

Water Quality Tool Set for Coastal Georgia OWTS Planning



C.R. Bodrey Jr.
Marine Resource Specialist III, The University of Georgia, Marine Extension Service,
Water Quality Program 715 Bay Street, Brunswick, Georgia 31520, rbodrey@uga.edu



Introduction

Coastal Georgia's population is growing at a significant rate and cities have limited sewer infrastructure to counter population rise. Onsite wastewater treatment systems (OWTS) will continue to be heavily permitted. These systems have the potential to impair surface water quality if not maintained, leaching bacteria and nitrogen that may cause health risks to humans and impact the environment. It is extremely important to establish water quality and land use assessment tools to enable better public health planning. The University of Georgia Marine Extension Service (MAREX) has partnered with U.S. EPA, NOAA, Georgia Environmental Protection Division, GA Dept. of Natural Resources, The Coastal Health District, Southern Georgia Regional Commission and UGA Dept. of Crop & Soil Science on the development of this suite of planning tools.

Methods

OWTS Geo-location & Analysis Project

- Conducted a survey of geo-locating and inspecting OWTS in proximity of state waterways of 11 coastal counties
- Created a GIS database, maps (Figure 1) and a septic pollution susceptibility index for each county

Water Quality Evaluation

- Analyzing surface water quality in relation to OWTS densities in Glynn County, GA
- Developing a nonpoint source indicator transport model and trend analysis with ArcGIS ModelBuilder

Nitrogen Fate & Transport in Coastal GA Mounded OWTS

- Researching a relatively new technology implemented in the region
- Producing a 2-D Hydrus model

Results

OWTS Geo-location & Analysis Project

- Mapped approximately 25 thousand OWTS parcels

Note - Onsite Septic System Synonyms: *OSDS or Onsite Septic Disposal Systems terminology was used during the grant period per funding source request. *OWTS or Onsite Wastewater Treatment System terminology is widely used by industry.

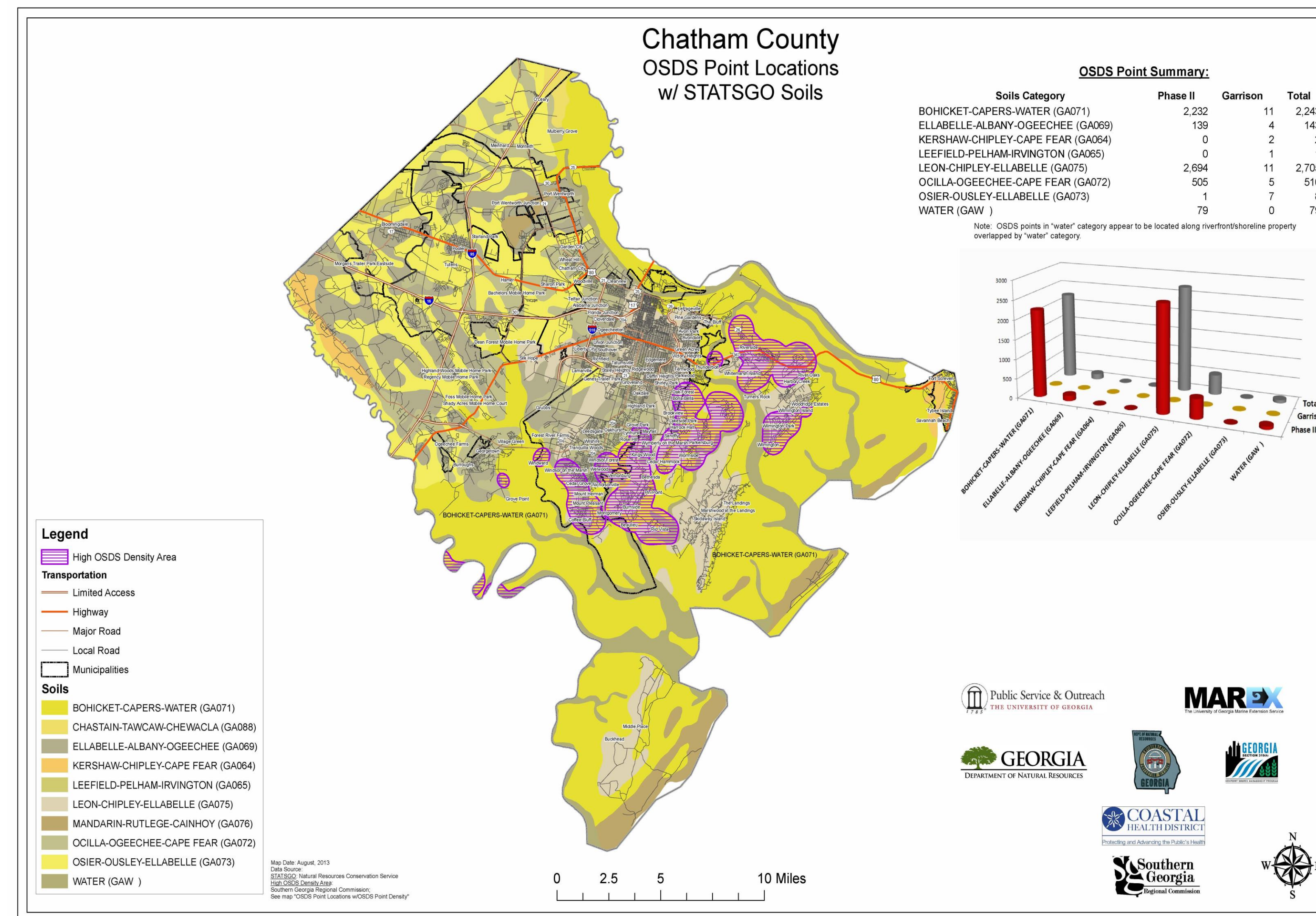


Figure 1. City of Savannah-Chatham County, GA OWTS Locations & STATSGO Soil (NRCS) GIS Layer.

- Produced the first GPS inventory of OWTS and wells in the 11 county GA EPD Coastal Nonpoint Source region
- Improved collection, verification and management of OWTS position locations
- Developed Southern Georgia Regional Commission's geo-referenced, web accessible, WeIStROM GIS database
- Produced GIS maps and analysis of the OWTS and wells
- Developed a pollution susceptibility index for each of the GA EPD Coastal Nonpoint Source counties Methodology (Figure 2 & Table 1)

Ongoing

Water Quality Evaluation

MAREX is gathering and analyzing water quality data until October 2015. This project will provide significant insight into pollution prevention and protection of water bodies facing potential impairment in the region.

Conclusion

Once complete, this initiative will have provided a GIS database of OWTS, an evaluation of surface water quality in selected densities of OWTS, and an evaluation of nitrogen fate and transport in coastal soils. This tool set can be utilized by government officials, planners and scientists to better articulate and quantify water quality conditions in coastal watersheds. The products can be used to assist in the identification of potential pollution sources and as an analytical tool to aid in establishing TMDL processes required for coastal waters. Tool set can aid in hazard resiliency issues, such as emergency management planning and other vulnerability assessments.

Project Data

Project reports, maps and pollution susceptibility indices for coastal Georgia can be viewed or downloaded at: http://marex.uga.edu/water_quality/

WeIStROM GIS database site: <http://www.sgwebmaps.com/welstrom/>

Nitrogen Fate & Transport in Coastal GA Mounded OWTS

Nitrogen processes are key to nonpoint source pollution activities in marine waters. Coupled with the limited research that has been conducted on mounded systems in a coastal Georgia, this project data set will be highly beneficial for water quality and land use planning efforts. Project is ongoing with results expected in 2015.

Risk Factor	Category	Value
FEMA floodplains	In 100 yr. floodplain area	50
	In 500 yr. floodplain area	30
	Not in floodplain	0
Proximity to Wetlands	0 to 500 ft. from wetlands	100 to 0
	Pollution Susceptibility (DRASTIC)*	50
	High	100
Groundwater Recharge Areas	Within recharge area	50
	Not within recharge area	0
Proximity to Shellfish Beds	0 to 500 ft.	100 to 0
	Proximity to 305(b)/303(d) Impaired Streams/Lakes/Sounds	0 to 1000 ft. from Impaired Stream centerline; 0 to 500 ft. from Impaired Lakes/Sounds
Proximity to Surface Waterbodies	0 to 500 ft. from surface waterbody	100 to 0
	OSDS density	low density to high density
TMDL Impaired Watershed	Within impaired watershed	50
	Not within impaired watershed	0

Table 1. Risk Factors and Weighted Values for Pollution Susceptibility Index.

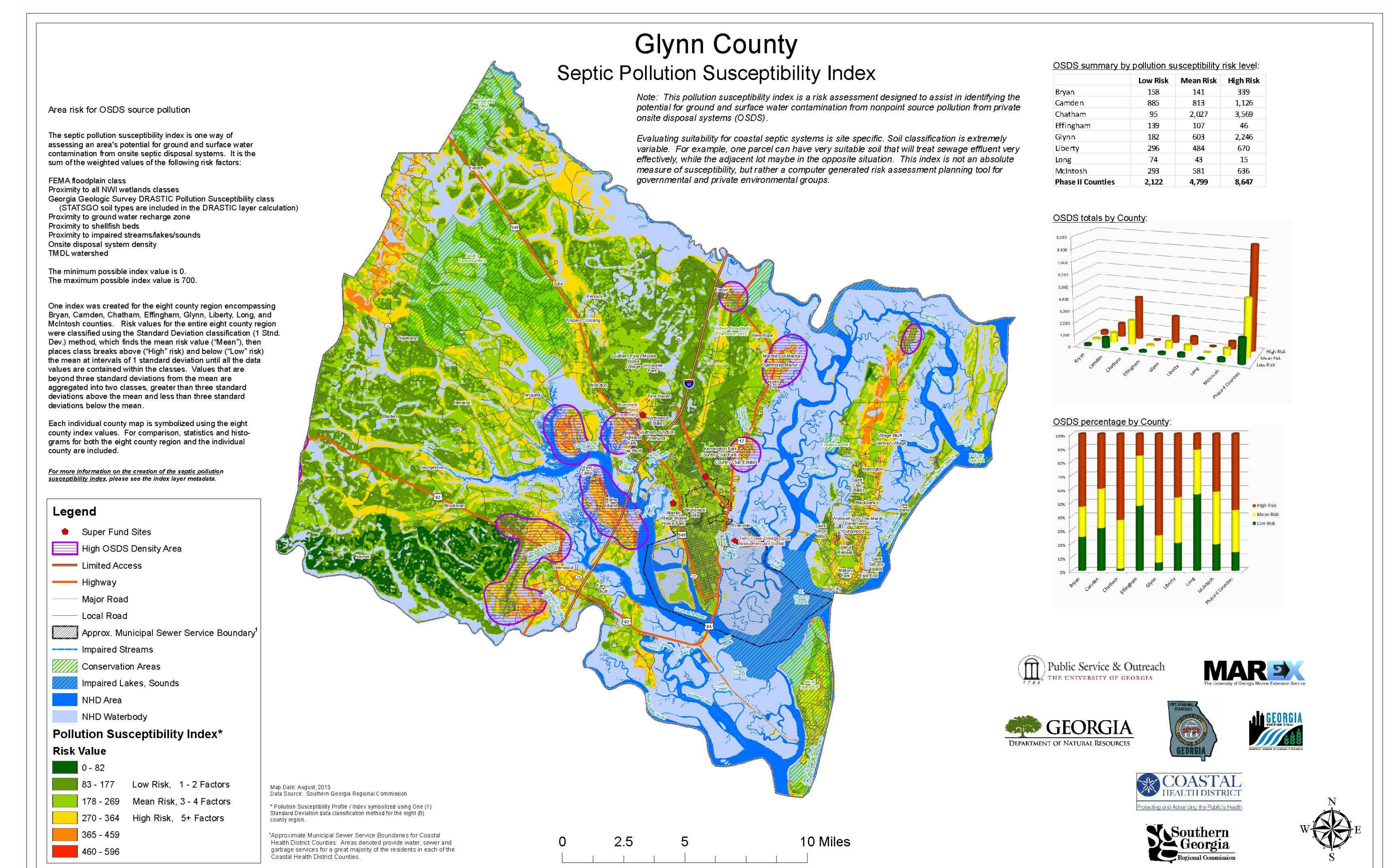


Figure 2. City of Brunswick-Glynn County, GA Pollution Susceptibility Index.