Exploration Green: Clear Lake’s 200-Acre Multi-Purpose Green Space

AIAA Houston Section Technical Symposium 2017
May 5, 2017
Doug Peterson
Exploration Green Conservancy
Clear Lake area has had seven 100 year floods and three 500 year floods since 1979
Clear Lake Area Flooding
Clear Lake City Water Authority Role

• Over 30 years, flooding has become major issue for Clear Lake City area.
• “100 Year” peak flow in Horsepen Bayou watershed increased by 20% in 1980s alone.
• CLCWA objectives include:
  1. Prevent increased rainwater runoff due to new development
  2. Reduce current flooding through proven methods such as detention
Extreme Weather Events

A Key Texas Message: As the climate warms, increases in hurricane rainfall rates, storm surge height due to sea level rise, and the intensity of the strongest hurricanes are projected.

And in May 2015 a statewide monthly average rainfall total of 9.05 inches, broke the previous all-time monthly record by well over two inches.
CLCWA DETENTION FACILITIES AND ASSOCIATED OPEN SPACE & PARK PLAN

Storm water detention
Water polishing
Conservation
Recreation
Exploration Green

- Located in very heart of Clear Lake community
- Green space for recreation, conservation and flood detention
- City recognizes as key park space of district
- At center of Houston Bike Plan and H-GAC CL Study
- Honors exploration heritage in space and energy
Master Plan Metrics

• 200 acres overall
• 1,680-acre ft storm water storage
• Excavation - 3 M cubic yards
• Water storage depth – 13 ft
• Permanent water depth – 6 ft
• Permanent surface water area – 38 ac
• Water Quality Wetlands – 39 ac
• 5 Habitat islands
• Upland / island areas – 101 acres
proposed typical section in detail
Exploration Green Benefits

- Reduces storm water flooding
- Green space park very accessible to Clear Lake neighborhoods
- Creates and conserves environmental area of natural habitats
- Recognizes Bay Area Houston as “home of human space exploration”
- Adds to walkable area of old Clear Lake City commercial district
- Increases real estate values of local homes
Short History & Milestones

2013. Master plan finalized
2014. Conservancy formed
2014. Conservation easement
2015. EGC awarded non-profit status
2015. Tree & Wetland Nurseries established
2016. Phase 1 excavation begins
2017. Major landscaping begins

Exploration Green Conservancy

- All volunteer group organized to support conservation, recreation, education
- Define alternatives for Master Plan
  - Landscape and natural plantings
  - Park amenities, e.g. trails
- Benchmarked park conservancies and conservation non-profits
- Formed 501(c)(3) non-profit organization
- Develop and maintain all green space amenities
- Raise funds and obtain grants to develop the Green
Exploration Green – A Partnership

- Clear Lake City Water Authority
- Exploration Green Conservancy
- Galveston Bay Foundation
- Trees for Houston
- Sea Grant Texas
- Texas A&M AgriLife Extension
- Texas Coastal Watershed Program
Awards and Recognition

✓ 2013 Mayor’s Proud Partner Award from Keep Houston Beautiful
✓ 2013 Houston-Galveston Area Council (H-GAC) “Planning Award for Parks and Natural Areas”
✓ 2015 Trees for Houston “Arbor Award”
✓ 2015 American Society of Landscape Architects Award to SWA
✓ 2016 H-GAC Our Great Region “Connections Award”
Construction Schedule Accelerates

- **Phase 1** to be complete Fall 2017
- **Phase 2** (Reseda to El Dorado) Fall 2017 to Fall 2018
- **Phase 3** Fall 2018 to Fall 2019
- **Phase 4** Fall 2019 to Fall 2020
- **Phase 5** Fall 2020 to Fall 2021
1. Main entrance and plaza
2. Parking lot
3. Plaza w/ water features
4. Stream w/ boulders and bridges
5. Open area
6. Sports fields
7. Forested area
8. Wetland area
9. Habitat island
10. Preserved wells
11. Trees
12. Paved upper bank trail
13. Bridge crossing
14. Grass lower trail

**Phase 1**

<table>
<thead>
<tr>
<th>WATER STORAGE (ACRE FT)</th>
<th>WATER AREA (ACRE)</th>
<th>WETLAND AREA (ACRE)</th>
<th>ISLAND AREA (ACRE)</th>
<th>TRAIL LENGTH (MILES)</th>
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<tbody>
<tr>
<td>345</td>
<td>8</td>
<td>6</td>
<td>0.5</td>
<td>1.1</td>
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</tbody>
</table>

NOTE: Uses and activities are preliminary and may expand to include other improvements
Urban and suburban stormwater carries pollution

- Wetland plants, soils and microbes reduce and remove contaminants

- Mosquitos reduced by flowing water, and ecosystems support frogs, tadpoles & mosquito fish

- Water flows from streets, yards, streams to wetlands cleansing to bayous to Galveston Bay
• Phase 1a pilot site
• Planted 5000 plants
• June 2016 community planting events
• 1450+ wetland volunteer hours since 2014
Landscaping

Benefits for the Community

- Initial grant of 1,000 native trees, 2,000 more coming
- Islands w/ protected habitat
- Enhanced habitat for resident and migrating birds, butterflies, wildlife
- Diversity of native trees, shrubs, aquatic plants, grasses, wildflowers
- Bird and wildlife watching and education for area visitors
Habitat and Landscaping Plan

- 60 species of oaks, other large trees, understory trees, and shrubs
- Over 200 species of birds, butterflies, amphibians and mammals

Eco-tourism is popular on the flyway
# 60 Species of Trees, Shrubs, Aquatic Plants

## Oaks
- Oak, Burr
- Oak, Cherry Bark
- Oak, Chinquapin
- Oak, Coastal Live
- Oak, Compton
- Oak, Nuttal
- Oak, Overcup
- Oak, Swamp
- Chestnut
- Oak, Water
- Oak, White
- Oak, Willow

## Other Trees
- Black Gum
- Black Cherry
- Cypress (Bald)
- Cypress (Montezuma)
- Elm (American)
- Elm (Cedar)
- Elm (Winged)
- Hackberry
- Hornbeam
- Loblolly Pine
- Maple (Red)
- Swamp Pecan
- Sweet Gum
- Sycamore (AmericaTup)
- Water Hickory
- Water Tupelo

## Understory Trees
- Carolina Buckthorn
- Farkleberry
- Fringe Tree (Mexican)
- May Haw
- Mexican Plum
- Parsley Hawthorn
- Persimmon, Common
- Red Bud (Eastern)
- Red Bay
- Roughleaf Dogwood
- Rusty Blackhaw
- Virburnum
- Sassafras
- Sweet Bay Magnolia
- Wild Crabapple
Tree Nursery

- 2,260 volunteers hours in 2015/16
- Lee College Early College High School students
- Texas Master Naturalists
- Eagle Boy Scout Projects

Tree Planting

- 240 trees planted in 2017
- 160+ volunteers from Boeing, JSC, High School groups, Lee College, local Boy and Girl Scout troops
Accessing best kept secret of Bay Area Houston!

Construction area
Take Reseda

Exploration Green
Access Points
Questions?

Comments?

www.ExplorationGreen.org
Recreation Needs

1. Benches and tables
2. Signs and trash cans
3. Drinking fountains
4. Picnic area
5. Restrooms
6. Nature playground
7. Stream & pebble beach
8. Small amphitheater
9. Planning support
Hike & Bike Trails

1. Center of Clear Lake Bike/Ped Plan
2. Approx. 6-12 miles w/ double trails
3. 10 ft. concrete trail above & water edge grass trail
4. ADA compliant
5. Phase One 1.1 mile connects to sections
6. Connects to other trails in area
7. Off-road to schools, NASA, library, Courthouse Annex, Park and Ride
District E Trails
Bike Plan Maps

Kingwood

Clear Lake
Clear Lake Bike/Pedestrian Study

District 2: Schools & Residential
Recommended Projects

3. CLCCA / Golf Course
   - Signed route along Reseda Dr. between Gemini Ave. and Sea Liner Dr.
   - Signed route along Ramada Dr. between Reseda Dr. and Diana Ln.
   - Signed route along Diana Ln. between Ramada Dr. and drainage ditch.
   - Shared-use path on one side of drainage ditch from Space Center Blvd. to west of El Dorado Blvd.

4. CCISD Drainage Easement Shared-Use Path
   - Shared-use path between Space Center Blvd. & Bay Area Blvd. behind Clear Lake High School

5. Space Center Blvd Shared-Use Path and Intersection Improvements
   - Shared-use path on north side of the road between El Dorado Blvd. and Middlebrook Dr.
   - Improvements at intersections to increase ease and safety of crossings.
Primary EG Trail Connections

- Park & Ride
- CLC Rec Ctr
- Courthouse
- Library
- JSC Entrance
- School - CCISD
- Parking Pull-out

Primary EG Trail Connections:
- Commercial District
- CLC Rec Ctr
- Courthouse Library
- Park & Ride
- JSC Entrance
Fundraising

1. Federal, state, city and local grants
2. Corporate and foundation donations
3. Individual donations
4. Matching donations

Volunteers for grant writing and administration, event planning and other fundraising activities.
Volunteers help with media relations, events, design, copywriting, data entry and other communications roles.

Events

- EG-hosted events
  - Earth Day – April 22
  - Banquet – September
- Tabling at events
- Speakers Bureau

Volunteers help with media relations, events, design, copywriting, data entry and other communications roles.
## EGC Budget

### Project Budget (in $1,000)

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<thead>
<tr>
<th>Category</th>
<th>Section 1</th>
<th>Total</th>
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<tbody>
<tr>
<td>Trails</td>
<td>260</td>
<td>2,300</td>
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<tr>
<td>Trees, shrubs and irrigation</td>
<td>1,000</td>
<td>5,050</td>
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<tr>
<td>Entry Plaza</td>
<td>800</td>
<td>900</td>
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<tr>
<td>Sport field, Future Building</td>
<td>30</td>
<td>440</td>
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<tr>
<td><strong>EGC Project Total</strong></td>
<td><strong>2,090</strong></td>
<td><strong>8,690</strong></td>
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EGC Fundraising

• Success at Funding:

  Trees for Houston $300,000+ (1000 trees)

  Storm Water Wetlands Program $250,000 (Wetlands Plants)

  Coastal Management Program $100,000 (Grant)

  Space City Rotary $12,000 (Park Benches)

  Clear Lake Civic League $18,000 (Irrigation)

  Individual contributions $40,000+

• Seeking funds for Trails, Irrigation, Entry Plaza, and future needs.

• Pursuing more grants (Local, State & Federal) & corporate donations.

www.ExplorationGreen.org
Additional Information

- Exploration Green Conservancy
  www.ExplorationGreen.org
- Clear Lake City Water Authority
  www.CLCWA.org
- Galveston Bay Foundation
  www.galvbay.org
- Trees For Houston
  www.treesforhouston.org
- Texas Coastal Watershed Program
  www.tcwp.tamu.edu
Clear Lake Flooding & Green Space

1. CLCWA responsible for storm water drainage
2. Flooding continues to worsen
3. 2006 CLCWA defines greater need for water detention
4. Golf course closes, owners plan apartments & condos
5. Keep Green Space Green grassroots uprising!
6. CLCWA develops stormwater detention plan
7. CLCWA purchases site
8. Master Plan for stormwater lakes in shared use facility
9. Flood damage reduction features
   • 1,680-acre feet temporary stormwater storage
   • Water storage depth - 13'