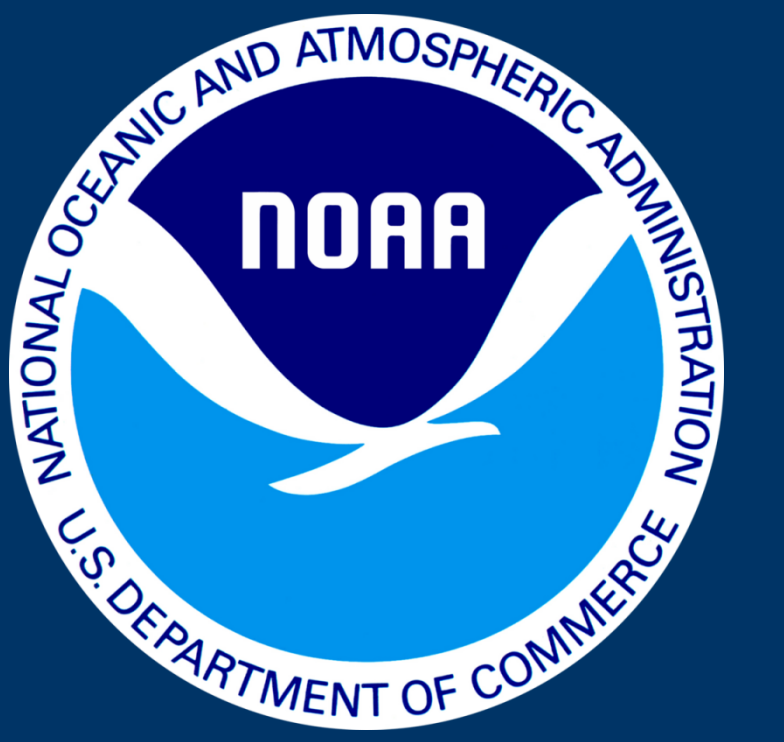




GTM NERR Watershed

Andrea Small-Watershed Coordinator



Introduction

In order to preserve or improve the quality of our water resources, we must understand our watershed. A few key components that determine the quality of the watershed are: soil characteristics, land use and land management, and topography. We must understand how these three main characteristics work together so we can plan for mitigation or adaptation strategies that will help us achieve a healthy watershed.

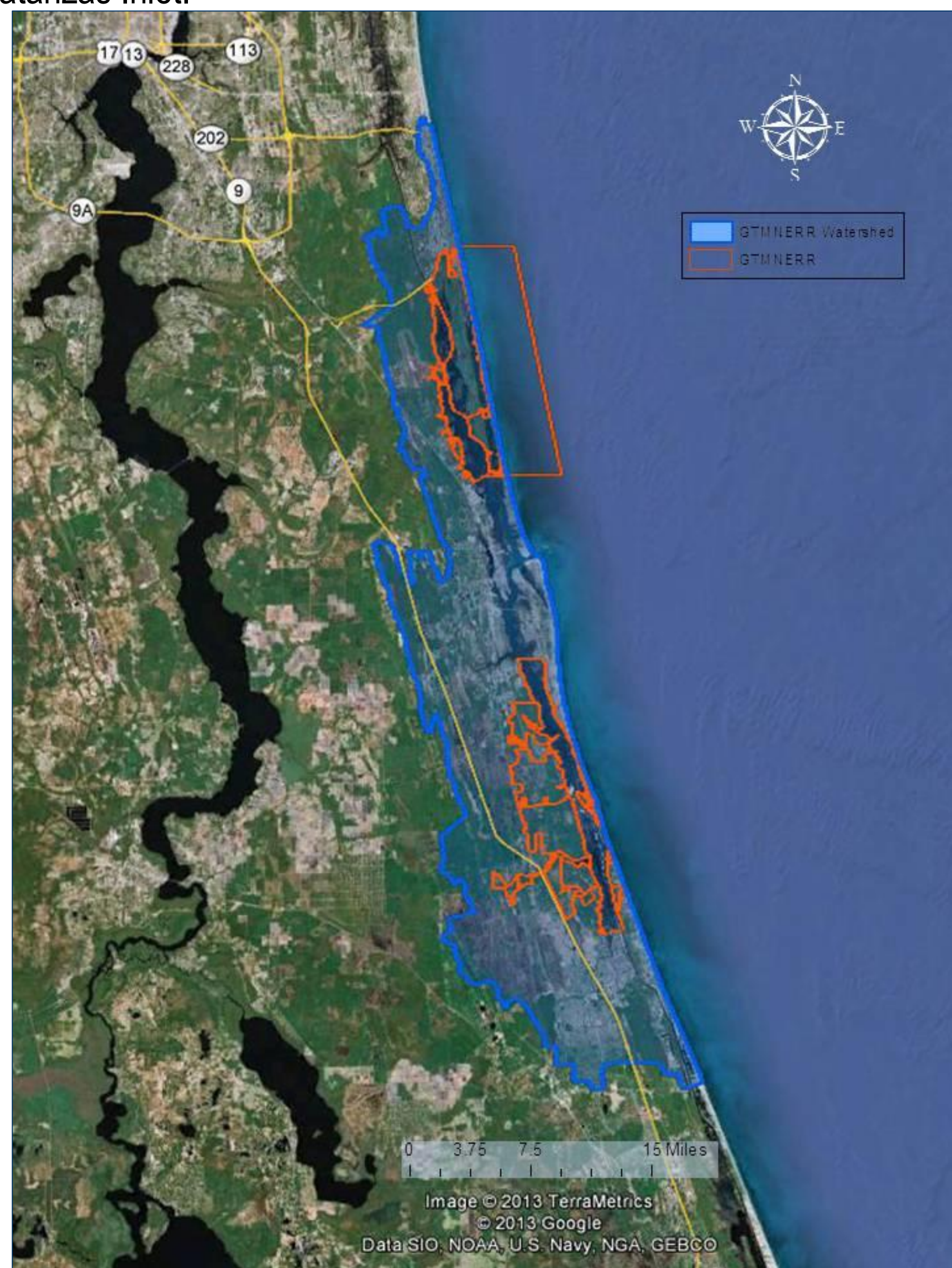
Location



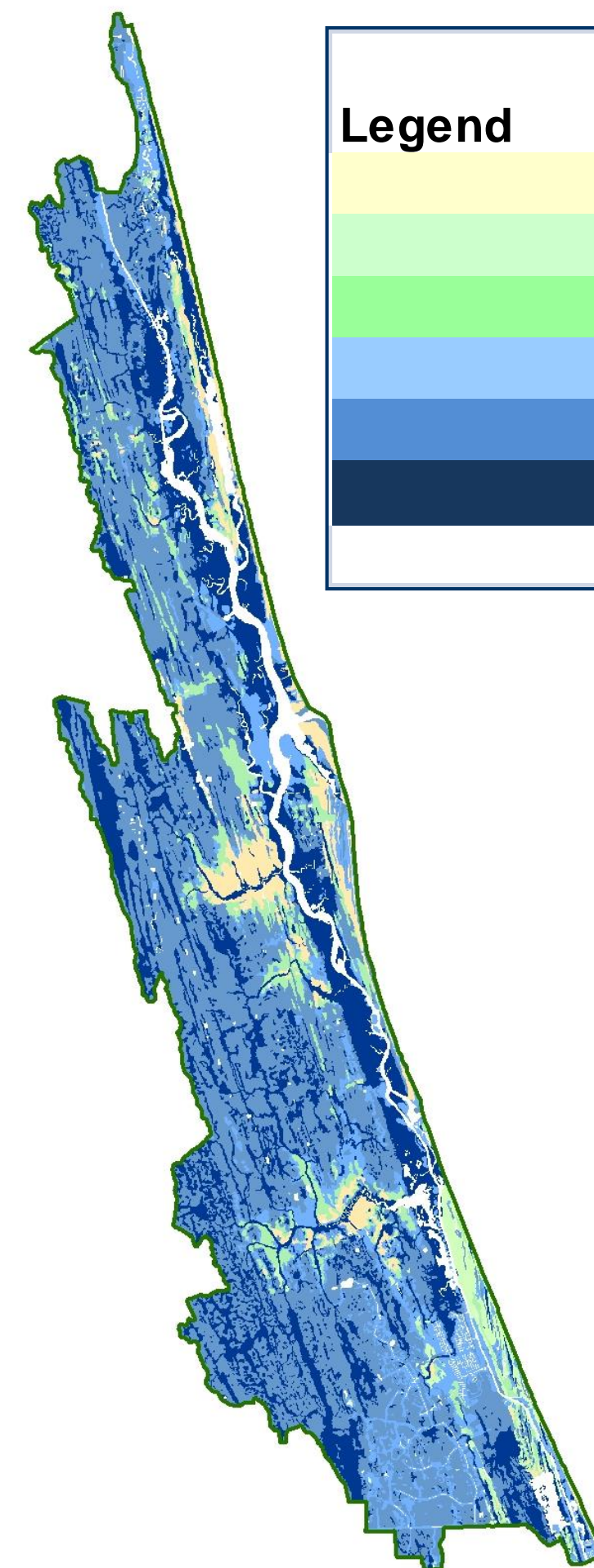
The watershed starts just north of Butler Blvd. in Jacksonville Beach and continues south along the coast for almost 60 miles to Route 100 just north of Flagler Beach. The watershed width ranges from just one-mile near Jacksonville Beach to its widest point in Flagler County of just around ten-miles. Interstate 95 runs north-south through the watershed for about 30 miles and A1A runs mostly north-south through the watershed for over 60 miles.

Boundaries

GTM Research Reserve consists of 73,256 acres of conserved lands and waters. The watershed consists of approximately 230,000 surface acres that drain to either the Tolomato or Matanzas Rivers which contribute to the Atlantic Ocean via the St. Augustine Inlet or the Matanzas Inlet.



Soil Characteristics

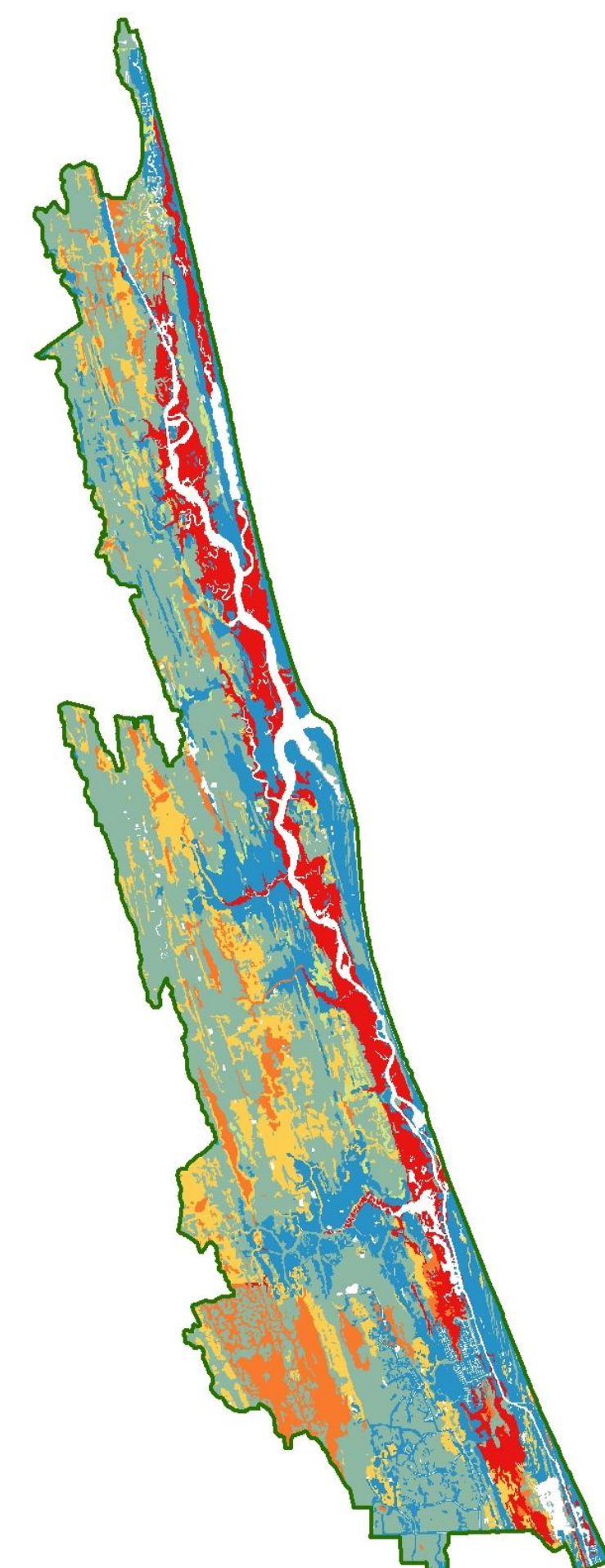


Legend	Drainage Class	% of Watershed
Yellow	Excessively Drained	5%
Light Green	Well Drained	2%
Medium Green	Moderately Well Drained	6%
Blue	Somewhat Poorly Drained	11%
Dark Blue	Poorly Drained	48%
Black	Very Poorly Drained	28%
		100%

Drainage Class	Definition
Excessively Drained	Water is removed from the soil rapidly, highly permeable surface
Well Drained	Water is removed from the soil readily but not rapidly
Moderately Well Drained	Water is removed from the soil more slowly at certain periods of the year and the soil will remain wet for short periods during rainy season
Somewhat Poorly Drained	Water is removed slowly, soil will remain wet at shallow depths for long periods
Poorly Drained	Water is removed so slowly that water remains for significant periods
Very Poorly Drained	Water is removed so slowly that free water remains at or above ground surface during much of the year

Soil Drainage

Soil characteristics play an important role in watershed health. The type of soil determines the rate at which water will be absorbed or drained. Soil drainage classification is derived from the type of soil and gives us the ability to visualize areas that may be problematic during rainfalls, as can be seen in the soil drainage map above. Included in the legend is the percent of the watershed by drainage class which shows that 76% of the soils in the watershed are poorly drained or very poorly drained. The magnitude of runoff depends on moisture present at the time of rainfall. When soil is saturated, water has no choice but to runoff. Runoff calculations are based on soil drainage, topography, and size and density of the watershed. Runoff potential maps like the one below can help planners prioritize where best management practices would be most beneficial.

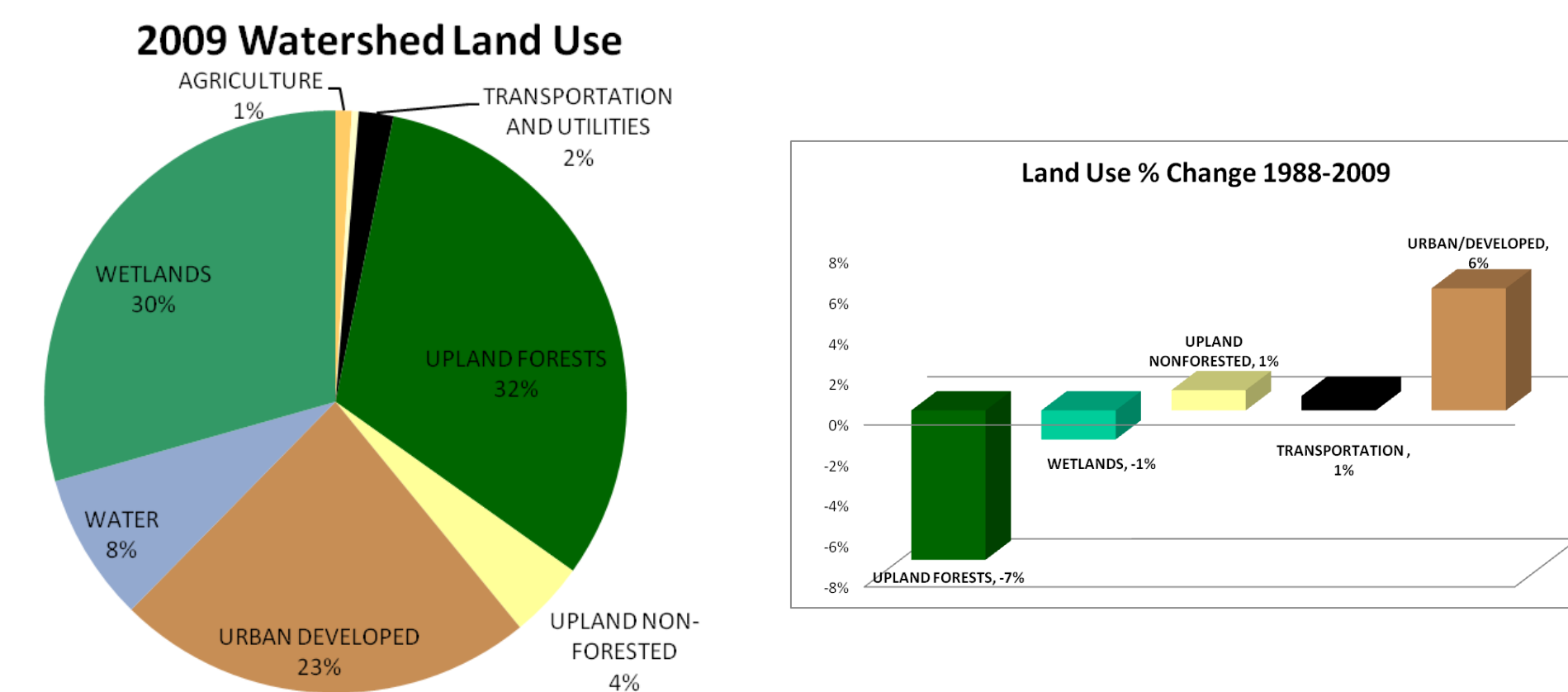


Water runs off saturated soil into a storm drain.

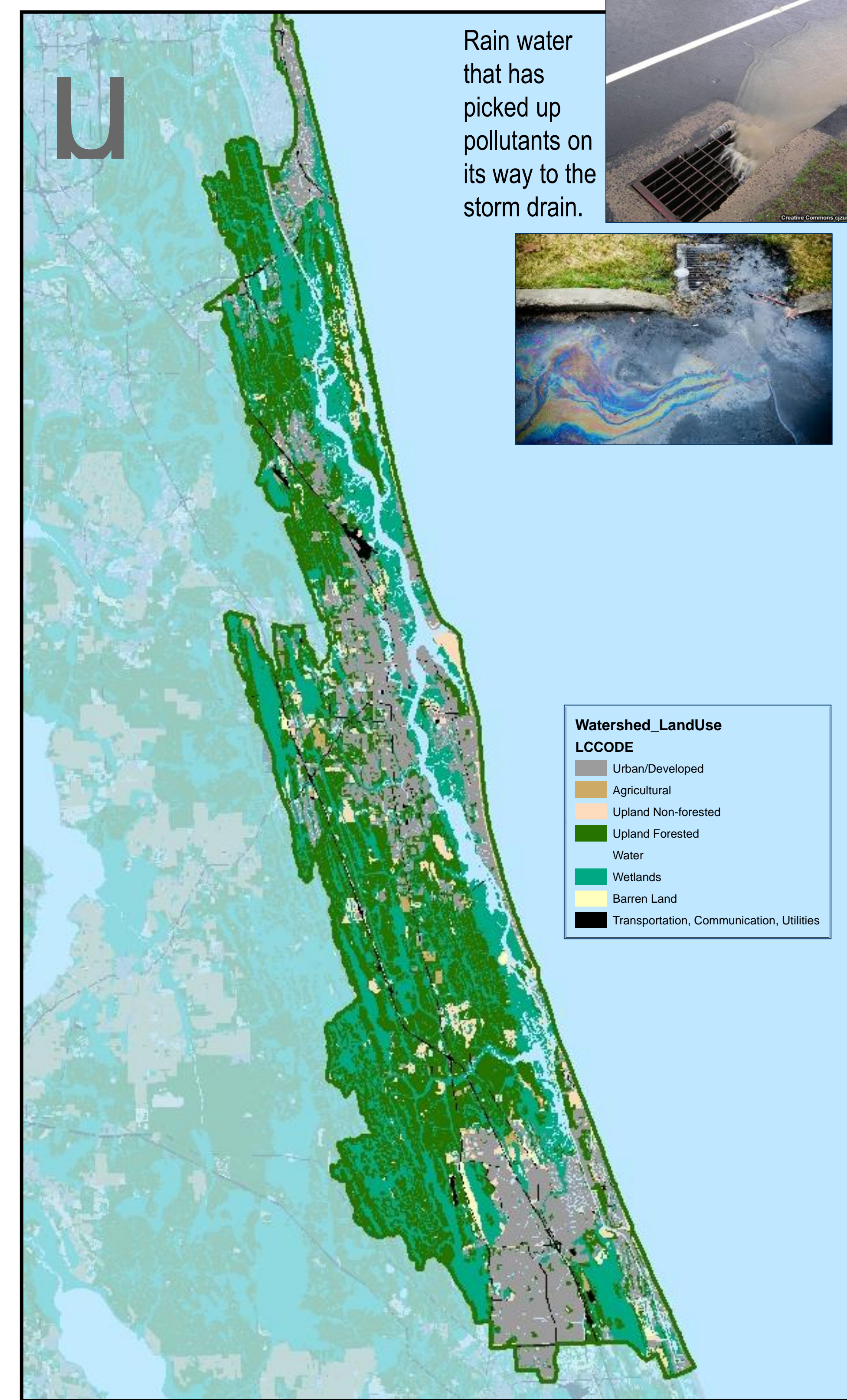
Watershed Runoff Potential	HYDGRP
Blue	A-Low
Light Green	A/D-Low/high during extreme events
Medium Green	B-Moderate
Dark Green	B/D-Moderate/high during extreme events
Orange	C/D-High to very high
Red	D-Very High

Runoff Potential

Land Use



Land use and land management practices have a great effect on the amount and intensity of runoff which directly affects water quality. Forested area and grasslands with thick layers of leaves and mulch help to slow the flow of water allowing time for it to penetrate into the ground. Developed areas have the opposite effect; impervious paved surfaces increase the velocity of water increasing its runoff potential. The more velocity water has the greater its ability is to carry solids like soil and pollutants. Between 1988 and 2009, the watershed lost 7% of its forests to developed areas. These kinds of landscape changes require mitigation strategies to prevent the degradation of water quality.



Rain water that has picked up pollutants on its way to the storm drain.

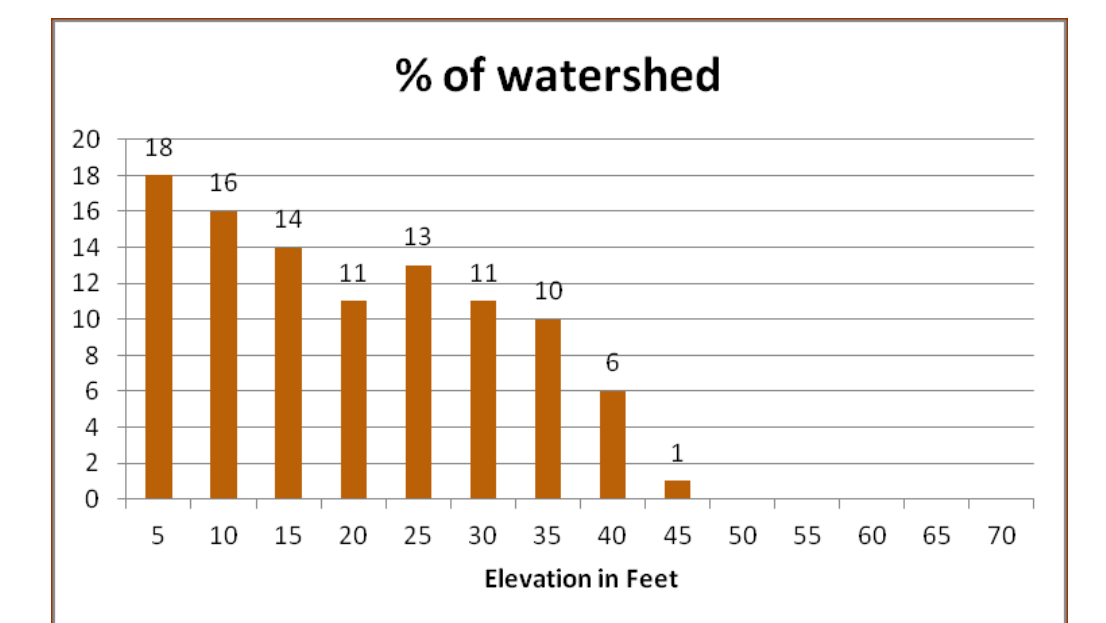


Watershed_LandUse	LCCODE
Urban/Developed	U
Agricultural	A
Upland Non-forested	N
Upland Forested	F
Water	W
Wetlands	WT
Barren Land	B
Transportation, Communication, Utilities	T

Topography



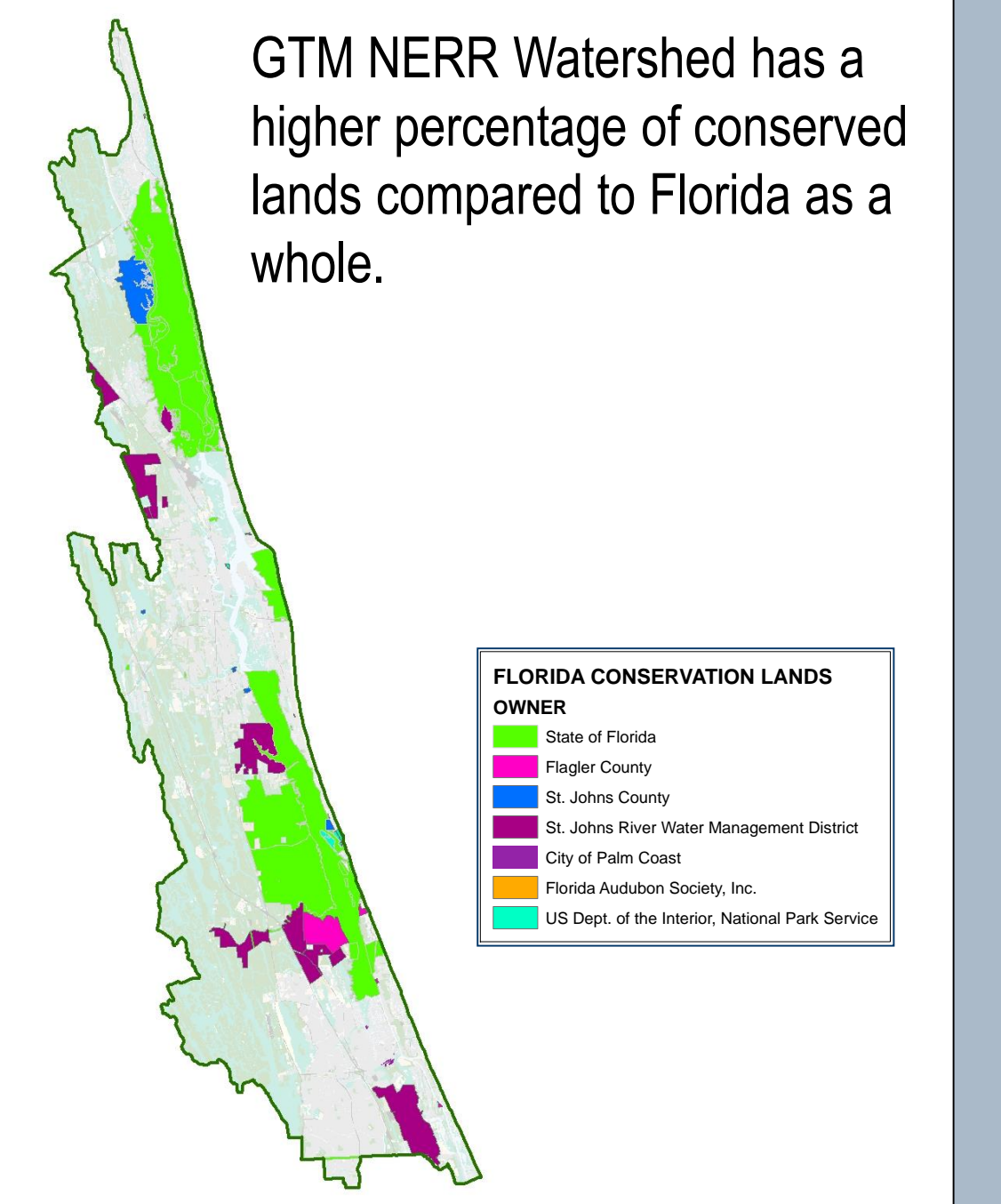
The watershed elevation ranges from sea level to a height of just 70 feet. The lighter colors represent lower elevations, darker colors are higher elevations, and blue is water. 18% of the watershed is five feet or less and over 50% of the watershed is lower than 25 feet above sea level. The average slope of the watershed is just over 1.5 feet. While a gradual slope is great for dry areas because it slows the flow of water, it can actually lead to flooding in wetter areas because it takes longer for the area to drain during and after rain falls.



Watershed Conservation Areas

Name	Acres
Deep Creek State Forest	360
Fever-Craves State Park	6945
Fort Matanzas National Monument	300
GTM NERR-Managed areas	44383
Guana River Wildlife Management Area	9815
Matanzas State Forest	4700
Pellicier Creek Conservation Area	3162
Princess Place Preserve	1503
Washington Oaks Garden State Park	425
Mosses Creek Conservation Area	2172
Stokes Landing	286
River to Sea Preserve	85
Total acres within NERR boundary	73,256
Anastasia State Park	1593
Binga Landing	12
Canopy Shores Park	36
Castillo De San Marcos National Monument	19
Fort Mose Historic State Park	41
Graham Swamp Conservation Area	3199
Guana River Marsh Sanctuary	6
Herschel King Senior Park	20
Intracoastal Waterway Park	114
Larson Tract	14
Lehigh Greenway	193
Long's Landing	9
Mandel Parcel	1
Martinez Varn Park	8
Musallam Trail Head	24
Nocasset Preserve	2245
Palm Coast Greenway	97
Roberts Property	186
Toool Junction	18
Twelve Mile Swamp Conservation Area	2226
Vail Point Park	24
Vilano Bridge Conservation Parcel	7
Vilano Oceanfront Park	2
Windswept Acres Park	3
Total acres outside of NERR boundary	10,155
Total Conservation Acres within GTM NERR Watershed	83,411
Total Watershed Acres	229,588
Percent of watershed in conservation	36%

PERCENT OF FLORIDA IN FEDERALLY MANAGED CONSERVATION LANDS: 12%
 PERCENT OF FLORIDA IN STATE MANAGED CONSERVATION LANDS: 14%
 PERCENT OF FLORIDA IN LOCALLY MANAGED CONSERVATION LANDS: 1%
 PERCENT OF FLORIDA LANDS IN CONSERVATION: 27%



GTM NERR Watershed has a higher percentage of conserved lands compared to Florida as a whole.

Conclusion

More than 1.3 million people live within 50 miles of the GTM Research Reserve, an area that has seen a 20% increase in population each decade for the last two decades. More than one-third of the watershed is marsh and water, and the soils are poorly drained, giving the watershed a very high rate of runoff. Combined with the low elevations the watershed is prone to flooding. In addition to those natural characteristics, urban and transportation areas increased by 8% over 20 years, adding to the runoff potential. Positive characteristics of the watershed include, 32% of lands remain forested and 36% of the watershed is already in conservation. Implementing best management strategies to slow the flow of runoff will help maintain the health of our watershed.

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Disclaimer

This map is for reference use only. Data provided are derived from multiple sources with varying levels of accuracy. GTM NERR disclaims all responsibility for the accuracy or completeness of the data shown herein. Maps produced: January 2013-AJS