

Biosolids Land Application: Can Phosphorus Pollution be Reduced?

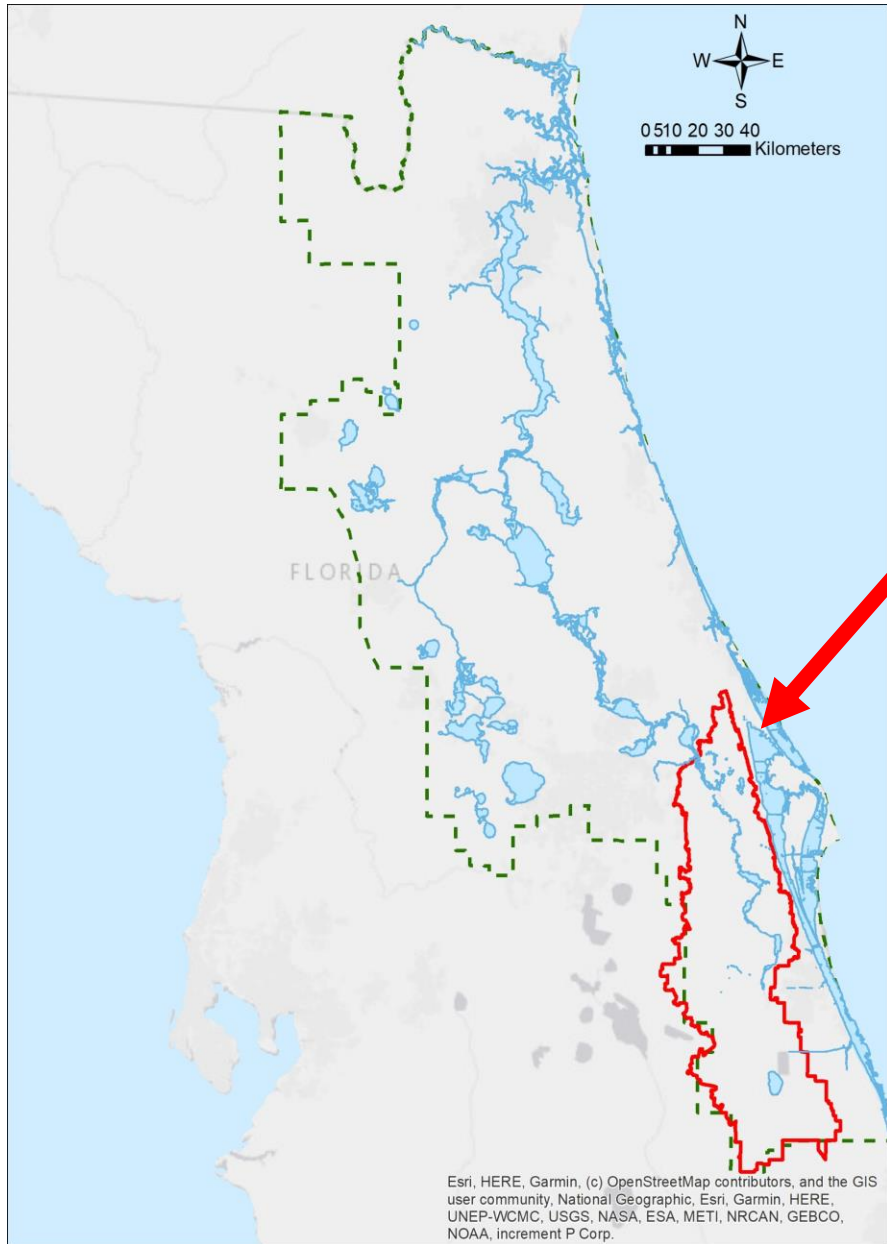
Vickie Hoge, St. Johns River Water Management District
Anthony Janicki, Janicki Environmental Inc.



St. Johns River
Water Management District

St. Johns River Watershed

Upper St. Johns River Basin

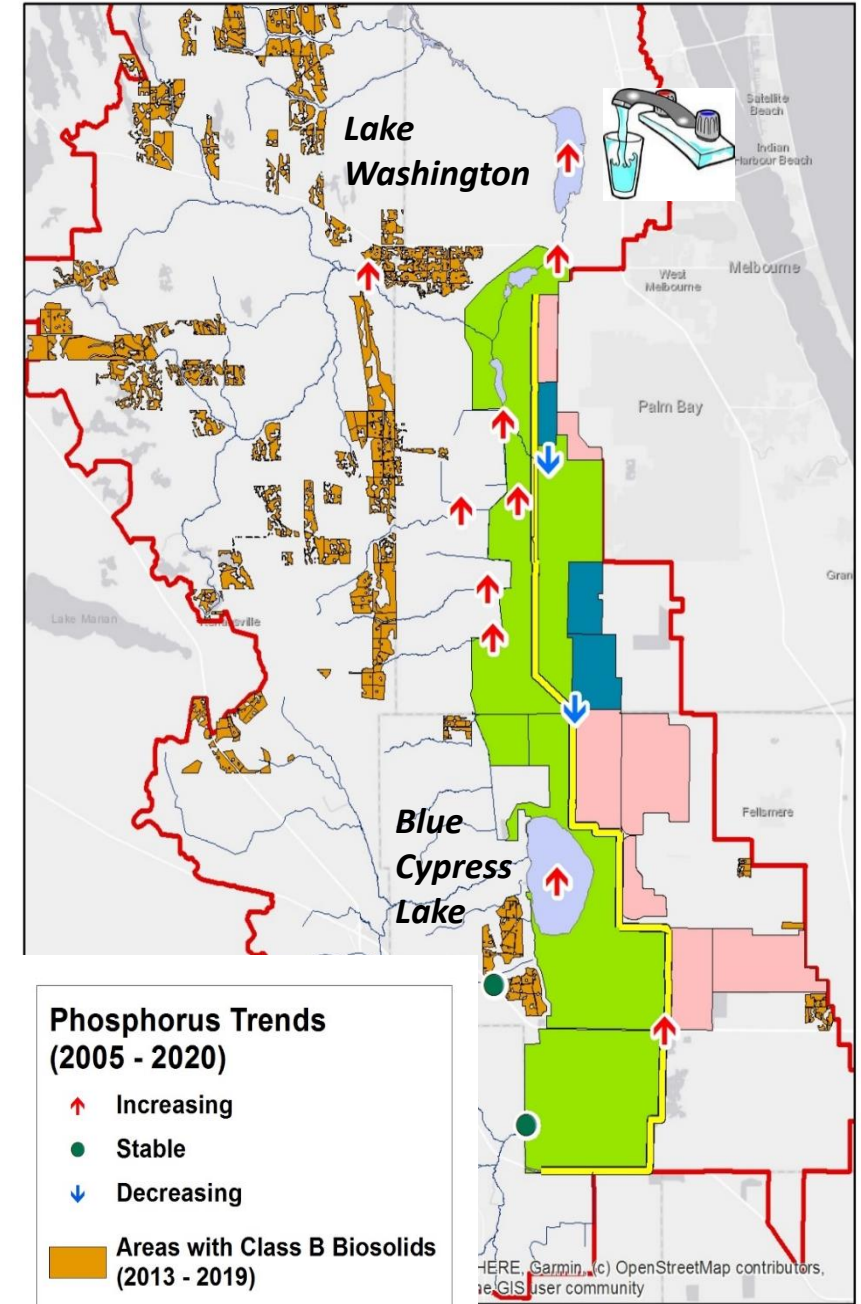
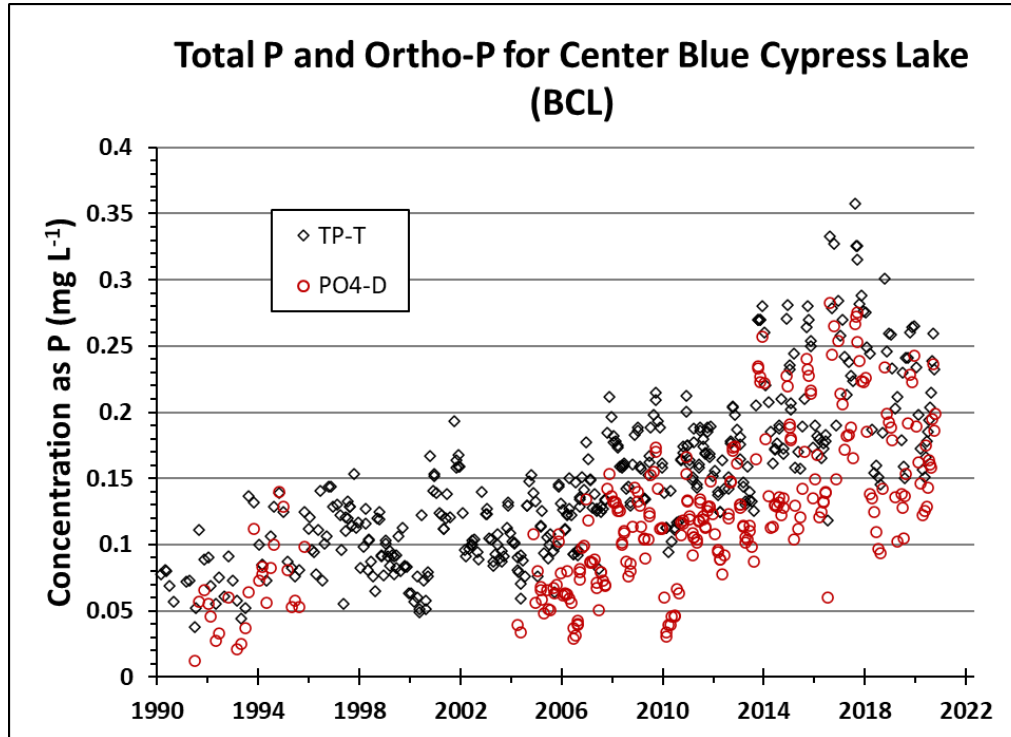


- Headwaters with a mix of restored and floodplain wetlands
- Uplands mainly agriculture; pasture, range land and a small amount of citrus



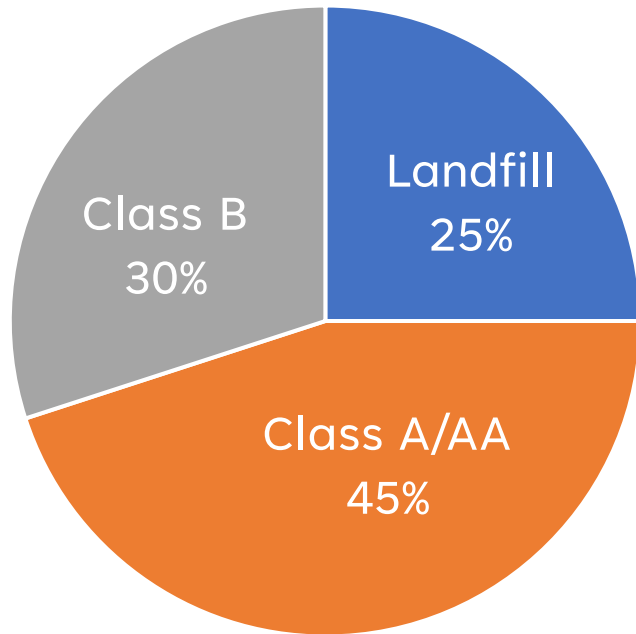
The Issue

Widespread increases in Phosphorus concentrations



What are biosolids?

Florida's biosolids
350,000 dry tons per year





Typical Florida cow-calf Ranch

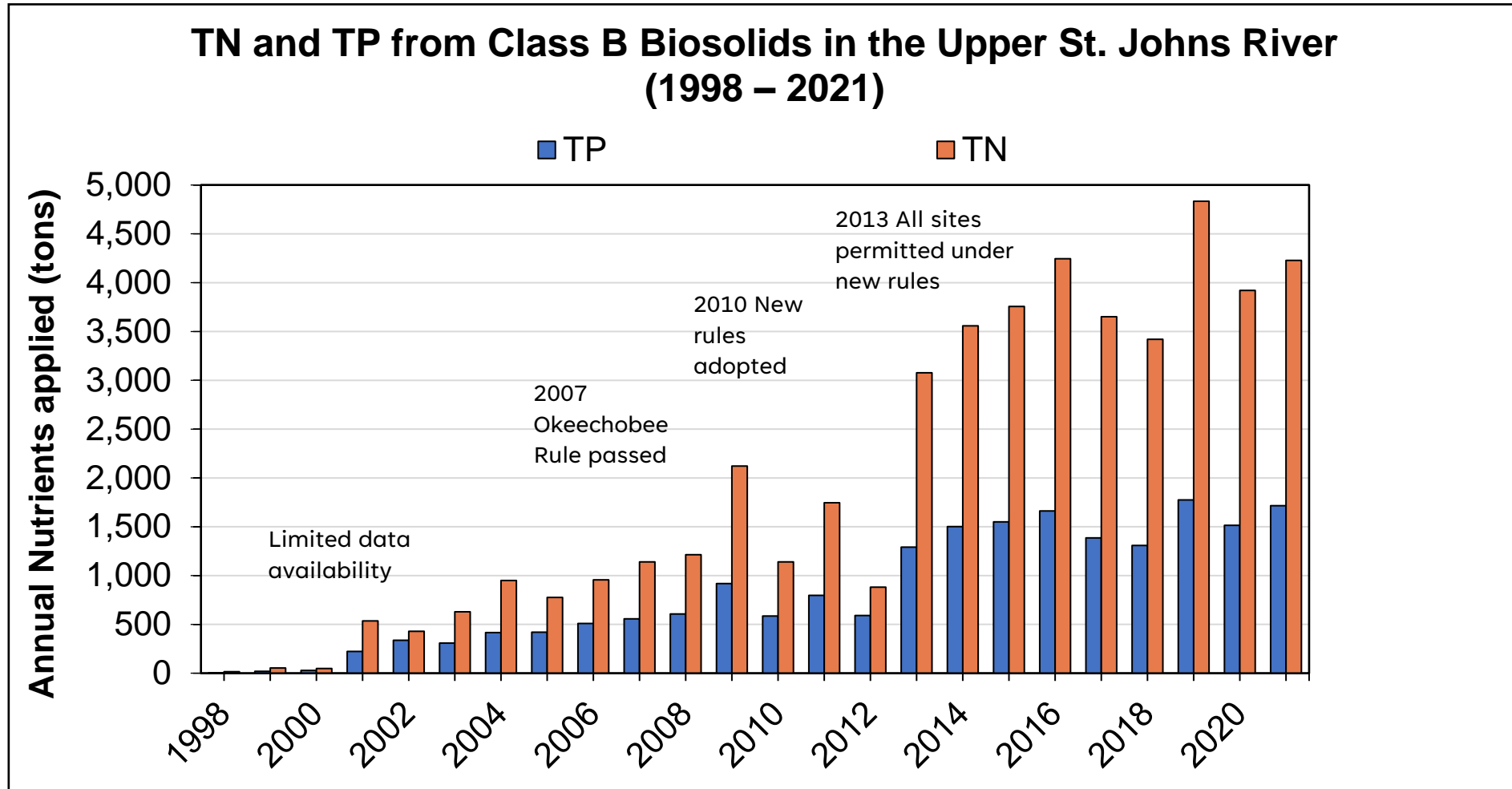


Nutrient of Concern — Phosphorus

- Typical agronomic N:P crop demands are ~ 10:1
- Biosolids typically contain N and P at a 2:1 mass ratio
- Nutrient management plans in Florida prior to 2021 allowed P application in excess of crop demand if P-index was low or medium
- New regulations (2021) state that application rates are limited to most restrictive nutrient



Upper St. Johns River Basin Class B Biosolids Applications

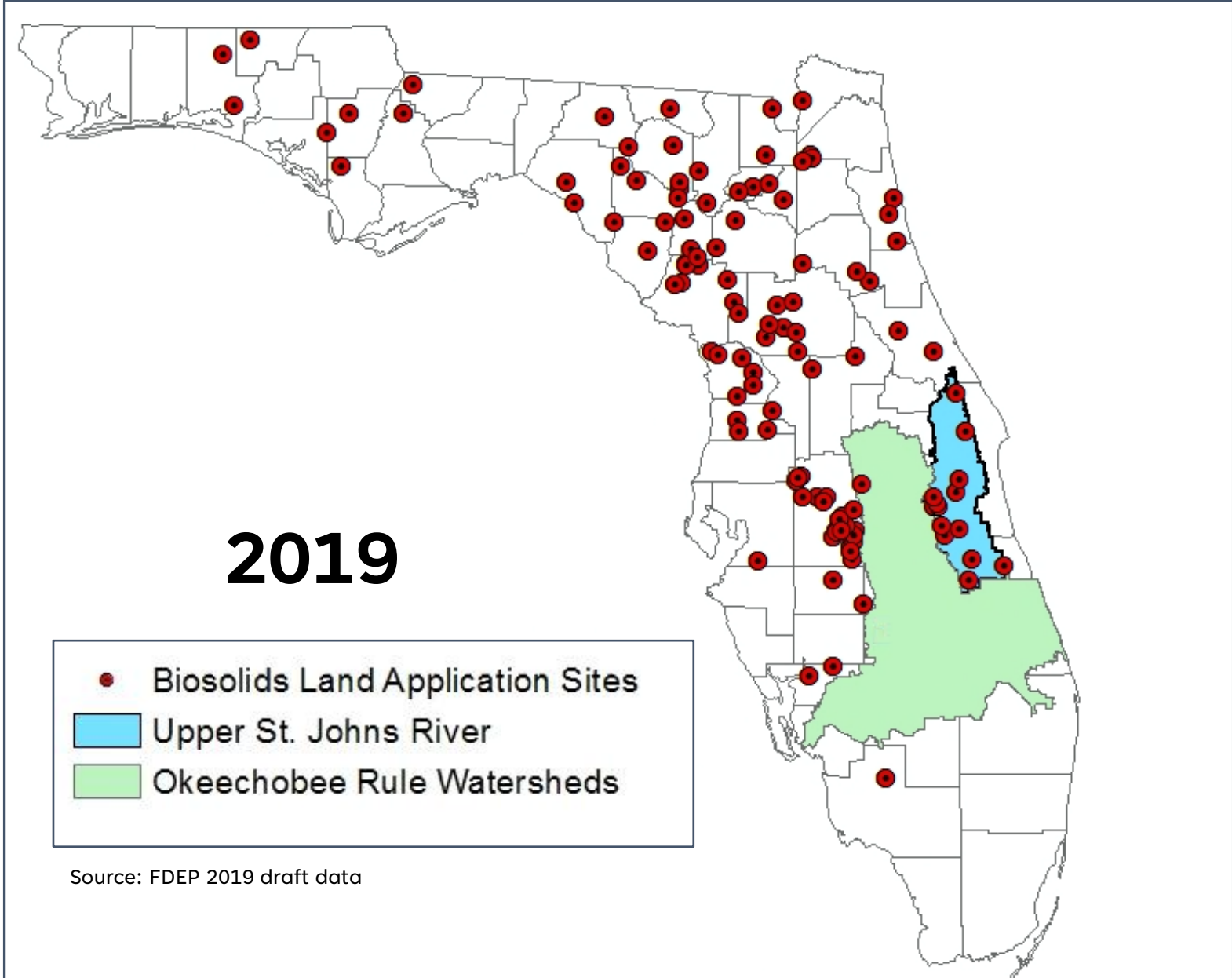


The Issue

Upper St. Johns River Basin

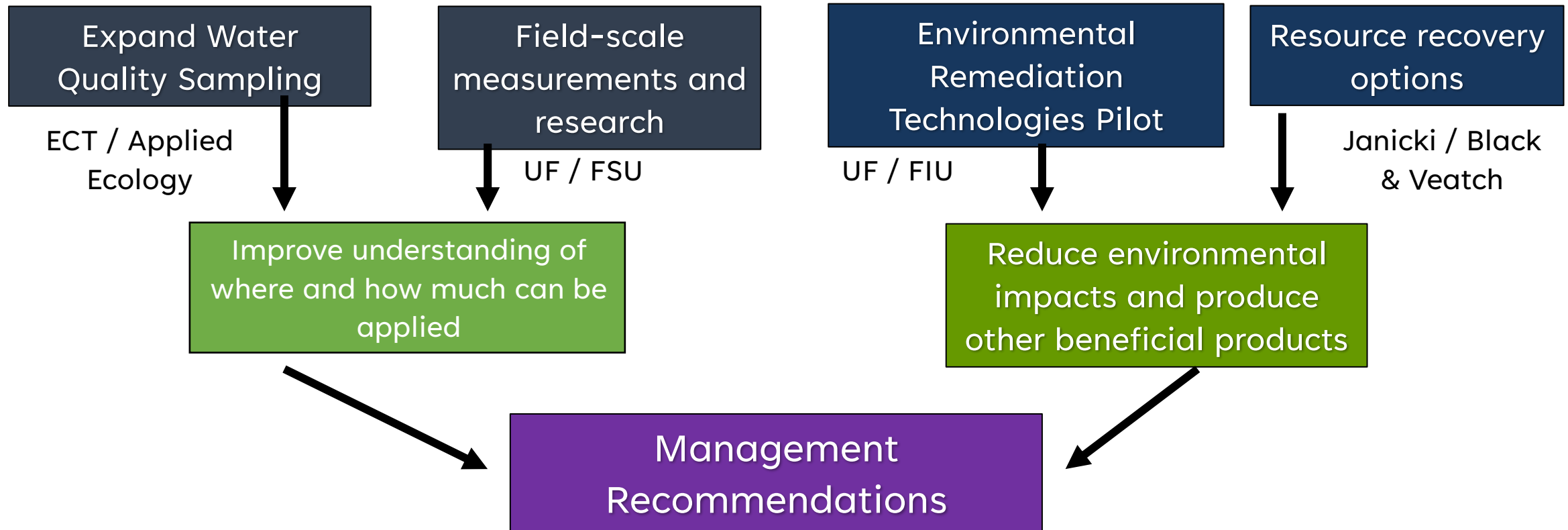
73,647 dry tons in 2019

78% of all Class B biosolids
statewide



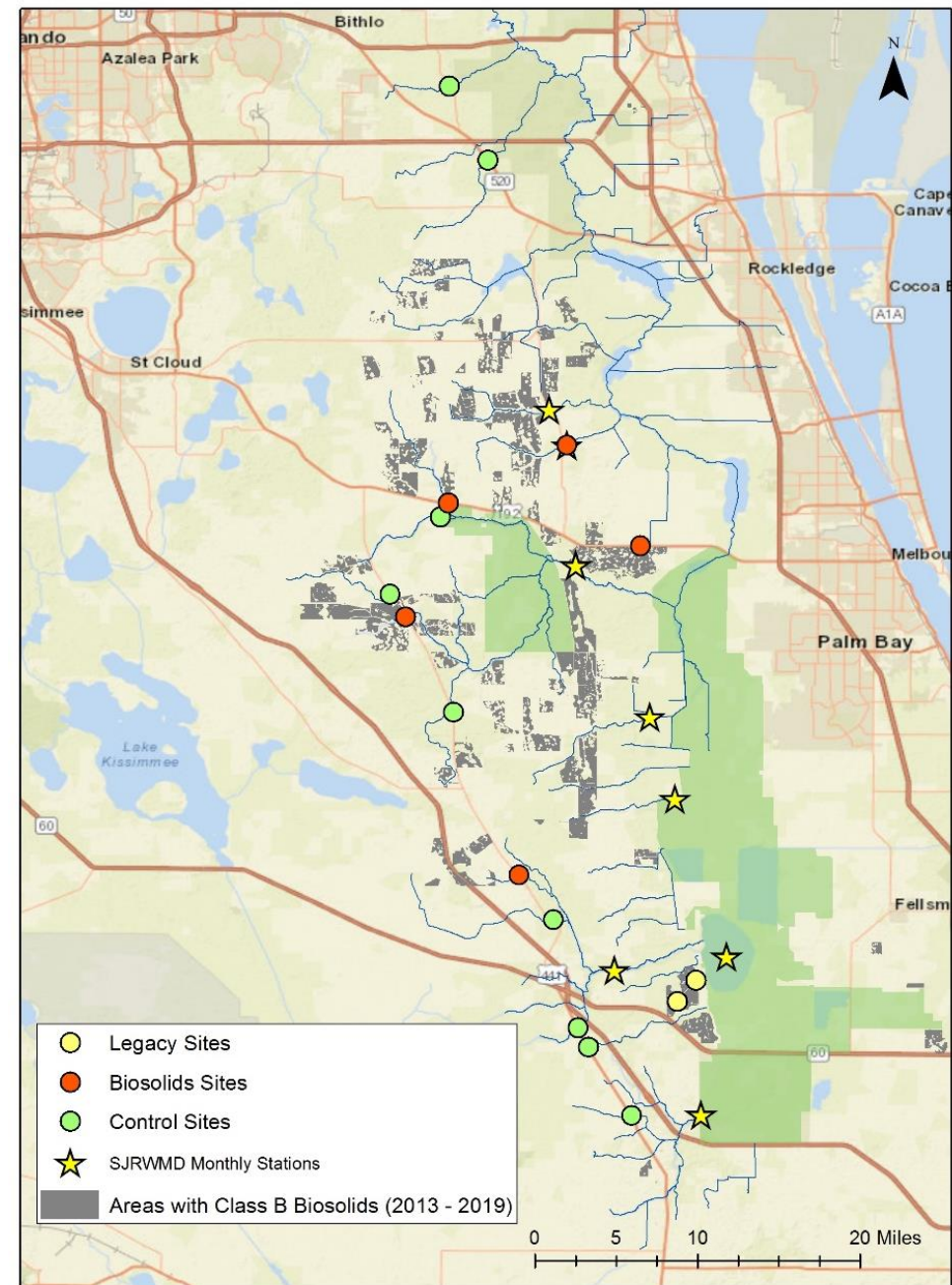
DEP Grant to District

Projects to Monitor and Improve Water Quality: Biosolids Assessment (\$1.9 M)



Expanded Water Quality Sampling

- Storm sampling
- Upstream/downstream
- Improve Event Mean Concentrations for modeling efforts
- Co-migrating tracers



Field Scale Assessment

- Soils assessment
- Groundwater sampling
- Develop P budget as function of biosolids applied
- Role of hydrologic manipulation
- Innovative monitoring



In-Field Remediation Technologies Pilot Project

- Phosphorus remediation technology review
- Benchtop study for evaluating and identifying potential technologies
- Field-scale evaluation of potential remediation methods
- Conceptually similar to earlier wetland restoration work



Resource Recovery

- Florida-based information needs assessment (survey)
- Evaluate existing technologies
- Life cycle analysis (LCA) modeling
- Process simulation for WWTP applications
- Develop plant modification options within Florida context
- Lower P in both biosolids and reclaimed water



Questions?



St. Johns River
Water Management District