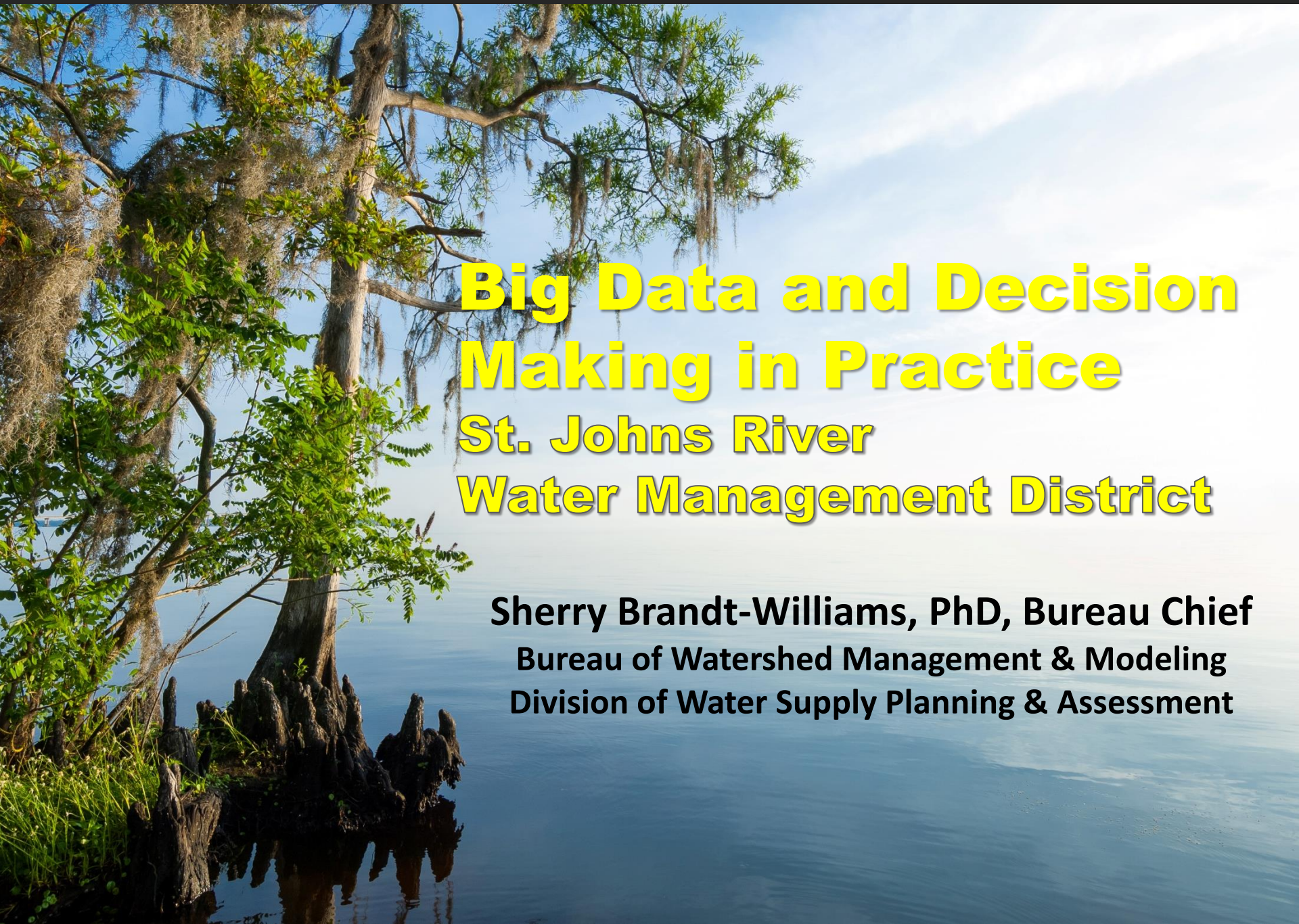


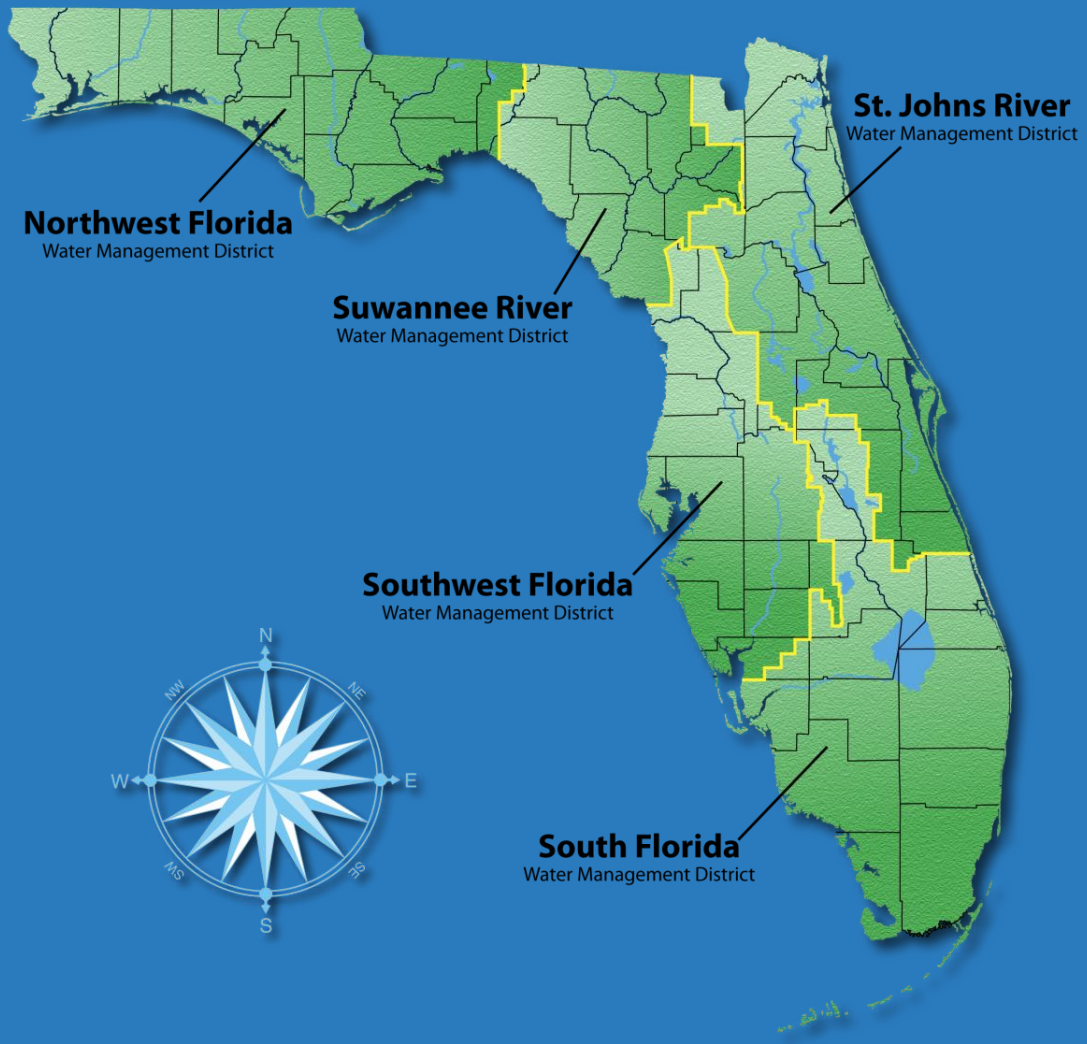
Big Data and Decision Making in Practice

St. Johns River Water Management District

Sherry Brandt-Williams, PhD, Bureau Chief
Bureau of Watershed Management & Modeling
Division of Water Supply Planning & Assessment

Who We Are

- 12,283 square miles
- Covers all or part of 18 counties in northeast and east-central Florida



Core Missions

Water supply

Flood protection

Water quality

Natural systems

Multi-jurisdictional Water Supply Initiatives

- NFSEG Groundwater Model
- Central Florida Water Supply Initiative

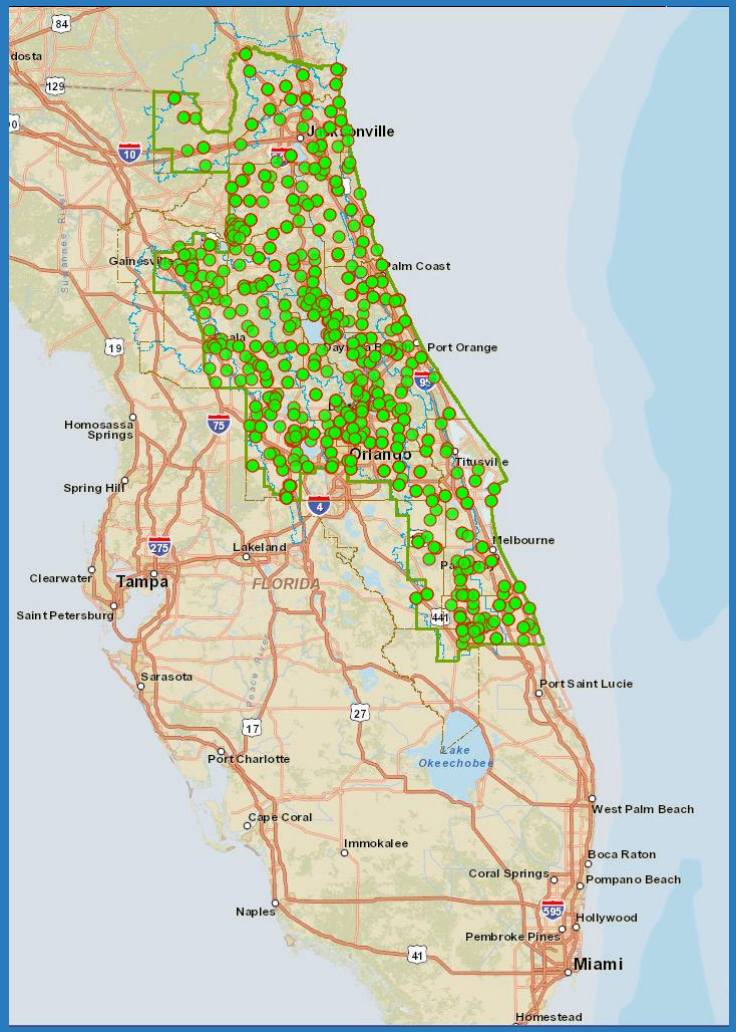
Overview

- Data collection in-house
- Data acquisition external
- Data storage
- Data use
- Challenges

Data Collection

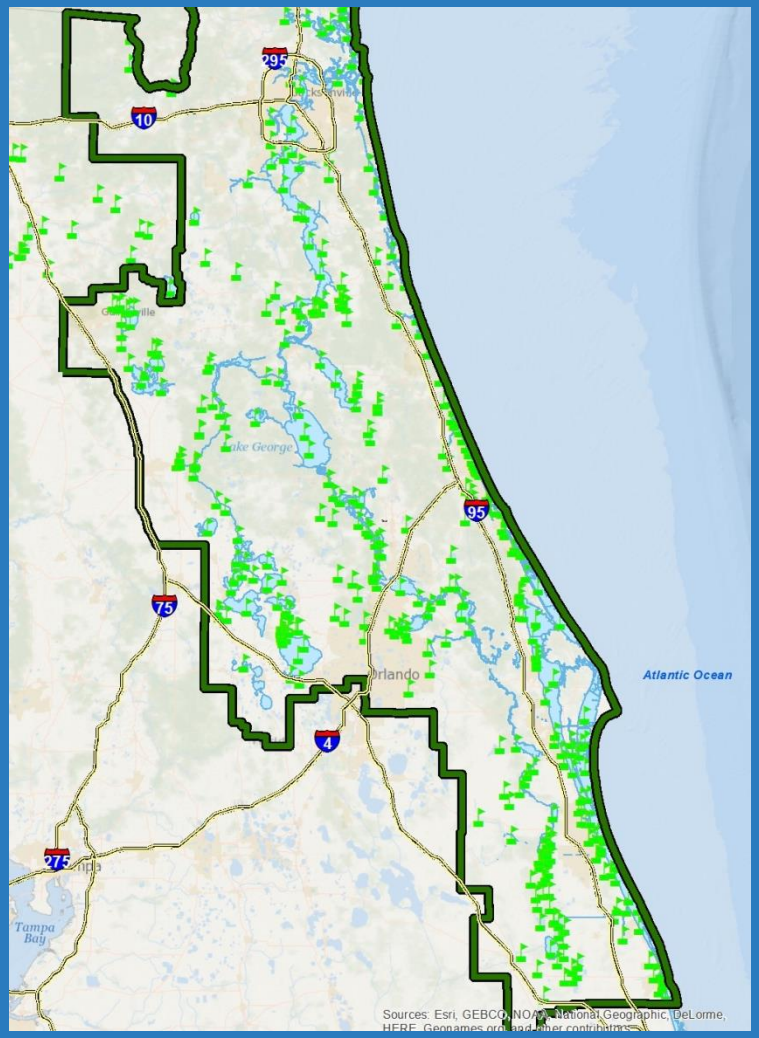
- **Extensive long term monitoring network**
- **Field staff trained in FDEP SOPs**
- **Lab is NELAP** (National Environmental Laboratory Accreditation Program) **certified**
- **Extensive QAQC**

Data Collection



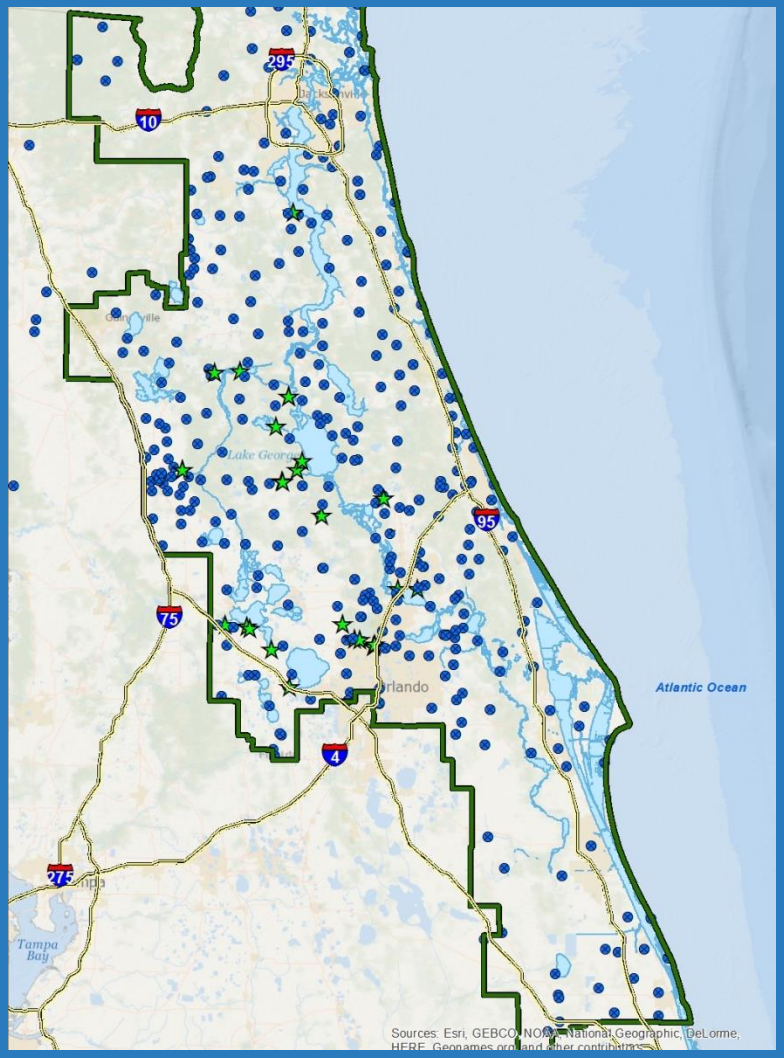
Discharge & stage continuous monitoring

Data Collection



Extensive surface water quality ambient monitoring network
470 sites, 150 analytes, every 2-4 weeks

Data Collection



Extensive groundwater monitoring network
485 wells, 23 springs

Data Collection

Biological monitoring: upland, wetland and open water

Data Collection

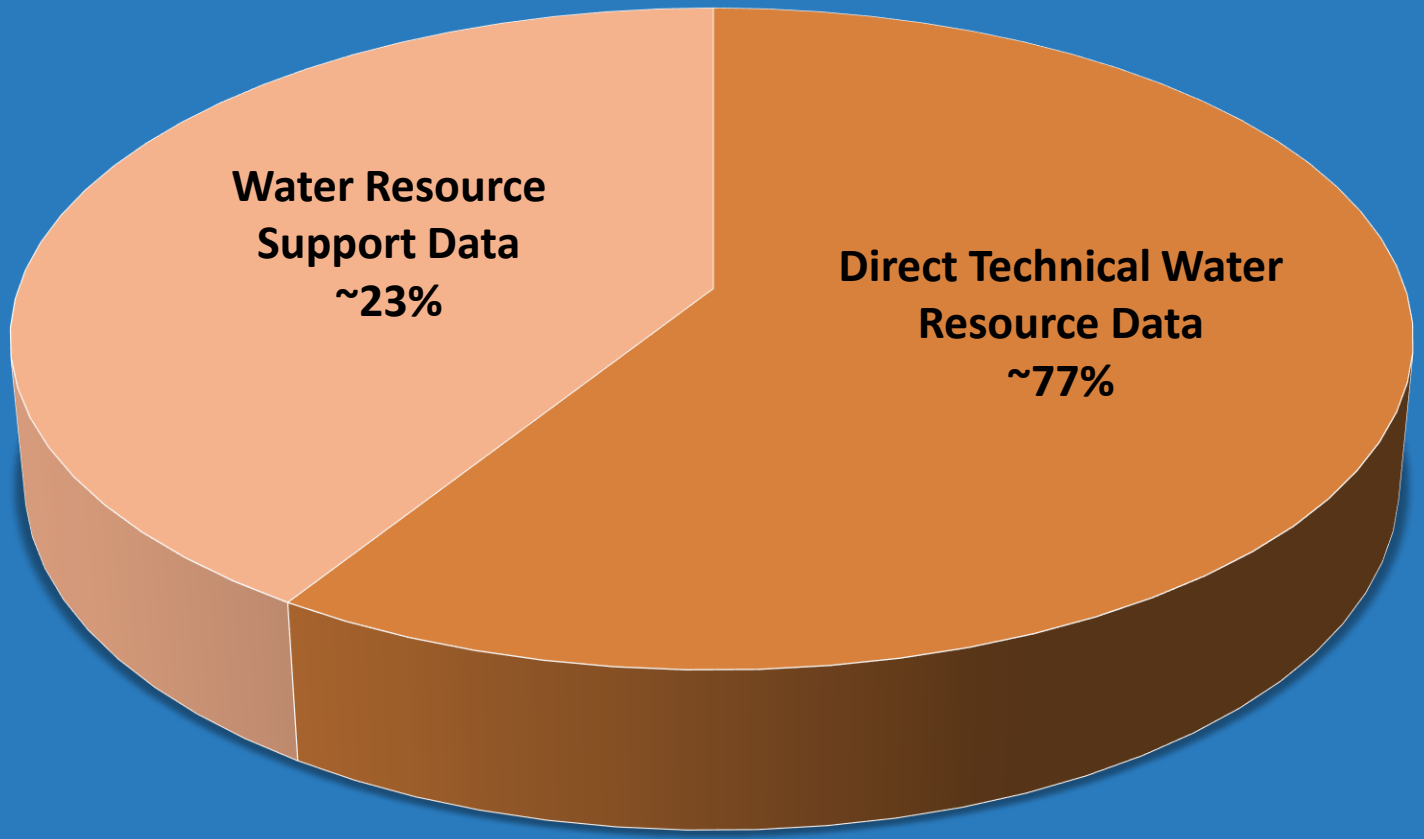
Restoration and nutrient reduction projects
Automated & telemetered

Data Acquisition

- USGS: discharge, stage, GOES ET
- NOAA: Meteorological & wave data
- NASA imagery
- Public utilities: consumption, wastewater & reuse
- FEMA maps
- NRCS Soils
- Radar Rainfall
- IFAS weather data
- 18 Counties: water quality; parcel data; private wells

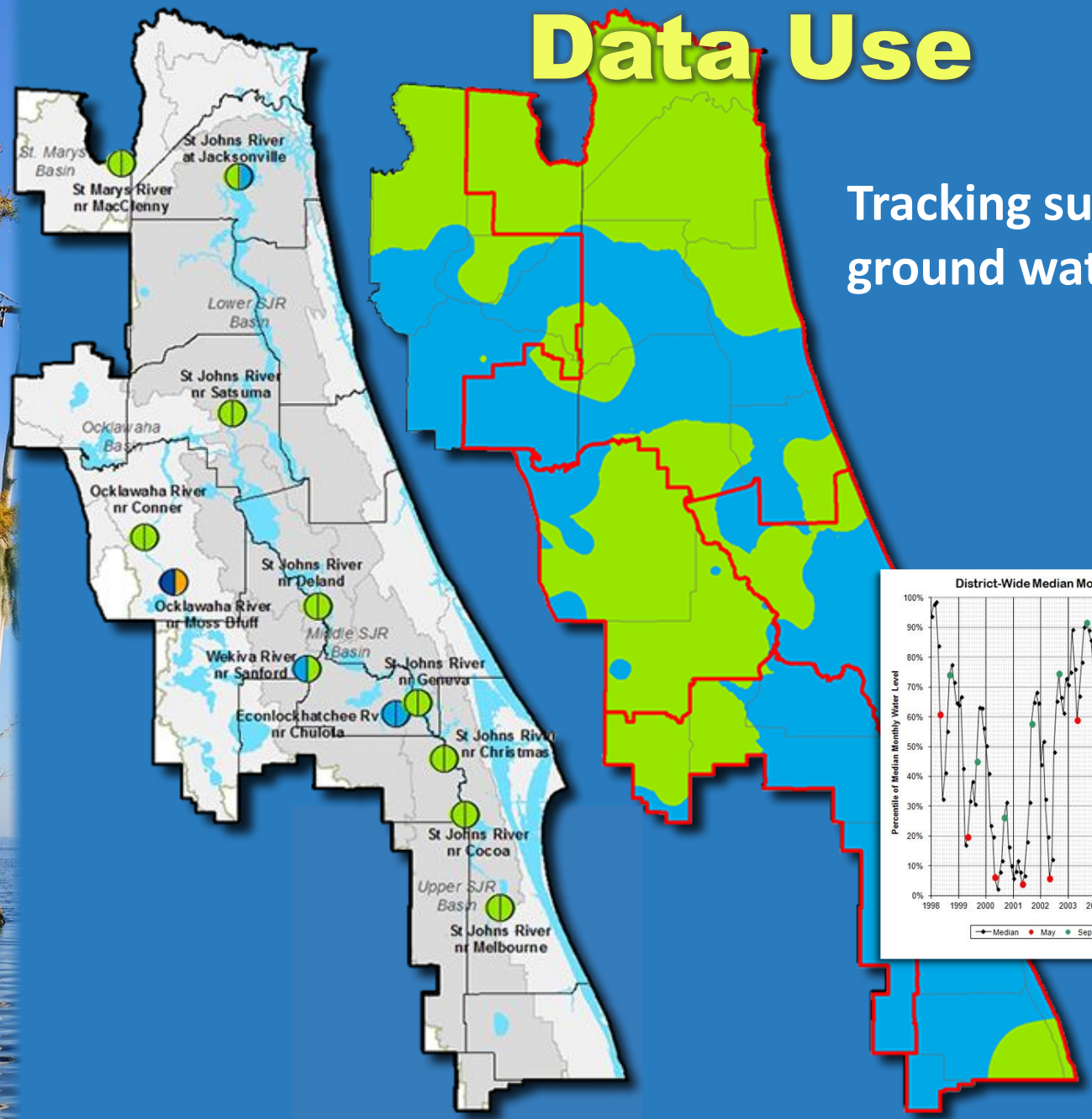
Data Storage

SJRWMD Requirements: ~115TB used

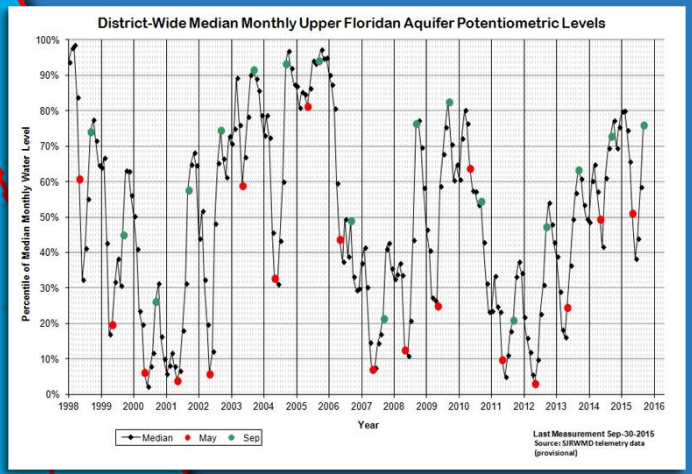


Active data use only, does not include back-up storage

Data Use

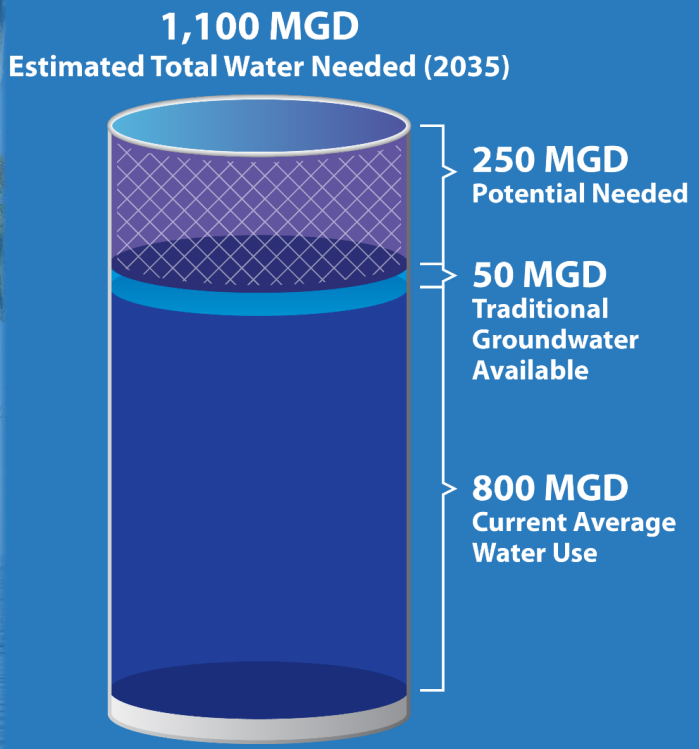


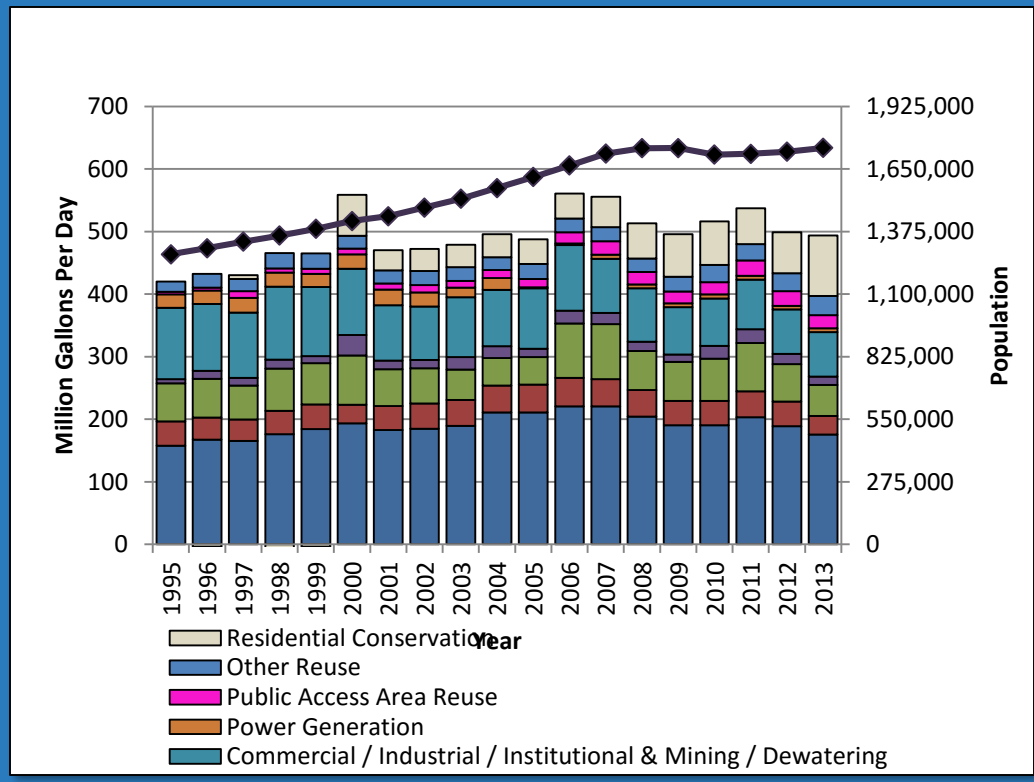
Tracking surface and ground water quantity



Data Use

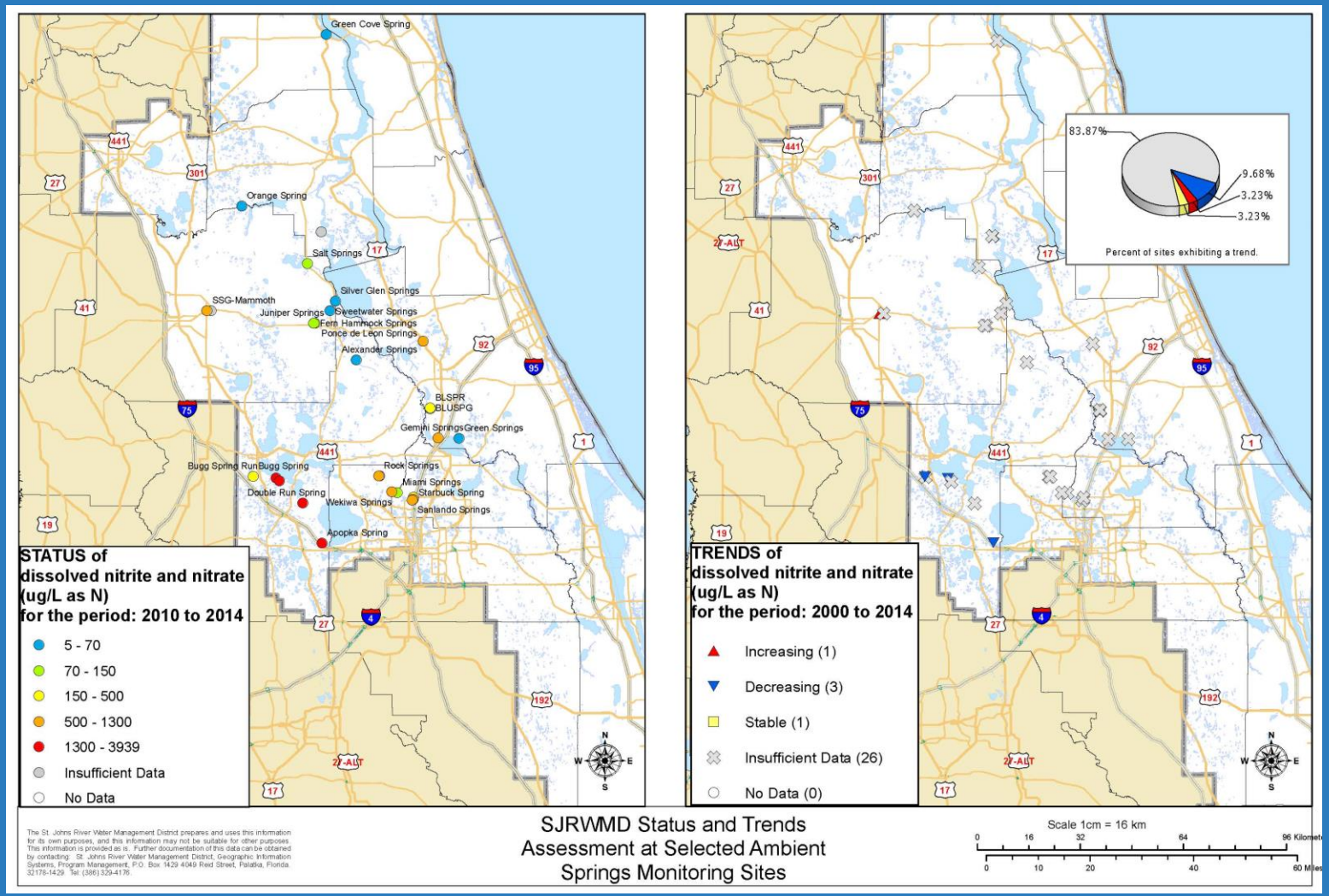
Groundwater modeling & projections for supply planning





Data Use

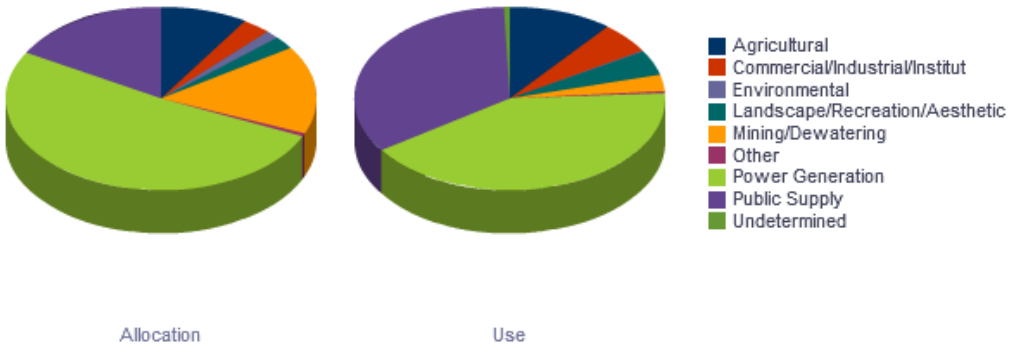
Annual water quality status and trend reporting in support of nutrient reduction regulations



Data Use

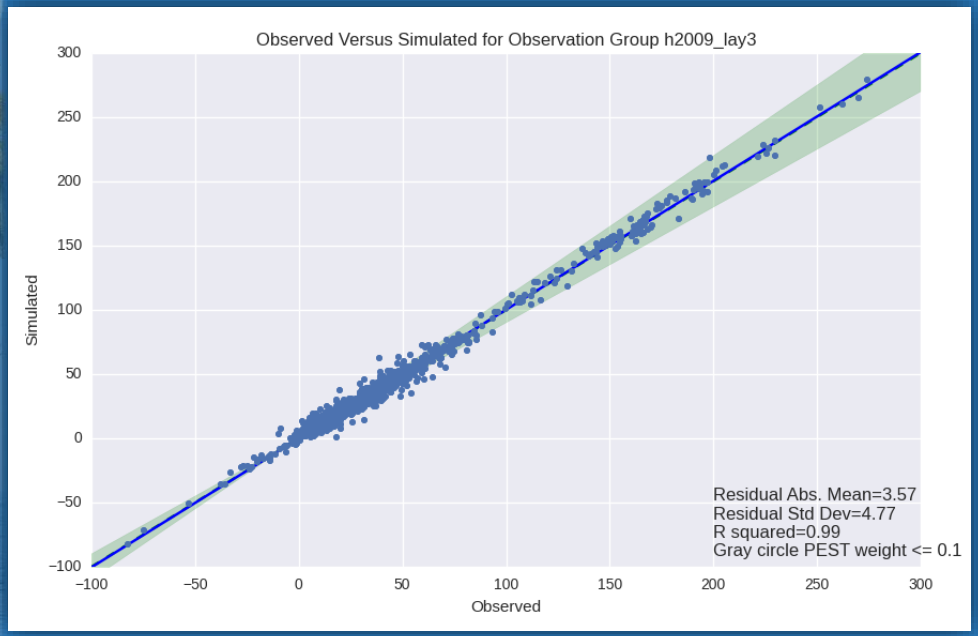
Permitting decisions about consumptive use

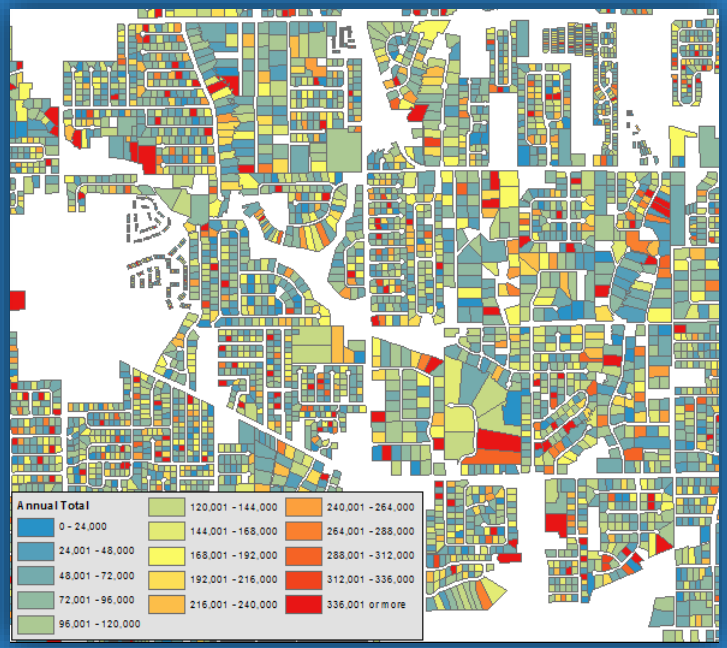
		Allocation				Use				Allocation	Use
Year	Water Use Class	Connection Point	Groundwater	Surfacewater	Undetermined	Connection Point	Groundwater	Surfacewater	Undetermined		
2014	Agricultural	0.72	125.23	27.31	15.12	0.55	38.20	25.56	2.13	**168.37**	**66.44**
	Commercial/Industrial/Institut	2.89	40.35	11.02		1.87	23.14	8.90		**54.26**	**33.91**
	Environmental		0.32	9.50	16.29		0.15	0.77		**26.12**	**0.92**
	Landscape/Recreation/Aesthetic	8.48	12.34	21.42		6.79	6.46	13.86	0.01	**42.24**	**27.12**
	Mining/Dewatering	2.19	6.31	279.86		0.00	2.30	15.45		**288.36**	**17.75**
	Other	4.19	2.07	3.82		2.39	0.21	0.00		**10.07**	**2.60**
	Power Generation	2.36	1.19	951.57		1.52	0.39	252.94		**955.12**	**254.85**
	Public Supply	3.59	294.21	11.94		7.22	196.02	5.76	0.00	**309.74**	**209.00**
	Undetermined					3.11	0.36	0.34			**3.81**
Grand Total		**24.42**	**482.03**	**1,316.43**	**31.41**	**23.46**	**267.22**	**323.58**	**2.14**	**1,854.29**	**616.39**



Data Use

Modeling and design of water supply, water quality improvement and habitat restoration projects





Data Use

Assessment of project efficacy: benefit and cost

Table 1. Ambient Loading into and out of facility 2008-2010.

	Total Nitrogen Load (kg)			Total Phosphorus Load (kg)			Total Suspended Solids Load (kg)		
	In	Out	Removal Efficiency (%)	In	Out	Removal Efficiency (%)	In	Out	Removal Efficiency (%)
2008									
Annual	3310	1314	60%	1801	1110	38%	17426	5538	68%
Growing Season	753	436	42%	388	172	56%	11188	2100	81%
Fallow Season	2558	878	66%	1413	938	34%	6237	3439	45%
2009									
Annual	1457	1186	19%	705	870	-23%	9224	10205	-11%
Growing Season	286	232	19%	104	85	18%	5726	2692	53%
Fallow Season	1170	954	19%	601	785	-31%	3498	4898	-40%
Through August 2010									
Annual	905	617	32%	294	164	44%	19011	2615	86%
Growing Season	403	525	-30%	125	102	19%	5313	2061	61%
Fallow Season	502	92	82%	168	63	63%	13697	554	96%

Challenges

- Large collection, QAQC & storage effort
- Constant reassessment of monitoring network
- Government agency = public records
- Documentation and archiving – when, how much, how
- Turning data into information useful for policy & regulation