We are in climate change in southwest Florida. Climate change is currently occurring and more change is to be expected.

The question for Southwest Floridians is not whether they will be affected by climate change, but how much they will be affected and in what ways including the degree to which it will continue, how rapidly change will occur, what type of climate changes will occur, and what the long-term effects of these changes will be.
In the last 100 years, Southwest Florida has:

- Increased average air temp change Fort Myers 1.2°F.
- Increased annual # days >90°F by 12.
- No change in total rainfall.
- Increased rain in rainy season by 6%.
- Increased sea level by 8-9 inches.
- We have already experienced:
  - More severe storms
  - Loss of mature mangrove, salt marsh, water quality, island area
  - Longer, more severe dry seasons
  - Shorter wet seasons of higher precipitation
12CHNEP/SWFRRPC CRE Projects

- Regional Vulnerability Assessment (CRE 2007-2009)
- Punta Gorda Adaptation Plan (CRE 2008-2009)
- Seagrass Response to Sea Level Rise (CHNEP 2009)
- Vulnerability Assessment CHNEP short version (2009-2010)
- Climate Change Environmental Indicators (CRE 2009-2010)
- Model Ordinances/Comp Plan (CRE 2009-2010)
- Punta Gorda Comp Plan Amendments (PG 2009-2010)
- Climate Change Vulnerability Assessment and Adaptation Opportunities for Salt Marsh Types in Southwest Florida (EPA 2009-2012)
- Lee County Resiliency Plan (Lee 2009-2010)
- Conceptual Ecological Models (CRE 2010-2011)
- Ecosystem Services & Climate Change (Elizabeth Ordway Dunn with SCCF 2012-2013)
- Coastal Resilience Online Tool (with The Nature Conservancy 2013-2013)
CHNEP/SWFRPC Climate Ready Estuary Projects Overview

- EPA Region IV funded Regional Vulnerability Assessment
- CCMP Update SG-Q: Climate Change
- GEER SWFFS Analysis
- CRE 2008 Punta Gorda Adaptation Plan
- CRE 2009 Environmental Indicators Model Ordinances
- EPA Region IV WPDG Salt Marsh Assessment Vulnerability, Adaptation
- Punta Gorda Adaptation Plan Implementation

Timeline:
- Late 2007
- 2009 TIME
- 2013+
Comprehensive Southwest Florida/Charlotte Harbor Climate Change Vulnerability Assessment

Southwest Florida Regional Planning Council
Charlotte Harbor National Estuary Program
Technical Report 09-3
September 15, 2009
James W. Beever III, Whitney Gray, Daniel Trescott,
Dan Cobb, Jason Utley: SWFRPC
And
Lisa B. Beever: CHNEP

1926 Victoria Avenue
Fort Myers FL 33901
(239) 338-2550
www.SWFRPC.org and www.CHNEP.org
Potential Impacts of Climate Change

**Infrastructure**
- Water
- Transportation
- Energy Supply & Use

**Health**
- Weather-related Mortality
- Infectious Diseases
- Air Quality - Respiratory Illnesses

**Agriculture**
- Crop yields
- Irrigation demands

**Forest**
- Change in forest composition
- Shift geographic range of forests
- Forest Health and Productivity

**Water Resources**
- Changes in water supply
- Water quality
- Increased competition for water

**Coastal Areas**
- Erosion of beaches
- Inundate coastal lands
- Costs to defend coastal communities

**Wildlife and Ecosystems**
- Shift in ecological zones
- Loss of habitat and species
- Damage to Habitats

**Cultural Resources**

**Economic Disruption**
Climate Change Drivers and Stressors
Charlotte Harbor Region

Drivers - Drivers include air temperature, air chemistry, water temperature and water chemistry. Air temperature increases as CO2 and other greenhouse gases are emitted, fuel is burned, deforestation occurs, normal global warming trends, and other factors. As air temperature increases, so does water temperature. As atmospheric CO2 levels increase, ocean acidity also increases. Reduced dissolved oxygen and increased chlorophyll a in freshwater lakes and streams is also possible.

Stressors - With the drivers of air and water temperature and chemistry, stressors on natural and human systems occurs. The climate becomes unstable with resulting changes in precipitation and increased storm frequency. Changes in rainfall patterns, results in altered hydrology (changes in stream flow) and increase chances of salt water intrusion. Water temperature and other changes increase sea level.
# Probability of Sea Level Rise

<table>
<thead>
<tr>
<th>Probability (%)</th>
<th>2025 (cm)</th>
<th>2025 (inches)</th>
<th>2050 (cm)</th>
<th>2050 (inches)</th>
<th>2075 (cm)</th>
<th>2075 (inches)</th>
<th>2100 (cm)</th>
<th>2100 (inches)</th>
<th>2150 (cm)</th>
<th>2150 (inches)</th>
<th>2200 (cm)</th>
<th>2200 (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid Stabilization Case</td>
<td>41</td>
<td>1.8</td>
<td>9</td>
<td>3.5</td>
<td>13</td>
<td>5.3</td>
<td>18</td>
<td>7.1</td>
<td>22</td>
<td>8.8</td>
<td>27</td>
<td>10.5</td>
</tr>
<tr>
<td>90 (least)</td>
<td>7</td>
<td>2.8</td>
<td>13</td>
<td>5.0</td>
<td>20</td>
<td>7.7</td>
<td>26</td>
<td>10.4</td>
<td>40</td>
<td>15.7</td>
<td>53</td>
<td>21.0</td>
</tr>
<tr>
<td>80</td>
<td>11</td>
<td>4.4</td>
<td>20</td>
<td>7.8</td>
<td>30</td>
<td>11.6</td>
<td>41</td>
<td>16.3</td>
<td>63</td>
<td>24.7</td>
<td>85</td>
<td>33.6</td>
</tr>
<tr>
<td>70</td>
<td>12</td>
<td>4.7</td>
<td>22</td>
<td>8.6</td>
<td>34</td>
<td>13.2</td>
<td>45</td>
<td>17.8</td>
<td>72</td>
<td>28.3</td>
<td>99</td>
<td>39.1</td>
</tr>
<tr>
<td>60</td>
<td>13</td>
<td>5.1</td>
<td>24</td>
<td>9.4</td>
<td>37</td>
<td>14.4</td>
<td>50</td>
<td>19.8</td>
<td>80</td>
<td>31.4</td>
<td>112</td>
<td>44.2</td>
</tr>
<tr>
<td>50 (moderate)</td>
<td>40</td>
<td>15.5</td>
<td>27</td>
<td>10.6</td>
<td>41</td>
<td>16.0</td>
<td>55</td>
<td>21.8</td>
<td>90</td>
<td>35.4</td>
<td>126</td>
<td>49.7</td>
</tr>
<tr>
<td>30</td>
<td>16</td>
<td>6.3</td>
<td>29</td>
<td>11.3</td>
<td>44</td>
<td>17.1</td>
<td>61</td>
<td>24.1</td>
<td>102</td>
<td>40.1</td>
<td>146</td>
<td>57.6</td>
</tr>
<tr>
<td>20</td>
<td>17</td>
<td>6.7</td>
<td>32</td>
<td>12.5</td>
<td>49</td>
<td>19.1</td>
<td>69</td>
<td>27.3</td>
<td>117</td>
<td>46.0</td>
<td>173</td>
<td>68.2</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td>7.9</td>
<td>37</td>
<td>14.5</td>
<td>57</td>
<td>22.3</td>
<td>80</td>
<td>31.6</td>
<td>143</td>
<td>56.2</td>
<td>222</td>
<td>87.5</td>
</tr>
<tr>
<td>5 (worst)</td>
<td>22</td>
<td>8.7</td>
<td>41</td>
<td>16.1</td>
<td>63</td>
<td>24.6</td>
<td>91</td>
<td>35.9</td>
<td>171</td>
<td>67.2</td>
<td>279</td>
<td>110.0</td>
</tr>
<tr>
<td>2.5</td>
<td>25</td>
<td>9.9</td>
<td>45</td>
<td>17.6</td>
<td>70</td>
<td>27.4</td>
<td>103</td>
<td>40.7</td>
<td>204</td>
<td>80.2</td>
<td>344</td>
<td>135.6</td>
</tr>
<tr>
<td>1</td>
<td>27</td>
<td>10.6</td>
<td>49</td>
<td>19.2</td>
<td>77</td>
<td>30.1</td>
<td>117</td>
<td>46.2</td>
<td>247</td>
<td>97.2</td>
<td>450</td>
<td>177.3</td>
</tr>
</tbody>
</table>

*The results of this table are based on using Tables 9-1 and 9-2 of the USEPA Report "The Probability of Sea Level Rise". Basically, the formula is multiplying the historic sea level rise (2.3 mm/yr) in Southwest Florida (closest point used is St. Petersburg, Fl., Table 9-2) by the future number of years from 1990 plus the Normalized Sea Level Projections in Table 9-1 and Table ES-2. Two Future Climate Scenarios for Florida Stanton and Ackerman 2007*

Table 13: Combined Sea Level Projections by Year for Southwest Florida
Habitat and Species Changes

Habitat Structure-2000
Southwest Florida

By: Lisa B. Beever, PhD, AICP
Date: 4/16/08
Charlotte Harbor National Estuary Program

Symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/), University of Maryland Center for Environmental Science.
Even the least impact future climate change scenario:

- increased climate instability
- wetter wet seasons
- drier dry seasons
- more extreme hot and cold events
- increased coastal erosion
- continuous sea-level rise
- shifts in fauna and flora
- increased tropical diseases in plants, wildlife & humans
- destabilized aquatic food webs including increased Harmful Algae Blooms
- increasing strains upon and costs in infrastructure
- increased uncertainty concerning variable risk assessment with uncertain actuarial futures.
Objective 2.4.2: Address the impacts of sea level rise, and seek strategies to combat its effects on the shoreline of the City.

Policy 2.4.2.1: The City will work with the SWFRPC to determine potential sea level rise impacts on the Coastal Planning Area.

Measurement: Completion and implementation of developed coastal studies or development of model scenarios.
On December 17, 2008, the Punta Gorda City Council voted unanimously to participate in the CHNEP CRE pilot program. This progressive municipality had already included climate change planning in their Comprehensive Plan.
A Citizen-Driven Process

Participants filled out a survey providing demographics and previous experience with Hurricane Charley.

Then, they wrote down the vulnerabilities they thought most important and played a “trading card” game, collaborating to group them into envelopes.
Public participation was key to the project.
Participants then voted to prioritize the grouped vulnerabilities.
1st Public Workshop Identified Vulnerabilities

Fish and Wildlife Habitat Degradation

Inadequate Water Supply and Fire

Flooding

Unchecked or Unmanaged Growth

Water Quality Degradation

Education and Economy
Participants labeled areas on maps where vulnerabilities and/or areas for adaptations existed. The labels named specific adaptations from citizen suggestions and from the literature. Adaptations that were NOT desired were also included.
Figure 8: Placed Based Adaptation Suggestions for the City of Punta Gorda
City of Punta Gorda Adaptation Plan

Southwest Florida Regional Planning Council
Charlotte Harbor National Estuary Program
Technical Report 09-4
11/18/2009

James W. Beaver III, Whitney Gray, Daniel Treccott, Dan Cobb, Jason Utley, David Hutchinson,
John Gibbons, Tim Walker, Migi Abinanta, SWFRPC
And Lisa B. Beaver, Judy Ott, CHNEP

Adaptation Plan · Page 1

Adopted November 18, 2009
<table>
<thead>
<tr>
<th>Prioritized Vulnerabilities</th>
<th>The top consensus adaptations for each area of vulnerability include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fish and Wildlife Habitat Degradation;</td>
<td>1. Seagrass protection and restoration</td>
</tr>
<tr>
<td>2. Inadequate Water Supply;</td>
<td>2. Xeriscaping and native plant landscaping.</td>
</tr>
<tr>
<td>3. Flooding;</td>
<td>3. Explicitly indicating in the comprehensive plan which areas will retain natural shorelines.</td>
</tr>
<tr>
<td>4. Unchecked or Unmanaged Growth;</td>
<td>4. Constraining locations for certain high risk infrastructure</td>
</tr>
<tr>
<td>5. Water Quality Degradation;</td>
<td>5. Restrict fertilizer use.</td>
</tr>
<tr>
<td>7. Fire;</td>
<td>7. Drought preparedness planning</td>
</tr>
<tr>
<td>8. Availability of Insurance.</td>
<td>8. Implementation of the other adaptations, particularly 3 and 4.</td>
</tr>
<tr>
<td>Adaptation</td>
<td>Proximal Monitoring Physical Measure</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Seagrass protection and restoration</td>
<td>Acres of seagrass in the Tidal Peace River segment</td>
</tr>
<tr>
<td>Xeriscaping and native plant landscaping.</td>
<td>Percent of City responsible landscape in xeriscape</td>
</tr>
<tr>
<td>Explicitly indicating in the comprehensive plan which areas will retain natural shorelines. Constraining locations for certain high risk infrastructure.</td>
<td>% natural shoreline</td>
</tr>
<tr>
<td>Restrict fertilizer use.</td>
<td>Amount of TDR transferred Out of Environmental Sending Locations</td>
</tr>
<tr>
<td></td>
<td>Nitrogen concentrations and loads in River and Harbor</td>
</tr>
</tbody>
</table>
From 2009 through 2012 progress has been made on 6 of the 7 adaptations.

<table>
<thead>
<tr>
<th>Adaptation</th>
<th>Proximal Monitoring Physical Measure</th>
<th>Secondary Measure</th>
<th>Responsible Entity Collecting Data</th>
<th>Primary Target Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote green building alternatives through education, taxing incentives, green lending.</td>
<td>Number of green buildings constructed</td>
<td>Estimated change in energy use in dollars and by energy audit methods</td>
<td>City of Punta Gorda</td>
<td>25% increase for building, 25% decrease for energy use by 2025</td>
</tr>
<tr>
<td>Drought preparedness planning.</td>
<td>Number of planning steps completed.</td>
<td>Number of use water restriction events</td>
<td>City of Punta Gorda</td>
<td>completed and implemented plan</td>
</tr>
</tbody>
</table>


Figure 25: Seagrass coverage map from the City of Punta Gorda Comprehensive Plan in the Tidal Peace River in the region of the City of Punta Gorda.
Charlotte Harbor

**Pie Chart**
- Continuous: 64%
- Patchy: 36%

**Seagrass % Change 2010-2012**

<table>
<thead>
<tr>
<th>Seagrass</th>
<th>% Change 2010-2012</th>
<th>2010</th>
<th>2012</th>
<th>Change in Acreage 2010 to 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patchy</td>
<td>3.77%</td>
<td>2,672</td>
<td>3,489.04</td>
<td>295</td>
</tr>
<tr>
<td>Continuous</td>
<td>4.82%</td>
<td>1,166</td>
<td>1,372.04</td>
<td>126</td>
</tr>
</tbody>
</table>

**Charlotte Harbor Bay Segments**

<table>
<thead>
<tr>
<th>Segment</th>
<th>2006</th>
<th>2008</th>
<th>2010</th>
<th>2012</th>
<th>Change in Acreage 2010 to 2012</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Charlotte N</td>
<td>3,358</td>
<td>2,672</td>
<td>3,194</td>
<td>3,489.04</td>
<td>295</td>
<td>9.2%</td>
</tr>
<tr>
<td>Eastern Charlotte S</td>
<td>1,461</td>
<td>1,166</td>
<td>1,246</td>
<td>1,372.04</td>
<td>126</td>
<td>10.1%</td>
</tr>
<tr>
<td>Myakka</td>
<td>340</td>
<td>277</td>
<td>256</td>
<td>254.40</td>
<td>-2</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Peace River</td>
<td>346</td>
<td>194</td>
<td>199</td>
<td>381.98</td>
<td>183</td>
<td>91.6%</td>
</tr>
<tr>
<td>Placida</td>
<td>3,877</td>
<td>4,473</td>
<td>4,546</td>
<td>4,639.60</td>
<td>94</td>
<td>2.1%</td>
</tr>
<tr>
<td>Southern Charlotte</td>
<td>2,270</td>
<td>2,294</td>
<td>2,280</td>
<td>2,358.06</td>
<td>78</td>
<td>3.4%</td>
</tr>
<tr>
<td>Turtle Bay Bull Bay</td>
<td>4,739</td>
<td>4,274</td>
<td>4,380</td>
<td>4,385.46</td>
<td>5</td>
<td>0.1%</td>
</tr>
<tr>
<td>West Charlotte</td>
<td>1,975</td>
<td>2,023</td>
<td>2,006</td>
<td>2,030.31</td>
<td>25</td>
<td>1.2%</td>
</tr>
<tr>
<td>Charlotte Total:</td>
<td>18,364</td>
<td>17,374</td>
<td>18,107</td>
<td>18,911</td>
<td>804</td>
<td>4.4%</td>
</tr>
</tbody>
</table>
Mapped Changes
2010 - 2012

Charlotte Harbor

Legend
Change_Analysis
Analysis
- Decrease
- Increase
- No Change
# Progress on Seagrass Coverage Extents

<table>
<thead>
<tr>
<th>Charlotte Harbor</th>
<th></th>
<th></th>
<th></th>
<th>Change in</th>
<th></th>
<th>% of Restoration Target Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Segments</strong></td>
<td>2006</td>
<td>2008</td>
<td>2010</td>
<td>2012</td>
<td>% Change</td>
<td></td>
</tr>
<tr>
<td>Eastern Charlotte N</td>
<td>3,358</td>
<td>2,672</td>
<td>3,194</td>
<td>3,489.04</td>
<td>295</td>
<td>9.20%</td>
</tr>
<tr>
<td>Peace River</td>
<td>346</td>
<td>194</td>
<td>199</td>
<td>381.98</td>
<td>183</td>
<td>91.60%</td>
</tr>
<tr>
<td>Punta Gorda Total:</td>
<td>3,704</td>
<td>2,866</td>
<td>3,393</td>
<td>3,871.02</td>
<td>478</td>
<td>14.09%</td>
</tr>
</tbody>
</table>

**Acreage 2010 to 2012**

Adaptation Plan Adopted
Florida Friendly Native Landscaping

Three related topics had the greatest support:

- Require Municipal Use of Xeriscaping
- Build Xeriscaping into Codes and Educate Homeowners
- Use Native Plants in Landscaping.

All three adaptations are geared to reducing the need for irrigation while increasing the drought hardiness of the planted landscape.

Florida-friendly landscaping can be considered an expansion of xeriscaping. A Florida-friendly yard goes beyond xeriscaping to better fit our unique landscape and climate. It includes best management practices concerning stormwater runoff and living on a waterfront. A properly maintained Florida-friendly yard can help homeowners conserve water and reduce pollution of water resources.

Both FYN and Florida Friendly programs approach to landscaping emphasizes nine interrelated principles including:

- Right plant, right place
- Water efficiently
- Fertilize appropriately
- Mulch
- Attract Wildlife
- Manage yard pests responsibly
- Recycle
- Reduce stormwater runoff
- Protect the waterfront
Options Examined for Infrastructure Protection From Flooding

• Redesign (Accommodation)
• Armoring/Diking/Filling (Protection)
• Managed Relocation (Retreat)
Old Style

- Low ground floor elevation
- Vertical bulkhead
- Typically no vegetative buffer
- Limited or no stormwater treatment
- Little habitat values except where mangroves were retained
Redesign (Accommodation)

New Style

- High ground floor elevation
- Living shoreline with sloped shoreline
- Substantial vegetative buffer with emergent wetlands and littoral shelf
- Modern stormwater treatment
- Significant fish and wildlife habitat
Armoring & Filling (Protection)

Notes: This diagram illustrates heightening of the existing seawall in response to a 5 foot rise in sea level. This response is not recommended. This option would enable easy boat access close to shore. It would however destroy natural shoreline processes and ecosystems and would be financially unsustainable requiring frequent upgrades and maintenance. It also decreases the visual connection to the waterfront, which is a valued waterfront amenity.

Figure 3.9: Extension of the existing seawall in response to a five foot sea level rise

From Volk 2008
Rolling Easement Concept
A hypothetical comparison of relative costs of various sea-level rise adaptations for the City of Punta Gorda (in 2009 dollars)

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Rolling Easement</th>
<th>Bulkhead with Fill to 6 feet (The Galveston Solution)</th>
<th>Gradual Sand Filling to Keep Pace (Volk 2008)</th>
<th>Elevating the Infrastructure (The Venice Solution)</th>
<th>Armored Dike with 4 Major Pumps (The New Orleans Solution)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoreline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than total: set at the boundary between current uplands with freshwater wetlands and tidal coastal wetlands.</td>
<td>$58,332,852</td>
<td>$1,530,358,919</td>
<td>$76,500,000</td>
<td>$1,269,520,000</td>
<td>$2,157,450,984</td>
</tr>
<tr>
<td>Total: with irregular outer mangrove shoreline without overwash mangrove islands or many convoluted embayments</td>
<td>$69,770,641</td>
<td>$1,554,071,794</td>
<td>$91,500,000</td>
<td>$1,269,520,000</td>
<td>$3,773,093,875</td>
</tr>
<tr>
<td>Total: with irregular outer mangrove shoreline with convoluted embayments but not the overwash mangrove islands with canals open to navigation</td>
<td>$77,777,108</td>
<td>$1,569,436,395</td>
<td>$102,000,000</td>
<td>$1,269,520,000</td>
<td>$3,868,536,601</td>
</tr>
</tbody>
</table>
Explicitly indicate in local master plans, (Comprehensive Plans), which areas will retain natural shorelines.
Chart 1.1 - The City of Punta Gorda’s Existing Land Uses in Percent of Total Land Uses

- Residential: 24%
- Commercial: 4%
- Industrial: 8%
- Agricultural: 12%
- Recreational: 1%
- Conservation: 43%
- Educational: 1%
- Public: 1%
- Institutional: 1%
- Vacant Land: 1%
- Right of Way: 0%
Future Growth in Relation to the Coastal High Hazard Zone
Constrain locations for certain high risk infrastructure
Restrict Fertilizer Use

SWRPC Resolution #07-01
Southwest Florida Regional Planning Council
Fertilizer Resolution

A resolution supporting the regulated use of fertilizers containing nitrogen and/or phosphorus within Southwest Florida; providing specific recommendations and guidelines to be considered by local government jurisdictions for the regulation and control of fertilizer application; providing recommended definitions; providing recommendations relating to timing of fertilizer application, content and application rate, impervious surfaces, buffer zones and mechanical application; providing recommended exemptions; providing recommendations for licensing of commercial and institutional applicators; providing recommendations for public education programs; providing recommendations relating to the retail sale of fertilizer; providing recommendations for appeals, administrative relief and penalties; providing for an effective date.

WHEREAS, Southwest Florida is a region where the water quality of the bays, estuaries, rivers, lakes, wetlands, bayous and the Gulf of Mexico is critical to the region's environmental, economic, and recreational prosperity and to the health, safety and welfare of the citizens of this region;

WHEREAS, recent increased frequency and duration of red tide blooms and increased accumulation of red drift algae on local beaches and other algae and water related problems have heightened community concerns about water quality and cultural eutrophication of surrounding waters;

WHEREAS, there is a need to develop a stronger knowledge of the connection between activities in yards, streets, and stormwater systems and natural water bodies among all those who live, work and recreate in the Southwest Florida Region;

WHEREAS, this resolution is part of a multi-pronged effort by the Southwest Florida Regional Planning Council to reduce nutrient leaching and runoff problems by actions including, but not limited to, stormwater management, water conservation, septic systems, central sewage treatment, public education, restoration of surface and groundwater levels, and regional drainage of native habitats;

WHEREAS, nutrients are essential elements for plant growth and are commonly used in various forms as a Fertilizer for lawns (Turf), specialized Turf and Landscape application;

WHEREAS, leaching and runoff of nutrients from improper or excess fertilization practices can contribute to nitrogen and phosphorus pollution of the Southwest Florida's water resources;
Promote green building alternatives through education, taxing incentives, and green lending.
Drought Preparedness Planning

Florida Drought Action Plan

April 17, 2007
prepared by the
Florida Department of Environmental Protection
Florida Division of Emergency Management
Florida Department of Agriculture and Consumer Services
South Florida Water Management District
The recommended adaptations have been easily incorporated by education programs, ordinance, or comprehensive plan additions/amendments in the normal course of City of Punta Gorda plan reviews and updates.

The identified adaptations do not constitute a cultural change for the City of Punta Gorda but rather a continuation of a general progressive approach undertaken by the City to improve and enhance its resource base and standard of living.
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