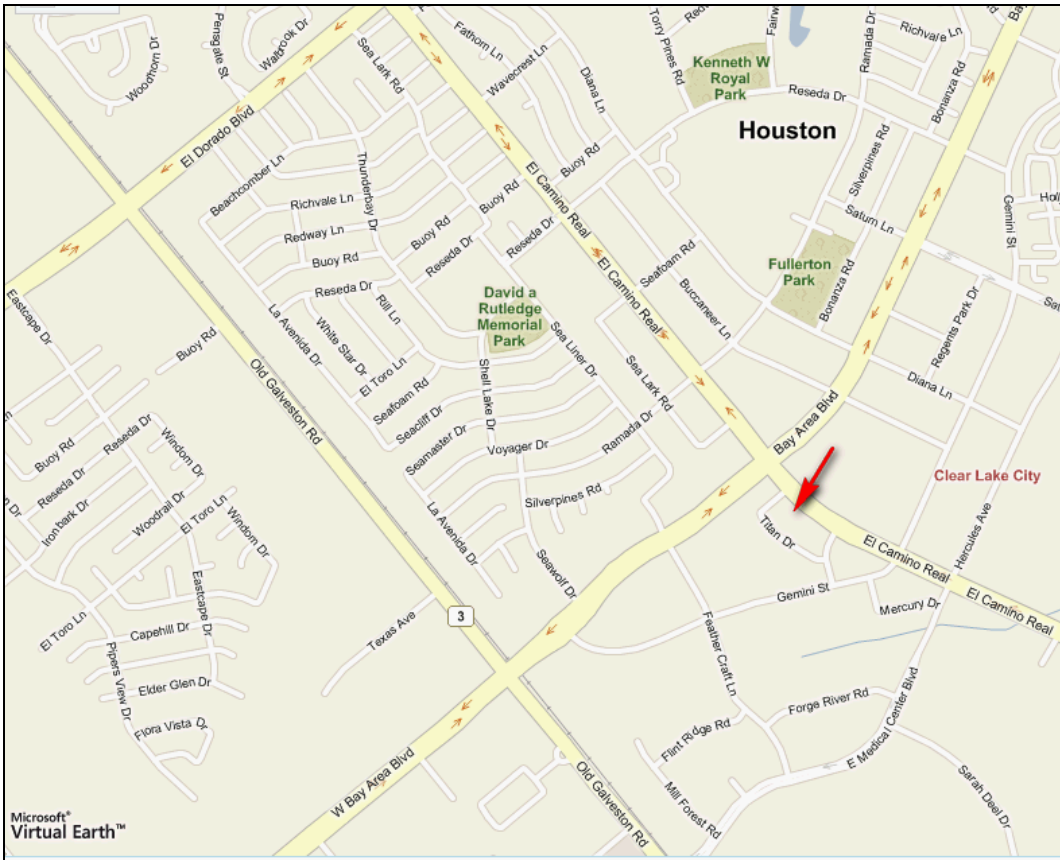
Environmental Institute of Houston, University of Houston, Clear Lake WaterSmart Landscape sign (24" x 36")

#### **4. A WaterSmart Landscape: Helping to Protect Galveston Bay**

A fourth landscape was installed at the Clear Lake City offices of the Texas Coastal Watershed Program (TCWP) of which WaterSmart is a part. As a demonstration garden in an office park setting, it shows examples of a design and plants that do not require chemical fertilizers and pesticides to be maintained. Further enhancing this unique area is a cistern that serves to demonstrate rainwater harvesting. The proximity of this landscape to the program headquarters makes it ideal for future classes and workshops.

Volunteers accomplishing installation were Texas Extension Master Gardener and Master Naturalists, WaterSmart Dirt Crew, and TCWP staff. A Boy Scout Eagle Project provided benches for the landscape.





**A WaterSmart Landscape  
Helping to Protect Galveston Bay  
Clear Lake City**





Demonstration landscape outside offices of  
Texas Coastal Watershed Program  
December 2006 (before)



December 2006



Volunteers on planting day—March 9, 2007



April 2007

# A WATERSMART LANDSCAPE: Helping to Protect Galveston Bay

This demonstration garden uses native and non-invasive adapted plants to highlight environmentally friendly landscape practices that can be used in residential and commercial areas.

WaterSmart Landscapes are beautiful, low maintenance, and help protect our natural world.

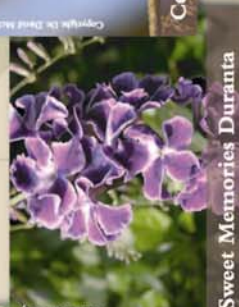
To learn more, go to: [www.watersmart.cc](http://www.watersmart.cc)

## A WATERSMART LANDSCAPE IS BAY FRIENDLY

*Don't Runoff! During a heavy rain or when we over-water, the excess water, or runoff, from our yards, roofs, and parking lots carries pollutants through the stormdrain system and out to Galveston Bay without being cleaned.*

## WHAT YOU CAN DO

- Choose native and non-invasive adapted plants. They are well-suited to our climate and soil.
- Avoid chemical fertilizers, herbicides, and pesticides. They pollute our waterways and harm wildlife.
- Conserve water. Water early in the day and use mulches to help prevent evaporation.
- Build healthy soil. Use compost — it adds nutrients and holds in moisture.
- Mow high and often, using a mulching mower. Leave clippings on the lawn to decompose and add nutrients to the soil.



To learn more about Butterfly Enthusiasts of Southeast Texas, go to: [www.best-nuba.org](http://www.best-nuba.org)

Texas Coastal Watershed Program WaterSmart Landscape sign (24" x 36")

## **5. A WaterSmart Rain Garden**

The Bay Area Courthouse Annex in Clear Lake City is the site of the first demonstration rain garden in the Houston area. Rain gardens are natural or excavated depressions in the soil that are planted like a garden and help manage stormwater on site. They do this by soaking up the water, holding it for a short time, allowing it to percolate through the soil to recharge groundwater and then filtering the remaining water before it enters the stormdrain. Although other parts of the country such as Pacific Northwest, Great Lakes region, and Northeast area have been using this technique for several years, it is relatively unknown in Texas. While the landscape brings public awareness of this natural process for treating stormwater in a beautiful and functional way, it also provides habitat for wildlife with its inclusion of native plants.

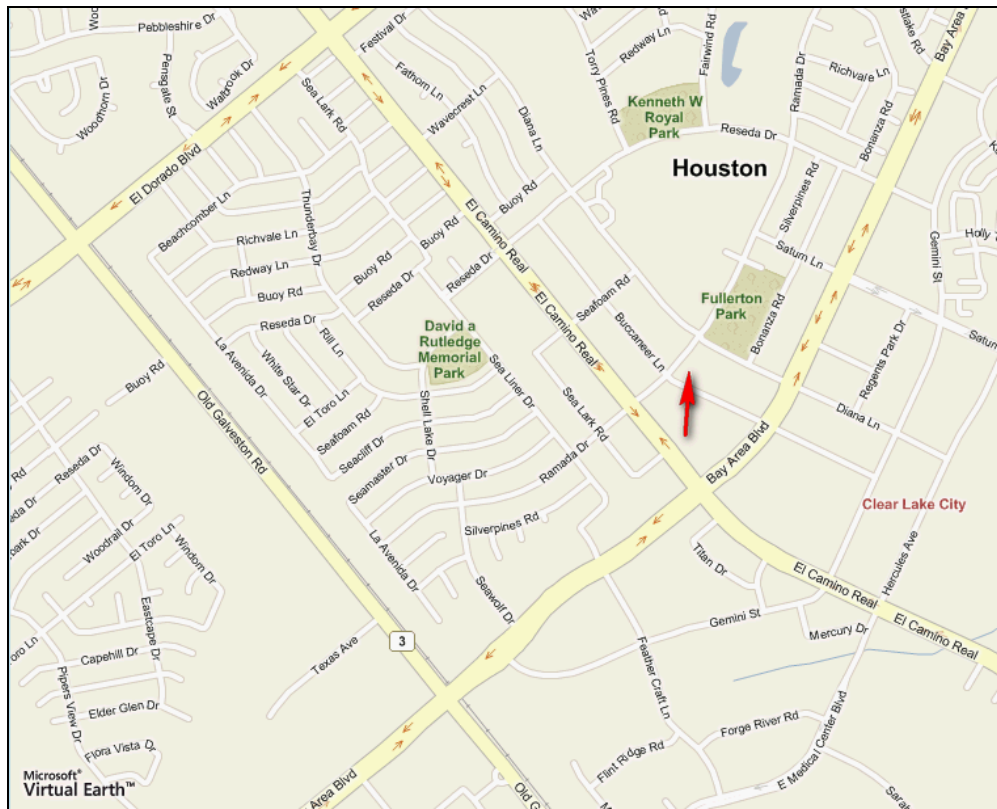
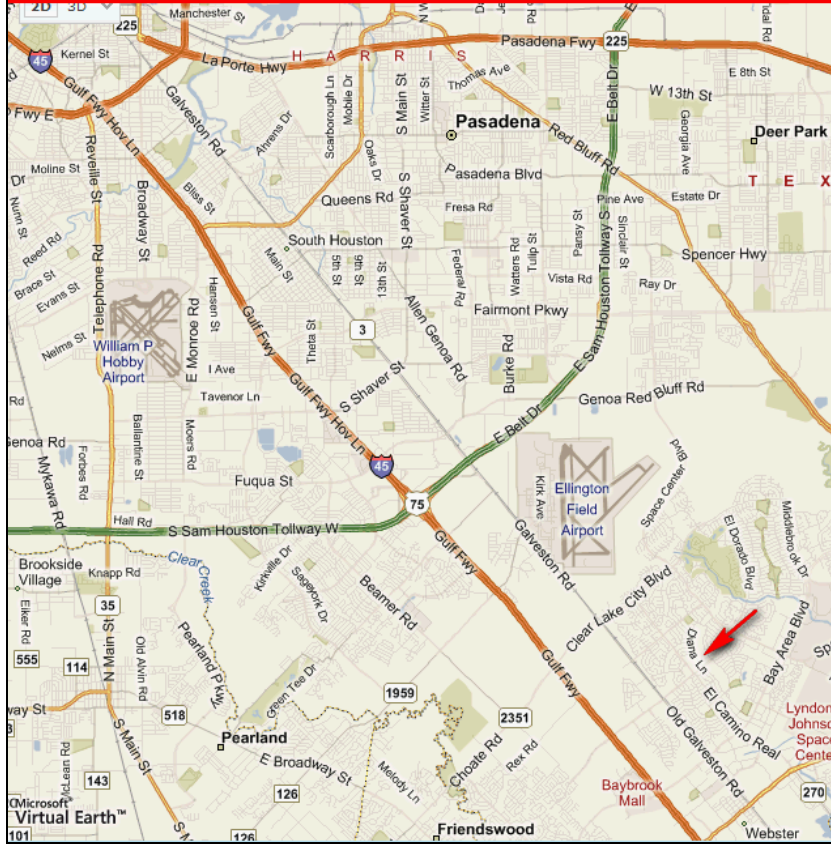
The success of this rain garden installation prompted a rain garden workshop and plant sale on May 13, 2006. Seventy participants came to hear how they can help the environment by creating a beautiful landscape feature that can treat stormwater where it falls. Harris County Precinct 2 Master Gardeners were co-sponsors of the event. In addition, a WaterSmart Rain Garden presentation was given at the Annual Native Plant Society/Texas Parks and Wildlife "Wildscapes" Workshop and Plant Sale on September 9, 2006 at the University of Houston.

Through a partnership with Harris County Precinct 2, county employees prepared and excavated the site. Soil and mulch were then donated by the county. More than forty volunteers, including Texas Extension Master Naturalists and Master Gardeners, Armand Bayou Nature Center volunteers, the WaterSmart Dirt Crew, Boy Scouts from a local troop, City of Pasadena employees, and Johnson Space Center employees accomplished final installation of plants and mulch.

A special dedication of the WaterSmart Rain Garden is being planned by Commissioner Sylvia Garcia's office.

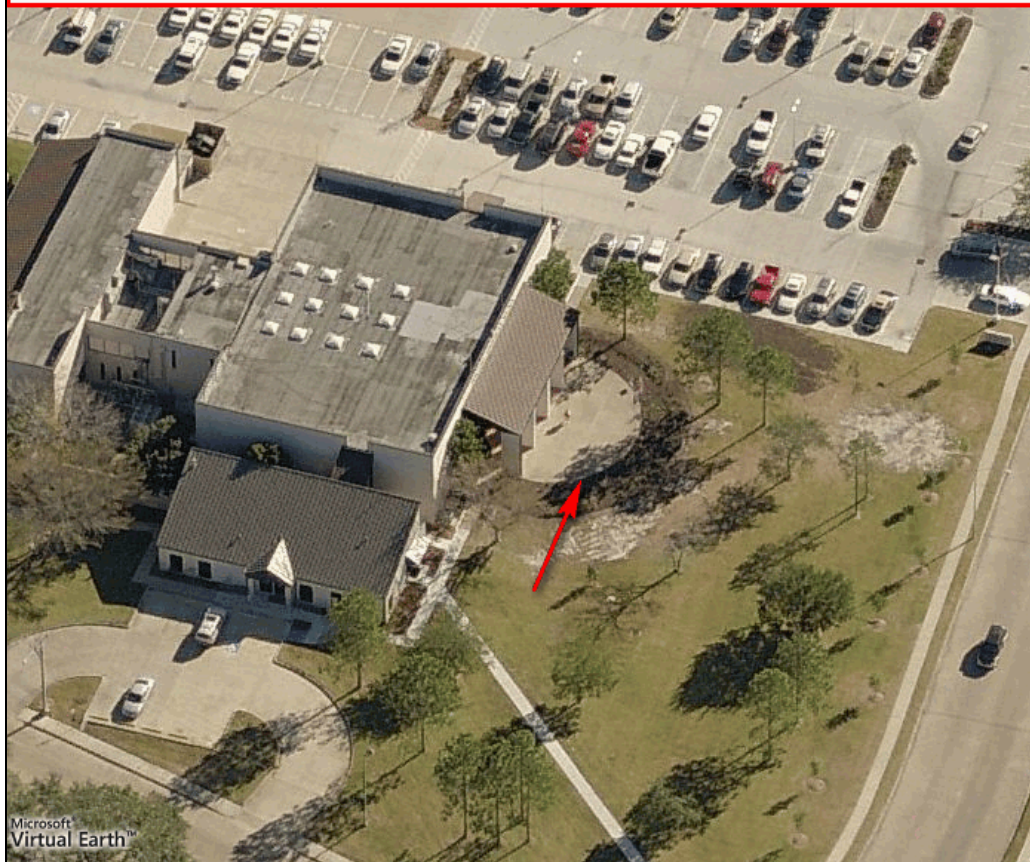
**Related WaterSmart Rain Garden Articles: See Appendix-C**

**WaterSmart Rain Garden  
Bay Area Courthouse Annex  
166603 Buccaneer Ln.  
Clear Lake City**





**WaterSmart Rain Garden  
Bay Area Courthouse Annex  
Clear Lake City**



Bay Area Courthouse Annex, Clear Lake  
Before construction of the rain garden



December 2005—Volunteers installing rain garden



May 2006



Rain garden in action--collecting runoff from Courthouse roof



Harris County Precinct 2 Commissioner, Sylvia Garcia enjoying the rain garden  
(The rain garden is located outside her Clear Lake office)



Galveston Bay Estuary Program's State of the Bay Symposium field trip tour of the WaterSmart Rain Garden—January 2007



**WaterSmart Rain Garden: A Beautiful Way to Protect Galveston Bay**

# A WATERSMART RAIN GARDEN: HELPING TO PROTECT GALVESTON BAY

During a heavy rain or when we over-water, the excess water, or runoff, from our yards, roofs, and parking lots carries pollutants through the stormdrain system and out to Galveston Bay without being cleaned.

A rain garden is an attractive landscape feature that captures stormwater, slows it down, and filters it through soil and plants. This helps to recharge groundwater while it reduces the pollution that ends up in our rivers, bayous and bays.

A WaterSmart Rain Garden is a beautiful way to protect Galveston Bay!

To learn more, go to: [www.watersmart.cc](http://www.watersmart.cc) and [www.raingardens.org](http://www.raingardens.org)

**YOU CAN CREATE A RAIN GARDEN  
IN YOUR YARD.**

➤ *Use native and non-invasive adapted plants. They are well-suited to our climate and can take the wet and dry conditions of a rain garden. They also provide habitat for wildlife.*

➤ *Do not use chemical fertilizers and pesticides. They pollute our waterways and harm wildlife.*



To learn more about Butterfly Enthusiasts of Southeast Texas, go to: [www.best-naba.org](http://www.best-naba.org)

## **Task #2—Publications**

**General Goal: The publication of two brochures that address non-point source pollution issues as these relate to residential and non-residential landscapes.**

The two brochures included were:

Five Tips for Organic lawn Care on the Upper Texas Gulf Coast

One of the main contributors to non-point source pollution entering Galveston Bay is runoff from residential and commercial lawns. This brochure addresses ways to maintain an attractive, healthy lawn while reducing protecting the health of our bayous and bays.

Avoiding Weed Wars: Strategies for Success, Neighborhood Friendly Natural Landscapes.

When homeowners make the decision to reduce the size of their lawns by replacing turf areas with watersmart plants in an effort to minimize the negative environmental impact of their landscapes, they are sometimes met with resistance from neighbors or neighborhood associations. This brochure addresses ways to best accomplish and communicate the goal while minimizing or eliminating confrontation.

These have both been very popular at presentations and seminars, outreach events, and as requested by mail. Harris County Storm Water Quality Section (now known as Harris County Watershed Protection) was instrumental in funding the printing of the Organic Lawn Care brochure.

**Copies of brochures: See Appendix D**

## **Task #3—WaterSmart Landscaping website**

**General Goal: To reach the widest audience for continuing the dissemination of information on ways to minimize nonpoint source pollution through positive landscape choices and practices.**

The WaterSmart Landscaping website, [www.watersmart.cc](http://www.watersmart.cc) was updated and its database of plants expanded. More than five hundred plants are now searchable at the website. Funding for the expansion was made possible by the Texas General Land Office's Coastal Management Program under the same grant cycle which supported the demonstration landscape installations.

A self-guided tour to locate the demonstration landscapes can be found at [www.watersmart.cc](http://www.watersmart.cc) and clicking on the "Take a WaterSmart garden tour" link located just below the left corner of the home page illustration.



# WaterSmart Landscapes

For the Upper Texas Gulf Coast

*WaterSmart Landscaping Workshop and Plant Sale*  
*Saturday, June 2, 2007*

[About Us](#) | [Events & Classes](#) | [Volunteer Opportunities](#)

[Why WaterSmart?](#) | [Site Map](#) | [Animated Landscape](#) | [Search Plants](#)

Select a Category



**Take a WaterSmart garden tour.** See WaterSmart principles in action! Six WaterSmart demonstration landscapes have been installed over the past year and a half. With the exception of the Sam Rayburn Ecology Center, all are open to the public.

To use this landscape, mouse over objects and click for information.  
Last Modified: Oct 27, 2005 - Contact: [webmaster](#) - Visited: 29,406 Times



[www.watersmart.cc](http://www.watersmart.cc)

## Award and Recognition

The WaterSmart Program was the recipient of Texas Master Naturalist Galveston Bay Chapter's Treasures of the Bay award given "in recognition of outstanding initiatives in preservation, restoration and education which have made a positive impact on the Galveston Bay Area community." The efforts of bringing education and outreach on environmentally-friendly landscaping and creating the demonstration landscapes funded by the Coastal Management Program were recognized by this award.

**Related material: See Appendix E**



The Texas Master Naturalist Galveston Bay Chapter Treasures of the Bay Award—December 2006



## **Appendix A**

# Along the Bayou

## ECOEXPLORATIONS

ARMAND  
BAYOU  
NATURE  
CENTER

[www.abnc.org](http://www.abnc.org)

Summer 2006



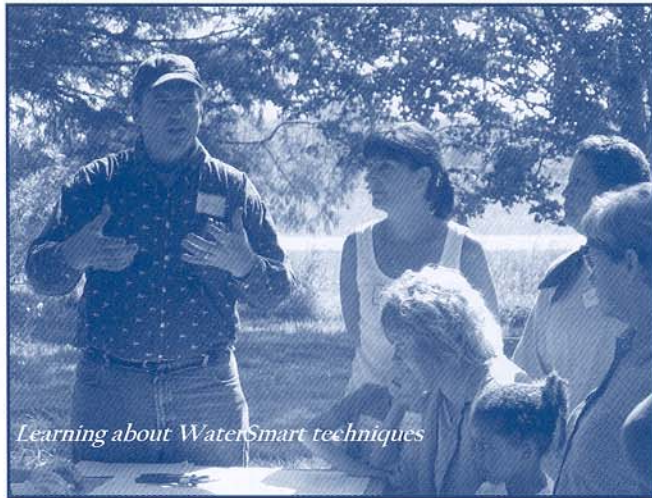
# Restoring the Earth

## WaterSmart Lessons

by Chris LaChance

**A**t a time when it appears the environment is being assaulted on many fronts, it is heartening to realize we can have a positive impact on at least our own little corner of the earth. Landscapes are often viewed as an afterthought, something to add interest to a structure. Typically, a

the landscapes can withstand our harsh climate of floods and droughts and we can eliminate the need for chemical fertilizers and pesticides. Once established, the plants flourish without an over abundance of water—a definite plus when we consider that 50-60% of a community’s water resources go to watering landscapes.



*Learning about WaterSmart techniques*

home landscape consists of an expanse of lawn and a few shrubs. And yet, these same landscapes have the potential to reach deeper into our collective environmental psyche to show that we can have beauty and function while heightening our sustainable sensitivities. “WaterSmart” demonstration landscapes showcase techniques—design, soil preparation, plant

water runoff. Armand Bayou Nature Center offers a prime location for “WaterSmart” demonstration gardens, offering immediate educational opportunities to local residents and the entire Houston and Galveston Bay area. Four such landscapes are well established—the Hanson House Conservation-scape, the Home Habitat Garden at the admissions building, A Prairie Home Landscape at the prairie platform and A Garden for the Birds located at the bird blind. Now a fifth has been added at the Heiman House: A WaterSmart Habitat Home Landscape. These “nature friendly” gardens demonstrate the diversity of



*Chris LaChance in the newly planted garden*

native and non-invasive adapted plants for the home landscape.

Major funding for this project was provided by a grant from the Texas General Land Office’s Coastal Management Program and coordination was performed by the WaterSmart Landscaping Program. Harris County Precinct 2 donated soil; additional financial contributions came from several ABNC volunteers and Board members. Mark Bowen of Living Art Landscapes designed the garden and supervised the crew of volunteers who installed it. Volunteers included Galveston and Harris County Master Gardeners, Galveston County Master Naturalists and ABNC Volunteers.

Eagle Scout Clint Holsomback and scouts of Troop 848 prepared the site and installed pathways for Clint’s Eagle Scout project.

*Continued on page 7*



*Martha Hood and Kathleen Crabb discuss the layout*

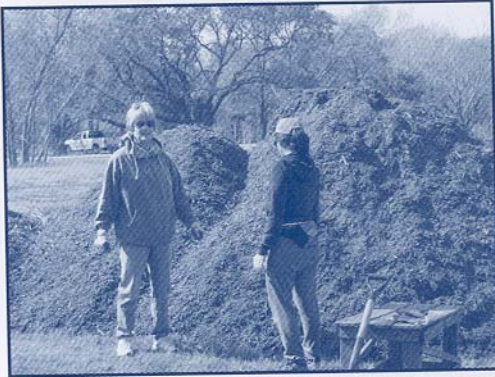


*The planting crew*

*These “nature friendly” gardens demonstrate the diversity of native and non-invasive adapted plants for the home landscape.*

selection, maintenance—that conserve water, protect water quality and add habitat for wildlife. Because native and non-invasive adapted plants are used,

## WaterSmart continued...



*Ellen Gerloff and Fiorela Thibodeaux survey the mulch*

The “critter excluder” fence was built by the nature center’s own Gem Crew, under the direction of J.T. Chapman. Other nature center volunteers were

Kathleen Crabb, Cris Santiago, Martha Hood, Fiorela Thibodeaux, Judy Schaefer and Chuck Snyder.

The next phase for A WaterSmart Habitat Home Landscape will be the addition of plant tags and informational signs. Future plans will include a self-guided garden tour information leading visitors to all five landscapes and the possibility of scheduled landscaping classes.

The WaterSmart Program, part of the Texas Coastal Watershed Program is grant funded through Houston Endowment and administered through Texas

Cooperative Extension and Texas Sea Grant, programs of the Texas A & M University System.



*Bob Paxton, Amal Bhattacharya and J.T. Chapman*

## **Appendix B**



University  
of Houston  
Clear Lake

June 1, 2006

Ms. Chris LaChance  
WaterSmart  
Texas A&M Cooperative Extension/Texas Sea Grant  
17000 El Camino Real, Suite 301  
Houston, Texas 77058

Dear Ms. LaChance:

On behalf of my colleagues at the University of Houston-Clear Lake, thank you for your organization's grant in support of the Environmental Institute of Houston (EIH) and its new School Habitat Demonstration Lab. Your contributions to the landscaping, planting and design have played a large part in the habitat's development, and made it a reality for enjoyment by the UHCL community and others within the Clear Lake area. It was also a pleasure to have you on campus last week.

We are very grateful for the many other ways in which your organization has partnered with EIH over the years, and we look forward to continuing to work with you in the future.

Best regards,

William A. Staples  
President

xc: George Guillen, Director, Environmental Institute of Houston  
Brenda Weiser, Director of Environmental Education, EIH

e

inside:

- inspire, imagine, invite
- environmental institute branches out
- new distinguished alumni named
- on location: UHCL's public art

E G R E T



**creative landscapes**  
art programs shape the UHCL experience

## HOW DOES YOUR GARDEN GROW?

Urban and suburban students will have increased opportunities to learn about their areas' native plants and the role natural resources play in their communities with a \$20,000 grant from the Meadows Foundation, awarded to expand the school-based environmental education program run by UHCL's Environmental Institute of Houston. The money will increase the number of schools where the institute offers School Habitat workshops, an initiative begun in the late 1990s.

School habitats provide educators a safe environment to conduct hands-on lessons for students. A habitat lets students walk outside the classroom and, without having to travel, begin studying the plants and animals native to that area. In addition, students become more aware of their responsibilities as stewards by building birdhouses and trails as well as participating in other environmental projects.

"Most of today's population lives in either an urban or a suburban environment," says Brenda Weiser, EIH's director of environmental education. "Many of these students, not to mention their parents, never experience the outdoors nor do they understand how they are part of their community."

Work by the institute, which has been located at UHCL since its inception in 1991, already has resulted in 37 school habitats in 12 school districts throughout the Houston-Galveston area. Most of these sites feature combinations of ponds and streams; vegetable, butterfly or hummingbird gardens; beehives; forest, desert, grassland or wetland areas; and structures such as bridges, shade areas or windmills.

"Students of today are voters of tomorrow, and we want them to understand that they can make an impact on the environment and natural resources," says Weiser.

Lack of environmental education among teachers is another problem EIH works to reconcile. More than 800 teachers have participated in 25 School Habitat workshops offered through the institute since 1999. Each workshop serves 40 to 50 teachers on average. Schools hosting full-day workshops receive \$1,000 in curriculum tools from EIH, while those hosting half-day programs receive \$500 in materials. The Meadows Foundation grant will be used to pay for workshops and materials for 10 to 20 schools in 2006-07.

A model habitat is being built at UHCL where teachers and students can get a taste of environmental education.



Helping children study the flora and fauna in UHCL's model habitat are EIH's Director of Environmental Education Brenda Weiser (l), Curriculum Specialist Wendy Reistle, Texas A&M Sea Grant and WaterSmart Coordinator Chris LaChance and Habitat Curriculum Specialist Sheila Brown.

Right, volunteers from Lyondell Chemical Co. spent a rainy Saturday in May transforming the grass and concrete in front of the EIH building into Phase I of the model habitat.



“Students, like many adults, know little about their environment, natural resources, or the interdependencies among them,” says Weiser. “Though Houston is one of the largest cities in the nation, located near the Gulf of Mexico and built on a system of bayous, little emphasis is placed on the importance of coastal natural resources, water education and the relationship to the urban environment.”

The WaterSmart School Habitat Demonstration Lab, being built in two phases, will be used to teach hands-on habitat lessons to teachers attending School Habitat workshops at UHCL. Volunteers at Lyondell Chemical Co. chose to build the demonstration lab as a community service day project and began Phase I, which was completed in spring 2006.

Phase I features a pond, rainwater garden, an arbor, songbird garden, butterfly garden, pizza vegetable garden, insect and wildlife gardens, and a wildlife tracking station. The institute is seeking a sponsor for the completion of Phase II of the project, which will contain similar features as well as a wetland.

The site also will be used for pre-K through 12th-grade field trips, research by UHCL students and promotion of native and water-smart landscaping to community members.

In addition to the grant from the Meadows Foundation, EIH’s School Habitat program received funding, donations and support from Project Learning Tree’s GreenWorks!, Lyondell Chemical Co., U.S. Fish and Wildlife Service, WaterSmart, Texas A&M University’s Texas Cooperative Extension and Texas Sea Grant College Program, Mark Bowen Landscaping, Bay Area Trees, Houston Products Processing, Harris County Master Gardeners and community volunteers.

EIH has become a leader in building partnerships in environmental research, education and outreach. The institute conducts outreach projects and performs research on regional environmental issues such as natural resource conservation, pollution prevention, public policy and societal issues.

The Meadows Foundation is a private philanthropic institution established in 1948 by Algur H. and Virginia Meadows to benefit the people of Texas. The foundation’s mission is to assist the people and institutions of Texas improve the quality and circumstances of life for themselves and future generations.

To view the EIH demonstration lab, visit the lab’s webcam at <http://www.eih.uhcl.edu>. For more information about the Environmental Institute of Houston at UHCL, call 281-283-3950 or visit <http://www.eih.uhcl.edu/education>.



Beryl Striewski



University  
of Houston  
Clear Lake

April 4, 2007

Dr. John Jacob  
Texas Coastal Program  
17000 El Camino Real, Suite 301  
Houston, TX 77058

Dear Dr. Jacob:

Both personally and on behalf of the University of Houston-Clear Lake, I want to express my deepest appreciation for the generous support and funding provided by the Texas Coastal Watershed/WaterSmart Program for the WaterSmart School Habitat Demonstration Lab. As you know, the WaterSmart School Habitat is located on the UH-Clear Lake campus at the Environmental Institute of Houston facility and is a true community project. There have been many partners involved in making this dream a reality, but without the technical and financial assistance provided by Ms. Chris LaChance the habitat would not have been completed in such a timely and professional manner.

I would like to recognize Ms. LaChance in particular for all of her efforts and contributions. Initially, she agreed to be one of our key sponsors and to provide over \$6,000 that was used toward the hiring of a professional landscaper. In addition, she has contributed numerous hours at the habitat as she assisted in the planning and construction of the site. She has shared her expertise and assisted with plant selection and plant delivery for the habitat. And in May 2006, Ms. LaChance weathered heavy rains to once again assist with the site as volunteers made final bed preparation, planted the many watersmart flora, and laid the liner for the pond.

Ms. LaChance continues her involvement as she helps coordinate the work of other partners at the site, including the Master Gardeners and Master Naturalists, and by purchasing and providing additional supplies and plants for the habitat. In addition, Ms. LaChance has been supportive of the Clear Creek ISD Alpha Program as she has volunteered her time to teach CCISD's 4<sup>th</sup> grade Alpha students as they visited the site this year. The students have learned how to plant vegetables, herbs, and flowering plants in addition to garden maintenance. These experiences can often be looked upon as significant life experiences.

I would also like to say thank you to other WaterSmart associates, Chariss York and Diane Humes, who have provided assistance over the year. Diane worked closely with UHCL students to install a Purple Martin Bird house and to remove invasive weeds.

Office of the President

2700 Bay Area Boulevard    Houston, Texas 77058-1098    (281) 283-2004    FAX (281) 283-2010    www.uhcl.edu

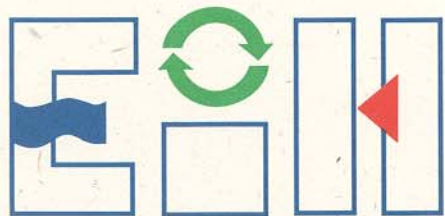
Finally, we greatly appreciate your recent donation of educational signage that will inform and educate future citizens, children and students who will visit the site. With your support we have created a home for wildlife, plants, and the community. We are able to provide an opportunity for students to learn about wetland protection and for community partners to work together for a common cause. By supporting teachers, we ensure that watershed education is a vital part of the curriculum. Most importantly, teaching stewardship is a priority for our future generations as they become active members of the Galveston Bay watershed. Your critical support has helped us create a beautiful watersmart school habitat on the UHCL campus that will leave a legacy for future students, teachers, and the community to enjoy while learning about the environment. Without your assistance and support this could not have happened.

Once again, we thank you and we are proud to have you as friends and partners in this endeavor. We look forward to future opportunities to work together on projects that promote conservation and environmental education in our community.

Best regards,

A handwritten signature in cursive script that reads "William A. Staples". The signature is written in black ink and is positioned above the typed name and title.

William A. Staples  
President



March 20, 2007

Environmental Institute of Houston

Chris LaChance  
WaterSmart Program Coordinator  
Texas Cooperative Extension/Texas Sea Grant  
17000 El Camino Real, Suite 301  
Houston, TX 77058

Dear Chris:

Thank you for taking time out of your busy schedule to present to the EIH/UHCL Regional Collaborative Science Teacher Mentors on March 19, 2007. I heard some very complimentary comments about your presentation on "Gardening with Your Class the WaterSmart Way." You and Carol did a great job.

Your enthusiasm for helping our local community teachers is very much appreciated. I hope you will continue to share your valuable time and expertise.

Thank you again for taking the time to present to the EIH/UHCL Regional Collaborative STMs here at the University of Houston-Clear Lake.

Sincerely,


Brenda Weiser, Ed.D.  
EIH/UHCL Regional Collaborative Project Director  
Director of EE/Environmental Institute of Houston

April 11, 2007

4302 Island Hills Dr.  
Houston, TX  
77059

Dear Ms. LaChance,

Thank you for teaching us at EIH Watersmart School Habitat. You taught me so many things. From strawberries to talking to us in the building. Thank you for all the wonderful pictures you have taken. You are very smart (I can tell), kind, caring, and very fun. You make something seem fun and another teacher would have made it dull. There is no doubt, we could not have done this without you!!

Sincerely,  
Ash Nair 

April 11, 2007

4302 Island Hills Dr.  
Houston, TX  
77059

Dear Ms. LaChance,

Thank you for teaching us at EIH Watersmart School Habitat. You taught me so many things. From strawberries to talking to us in the building. Thank you for all the wonderful pictures you have taken. You are very smart (I can tell), kind, caring, and very fun. You make something seem fun and another teacher would have made it dull. There is no doubt, we could not have done this without you!!



Sincerely,  
Ash Nair 😊

April 11, 2007

15203 Diana, Lane

Dear Ms. La Chance,

Thank you for teaching us at EIH Water Smart School Habitat! You've helped me SOOOOOO much for helping me! I have really enjoyed you there helping us! I really don't know how to say thank you because it would last for ever!



get it  
ladybug  
A-Z-Z-Z

you are  
a nice lady

love,  
Devon  
Gardner



this is all of  
the vegetables  
that you helped  
pull out!

## **Appendix C**



A Publication of the Texas Water Resources Institute

tx

H<sub>2</sub>O

volume 2 | number 2

In This Issue:

- PARTNERING WITH THE MILITARY • TEXAS GOLD RUSH • NATURAL PREDATOR
- A PIECE OF THE PUZZLE • EVERY DROP COUNTS • AND MORE

# Be Water Smart

*Conservation program incorporates rain gardens*

**W**aterSmart, a water conservation program, uses a unique approach to protect and conserve water quality and quantity in upper Texas Gulf Coast urban landscapes.

Part of the Texas Coastal Watershed Program (TCWP), WaterSmart is creating rain gardens as just one method of demonstrating how water conservation can function in an attractive landscape.

In December of 2005, the first demonstration WaterSmart rain garden was established at the Bay Area Courthouse Annex in Clear Lake City in partnership with Harris County Precinct 2. The rain garden, which filters stormwater coming from the annex's roof and sidewalks, has generated much interest from businesses and homeowners.

John Jacob, team leader of TCWP, said, "We are having a major impact with early adopters—those who are willing to make a switch to more sustainable landscaping practices now.

"We need many, many more of these early rain-garden adopters to be able to start to reach all the rest of the homeowners and groundskeepers who manage landscapes," he said.



Chris LaChance, WaterSmart Program coordinator, said rain gardens are a new concept to many people, although other parts of the country (Michigan, the northeast, Pacific Northwest) have been using them for several years. “When the light bulb goes off, they realize it’s a win-win situation. They can create a beautiful addition to their landscape, help protect water quality, recharge groundwater and add habitat for wildlife,” she said.

The WaterSmart program brings information about runoff pollution and water conservation to the attention of homeowners, garden clubs, environmental groups and city planners, and addresses coastal issues. Texas Cooperative Extension and Texas Sea Grant provide the leadership for the program. And a grant from Houston Endowment provides funding.

LaChance said there are other water conservation methods that can function in attractive landscaping such as edible landscapes, or even adding shrubs or vines.

According to the TCWP Web site, residential and commercial landscapes on the upper Gulf Coast of Texas consume at least 50 percent of municipal water supplies during the summer months. In addition, runoff from highly maintained landscapes pollutes sensitive bays and bayous.

Jacob said, “Residential and commercial landscapes are a major source of polluted runoff in our bays and bayous, and they are perhaps the ‘lowest hanging fruit’ that we can pick in addressing this area.”



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Rain gardens can be created by taking advantage of naturally low-lying areas that collect water. Rain gardens help divert the flow of excess water from roofs, driveways, parking lots, and lawns, while offering a low-maintenance way of gardening. This site is ready to be excavated and planted with water-loving plant species.



The program's Web site explains that rain gardens are made from a shallow depression in the landscape at least 10 feet from a building. The sod is removed and excavated to create a shallow, bowl-like area. Compost and sharp sand is added to the soil and planted with a mixture of native or non-invasive adapted trees, shrubs, grasses and flowers that can tolerate temporary wet conditions. A layer of mulch prevents weed growth and aids in filtration.

These low spots fill with water during periods of heavy rain, helping to reduce water runoff by capturing, soaking up and filtering excess water from roofs, driveways, parking lots and lawns.

She said that rain gardens can be simple or complex. No rain garden is too small or too large, and cost and size is really site specific. People need to understand

deed restrictions and landscape ordinances to allow for any variance that might need to be obtained before installation. People must also understand that it is important to "call before you dig" to be sure that no utility lines are present, LaChance said.

Supplemental grants from entities such as Texas General Land Office's Coastal Management Program, Galveston Bay Estuary Program and others allow LaChance to install demonstration gardens; coordinate workshops; consult with communities; homeowners, and environmental groups; and offer presentations to a wide variety of audiences.

Minimal grass cover and maximum use of native and adapted plants produce a WaterSmart landscape that requires less water, little or no fertilizers and pesticides, and is easy to maintain. The WaterSmart

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This rain garden has been designed to fit naturally with the landscape and was planted with water-loving plant species. These plant species create a landscape that will collect water and aid in diverting the flow of runoff water.

program's goal is to provide a tool that will help people landscape in a way that is low maintenance, beautiful and does not negatively impact the environment.

“The next phase of the WaterSmart program will add a new component to the existing program, landscaping for wildlife, called Habitat Highways,” said LaChance.

Jacob said that the WaterSmart program will be needed for a long time because people will want to continue to water and fertilize lawns. “We will need to help them minimize the impacts,” he said.

For more information, visit TCWP's WaterSmart Landscapes Web site at: <http://www.watersmart.cc/>. 

## TCE Connection

# Rain Gardens – the Trend in Beauty and Function

By Kim Fuller



Kim Fuller is a free-lance columnist for TNLA Green Magazine.

Just Google “rain gardens” on the Internet and you’ll be flooded with information - information that ranges from reasons why to rain garden, to the how-to’s of rain gardening, to locations of demonstration sites. For years the industry has been trying to instruct, promote, and plant Xeriscapes or water conserving gardens and now rain gardens are the rage? What’s the deal?

Both types of gardens or gardening practices work to conserve water. Xeriscapes approach conservation by using less overall water, while rain gardens conserve by catching and absorbing the site’s rainfall and thereby reducing stormwater run-off.

According to Chris LaChance, WaterSmart Landscaping Coordinator, a rain garden is “a natural or excavated depression planted to look like a garden that soaks up runoff from roofs, driveways, parking lots, and lawns.” WaterSmart Landscaping is a program of Texas Cooperative Extension and Texas Sea Grant, part of the Texas A&M University System, and is funded by a grant from Houston Endowment.

Retention areas and ponds have been the norm for years in commercial development. Although effective, these sites are often unattractive and unnatural. Rain gardens have brought beauty and function

to “retention ponds,” making stormwater management attractive to the homeowner as well as commercial entities.

Government studies have shown that up to 70 percent of the pollution in our streams, rivers, and lakes is carried there by stormwater. Rain gardens mitigate these pollutants by holding the water for a short time. LaChance explains, “The garden allows the stormwater to percolate through the plants and soil, which acts as a filter,

cleaning up sediments and possible pollutants before it enters the storm drain.”

Rain gardens are designed with a dip at the center to collect rain. Any degree of indentation is useful, from slight dips made with your garden trowel to large swales created by the professional. The first flush of rainwater is ponded in the depression of the rain garden, and contains the highest concentration of materials washed off impervious surfaces such as roofs, roads, and parking lots.

Because the purpose is to capture impervious run-off, strategic placement is crucial. Locate the rain garden next to hard surfaces such as sidewalks, driveways, and under gutters.

Ideal components for a rain garden include a buffer strip of turf, the ponding area, and a mulch or organic layer. A turf buffer slows water as it enters the rain garden and its surface filters particulates from the runoff. The ponding or depression area stores the water, provides for evaporation, and allows the particulate material, not filtered by the turf buffer, to settle to the bottom. Preferably, the ponding area should have a depth sufficient to provide adequate water storage, but should not have standing water for more than two to five hours.

During its decomposition process, the organic material plays an important role in the removal of metals. Shredded hardwood mulch is popular due to coverage and binding qualities that resist flotation and washout.

“Rain gardens provide stormwater management right at the site and keep the water from going somewhere else to be treated,” states LaChance. To show the Houston community the specifics of how a rain garden operates, a demonstration rain garden was planted in December 2005, in the front of the Bay Area Courthouse Annex, at 16603 Buccaneer in Clear Lake.

For more information, contact Chris LaChance at 281.218.0721, or e-mail her at [c-lachance@tamu.edu](mailto:c-lachance@tamu.edu).



*Jan. 30, 2006, 6:55AM Houston Chronicle, Home and Garden*

## **LAZY GARDENER**

# **Creating rain gardens is WaterSmart approach**

## **Concept benefits plants, homeowners by utilizing runoff**

**By BRENDA BEUST SMITH**

Spring and fall are our rainiest seasons. Now's a good time to look at areas where water stands in yards after heavy downpours.

Instead of moaning, consider how to use these spots to your advantage. The concept of a rain or bog garden was first publicized in this area years ago by Anita Nelson of Nelson's Water Gardens. Now Texas A&M University and other agencies are supporting a program called WaterSmart to encourage homeowners to utilize excess rainwater.

Subsidence from the excessive removal of ground water is cracking house foundations all over the Gulf Coast. The proliferation of concrete is preventing reabsorption of rainwater into subsoil layers.

Most of our rainwater runs off into sewers, taking with it lawn and garden chemicals that are detrimental to our bayous and bays. Heavy runoff contributes to flooding.

During summer, prolonged droughts and resultant water rationing are hard on plants. Dry subsoils encourage roots to grow upward, reaching for moisture in often-dry, overheated upper levels.

Shallow root systems are weaker and more susceptible to insect/disease damage. Shallow rooted trees are more likely to topple during heavy winds or flooding periods.

Rain gardens can help with all of these problems. Where they can be installed efficiently and correctly, they are a win-win situation for everyone.

The WaterSmart program is funded by a Houston Endowment grant and administered through the Texas Cooperative Extension. Coordinator Chris LaChance is charged with helping homeowners, schools and businesses create more rain gardens.

The first official WaterSmart garden installed is still going strong at the Bay Area Courthouse Annex in Clear Lake City, an area where water rationing made the concept of stockpiling excess rain especially appealing. A rain garden filters storm water into subsoil levels, leaving no standing water to attract mosquitoes. To loosen soil that holds water too long, dig the area deeper and work in compost and/or sharp (masonry) sand.

A rain garden can be a stand-alone area or part of another garden where the ground is naturally low. Rain gardens can also be built adjacent to ponds, to attract more wildlife.

More suggestions from LaChance and Angela Chandler, Harris County Precinct 2 master gardener:

- Make sure you know where utility lines are located before digging.
- Don't put a solid border around the rain garden. The flow of water into the area (and out in heavy rains) is essential.
- Locate the garden at least 8-10 feet away from house foundations and make sure the water flows away from structures.
- Make sure trees near the rain garden can take extended periods of excess moisture.
- Use swales (low, dry creek beds) to direct water from the rest of the yard into the rain garden. Some plants, such as compact ruellia, thrive in these areas. Or fill them with decorative stones.

If well planted, a rain garden will be low maintenance. Like any garden, it may attract weeds that will need pulling. A heavy mulch will help retard weed growth and keep the garden high in organic matter (that will help water seep down faster).

Another way to help filtration is to keep foot traffic in the area to a minimum. This compacts the soil. Stepping stones will help. Don't use heavy equipment to dig the garden.

One last tip from Chandler: Be patient. A thriving, beautiful rain garden can take up to three years to become well established. It will function more efficiently once the plants have set strong, deep root systems.

Great tips are available at the WaterSmart Web site, [www.watersmart.cc](http://www.watersmart.cc) and [www.raingardens.org](http://www.raingardens.org) (a Michigan site, so be careful of actual planting advice).



# RAIN GARDENS

WORKSHOP AND PLANT SALE  
SATURDAY, MAY 13, 2006

Create a beautiful garden and help the environment at the same time. Discover the joy and satisfaction of a rain garden in the home landscape. Attend this workshop and learn how to create a visually-appealing natural area that will attract birds and butterflies, store rainfall and improve local water quality.

Workshop 9 a.m.—12 noon  
Instructors: Angela Chandler, President of Harris County Master Gardeners, and Chris La Chance, WaterSmart Program Coordinator.  
\$10 preregistration; \$15 at the door.

Plant sale free to the public 12:30–2 p.m. (Workshop participants may begin shopping at 12 noon.)

See next page for workshop registration information.

The plant sale will feature low-maintenance varieties ideal for our area, including hard-to-find beauties for butterfly and hummingbird gardens and many selections especially suited for local rain gardens. These plants are all Texas-tough survivors.

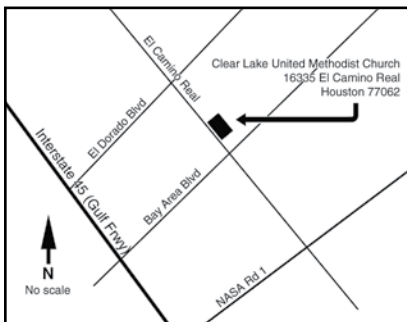


### Event Location

Clear Lake United Methodist Church  
16335 El Camino Real  
Houston 77062

### Information

281.991.8437  
<http://hcmgap2.tamu.edu>  
<http://harris-tx.tamu.edu/hort>



Extension programs serve people of all ages regardless of socioeconomic level, race, color, sex, religion, disability or national origin. The Texas A&M University System, U.S. Department of Agriculture and the County Commissioners Courts of Texas cooperating.



Ninth

# WILDSCAPES WORKSHOP & Native Plant Sale- Landscaping for Wildlife



## AGENDA

Saturday, September 9, 2006

9:00 am – 3:00 pm

8:00 am	CHECK IN BEGINS
9:00 — 9:10 am	<b><u>WELCOME AND OPENING REMARKS</u></b> Dee Howell, Horticulturalist- City of Houston Parks & Recreation
9:10 — 10:00 am	<b><u>WATERSMART LANDSCAPING</u></b> <b><u>Rain Gardens &amp; More</u></b> Chris LaChance- Watersmart Program Coordinator, Texas Coastal Watershed Program
10:00 am – 10:15 am	Questions/Break
10:15 — 11:00 am	<b><u>GREAT PLANTS</u></b> <b><u>For a Wildscapes Landscape</u></b> Diane Cabiness- Diane Cabiness Native Plants
11:00 am – 12:30 pm	Boxed LUNCH in Atrium
11:00 – 3:00 pm	NATIVE PLANT SALE in Atrium
12:30-1:15 pm	<b><u>INVASIVE PLANTS</u></b> <b><u>Invaders of the Houston-Galveston Region</u></b> Lisa Gonzalez- Research Scientist, Houston Advanced Research Center
1:15 – 1:45 pm	Questions/Break/Plant Sale Shopping
1:45 – 2:30 pm	<b><u>HUMMINGBIRDS &amp; NATIVE PLANTS</u></b> Mark Klym- Texas Parks & Wildlife Department
2:30 – 2:40 pm	RAFFLE/CLOSING REMARKS
3:00 pm	PLANT SALE CLOSES

## **Appendix D**



FIVE TIPS FOR



*Organic Lawn Care*  
ON THE UPPER TEXAS GULF COAST



# Why an Organic Lawn?

Green, suburban lawns are beautiful, but are they worth the price? Frequent watering depletes our finite water supply while excessive pesticides and fertilizers harm our bays and bayous. Runoff from rainwater carries lawn chemicals to our waterways. Fertilizers feed algae that remove oxygen from the water and pesticides are toxic to many forms of aquatic life. Lawns and turf are one of the largest "crops" grown in the United States. An organic approach to lawn care minimizes the use of toxic chemicals and produces a beautiful green lawn.

One of the main causes of disease in Gulf Coast lawns is excessive watering. Organic lawn care methods help reduce this wasteful practice. Our population is growing, but not our water supply.

Organic lawn care is not just replacement of chemical pesticides with organic pesticides. Organic lawn care is a combination of practices. It is about making sure the conditions for good growth are maximized and the conditions for weeds and disease are minimized.



## *Mow at the right height and Grasscycle.*

Mow at the right height for the grass. Recommended heights for St. Augustine grass is 2.5-3.5 inches, Bermuda grass, 1-1.5 inches. Taller grass develops deeper roots and thus makes better use of water in the soil. Never mow more than 1/3 of the grass length. Cutting too much at once stresses the grass and leads to disease or insect problems. Never bag your lawn clippings. Remember to grasscycle - lawn clippings are free organic fertilizer and supply 25% or more of your lawn's needs. Consider a "mulching mower" next time you buy a mower. Mulching mowers make smaller clippings and blow them down into the grass where they can quickly turn into fertilizer.

## Fertilize Organically.

Even an organic lawn will need some additional fertilizer to stay green. Organic fertilizers are slow release in form, providing a long-term green up of the lawn. This healthy fertilizer might be composed of fishmeal, bone meal, blood meal, seaweed, cottonseed meal, compost, or other materials. Organic lawn care is based on the premise of feeding the soil as well as the grass. The "soil food web" is a complex ecosystem of microorganisms, insects, spiders, etc. Organic fertilizers nourish microorganisms as well as provide nutrients for plant growth. And lawns grown in soils rich in organic matter require much less water.

LAWN CLIPPINGS  
*can supply at least*

DON'T BAG IT! USE A  
MULCHING MOWER.

of the fertilizer needed by  
your lawn.

# Adding Good Compost

is the

# #1

practice that builds

# GOOD SOIL.

APPLY A 1/4-INCH LAYER OF  
1/4"-SCREENED COMPOST  
IN THE SPRING.

Yes, organic fertilizers are more expensive than chemical fertilizers, but they do many jobs. Not only do they feed your plants and soil, but they also reduce pollution on land and sea. The best organic fertilizers will come with a "guaranteed minimum analysis", a set of three numbers which indicate the amount of nitrogen, phosphorous and potassium in the formula.

How much is enough? The recommended rate for our region is 1lb of nitrogen per 1000 square feet for any single application of fertilizer. To figure out the amount of fertilizer you need, divide 1 by the percentage of nitrogen (the first of the three numbers on the label) and then multiply by 100. For a fertilizer with 5% nitrogen, apply 20 lbs. of fertilizer/1000 square feet ( $1/5 \times 100 = 20$ ). Fertilize twice a year, spring and fall. With any fertility program, it is important to have a soil test completed every 2-3 years to learn how much fertilizer is really needed, and to make sure excessive levels of nutrients such as phosphorous do not occur.



### *Good compost is the ultimate soil additive.*

Compost is the ultimate organic practice. It simply returns to the earth that which has been removed. Yes, compost is organic waste, but it is not wasteful. It is much more than simply a fertilizer. Good compost acts as a soil stabilizer and a sponge that not only retains water, but also releases it when needed. It is nature's ultimate slow-release fertilizer.

Commercial organic fertilizer is similar to compost, but true compost usually has a higher content of plant material, and thus has more of the "humus-like" materials that act as true soil stabilizers. Because compost usually has a lower nutrient content than commercial-grade organic fertilizer, you may still need to occasionally apply commercial organic fertilizer to have a solid green lawn.

All compost is not the same. Low quality compost – the kind most commonly available – may actually tie up nutrients needed to feed your lawn. High quality compost is fully decomposed and has no odor. It should feel "smeary" with few wood chips or obvious plant parts. Spread high quality compost 1/4" to 1/2" inches thick once a year in spring or early summer. Finely screened (1/4") compost works best. Let the cycle of nature work for you.

Care should be taken with composts with high amounts of manure or biosolids, as the application rates given above could easily result in excessive amounts of nutrients that could end up in runoff. Always ask about the source of the compost and what went into it.



## Use less Water. *Tip #4*

Overwatering is the most frequent mistake a homeowner will make in lawn care. It is one of the main causes of brown patch and other fungal diseases. A few simple rules will help you maintain a beautiful yard with minimal watering.

- Wait until it wilts. Grass will not suffer with a little wilting. Most grasses will turn a bit dark or dull when the plant is in water stress. Grass under water stress shows tracks after someone walks across the lawn.
- Apply water in a series of short intervals. Allow 1/4 to 1/2" of water to soak into the earth before the next application. Most lawns perform quite well on 1" of water applied each week during the growing season. Never apply water to the point of runoff.
- Water early in the morning. This will minimize loss due to evaporation and wind.
- Know your water usage. Place a small container, such as a tuna can, in the lawn while watering. Note the time necessary for collection of 1" of water. Thus you can time your water applications.

## *Tip #5* *Pest Management.*

The goal of organic management is the development of healthy turf that resists pests with little intervention. However, a lawn is an artificial system and subject to attacks by a variety of pests. Organic solutions require organic materials made from plants and animals. On the Upper Gulf Coast, our main problems are chinch bugs and brown patch. Chinch bugs thrive in dry, stressed grass. Proper irrigation is the best way to keep these pests at bay; compost will help retain moisture. Little research has been done on the organic treatment of chinch bugs. Neem oil is reported to be somewhat effective against chinch bugs. Do not treat dead grass areas. It is the edges around the dead areas where chinch bugs thrive and need control. A diverse lawn is often the best prevention for chinch bugs. A mix of Bermudagrass and St. Augustine provides great protection, although this mix is not appealing to some homeowners.

Excessive water and fertilizer promotes Brown Patch. Reduce irrigation in the spring and fall to avoid the wet conditions necessary for Brown Patch. Use organic fertilizer and good compost to build the soil food web under your grass. Brown Patch does not destroy a lawn. It is a cosmetic issue that can be reversed by appropriate watering and fertilization.

A weed is just a plant that is out of place. A little toleration is the best remedy for most situations. A "hand remedy" is the best solution for the larger variety. The promotion of healthy turf is key to crowding out weeds.

In the summer up to  
**50%**

of our municipal water supply is used to  
**water landscapes.**

Water early in the day for maximum  
water use efficiency.



100% Recycled / 20% Post-Consumer



## Nature's Way Resources

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# BE PROACTIVE

Understand landscape ordinances and deed restrictions before you begin. Be proactive. Before creating the natural landscape, read copies of local landscape ordinances or deed restriction and become familiar with the process of applying for a variance or permit should these be necessary. These are readily available from city parks department, homeowner association offices or property management company offices. Also, understand the appeal process. Sometimes this may be as simple as a phone call.

Learn about “natural” landscapes both by definition and function. Being able to communicate what is or will be accomplished with the landscape will help to explain the “why” questions. This will also provide an excellent opportunity to win support and possible converts.

Find opportunities to inform others by word and example. Participate at homeowner association or community association meetings, welcome questions from neighbors and create a landscape that others will want to use as an example.



# AVOIDING WEED WARS

*Strategies for Success*

## Neighborhood Friendly Landscapes

### RESOURCES

**Landscaping with Native Plants (4th Edition).** 2004. [www.epa.gov/greenacres](http://www.epa.gov/greenacres)  
**The Landscaping Revolution.**  
Wasowski, Andy. 2000. Chicago, Illinois: Contemporary Books

### FOR MORE INFORMATION

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# NATURAL LANDSCAPES

*As water quality and habitat loss become more compelling issues, people are being drawn to the idea of a more natural approach to landscaping. Natural landscapes, also referred to as habitat gardens, have recently been met with resistance, mainly as a result of miscommunication and misinformation. Despite good intentions, conflicts within a neighborhood, with cities or homeowner associations may occur, but need not be inevitable.*

*Natural landscapes can take many forms—from the rather wild and unkempt to a more traditional, more manicured design. What is important, however, is being mindful of the ordinances, deed restrictions, laws or policies of the location in which the landscape exists or will be created. Laws are changing; cities and homeowner associations are becoming more sensitive to environmental issues, but many still rely on outdated concepts and laws. Use legal recourse as a last resort. Choosing an antagonistic approach is not the best way to win support or approval, but promoting a spirit of cooperation and good will is.*

*Following are some ideas for implementing strategies that foster communication, education and can help avoid confrontation before, during and after the installation of the natural landscape.*



# TIPS AND TRICKS



There are strategies that can be taken within the landscape that can maximize communication and education while minimizing or eliminating confrontation.

## **Gradual change.**

*This could be as simple as including some well placed native plants in the border. A next step might be to gradually enlarge the landscape beds on a yearly basis to avoid negative feedback from skeptics.*

## **Communicate with neighbors.**

*Let them know what the plans will be and keep dialogue positive. This could include keeping neighbors updated as the landscape progresses. Also, welcoming neighborhood children to hear information about the landscape can generate excitement that will be transmitted to the adults.*

## **Use identification tags on plants if possible.**

*Neighbors will want to know the names of plants. This will also add an element of prominence to the landscape and offer an instant source of education.*

## **Create borders or setbacks.**

*A neat and tidy edge will create the appearance of order, even if it's ordered chaos! A setback will also prevent plant material from hanging over curbs and sidewalks.*

## **Practice tolerance.**

*Recognize and acknowledge neighbors' choice in plant material. Arrogance will not win converts.*

## **Avoid straight lines and hard edges.**

*Creating pleasing curved planting beds enhance the natural look of the landscape.*

## **Think “plant communities”.**

*Choosing a variety of plants found in naturally occurring areas such as wetlands or shaded forest and incorporating them in groups create planting zones with the same light and moisture requirements.*

## **Plant in masses for visual impact.**

*Native plants are sometimes not as showy as traditional landscape-plants. Planting them in masses offers eye-catching interest.*

## **Vary plant selection size, color and texture.**

*A more interesting and visually appealing landscape is achieved when plants with varying characteristics are planted together to form a rich tapestry.*

## **Add structural interest.**

*Including garden structures, bird baths or even sculpture will add a personal signature to the landscape.*

## **Practice Proper Maintenance.**

*Above all follow good maintenance practices. Allowing the natural landscape to have a “vacant lot” look will not create a climate of understanding or acceptance.*

Keep in mind the ultimate goal whenever choosing to have a natural landscape area. By setting an example through good communication, information and proper maintenance practices, “weed wars” will be avoided.

## **Appendix E**



Master Naturalist  
Galveston Bay Area Chapter

**Treasures of the Bay  
Non-Profit Award**

Presented to

*Chris LaChance*  
WaterSmart

In recognition of outstanding initiatives in  
preservation, restoration and education which  
have made a positive impact on the  
Galveston Bay Area community  
2006

*Sara Snell*  
\_\_\_\_\_  
President