

Plan Integration *for Resilience* Scorecard:

How to spatially evaluate networks of plans to reduce hazard vulnerability

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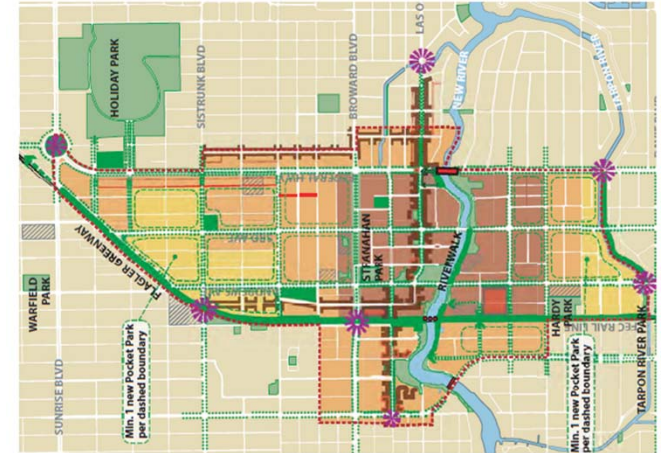
COASTAL RESILIENCE CENTER

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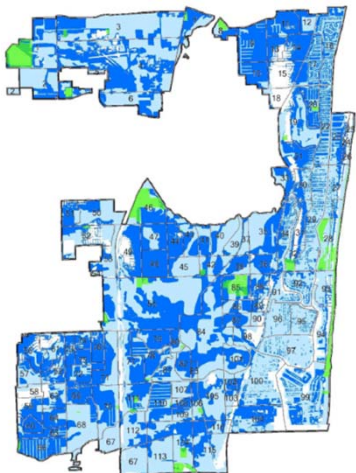


Project Overview

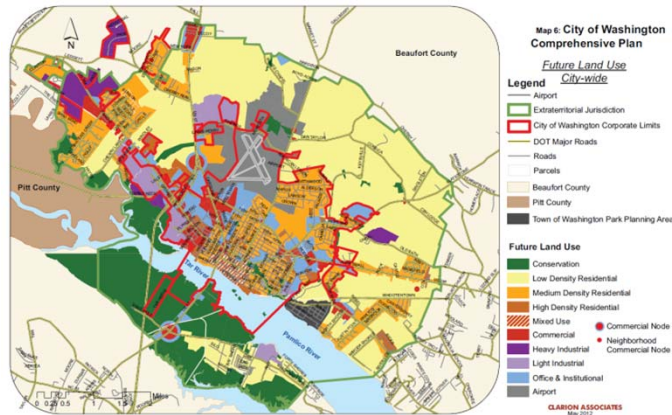
- Land use planning is key to mitigation
- Communities adopt networks of plans
- Integration of mitigation in local plans can significantly affect future vulnerability



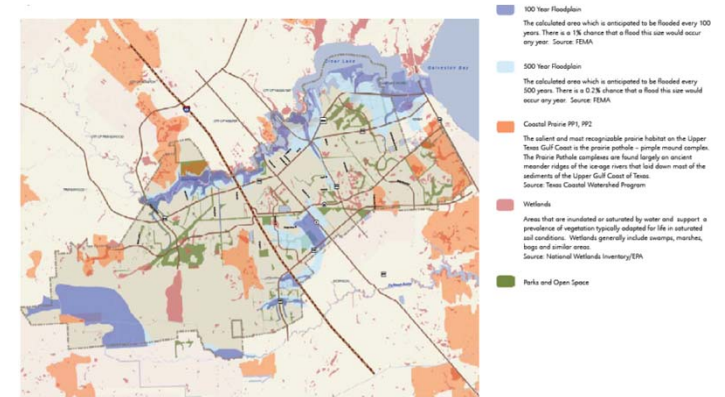
Ft. Lauderdale Downtown Area Framework Plan



Ft. Lauderdale Future Park Plan



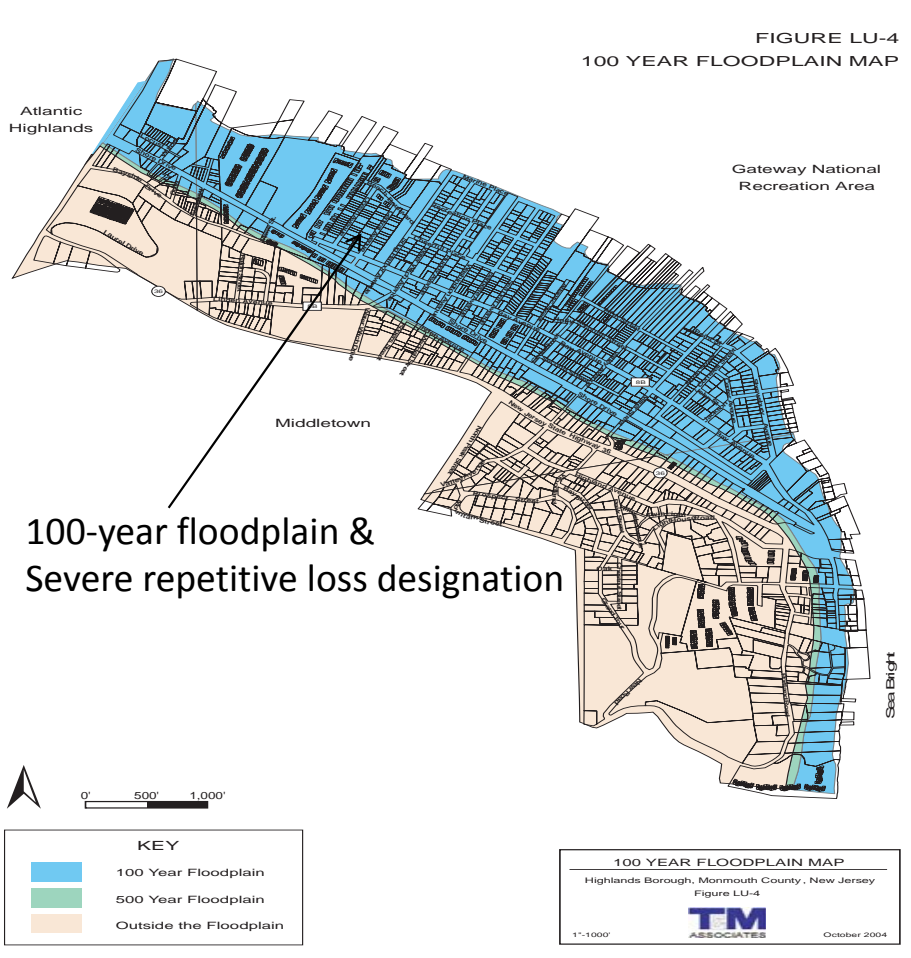
City of Washington Comprehensive Plan



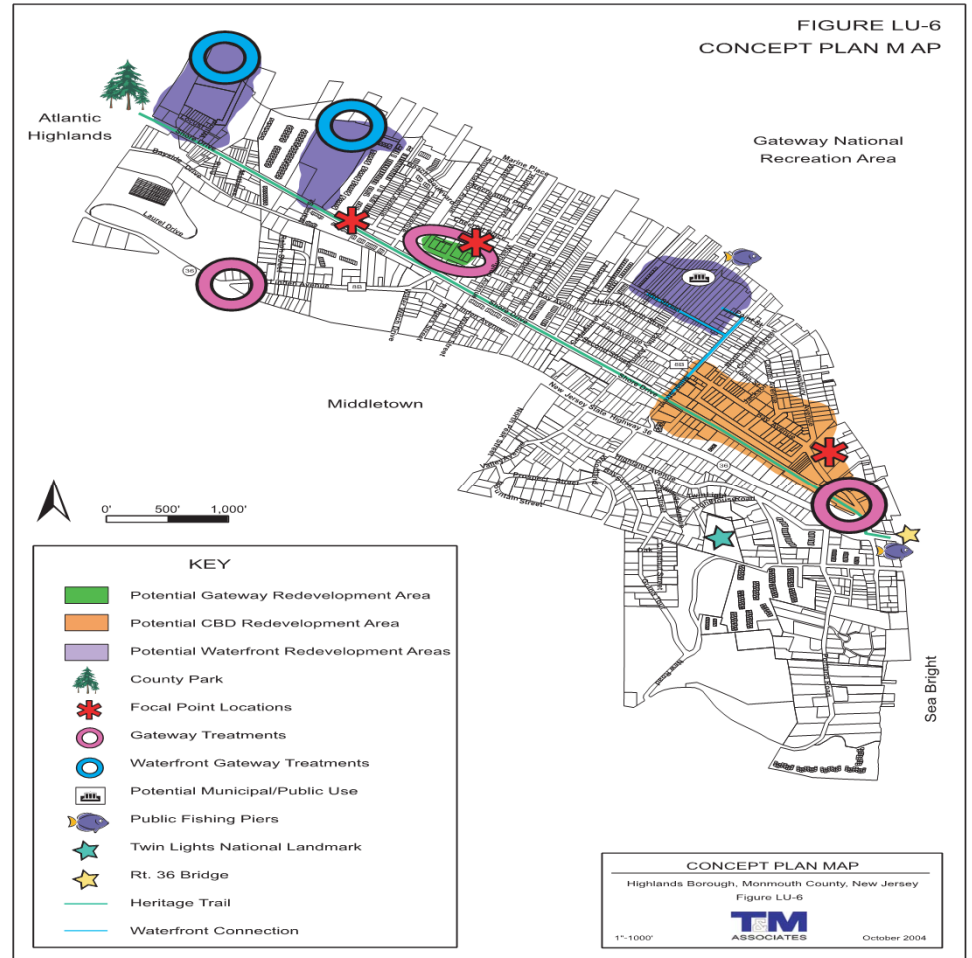
League City Open Space and Sensitive Area Plan

Highlands, NJ Before Hurricane Sandy: Opposing Intentions?

Hazard Mitigation Plan



Comprehensive Plan



Project Objectives

We develop a resilience scorecard:

1. To evaluate the coordination in local networks of plans.
2. To assess the degree to which the network of plans targets areas most vulnerable.

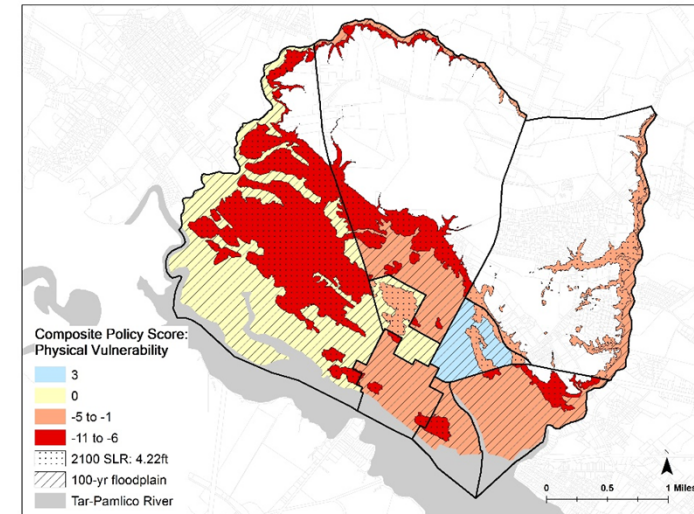
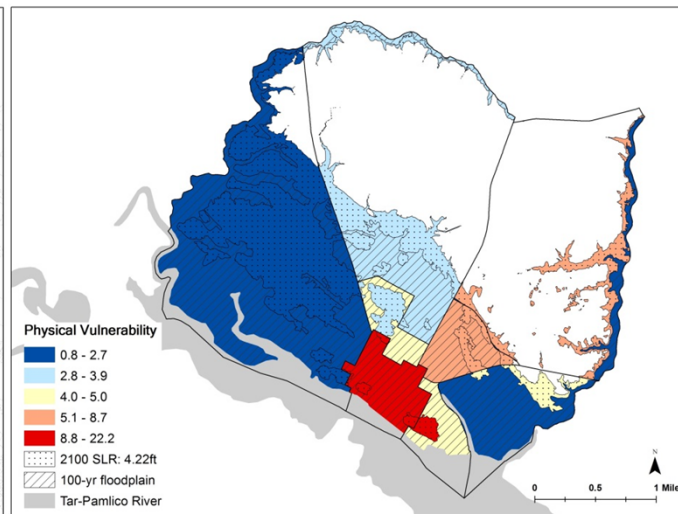
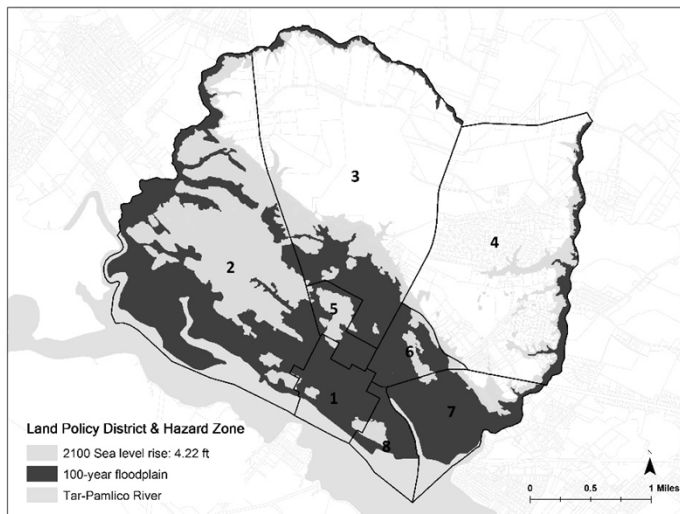
Source: Berke, P. et al. 2015. *Journal of the American Planning Association*. 81(4): 287-302

Important because:

- *Biggest problem is the plethora of plans (this provides consistency to deal with it),*
- *It is a collaborative approach for a community to understand vulnerability holistically*

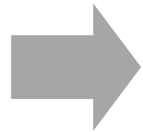


Technical Approach: Developing and Testing a Resilience Scorecard



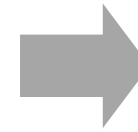
Phase 1

Delineate planning districts and hazard zones



Phase 2

Determine vulnerability

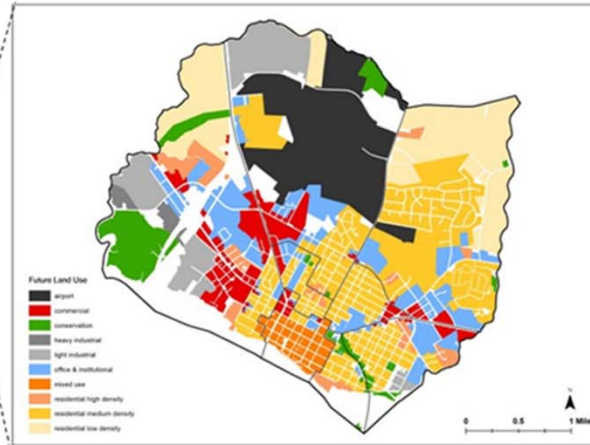


Phase 3

Score plans



2023 Comprehensive Plan

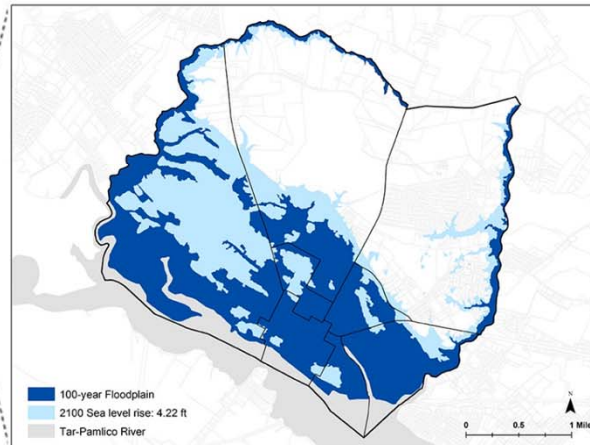


Future Land Use

✓ **Policy 1** Increase and bolster the number of key destinations near the downtown and waterfront to provide multiple components and uses catering to different audiences.



Beaufort County Multi-Jurisdictional Hazard Mitigation Plan



Hazard Zone & Planning District

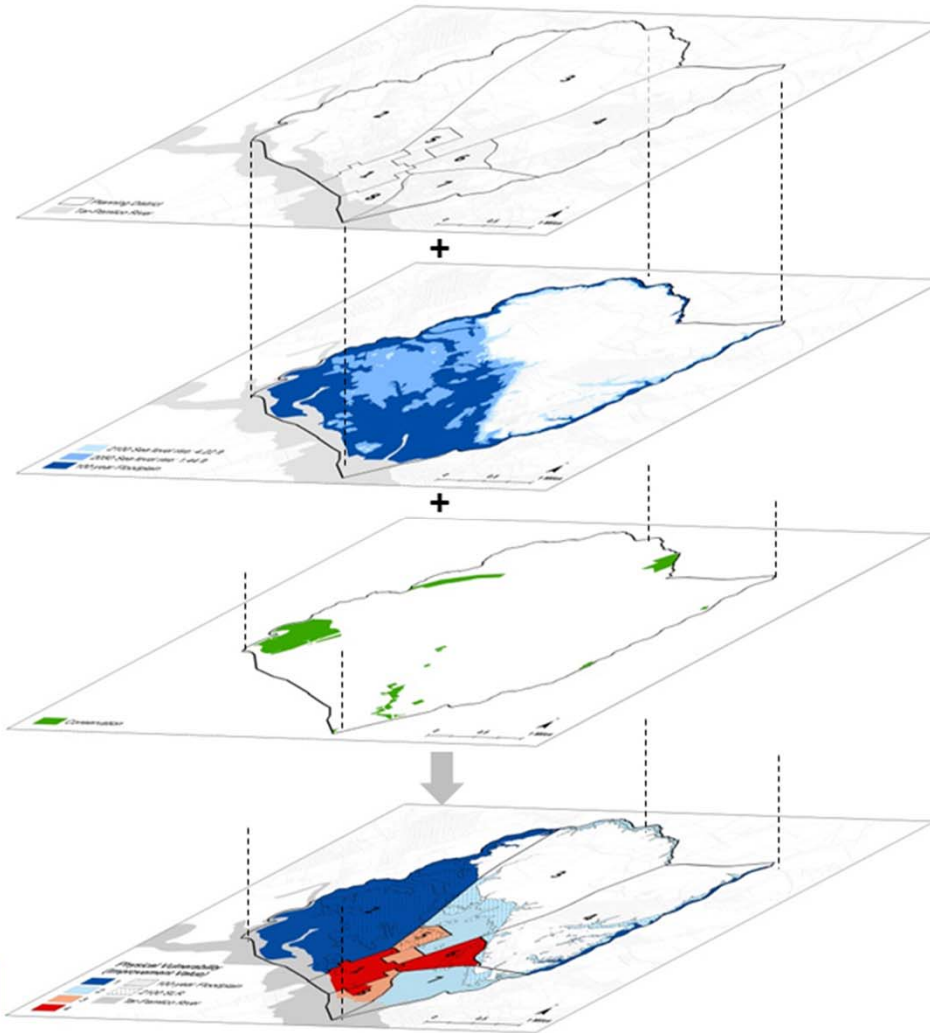
✓ **Policy A** Strengthen controls on development within flood-prone and wetland areas by improving existing ordinances, such as the erosion and sediment control ordinance, zoning ordinance, subdivision ordinance, flood plain regulations and other development regulations.

Planning District:
Future land use plan

Hazard Zone:
Current 100 year
floodplain
2100 floodplain

Mappable Areas:
Conservation areas

Score





Aligning with other initiatives

- FEMA Mitigation Guide 2013
- NFIP CRS score enhancement

	Agency	Plan	Funding	Technical assistance
Consolidated Housing Plan (CHP) and Annual Action Plans (AAP)	HUD	X		
Hazard Mitigation Plan [Preparedness Grants, Hazard Mitigation Grant Program, Pre-disaster Mitigation Grants, Flood Mitigation Assistance]	FEMA	X	X	
Habitat Management Plan (HMP) and Annual Habitat Work Plans (AHWP)	USFWS	X		
State Wildlife Action Plans (SWAP), aka Comprehensive Wildlife Conservation Strategies [Wildlife Conservation and Restoration Program (WCRP) funds; State and Tribal Wildlife Grants (SWG) program]	Congress by Conservation and Reinvestment Act of 2000	X	X	
Coastal Zone Management Program (CZMP) [Coastal Zone Enhancement Program; Coastal Nonpoint Pollution Control Program]	NOAA		X	
Forest Plan (Land Management Plan)	USFS	X		
Endangered Species Recovery Plan	NOAA	X		
Climate Action Plan (focusing on adaptation, mitigation, and/or resilience)	NA	X		
Historic Preservation Planning Program	NPS	X		
National Conservation Innovation Grants	NRCS		X	
NOAA Climate Program Office: Regional Integrated Sciences and Assessments (RISA) Program	NOAA		X	
Resilience AmeriCorps	CNCS			X
Resilience Dialogues	USGCRP			X
Regional Integrated Sciences and Assessments	NOAA			X
Landscape Conservation Cooperatives	DOI			X
Regional Climate Hubs	USDA			X
Climate Adaptation Community of Practice	USGCRP			X
Clean Water State Revolving Fund (CWSRF)	EPA		X	
Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies (FASTLANE)	DOT		X	
Sustainable Communities Initiative	HUD		X	

Forming your team



Structure of the guidebook

Structure of the Guidebook

We recommend reading through the entire guidebook as you might read through a recipe, identifying ingredients, materials, and techniques needed to ‘cook your meal’. Ask yourself: What plans and data are available? What people have authority to make land use or emergency planning decisions? What skillsets are needed?

The guidebook is broken into the following:

Chapter 2: Technical Analysis– With the Policy Team, gather all community plans and extract applicable policies. With the Mapping Team, use maps—digital, printed, or with geographic information systems (GIS) software—to overlay planning districts and existing and future flood hazard zones.

Chapter 3: Scoring – Using the information from the Policy Team and the Mapping Team, score the policies based on whether they increase or decrease exposure in hazard zones and create tables and/or maps to compare planning districts.

Chapter 4: Vulnerability - To better understand the impacts of the planning district scores, develop a physical vulnerability and social vulnerability map. Compare maps with the scores map to reveal vulnerability hotspots.

Chapter 5: Stories - Before you communicate with agencies, residents, and other stakeholders you must be able to tell your plan integration story. Learn from other communities’ plan integration stories in preparation for your story.

Chapter 6: Update Plans – Once the technical analysis and scoring is complete, engage the whole community to determine community values and a plan-of-action going forward in light of new information. This may mean amending plans to minimize conflicts and taking advantage of opportunities revealed by the evaluation

TECHNICAL ANALYSIS	Policy Team	<ul style="list-style-type: none"> Assemble the ‘Network of Plans’ Generate lists of applicable policies
	Mapping Team	<ul style="list-style-type: none"> Determine planning districts Delineate hazard zones Map your ‘mappable policies’
ASSESSMENT	Scoring Policies	<ul style="list-style-type: none"> Create Plan Integration for Resilience ‘Scorecards’ Create tables, maps, and indexes
	Vulnerability	<ul style="list-style-type: none"> Assess physical vulnerability Assess social vulnerability
SETTING PRIORITIES	Stories	<ul style="list-style-type: none"> Identify strategies for undeveloped areas Identify strategies for developed and built-out areas
	Update Plans	<ul style="list-style-type: none"> Engage stakeholders Prioritize policies and plans

Policy Team

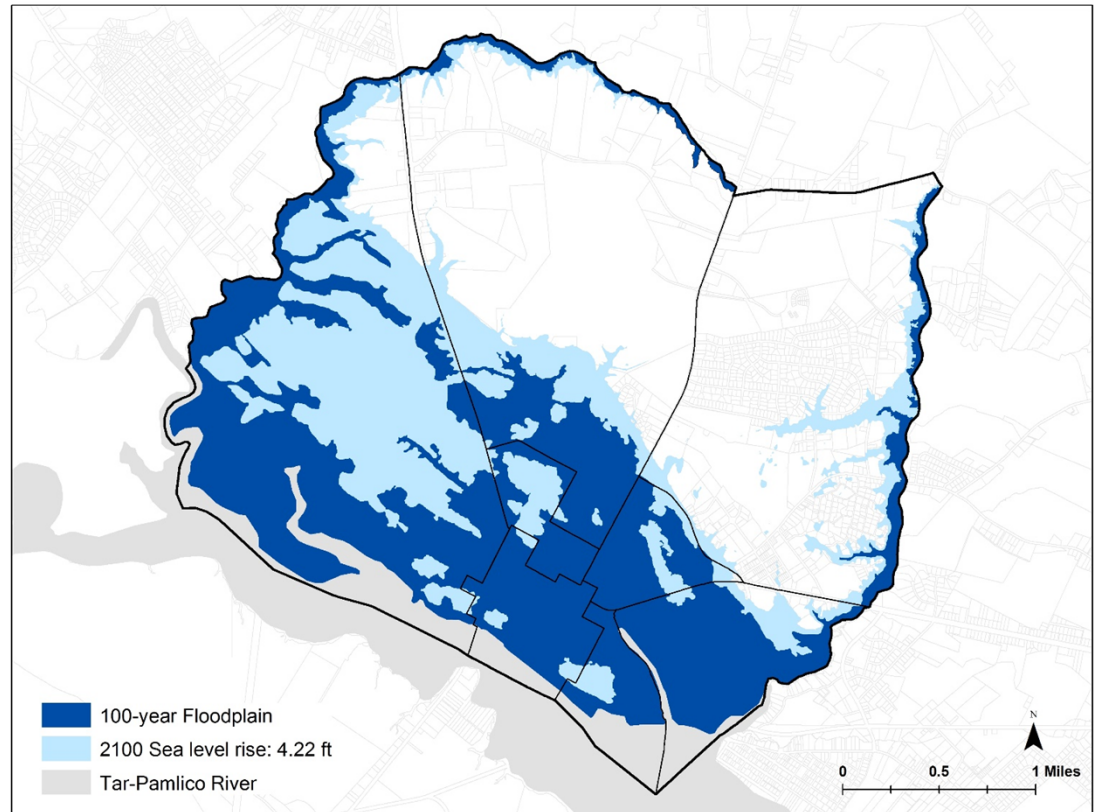
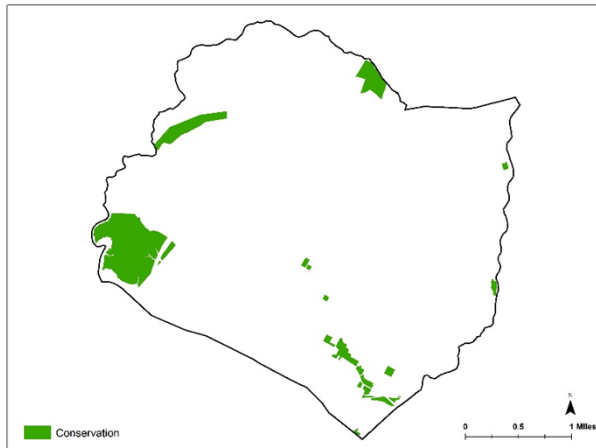
- Assemble the network of plans
- Generate lists of applicable policies
 - Contain at least one mappable, place-specific term (political area, cultural area, geographic feature, individual building or facility)
 - Potentially reduce or increase vulnerability to hazards; and
 - Contain a recognizable policy tool, or a form of government intervention to achieve specific objectives and outcomes.

Table 2.1 Examples of Types of Plans in a Community's 'Network of Plans'

Plan Type	Purpose	Contribution (+/-) to Vulnerability
Comprehensive/General Plan	Main community planning document	Policies can guide future development into or away from hazard zones.
Hazard Mitigation Plan	Reduce long-term risk to human life and infrastructure	Advocates vulnerability reduction and resiliency building, often via general policies or specific "action items"
Disaster Recovery Plan	Address disaster recovery related needs to be activated during recovery	Advocates vulnerability reduction and resiliency building post-disaster. Coordinates agencies to assist people post-disaster.
Area Plans:		
Downtown (Redevelopment)	Address planning issues pertaining to a portion of the community	Targeted policies may increase or decrease vulnerability, depending on purpose and location. Area plans may also contribute to policy district delineation.
Small Area/Neighborhood/District		
Waterfront		
Corridor Plan		
Functional or Sector-specific Plans:		
Transportation (or Transit)	Focus on individual or related functions or sectors in need of specialized planning	Individual plan policies (or objectives, action items, etc.) may increase or decrease vulnerability, and are often distinct from those found in comp or hazard mitigation plans. Applicability to individual policy district may be aided by additional function/sector maps.
Parks / Open Space		
Economic Development		
Environmental Management		
Climate Adaptation/Mitigation		
Housing (Consolidated/Strategic)		
Wildlife Management		
Wildfire Protection		

Mapping Team

- Delineate planning districts
- Delineate hazard zones
- Map your 'mappable policies'



Scoring Policies

- Create scorecards
- Create tables and maps

Table 3.1 Example of Portion of Scorecard for Washington, NC.

DEVELOPMENT REGULATIONS	Planning Districts	1	2
Permitted Land Use			
The City of Washington will give priority to the protection of the following shoreline assets... (p.185).	Current Hazard Zone	1	1
	Future Hazard Zone	1	1
The City should discourage development in areas designated for <u>light-density residential use</u> with the exception of <u>low-density residential/agriculture land uses</u> (see Map 21). Because of its current land use patterns, rezoning and amendments to the future land use map should carefully balance with a demonstrated need for such proposed development that will be the overall best management policy for Washington's future land development. (p.189)	Current Hazard Zone		1
	Future Hazard Zone		1
Industrial development which can comply with the use standards specified by 15A NCAC7H, the City of Washington zoning ordinance and state/federal regulations may be located within <u>conservation classified areas</u> . (p. 191)	Current Hazard Zone		-1
	Future Hazard Zone		-1
The City supports commercial development at the intersections of major roads (i.e., in a nodal fashion) and in the <u>Central Business District</u> consistent with the City's future land use map. (p.192)	Current Hazard Zone	-1	
	Future Hazard Zone	-1	

Figure 3.2 Scores by district, and hazard zone for Washington, NC for the comprehensive plan.

Development Regulations										
	Land Policy District:	01	02	03	04	05	06	07	08	TOTAL (ALL LPDs)
Permitted Land Use										
[GOAL] Public facilities and publicly owned lands will be used at their highest and best use, except for those public lands that are in <u>environmentally sensitive locations</u> , where conservation should be the objective. (p. 47)	Current hazard zone		1				1			2
	Future hazard zone		1				1			2
Subdivision Regulations										
Strengthen controls on development within <u>flood-prone and wetland areas</u> by improving existing ordinances, such as the erosion and sediment control ordinance, zoning ordinance, subdivision ordinance, flood plain regulations and other development regulations. (p. 46)	Current hazard zone	1	1			1	1	1	1	6
	Future hazard zone	1	1	1		1	1	1	1	7
Zoning Overlays										
Consider creation of a Conservation Overlay Zoning District to help protect <u>sensitive areas</u> . (p. 42)	Current hazard zone		1				1			2
	Future hazard zone		1				1			2
Increase and bolster the number of key destinations near the <u>downtown and waterfront</u> to provide multiple components and uses catering to different audiences. (p. 38)	Current hazard zone	-1	-1					-1	-1	-4
	Future hazard zone	-1	-1					-1	-1	-4
Seek out opportunities to enhance <u>downtown</u> as a center of arts and cultural resources. Promote efforts to enhance the visibility and use of the historic Turnage Theater. (p44)	Current hazard zone	-1								-1
	Future hazard zone	-1								-1
Policy Category Total	Current hazard zone	-1	2	0	0	1	3	0	0	5
	Future hazard zone	-1	2	1	0	1	3	0	0	6

District (total score for all policies in district)	Core Land Use (CAMA)		2023 Comprehensive		Hazard Mitigation		Parks & Recreation		All Four Plans (Combined)	
	100-year Floodplain	SLR	100-year Floodplain	SLR	100-year Floodplain	SLR	100-year Floodplain	SLR	100-year Floodplain	SLR
District 1 (Downtown)	-4	-7	-6	-6	6	0	0	0	-4	-13
District 2	-1	-4	-3	-3	5	0	0	0	1	-7
District 3	-3	-5	-1	-1	1	0	0	0	-3	-6
District 4	-3	-4	0	0	1	0	0	0	-2	-4
District 5	-1	-4	-1	-1	4	0	0	0	2	-5
District 6	0	-3	-1	-1	5	0	0	0	4	-4
District 7	-2	-5	-3	-3	6	0	0	0	1	-8
District 8	-3	-6	-2	-2	6	0	0	0	1	-8

Figure 3.3 Scores by district, plan, and hazard zone for Washington, NC

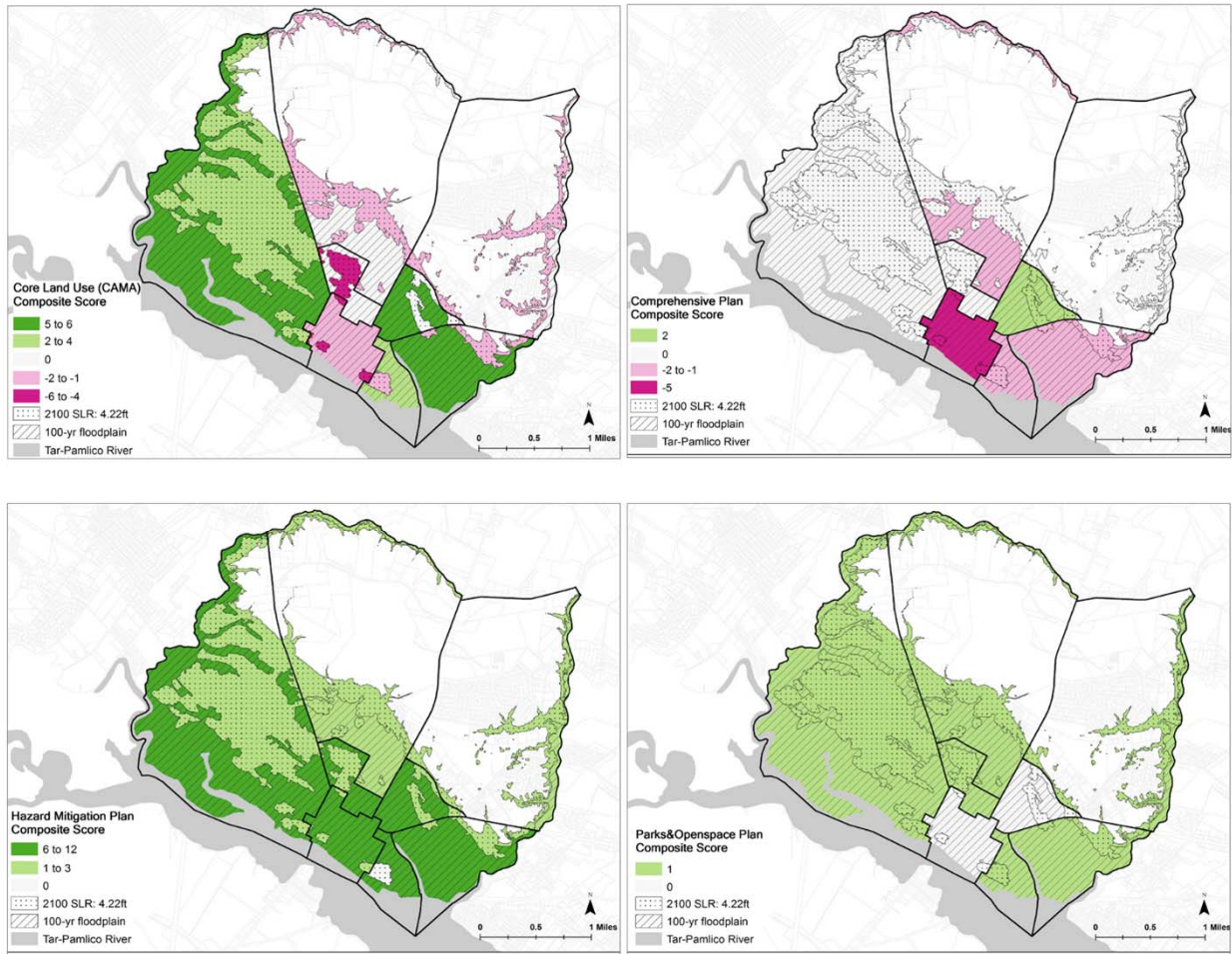


Figure 3.3 Comparing Scores of Different Planning Documents in Washington, NC.

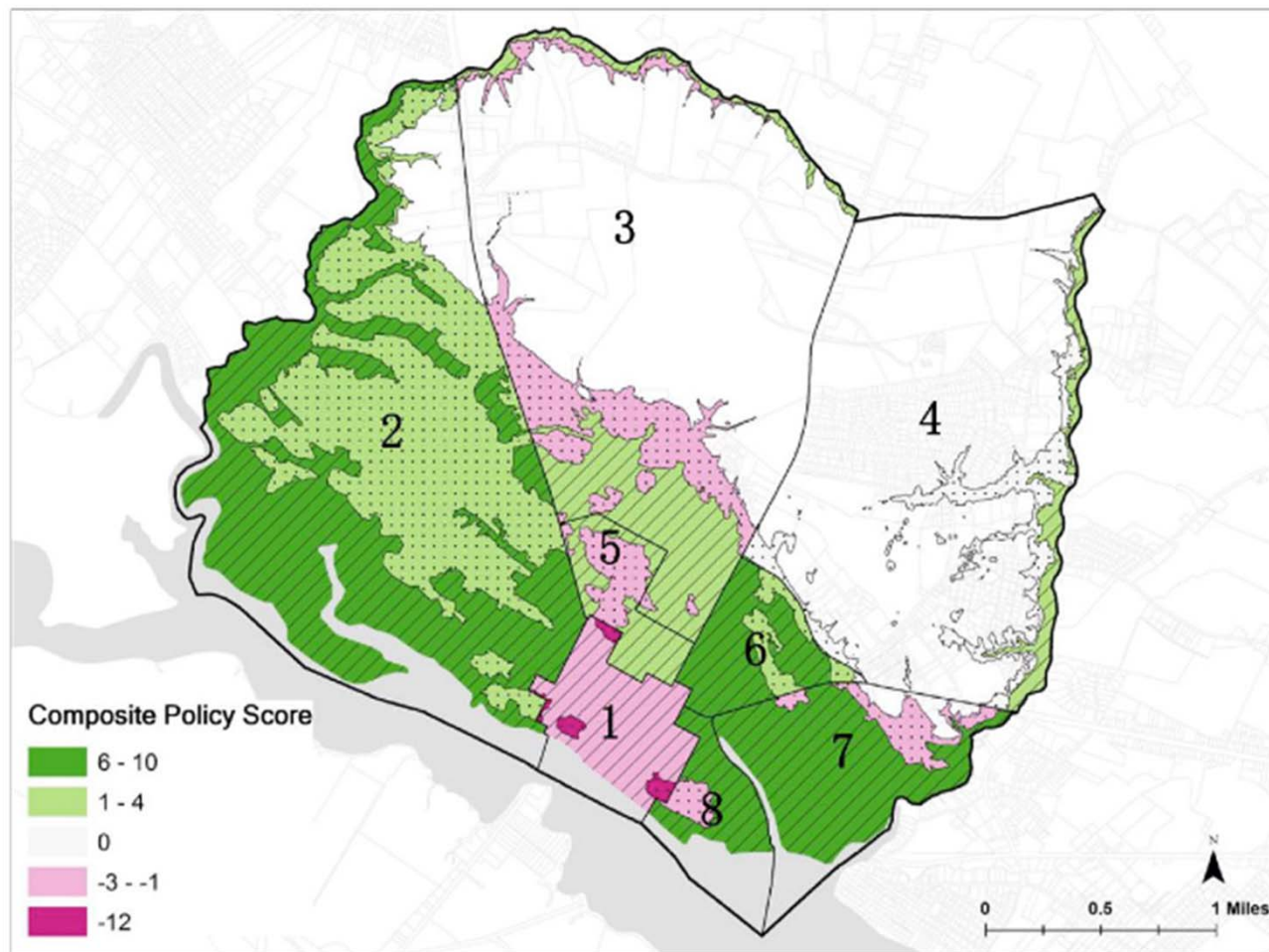


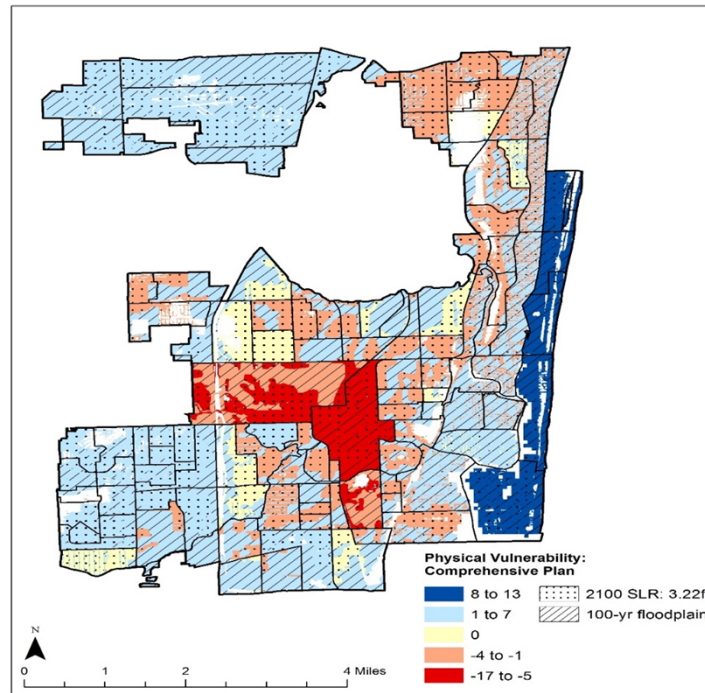
Figure 3.5 Composite score among all plans.

Vulnerability

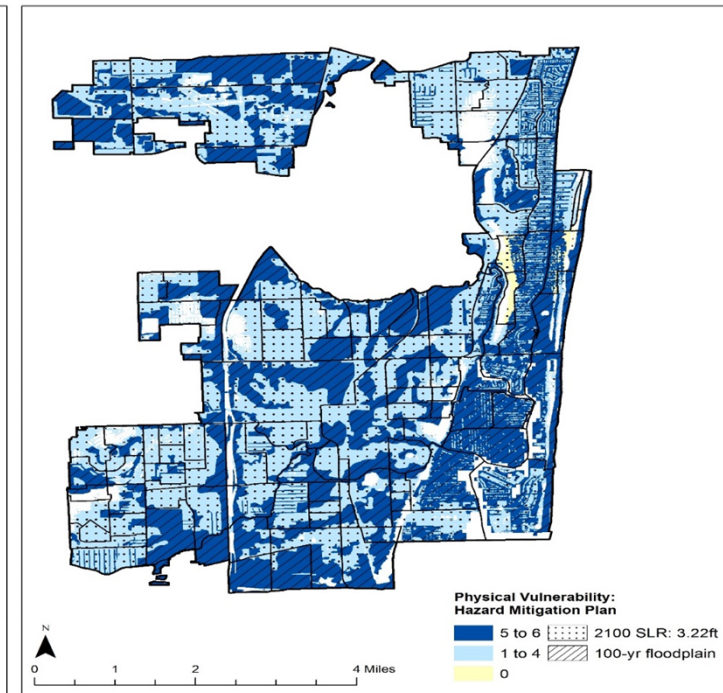
- Assess physical vulnerability
- Assess social vulnerability

Ft. Lauderdale, FL

Comprehensive Plan

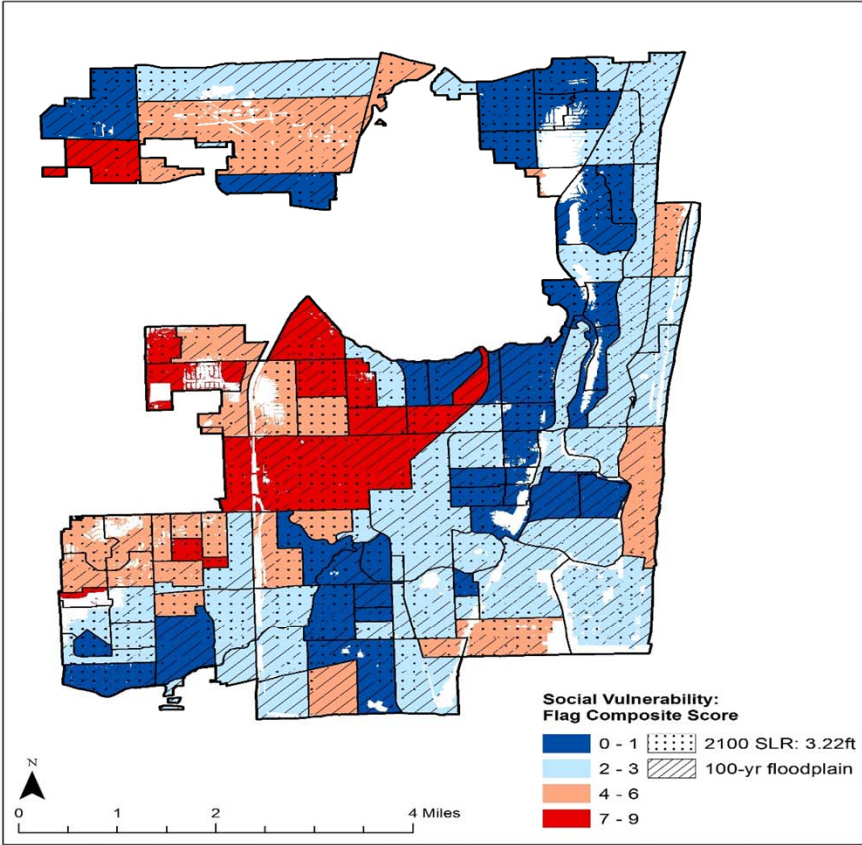


Hazard Mitigation Plan

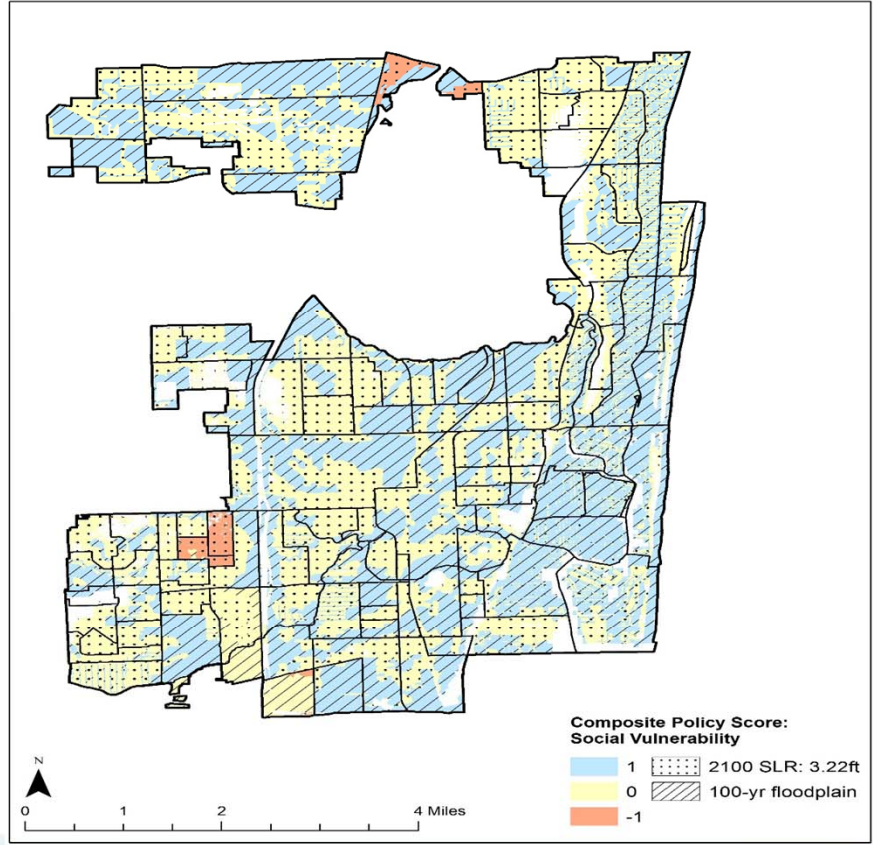


Social Vulnerability Policy Scores: Ft. Lauderdale, FL

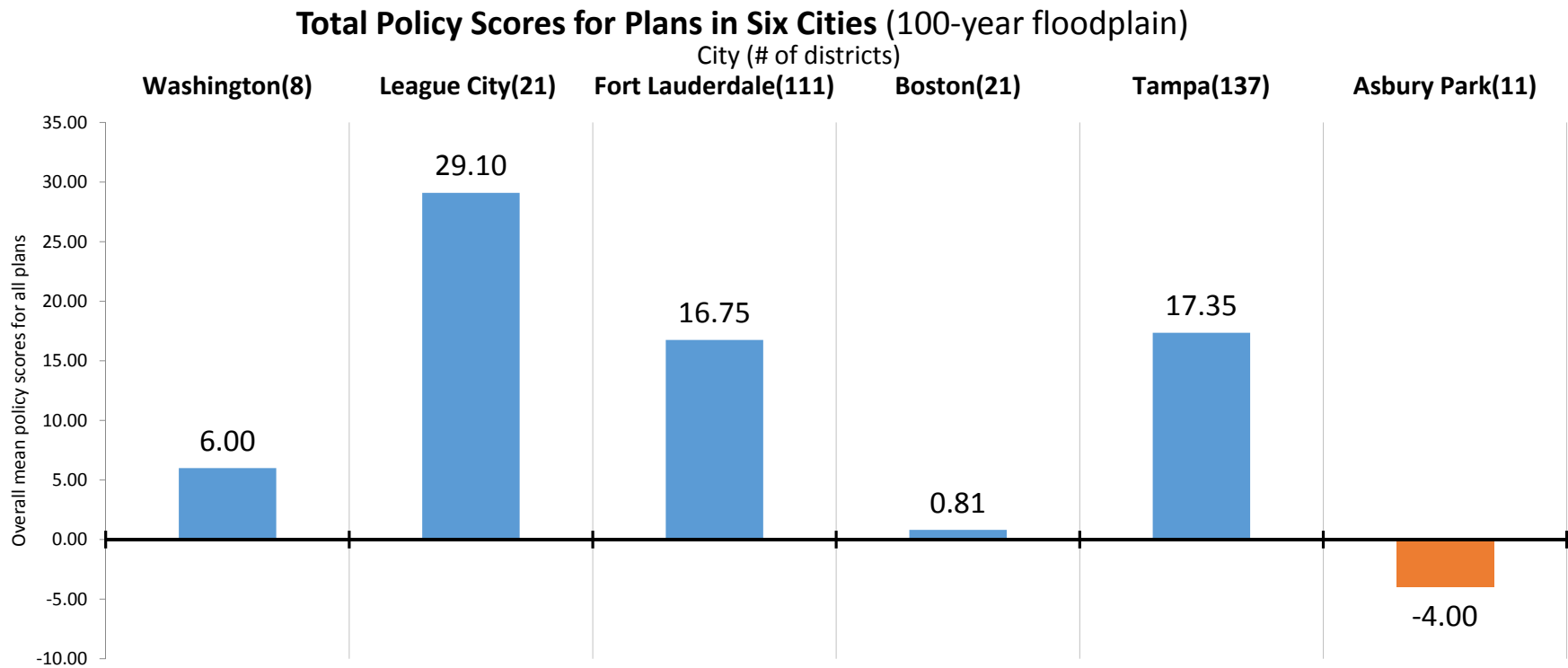
SV Composite Flag Score



SV Composite Network of Plans Score

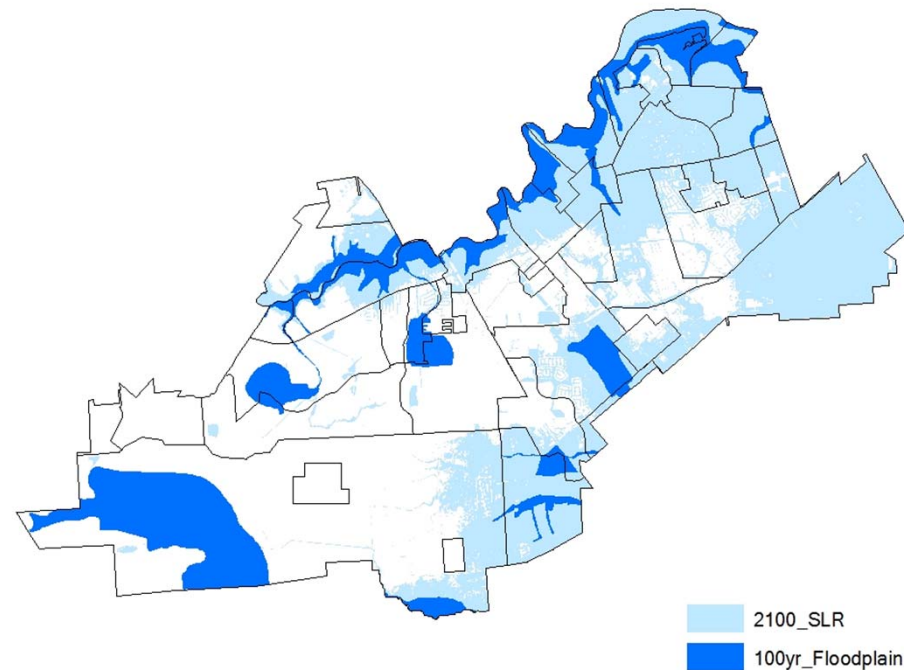


Stories & Case Studies



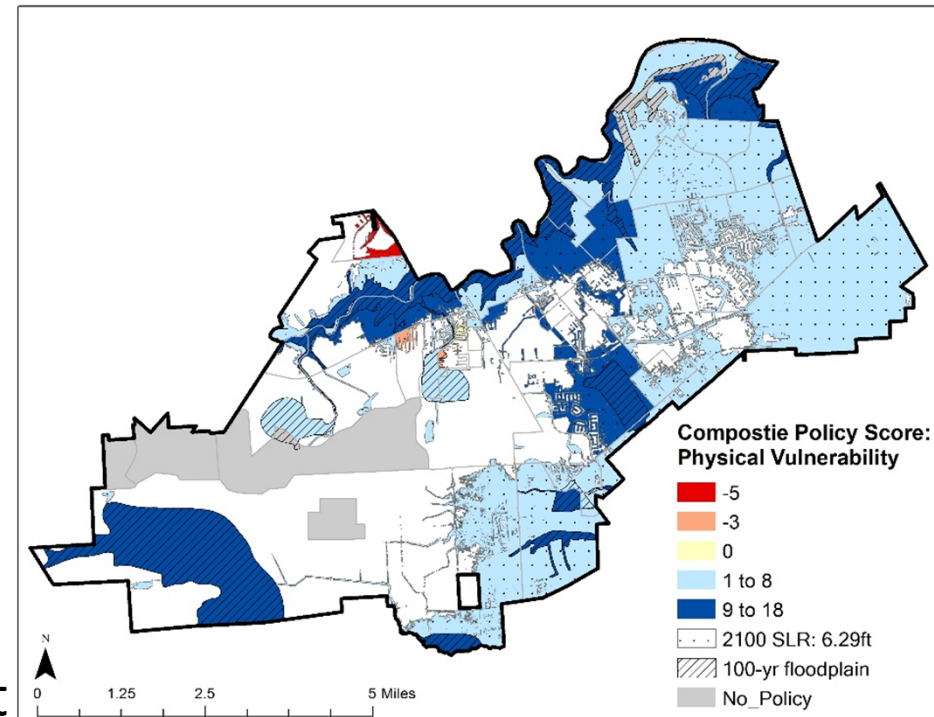
League City, TX

- Four major flood events since 2000
- Rapidly growing with a population increase from 83,500 in 2010 to a projected 228,000 in 2040
- 4,730 acres (15% of the city's total land area) is in the 100-year floodplain mostly due to the Clear Creek riparian area
 - 496 acres public park land and conservation areas
 - 4,234 acres privately owned
 - 57% is undeveloped

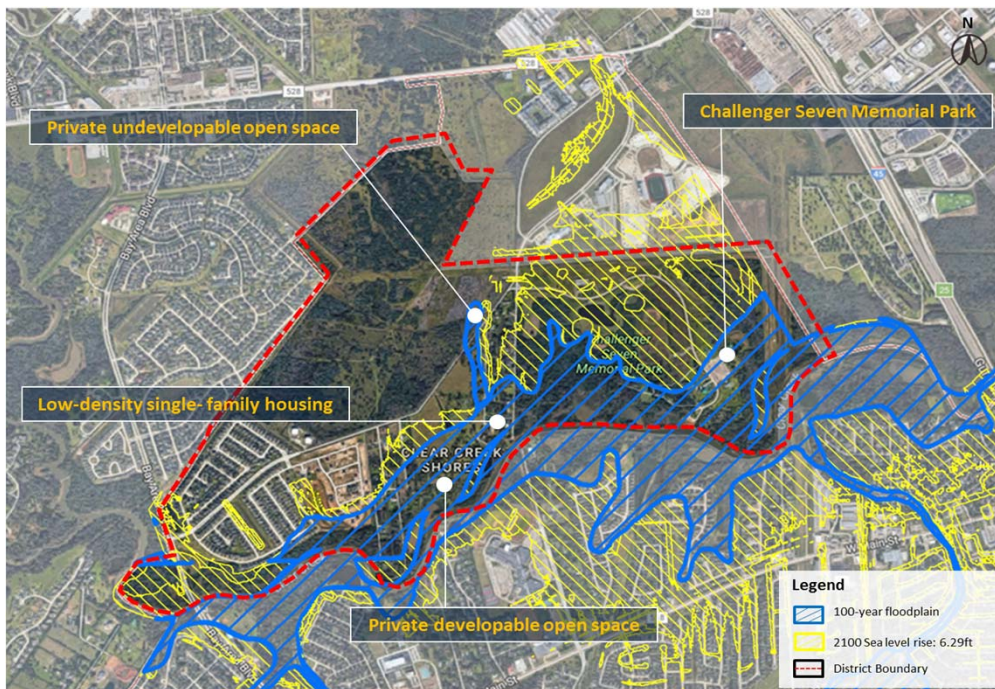


League City, TX

- All plans include similar hazard goals involving protection of people and structures through sound development and/or environmental practices that support flood mitigation
- The comprehensive plan, mitigation plan, and parks plan contain the city's future land use map to guide future new development and redevelopment



Innovative Policies in Low Vulnerability Areas



- Land use regulations that limit new development
 - Comp plan: Floodplain buffer regulations to preserve riparian areas
 - Subdivision Regs: cluster development and low density standards dedicating natural areas in floodplains
- Land acquisition in proposed conservation areas
 - Funds targeted toward repetitive loss areas, wetlands, etc. for parks and recreation use
- Public facility investments for stormwater
 - Low impact design technologies (i.e. rain gardens, bio-swales, retention/detention)
 - Government buildings and special needs facilities prohibited in floodplains
- Development limits tied to evacuation times
 - Density limit standards

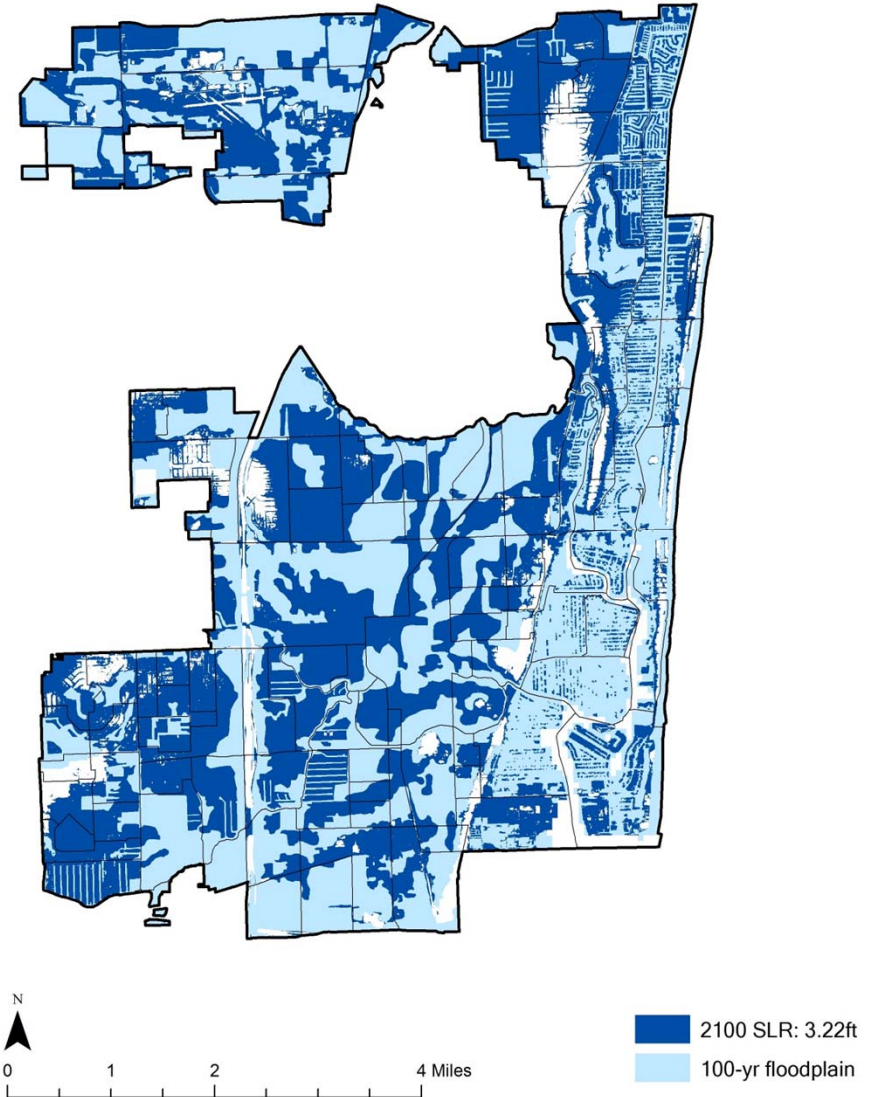
Little Attention to High Vulnerability Areas



- Policies in the Comp Plan support increased development in the 100-yr floodplain
- No high priority conservation district like the Clear Creek riparian areas.
- A few policies deal with reducing vulnerabilities:
 - Public facility investment policies to reduce flood impacts (i.e., pervious pavement for parking lots, detention ponds, rain gardens, and vegetative swales)
 - Purchase of drainage easements in floodplain
 - Affordable housing includes stormwater drainage policy
 - Mitigation Plan includes repetitive flood loss properties in existing neighborhoods

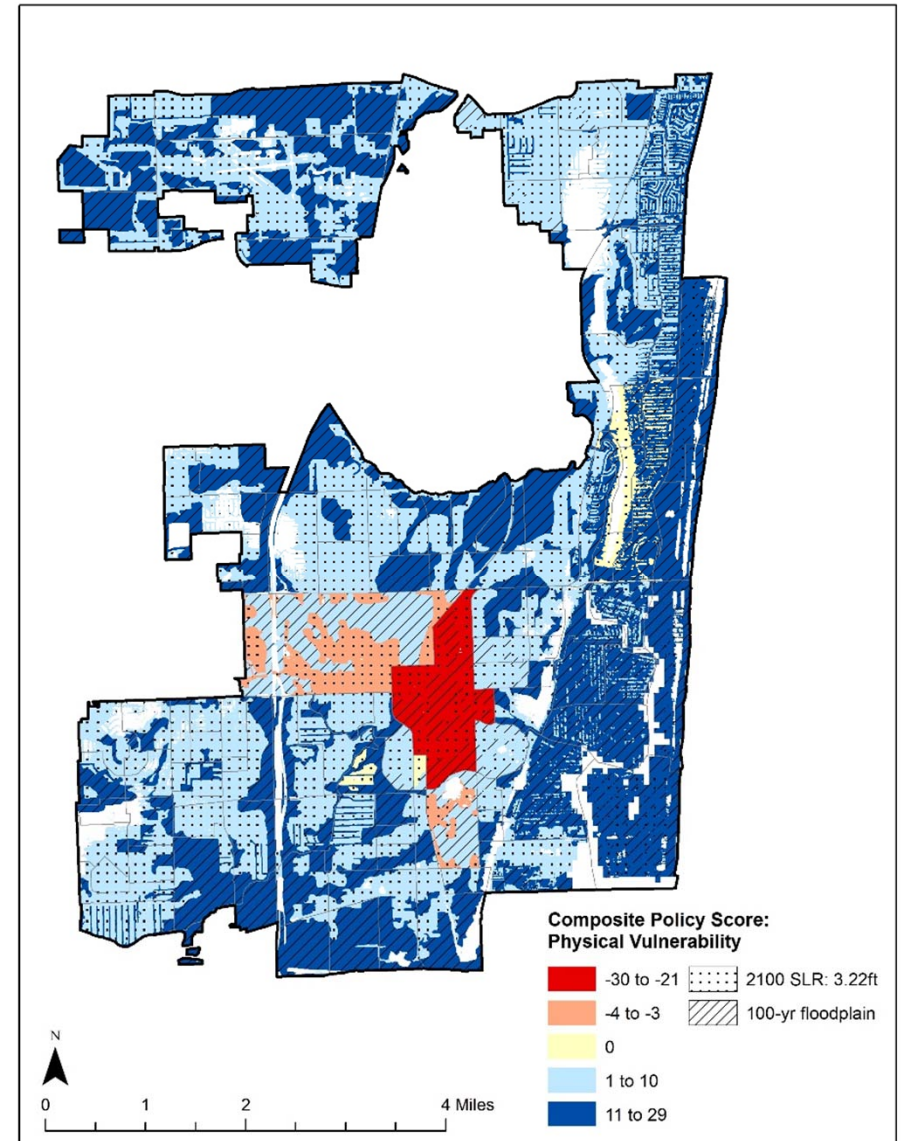
Fort Lauderdale, FL

- The “Venice of America” due to its many canals, the city offers 337 miles of coastline
- Considered one of the world’s most vulnerable urban areas with respect to climate change and hazard events
- Principle city of the Miami metropolitan area, which is home to 5,564,635 people
- Almost entirely built out, with only four percent remains vacant
- 100-year floodplain, which encompasses approximately 44% of the city



Fort Lauderdale, FL

- Network of eight plans
 - city consolidated plan;
 - downtown master plan;
 - downtown new river master plan;
 - Davie Boulevard corridor plan;
 - South Andrews Avenue plan
 - city comprehensive plan;
 - local mitigation strategy;
 - county comprehensive plan;



High Vulnerability and High Score



- Development regulations aimed at protecting coastal and hazard-prone areas
 - protection and conservation of existing natural beaches or berm areas, wetlands, and other types of open space in coastal and hazard-prone areas
 - Policies propose to regulate inappropriate development and limit land use densities and intensities within the CHHA overlay zone in sensitive areas
 - Enforcement and monitoring statewide program to protect the state's beaches and dunes
 - development regulations, such as setback provisions and other site controls, to reduce future property damages and losses
- Land acquisition and land use guidelines aimed at reducing vulnerability for new development and redevelopment in coastal and hazard-prone-areas
 - Undeveloped land in floodplain to remain such
 - Strict design guidelines for new construction
 - Limit impacts of development on wetlands, water quality, habitats, etc.
- Directing capital funding related to coastal and hazard-prone areas
 - Public expenditures directed to public stormwater infrastructure
 - Capital improvements to restore dunes
 - Mitigation projects in plan must link to capital improvement funding

What's Next for the Scorecard

Outreach

- APA include scorecard in best practice standards
 - Incorporating into PAS 578
- ASFPM network
- National Hurricane Conference 2017
- American Planning Association Conference 2017
- Folding into National Institute for Science and Technology (NIST)
- FEMA require scorecard for mitigation planning and climate change

Current Applications

- Rotterdam, Netherlands
- Norfolk, VA; League City, TX; San Luis Obispo, CA
- Rockefeller Foundation 100 Resilient Cities

Interactive website

- mitigationguide.org
- planningforhazards.com



Thank you

Questions?

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