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Climate Resiliency Planning for Local Governments

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The Challenge

Types of Natural Stresses:

How will
climate
change
increase our
vulnerability
and risk?

- ▶ Agricultural diseases and pests
- ▶ Damaging winds
- ▶ Drought and water shortage
- ▶ Earthquakes
- ▶ Emergency diseases
- ▶ Extreme heat
- ▶ Floods and flash floods
- ▶ Hail
- ▶ Hurricanes and tropical storms
- ▶ Landslides and debris flow
- ▶ Thunderstorms and lightning
- ▶ Tornadoes
- ▶ Wildfire
- ▶ Winter and ice storms
- ▶ Sinkholes



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What Can We Do?

Prepare and Adapt

Vulnerable Critical Infrastructure



Transportation

- Roads
- Trails
- Bridges
- Docks



Water Resources

- Water supply
- Wastewater
- Stormwater




Emergency Facilities

- Fire
- Police
- EMS



Built Environment

- Housing
- Businesses
- Public



Understand
Your
Vulnerabilities
Mitigate Your
Risk, Plan for
Your Response
& Recovery



Drainage Infrastructure GIS Database and Condition Assessment



Hazard Risk and Vulnerability Assessment (ICLEI)



Sea Level Rise Study/Shoreline Resiliency Plan



Hazard Mitigation Plan



Disaster Response and Redevelopment Plan



Utility Resiliency Study



Floodplain Management Program

Garden City - GPS Stormwater Inventory



- Sub-meter accurate GPS location
- Structure type and size
- Damage
- Sedimentation
- Debris
- Vegetation
- Erosion
- Water quality
- Maintenance need
- Photo inventory

GPS Stormwater Inventory – Findings



Damage



Sediment



Erosion



Debris

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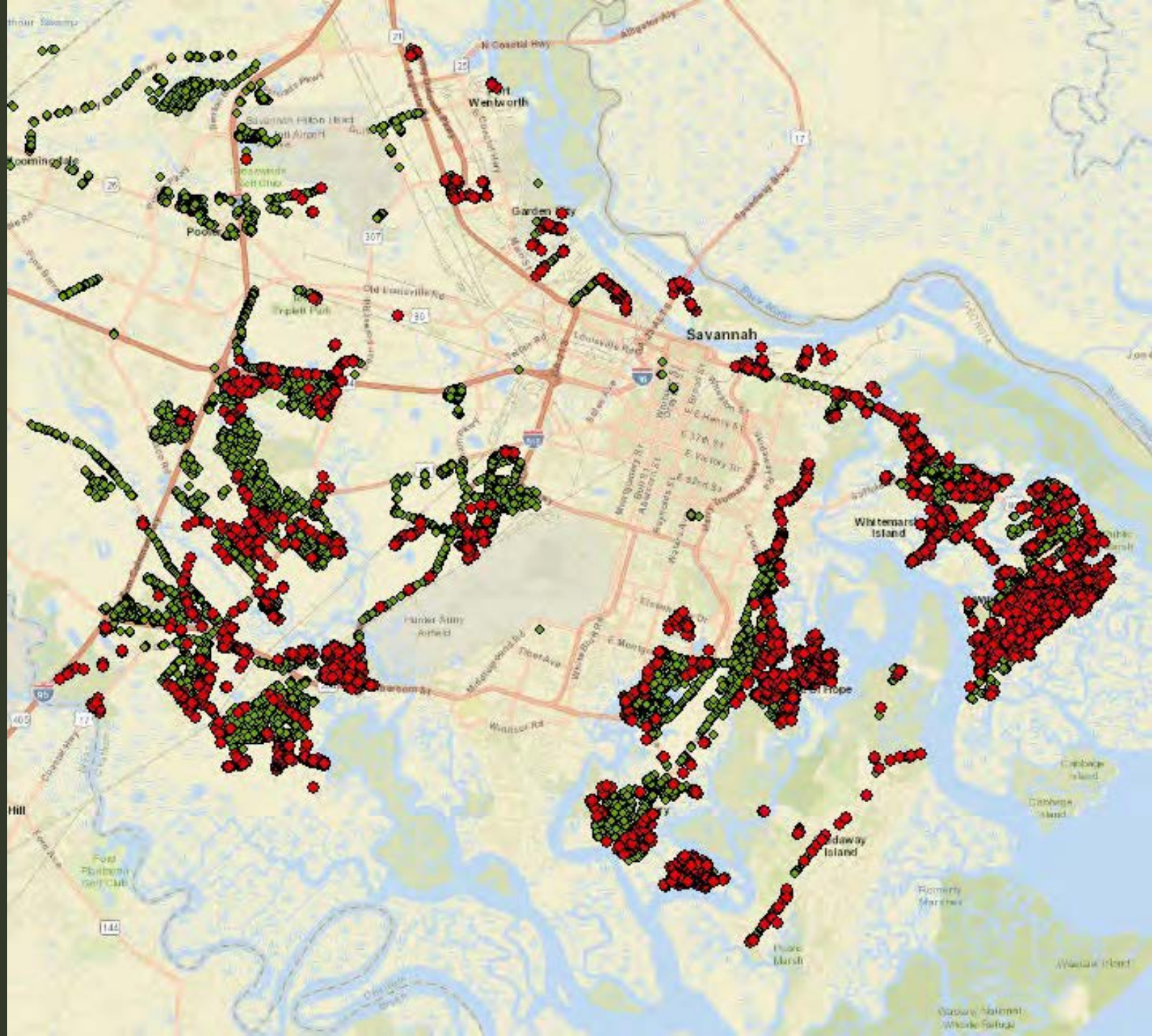
Garden City Hazard Risk and Vulnerability Assessment

Improve it, plan for it, or accept it.

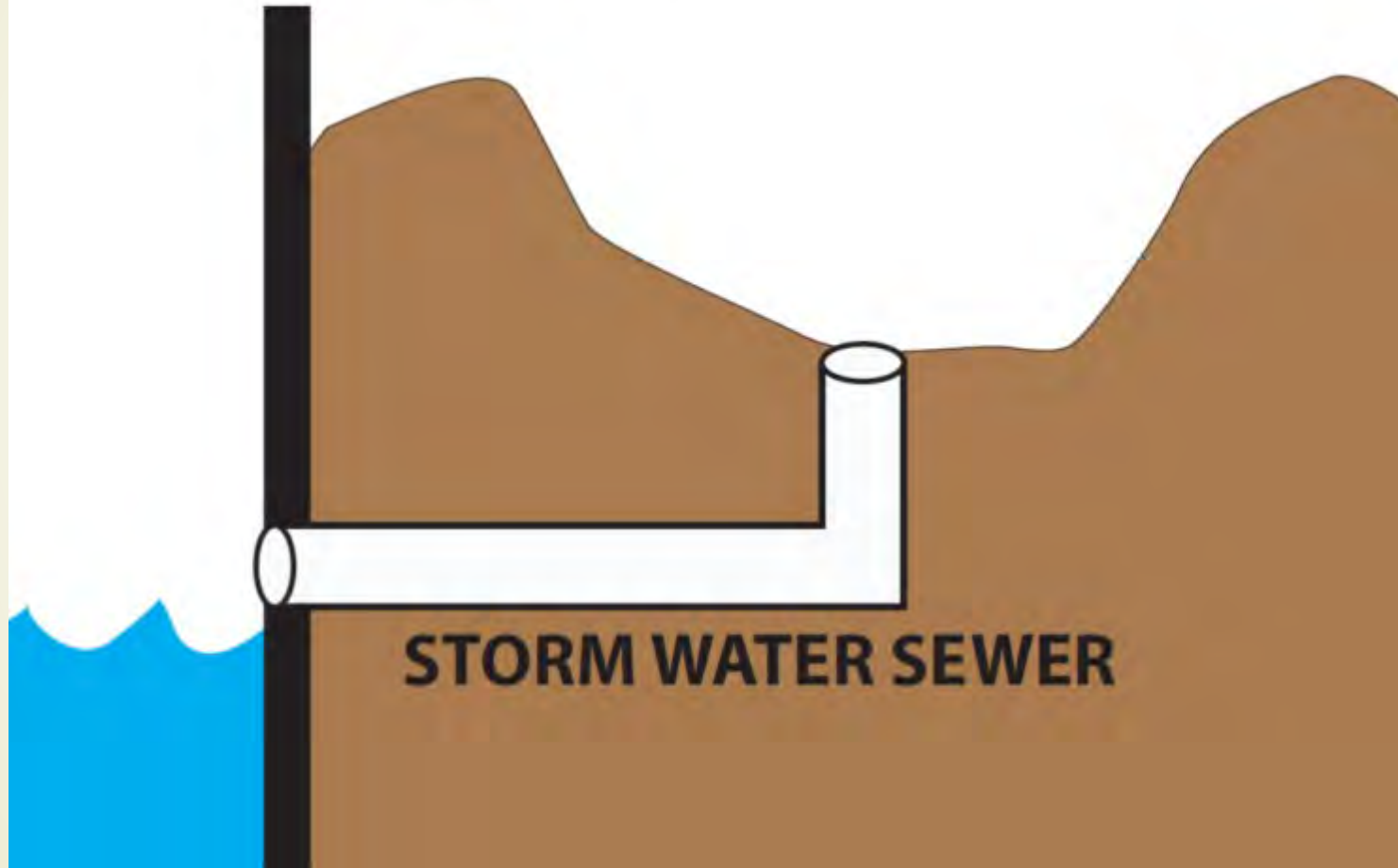
	Planning Area	Issues / Concerns	Vulnerability	Risk
Sea Level Rise	Public Works	More frequent flooding of roads	High	Medium
		Disruption of transportation network	Medium	Low
		Damage to roads, bridges, sidewalks, etc.	Medium	Low
		Maintenance and functionality of stormwater infrastructure	High	Medium
	Water Operations	Water quality issues	Medium	Medium
		Saltwater intrusion	High	High
		Damage to water delivery system elements and infrastructure	Medium	Medium
		Potential decrease in water supply	High	Medium
	Planning and Economic Development	Lack of long-term planning and preparedness	High	Medium
		Ability for development codes to adapt	High	Medium
	Finance	Increase in cost of services provided to residents	Medium	Medium
	Public	Limits water supply	Medium	Medium
		Potential for increase costs for services	Medium	Medium
		Economic impacts / increased costs	Medium	Medium
	Natural Resources	Soil erosion / poor soil quality	High	High
		Loss of wetlands	High	High
Increased flooding in low lying areas		High	High	
Negative impact on habitat / wildlife		High	High	

Chatham County Sea Level Rise Study

- Impacted Drainage Structures during high tide & during storm events in 2100
- Vulnerable roadways
- Green infrastructure recommendations
- CRS Credit



SEAWALL

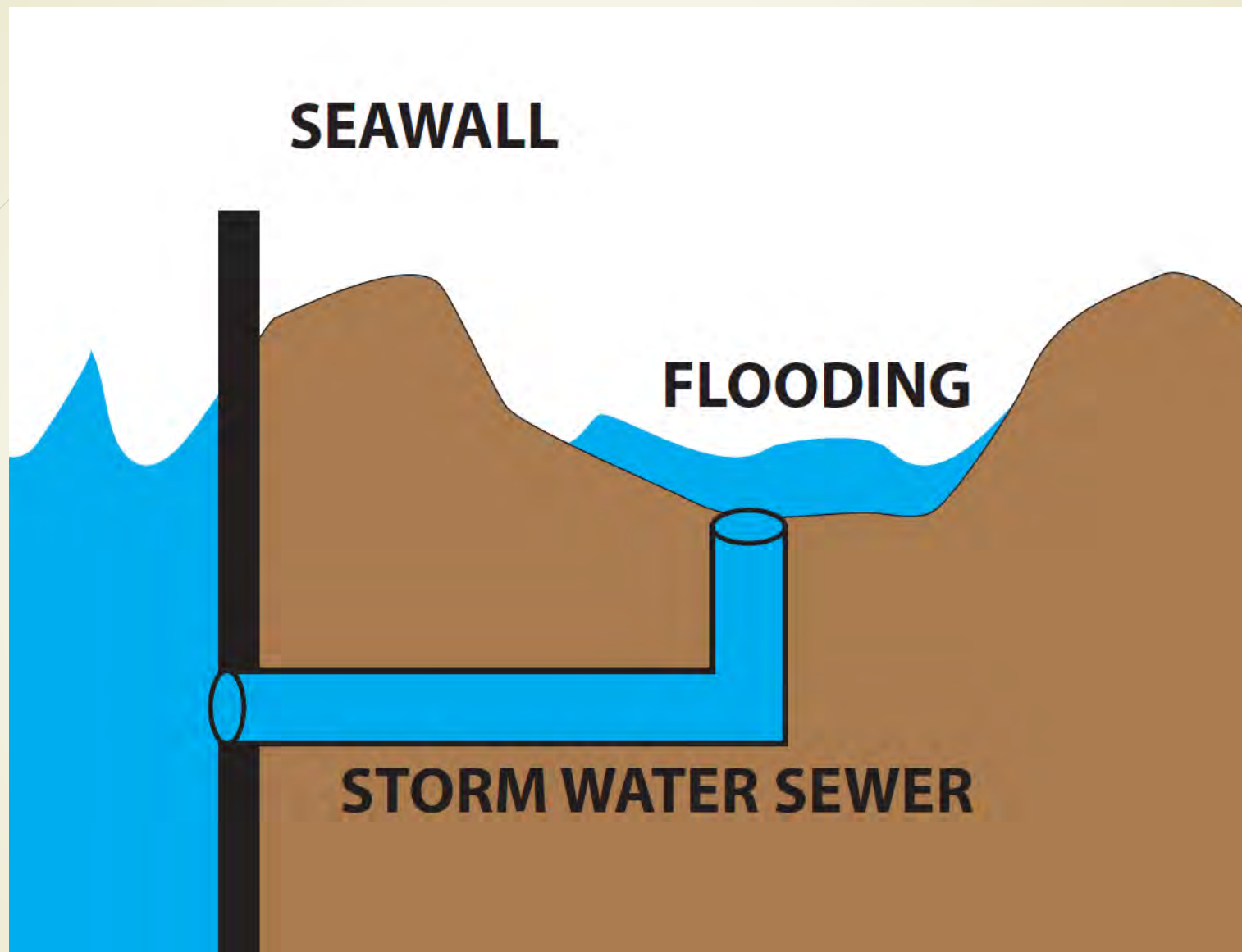


STORM WATER SEWER

SEAWALL

FLOODING

STORM WATER SEWER



Potential Solutions

Stormwater backflow preventers and pipe enlargement



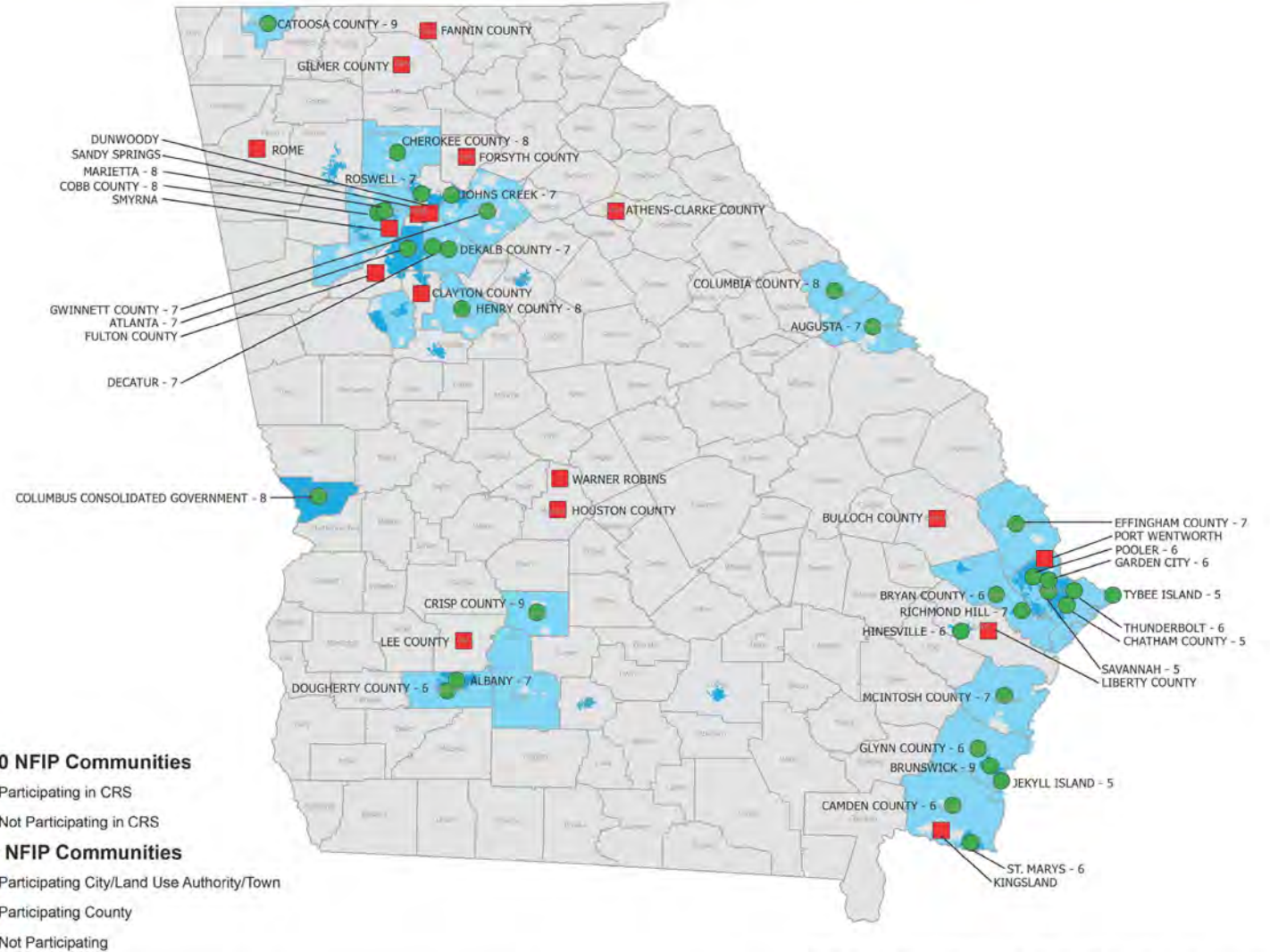
FIGURE 4.9: STORMWATER TIDAL BACKFLOW PREVENTERS, NEAR INTERSECTION OF 14TH ST. AND VENETIAN DR.

Georgia

Top 50 National Flood Insurance Program (NFIP) Policy Count Communities* and Community Rating System (CRS) Participation

*Ranked by the total number of NFIP insurance policies-in-force

Rank	CID	Community Name	Policies	Class
1	130030	Chatham County	16,480	5
2	130092	Glynn County	11,864	6
3	135163	Savannah	6,828	5
4	135164	Tybee Island	2,716	5
5	130016	Bryan County	2,610	6
6	130052	Cobb County	2,514	8
7	130065	Dekalb County	2,474	7
8	135157	Atlanta	2,308	7
9	130018	Richmond Hill	2,007	7
10	130261	Pooler	1,740	6
11	130027	St. Marys	1,714	6
12	130322	Gwinnett County	1,177	7
13	130093	Brunswick	1,160	9
14	130075	Albany	1,118	7
15	130262	Camden County	1,066	6
16	130158	Augusta	1,012	7
17	130125	Hinesville	949	6
18	130238	Kingsland	893	--
19	135158	Columbus Consolidated G	840	8
20	130201	Jekyll Island	839	5
21	130059	Columbia County	799	8
22	130123	Liberty County	792	--
23	130076	Effingham County	789	7
24	130130	Mcintosh County	716	7
25	130669	Sandy Springs	532	--
26	130088	Roswell	461	7
27	130312	Forsyth County	417	--
28	130041	Clayton County	393	--
29	130074	Dougherty County	356	6
30	135160	Fulton County	351	--
31	130460	Thunderbolt	333	6
32	130468	Henry County	324	8
33	130249	Fannin County	321	--
34	130424	Cherokee County	315	8
35	130122	Lee County	312	--
36	130019	Bulloch County	288	--
37	130040	Athens-Clarke County	282	--
38	135161	Garden City	279	6
39	130317	Gilmer County	261	--
40	130504	Crisp County	257	9
41	130111	Warner Robins	255	--
42	130247	Houston County	251	--
43	135162	Port Wentworth	236	--
44	130679	Dunwoody	226	--
45	130678	Johns Creek	215	7
46	130057	Smyrna	212	--
47	130081	Rome	212	--
48	130028	Catoosa County	209	9
49	130226	Marietta	209	8
50	135159	Decatur	207	7

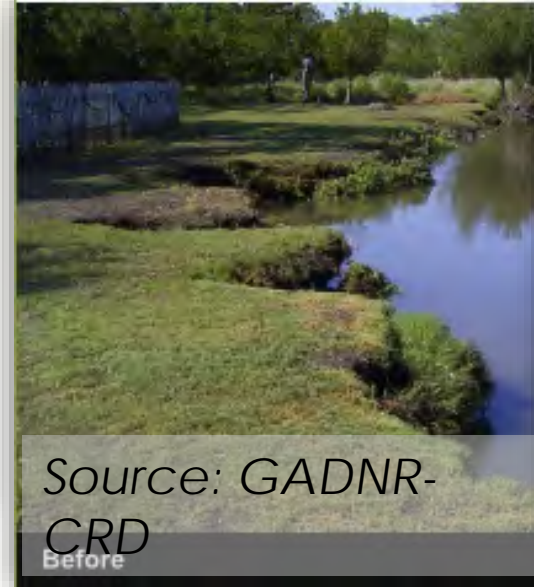


CRS Class Data: October 1, 2019 / Policy Data: August 19, 2019

For a full list of all CRS Communities as of October 1, 2019, visit http://j.mp/CRS_FIM_Oct_2019

Glynn County Shoreline Resiliency Plan -

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Source: GADNR-
CRD

After



Source: Guardian Retention
Systems



Camden County – St. Marys Resiliency Plan

- ▶ Land Preservation allows for migration of water levels, marsh, animal species, etc.
- ▶ NFWF Grant Funding



Hazard Mitigation Plan – McIntosh County

Action #	Action Step	Priority Status	Responsible Agency	Anticipated Cost	Funding Sources	Jurisdiction	Timeframe	Notes
Goal #1: Minimize losses to existing and future structures, especially critical facilities, caused by flooding from coastal storms, flooding from excessive rainfall. Hazards: Coastal Storm/Hurricane & Flood								
1.1	Seek funding to construct stormwater retention facilities and improve storm drain and ditch capacity and conveyance to protect existing and new developments.	Med	County & City	Variable, Depends on Project Scale	General Fund, SPLOST, grants	Both (City & County)	2018-2020	Funding was not available to conduct. Text was revised.
1.2	Seek funding to hire engineer (external consultant) to evaluate effectiveness of present drainage systems, conduct watershed planning, study erosion control issues in the county including waterways and tributaries, make retrofit suggestions, and review stormwater management plans.	High	County & City	\$200,000	General Fund, grants	Both (City & County)	2018-2020	Funding was unavailable to conduct. Text was revised.

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Does your County
have a DRRP?



POST-DISASTER RECOVERY AND REDEVELOPMENT PLANNING

A Guide for Georgia Communities

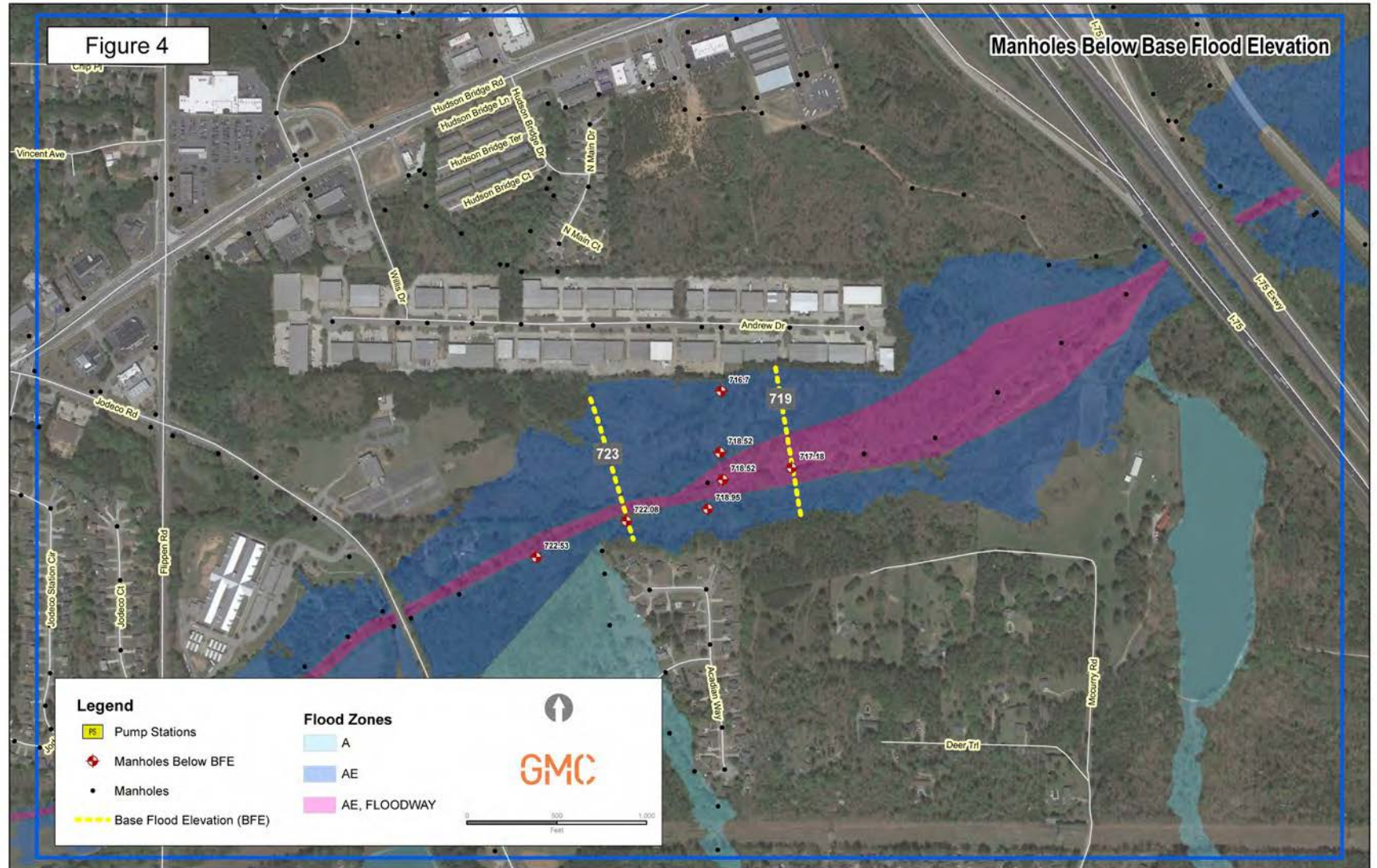


HAGERTY

MNGWPD Utility Climate Resiliency Study

Water Resource	Range of Potential Impacts (for the case studies evaluated)	Most Severe Climate Scenario
Water Demand	<ul style="list-style-type: none"> • 13% to 3.8% increase 	Hot/Dry
Water Supply and Drought	<ul style="list-style-type: none"> • Increased drought severity • Up to 11% reduction in reservoir firm yield for small to midsize reservoirs (but potential increase in wetter scenarios) 	Hot/Dry
Water Quality	<ul style="list-style-type: none"> • Decrease in annual low flows with potential for some basins to be completely dry • 0 - 3 deg. F. increase in water temperature • Between 0 – 1.5 mg/l decrease in dissolved oxygen 	Hot/Dry
Watershed Impacts	<ul style="list-style-type: none"> • Up to a 12% increase in rainfall depth • Up to an 11% increase in peak streamflow • Up to a 40% increase pollutant loading 	Hot/Wet
Water Availability	<ul style="list-style-type: none"> • Between 2050-2100, climate scenarios indicate an average Palmer Drought Severity Index (PDSI) from near (0.21) normal conditions to extreme drought (-4.49). 	Hot/Dry

- Raising manholes
- Floating water intakes
- Water Conservation & Efficiency Programs
- Alternative Water Sources
- New Treatment Processes
- Stormwater Management





The National Flood Insurance Program (NFIP) requires

- ▶ Identification of flood risk
 - ▶ Development of building standards in high risk areas
 - ▶ Make flood insurance available within participating communities.
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- ▶ Flood maps
 - ▶ Flood ordinance: minimum standards
 - ▶ Federally-subsidized flood insurance

Community Rating System (CRS)

- ▶ NFIP voluntary program offers discounts on flood insurance to reward good floodplain management within a community.
- ▶ Communities receive points for implementing activities above minimum standards.
- ▶ The more points the greater the reduction on eligible flood insurance policies within that community.

Class	Points	Premium Reduction for SFHA policies
1	4500+	45%
2	4000-4499	40%
3	3500-3999	35%
4	3000-3499	30%
5	2500-2999	25%
6	2000-2499	20%
7	1500-1999	15%
8	1000-1499	10%
9	500-999	5%
10	0-499	0%

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