

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 Trescott, Dan Cobb, Jason Utley, David Hutchinson,
John Gibbons, Tim Walker, Moji Abimbola: SWFRPC
And Lisa B. Beaver, Judy Ott: CHNEP



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Punta Gorda Adaptation Planning

Jim Beaver

Principle Planner IV

SWFRPC

May 31, 2013

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.

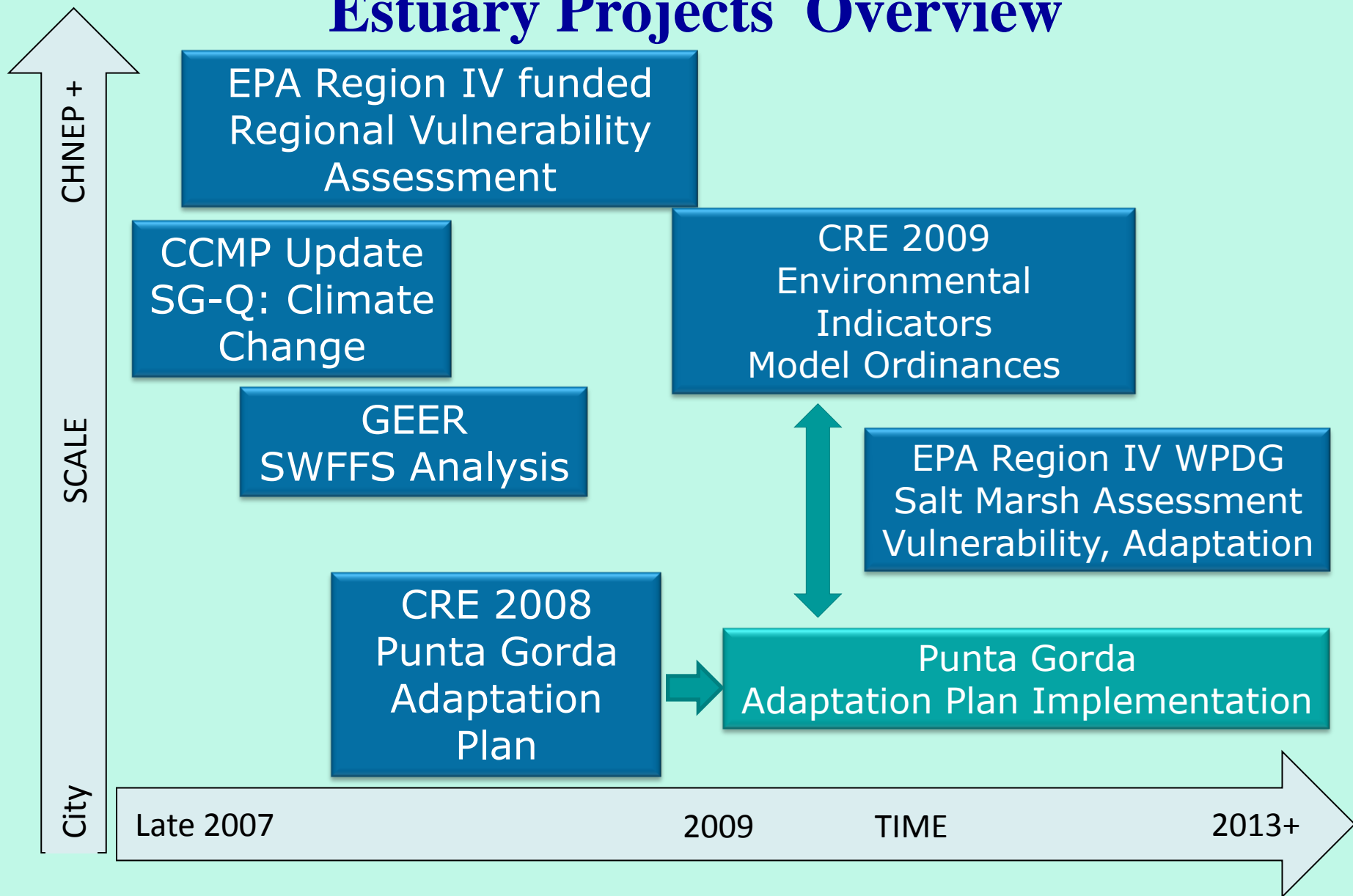
In the last 100 years, Southwest Florida has:

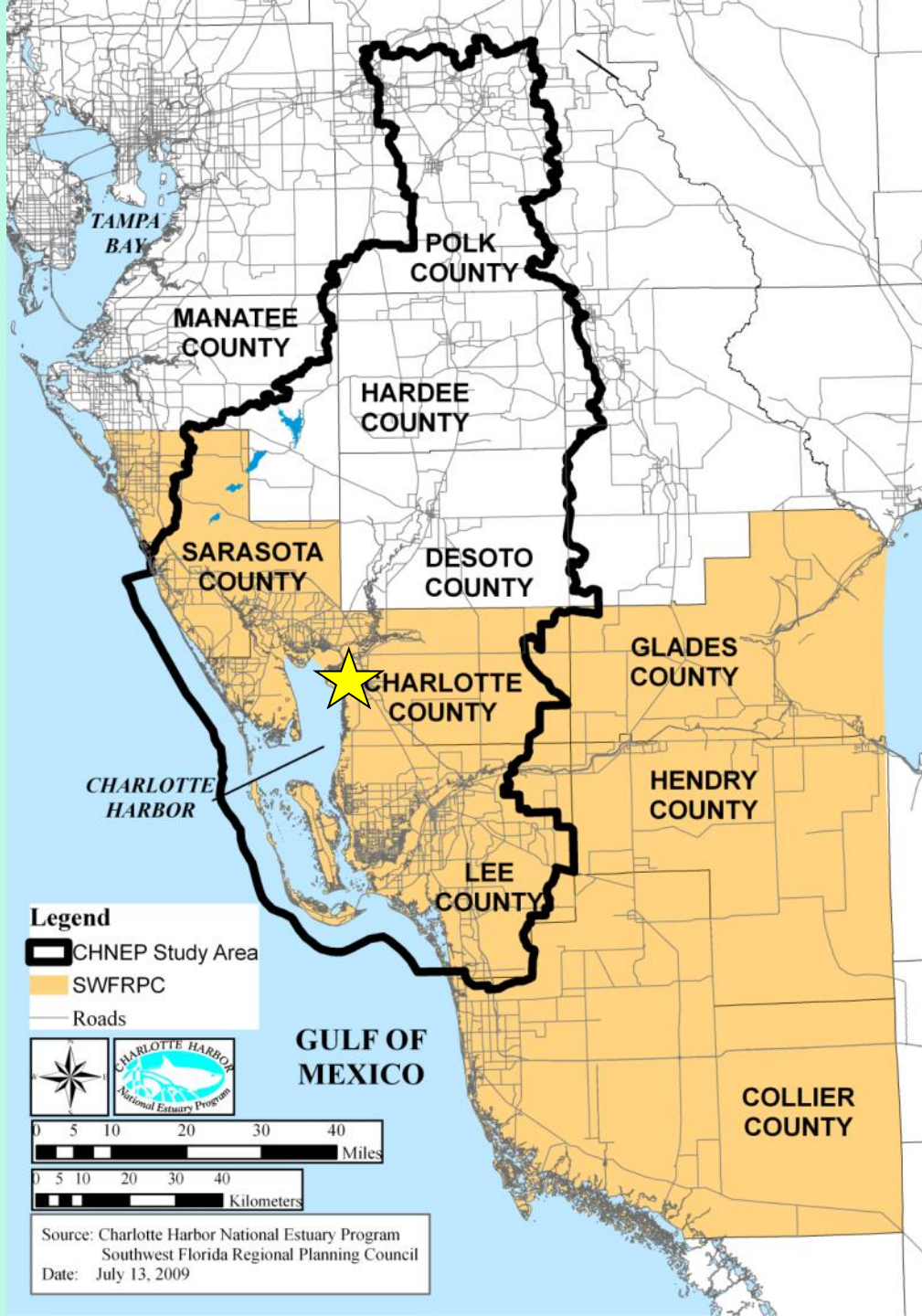
- Increased average air temp change Fort Myers 1.2°F.
- Increased annual # days >90° F by 12.
- No change in total rainfall.
- Increased rain in rainy season by 6%.
- Increased sea level by 8-9 inches.
- We have already experienced:
 - More severe storms
 - Loss of mature mangrove, salt marsh, water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

12CHNEP/SWFRPC CRE Projects

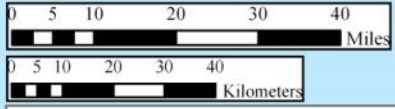
- Regional Vulnerability Assessment (CRE 2007-2009)
- Punta Gorda Adaptation Plan (CRE 2008-2009)
- Seagrass Response to Sea Level Rise (CHNEP 2009)
- Vulnerability Assessment CHNEP short version (2009-2010)
- Climate Change Environmental Indicators (CRE 2009-2010)
- Model Ordinances/Comp Plan (CRE 2009-2010)
- 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





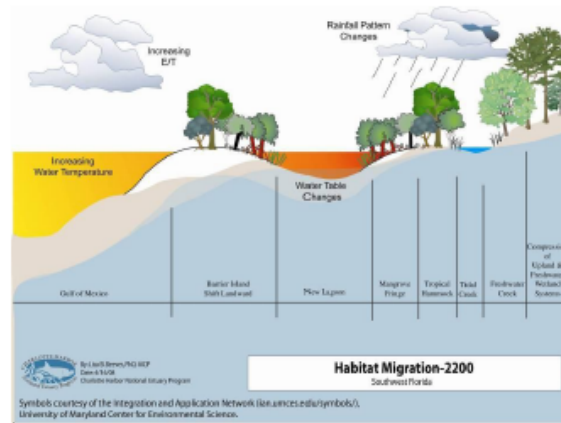
Legend
 [Black outline] CHNEP Study Area
 [Orange fill] SWFRPC
 [Thin grey line] Roads



Source: Charlotte Harbor National Estuary Program
 Southwest Florida Regional Planning Council
 Date: July 13, 2009



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

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Potential Impacts of Climate Change

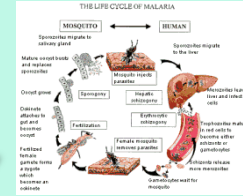
Infrastructure

Water
Transportation
Energy Supply & Use



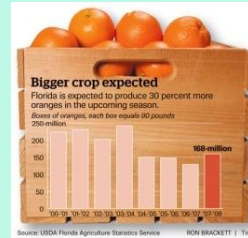
Health

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

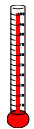


Wildlife and Ecosystems

Shift in ecological zones
Loss of habitat and species
Damage to Habitats



Climate Changes



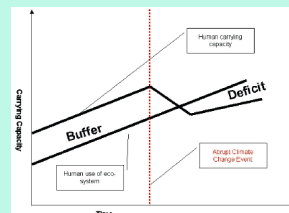
Temperature



Climate Instability



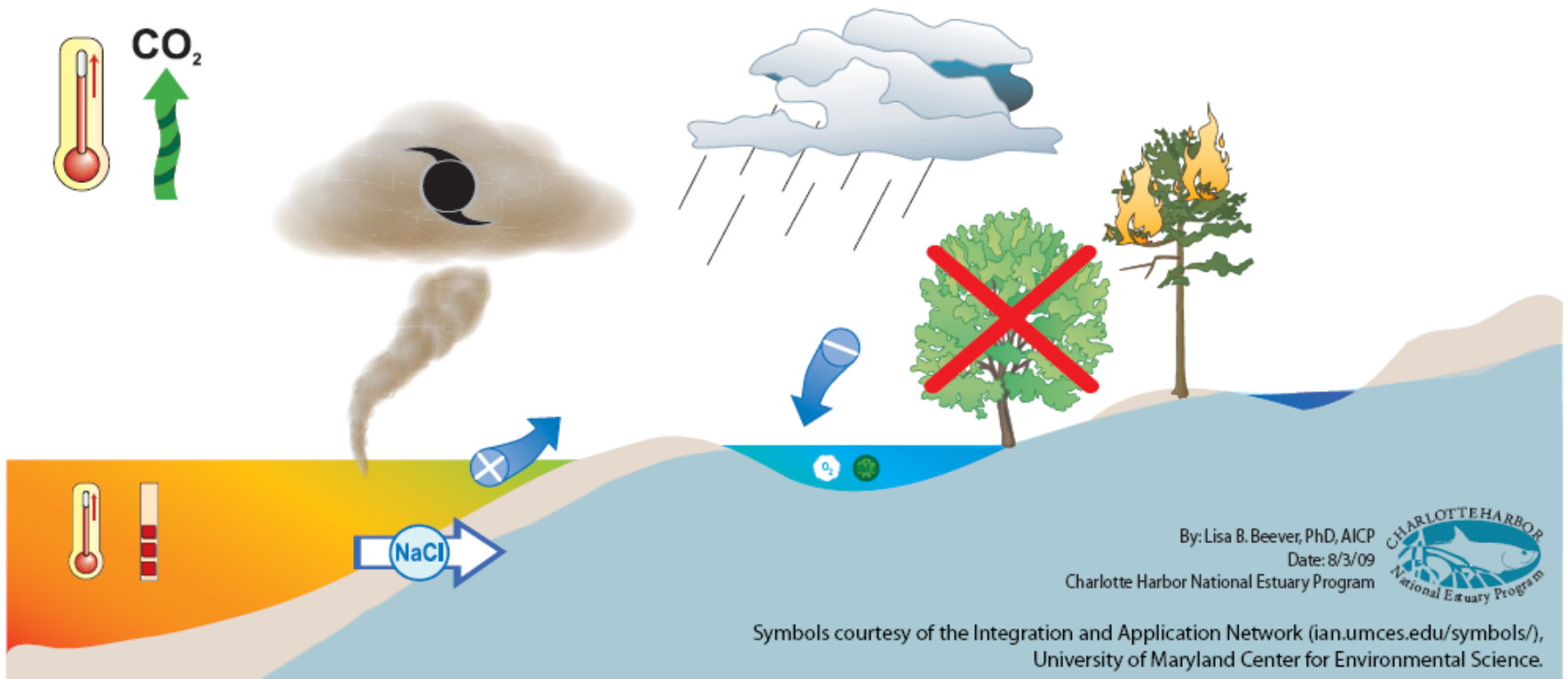
Sea Level Rise



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 .

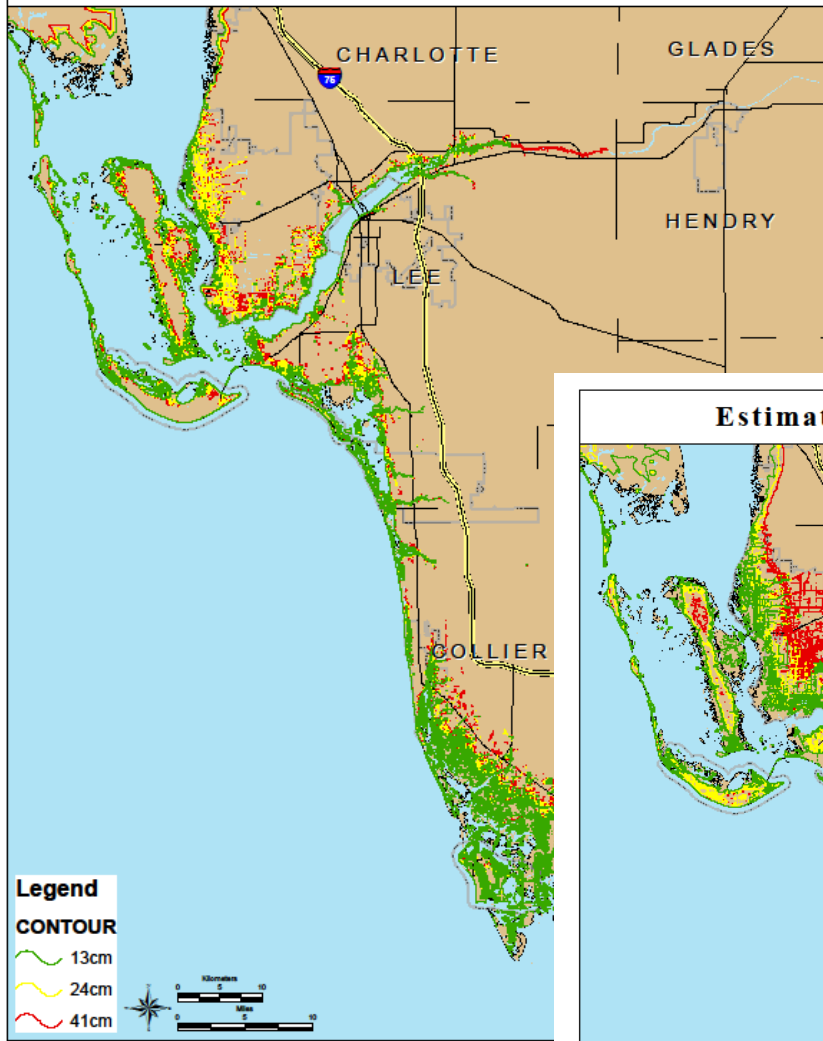
Probability of Sea Level Rise

Probability (%)	2025		2050		2075		2100		2150		2200	
	cm	inches	cm	inches	cm	inches	cm	inches	cm	inches	cm	inches
Rapid Stabilization Case	41	1.8	9	3.5	13	5.3	18	7.1	22	8.8	27	10.5
90 (least)	7	2.8	13	5.0	20	7.7	26	10.4	40	15.7	53	21.0
80	9	3.6	17	6.6	26	10.1	35	13.9	53	20.8	71	28.1
70	11	4.4	20	7.8	30	11.6	41	16.3	63	24.7	85	33.6
60	12	4.7	22	8.6	34	13.2	45	17.8	72	28.3	99	39.1
50 (moderate)	13	5.1	24	9.4	37	14.4	50	19.8	80	31.4	112	44.2
40	14	5.5	27	10.6	41	16.0	55	21.8	90	35.4	126	49.7
30	16	6.3	29	11.3	44	17.1	61	24.1	102	40.1	146	57.6
20	17	6.7	32	12.5	49	19.1	69	27.3	117	46.0	173	68.2
10	20	7.9	37	14.5	57	22.3	80	31.6	143	56.2	222	87.5
5 (worst)	22	8.7	41	16.1	63	24.6	91	35.9	171	67.2	279	110.0
2.5	25	9.9	45	17.6	70	27.4	103	40.7	204	80.2	344	135.6
1	27	10.6	49	19.2	77	30.1	117	46.2	247	97.2	450	177.3
Business as Usual	29	11.3	57	22.6	86	34	115	45.3	247	97	450	177

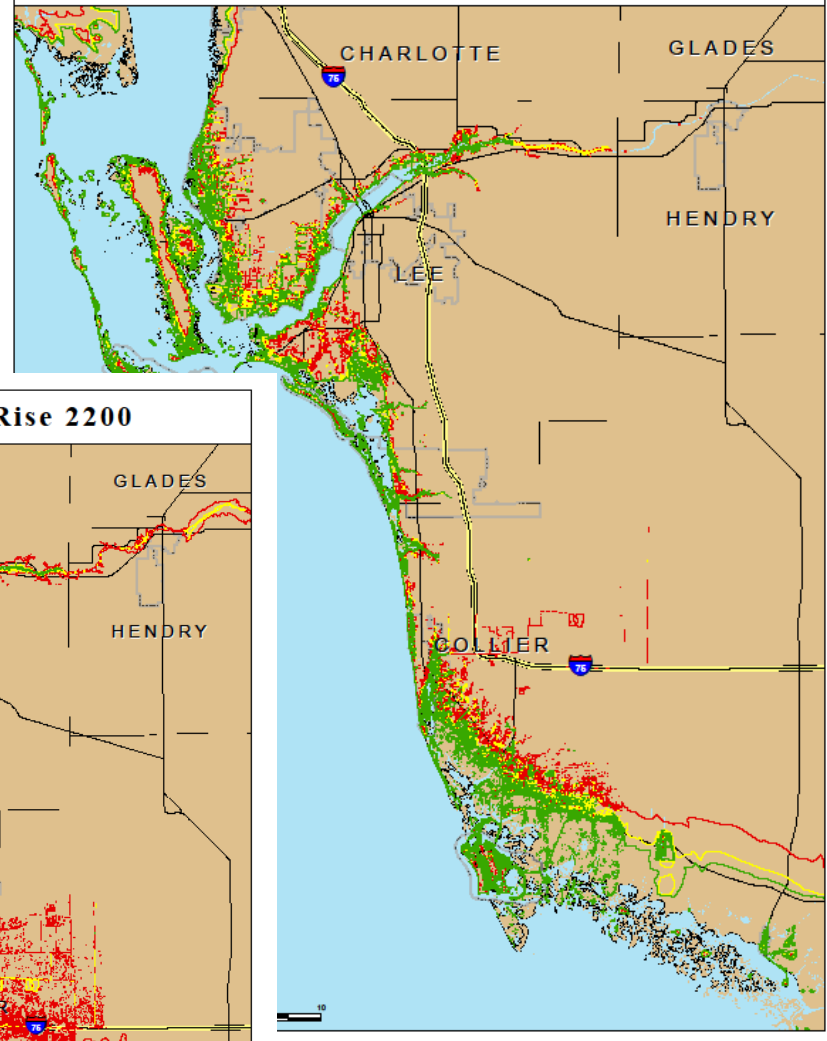
*The results of this table are based on using Tables 9-1 and 9-2 of the USEPA Report "The Probability of Sea Level Rise". Basically, the formula is multiplying the historic sea level rise (2.3 mm/yr) in Southwest Florida (closest point used is St. Petersburg, Fl., Table 9-2) by the future number of years 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

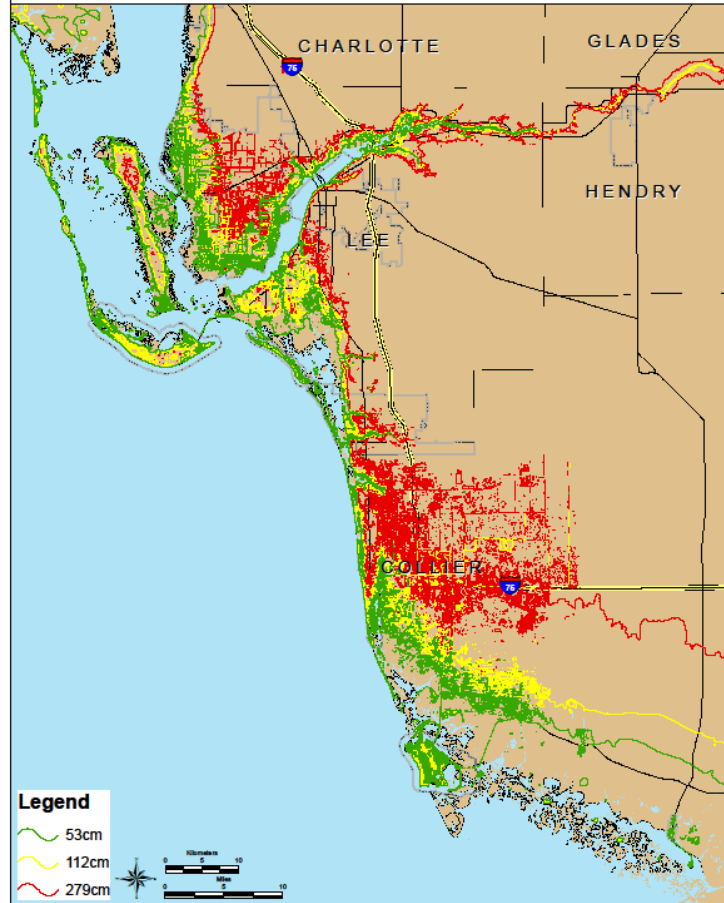
Estimated Sea Level Rise 2050

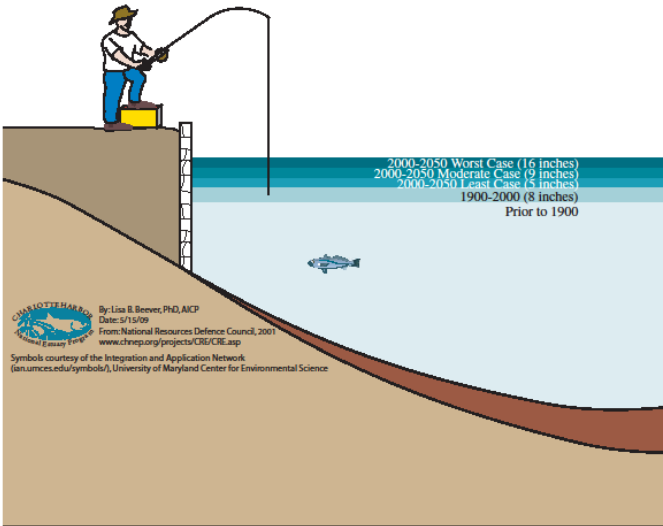


Estimated Sea Level Rise 2100

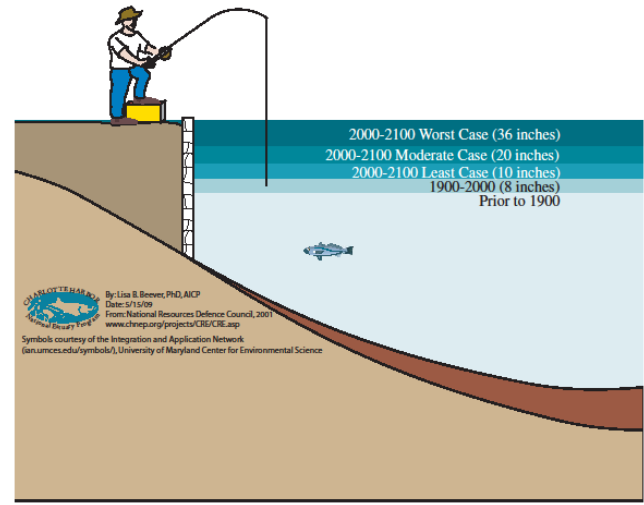
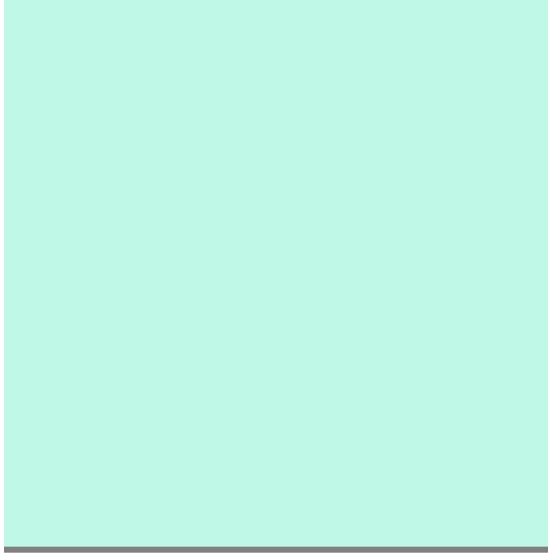


Estimated Sea Level Rise 2200

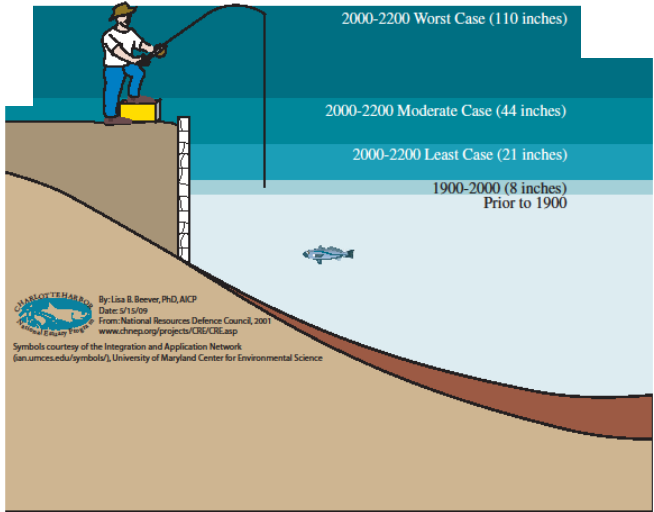




2050

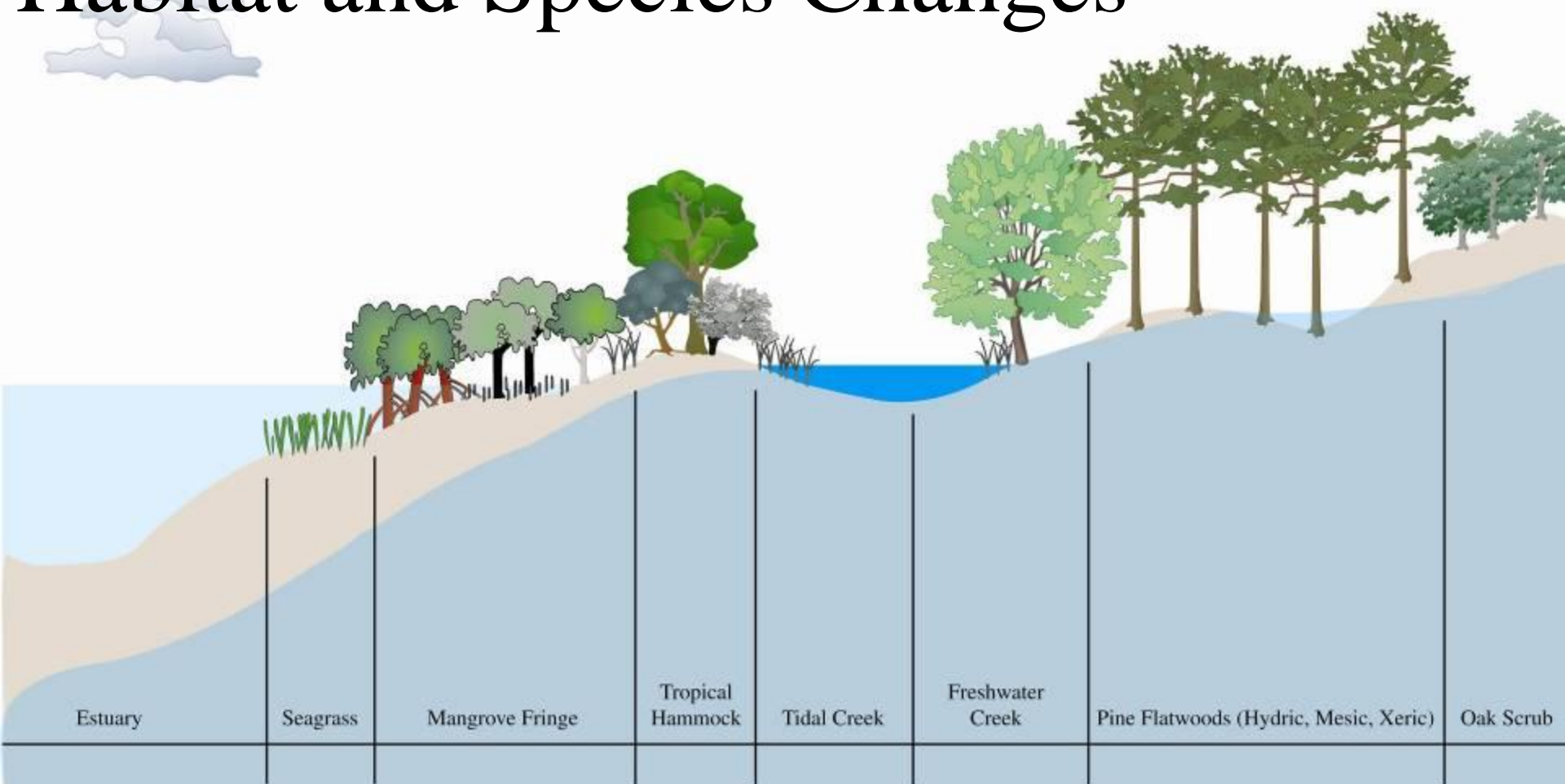


2100



2200

Habitat and Species Changes

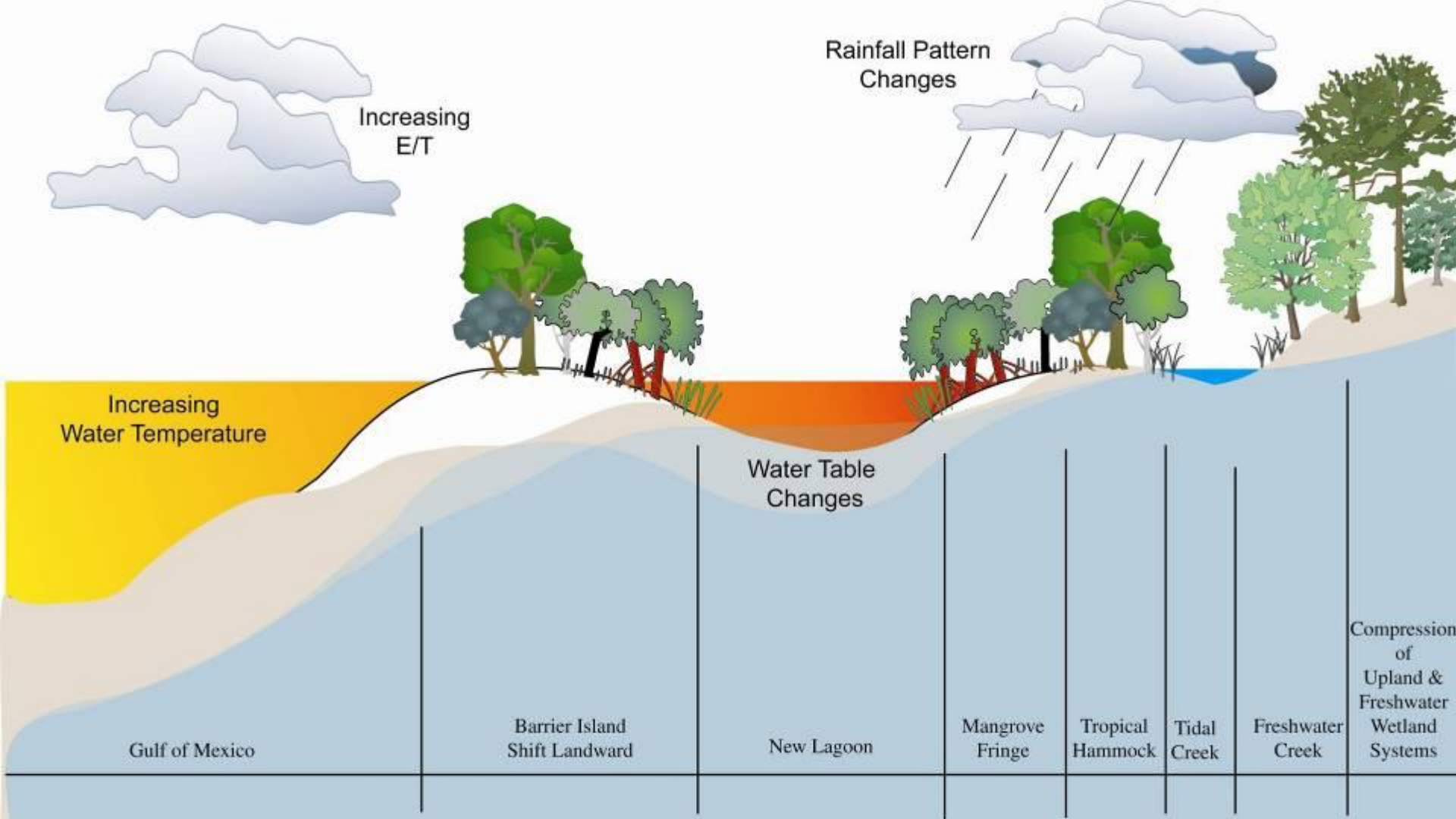


By: Lisa B. Beever, PhD, AICP
Date: 4/16/08
Charlotte Harbor National Estuary Program

Habitat Structure-2000

Southwest Florida

Symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/),
University of Maryland Center for Environmental Science.



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

Habitat Migration-2200
 Southwest Florida

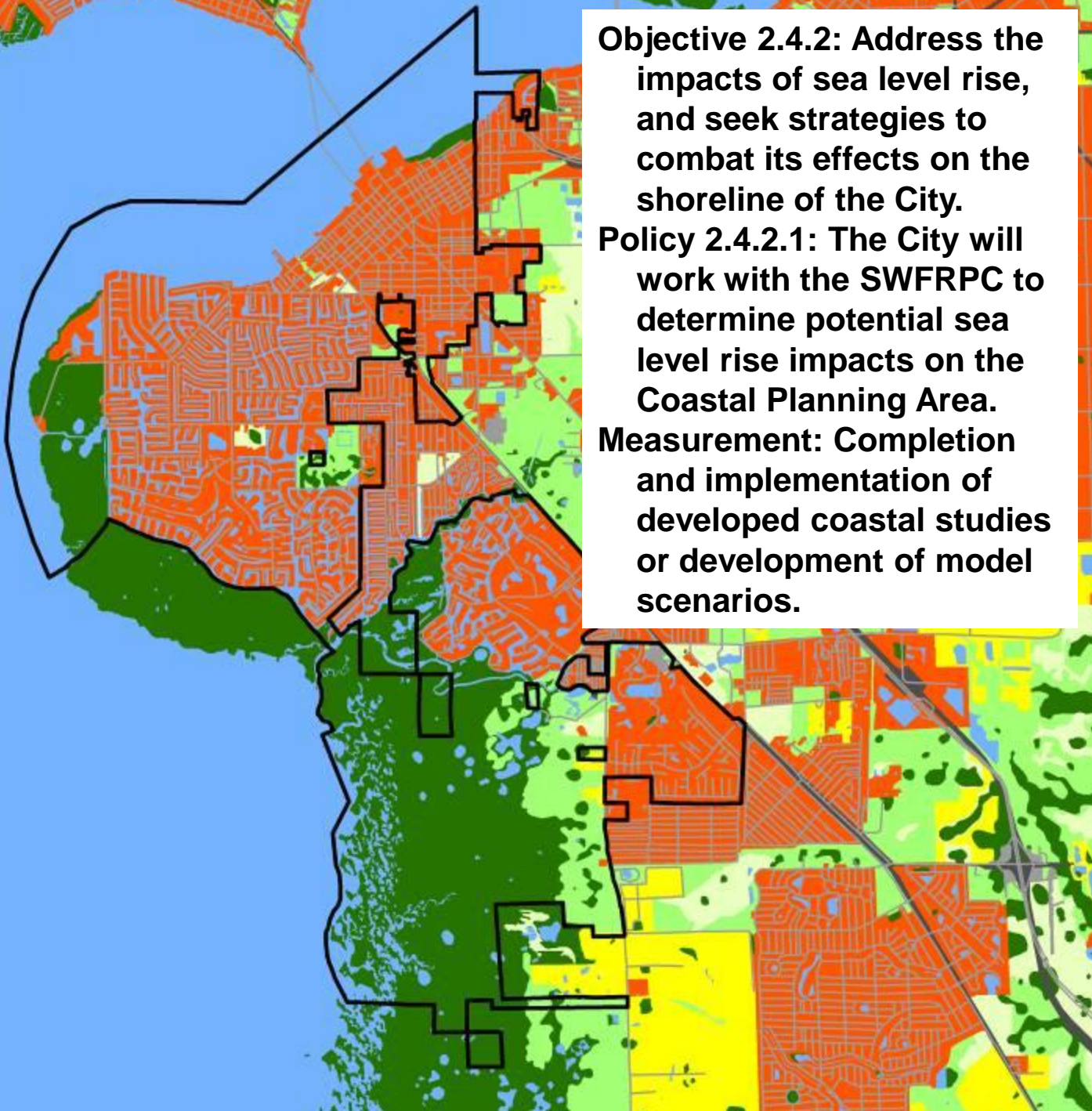
Symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/), University of Maryland Center for Environmental Science.

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.




Source: Southwest Florida Regional Planning Council
Charlotte Harbor National Estuary Program
Southwest Florida Water Management District
Date: December 11, 2008



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



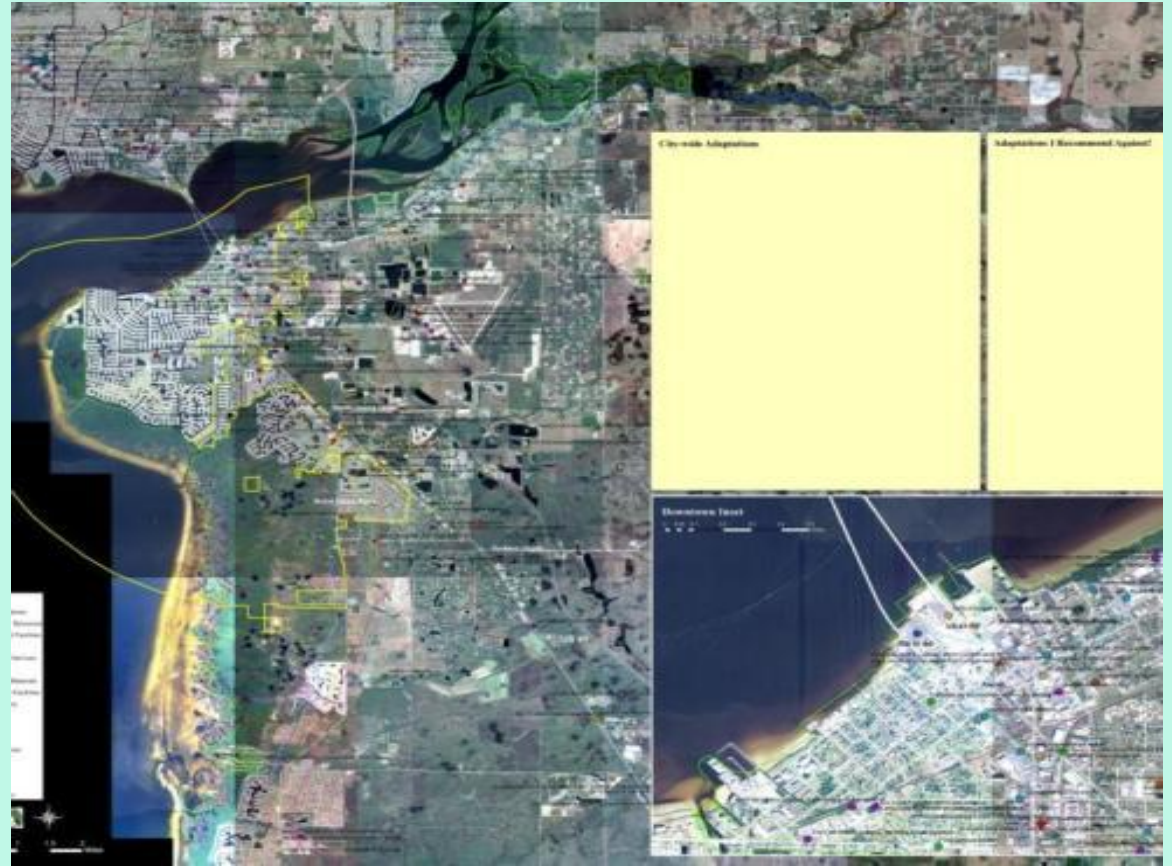
Water Quality Degradation

Education and Economy



Second Public Meeting

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.



Photograph 4: Two participants playing the Adaptation Game at the Unchecked or Unmanaged Growth table.

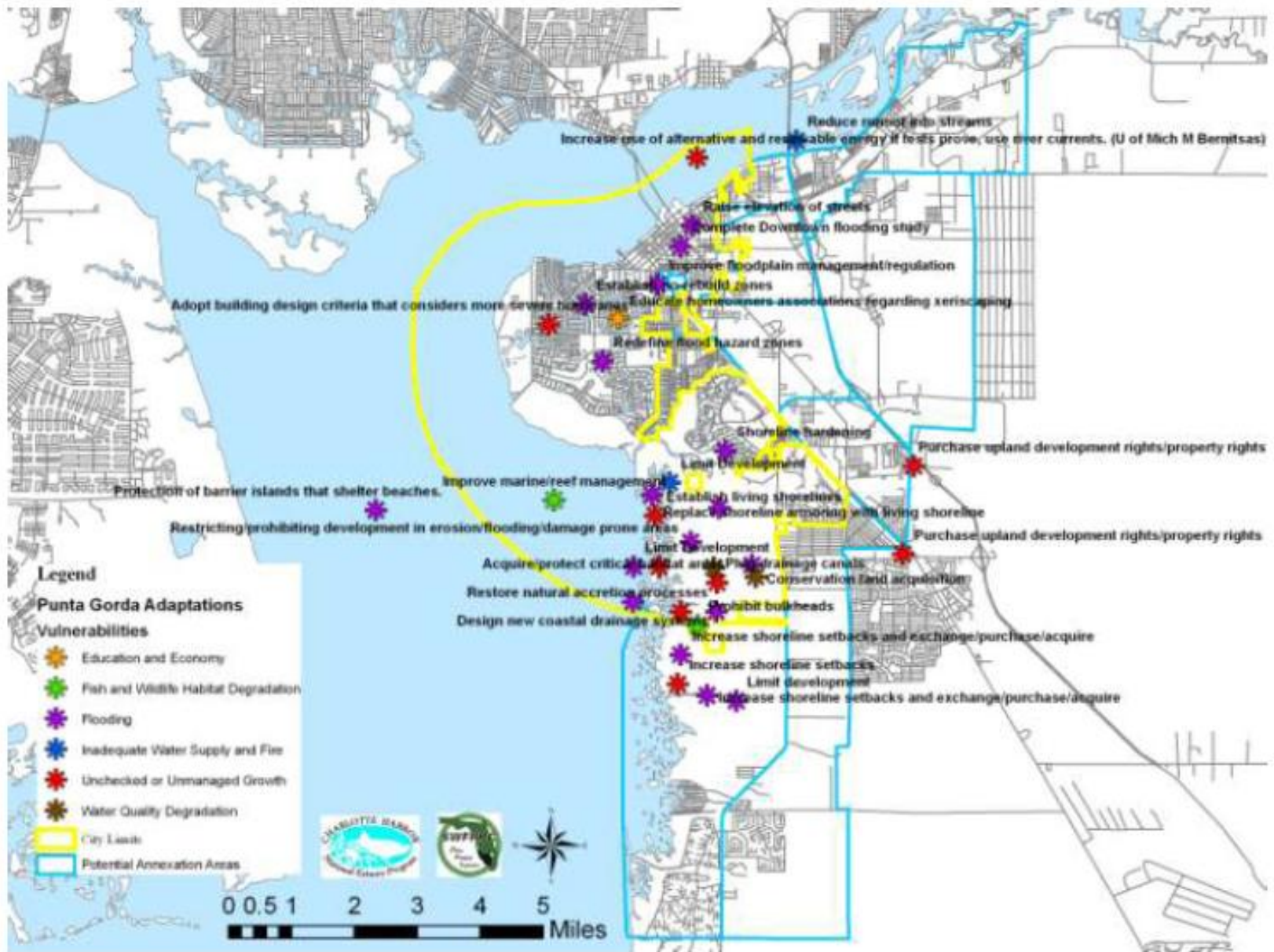


Figure 8: Placed Based Adaptation Suggestions for the City of Punta Gorda

City of Punta Gorda Adaptation Plan



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Prioritized Vulnerabilities	The top consensus adaptations for each area of vulnerability include:
1. Fish and Wildlife Habitat Degradation;	1. Seagrass protection and restoration
2. Inadequate Water Supply;	2. Xeriscaping and native plant landscaping.
3. Flooding;	3. Explicitly indicating in the comprehensive plan which areas will retain natural shorelines.
4. Unchecked or Unmanaged Growth;	4. Constraining locations for certain high risk infrastructure
5. Water Quality Degradation;	5. Restrict fertilizer use.
6. Education and Economy and Lack of Funds;	6. Promote green building alternatives through education, taxing incentives, green lending.
7. Fire;	7. Drought preparedness planning
8. Availability of Insurance.	8. Implementation of the other adaptations, particularly 3 and 4.

Table 70: Adaptation Plan Monitoring Summary for the Primary Initial Adaptation Actions

Adaptation	Proximal Monitoring Physical Measure	Secondary Measure	Responsible Entity Collecting Data	Primary Target Goal
Seagrass protection and restoration	Acres of seagrass in the Tidal Peace River segment	Quality of seagrass	SWFWMD/CHNEP	CHNEP seagrass target (951 acres) for Tidal Peace River segment
Xeriscaping and native plant landscaping.	Percent of City responsible landscape in xeriscape	Percent of citizen responsible landscape in xeriscape	City of Punta Gorda	25% by 2025
Explicitly indicating in the comprehensive plan which areas will retain natural shorelines.	% natural shoreline	% natural shoreline restored	City of Punta Gorda	50%
Constraining locations for certain high risk infrastructure.	Amount of TDR transferred Out of Environmental Sending Locations	amount of high risk infrastructure remaining in the Tropical Storm and Category 1 Storm Surge Zones	City of Punta Gorda	No high risk infrastructure remaining in the Tropical Storm and Category 1 Storm Surge Zones
Restrict fertilizer use.	Nitrogen concentrations and loads in River and Harbor	Reduction in nitrogen levels and loads in City canals	SWFWMD, Charlotte County, FMRI	Reduction in nitrogen in River and Harbor to achieve non-impairment per TMDL

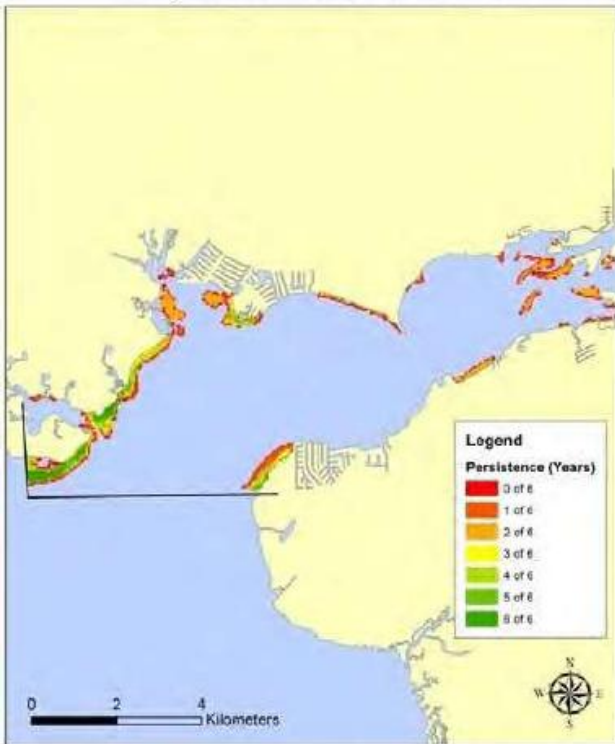
Adaptation	Proximal Monitoring Physical Measure	Secondary Measure	Responsible Entity Collecting Data	Primary Target Goal
<p>Promote green building alternatives through education, taxing incentives, green lending.</p>	<p>Number of green buildings constructed</p>	<p>Estimated change in energy use in dollars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

From 2009 through 2012 progress has been made on 6 of the 7 adaptations.

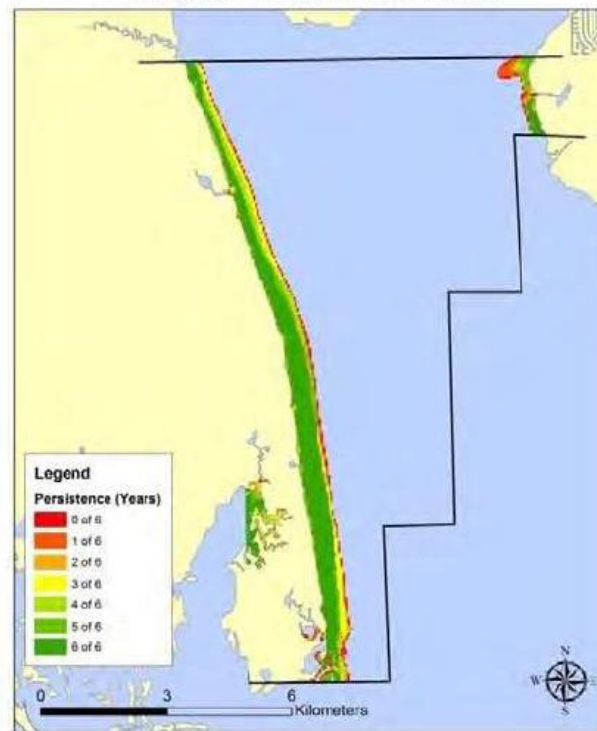


Figure 25: Seagrass coverage map from the City of Punta Gorda Comprehensive Plan in the Tidal Peace River in the region of the City of Punta Gorda

Tidal Peace
Seagrass Persistence 1988-2006



West Wall
Seagrass Persistence 1988-2006

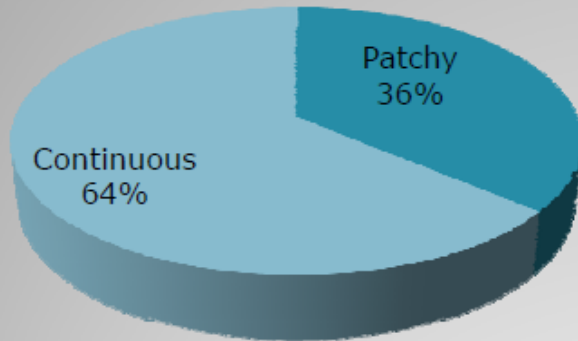


East Wall
Seagrass Persistence 1988-2006



Draft CHNEP Seagrass Targets in acres						
Harbor Segment	Baseline, adjusted (B)	Mean Annual Extent all years (A)	Protection Target	Restoration Target	Total Target	Target Range
Tidal Peace River	975	384	384	591	975	295-573
TOTAL for CHNEP	59,776	62,103	62,103	3,954	66,057	N/A

Charlotte Harbor



Seagrass	% Change 2010-2012	
Patchy	3.77%	249
Continuous	4.82%	554

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

Mapped Changes 2010 - 2012



Charlotte Harbor

Legend

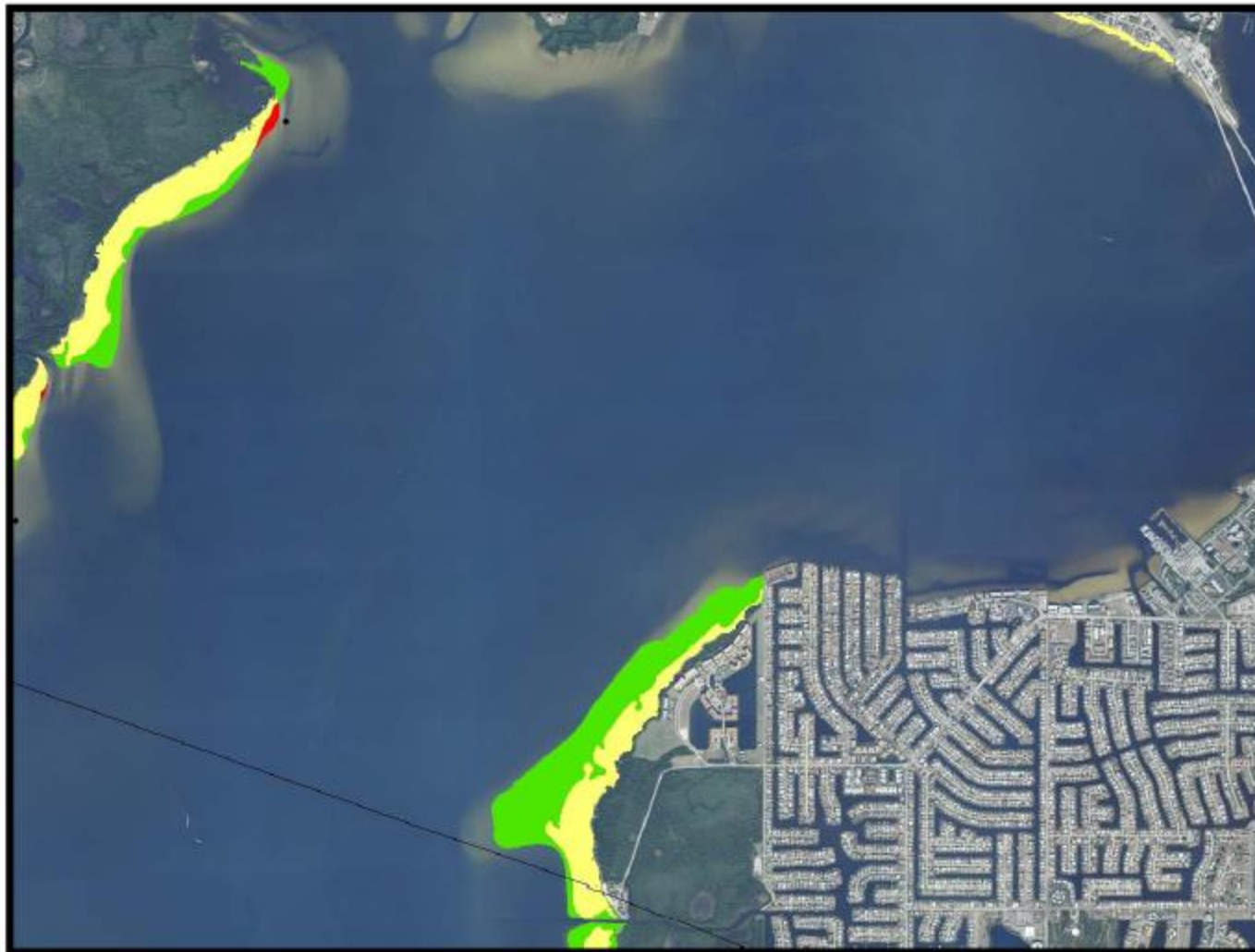
Change_Analysis
Analysis

Decrease

Increase

No Change

Mapped Changes 2010 - 2012



Peace River

Legend

Change_Analysis
Analysis

Decrease

Increase

No Change

Progress on Seagrass Coverage Extents

Charlotte Harbor							
Segments	2006	2008	2010	2012	Change in	% Change	% of Restoration Target Achieved
					Acreage 2010 to 2012		
Eastern Charlotte N	3,358	2,672	3,194	3,489.04	295	9.20%	68.13%
Peace River	346	194	199	381.98	183	91.60%	30.96%
Punta Gorda Total:	3,704	2,866	3,393	3,871.02	478	14.09%	46.68%



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

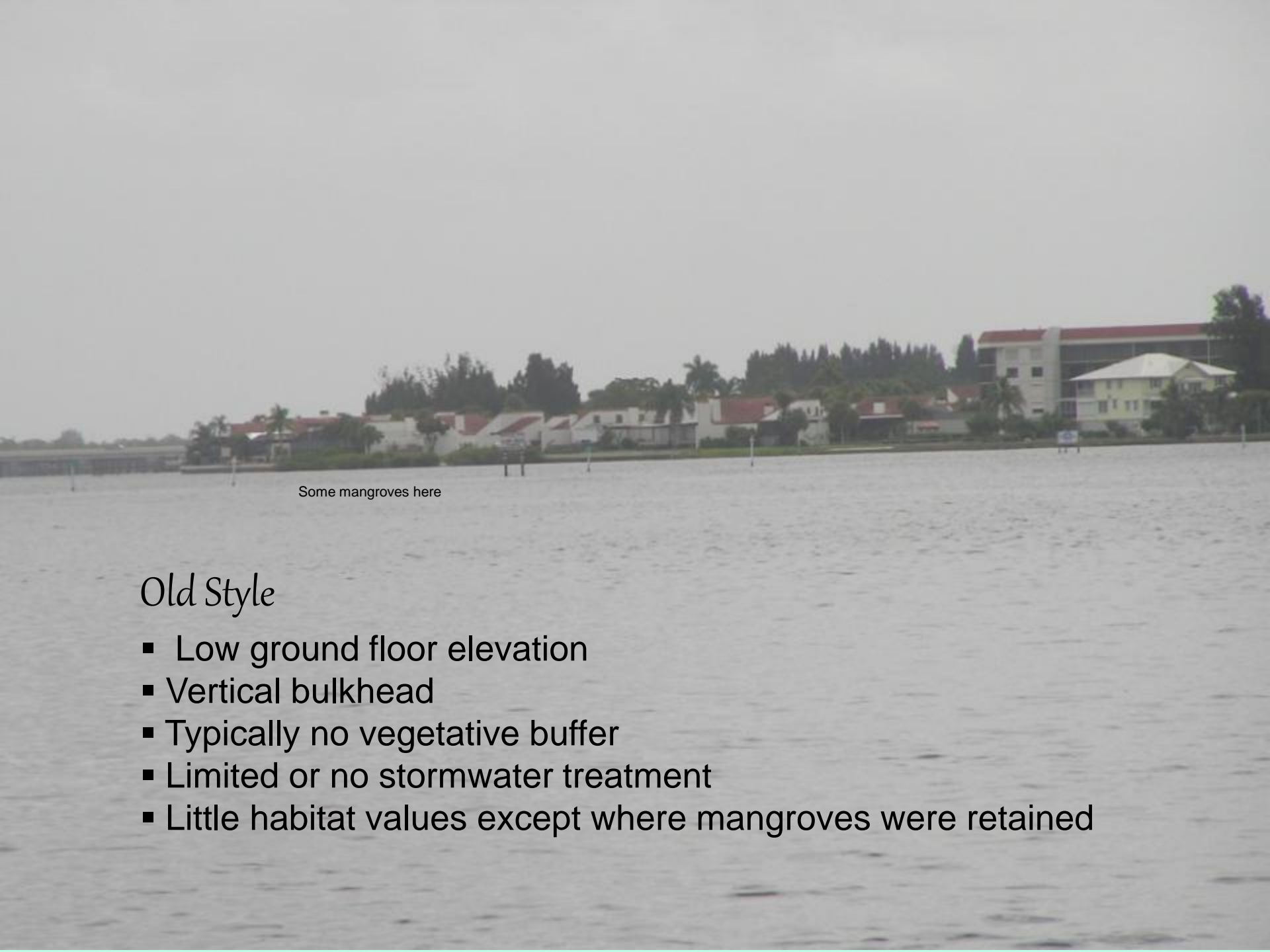
Reduce stormwater runoff

Protect the waterfront



Options Examined for Infrastructure Protection From Flooding

- Redesign (Accommodation)
- Armoring/Diking/Filling (Protection)
- Managed Relocation (Retreat)



Some mangroves here

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)

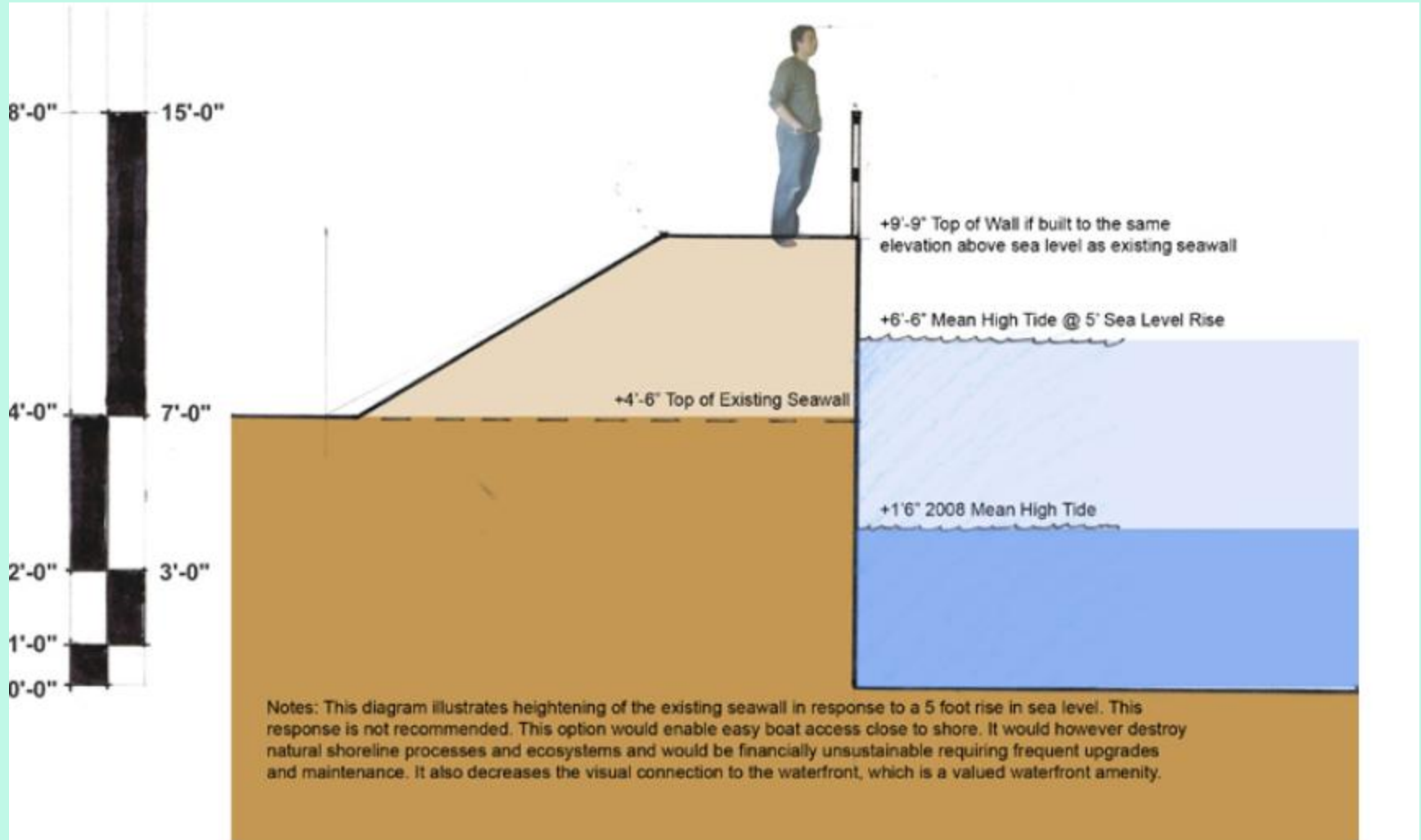
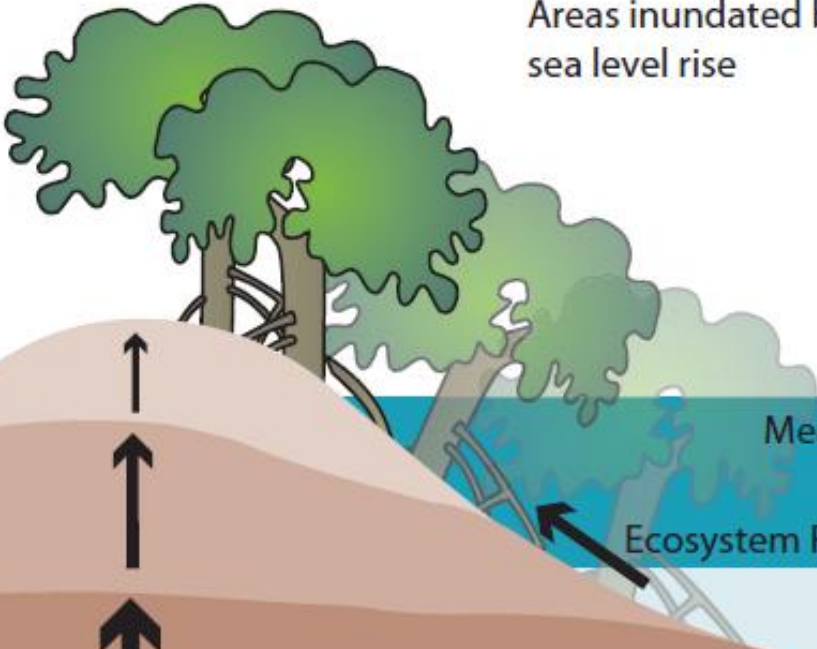


Figure 3.9: Extension of the existing seawall in response to a five foot sea level rise

←
Development to
be protected

→
Areas inundated by
sea level rise



Mean High Tide @ 44 inches sea level rise
(2200 Moderate Case)

Ecosystem Retreat

2000 Mean High Tide

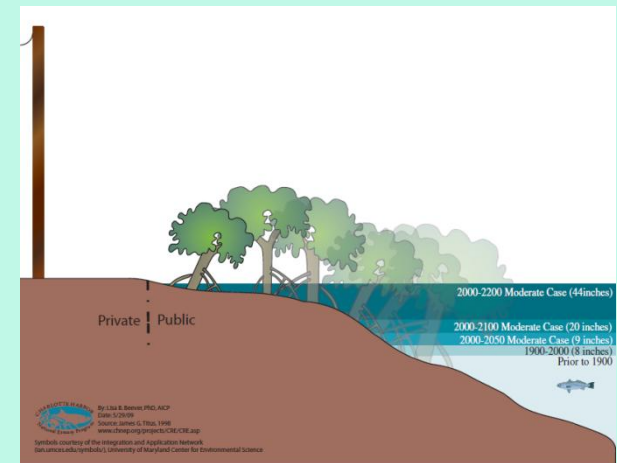
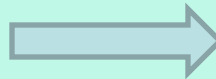
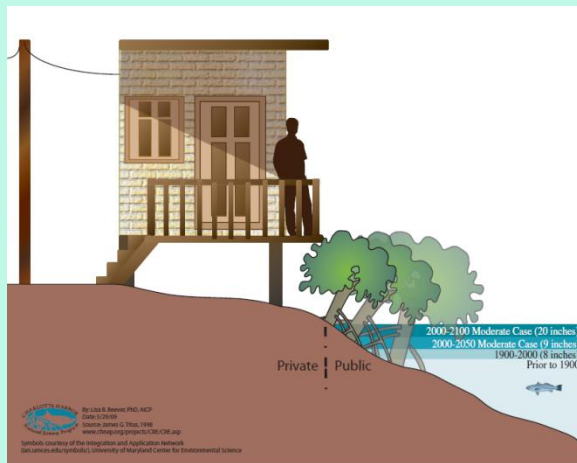
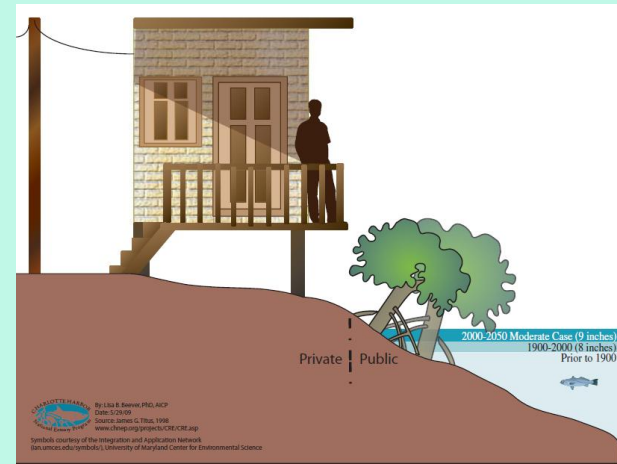
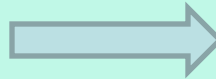
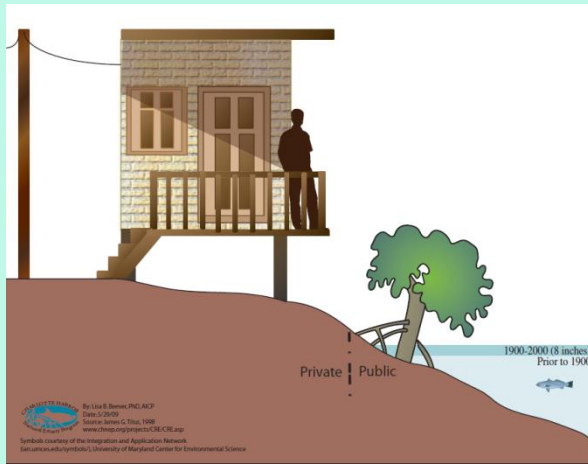


By: Lisa B. Beever, PhD, AICP
Date: 5/15/09
Source: Micheal Volk, 2008
www.chnep.org/projects/CRE/CRE.asp

Filling (Protection)

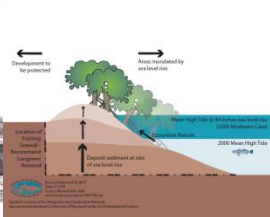
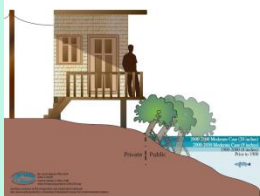
Symbols courtesy of the Integration and Application Network
(ian.umces.edu/symbols/), University of Maryland Center for Environmental Science

Rolling Easement Concept



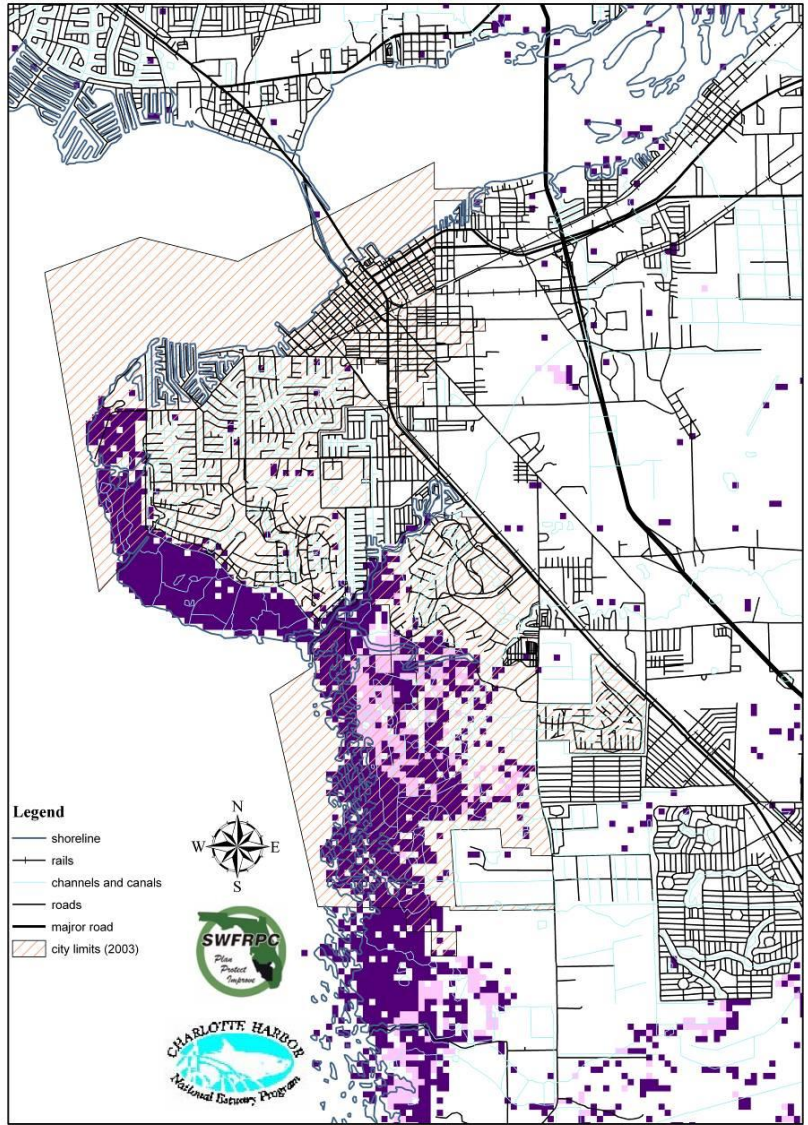
A hypothetical comparison of relative costs of various sea-level rise adaptations for the City of Punta Gorda (in 2009 dollars)

Alternative	Rolling Easement	Bulkhead with Fill to 6 feet (The Galveston Solution)	Gradual Sand Filling to Keep Pace (Volk 2008)	Elevating the Infrastructure (The Venice Solution)	Armored Dike with 4 Major Pumps (The New Orleans Solution)
Shoreline					
Less than total: set at the boundary between current uplands with freshwater wetlands and tidal coastal wetlands.	\$58,332,852	\$1,530,358,919	\$76,500,000	\$1,269,520,000	\$2,157,450,984
Total: with irregular outer mangrove shoreline without overwash mangrove islands or many convoluted embayments	\$69,770,641	\$1,554,071,794	\$91,500,000	\$1,269,520,000	\$3,773,093,875
Total: with irregular outer mangrove shoreline with convoluted embayments but not the overwash mangrove islands with canals open to navigation	\$77,777,108	\$1,569,436,395	\$102,000,000	\$1,269,520,000	\$3,868,536,601



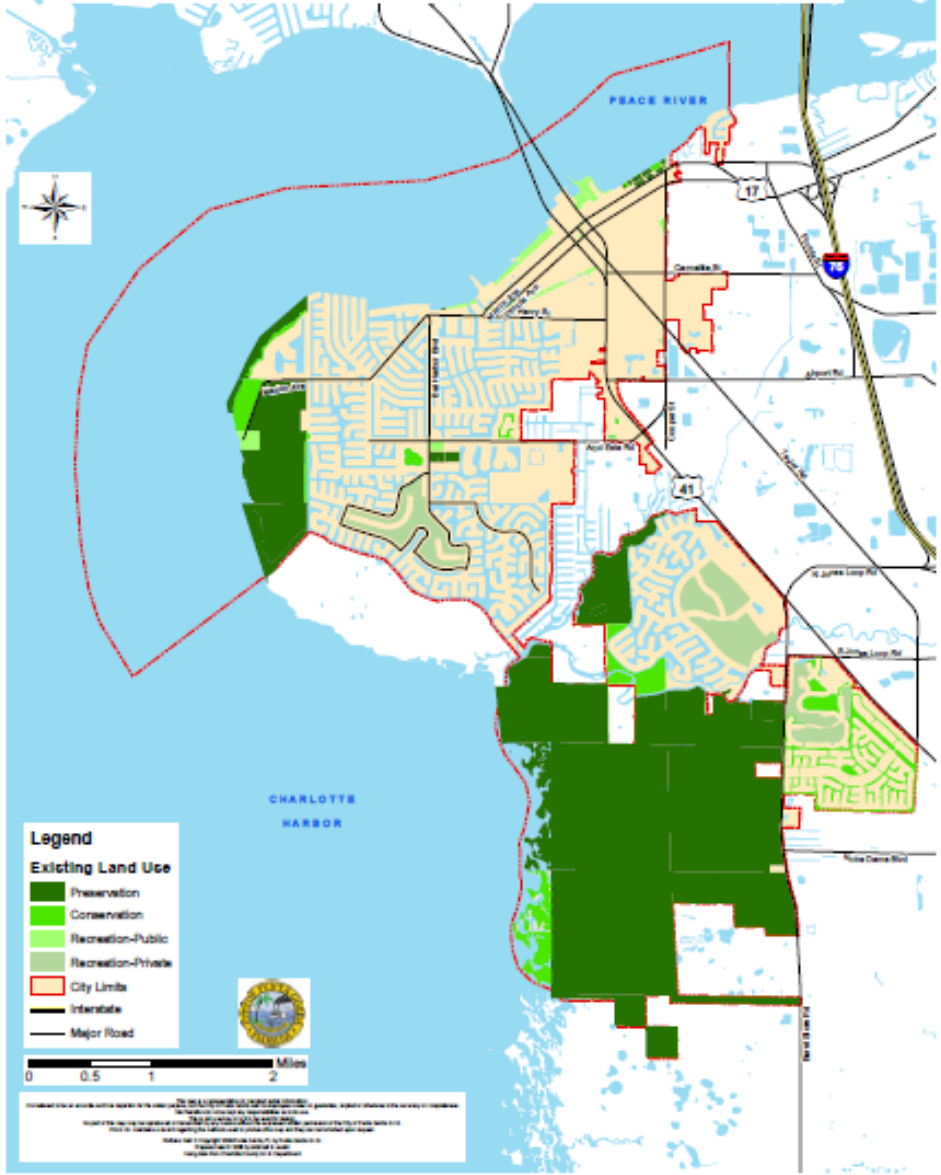
Explicitly indicate in local master plans, (Comprehensive Plans), which areas will retain natural shorelines.

Wetlands and Uplands of Significance to Wetland-Dependent Listed Species of the City of Punta Gorda



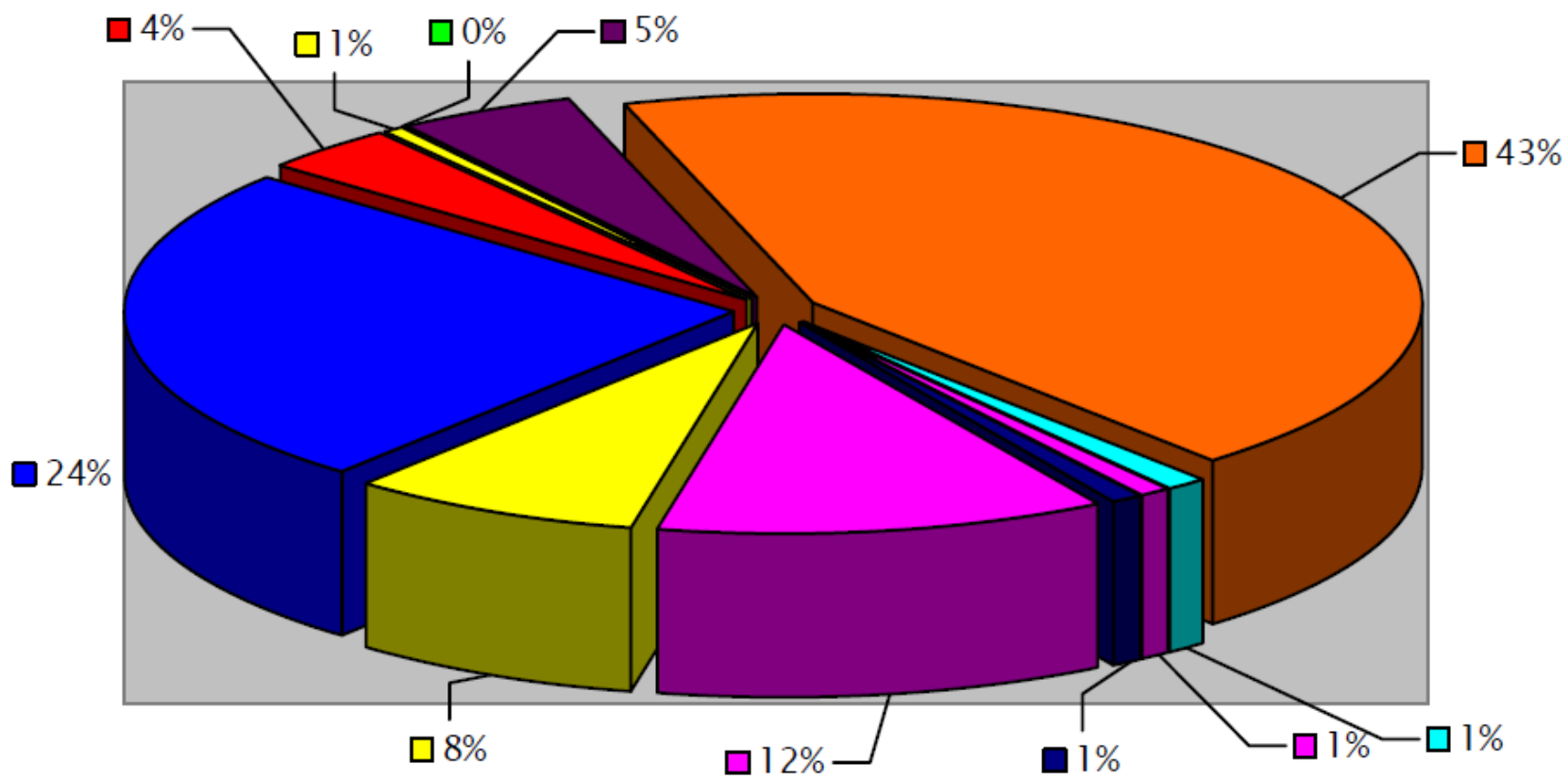
City Boundary indicated in crosshatched orange 0 0.5 1 2 Miles J. Beaver 20081231

Map 1.2 - Conservation & Recreation Land Use Categories



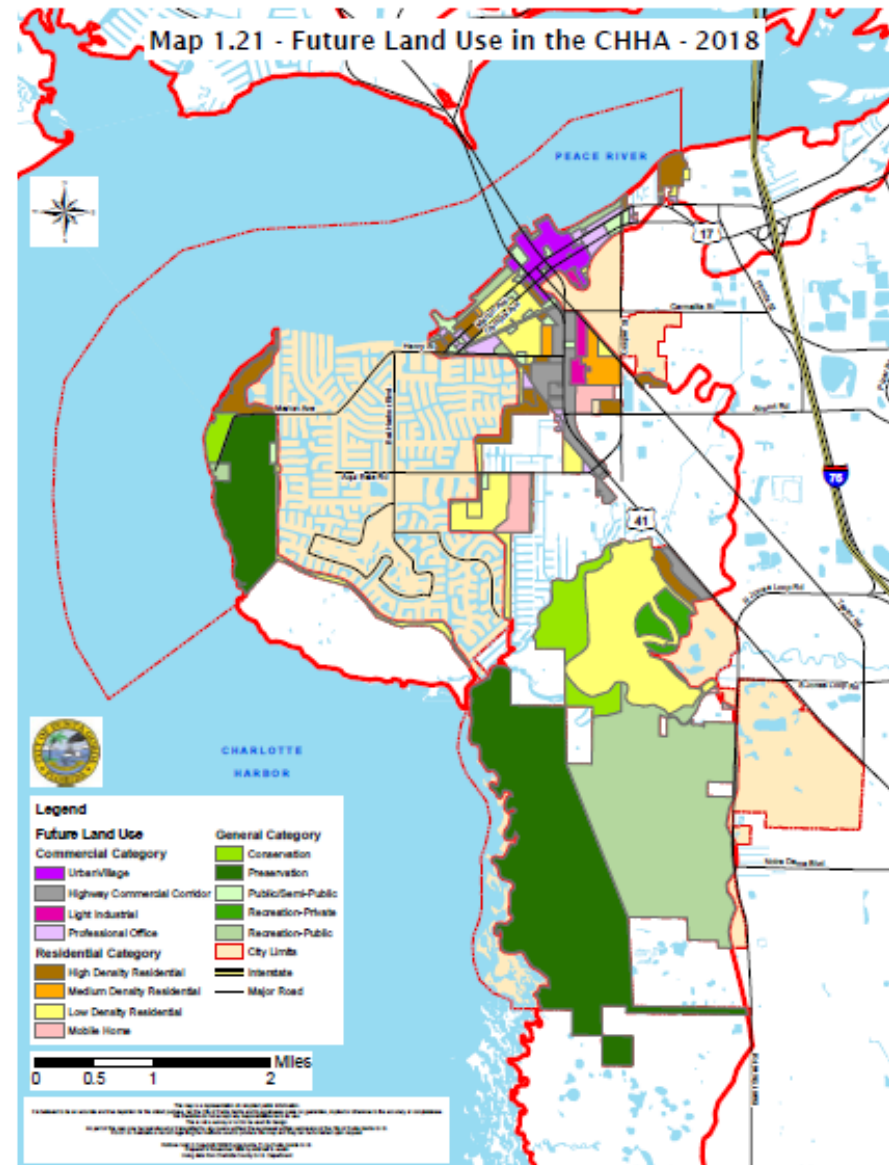
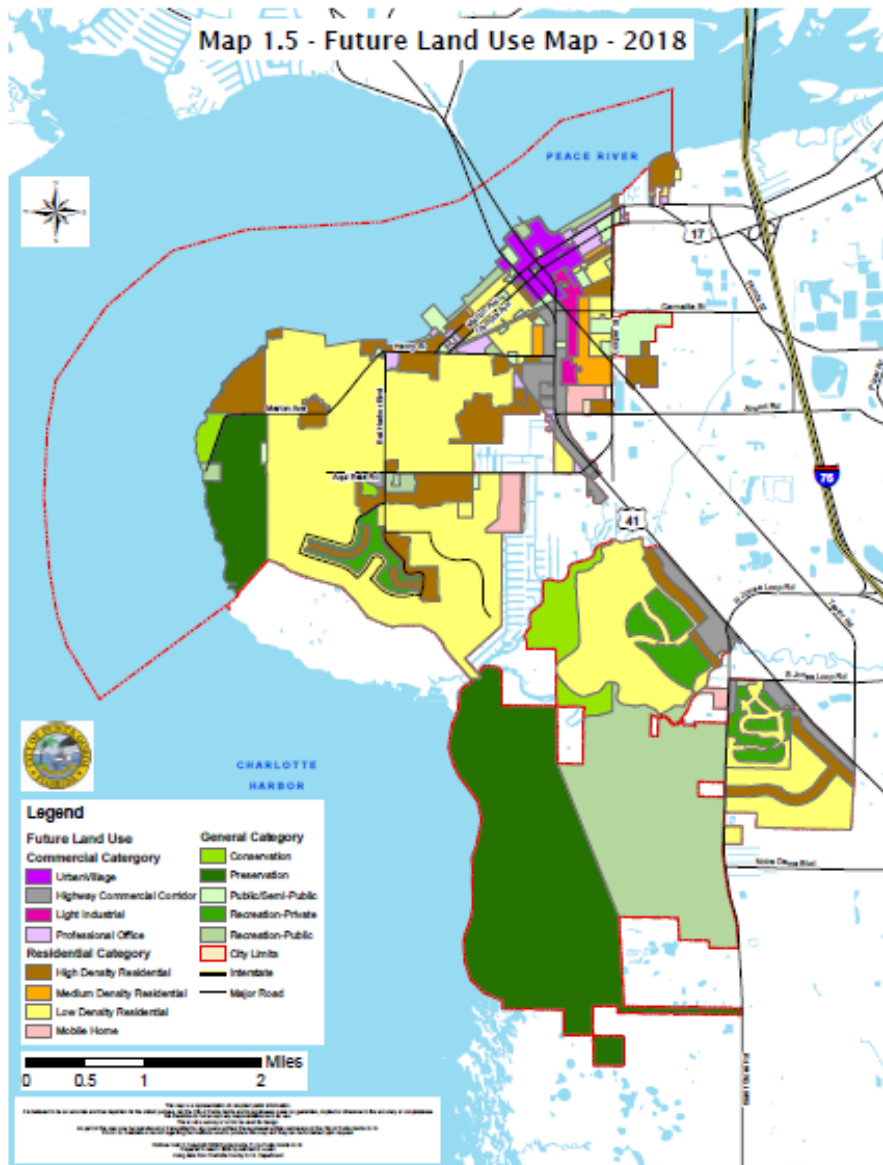
City of Punta Gorda Comprehensive Plan 2025

Chart 1.1 - The City of Punta Gorda's Existing Land Uses in Percent of Total Land Uses



- Residential
- Commercial
- Industrial
- Agricultural
- Recreational
- Conservation
- Educational
- Public
- Institutional
- Vacant Land
- Right of Way

Future Growth in Relation to the Coastal High Hazard Zone



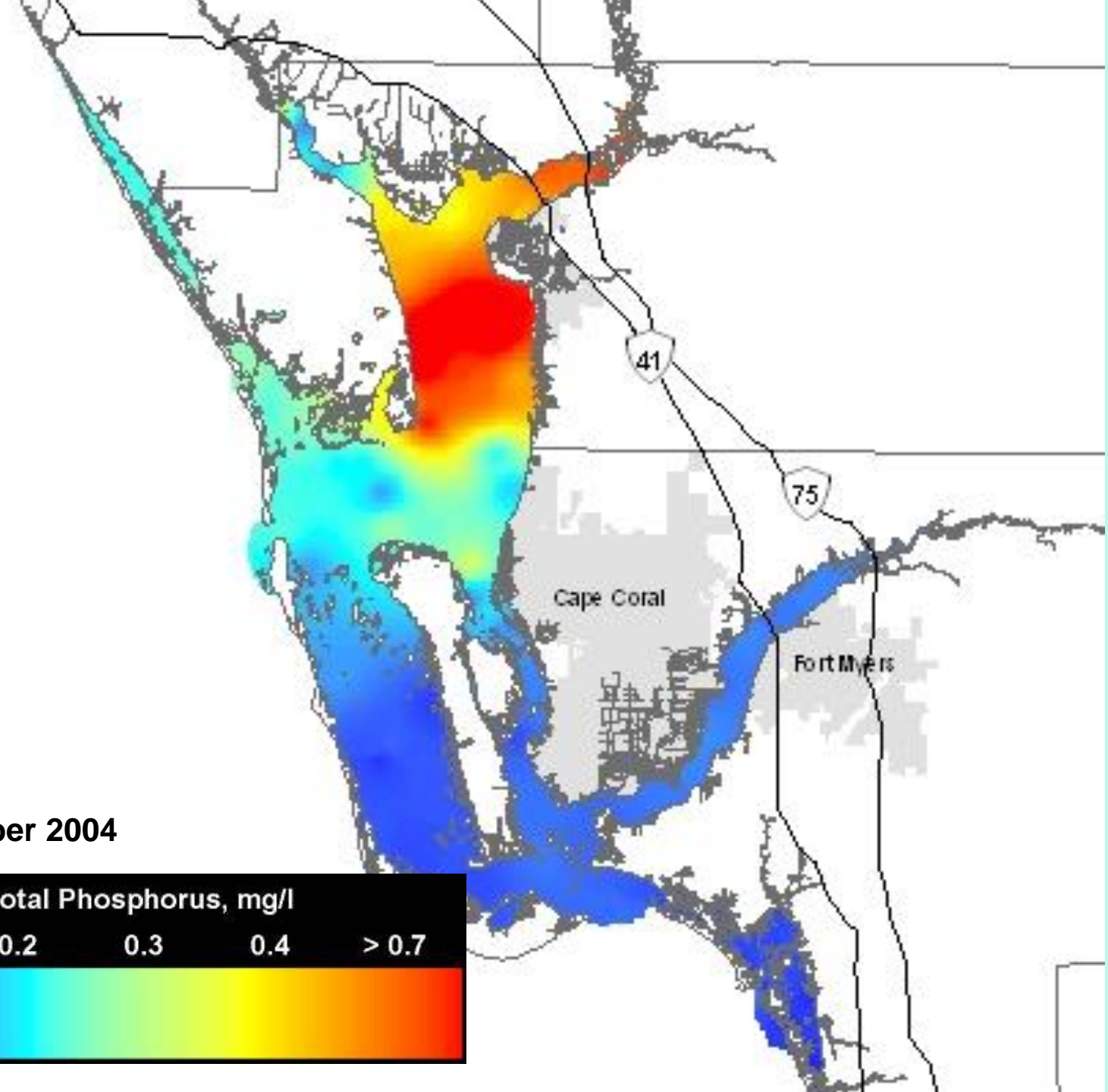
Constrain locations for certain high risk infrastructure



September 2004

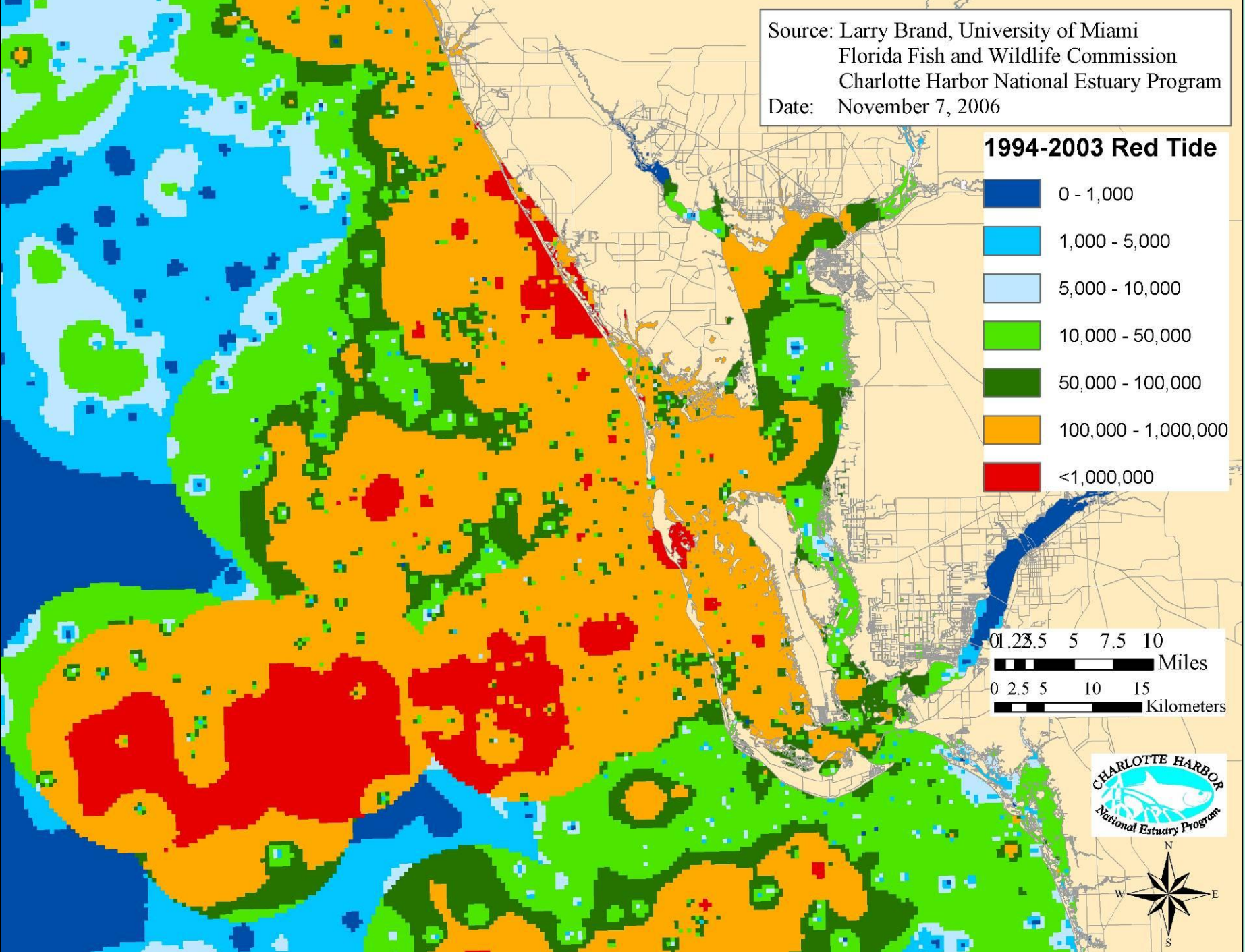
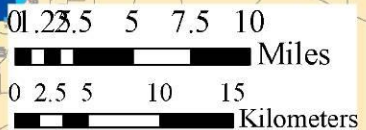
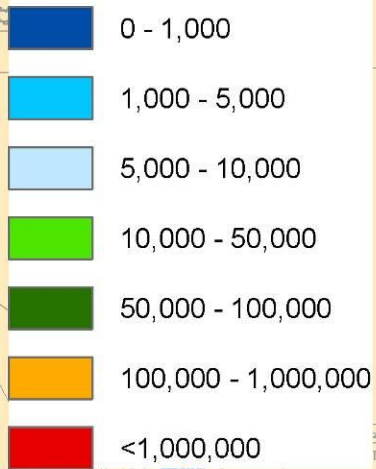
Total Phosphorus, mg/l

< 0.1 0.2 0.3 0.4 > 0.7



Source: Larry Brand, University of Miami
Florida Fish and Wildlife Commission
Charlotte Harbor National Estuary Program
Date: November 7, 2006

1994-2003 Red Tide



Restrict Fertilizer Use

SWFRPC 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;

ORDINANCE NUMBER 2008 -

AN ORDINANCE OF CHARLOTTE COUNTY, FLORIDA, PROVIDING THAT THE CODE OF LAWS AND ORDINANCES OF CHARLOTTE COUNTY, FLORIDA, BE AMENDED BY CREATING A NEW SECTION 3-9-64.1; PROVIDING FOR THE REGULATION OF FERTILIZERS; PROVIDING FOR PURPOSE AND INTENT; PROVIDING FOR DEFINITIONS; PROVIDING FOR APPLICABILITY; PROVIDING FOR THE LOCATION, TIMING, CONTENT, RATES, AND METHODS OF FERTILIZER APPLICATION; PROVIDING FOR EXEMPTIONS; PROVIDING FOR CERTIFICATION AND TRAINING; PROVIDING FOR ENFORCEMENT AND PENALTIES; PROVIDING FOR ADMINISTRATIVE RELIEF; PROVIDING FOR CONFLICT WITH OTHER ORDINANCES; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, surface water and base flow runoff enters into natural and artificial storm water and drainage conveyances and natural water bodies in Charlotte County; and

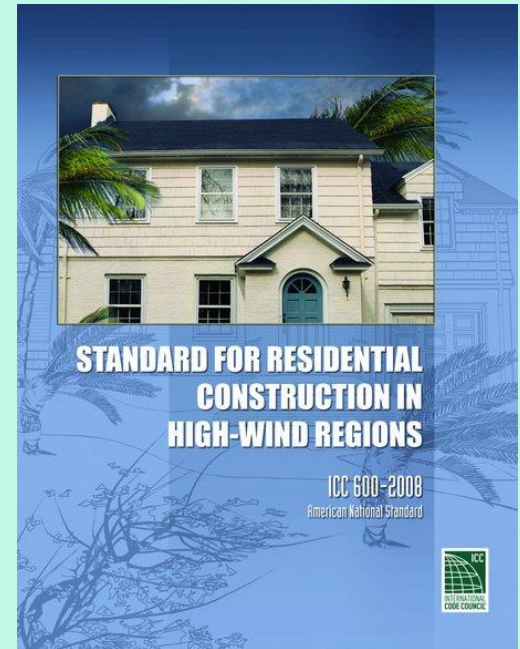
WHEREAS, leaching and runoff of nutrients from improper or excess fertilization practices can contribute to nitrogen and phosphorus pollution of the community's water resources; and

WHEREAS, the amount of Fertilizer applied should be the minimum necessary for the lawn (Turf), specialized Turf and landscape to meet initial establishment and growth needs; and

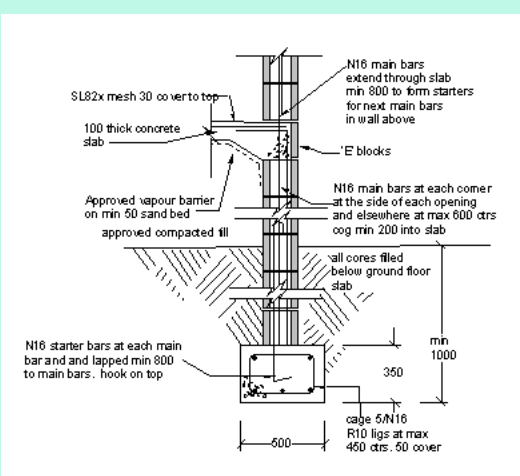
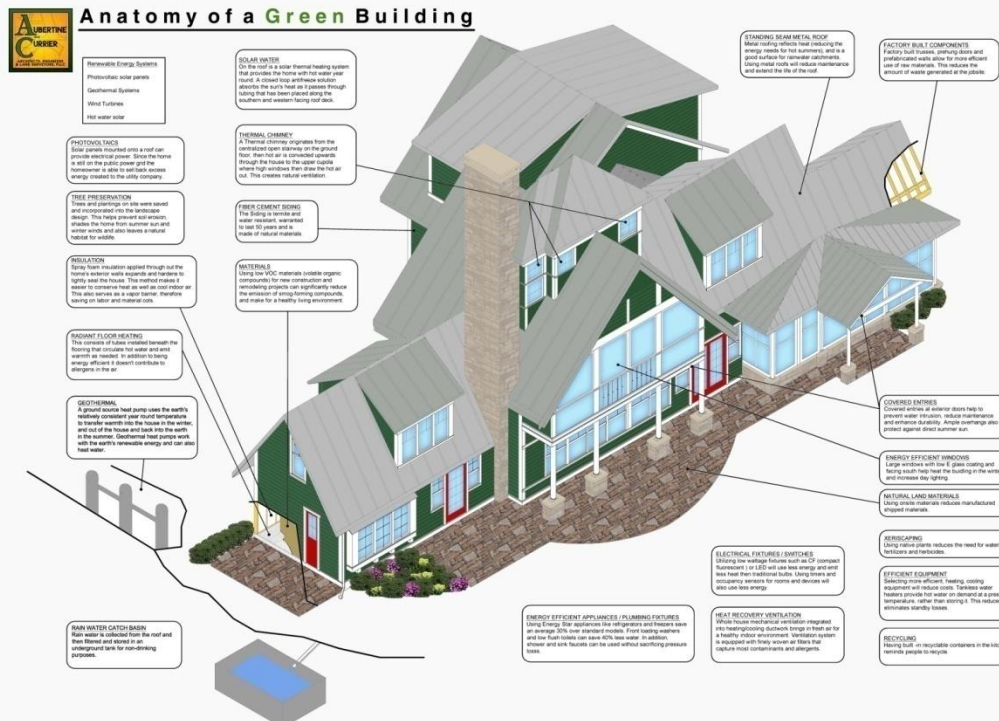
WHEREAS, nutrients are essential elements for plant growth and are commonly used in various forms as a Fertilizer for lawn (Turf), specialized Turf and landscape application; and

WHEREAS, the amount of Fertilizer applied and the method of application of that Fertilizer have the greatest impact on the potential for creating pollution;

Promote green building alternatives through education, taxing incentives, and green lending.



Anatomy of a Green Building



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*



Florida Department of Agriculture
and Consumer Services



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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