

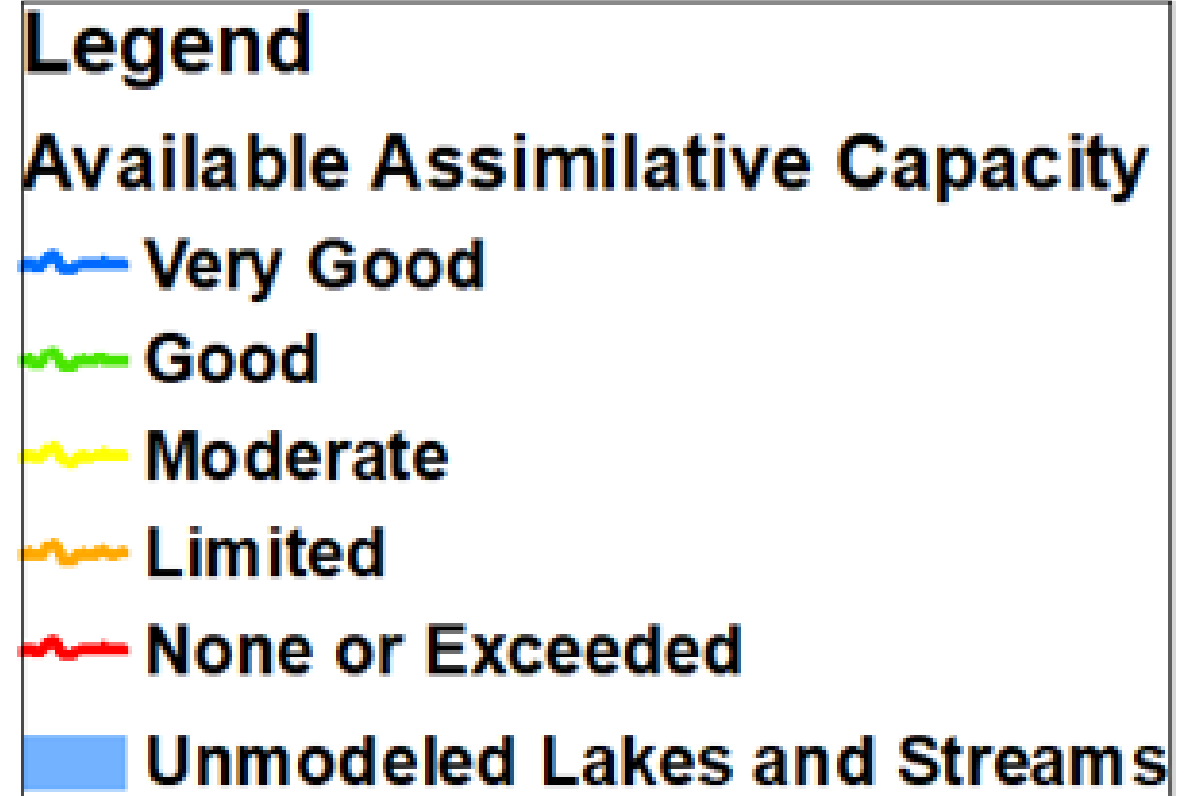
An aerial photograph of a river winding through a dense forest. The river is dark and reflects the sky. The forest is lush and green. In the distance, some buildings and a road are visible. The overall scene is serene and natural.

# Water Quality Resource Assessment

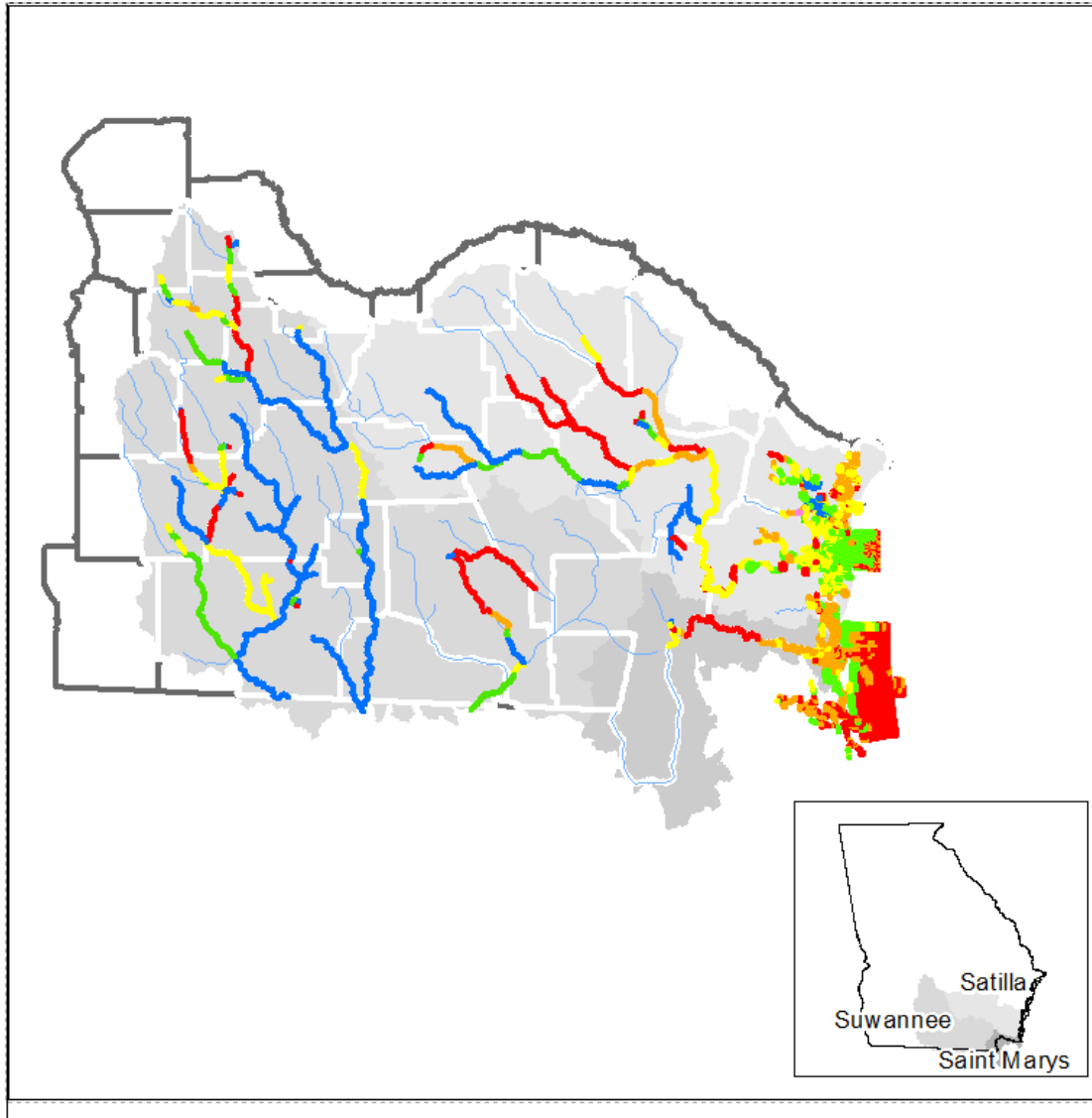
## Results under Current Conditions

# Dissolved Oxygen (DOSAG Models)

- **Current Conditions** **Section 3**
  - 2019 Permit Limits **Figure 3-6**
- **Assimilative Capacity**
  - How DO levels compare to water quality standard of 5.0 mg/L (or natural conditions)
- **DOSAG Models:**
  - Dischargers at permit limits
  - High temp, low flow conditions



# Current DO Conditions: All Basins

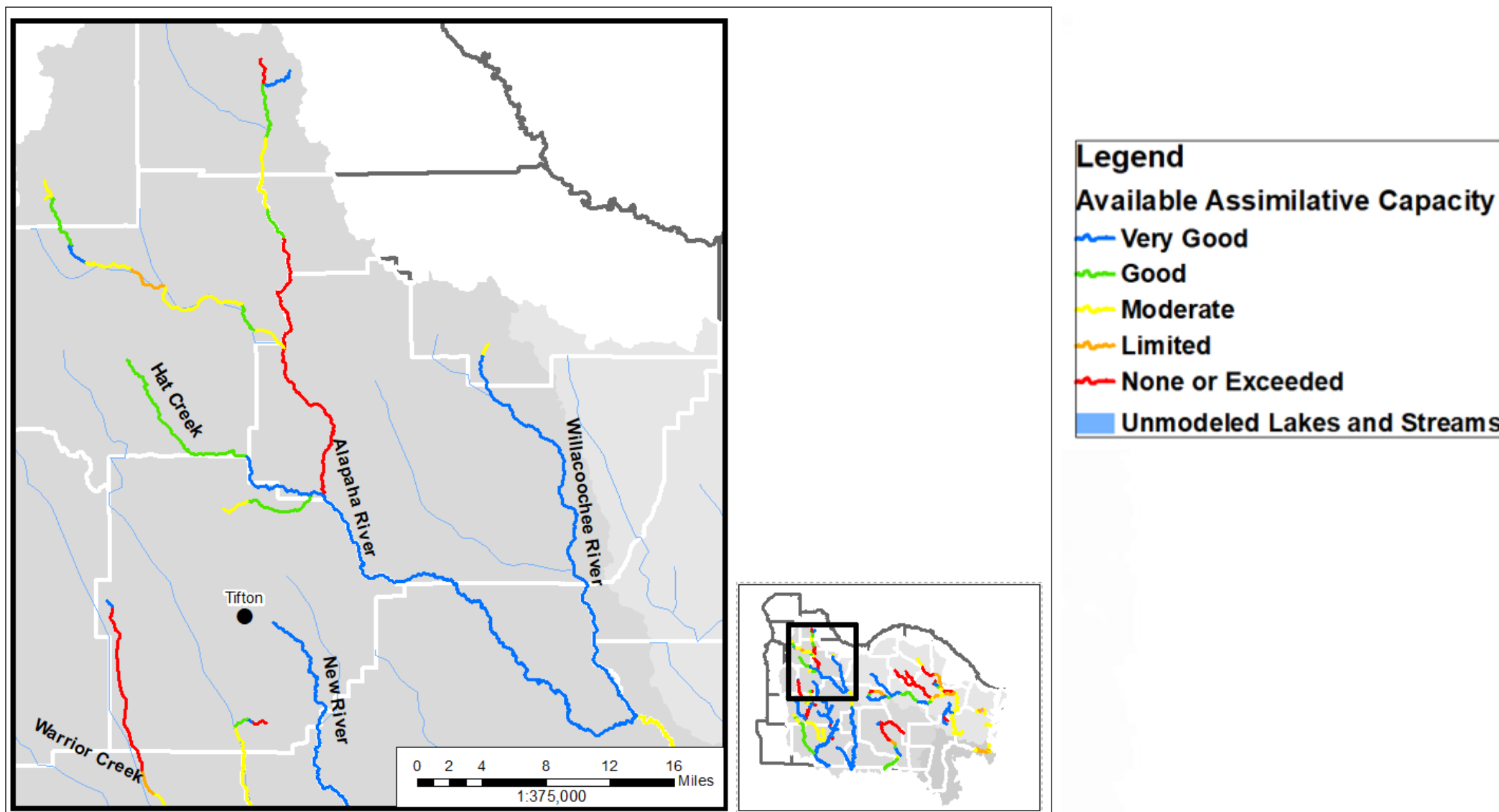


## Legend

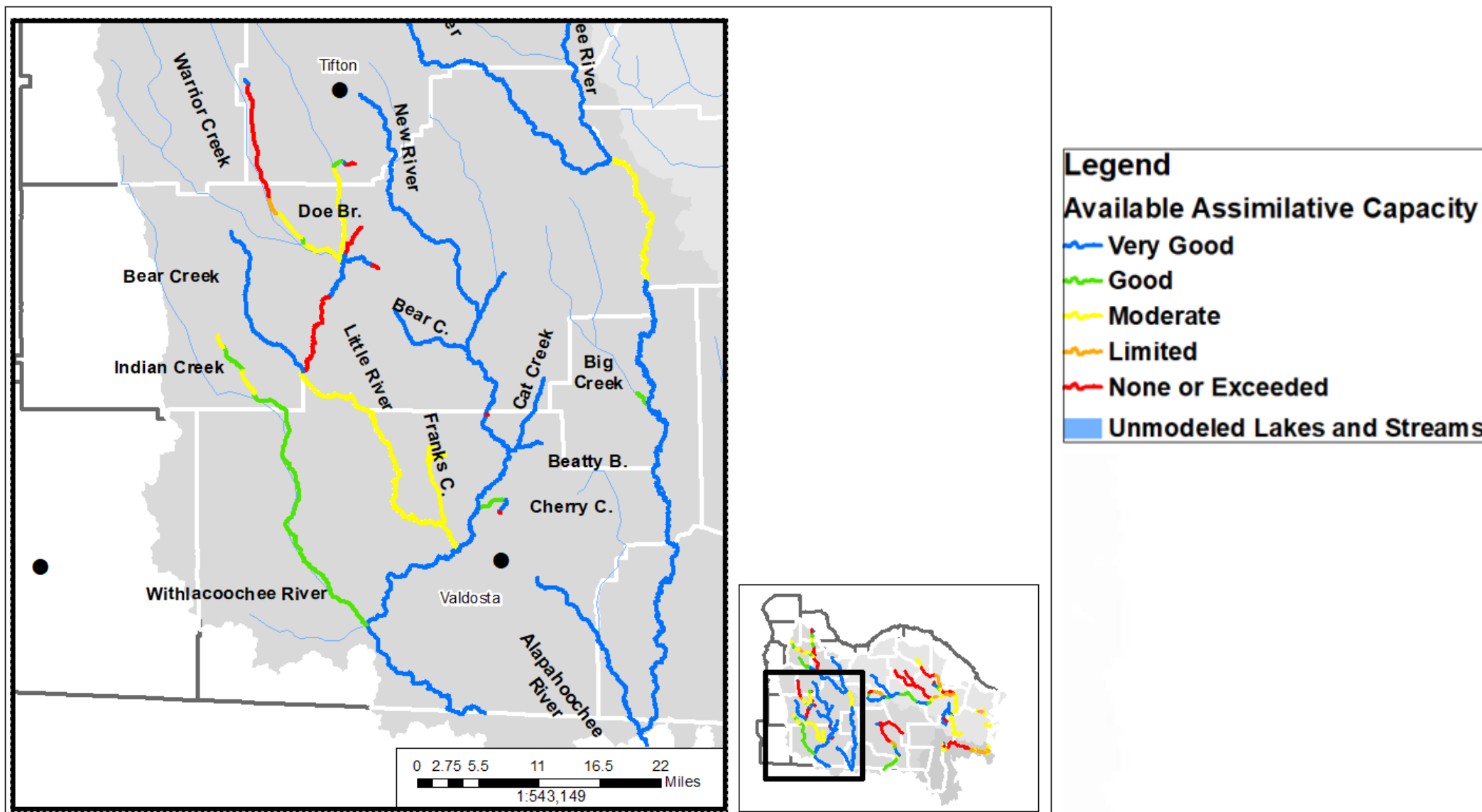
### Available Assimilative Capacity

- Very Good  $\geq 1$  mg/L DO available
- Good 0.5 mg/L to  $< 1$  mg/L DO available
- Moderate 0.2 mg/L to  $< 0.5$  mg/L DO available
- Limited  $> 0$  mg/L to  $< 0.2$  mg/L DO available
- At Assimilative Capacity 0 mg/L DO available
- None or Exceeded  $< 0.0$  mg/L DO available
- Unmodeled Lakes and Streams

# Current DO Conditions: Upper Suwannee Basin

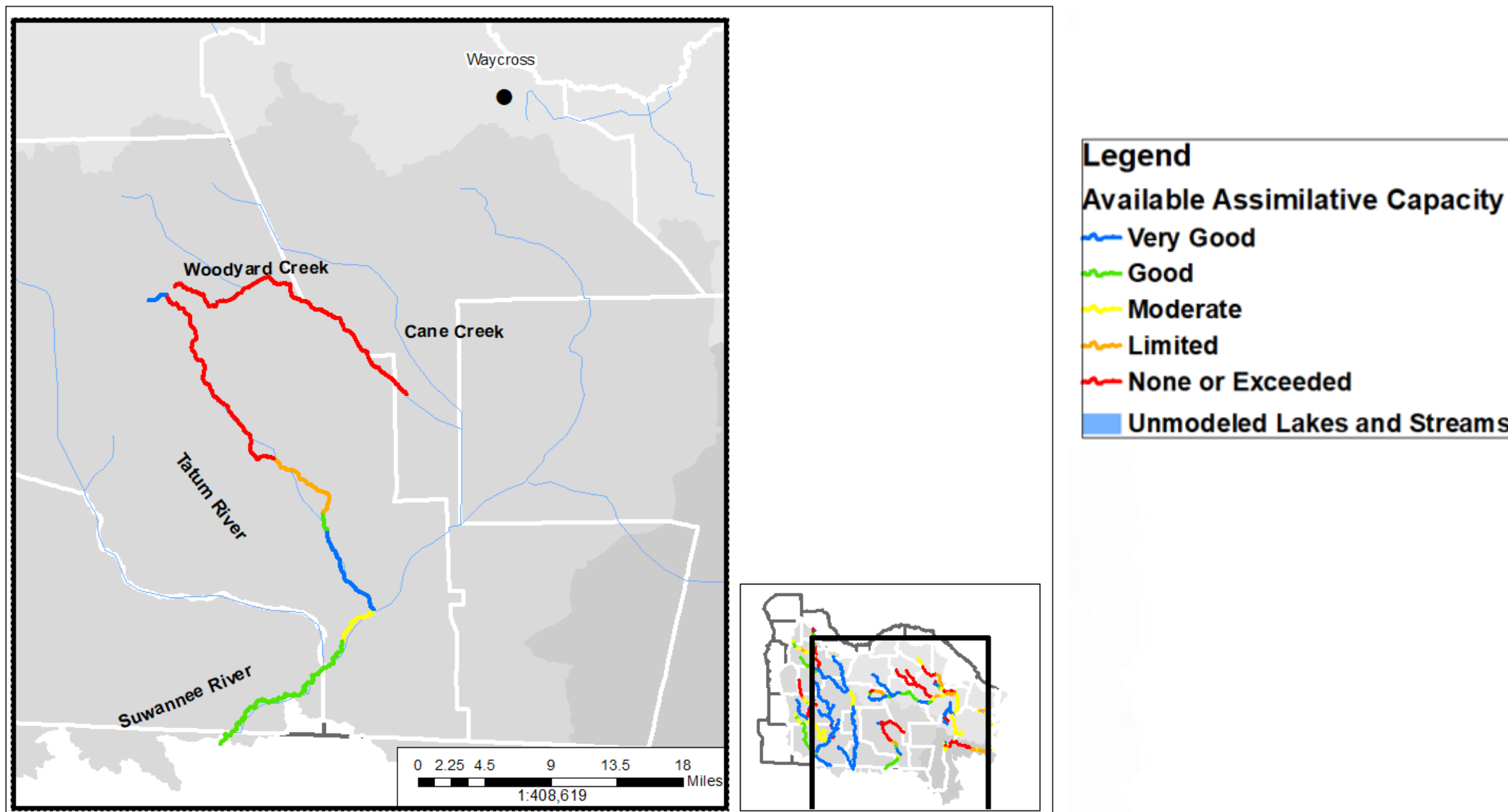


# Current DO Conditions: Western Suwannee Basin

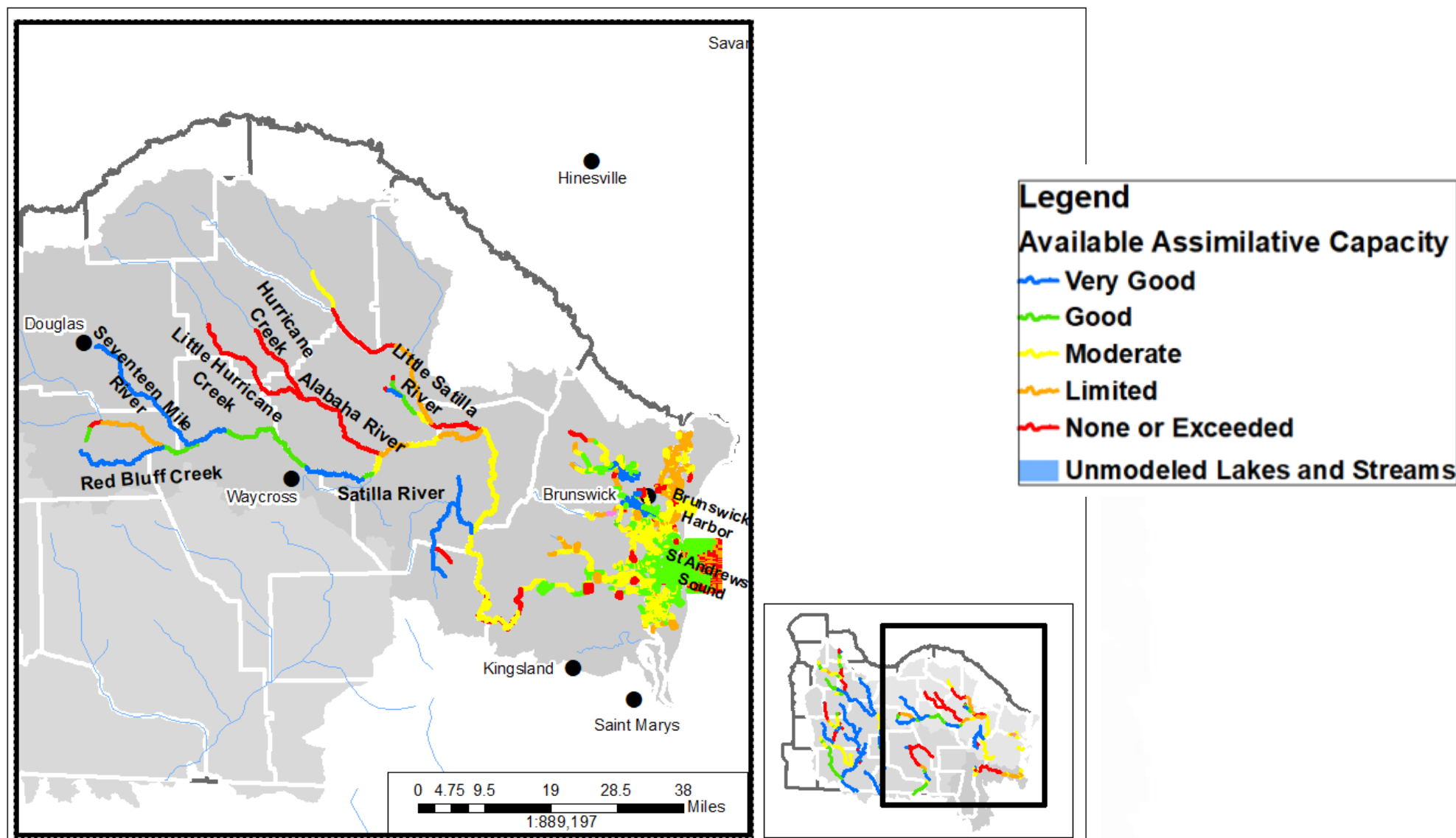




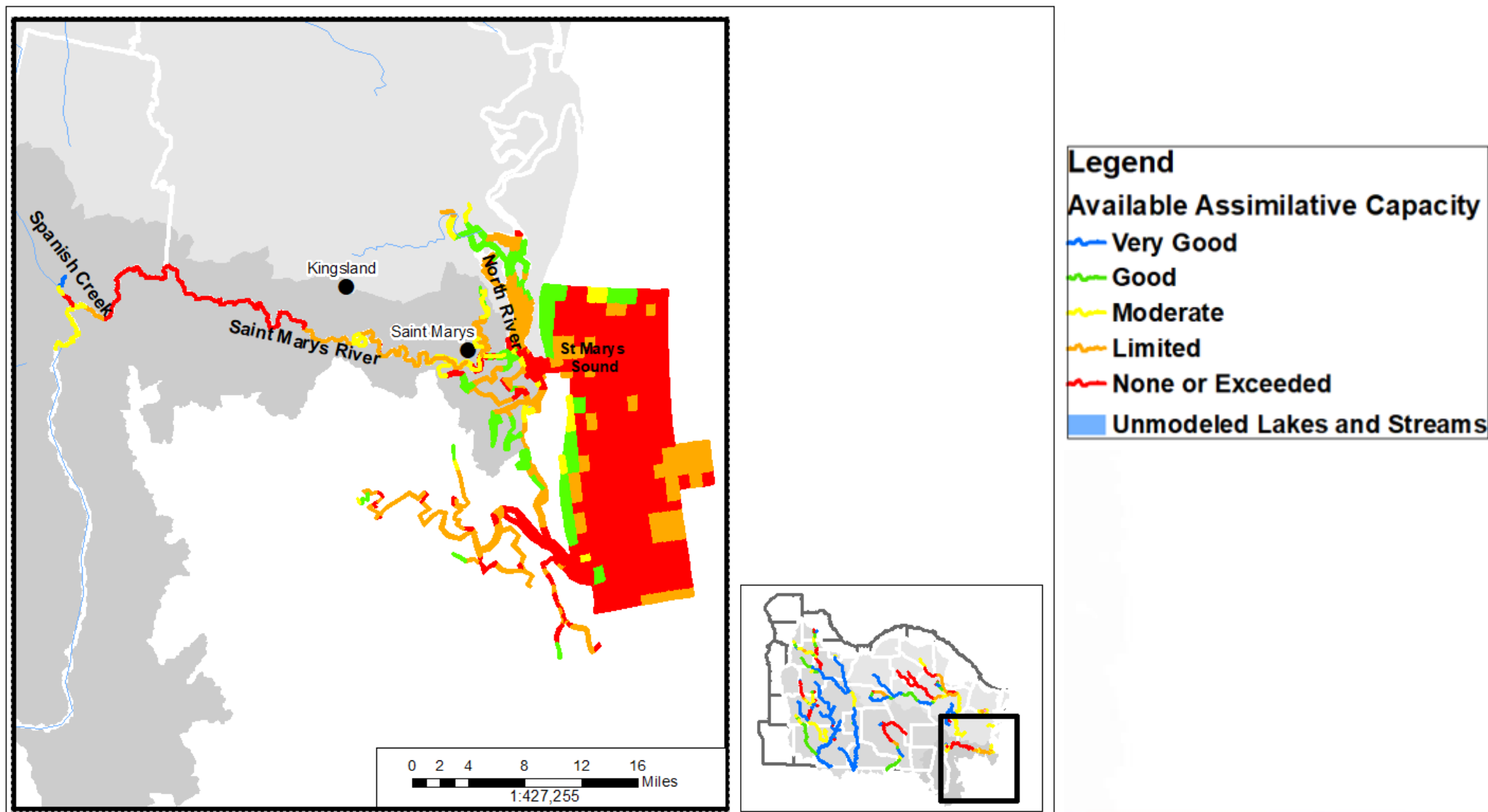
# Current DO Conditions: Eastern Suwannee Basin



# Current DO Conditions: Satilla Basin



# Current DO Conditions: St. Marys Basin



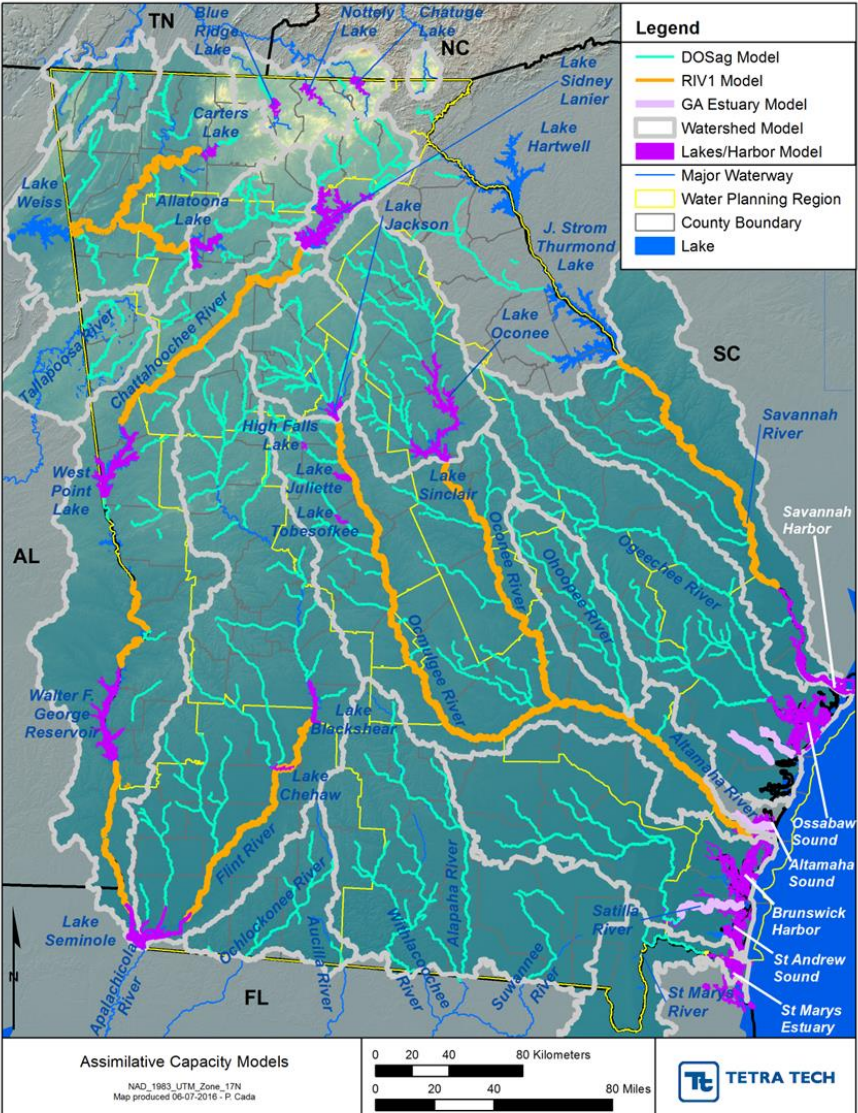


# Heat Maps (Watershed Models)

- Land use & runoff
- Meteorological information
- Dischargers at permit limits
- Heat Maps
  - Loadings – by subbasin – under representative wet and dry years
  - Biochemical Oxygen Demand (BOD)
  - Total Nitrogen
  - Total Phosphorus

GEORGIA WATER PLANNING

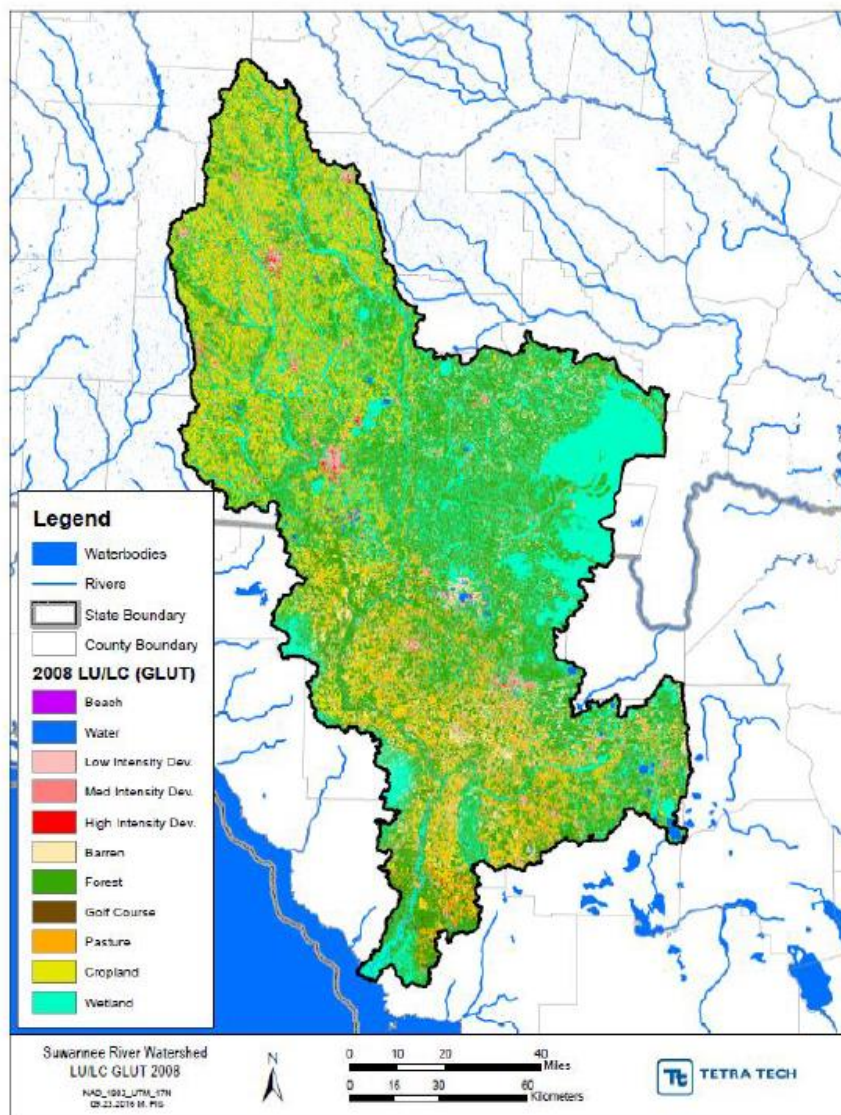
- **Total Nitrogen**
- **Total Phosphorus**



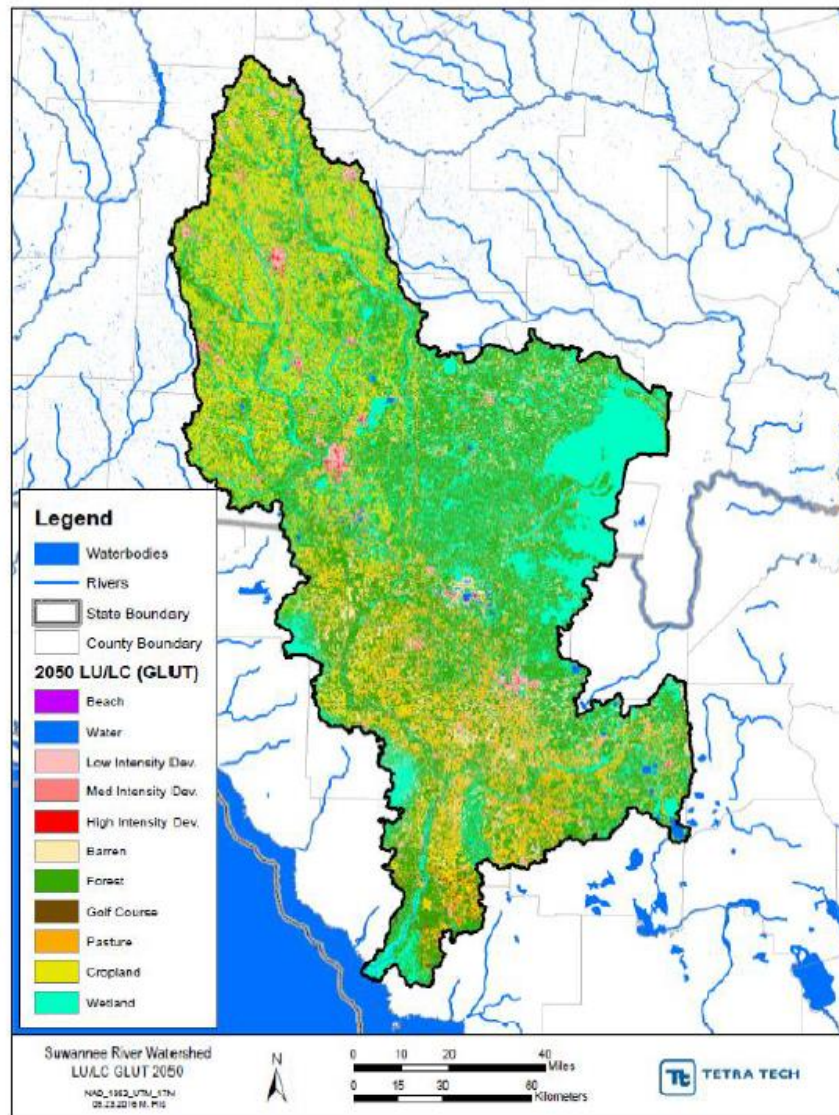


# Land Use Changes: Suwannee Basin

Suwannee Basin Landuse (2008)



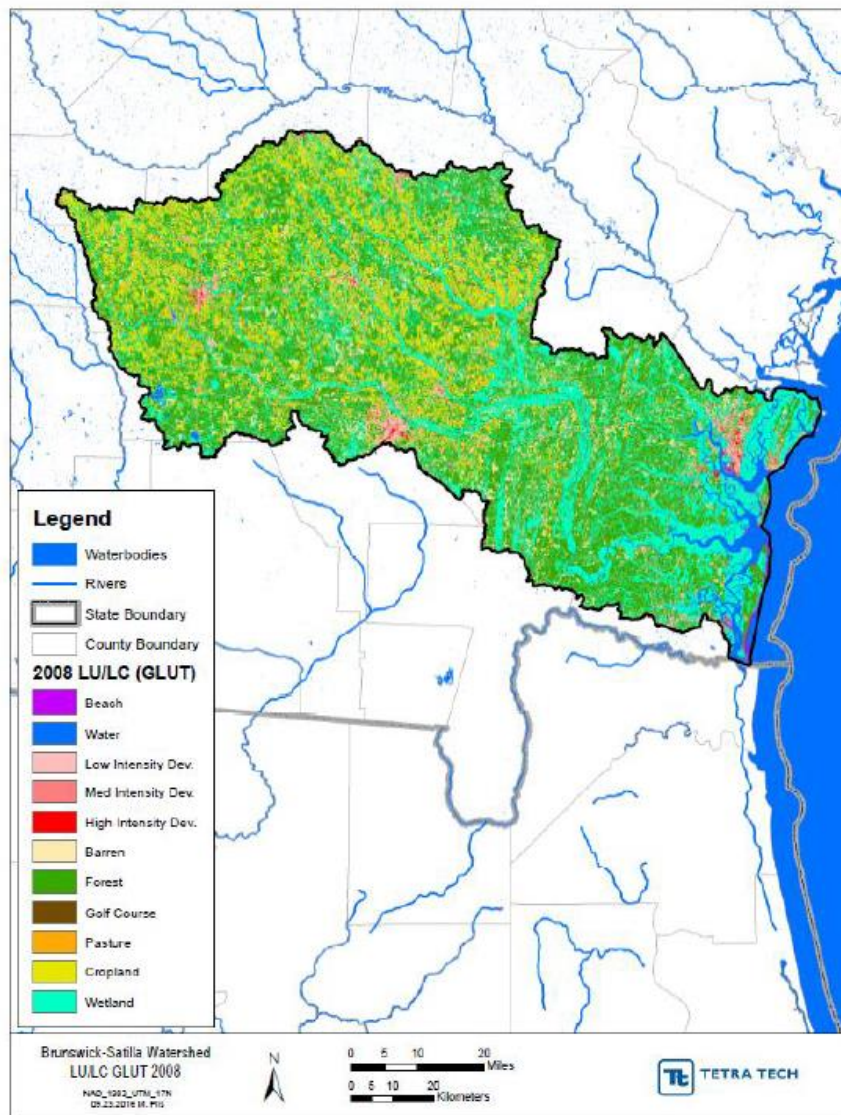
Suwannee Basin Landuse (2050)



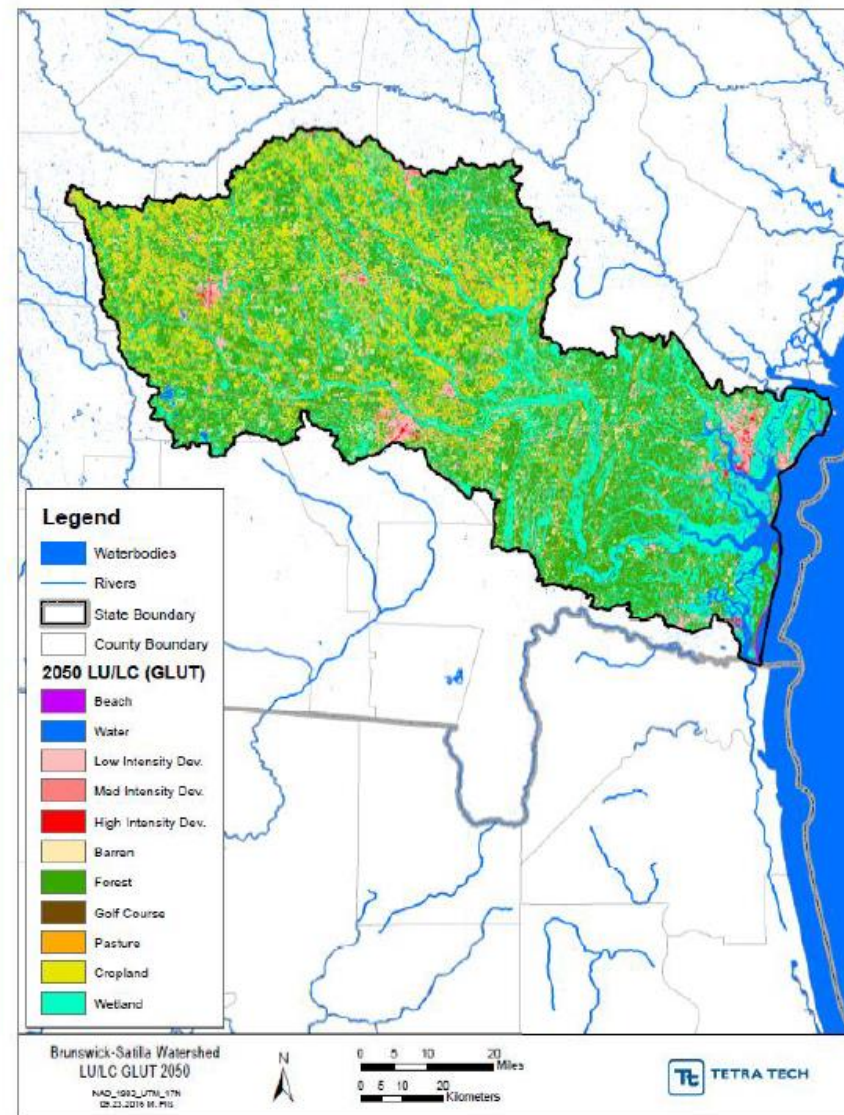


# Land Use Changes: Satilla Basin

Satilla Basin Landuse (2008)



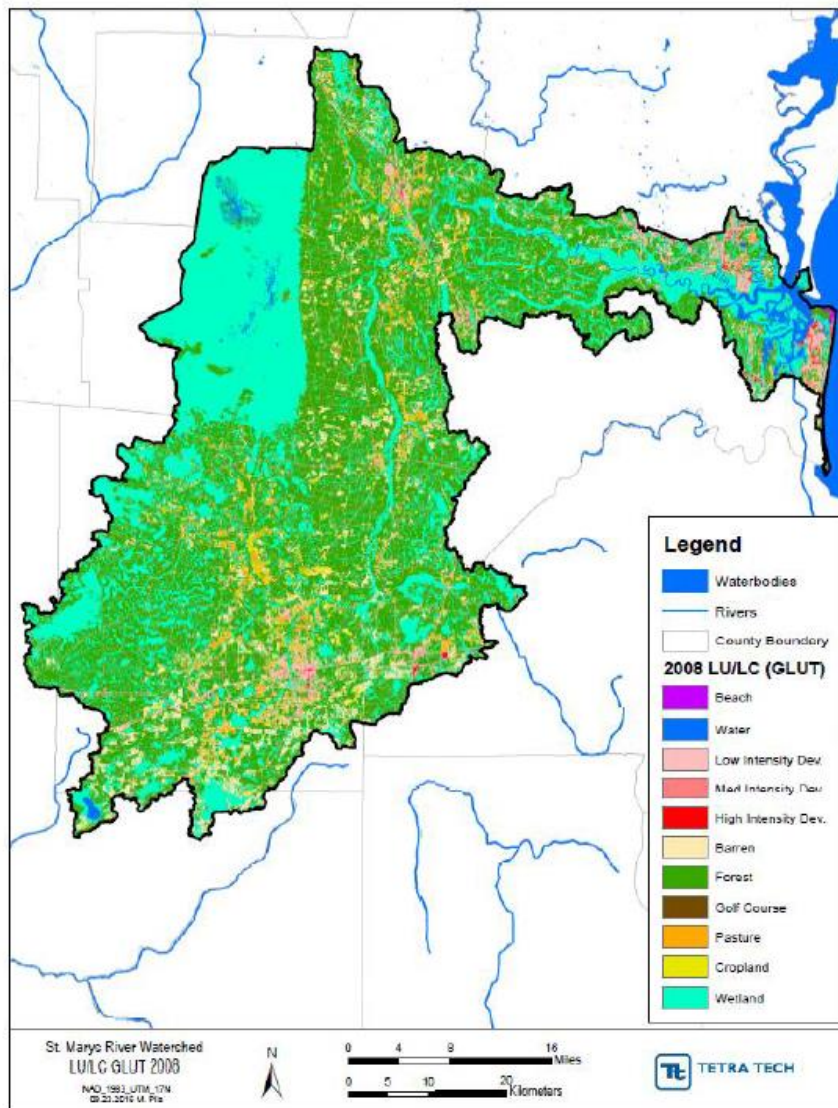
Satilla Basin Landuse (2050)



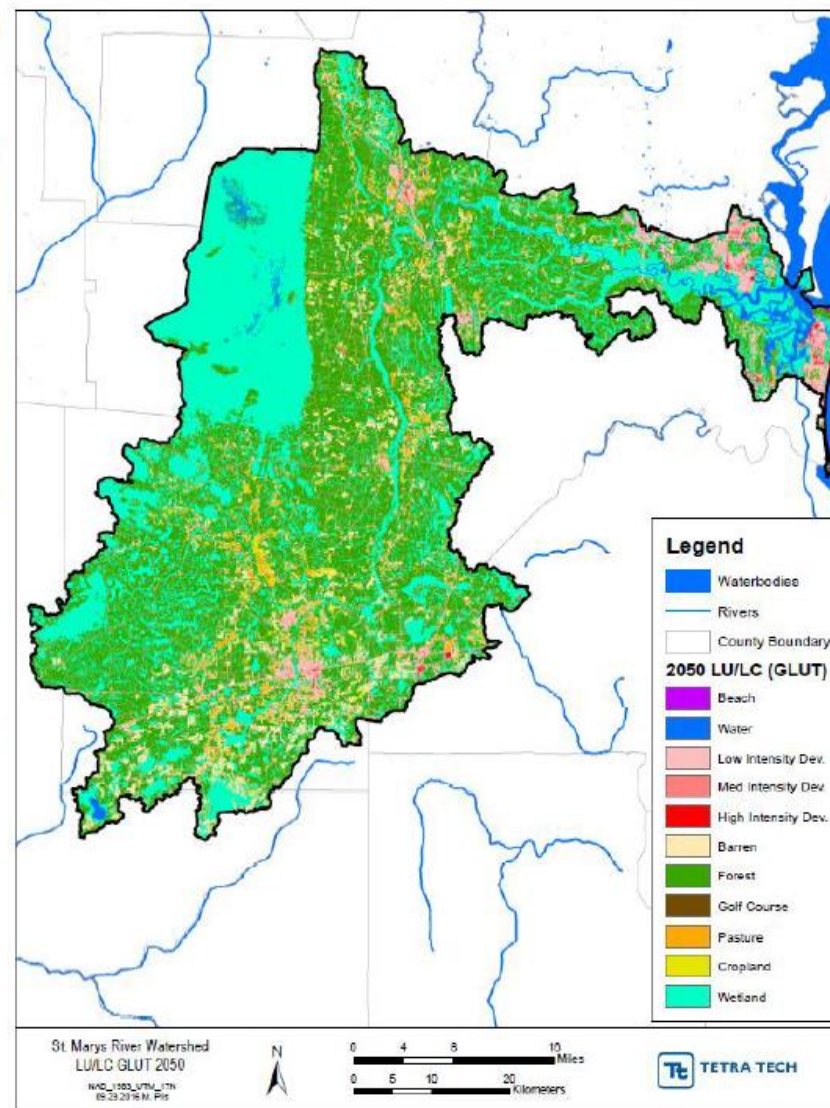


# Land Use Changes: St. Marys Basin

St. Marys Basin Landuse (2008)



St. Marys Basin Landuse (2050)



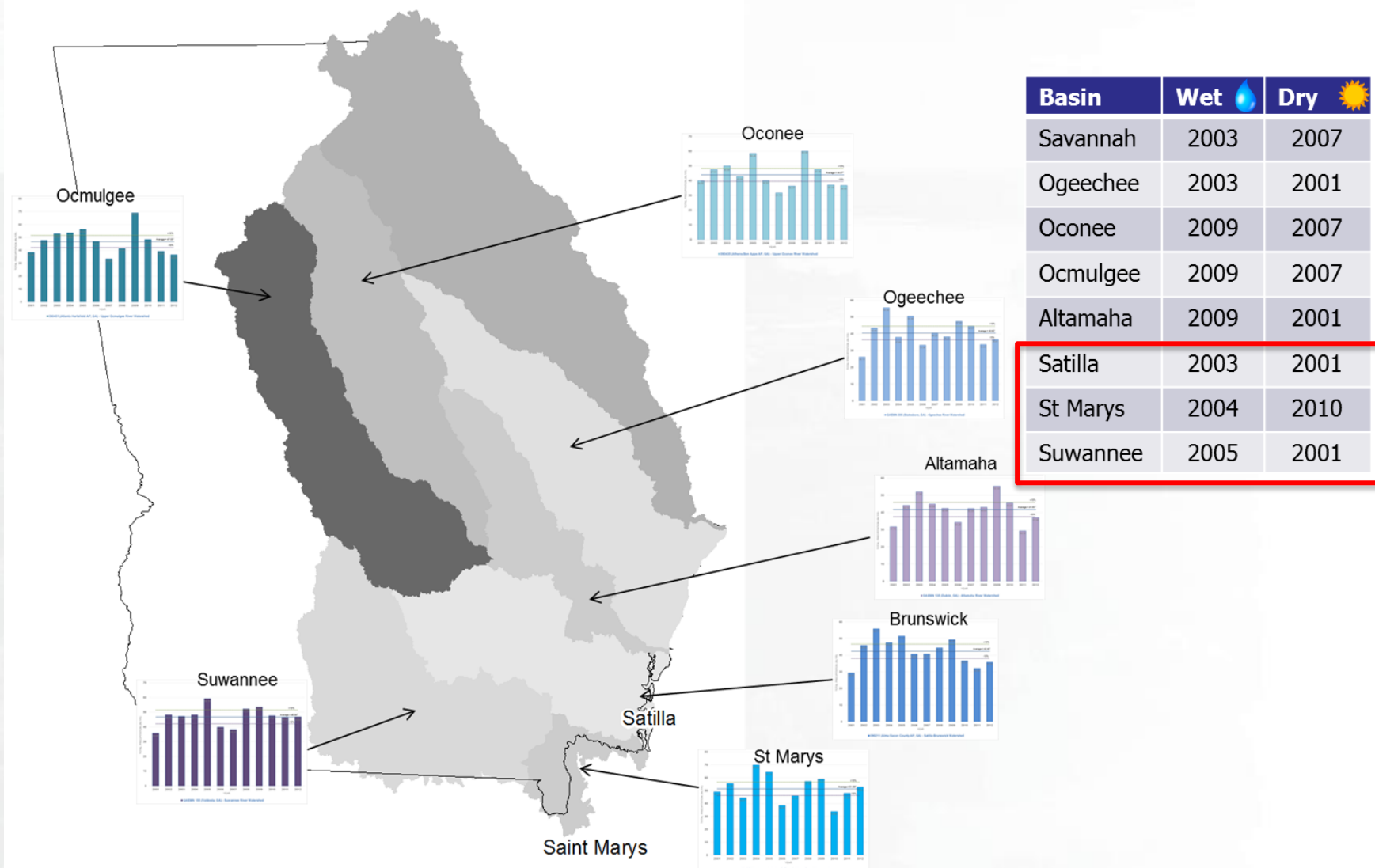
# Land Use Changes Summary

Changes in Landuse between 2008 and 2050

Landuse	Suwannee		Satilla		St Marys		Total	
	2008	2050	2008	2050	2008	2050	2008	2050
Beaches/Dunes/Mud	0.12%	0.11%	0.39%	0.37%	0.17%	0.16%	0.20%	0.18%
Open Water	0.92%	0.89%	0.78%	0.76%	1.66%	1.64%	0.96%	0.93%
Utility Swaths	0.17%	0.17%	0.27%	0.25%	0.06%	0.06%	0.19%	0.18%
Developed, Open Space	4.32%	5.00%	4.19%	5.15%	4.41%	5.35%	4.29%	5.08%
Developed, Low Intensity	1.38%	1.55%	1.64%	1.89%	1.32%	1.49%	1.45%	1.63%
Developed, Medium Intensity	0.14%	0.17%	0.18%	0.25%	0.16%	0.18%	0.15%	0.19%
Developed, High Intensity	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%	0.01%	0.02%
Clearcut/Sparse	6.57%	6.53%	6.10%	5.98%	7.81%	7.63%	6.57%	6.50%
Quarries/Strip Mines	0.10%	0.10%	0.02%	0.02%	0.01%	0.01%	0.07%	0.07%
Rock Outcrop	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Deciduous Forest	6.06%	5.92%	5.37%	5.21%	4.96%	4.85%	5.77%	5.62%
Evergreen Forest	27.57%	27.23%	32.77%	32.20%	39.70%	39.16%	30.19%	29.77%
Mixed Forest	5.65%	5.54%	1.97%	1.93%	1.54%	1.49%	4.26%	4.17%
Golf Courses	0.37%	0.37%	0.02%	0.02%	0.01%	0.01%	0.24%	0.24%
Pasture	5.80%	5.54%	1.98%	1.85%	1.53%	1.42%	4.35%	4.14%
Row Crop	12.73%	11.33%	12.61%	11.48%	1.62%	1.46%	11.56%	10.36%
Irrigated Row Crop	3.80%	5.31%	3.08%	4.05%	0.00%	0.05%	3.22%	4.44%
Forested Wetland	22.28%	22.15%	21.93%	21.73%	30.87%	30.78%	23.07%	22.93%
Non-forested Salt/Brackish Wetland	0.00%	0.00%	0.00%	4.54%	1.81%	1.80%	0.19%	1.38%
Non-forested Freshwater Wetland	1.16%	1.15%	5.32%	0.76%	1.53%	1.52%	2.29%	1.09%
Developed, Low Intensity (Impervious)	0.40%	0.43%	0.47%	0.53%	0.37%	0.42%	0.41%	0.46%
Developed, Medium Intensity (Impervious)	0.19%	0.22%	0.29%	0.34%	0.20%	0.23%	0.22%	0.25%
Developed, High Intensity (Impervious)	0.20%	0.21%	0.29%	0.30%	0.17%	0.19%	0.22%	0.23%
All Other Impervious	0.00%	0.01%	0.00%	0.02%	0.00%	0.01%	0.00%	0.01%
Landuse Application Systems	0.04%	0.04%	0.26%	0.26%	0.05%	0.05%	0.10%	0.10%
Failed Septic Systems	0.03%	0.04%	0.06%	0.09%	0.02%	0.02%	0.04%	0.05%



# Watershed Models: Wet & Dry Years



# Watershed Model Heat Maps

- Current Conditions
  - 2014 permit conditions
  - Calibrated to temperature, salinity and DO data collected from 2001 through 2012
- Future Conditions
  - 2050 forecasted permit conditions (2017 Plan)

## Nutrient Modeling

In addition to Assimilative Capacity modeling for DO, EPD completed nutrient (total nitrogen and total phosphorous) modeling for the watersheds in the Suwannee–Satilla region. The location of the watershed model boundaries, and harbors and estuaries model locations are shown in Figure 3-5. There are currently no nutrient standards for total nitrogen and total phosphorus, but these standards may be developed within this region following a public stakeholder process(es). The watershed models evaluate point and non-point source nutrient loadings of total phosphorus and total nitrogen to the Brunswick Harbor and to the state line. The Suwannee-Satilla Council proactively identified several non-point source best management practices (BMPs) that can be used to help reduce nutrient loading as discussed in Section 6.

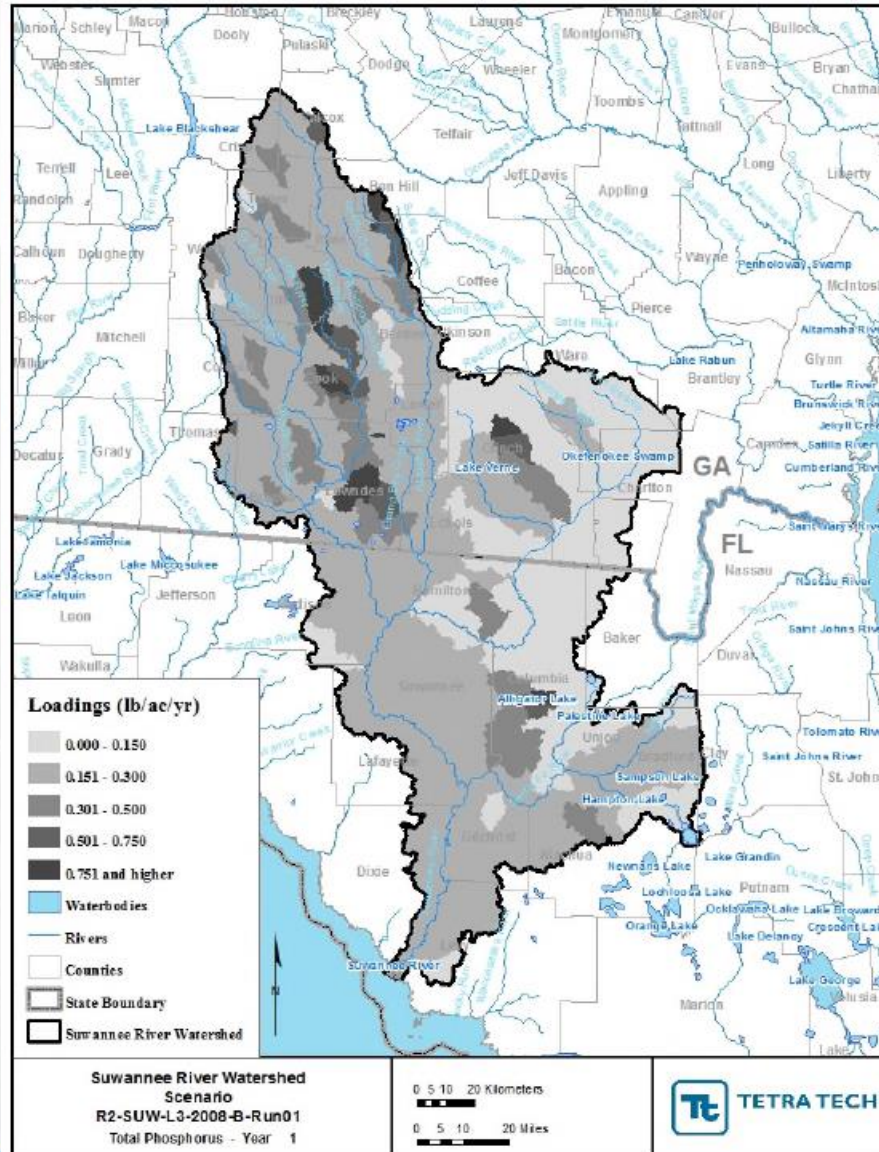
## Section 3.2.1



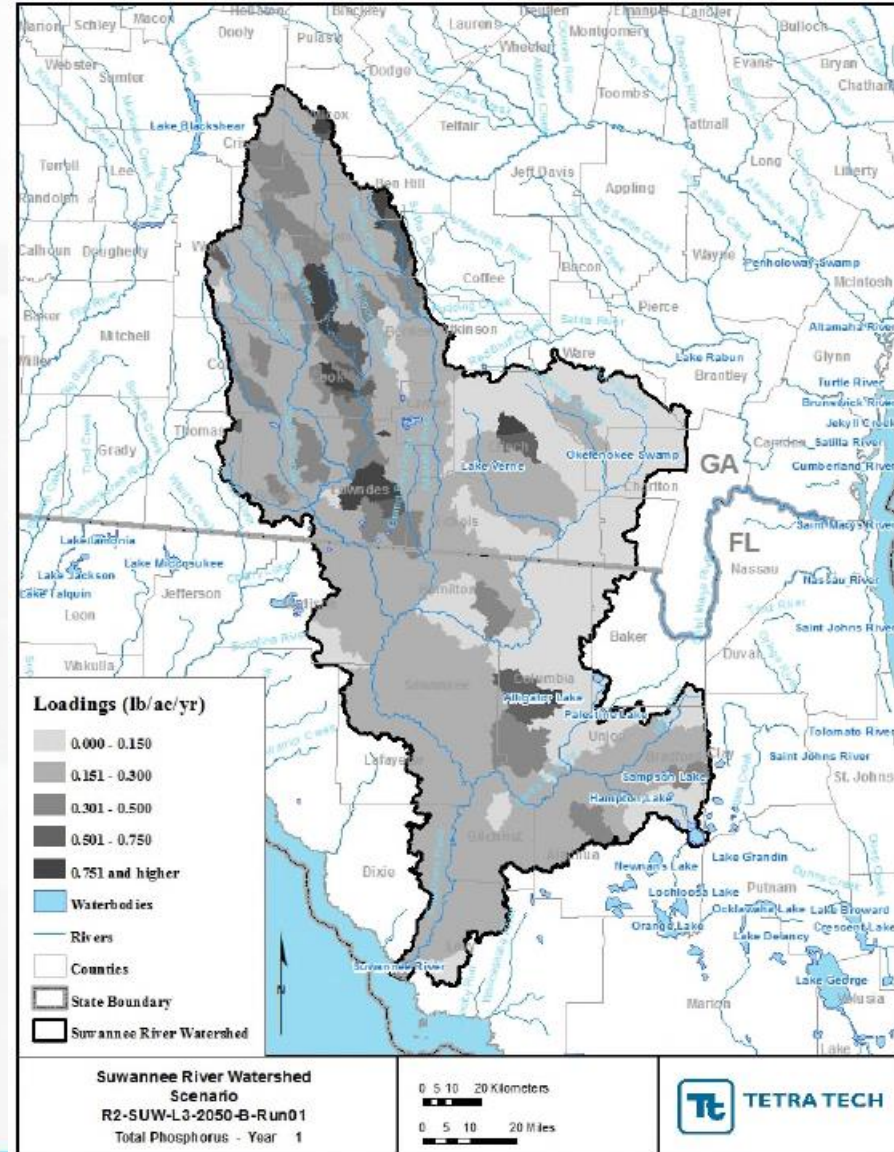
# Total P in Suwannee Basin (Dry Year)



CURRENT

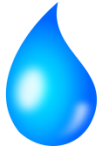


FUTURE

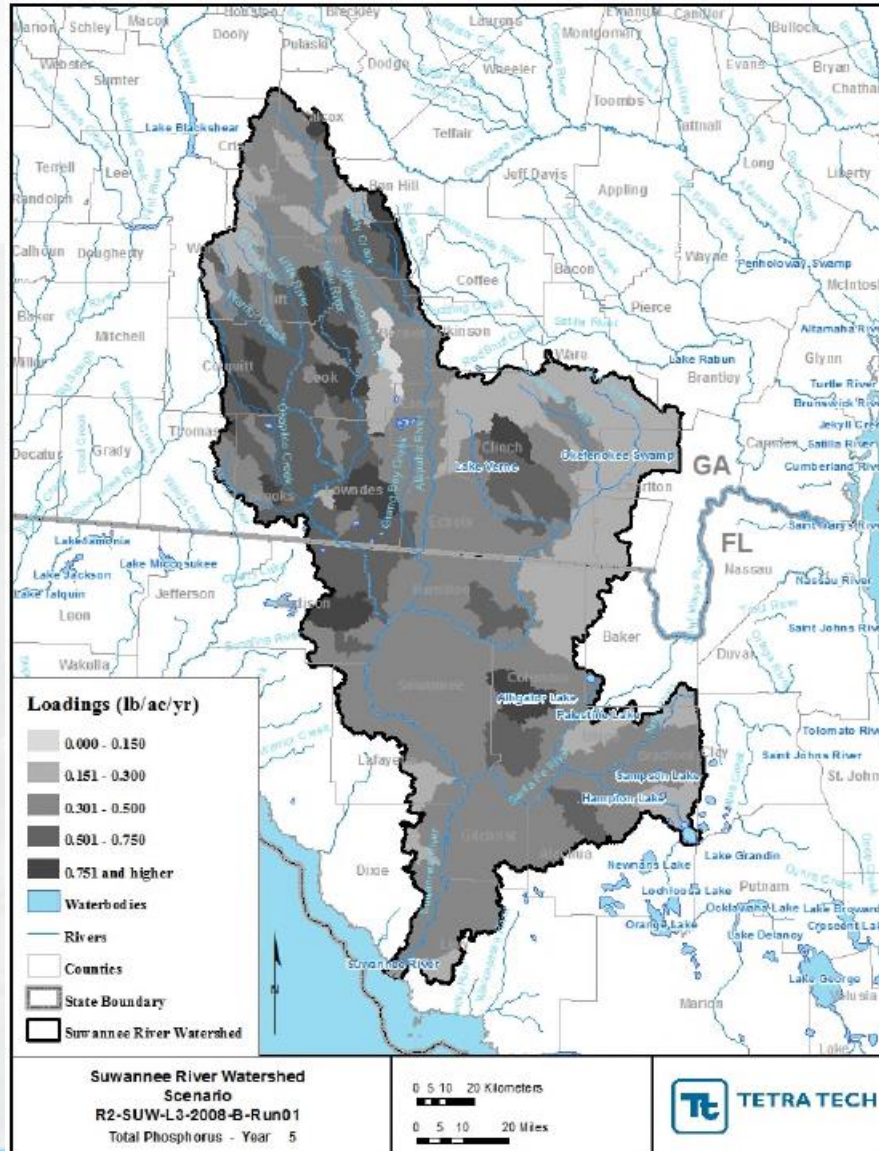




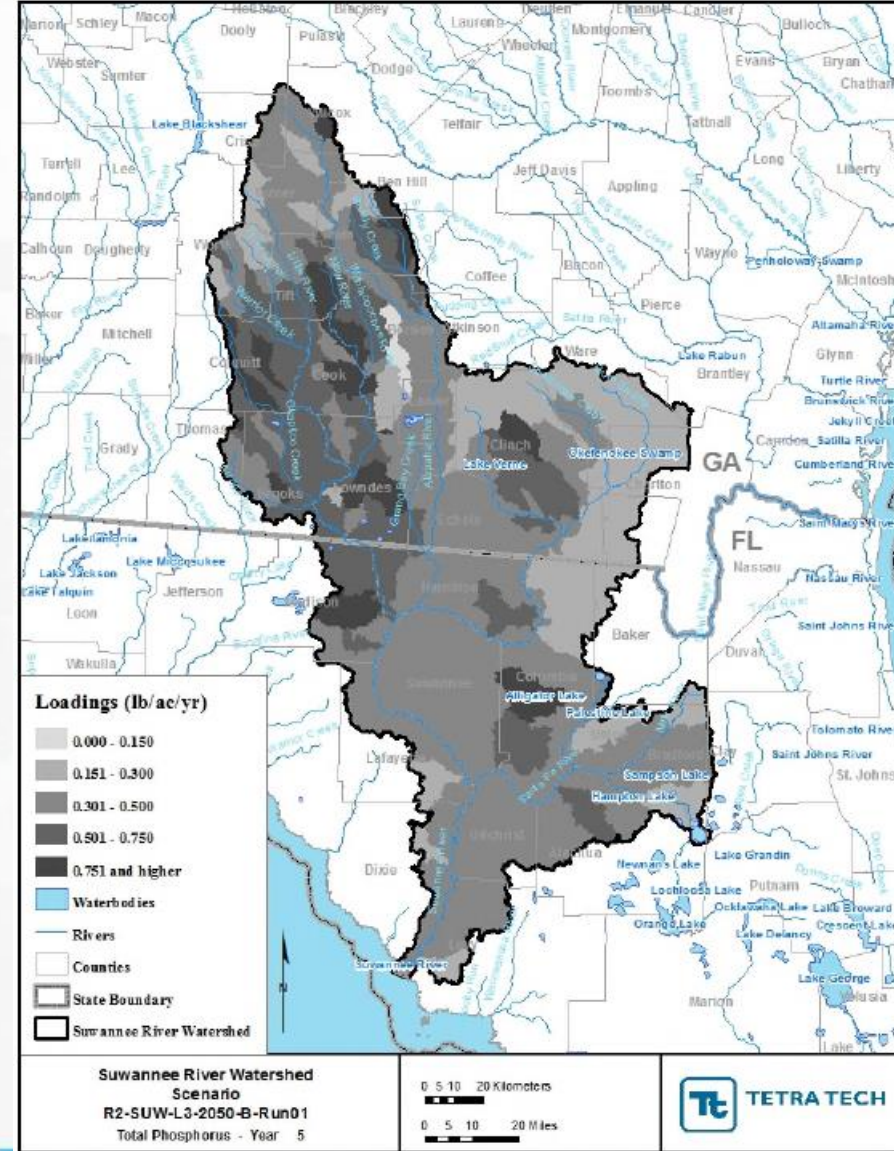
# Total P in Suwannee Basin (Wet Year)



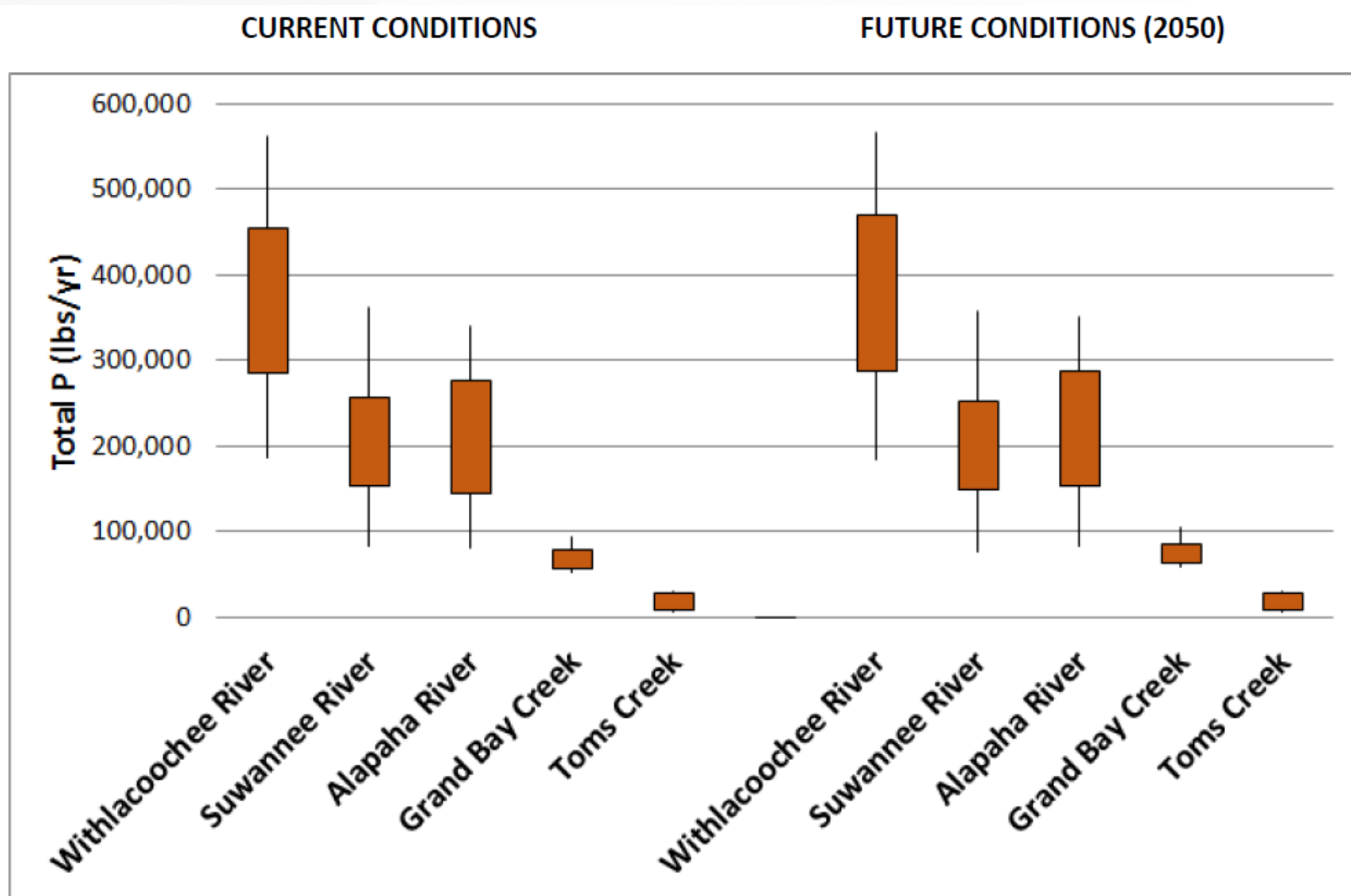
CURRENT



FUTURE



# Modeled State Line Total P Loads

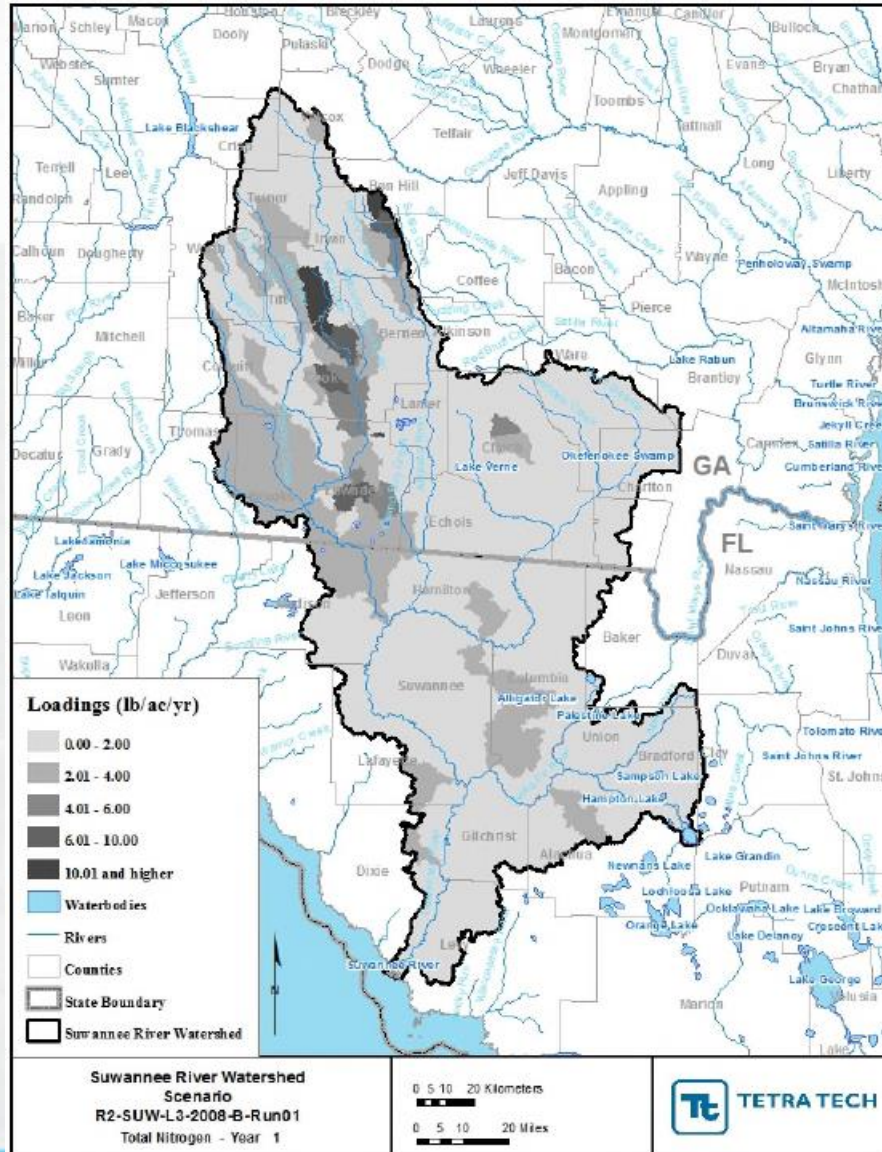




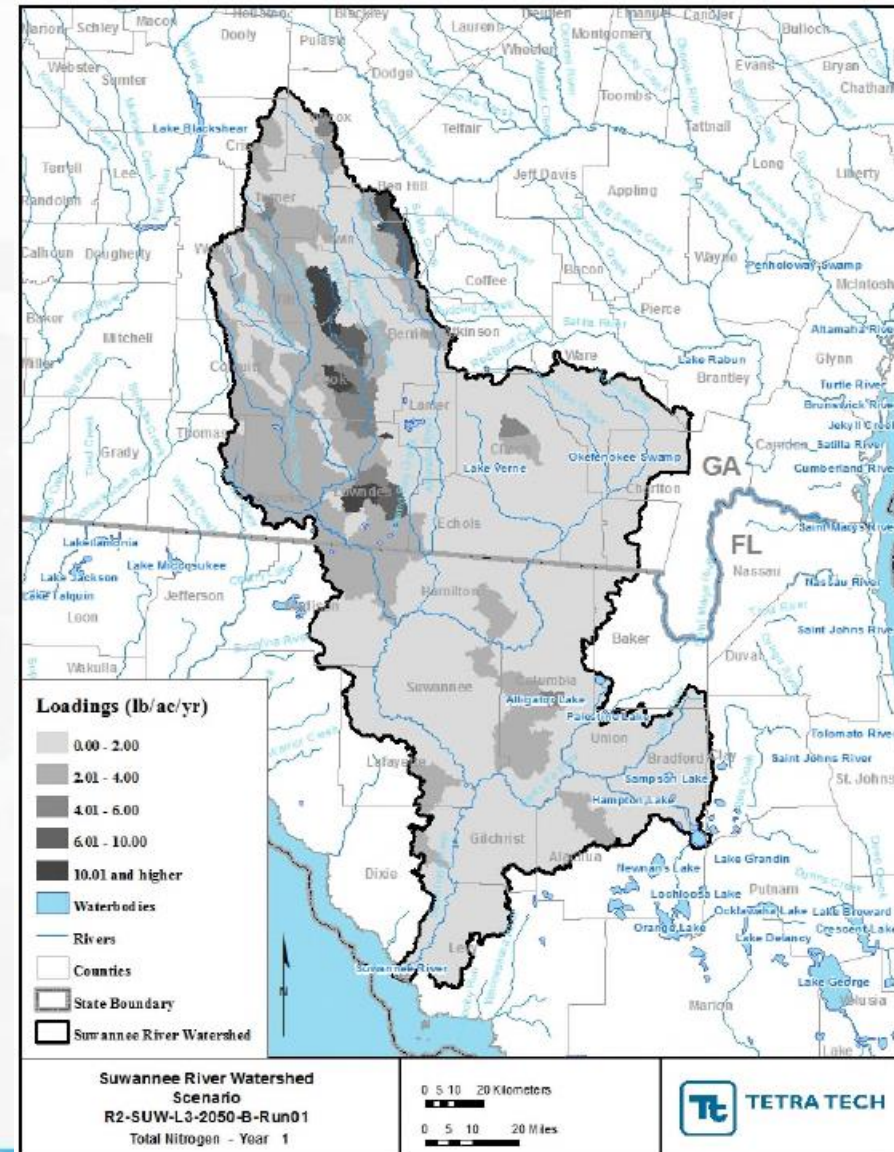
# Total N in Suwannee Basin (Dry Year)



CURRENT

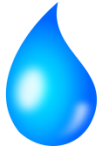


FUTURE

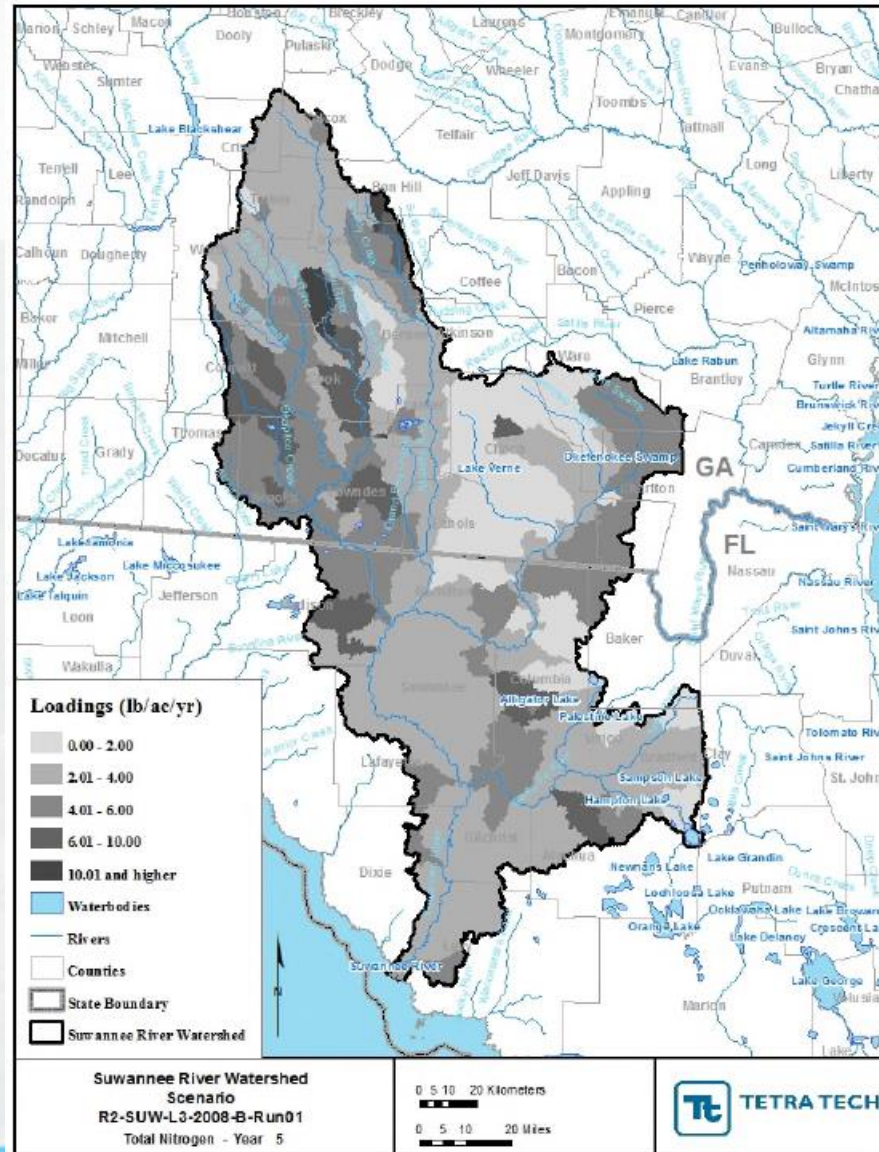




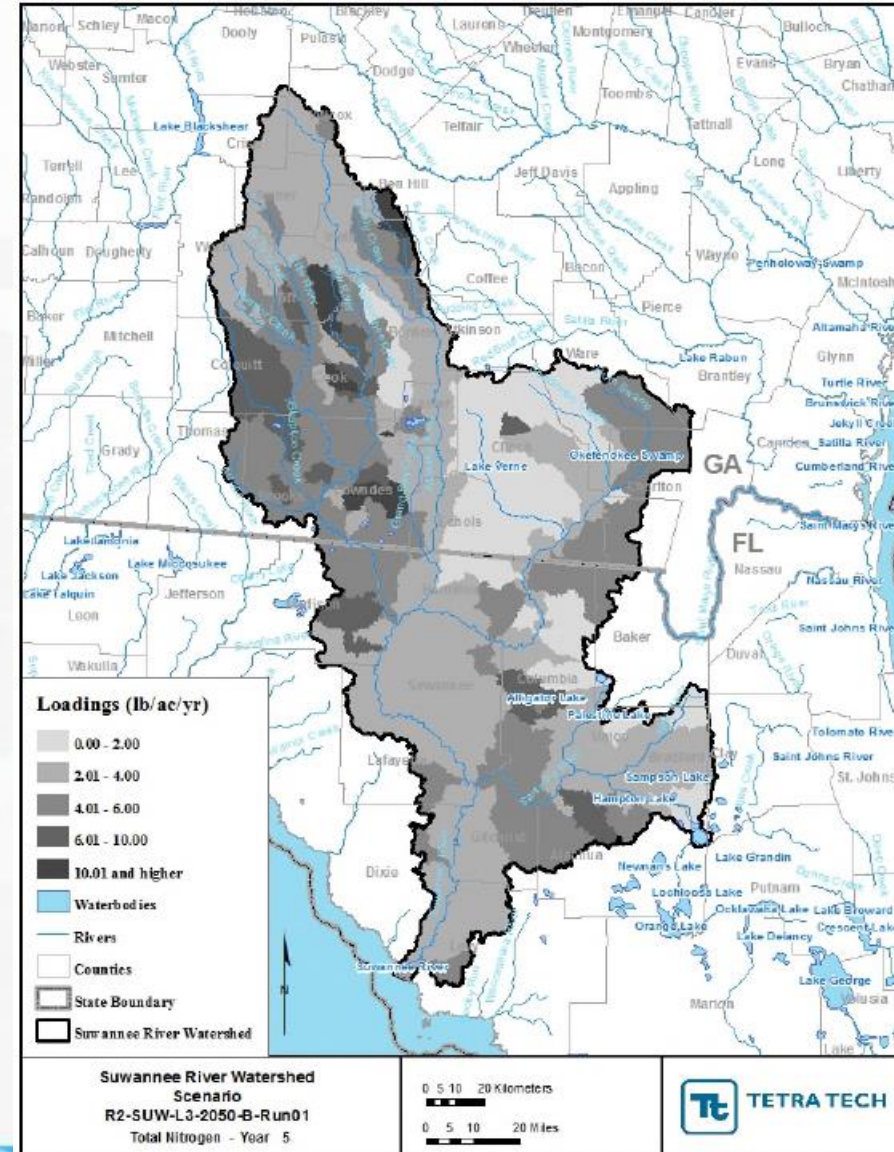
# Total N in Suwannee Basin (Wet Year)



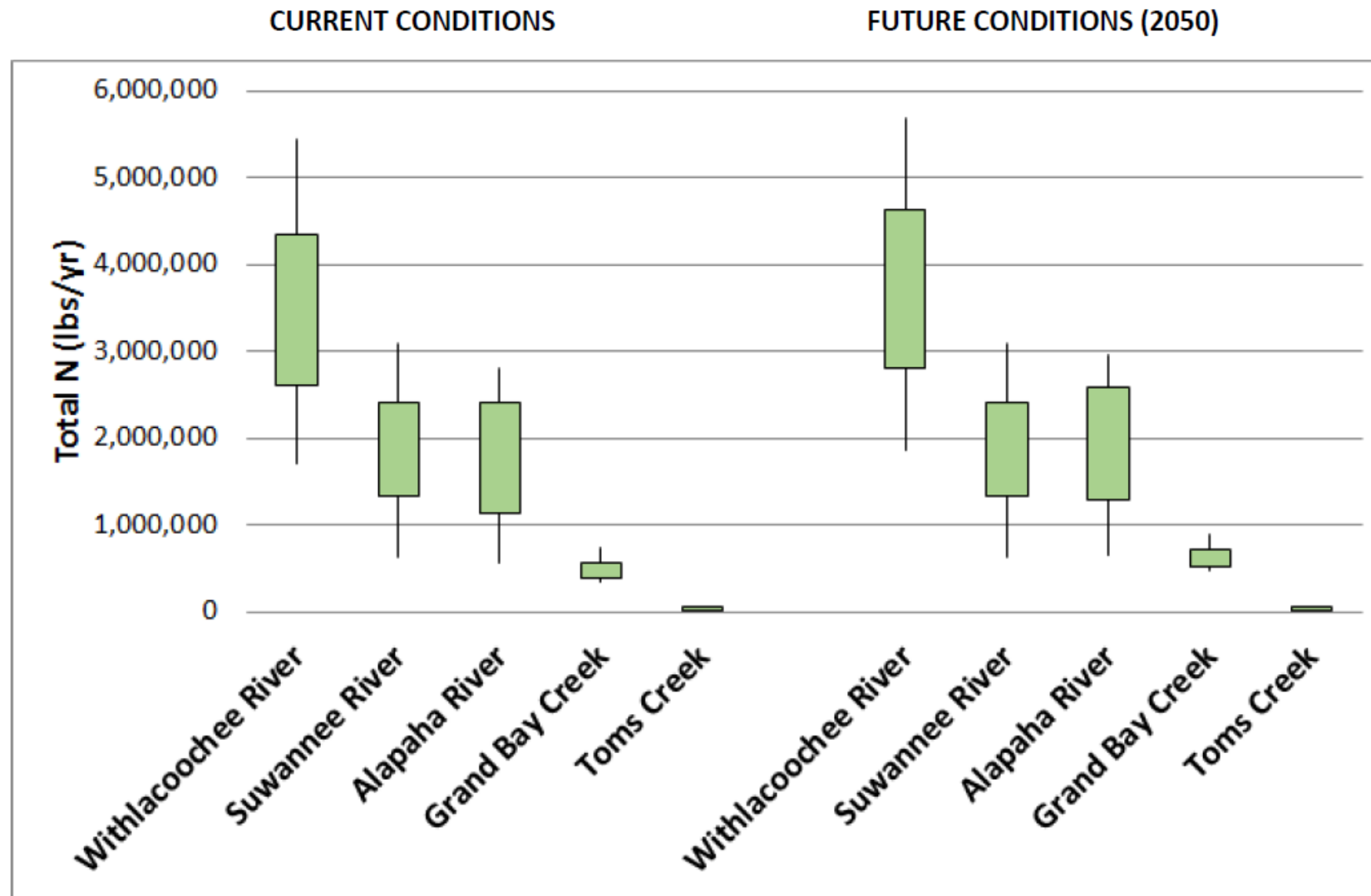
CURRENT



FUTURE



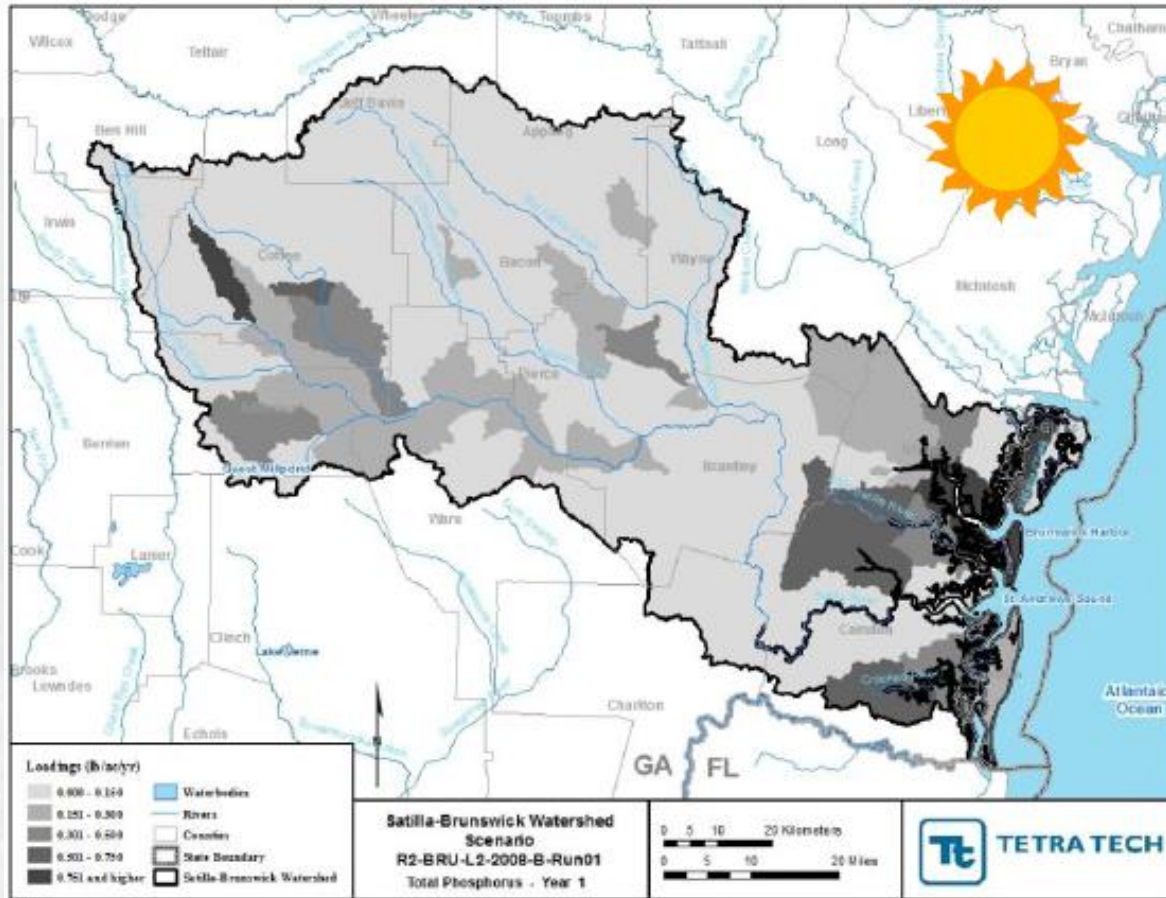
# Modeled State Line Total N Loads



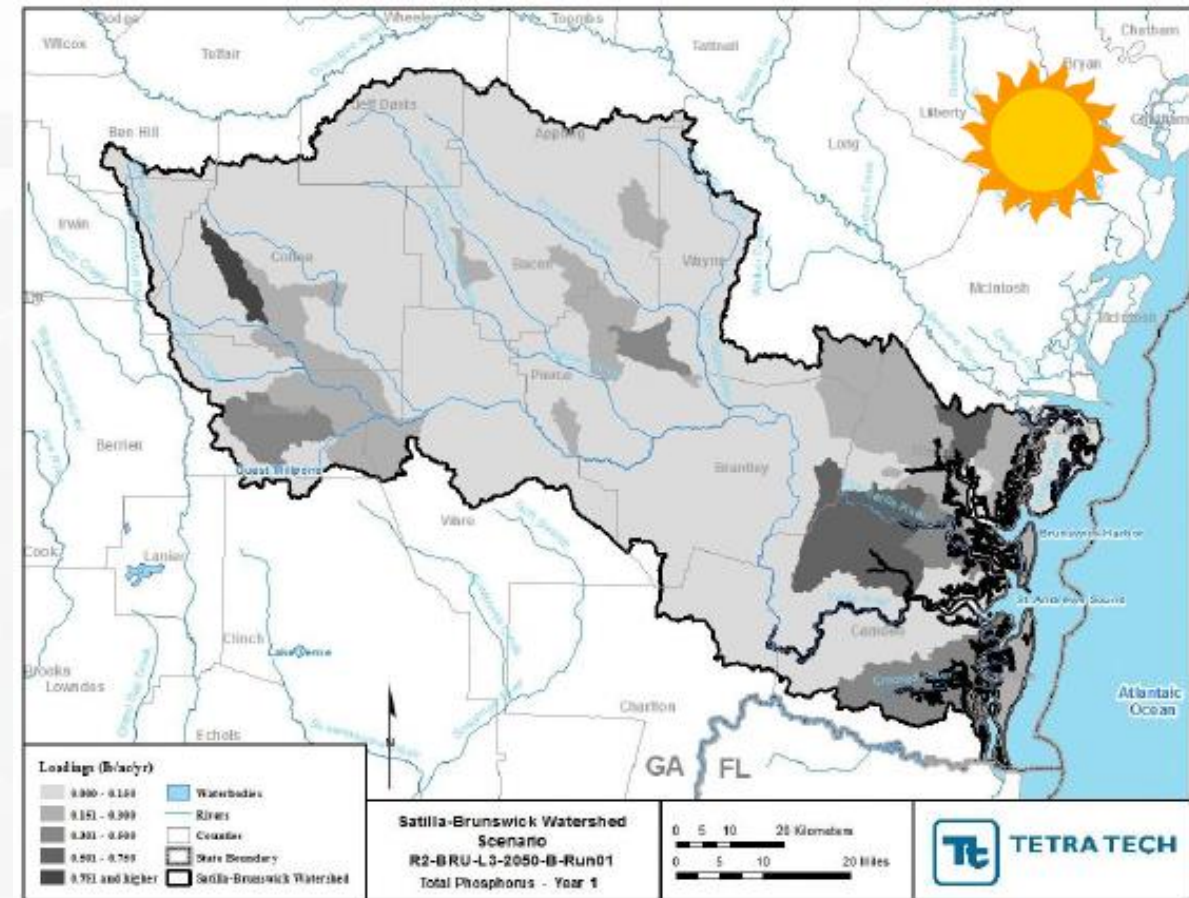


# Total P in Satilla Basin (Dry Year)

CURRENT

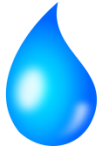


FUTURE



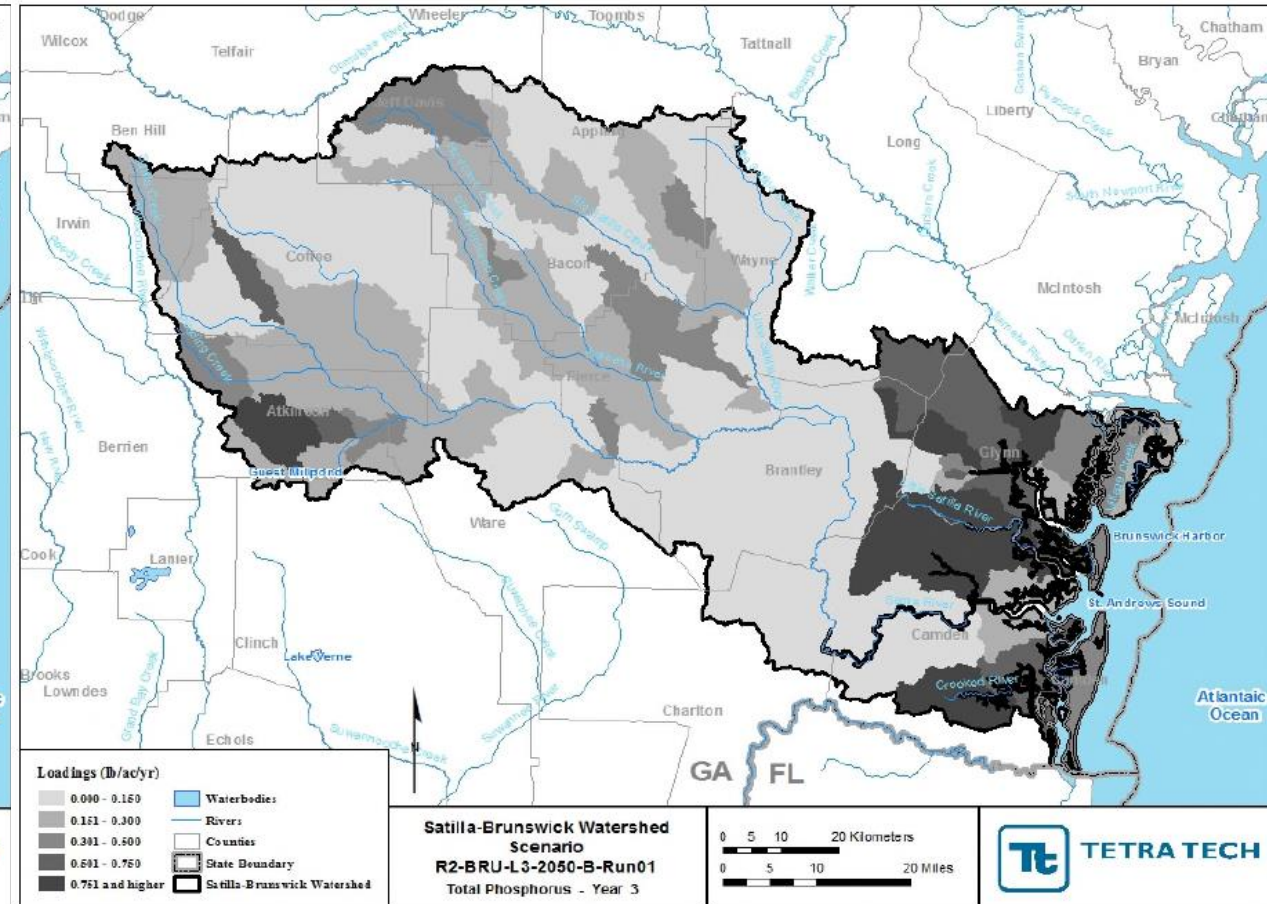
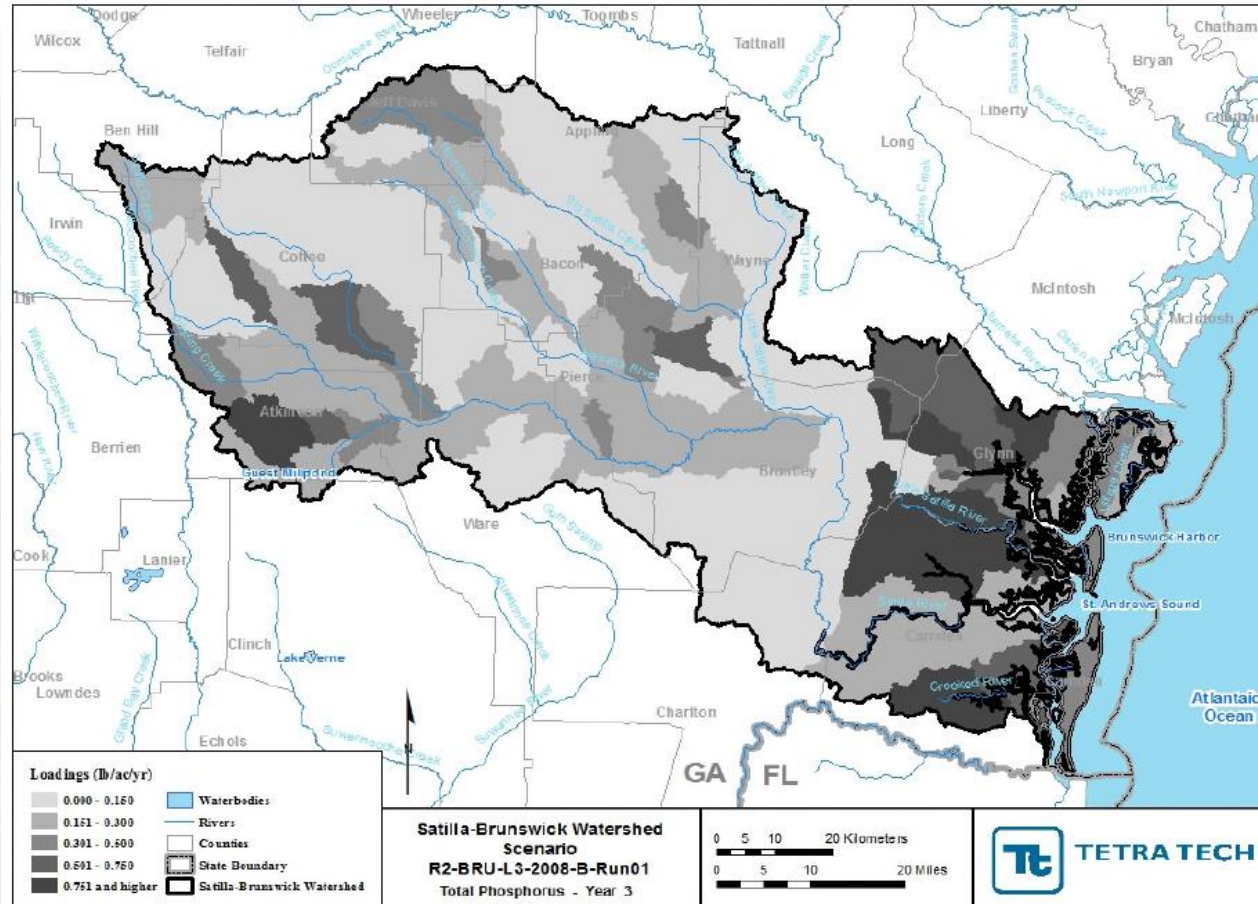


# Total P in Satilla Basin (Wet Year)



**CURRENT**

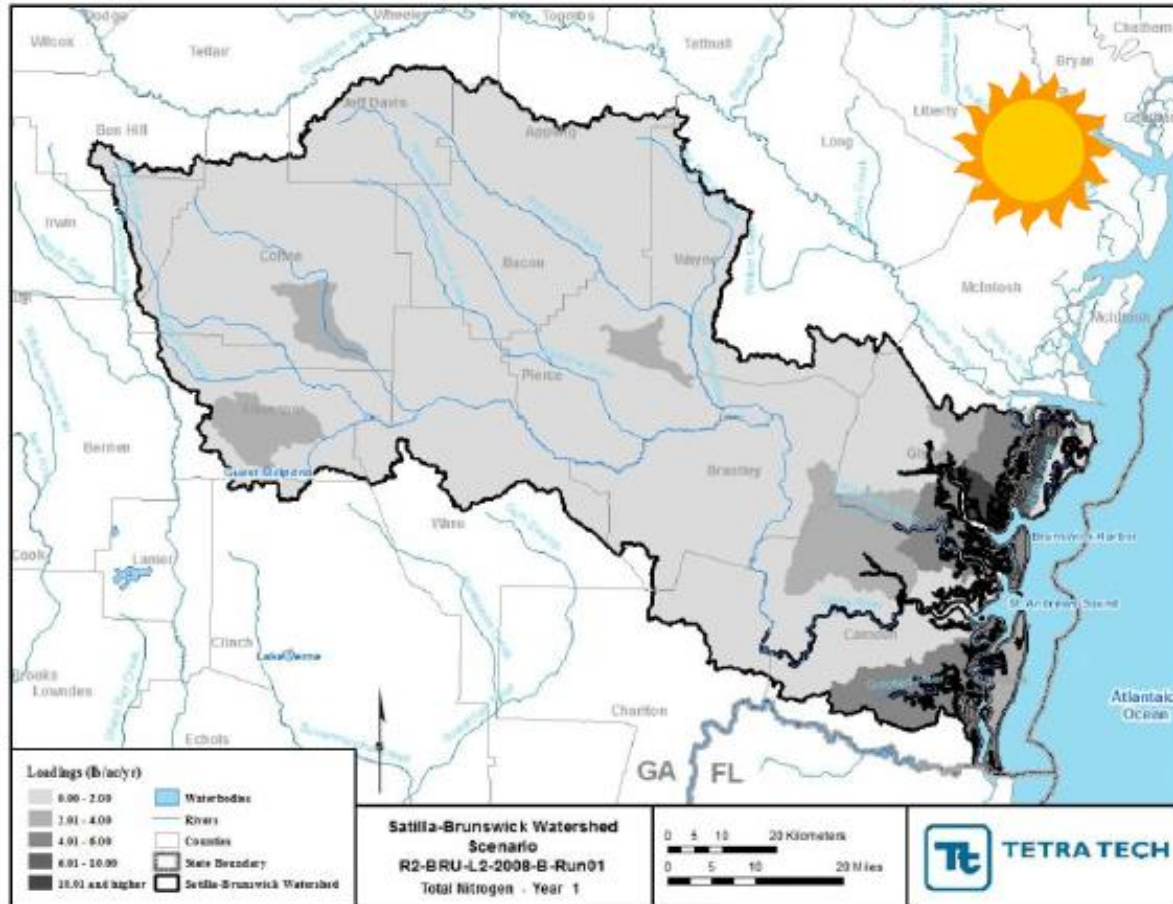
**FUTURE**



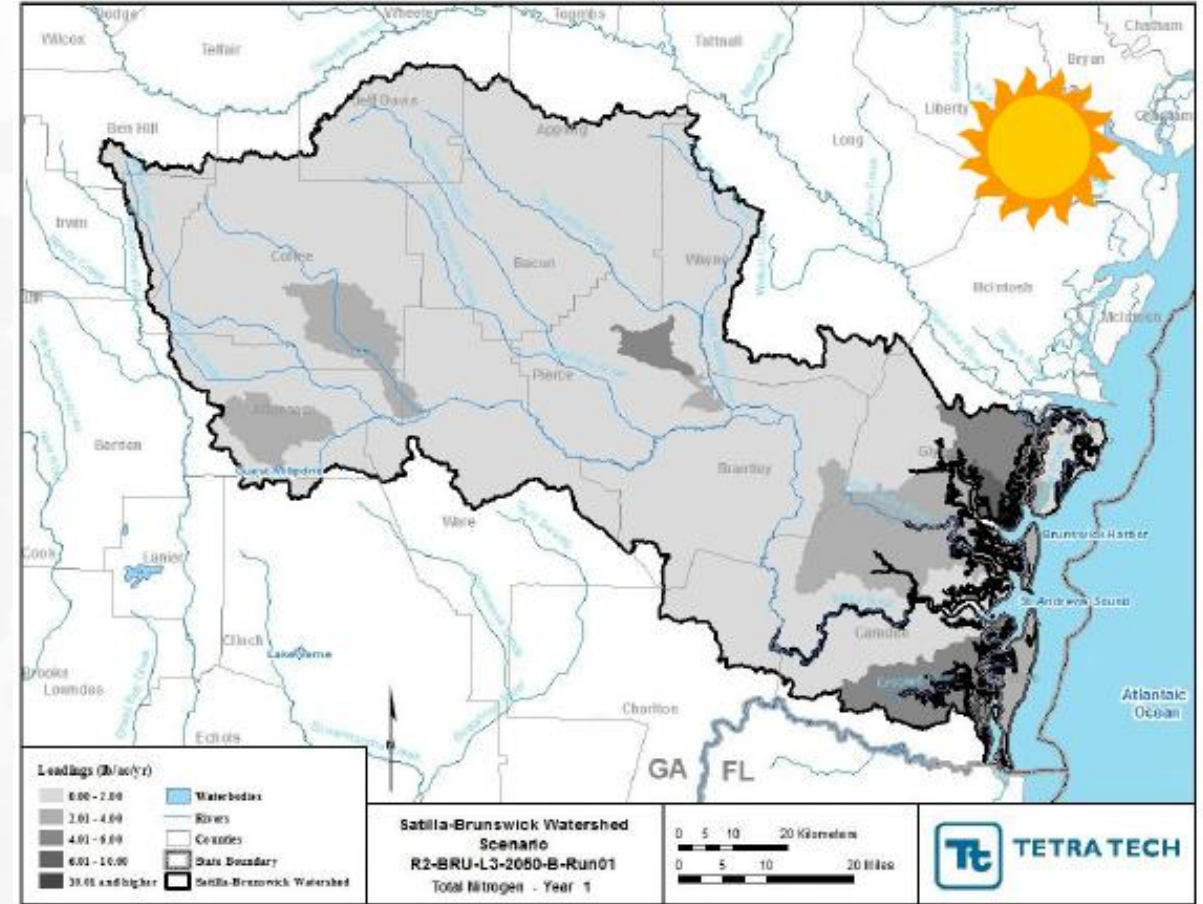


# Total N in Satilla Basin (Dry Year)

CURRENT



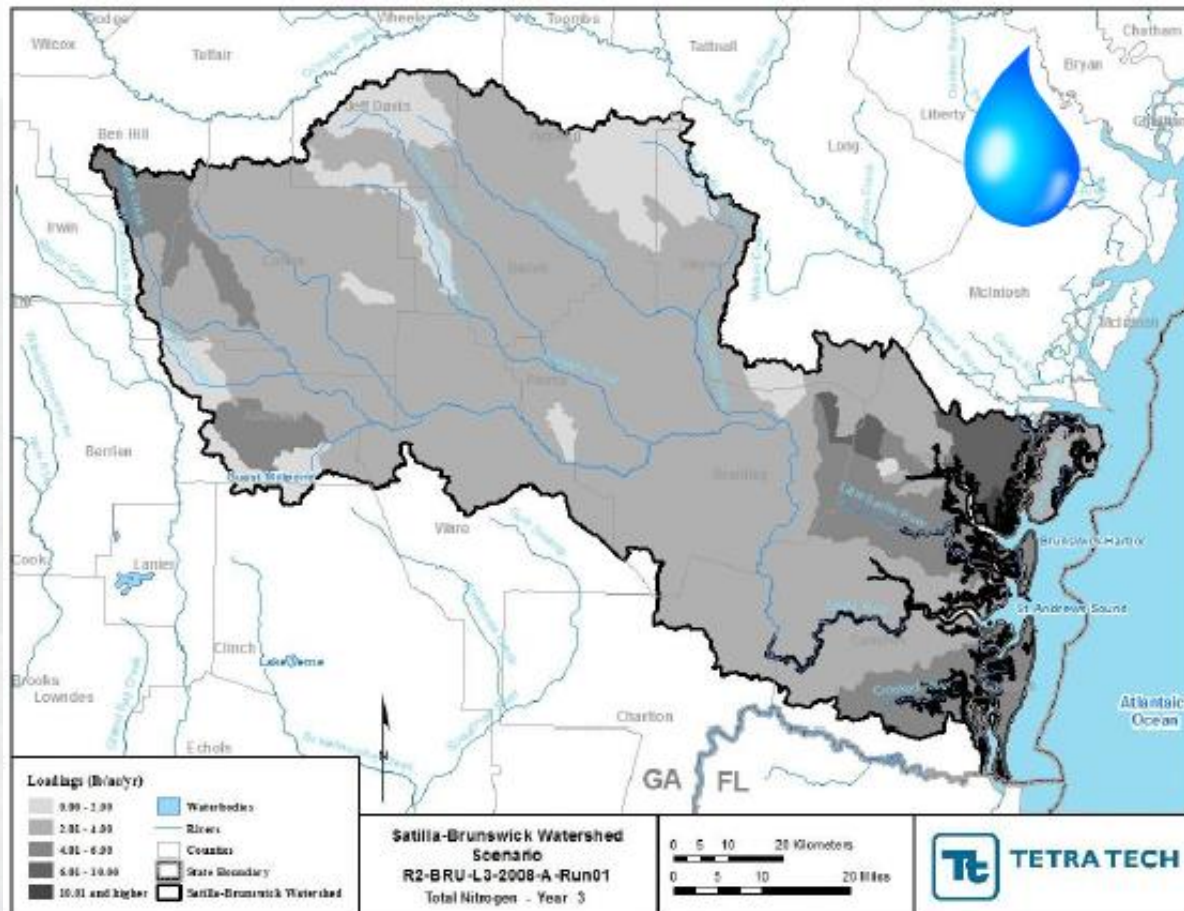
FUTURE



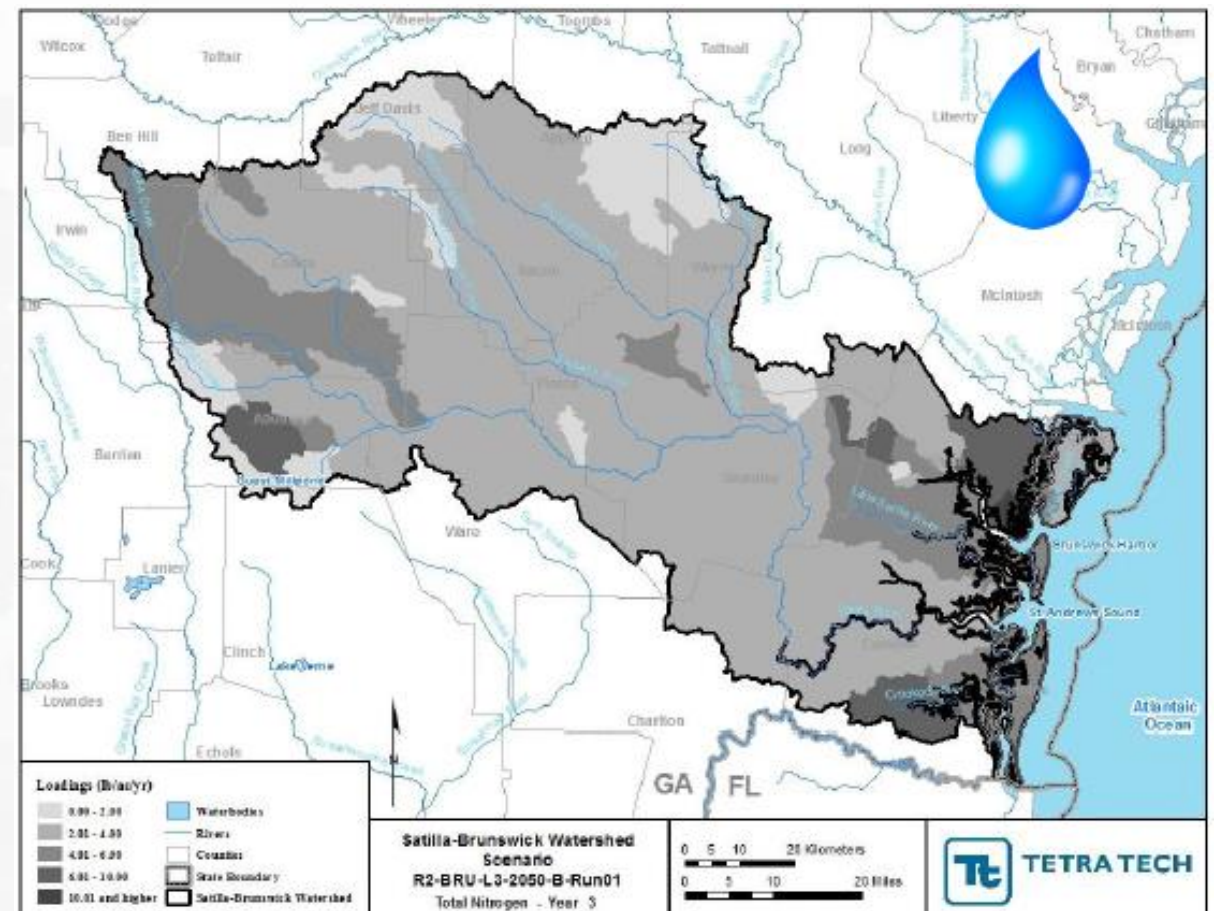


# Total N in Satilla Basin (Wet Year)

CURRENT

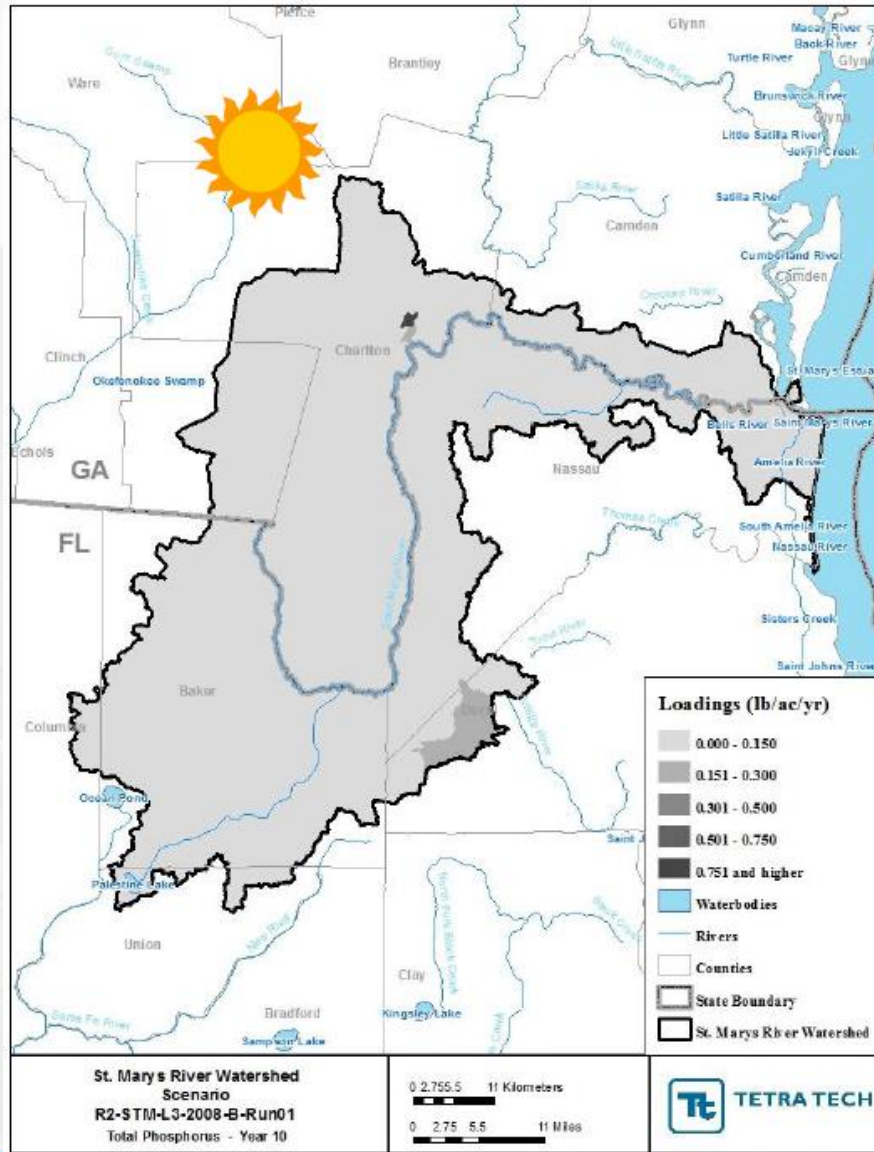


FUTURE

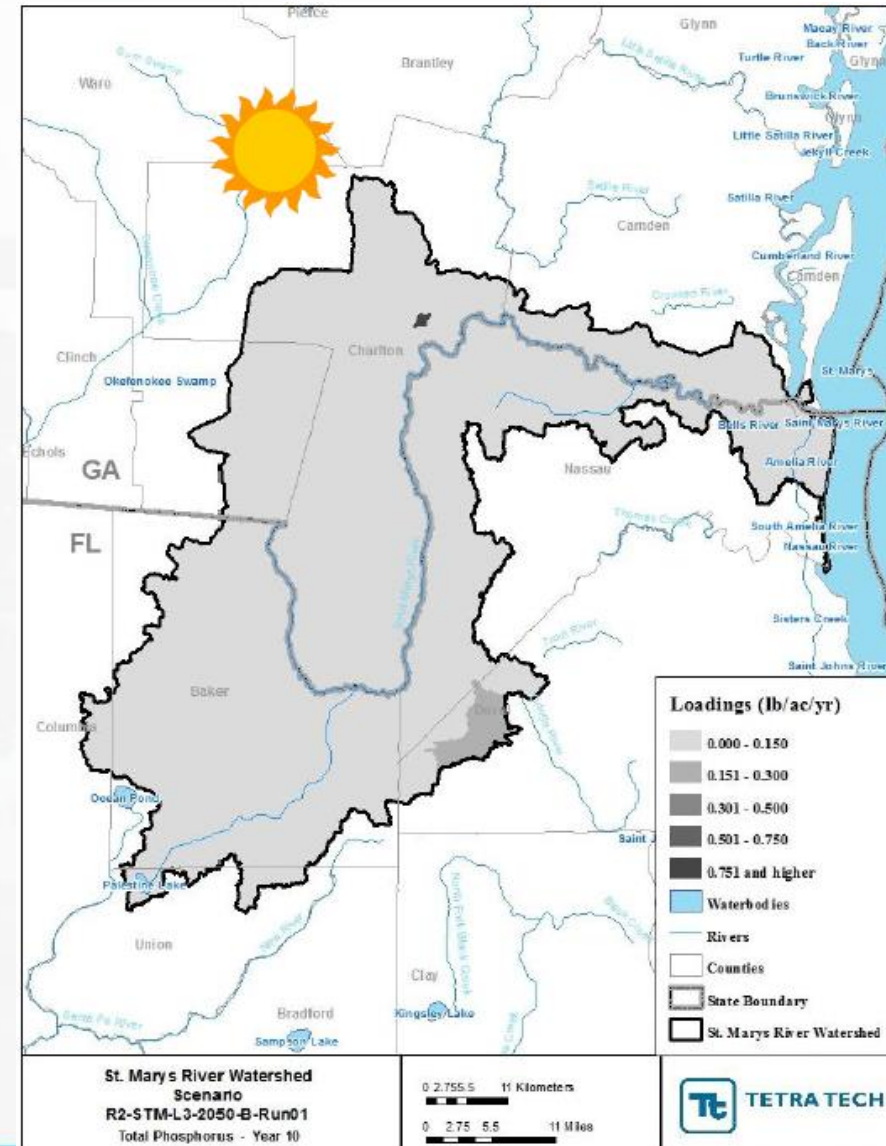


# Total P in St. Marys Basin (Dry Year)

CURRENT



FUTURE

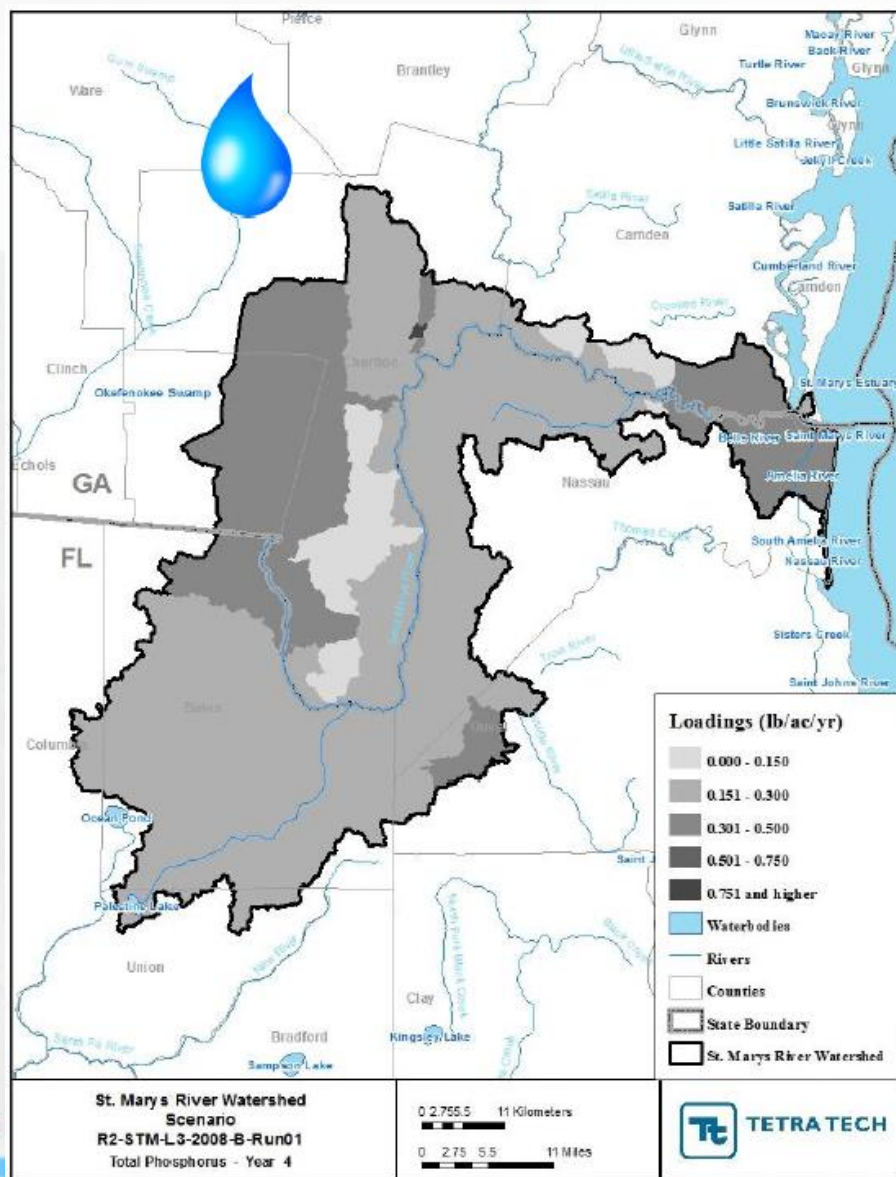




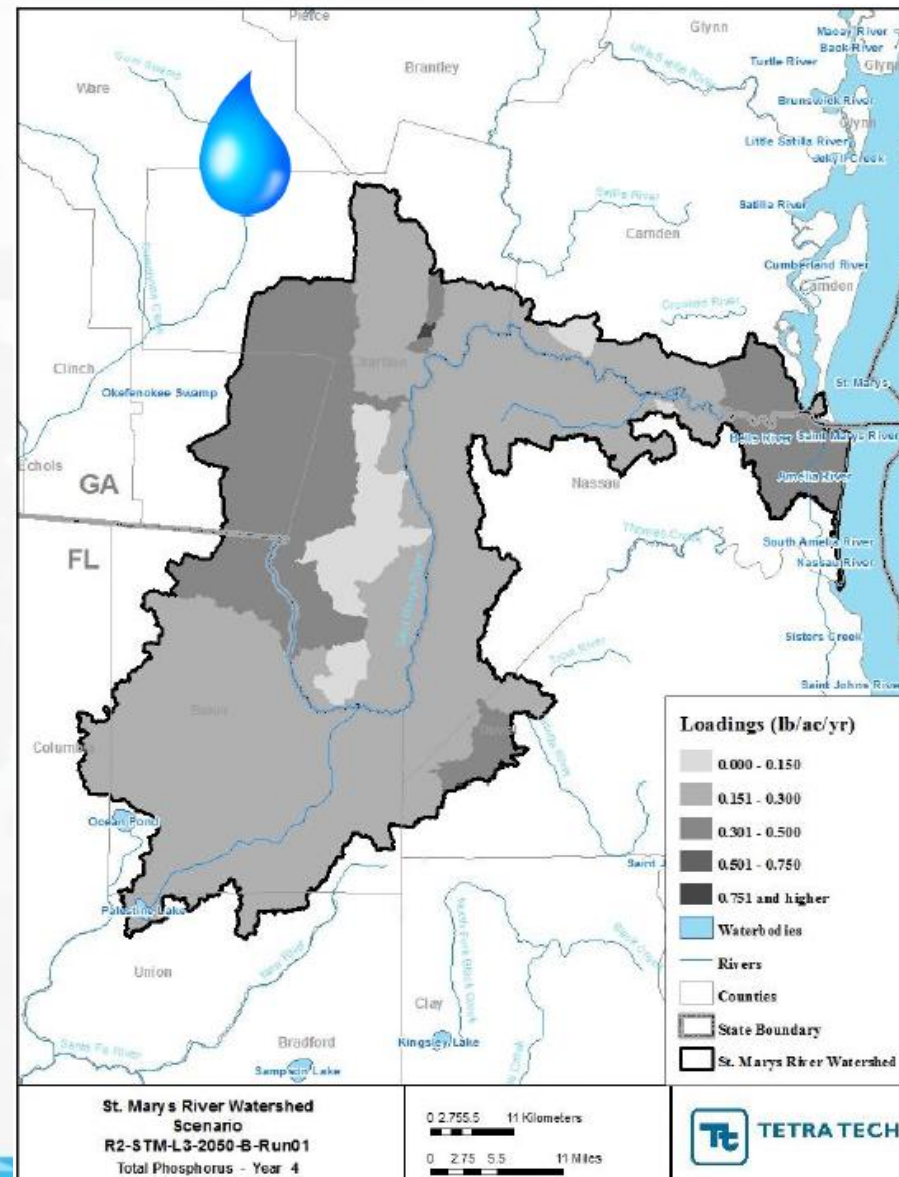
# Total P in St. Marys Basin (Wet Year)



CURRENT



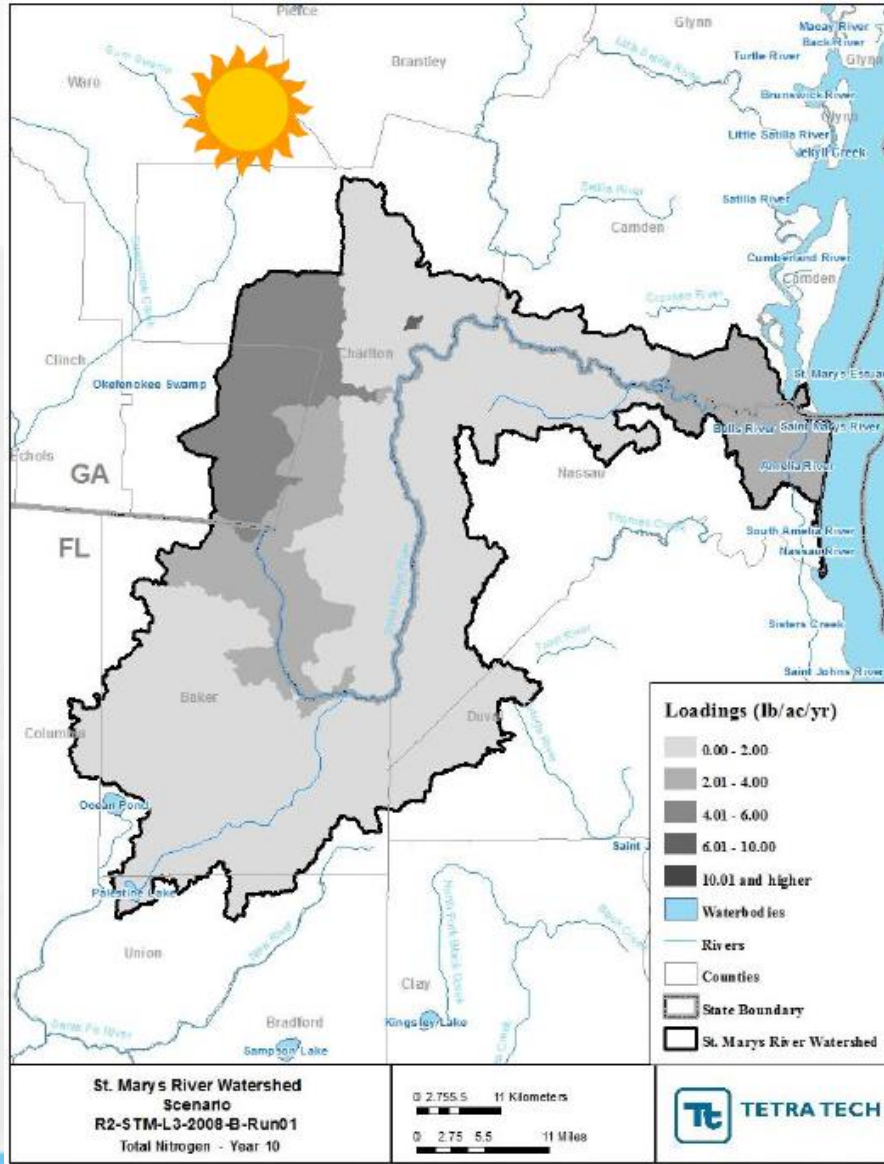
FUTURE



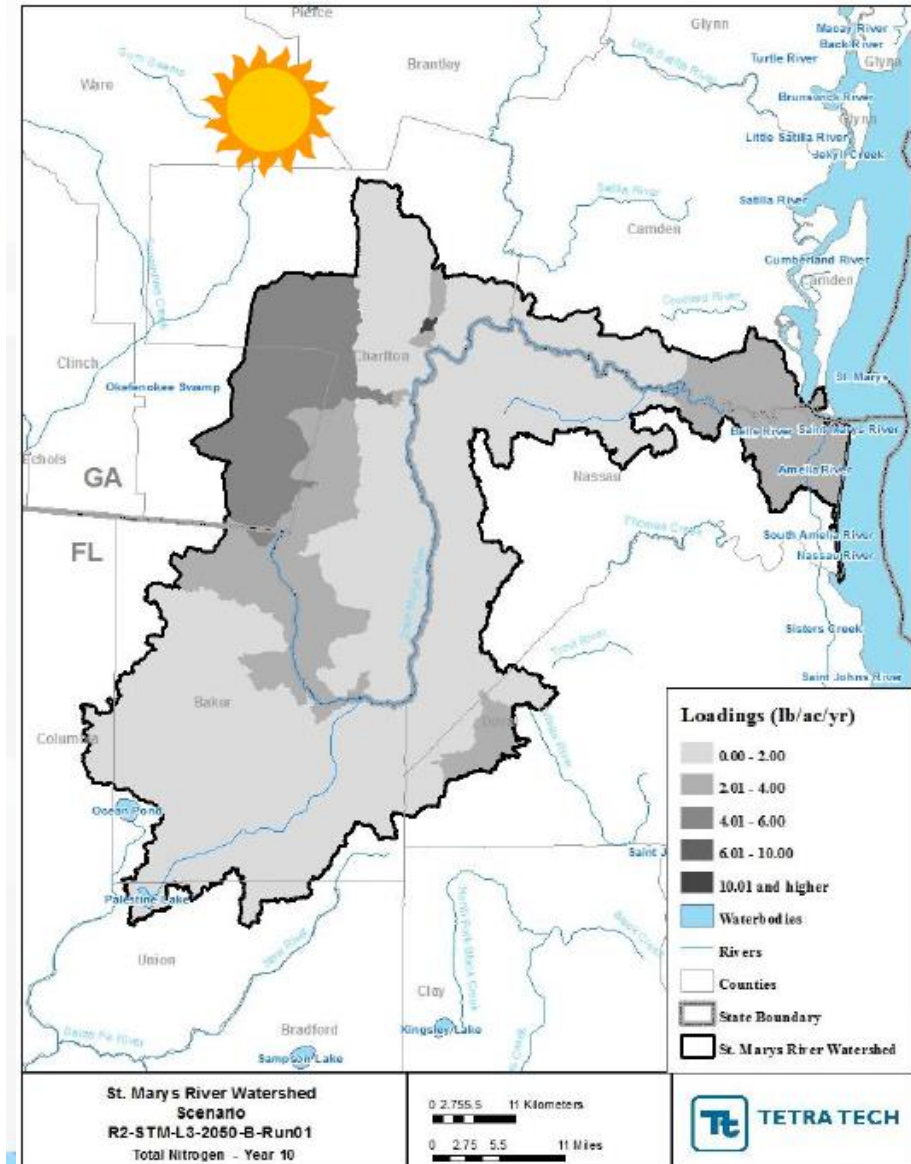
# Total N in St. Marys Basin (Dry Year)



CURRENT

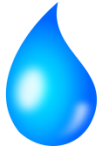


FUTURE

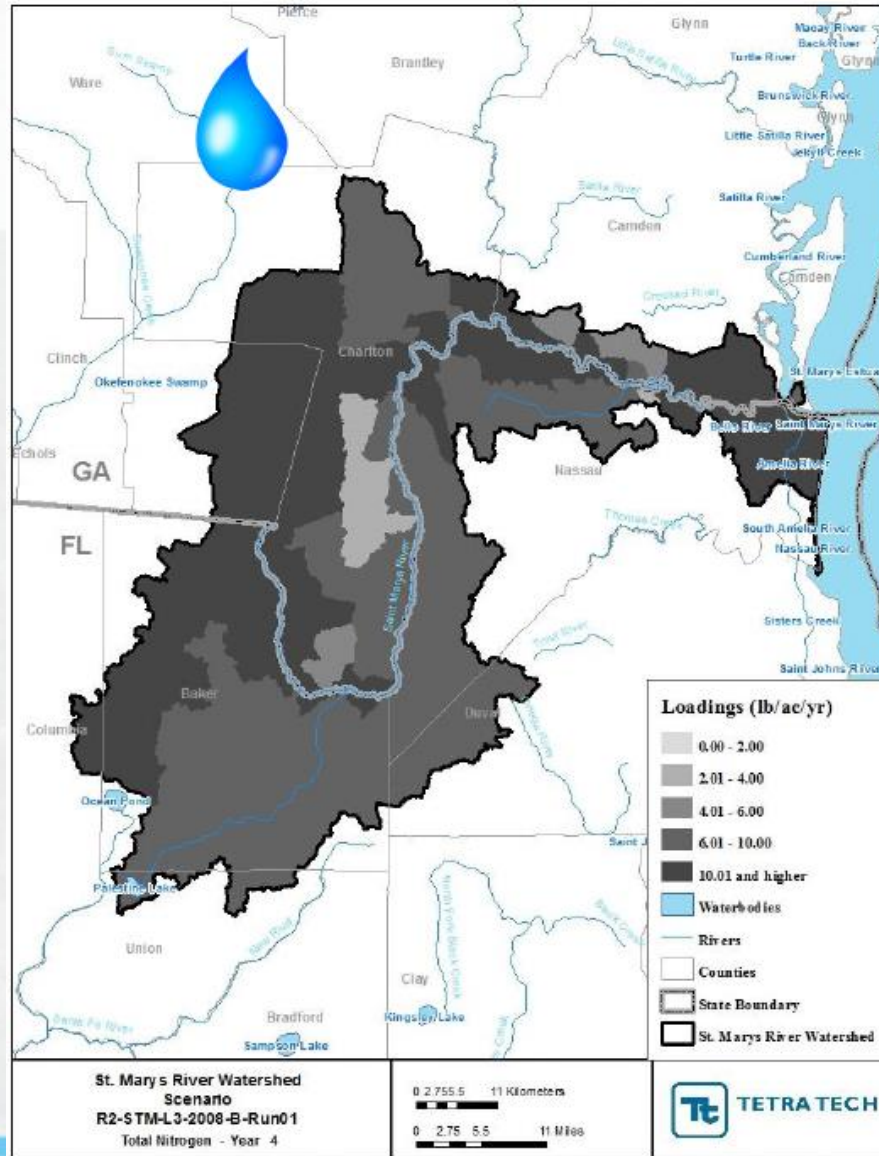




# Total N in St. Marys Basin (Wet Year)



CURRENT



FUTURE

