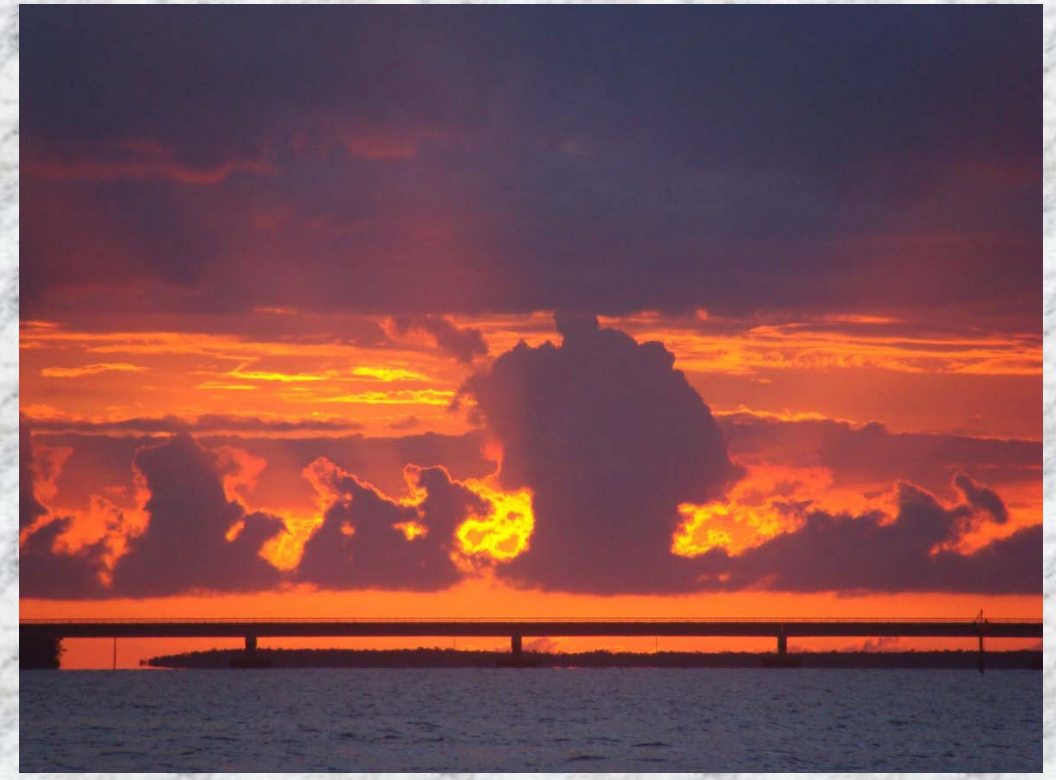
WE ARE IN CLIMATE CHANGE IN SOUTHWEST FLORIDA



James W. Beever III

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 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:
- Increased average air temp change Fort Myers 1.2°F.
  - … More severe storms
  - … Loss of mature mangrove, salt marsh, water quality, island area
  - … Longer, more severe dry seasons
  - … Shorter wet seasons of higher precipitation

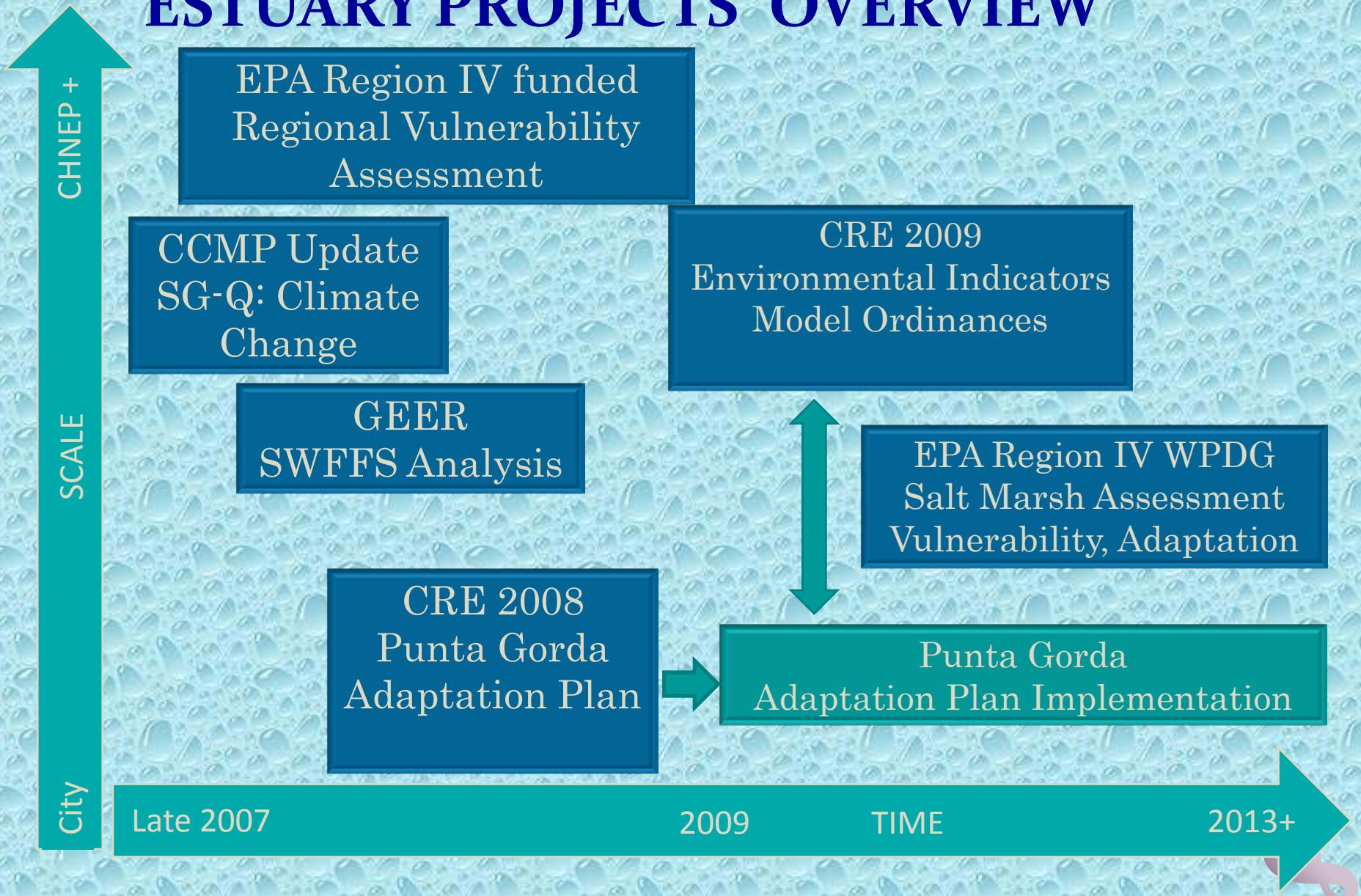
Even the least impact future climate change scenario:

- increased climate instability
- wetter wet seasons
- drier dry seasons
- more extreme hot and cold events
- increased coastal erosion
- continuous (perhaps accelerated) 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.

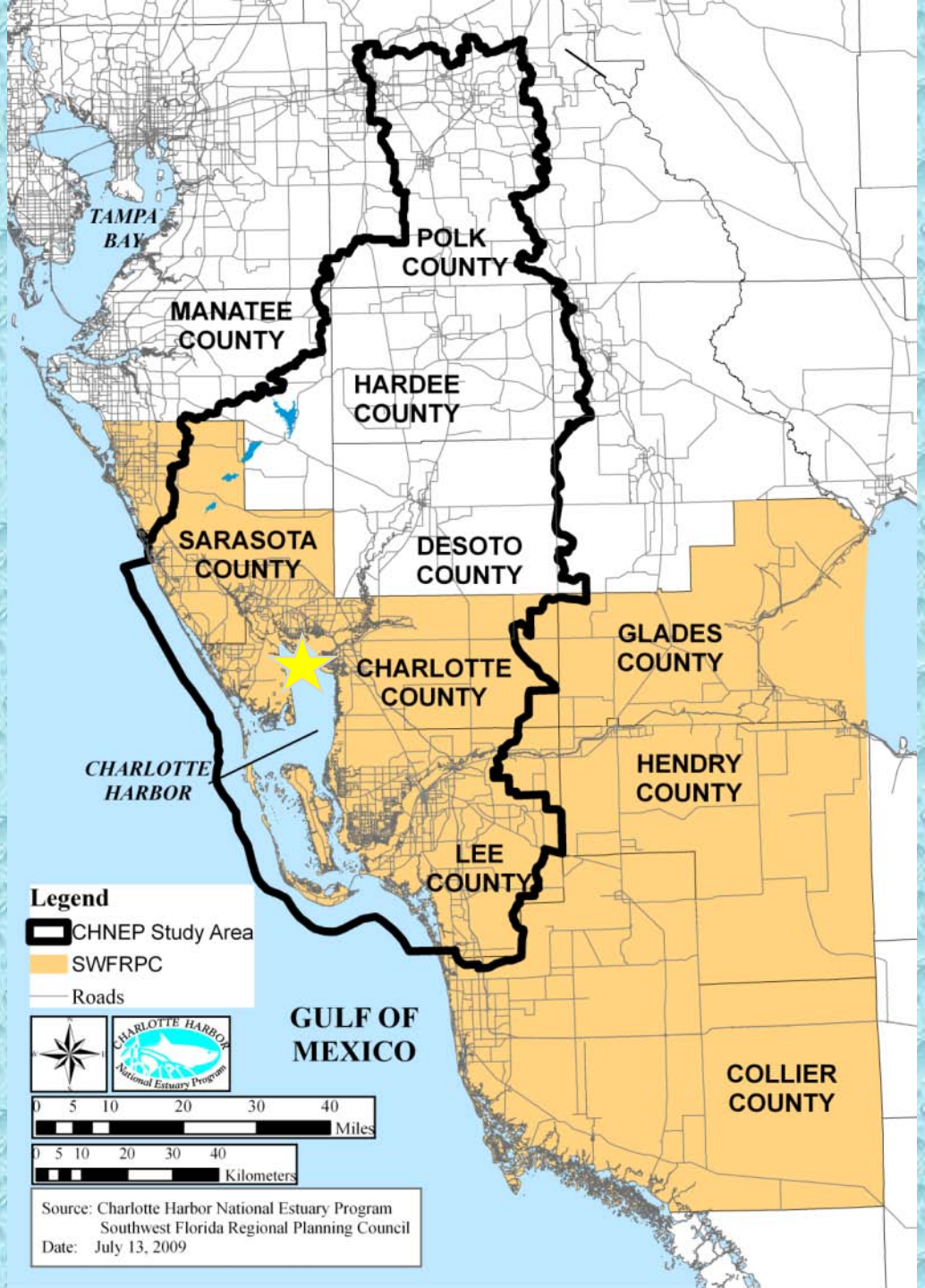
11 CHNEP/SWFRPC CRE PROJECTS

- 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)

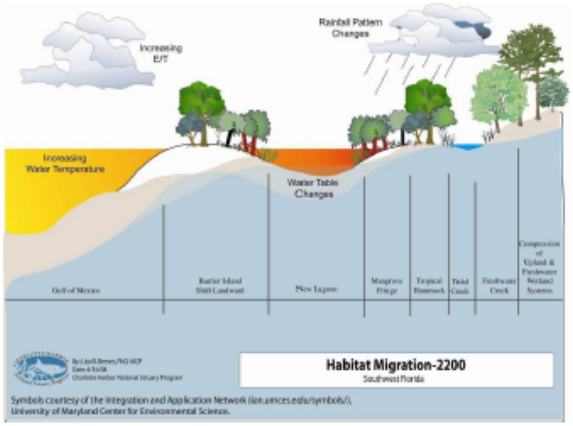
CHNEP/SWFRPC CLIMATE READY ESTUARY PROJECTS OVERVIEW



- Polk
- Manatee
- Hardee
- Desoto
- Sarasota
- Glades
- Charlotte
- Hendry
- Lee
- Collier



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

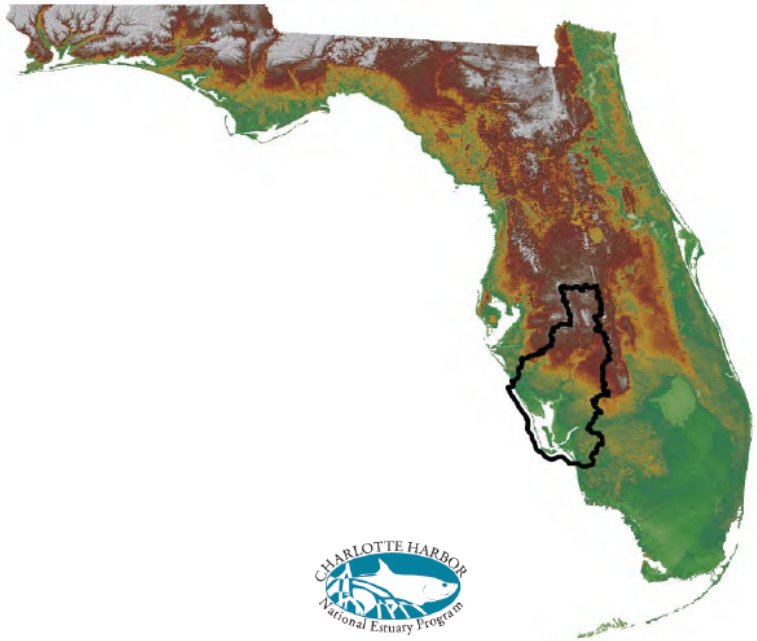
And

Lisa B. Beever: CHNEP

1926 Victoria Avenue
Fort Myers FL 33901
(239) 338-2550
www.SWFRPC.org and www.CHNEP.org

CHNEP VULNERABILITY ASSESSMENT (2010)

Charlotte Harbor Regional Climate Change Vulnerability Assessment



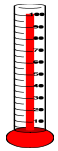
The Charlotte Harbor National Estuary Program (CHNEP) is a partnership of citizens, scientists, elected officials, resource managers and commercial and recreational resource users who are working to improve the water quality and ecological integrity of the CHNEP study area. A cooperative decision-making process is used within the program to address diverse resource management concerns in the 4,700-square-mile CHNEP study area.

February 19, 2010

Potential Impacts of Climate Change

Infrastructure
Water
Transportation
Energy Supply & Use

Changes in the Climate

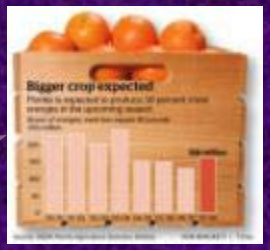


Temperature

Climate Instability

Sea Level Rise

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



Agriculture
Crop yields
Irrigation demands

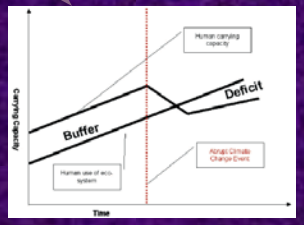
Forest
Change in forest composition
Shift geographic range of forests
Forest Health and Productivity

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

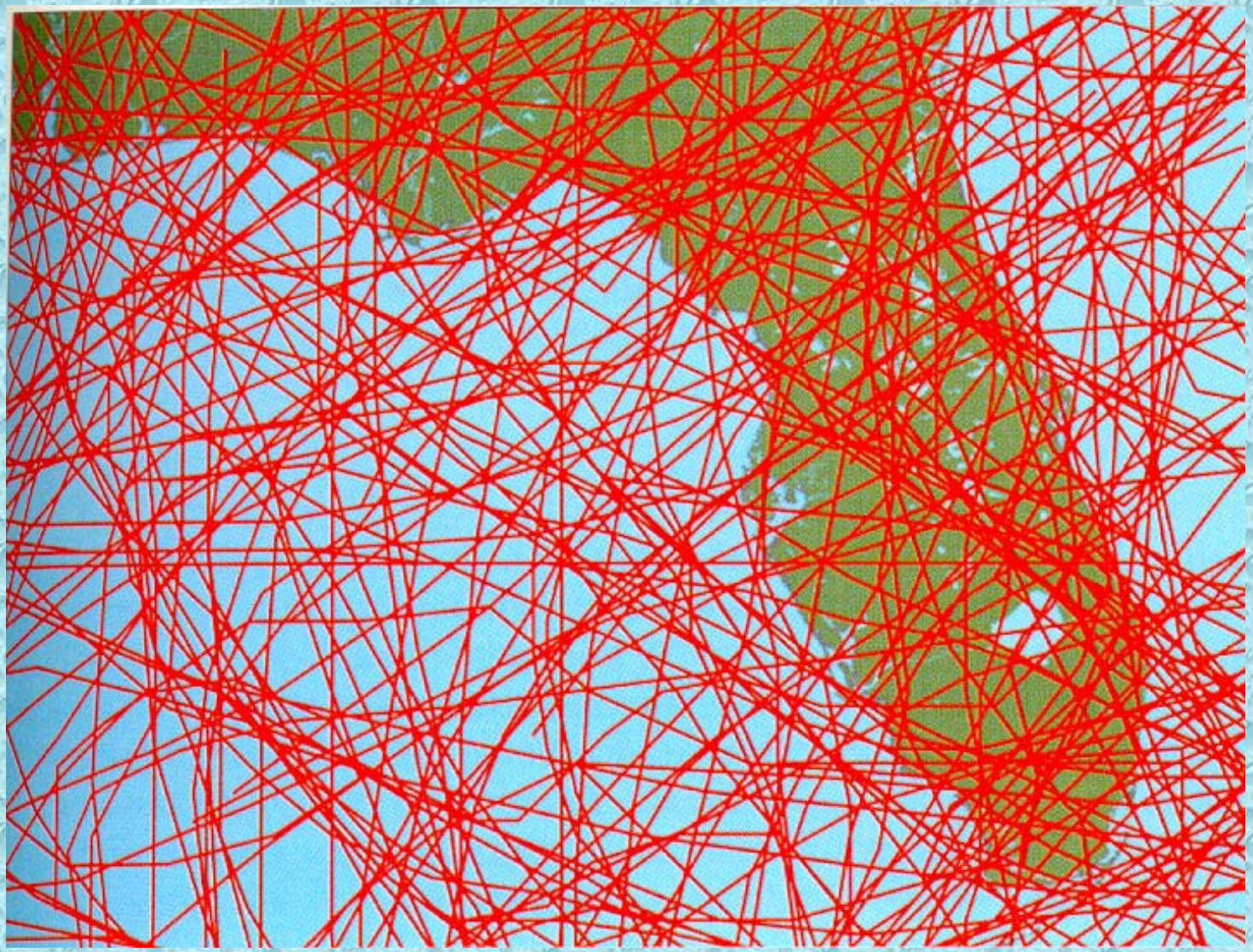
Wildlife and Ecosystems
Shift in ecological zones
Loss of habitat and species
Damage to Habitats

Cultural Resources



Economic Disruption

84 Climate Effects on Natural and Man-Made Systems of Southwest Florida Identified So Far



Tracks of All Recorded Hurricanes for Florida and Eastern Gulf of Mexico

DATABASE OF EXISTING AND POTENTIAL CLIMATE CHANGE EFFECTS

84 effects potential in southwest Florida

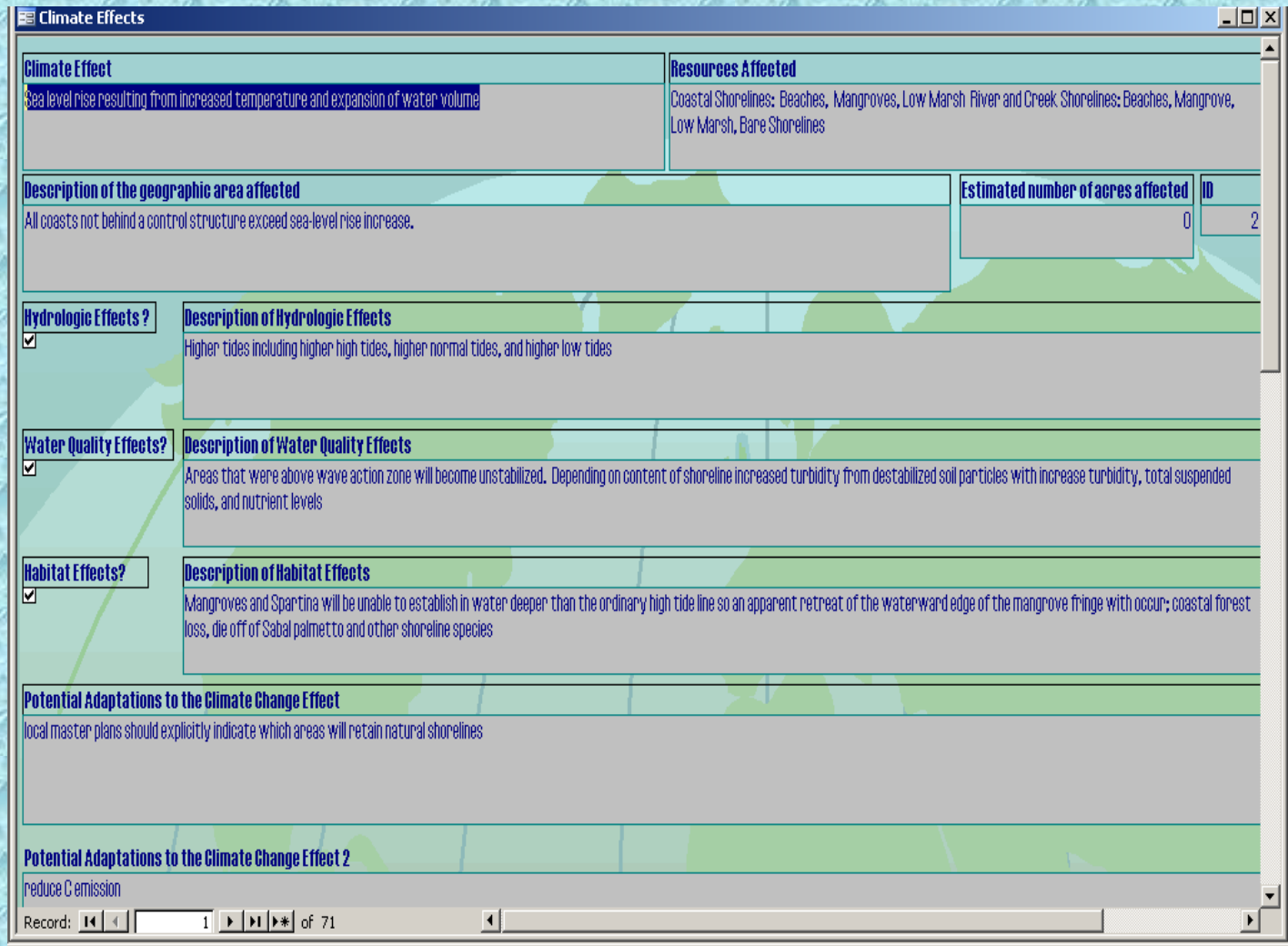
5 future scenarios of climate change into the year 2200

Analysis of effects with no action and with various adaptations

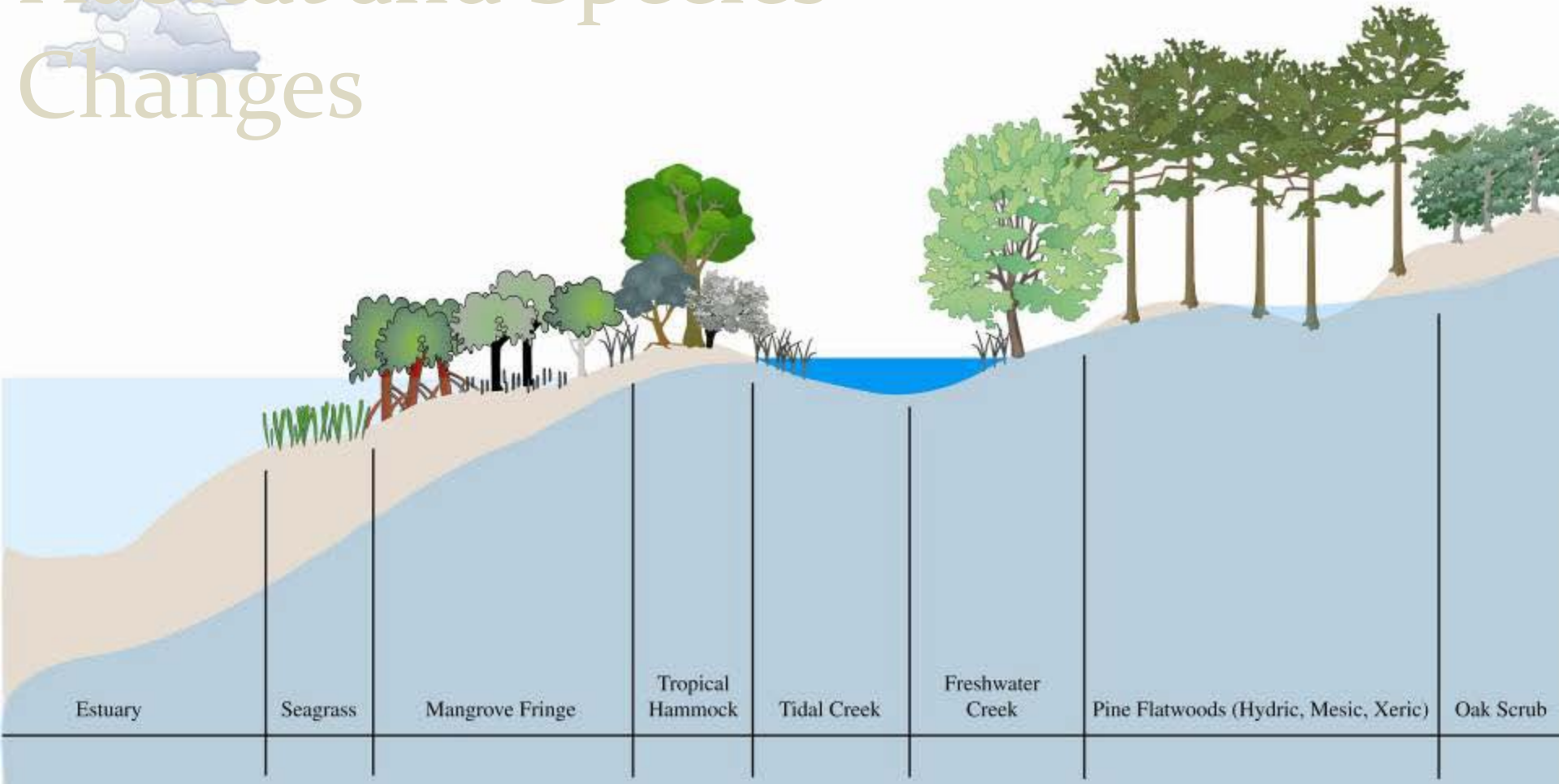
Source material citation and PDF library

Current conditions and potential future conditions

500+ source documents reviewed



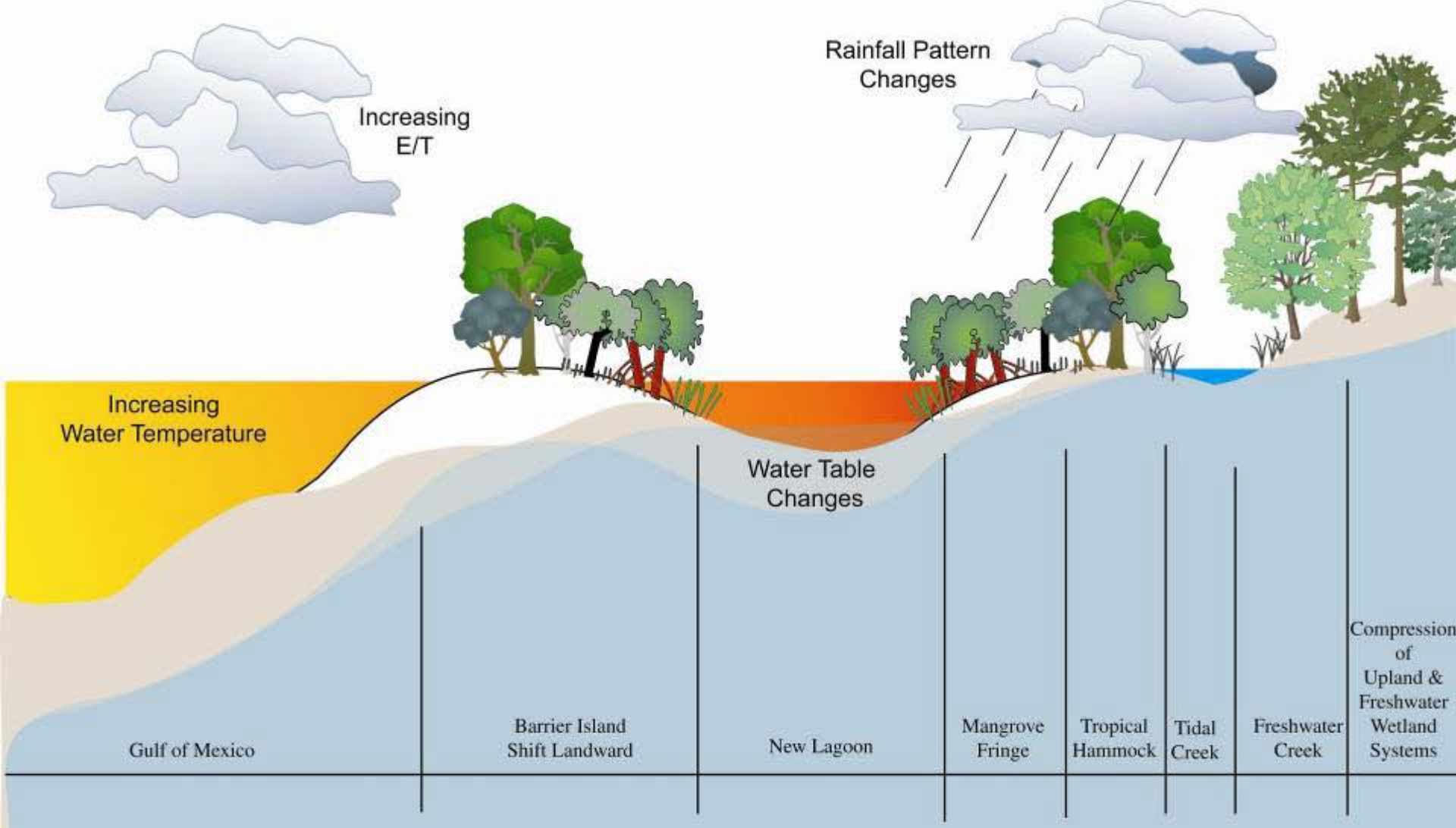
Habitat and Species Changes



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.

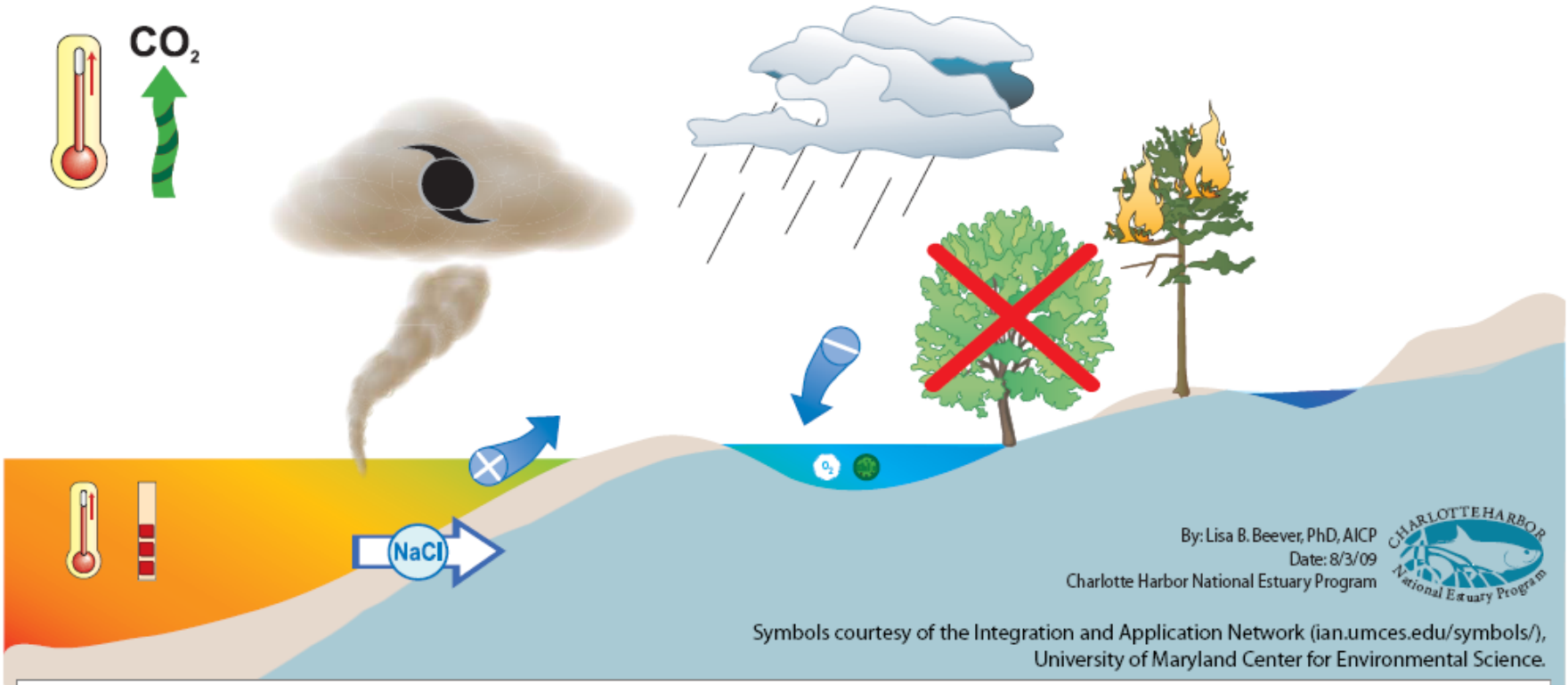


By: Lisa B. Beever, PhD, AICP
Date: 4/16/08
Charlotte Harbor National Estuary Program

Habitat Migration-2200

Southwest Florida

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



By: Lisa B. Beever, PhD, AICP
Date: 8/3/09
Charlotte Harbor National Estuary Program

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

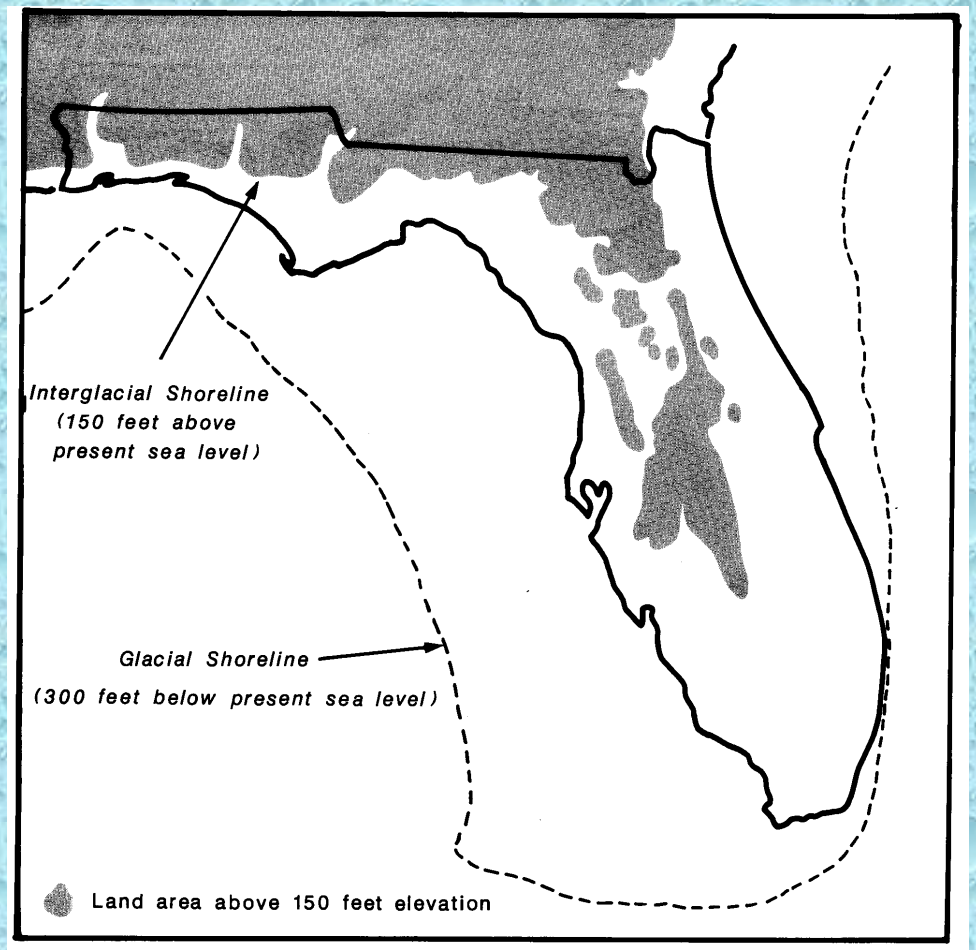
Climate Change Drivers and Stressors

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.

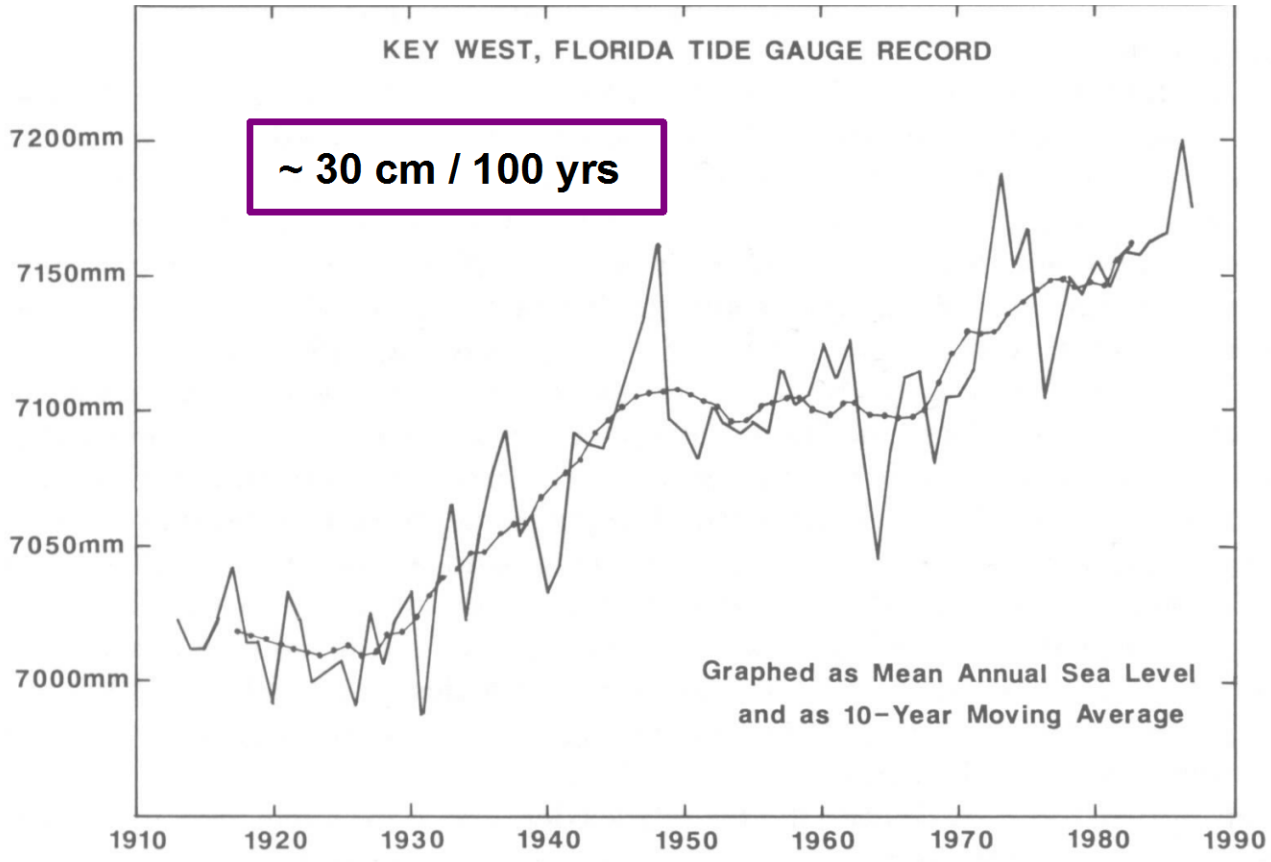
Stressors- With the drivers of air and water temperature and chemistry, stressors on natural and human systems occurs. The climate Becomes unstable with resulting changes in precipitation and increased storm frequency. Changes in rainfall patterns, results in altered hydrology (changes in stream flow)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

The climate of southwest Florida is changing now, and has been changing for millennia.



	1900	2008	Scenario	2100	Citation
Average Air Temperature (F)	72.3	73.5	Lower	75.7	Stanton and Ackerman 2007
			Intermed.	76.5	Analysis of local data since 1968
			Upper	84.5	USGCRP 2009
Days per year over 90°	77.7	90.4	Lower	91.8	Rate applied from 1931-1949
			Intermed.	104.6	Rate applied from 1901-1919
			Upper	180	USGCRP 2009
North Atlantic Water Temperature [1](F)	80.6 [2]	81.7	Lower	82.8	IPCC 2007a
			Intermed.	82.9	FOCC 2009
			Upper	85.3	IPCC 2007a
Global Air CO_2 Levels (ppm)	298.0	387.0	Lower	450.0	USGCRP 2009
			Intermed.	680.0	USGCRP 2009
			Upper	950.0	USGCRP 2009
Ocean pH	8.2	8.1	Lower	8.0	Royal Society 2005
			Intermed.	7.8	Royal Society 2005
			Upper	7.7	Royal Society 2005
Rainfall (inches)	54	54	Lower	54	Stanton and Ackerman 2007
			Intermed.	52	10-year rolling average rate
			Upper	49	Stanton and Ackerman 2007
Rainfall Delivered in Rainy Season (6/1 through 9/30)	62%	68%	Lower	70%	10-year rolling average rate
			Intermed.	74%	USGCRP 2009
			Upper	82%	USGCRP 2009
Sea Level Rise (inches)	0.0	8.0	Lower	7.1 + 8	Stanton and Ackerman 2007
			Intermed.	19.8 + 8	Titus and Narayanan 1995
			Upper	45.3 + 8	Stanton and Ackerman 2007

Tide Gauge Data for Key West



From Maul & Martin 1993

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

County	Dengue and dengue hemorrhagic fever	Malaria	West Nile Virus	Yellow Fever	Encephalitis including St. Louis, California	Equine Encephalitis (Eastern & Western)	Lyme Disease (Borrelia burgdorferi)	Rocky Mountain Spotted Fever	Ehrlichiosis	Typhus Fevers
Charlotte	1	4	0	0	7	0	14	0	1	0
Collier	3	44	3	0	11	0	3	0	1	0
DeSoto	0	0	1	0	0	0	0	0	0	0
Glades	0	0	0	0	0	0	2	0	0	0
Hardee	0	1	0	0	3	0	0	1	0	0
Hendry	0	1	0	0	0	1	0	0	1	0
Lee	5	31	5	0	17	0	37	6	2	2
Manatee	2	8	1	0	3	0	19	0	2	0
Polk	4	21	1	0	4	2	9	2	1	0
Sarasota	0	13	6	0	28	0	55	5	3	0
Totals	15	123	17	0	73	3	139	14	11	2

County	Plague (Yersinia pestis)	Chagas (Trypanosoma cruzi)	Rabies (possible exposures)	Hantavirus	Tularemia (Francisella tularensis)	
Charlotte	0	X	0 (298)	0	0	
Collier	5	X	1 (382)	0	0	
DeSoto	1	X	0 (4)	0	0	mosquito-borne
Glades	0	X	0 (1)	0	0	tick-borne
Hardee	0	X	0 (35)	0	0	flea-borne
Hendry	1	X	0 (44)	0	0	other insect-borne
Lee	2	X	0 (624)	0	0	mammal-borne
Manatee	0	X	0 (225)	0	0	
Polk	2	X	0 (21)	0	0	
Sarasota	0	X	0 (189)	0	0	
Totals	11		1 (1823)	0	0	

Table 25: Tropical diseases occurrence in southwest Florida

Human Health

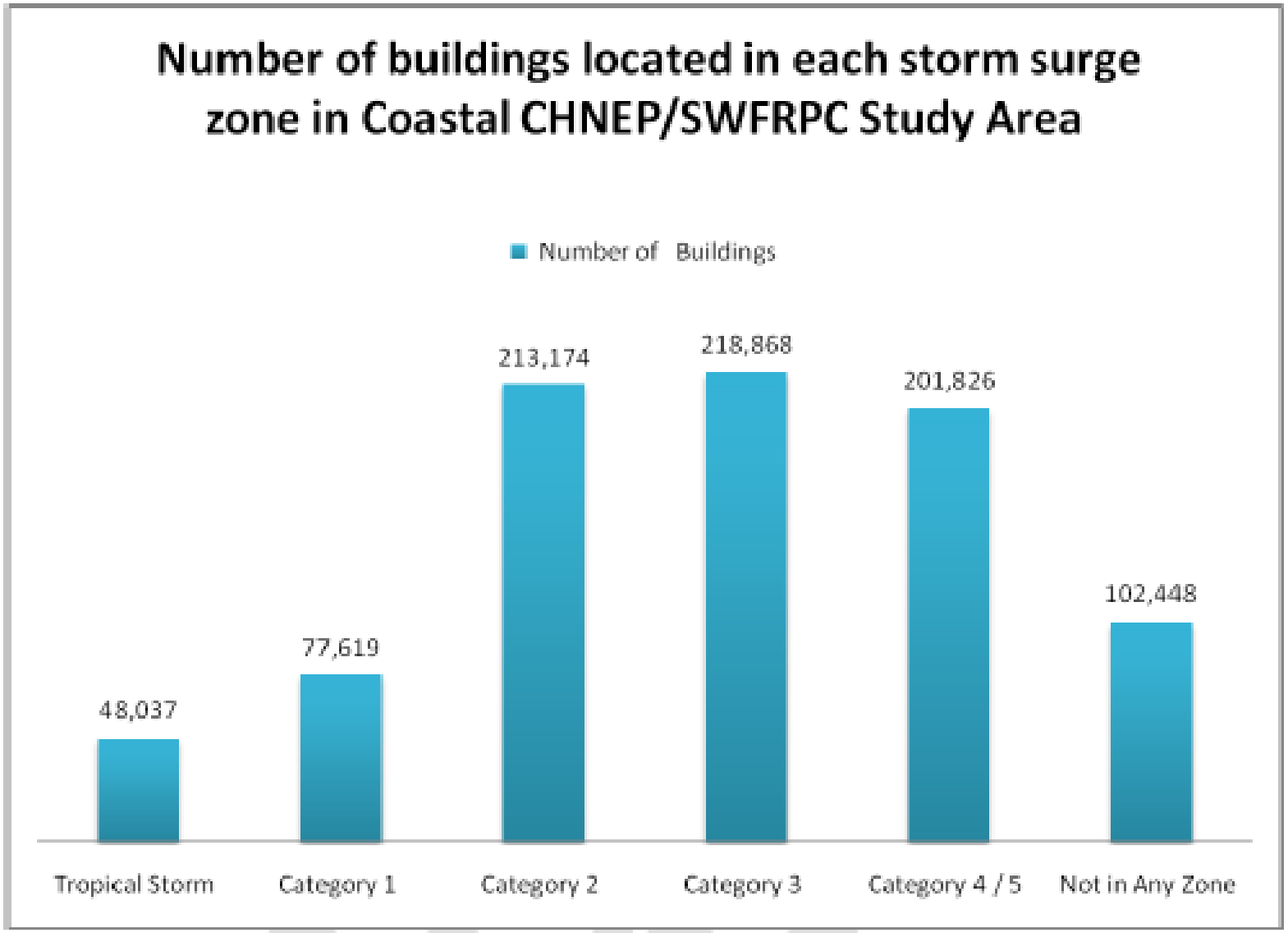


Figure 9: Number of buildings located in each tropical storm and hurricane storm surge zone in coastal CHNEP/SWFRPC study area

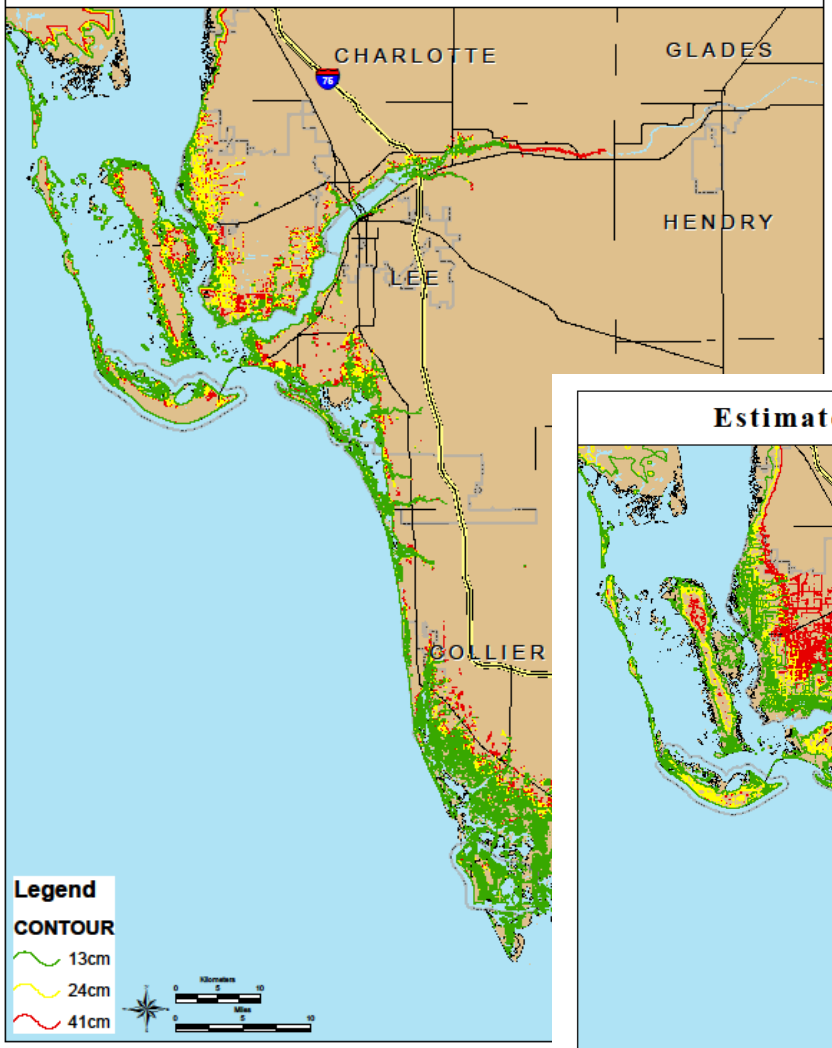
Estimated Values for Structures within Punta Gorda Based on the 100 Year Floodplain

	No. of Buildings	Building Value	Contents Value	Functional Use Value	Total Value
Inside 100 Year Floodplain	9,328	$1,502,477,972	$934,065,737	$112,042,972	$2,548,586,681
Outside 100 Year Floodplain	658	$90,433,868	$48,949,138	$3,529,030	$142,912,036
Total	9,986	$1,592,911,840	$983,014,875	$115,572,002	$2,691,498,717

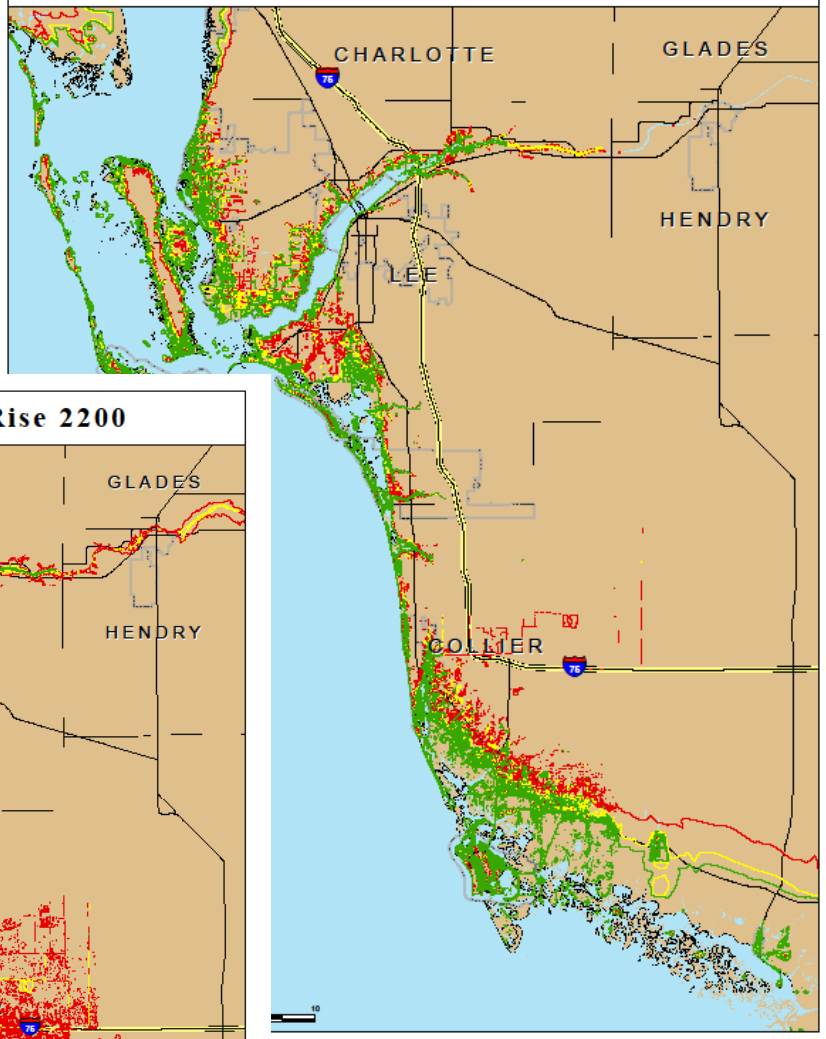
Estimated Values for Historic Structures within Punta Gorda Based on the 100 Year Floodplain

	No. of Buildings	Building Value	Contents Value	Functional Use Value	Total Value
Inside 100 Year Floodplain	44	$21,914,968	$21,914,968	$426,480	$44,256,416
Outside 100 Year Floodplain	0	$0	$0	$0	$0
Total	44	$21,914,968	$21,914,968	$426,480	$44,256,416

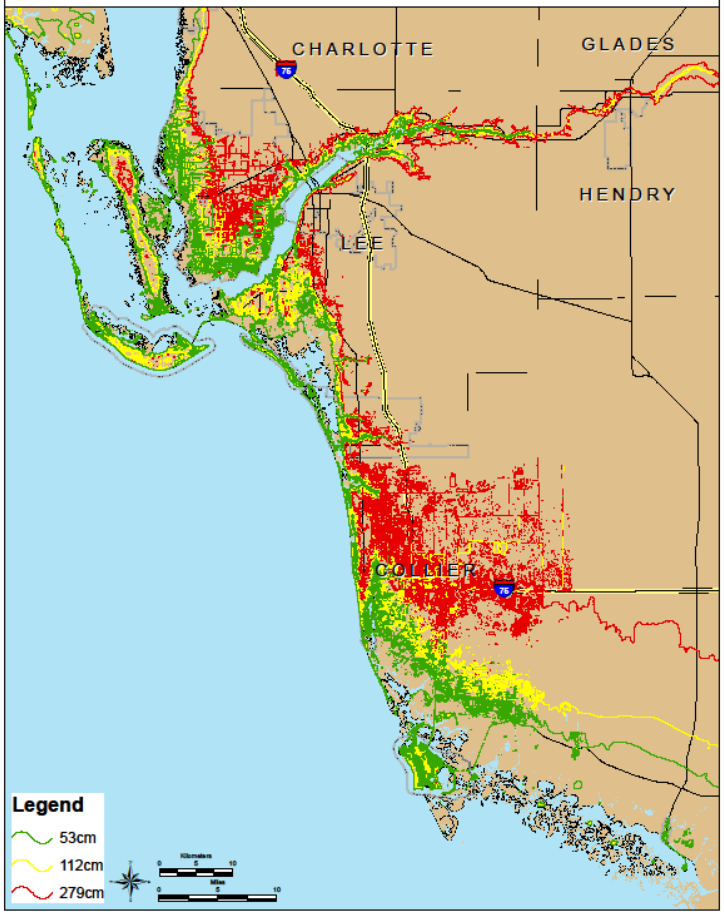
Estimated Sea Level Rise 2050

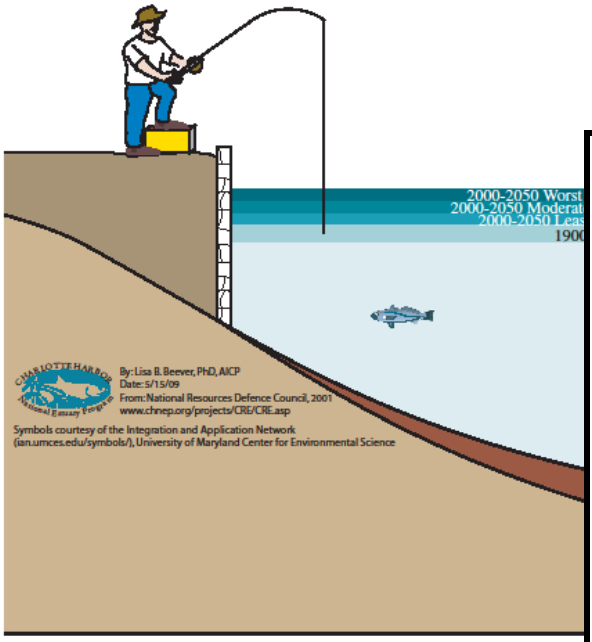


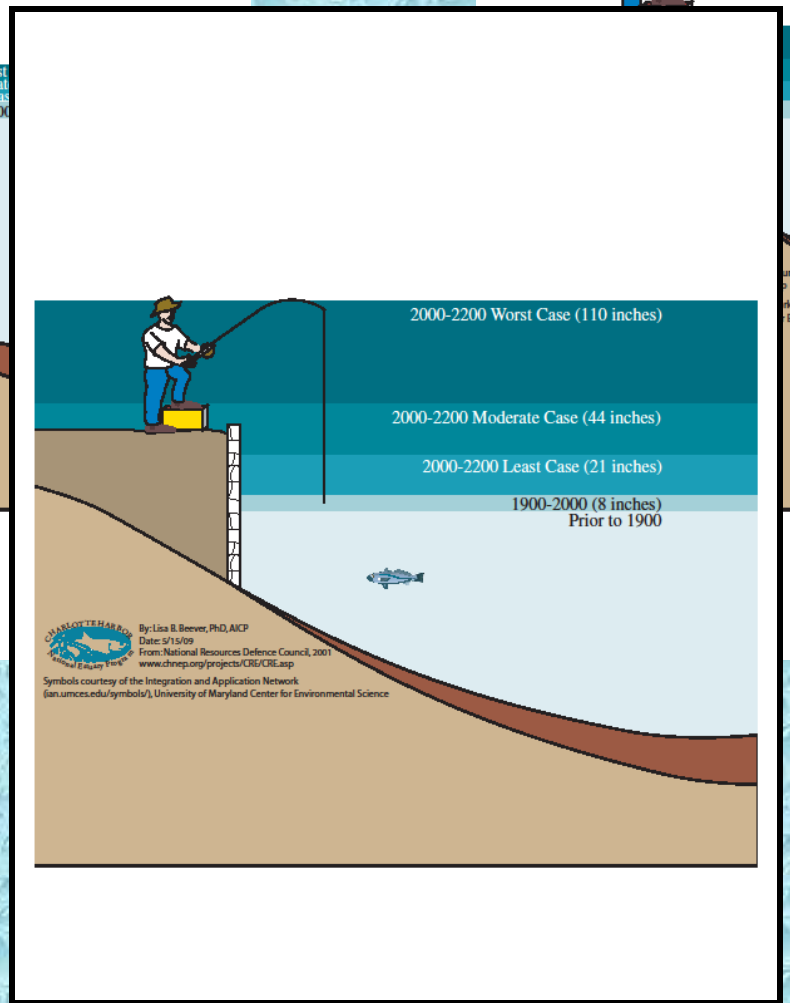
Estimated Sea Level Rise 2100

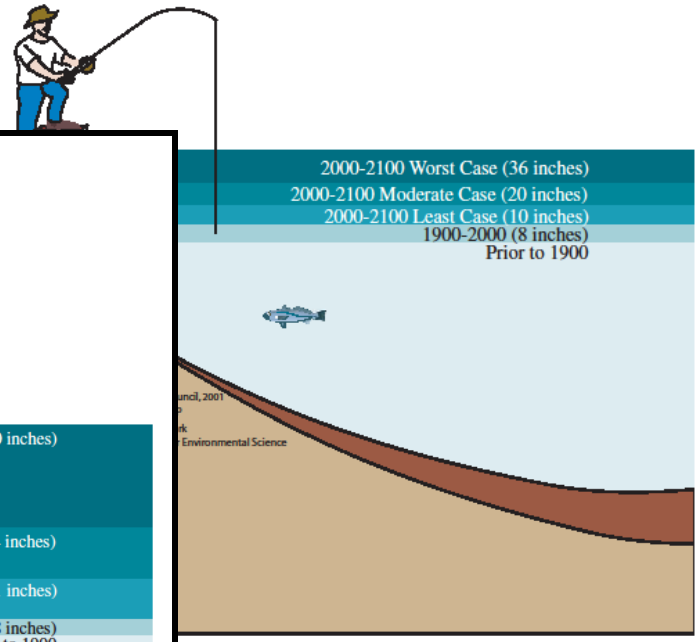


Estimated Sea Level Rise 2200




2000-2050 Worst
2000-2050 Moderat
2000-2050 Leas
1900
By: Lisa B. Beever, PhD, AICP
Date: 5/15/09
From: National Resources Defence Council, 2001
www.chnep.org/projects/CRE/CRE.asp
Symbols courtesy of the Integration and Application Network
(ian.umces.edu/symbols/), University of Maryland Center for Environmental Science


2000-2200 Worst Case (110 inches)
2000-2200 Moderate Case (44 inches)
2000-2200 Least Case (21 inches)
1900-2000 (8 inches)
Prior to 1900
By: Lisa B. Beever, PhD, AICP
Date: 5/15/09
From: National Resources Defence Council, 2001
www.chnep.org/projects/CRE/CRE.asp
Symbols courtesy of the Integration and Application Network
(ian.umces.edu/symbols/), University of Maryland Center for Environmental Science


2000-2100 Worst Case (36 inches)
2000-2100 Moderate Case (20 inches)
2000-2100 Least Case (10 inches)
1900-2000 (8 inches)
Prior to 1900
Environmental Science

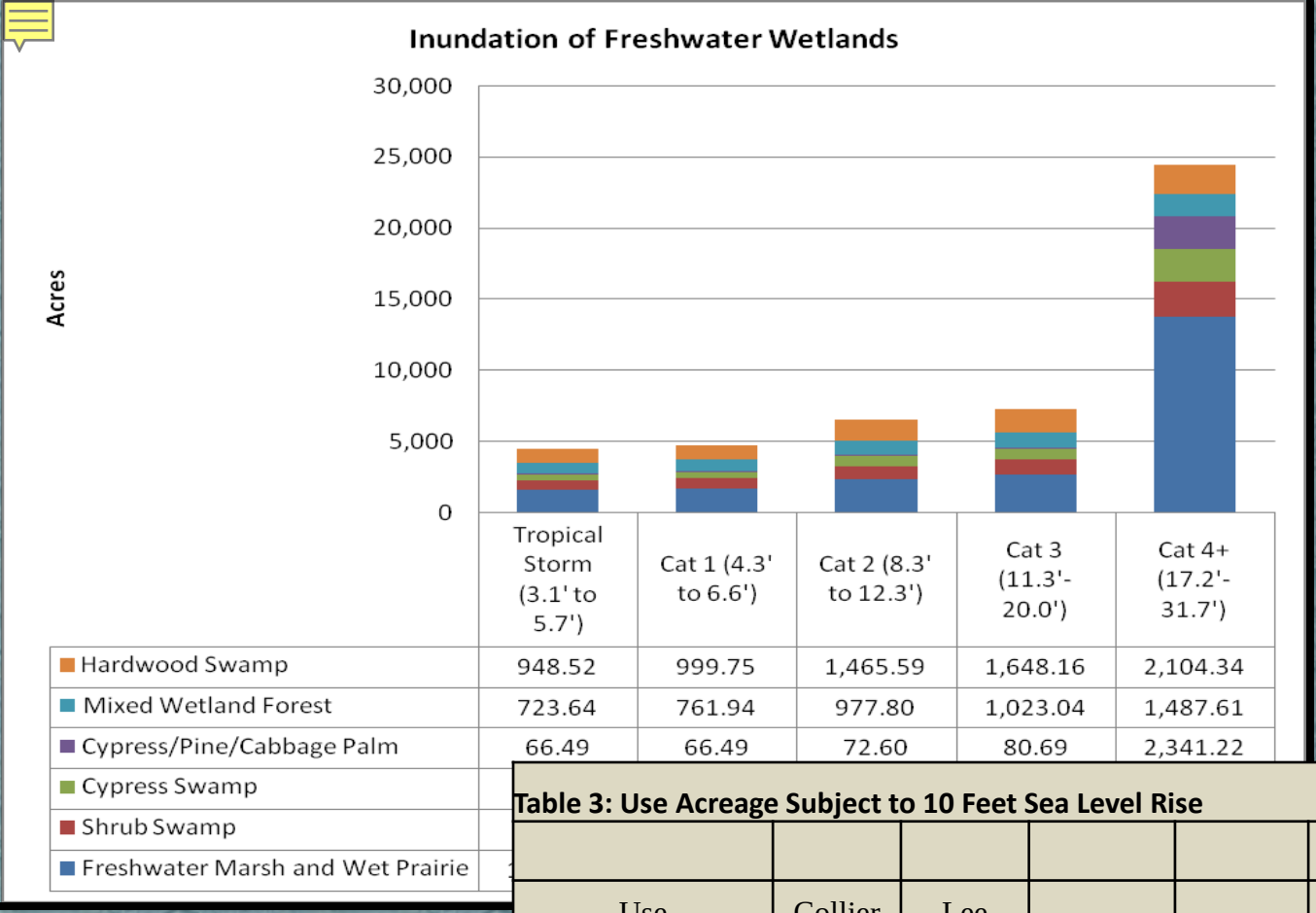


Table 3: Use Acreage Subject to 10 Feet Sea Level Rise

Use	Collier	Lee			Total	Sq. Miles	% of Region
Agriculture	7,766	467	1,247	1,188	10,669	16.7	0.28
Commercial	2,363	9,247	6,260	1,082	18,953	29.6	0.49
Estate	1,005	16,110	107	2,894	20,117	31.4	0.52
Industrial	653	2,597	1,321	382	4,952	7.7	0.13
Multi-Family	2,269	1,937	7,758	3,891	15,855	24.8	0.41
Preserve	615,177	247,286	108,897	22,737	994,098	1,553.3	25.79
Single Family	53,444	89,621	50,668	45,991	239,724	374.6	6.22
Total Acreage	682,677	367,266	176,259	78,165	1,304,368	2,038.1	33.84

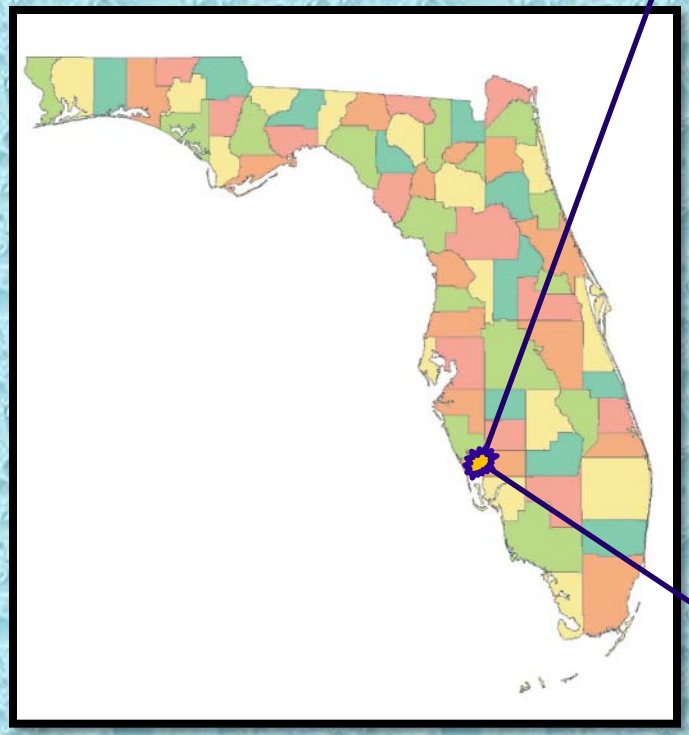
City of Punta Gorda, Florida

Population: 16,600

Area: 14 square miles

Elevation: 0-15 ft.

Already included climate change planning language in 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.

Punta Gorda's Grouped Vulnerabilities/ Areas For Adaptation

Fish and Wildlife Habitat Degradation

Inadequate Water Supply

Flooding

Unchecked or Unmanaged Growth

Water Quality Degradation

Education and Economy

and Lack of Funds

Fire

Availability of Insurance

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.

Prioritized List of Adaptations

Vulnerability	First Adaptation
Fish and Wildlife Habitat Degradation	Seagrass protection and restoration
Inadequate Water Supply	Xeriscaping and native plant landscaping
Flooding	Explicitly indicating in the comp plan which areas will retain natural shorelines
Unchecked or Unmanaged Growth	Constraining locations for certain high risk infrastructure
Water Quality Degradation	Restrict fertilizer use
Education and Economy and Lack of Funds	Promote green building alternatives through education, taxing incentives, green lending
Fire	Drought preparedness planning
Availability of Insurance	(Implementation of other adaptations will reduce this vulnerability)

Implementation in Punta Gorda - From Concept to Concrete

Acceptance by City Council

New riverfront built with resilient design

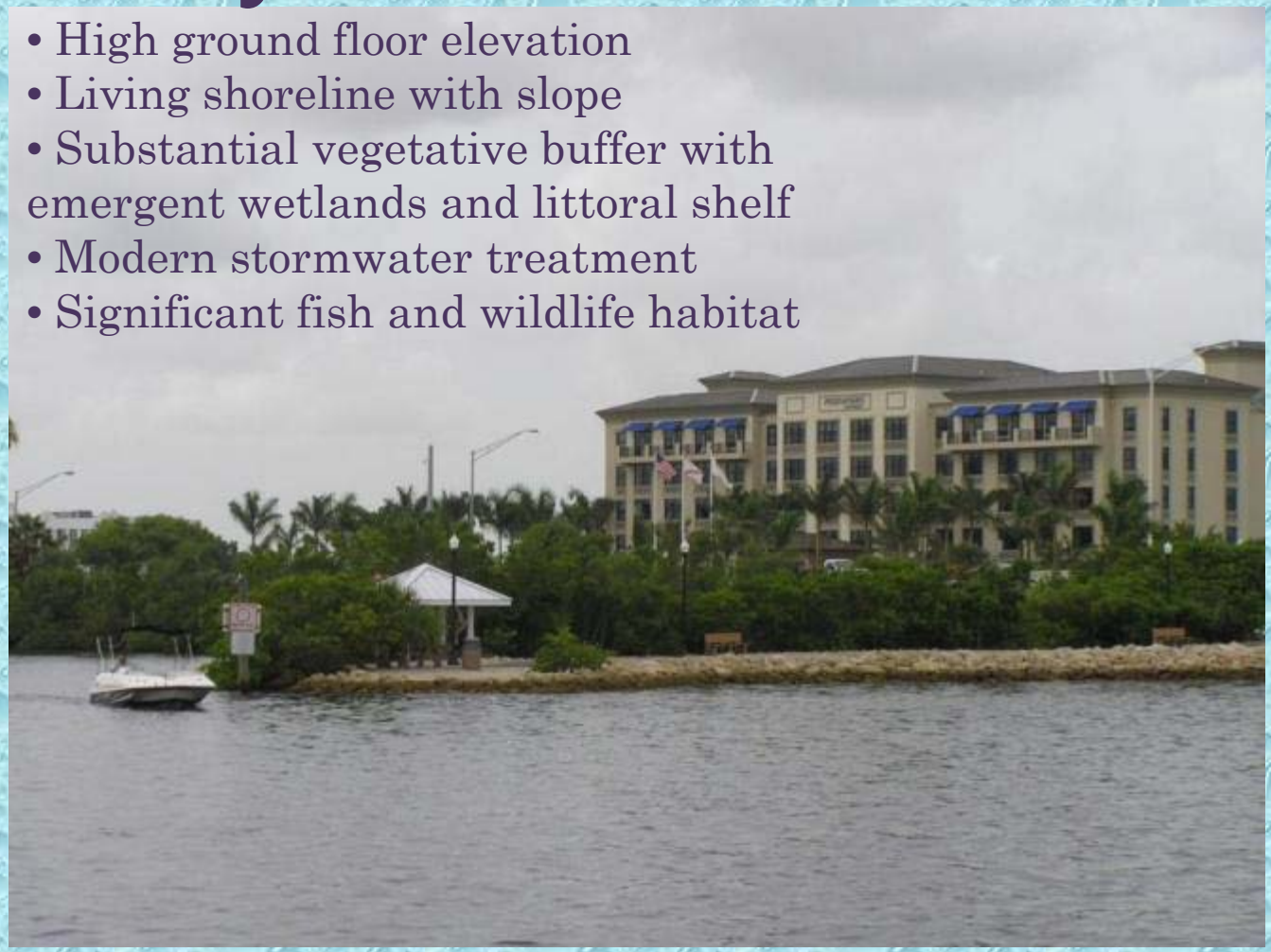
Public Works facility lost in Hurricane Charley relocated

Model Ordinance Development with UF

Comprehensive Plan language added

New Style

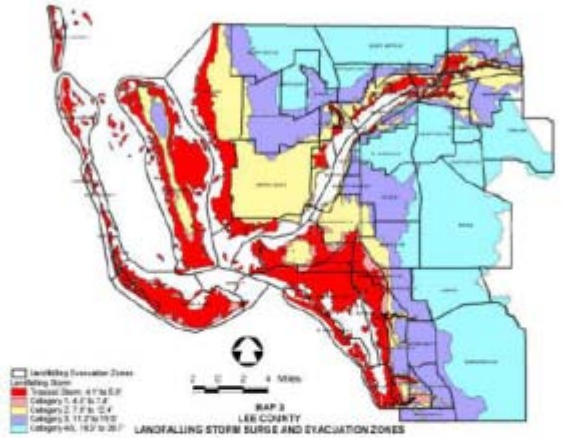
- High ground floor elevation
- Living shoreline with slope
- Substantial vegetative buffer with emergent wetlands and littoral shelf
- Modern stormwater treatment
- Significant fish and wildlife habitat



LEE COUNTY VULNERABILITY ASSESSMENT

- Characterizes current Lee County climate
- Assesses significant potential climate changes and their effects in Lee County
- Suggests methods for prioritizing vulnerabilities

Lee County Climate Change Vulnerability Assessment



Southwest Florida Regional Planning Council
DRAFT March 18, 2010

James W. Beever III, Whitney Gray, Daniel Trescott, Dan Cobb, Jason Utley, David Hutchinson

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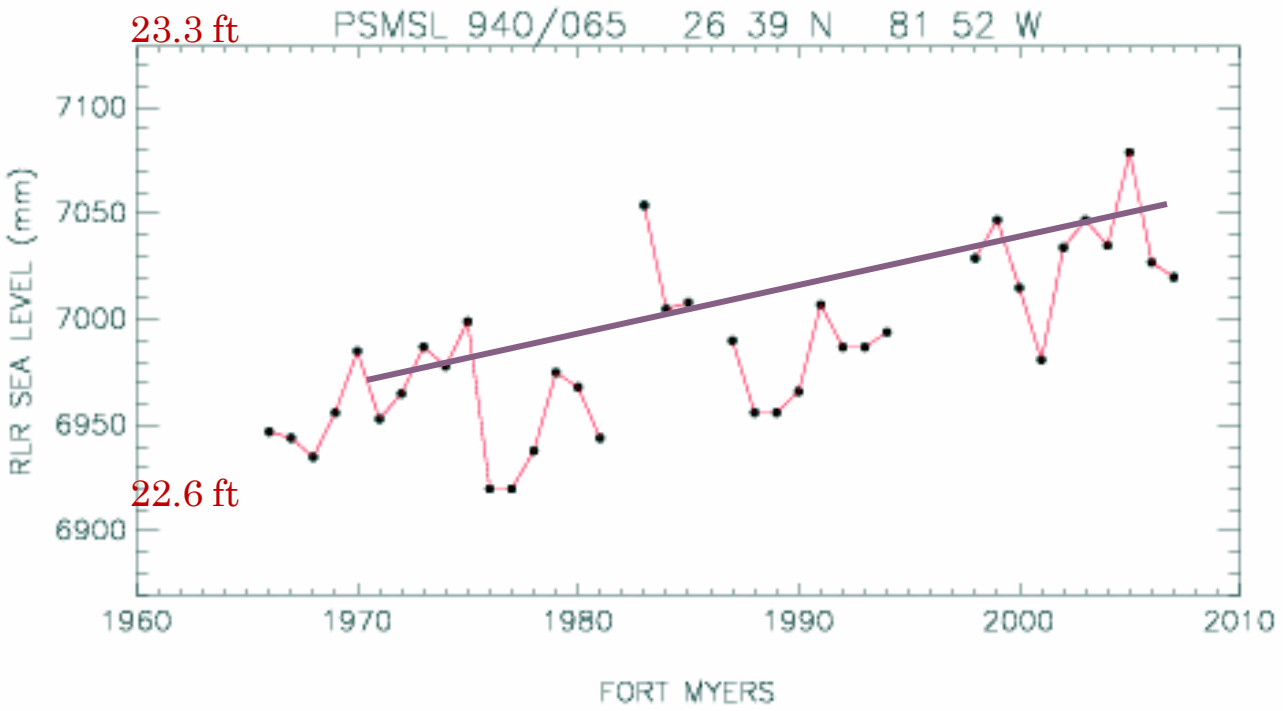
Patterns of Local Average Sea Level

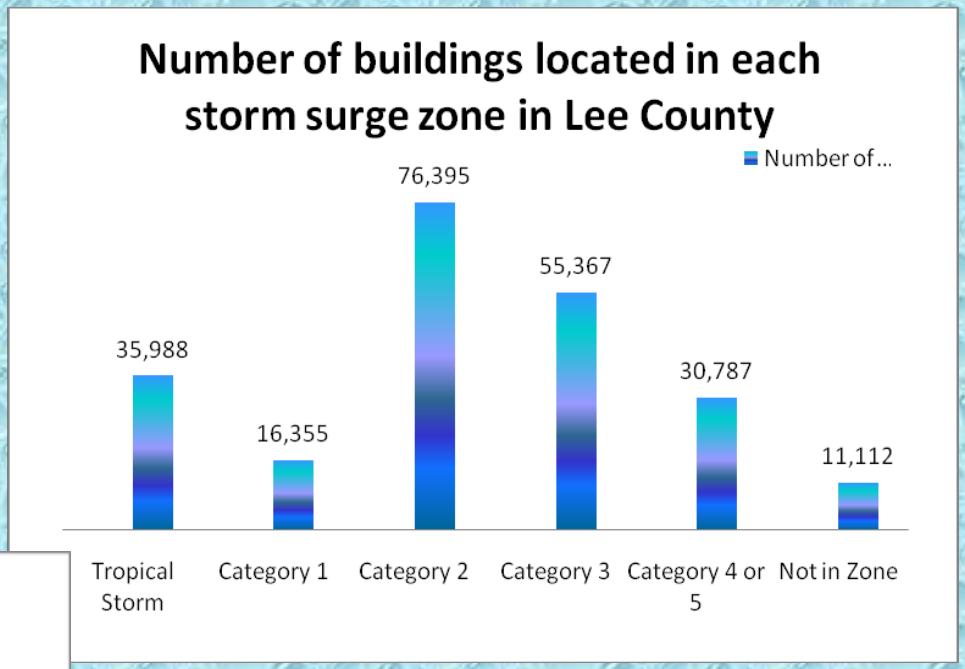
From the Ft. Myers Tide Gauge

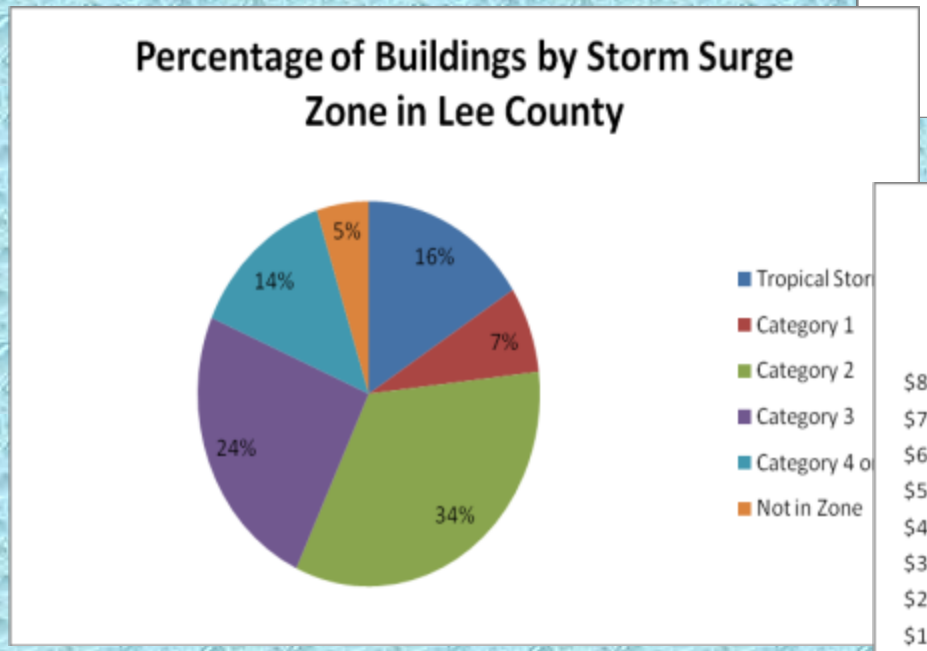


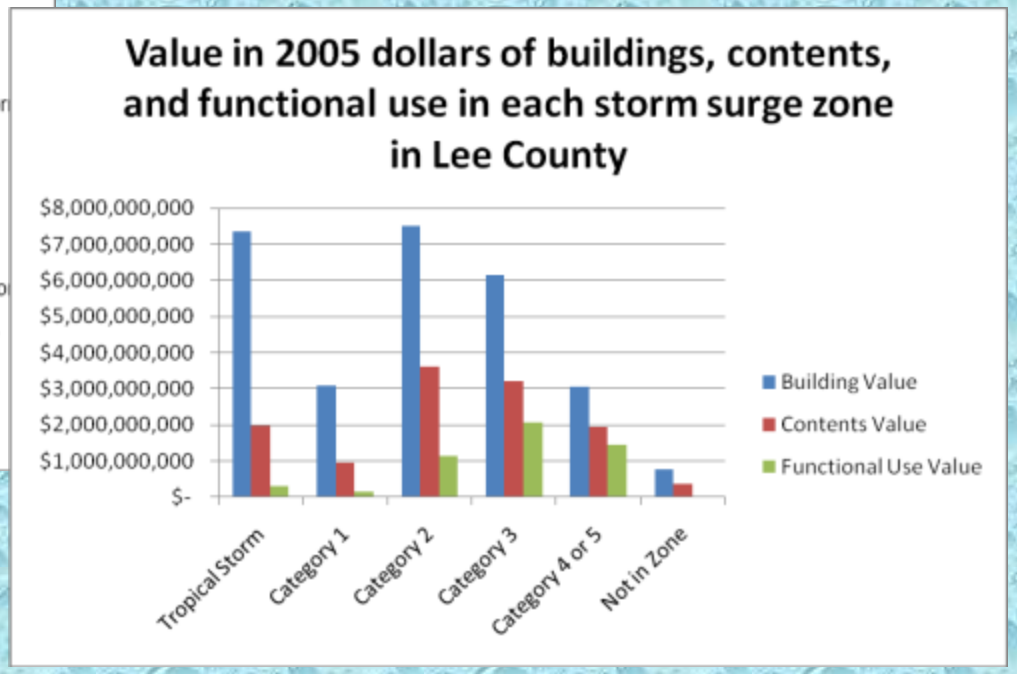
Probability (%)	2025		2050		2075		2100		2150		2200	
	cm	inches	cm	inches	cm	inches	cm	inches	cm	inches	cm	inches
Rapid Stabilization Case	41	1.8	9	3.5	13	5.3	18	7.1	22	8.8	27	10.5
90% chance	7	2.8	13	5.0	20	7.7	26	10.4	40	15.7	53	21.0
80	9	3.6	17	6.6	26	10.1	35	13.9	53	20.8	71	28.1
70	11	4.4	20	7.8	30	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% chance	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% chance	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 Stanton and Ackerman 2007

Development In Storm Surge Zones





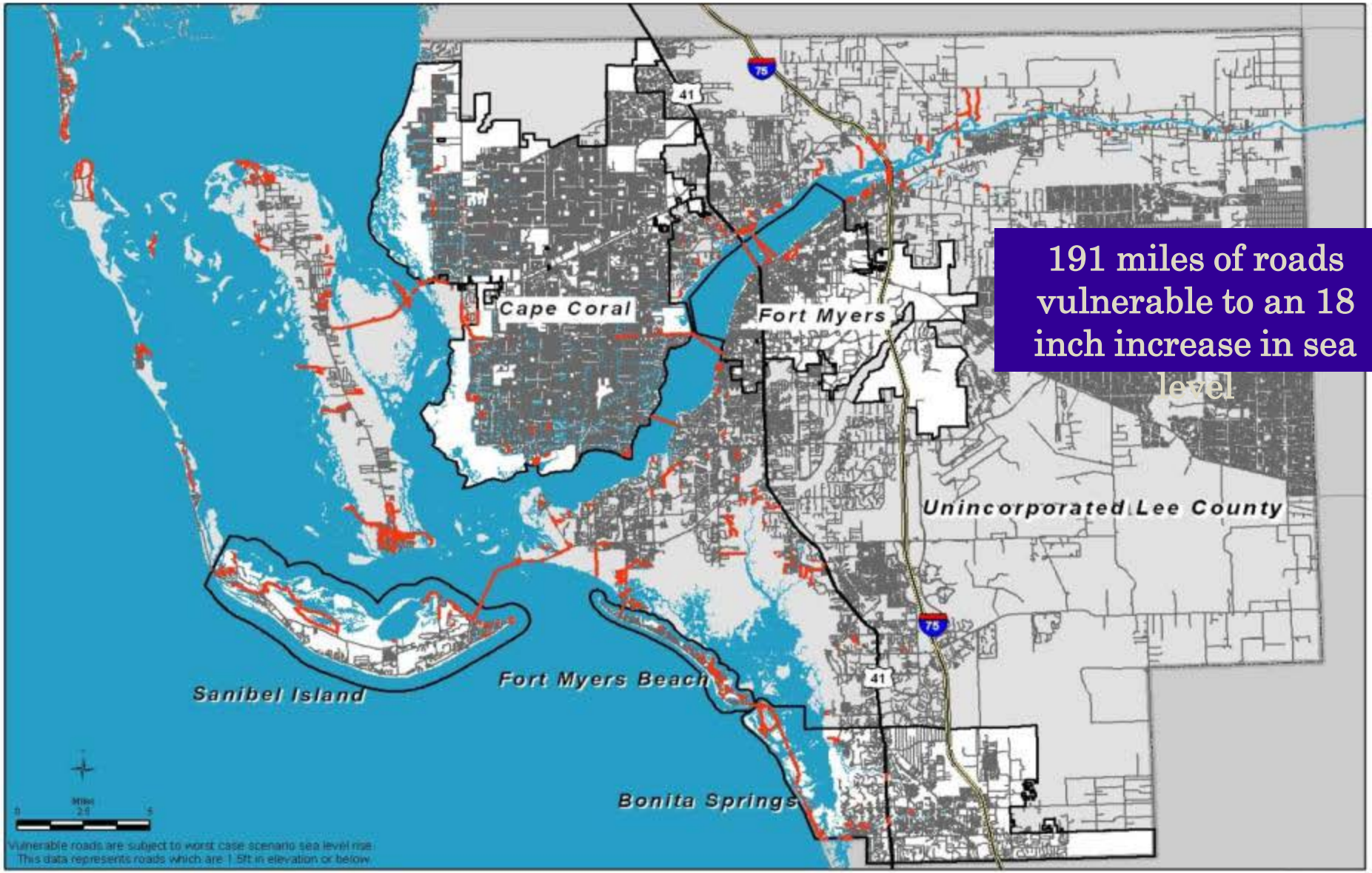


CRITICAL FACILITIES

Ports	1
Community Colleges	1
Hospitals	1
Boat Locks	2
Clinics	2
High Schools	2
Landfills	2
Airports	3
Police/Sheriff Facilities	3
Emergency Medical Services	3
Middle Schools	3
Communication Towers	9
Elementary Schools	11
Hurricane Shelters	12
Drinking Water Facilities	13
Electrical Facilities	14
Fire Stations	19
Nursing Facilities	26
Government Facilities	27
Sewage Treatment Facilities	43

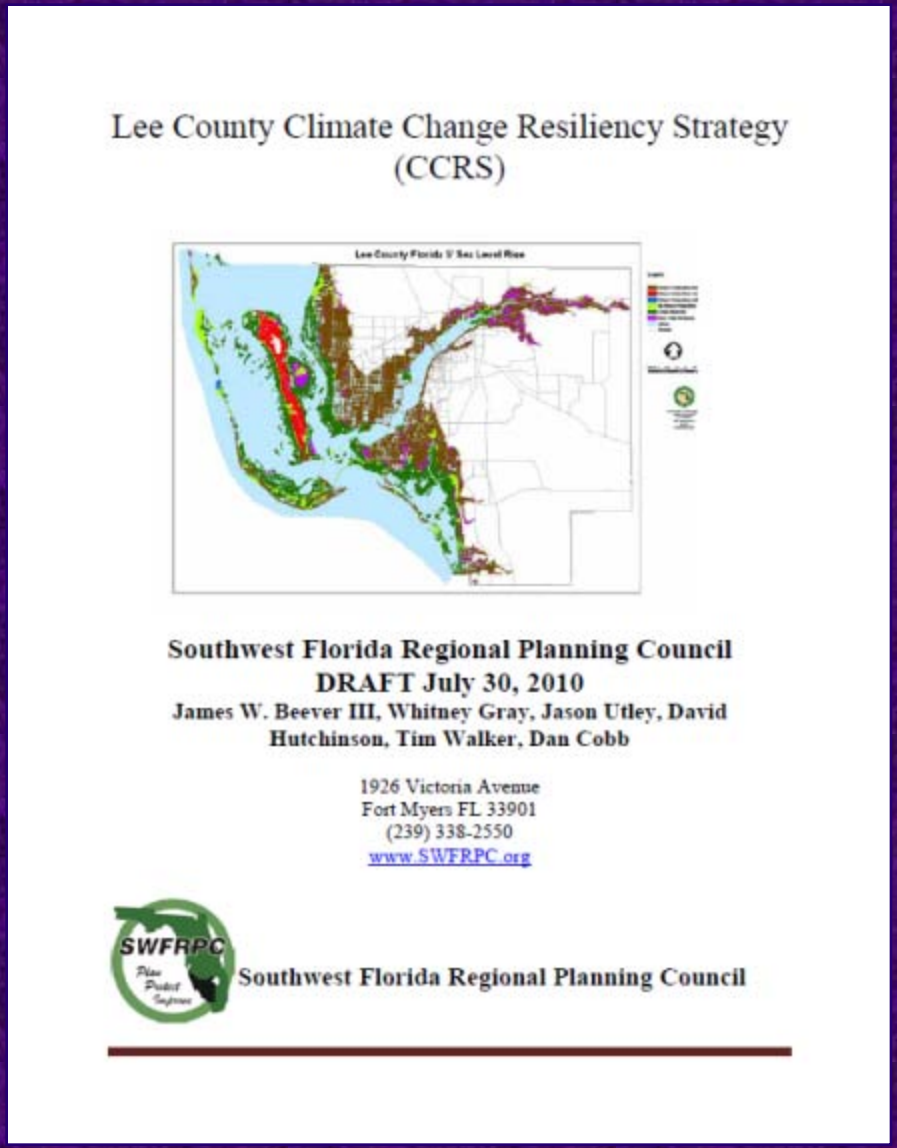
Critical facilities in Lee County that are vulnerable to tropical storm and hurricane flooding and sea level rise

Total: 197


191 miles of roads vulnerable to an 18 inch increase in sea level
Cape Coral
Fort Myers
Unincorporated Lee County
Sanibel Island
Fort Myers Beach
Bonita Springs
75
41
Miles
Vulnerable roads are subject to worst case scenario sea level rise.
This data represents roads which are 1.5ft in elevation or below.
VulnerableRoads_1.5Ft
Lee Roads
Lee County Roads Vulnerable to Sea Level Rise 2050
SWFRPC
Source: SWFRPC, Lee County, FLDOT, EPA

Temperature increases could cause changes in ranges for habitats, crop plants, trees, endangered species, exotic species, pests, and disease vectors.

RESILIENCY STRATEGY


Lee County Climate Change Resiliency Strategy
(CCRS)

Southwest Florida Regional Planning Council
DRAFT July 30, 2010
James W. Beever III, Whitney Gray, Jason Utley, David Hutchinson, Tim Walker, Dan Cobb

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Southwest Florida Regional Planning Council

- Outlines the essential elements of a resiliency strategy
- Summarizes vulnerabilities
- Summarizes input received from Lee County leadership and constitutional officers
- Identifies strategies that Lee County could pursue to increase resiliency to the identified vulnerabilities
- Identifies ways to incorporate climate change resiliency into the LeePlan
- Outlines monitoring and evaluation strategies

ONLINE SURVEY

Years in Florida

Years in Lee County

Perceptions of changes in weather, water quality, fishing and wildlife

Impacts of Hurricane Charley on department assets, personnel and processes

County Commissioners

Division Heads

Constitutional Officers

Age & location of facilities

Potential for facilities to be storm-hardened

Potential energy-saving measures for facilities and staff

What is the most important thing for Lee County to do to prepare for climate change?

What is the worst thing Lee County could do to prepare for climate change?

INTERVIEWS

Reaction to online survey

Reaction to draft

Did we leave out anything important?

Who else should we talk to?

Potential effects of climate change on the department

Lee County's greatest vulnerability to climate change

County Commissioners

Division Heads

Constitutional Officers

How important do you think it is for Lee County to try to deal with climate change in an organized manner?

Avoidance, minimization, mitigation and adaptation ideas

VULNERABILITIES IDENTIFIED BY INTERVIEWEES

Buildings and County Infrastructure
•Impacts to roads from increased creek and stream flows
•More frequent replacement of materials

Coastal Economies
•Declining property values impacting the County's ability to maintain infrastructure and provide adequate services
•Impact on tourism.
•Hotter temperatures will increase the cost of workers' compensation.

Land Use Planning and Growth Management
•Possible reduction of migration into the area and a possible increase in migration out of the area.
•Residents may experience increased response times for emergency services

Economic Development
•Higher utility bills
•More frequent adverse working conditions for outdoor workers

Education and Outreach
•Could impact nearly every area of how the County functions impacting the budget and demanding more interdepartmental and intergovernmental coordination
•Potential for increased variability of weather – more rainfall during and longer periods of drought

Coastal Protections
•Impacts to beaches and the demand for beach renourishment
•More frequent storm events with associated erosion

Health and Human Services
•Increased impact on the economically disadvantaged
•Possible modification of work hours due to hotter temperatures.

Water and Wastewater
•Could experience strains on our freshwater aquifers
•Surface water management issues

Natural Systems and Resources
•Concerns regarding Lake Okeechobee flows
•Could experience impacts to landscaping and plants
•Could impact sea life and the estuary
•Destruction of ecological systems which could severely impact our tourism industry

RESILIENCY STRATEGIES

Building to LEED certification standards.

Converting buses to hybrids.

Offsite data storage and protection.

Identify Lee County's energy goals.

Limit the placement of county facilities and infrastructure in flood prone and storm surge areas. This can be problematic since the facilities and infrastructure should be community-based.

Build or modify structures where they can function in areas with higher surface waters.

Technology infrastructure reduces the need for driving the fleet of automobiles to property locations for valuations.

Land acquisition for carbon sequestration

Building and development codes should be reviewed in light of vulnerabilities/to address strategies

Conservation 20/20

Native plants and reduced irrigation for County facilities

Locating healthcare facilities out of vulnerability zones.

Widening of Alico Road to accommodate business interested in energy research.

Modify County dress codes

Incentivize development and redevelopment within the urban area.

Observation of Coastal Control Line and not allowing building seaward of the coastal construction control line.

Update Comprehensive Plan to reflect changing conditions.

Development of a Solar Strategy for inclusion in the comprehensive plan.

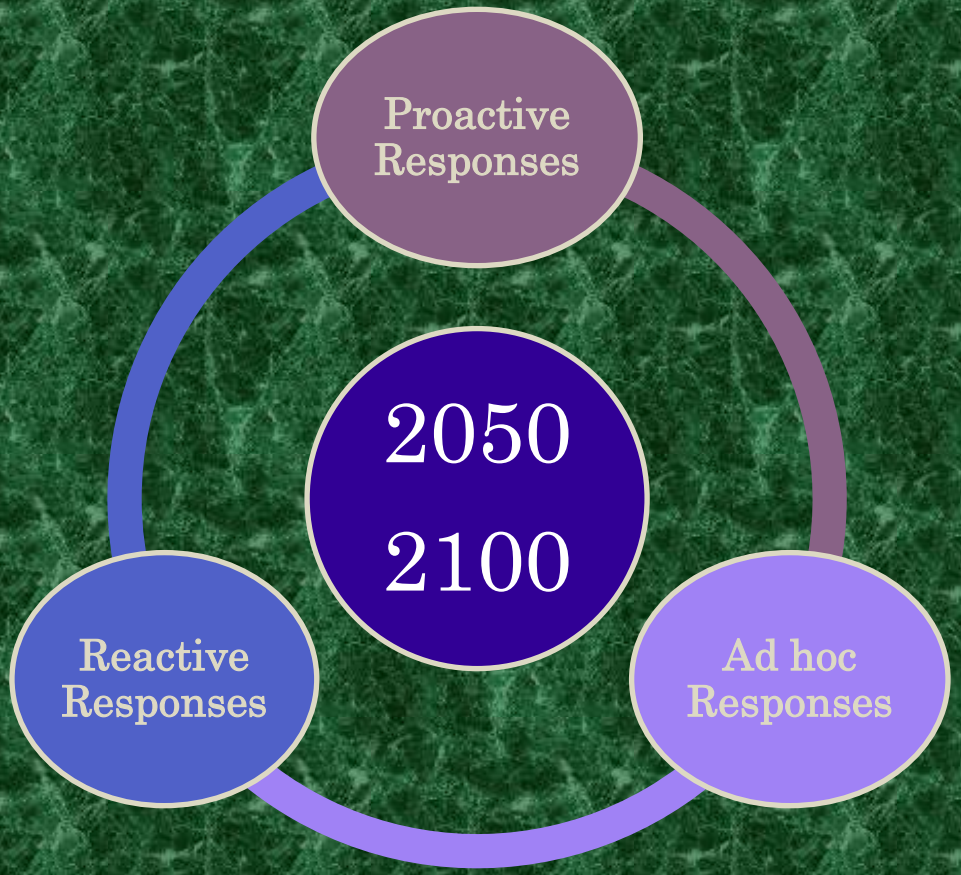
Need more policy analysis regarding land use regulations.

Encourage behavior change in employee trips (carpooling, transit, bicycling, walking, teleworking, four day work weeks, reduction of VMTs, etc)

Reduce automobile dependence.

CONCLUSIONS

- Monitor climate change effects to avoid passing a tipping point
- Consider climate change effects in planning for infrastructure and development
- Continue to set aside natural areas, especially mangroves and salt marsh, as a buffer against climate change effects
- A more detailed communication plan could be developed to take it to the next level



Implementation in Lee County

- Resiliency strategies incorporated into EAR and Comprehensive Plan revisions
- Development of LEED certified county facilities
- Development of biofuels
- Major energy efficiency effort in county facilities
- Establishment of an Office of Sustainability

Lee County Public Safety Building with solar array

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