



Orange Creek BMAP Meeting

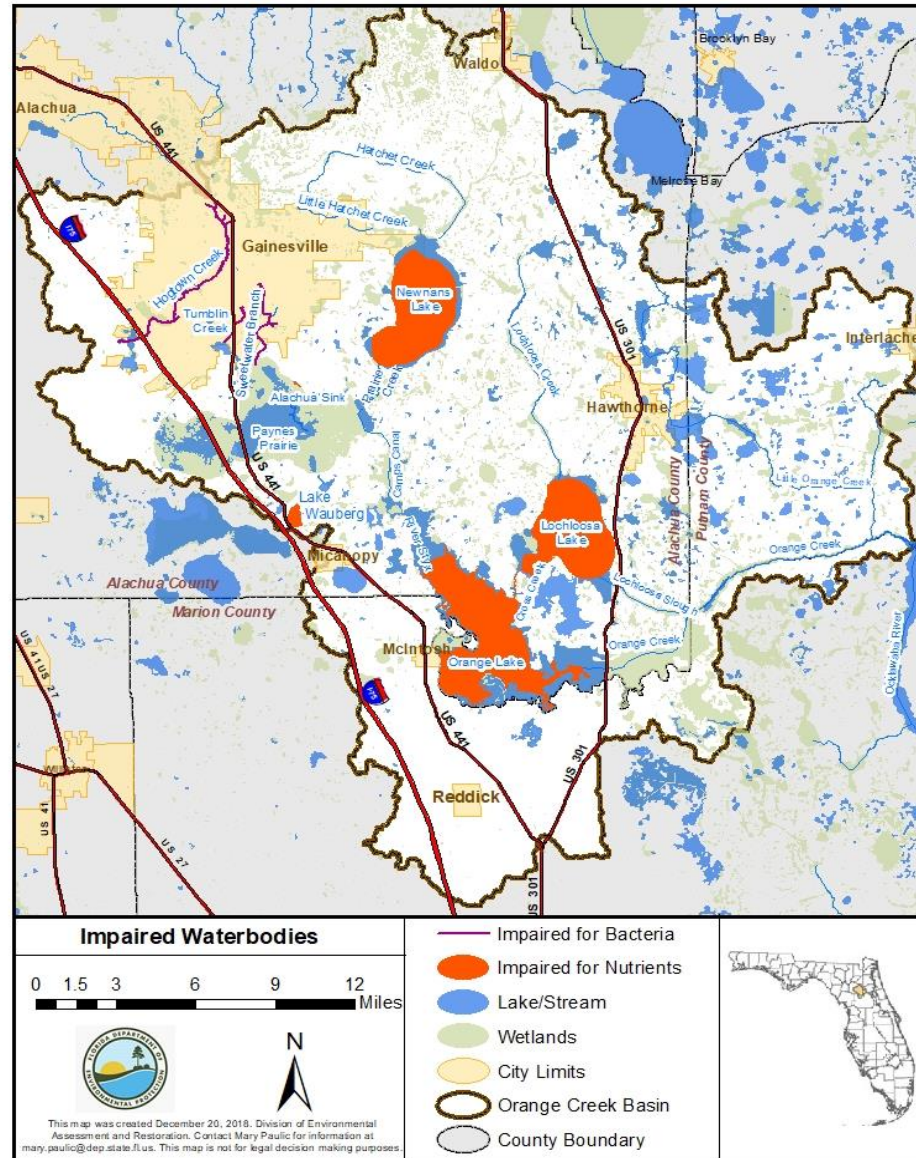
Mary Paulic

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September 15, 2020



Orange Creek Basin



AGENDA

Welcome, Introduction, and Purpose (*Tiffany Busby*)

Project Status and Preparation for 2020 Project Reporting (*Mary Paulic*)

Water Quality and Monitoring Update (*Mary Paulic*)

Verified Impaired Waterbodies within the Orange Creek Basin (*Kevin O'Donnell*)

Alachua County Public Education and Lake Restoration and Evaluation Activities (*Shane Williams*)

Florida Fish and Wildlife Commission Activities Update (*Patrick McCord*)

Next Steps (*Tiffany Busby*)



Project Status and Preparation for 2020 Project Reporting

- Project information reported through December 2019



Project Summary

- Added 20 new projects
 - 2 regulation
 - 2 Education and studies
 - 10 Land acquisition
 - 3 Agriculture best management practices (BMP)
 - 1 Habitat enhancement
 - 1 Street sweeping
 - 1 Urban structural
- New total of 277 projects
- Information reported to Legislature through STAR report



STAR Report

- Available at <https://floridadep.gov/star>
- Reported that
 - 240 projects were completed
 - 22 projects were underway or planned
 - Allocation of stormwater loadings to local entities are complete for Newnans Lake, Orange Lake, and Lochloosa Lake
 - Since BMAP was adopted (2008) 15 projects have been canceled.
 - 1 agriculture BMP
 - 2 land acquisition
 - 8 Stormwater rehabilitation
 - Remaining are studies, data collection or reclassification



New Project Highlights

Agriculture and Land Acquisition

- Agriculture BMPs – improvements in irrigation and fertilizer application
 - Soil moisture sensors and soil grid mapping
 - GPS variable rate fertilizer application
 - Irrigation conversion
- Land acquisition
 - Conservation easements for Lochloosa Slough, Brown property, Parcel E, and Fox Pen-Lochloosa Slough Connector, Johnson, Carr, and Franklin Crates
 - Donation or purchase of properties including Raydient, Smith & Smith, and Stephens



New Project Highlights

- Lochloosa Lake Improvement Initiative – Study or assessment of watershed sources
- Little Hatchet Creek Retaining Wall and Stream Stabilization – retaining wall and stream stabilization by Gainesville Airport
- Orange Lake-Heagy Burry Deep Marsh Restoration – Removal of dense floating vegetation and tussocks



New Project Highlights

Regulations

- Alachua County-wide Stormwater Treatment code
 - New development
 - 70% TN and 80% TP reduction in stormwater discharge
 - 95% for Outstanding Florida Waters
 - 10% below predevelopment for impaired waters
 - Low impact development/design in sensitive karst areas
- Alachua County-wide Florida Friendly Landscaping Homeowner Association Code
 - Prevents HOA from prohibiting FFL
 - Newer HOA codes (since 2016) cannot require irrigation



Loading Adjustments

- Adjustments to agriculture loading from BMPs
 - Canceled project OR34 removed 16 lbs TP credit for Orange Lake
 - Reduced ag project credits from 691 lbs TP to 675 lbs TP
 - Increases remaining TP loading from agriculture to 4,727 lbs/yr from 4,711 lbs/yr
- Addition of street sweeping (URBAN01-TUM) for Tumblin Creek watershed provisional change
 - Adds TN credit of 3,846 lbs TN to Alachua Sink
 - Total TN reduction for Alachua Sink now 146,505 lbs TN/yr



Project Funding

- Information about FDEP grant programs is available at <https://floridadep.gov/wra>
- Nonpoint Source funding programs:
 - Federal Clean Water Act Section 319(h) grants and State Water-quality Assistance grants
 - Submit proposal anytime during the year. Primary review for funding periods are September/October and March/April
 - Local and state governments (including water management district) and public universities are examples of local groups eligible for funding



Project Funding

Examples of Nonpoint source projects

- Demonstration and evaluation of best management practices (BMPs)
- Nonpoint pollution reduction in priority watersheds (e.g., areas with water quality restoration plans, etc.)
Example includes treatment of impaired waters.
- Green Infrastructure/Low Impact Development for stormwater
- Ground water protection from nonpoint sources
- Public education programs on nonpoint source management ("319 Grant" only)
- Septic to sewer projects ("319 Grant" only)



Looking Forward

- Requests for 2020 project updates will go out about early to mid-November time frame
- Expect some changes in how project type and status are used
- Importance of providing latitude and longitude information or maps of project area where possible



Monitoring and Water Quality Update

- Recent and historic sampling locations
 - Starts a review of monitoring plan adequacy
 - Mapping of sampling locations
 - Analyte list
- Status of water quality
 - Long term lake water quality averages



Purpose of Monitoring

As Stated in 2014 BMAP

- Primary Objective
 - *Identify and track water quality trends in BMAP waterbodies to determine if TMDL targets are being achieved.*
 - For lakes nutrient long term (7 year) rolling average of chlorophyll a, TN, and TP.
 - Lochloosa Lake uses geometric mean
 - Fecal coliforms bacteria TMDLs for streams
 - Change in criteria to E. coli
 - Exceedances of criteria
 - Delay discussion of evaluation to next meeting



Active Sampling Locations

Changes

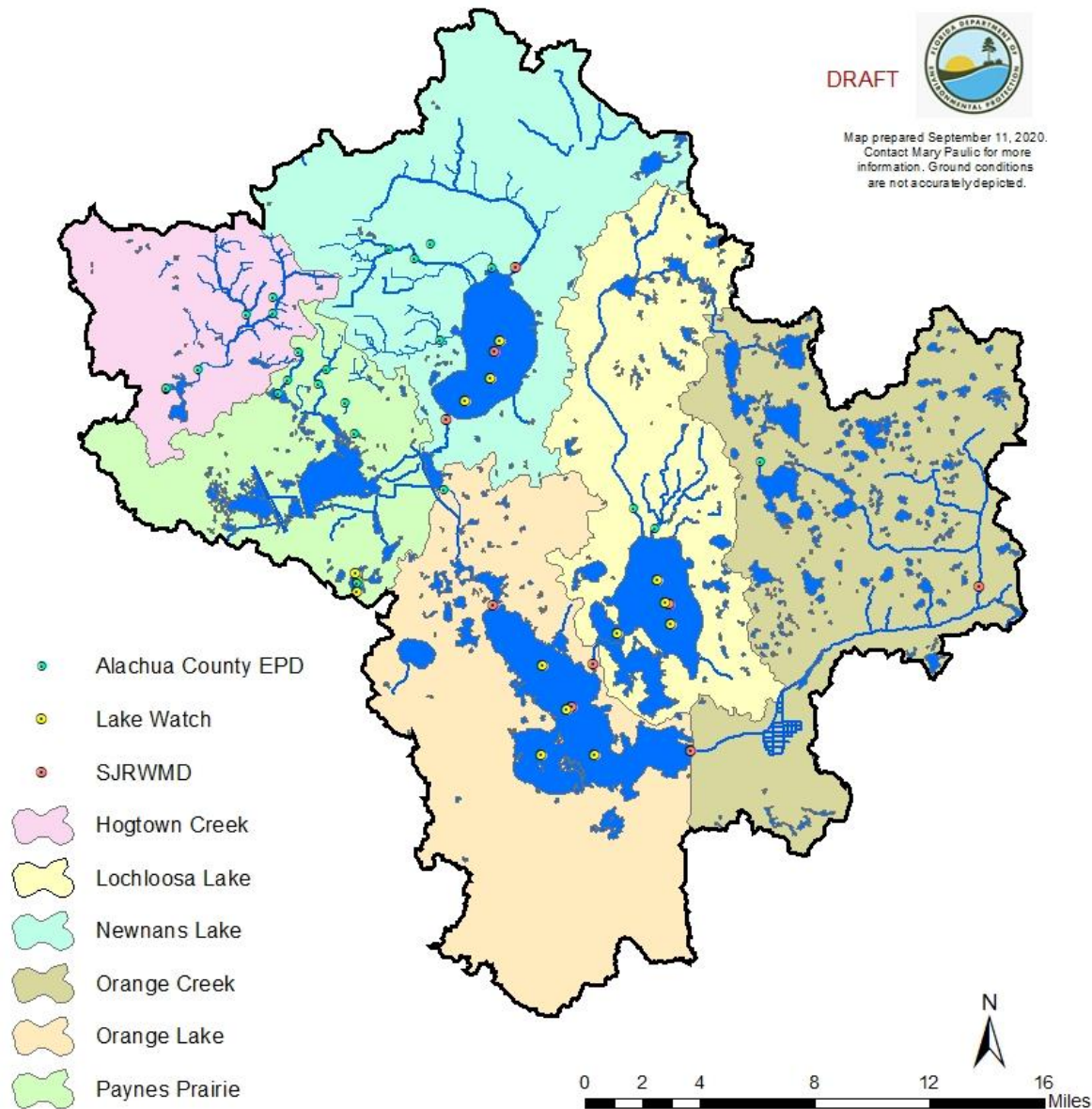
- Three primary monitoring entities
 - SJRWMD
 - Alachua County EPD
 - Lake Watch
 - FDEP does periodically sample in the basin, but it is variable by location and analyte
- Change in number of stations
 - SJRWMD dropped 12 stations
 - ACEPD added 10 stations, but dropped 3 stations
- Long term decrease in frequency of sampling
- Differences in analyte list

Orange Creek BMAP 2020 Sampling Locations

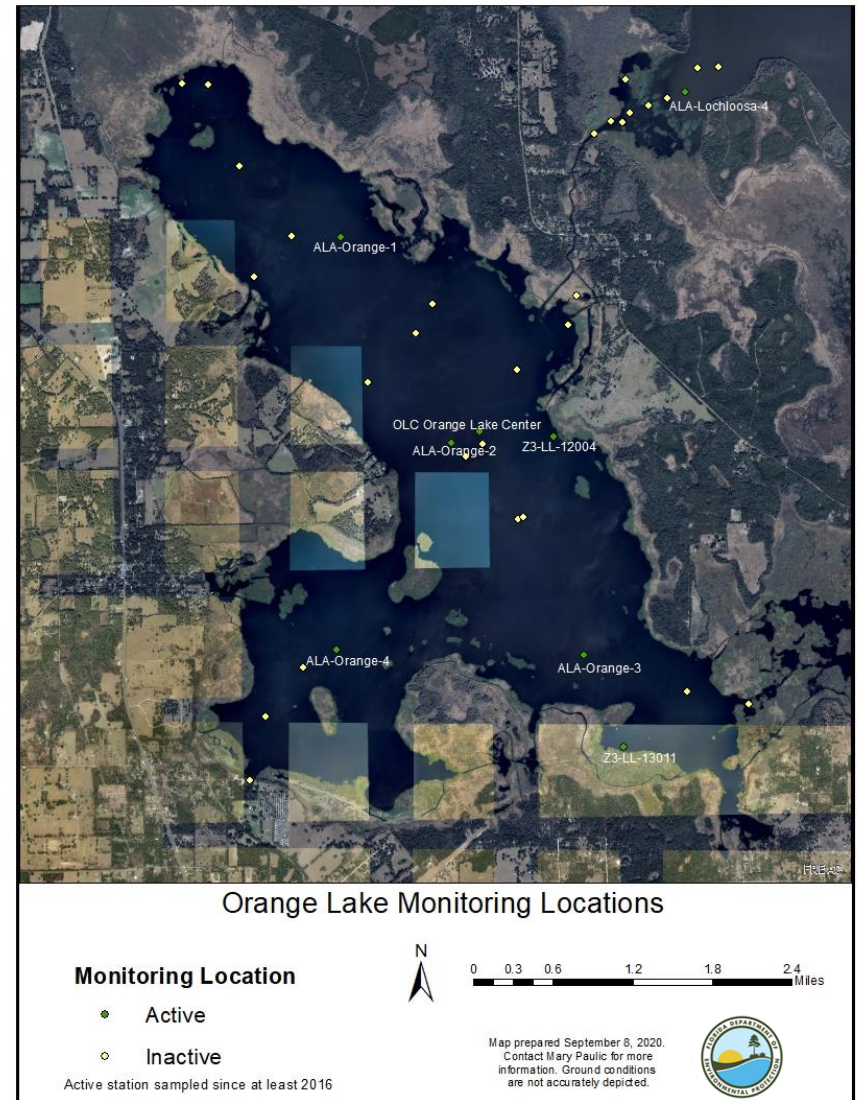
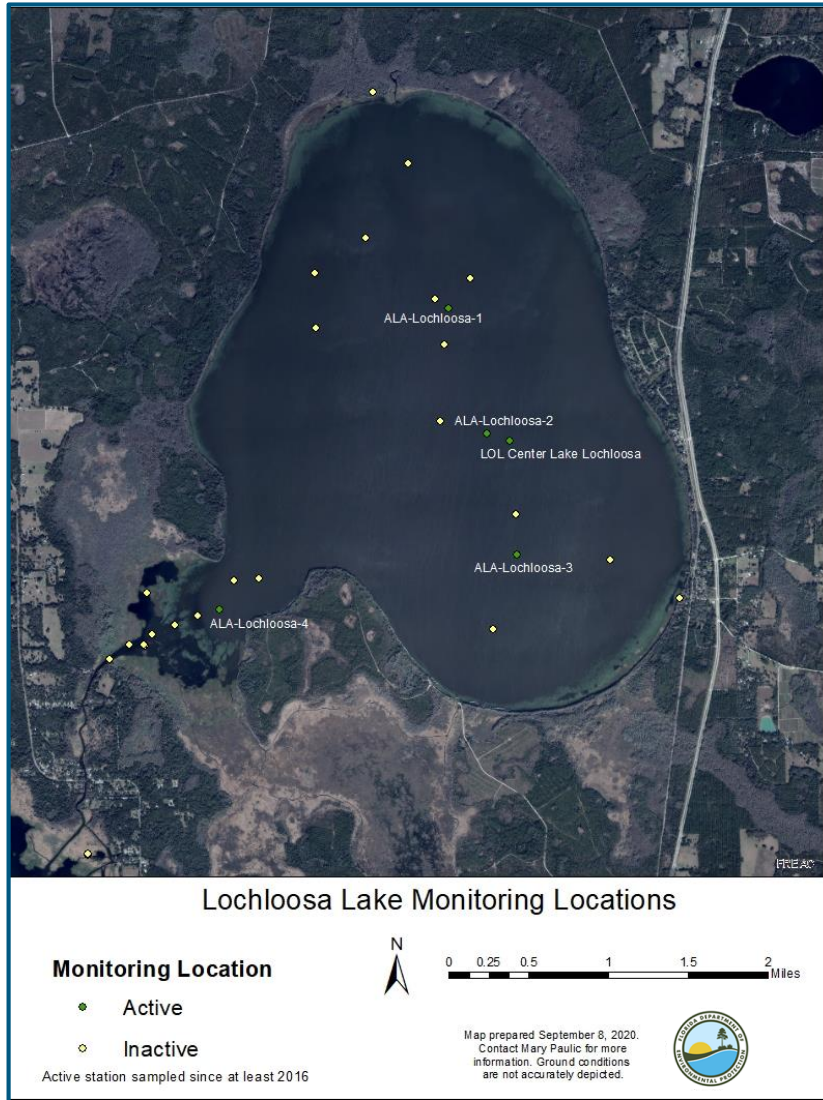
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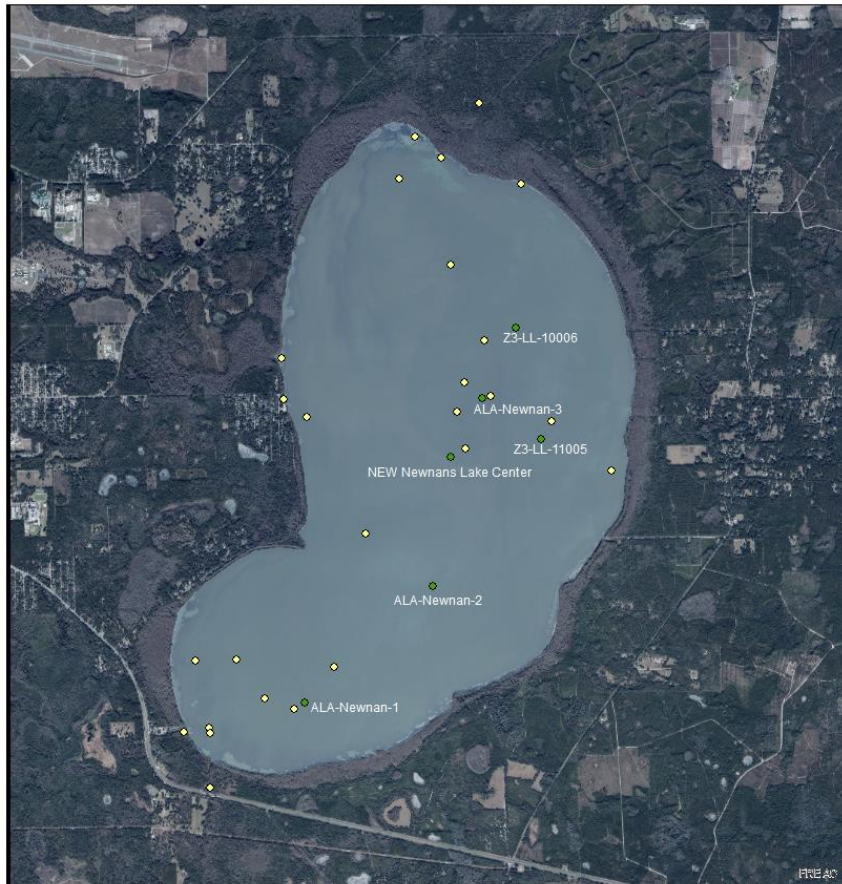
Map prepared September 11, 2020.
Contact Mary Paulic for more
information. Ground conditions
are not accurately depicted.



Lochloosa and Orange Lakes Historic Sampling Locations



Newnans and Wauberg Lakes Historic Sampling Locations



Newnans Lake Monitoring Locations

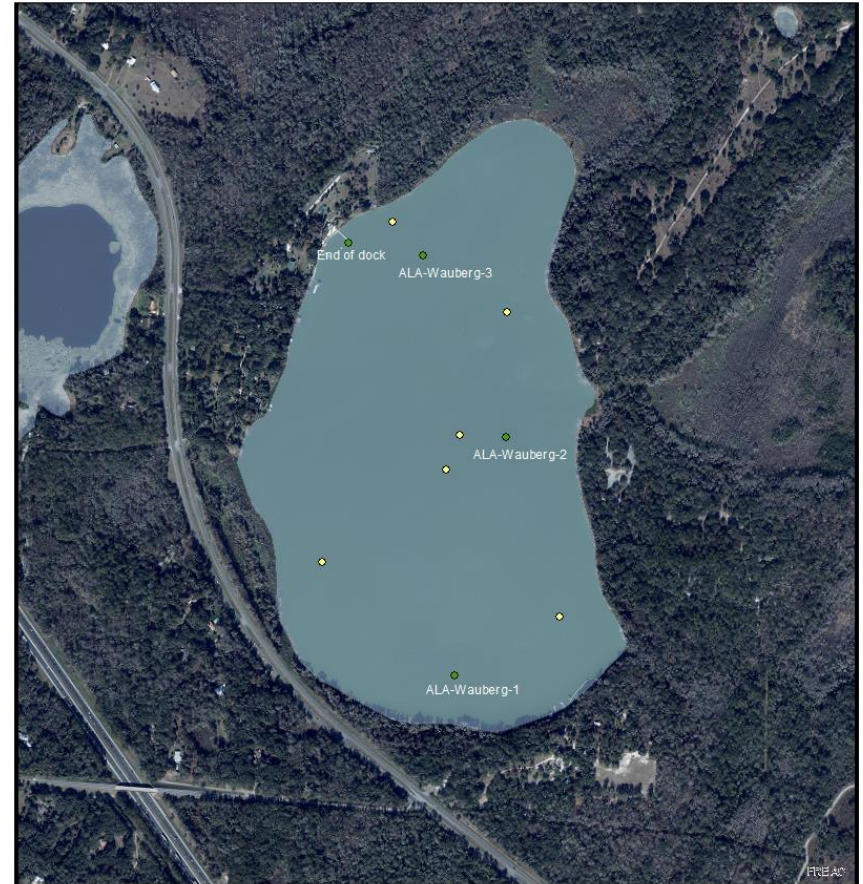
Monitoring Location

- Active
- Inactive

Active station sampled since at least 2016



Map prepared September 8, 2020.
Contact Mary Paulic for more
information. Ground conditions
are not accurately depicted.

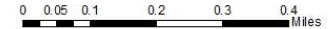


Lake Wauberg Monitoring Locations

Monitoring Location

- Active
- Inactive

Active station sampled since at least 2016



Map prepared September 8, 2020.
Contact Mary Paulic for more
information. Ground conditions
are not accurately depicted.





SJRWMD Monitoring Locations

Water Quality

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Sub-basin	Entity	Station ID	Station Description	Sampling Frequency	Year Site Est.	Analytes
Newnans Lake and Hatchet Creek	SJRWMD	NEW	Newnans Lake center	Bimonthly	1994	Field parameters; Water chemistry; Chlorophyll-a; Light attenuation;
Newnans Lake and Hatchet Creek	SJRWMD	HAT26	Hatchet Creek at SR 26	Bimonthly	1994	Field parameters; Water chemistry
Newnans Lake and Hatchet Creek	SJRWMD	PC20	Prairie Creek at SR 20	Bimonthly	1998	Field parameters; Water chemistry
Orange Lake	SJRWMD	OLC	Orange Lake center (between Cow Hammock & Samsons Point)	Bimonthly	1994	Field parameters; Water chemistry; Chlorophyll-a; Light attenuation;
Orange Lake	SJRWMD	OC301	Orange Lake outlet west of US 301	Bimonthly	1994	Field parameters; Water chemistry
Orange Lake	SJRWMD	CCN325	Cross Creek about 50 feet north of County Road (CR) 325 bridge	Bimonthly	1994	Field parameters; Water chemistry
Orange Lake	SJRWMD	STX346	River Styx at CR 346	Bimonthly	1994	Field parameters; Water chemistry
Lake Lochloosa	SJRWMD	LOL	Lochloosa Lake center	Bimonthly	2003	Field parameters; Water chemistry; Chlorophyll-a; Light attenuation;



SJRWMD Monitoring Locations

Discharge and Water Level

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Sub-basin	Entity	Station ID	Station Description	Station Type
Sweetwater Branch	SJRWMD	1980199	Sweetwater Branch	Discharge
Newnans Lake	SJRWMD	8631958	Prairie Creek	Discharge
Orange Lake	SJRWMD	8661963	Camps Canal	Discharge
Orange Lake	SJRWMD	2601462	Orange Lake Outlet	Discharge
Orange Lake	SJRWMD	19274284	Cross Creek	Discharge
Orange Lake	SJRWMD	2611465	Orange Lake Boardman	Water Level
Lake Lochloosa	SJRWMD	19234272	Lochloosa Creek South	Discharge
Hatchet Creek	SJRWMD	14342633	Hatchet Creek	Discharge
Hogtown Creek	SJRWMD	8641960	Hogtown Creek at Arredondo	Discharge



ACEPD Monitoring Locations

Water Quality

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Sub-basin	Entity	Station ID	Station Description	Sampling Frequency	Year Site Est.	Analytes
Lake Wauberg	ACEPD	LWAUBERG	Center of Lake Wauberg east of US 441	Semi-annually	2007	Field; Fecal Coliform; Surface Water; Chlorophyll
Hogtown Creek	ACEPD	HOGNW16	Ring Park, north of NW 16 th Avenue	Quarterly	1998	Field; Fecal Coliform; Surface Water
Hogtown Creek	ACEPD	HOG30US	North side of CR 30 (SW 20 th Ave) upstream of bridge	Quarterly	1999	Field; Fecal Coliform; Surface Water
Hogtown Creek	ACEPD	HOGSINK	Hogtown Creek approx. 100 meters upstream of Haile Sink	Quarterly	1998	Field; Fecal Coliform; Surface Water ; Flow
Hogtown Creek	ACEPD	POSNW16	South of NW 16th Ave west of NW 27th Terr.	Quarterly	1996	Field; Fecal Coliform; Surface Water
Hogtown Creek	ACEPD	GLENSP	Glen Springs at spring boil in the concrete pool	Quarterly	2005	Field; Flow; Micro; Surface Water
Sweetwater Branch	ACEPD	SWBSE4	Site is east of SE 4th St between SE 13th Lane and SE 11th Place.	Quarterly	2003	Field; Fecal Coliform; Surface Water ; Flow
Sweetwater Branch	ACEPD	SWB331	West of SR 331 (Williston Rd) just north of SE 16th Ave.	Quarterly	1994	Field; Fecal Coliform; Surface Water; Chlorophyll (if also sampling on Paynes Prairie)
Tumblin Creek	ACEPD	TUMSW5	South of SW 5th Ave between SW 8th St and SW 10th St.	Quarterly	2001	Field; Fecal Coliform; Surface Water ; Flow



ACEPD Monitoring Locations

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Sub-basin	Entity	Station ID	Station Description	Sampling Frequency	Year Site Est.	Analytes
Tumblin Creek	ACEPD	BIVARM	Bivens Arm Lake at US 441	Semi-annually	1998	Field; Surface Water; Chlorophyll
Alachua Sink	ACEPD	ALACHCHAN	Channel at Alachua Sink leading to the Primary Sink Feature	Quarterly	1990	Field; Flow; Surface Water
Alachua Sink	ACEPD	BOULSP	Boulware Spring at the spring boil near base of concrete wall	Quarterly	2000	Field; Flow; Surface Water



ACEPD New Stations

Transferred from SJRMWD

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Sub-basin	Entity	Station ID	Station Description	Sampling Frequency	Year Site Est.	Analytes
Hatchet Creek	ACEPD	GRSC	Gum Root Swamp Creek NE of Gainesville Airport (GRU system key)	Quarterly	2009	Field, Flow, Surface Water
Hatchet Creek	ACEPD	LHATNB	North branch of Little Hatchet Creek downstream NE 52nd Drive	Quarterly	1996	Field, Surface Water
Hatchet Creek	ACEPD	LHAT26E	Little Hatchet Creek East Branch	Quarterly	1994	Field, Flow, Surface Water
Hatchet Creek	ACEPD	LHAT26	Little Hatchet Creek upstream of SR 26	Quarterly	1994	Field, Flow, Surface Water
Lake Forest Creek	ACEPD	LFC329B	Upstream of CR 329B on Lake Forest Creek	Quarterly	1998	Field, Flow, Surface Water
Camps Canal	ACEPD	CAMPSCANAL	Upstream of CR 234 at water level gauge on Camps Canal	Quarterly	1948	Field, Flow, Surface Water
Lochloosa Creek	ACEPD	LC1LB	Lochloosa Creek at One Lane Bridge	Quarterly	2003	Field, Flow, Surface Water
Lochloosa Creek	ACEPD	CELCS	West Hawthorne Branch Creek East of Lochloosa Creek South	Quarterly	2006	Field, Flow, Surface Water
Little Orange Creek	ACEPD	LORC65	Little Orange Creek upstream of SE 65th Lane	Quarterly	2009	Field, Flow, Surface Water



ACEPD Monitoring

*Discharge and Water Level**

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Sub-basin	Entity	Station ID	Station Description	Station Type	Date Established
Newnans Lake	ACEPD	LHATWALDO	Little Hatchet Creek east of Waldo Rd.	Discharge	2008
Haile Sink	ACEPD	HAILESINK	Haile Sink (terminus of Hogtown Creek)	Stage	2009
Hogtown Creek	ACEPD	HOGNW16	Hogtown Creek south of NW 16th Avenue	Discharge	2005
Hogtown Creek	ACEPD	POSNW16	Possum Creek south of NW 16th Avenue	Discharge	2004
Little Hatchet Creek	ACEPD	LHATNB	North Branch of Little Hatchet Creek downstream of NE 52nd Dr	Discharge	
Tumblin Creek	ACEPD	TUM441	Tumblin Creek west of US Hwy. 441	Discharge	2006

*Funded by City of Gainesville Public Works Department and Alachua County Public Works Department



Lake Watch Monitoring

Water Quality

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Sub-basin	Entity	Station ID	Station Description	Sampling Frequency	Year Site Est.	Analytes
Lochloosa Lake	Lake Watch	Lochloosa Lake ALA-Lochloosa-1 ALA-Lochloosa-2 ALA-Lochloosa-3 ALA-Lochloosa-4	4 sampling locations	Approximately Monthly; Annual Vegetation Survey	Unknown	TN, TP, Secchi depth, and chlorophyll-a
Newnans Lake	Lake Watch	Newnans Lake ALA-Newnan-1 ALA-Newnan-2 ALA-Newnan-3	3 sampling locations	Approximately Monthly; Annual Vegetation Survey	Unknown	TN, TP, Secchi depth, and chlorophyll-a
Orange Lake	Lake Watch	Orange Lake ALA-Orange-1 ALA-Orange-2 ALA-Orange-3 ALA-Orange-4	4 sampling locations	Approximately Monthly; Annual Vegetation Survey	Unknown	TN, TP, Secchi depth, and chlorophyll-a
Lake Wauberg	Lake Watch	Lake Wauberg ALA-Wauberg-1 ALA-Wauberg-2 ALA-Wauberg-3	3 sampling locations	Approximately Monthly	1990	TN, TP, Secchi depth, and chlorophyll-a



Monitoring Analytes

As Listed in 2014 BMAP

INDICATOR	PARAMETER	LAKES	CREEKS
Core	Chlorophyll-a	Decrease in concentration	Not applicable
Core	Phosphorus	Decrease in concentration	Decrease in concentration
Core	Nitrogen, Nitrite and Nitrate	Decrease in concentration	Decrease in concentration
Core	Total Kjeldahl Nitrogen	Decrease in concentration	Decrease in concentration
Core	Fecal coliform	Not applicable	Decrease in concentration; fewer exceedances of criteria
Supplemental	Specific conductance	Monitored to facilitate interpretation of core indicator trends	Not applicable
Supplemental	Dissolved oxygen	Monitored to facilitate interpretation of core indicator trends	Not applicable
Core	Alkalinity	Monitored to facilitate interpretation of core indicator trends	Not applicable
Supplemental	pH	Monitored to facilitate interpretation of core indicator trends	Not applicable
Supplemental	Temperature	Monitored to facilitate interpretation of core indicator trends	Not applicable
Supplemental	Color	Monitored to facilitate interpretation of core indicator trends	Not applicable
Supplemental	Turbidity	Monitored to facilitate interpretation of core indicator trends	Monitored to facilitate interpretation of core indicator trends
Supplemental	Total suspended solids	Monitored to facilitate interpretation of core indicator trends	Monitored to facilitate interpretation of core indicator trends
Supplemental	Total organic carbon	Monitored to facilitate interpretation of core indicator trends	Monitored to facilitate interpretation of core indicator trends



Analyte Checklist

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Entity	Core Lakes	Supplemental Lakes
SJRWMD	All	All
Alachua County EPD	All	Everything but TOC
Lake Watch	Partial, missing alkalinity	None

Entity	Core Streams	Supplemental Streams
Alachua County EPD	All	Everything but TOC and TSS



Water Quality Update

- Data extracted from IWR or Impaired Waters database
 - Supplemented with 2019/2020 data from SJRWMD
- For annual means required data in all 4 quarters of the year.
- Geometric means require data in 2 seasons and minimum of samples
- Corrected chlorophyll a used for all analyses after 2012



Lake Nutrient Targets

Lake	TN TMDL Target (mg/L)	TP TMDL Target (mg/L)	Chlorophyll <i>a</i> TMDL Target (µg/L)	TSI TMDL Target
Lochloosa	1.15	0.055	38*	N/A
Newnans	0.97	0.062	57.6	65
Orange	N/A	0.031	24.1	60
Wauberg	1.01	0.056	29.2	60

*=7 year average of annual geometric mean (AGM)

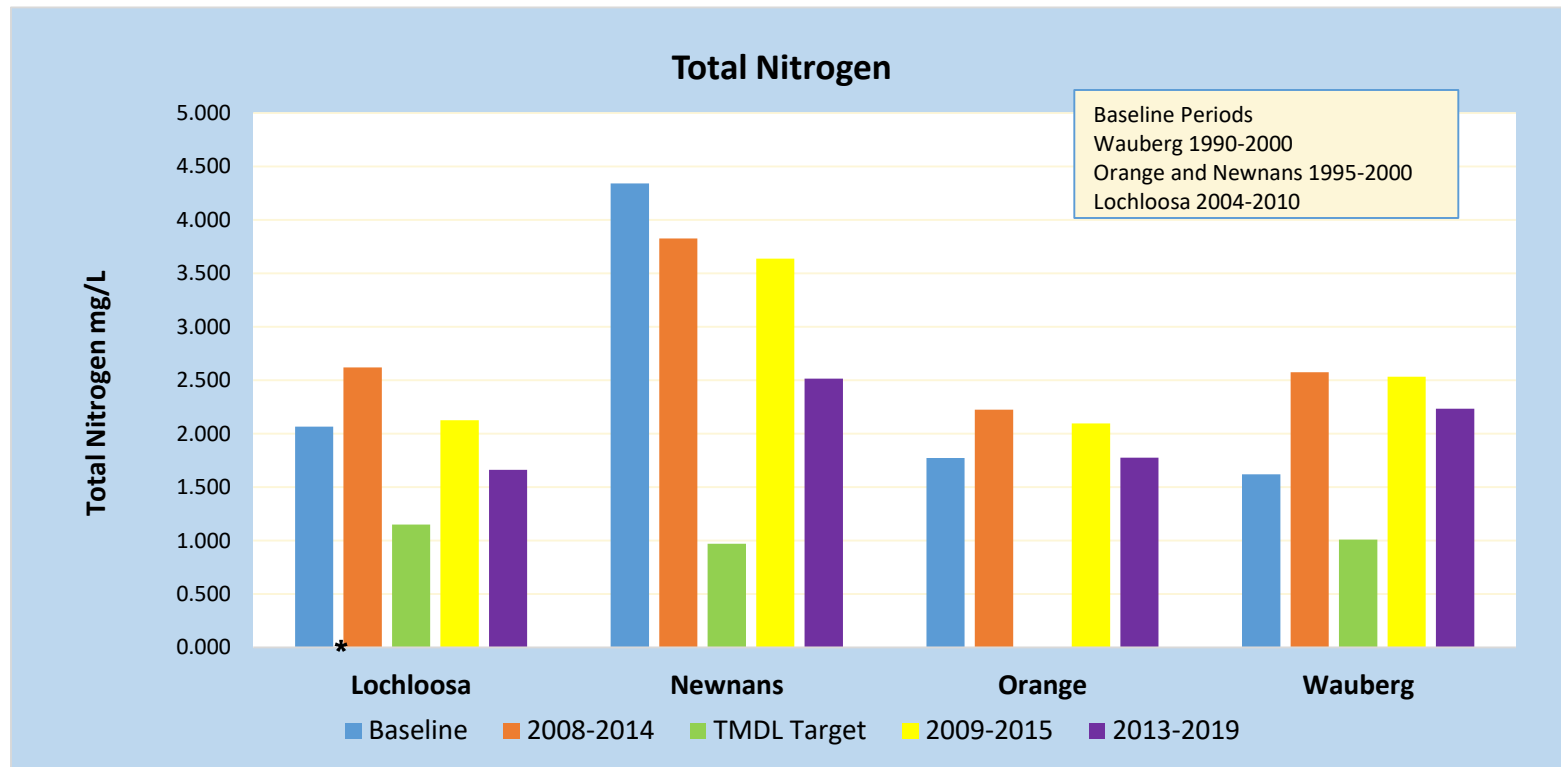
TN and TP for Lochloosa Lake are geometric means

TSI=Trophic State Index



Total Nitrogen

Draft data subject to change

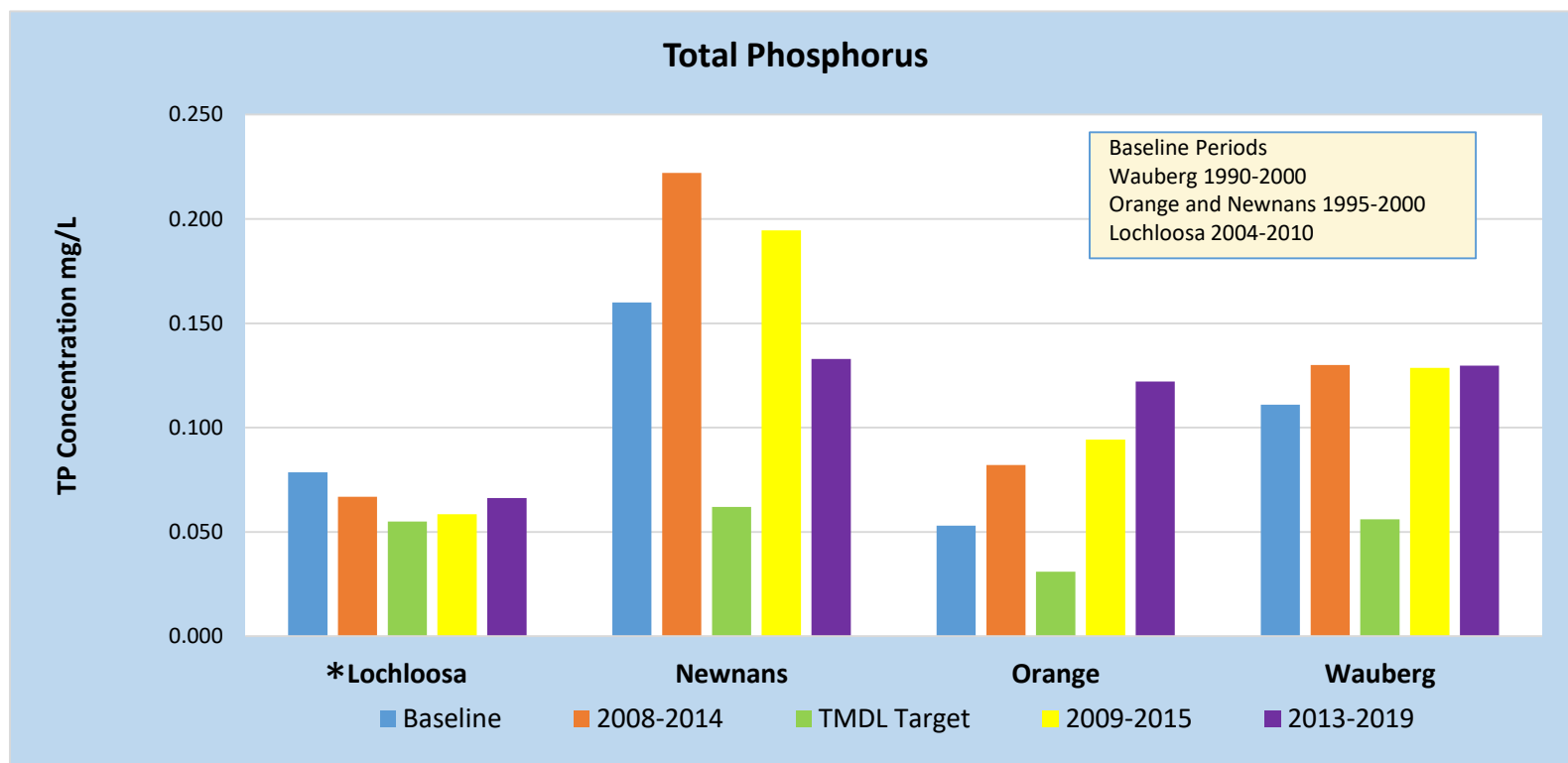


*Lochloosa numbers are annual geometric means.



Total Phosphorus

Draft data subject to change

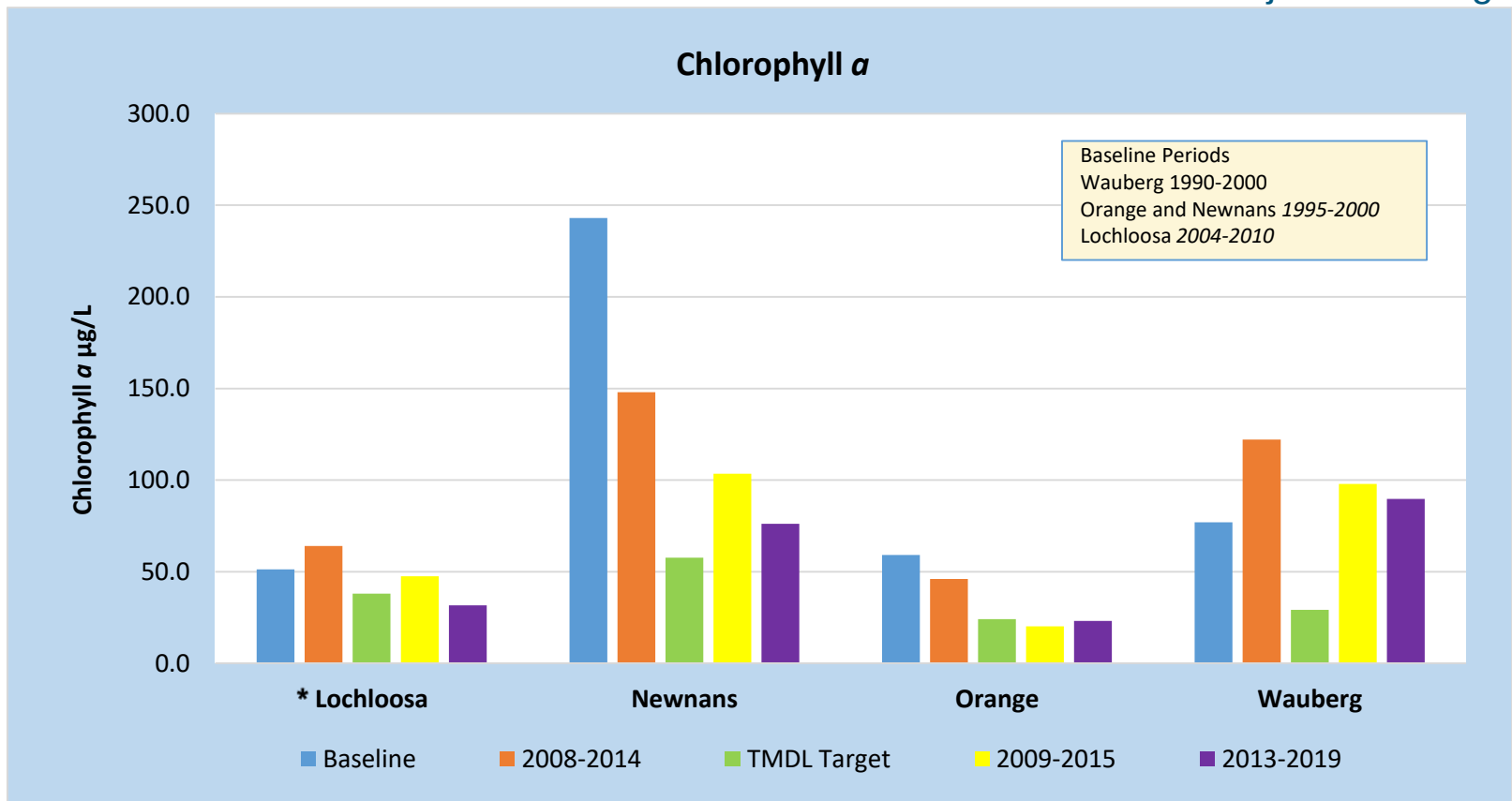


*Lochloosa numbers are annual geometric means.



Chlorophyll *a*

Draft data subject to change



*Lochloosa numbers are annual geometric means.



Observations

- What is happening in different lakes?

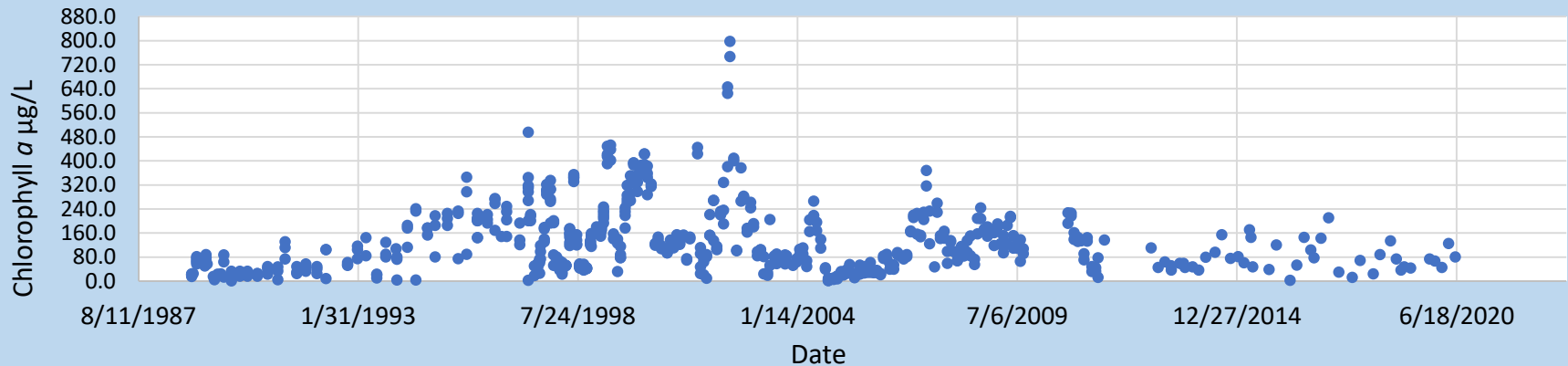


Newnans Lake

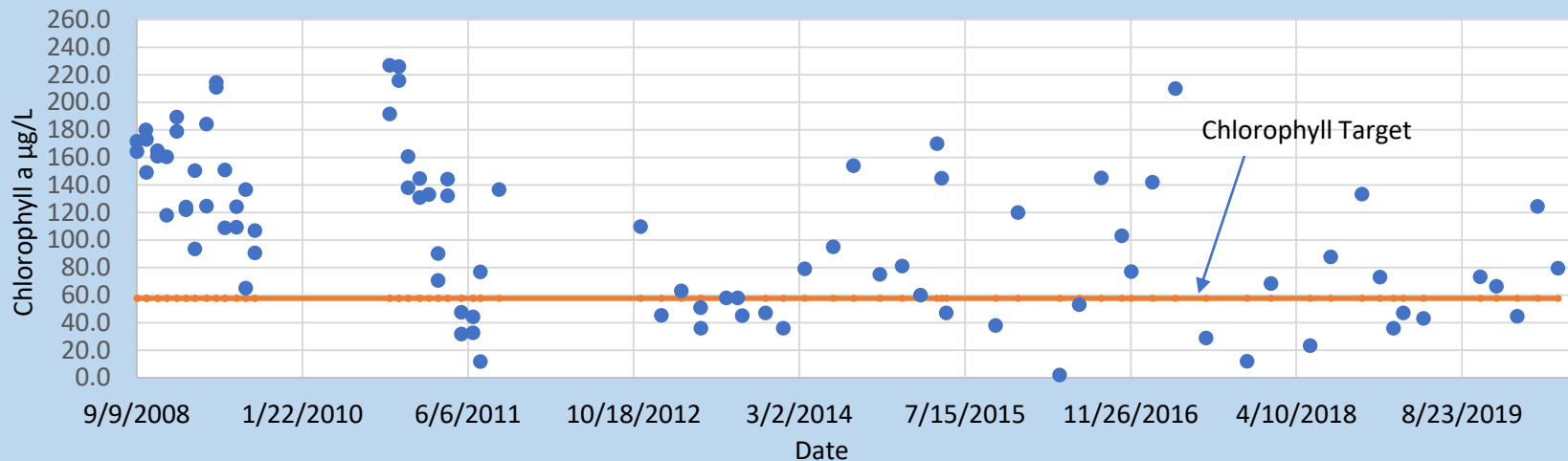
Chlorophyll a Time Series

Draft data subject to change

Newnans Lake Chlorophyll *a* Corrected Time Series



Newnans Lake Chlorophyll *a* Corrected 2008-2020

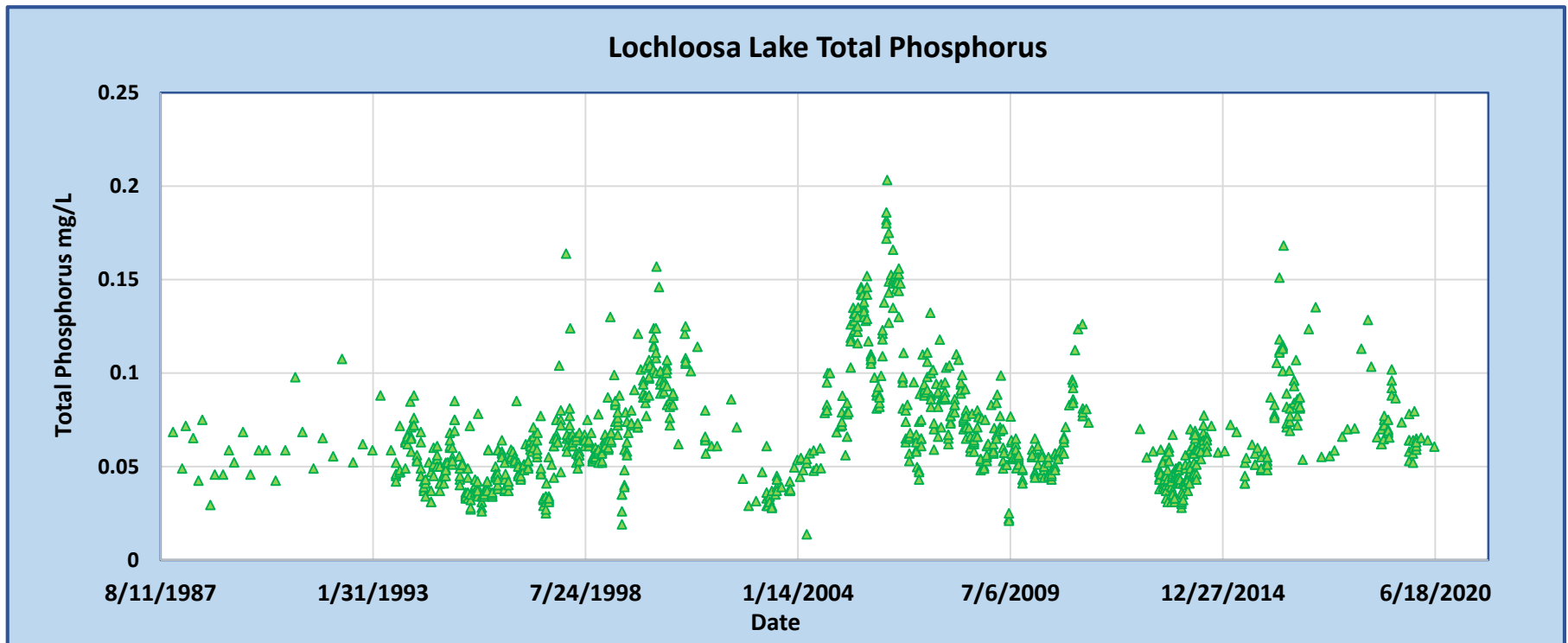




Lochloosa Lake

Total Phosphorus Time Series

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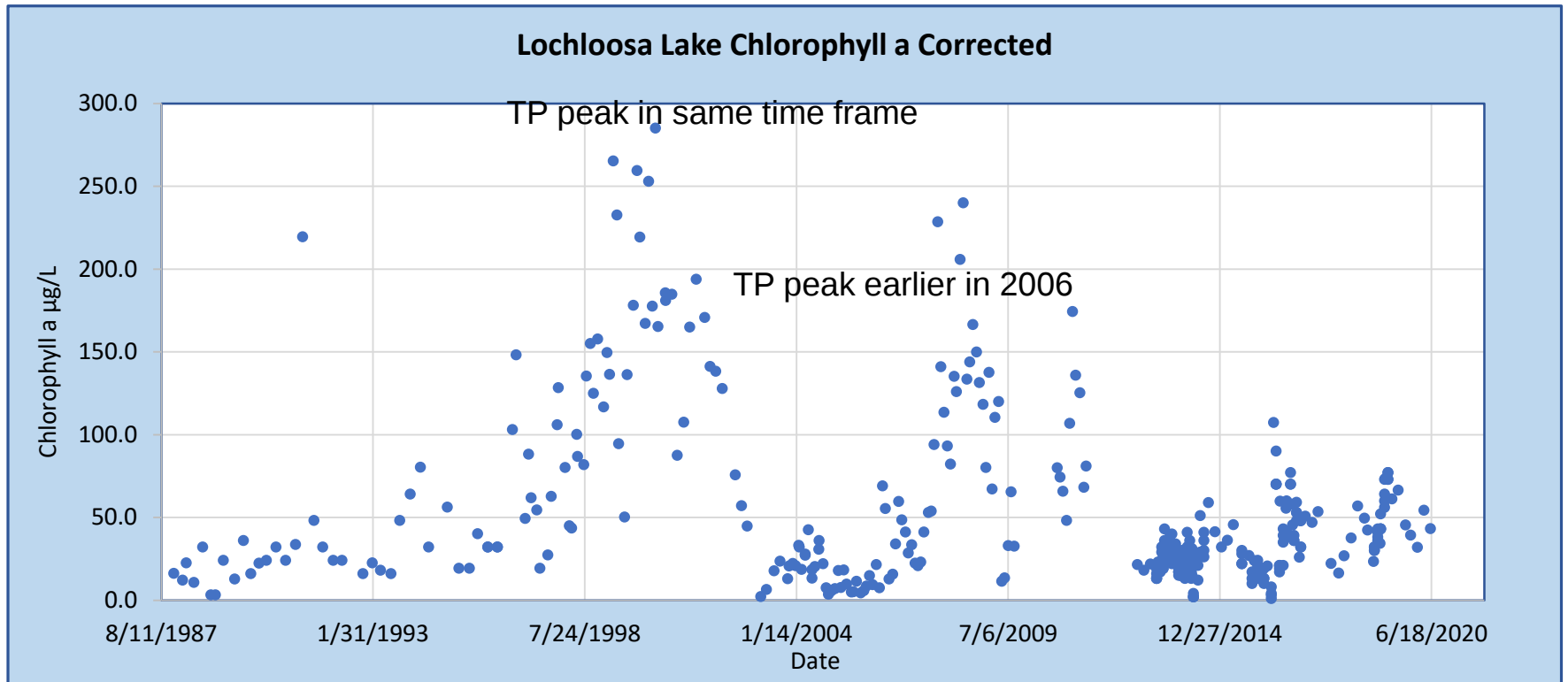




Lochloosa Lake

Chlorophyll a Time Series

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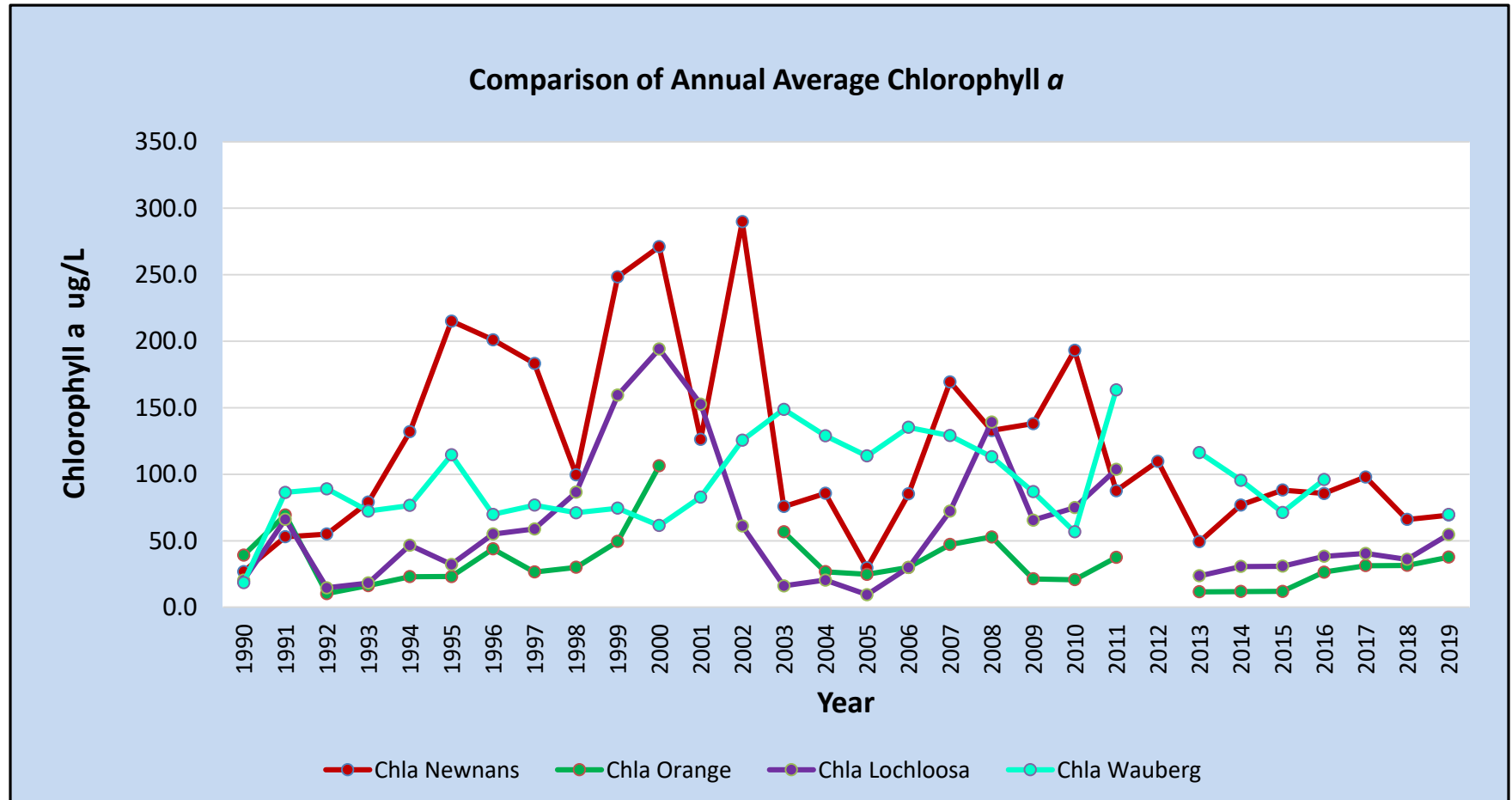




Comparison of Annual Averages

Corrected Chlorophyll a

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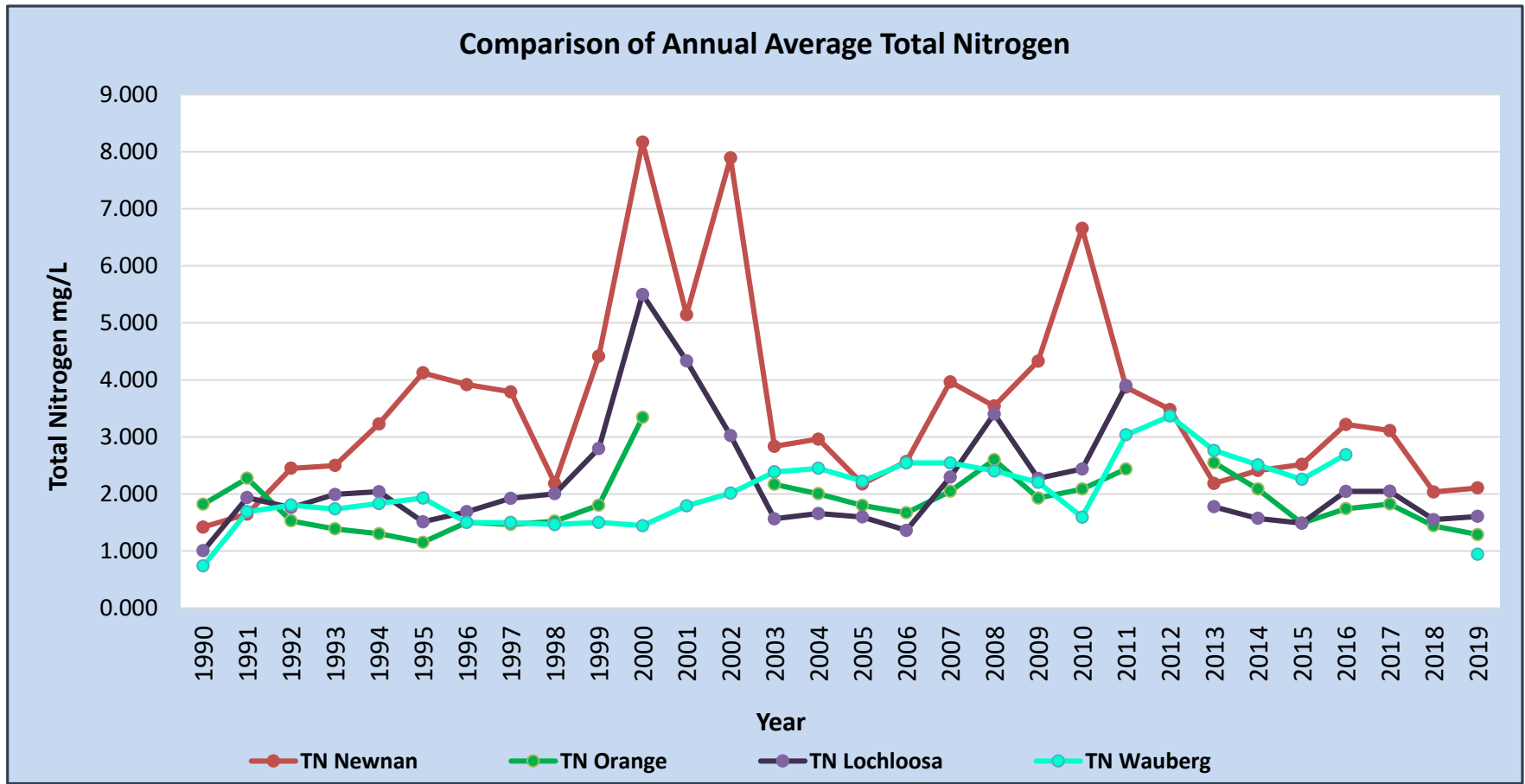
For comparison purposes Lochloosa values are arithmetic means.



Comparison of Annual Averages

Total Nitrogen

Draft data subject to change



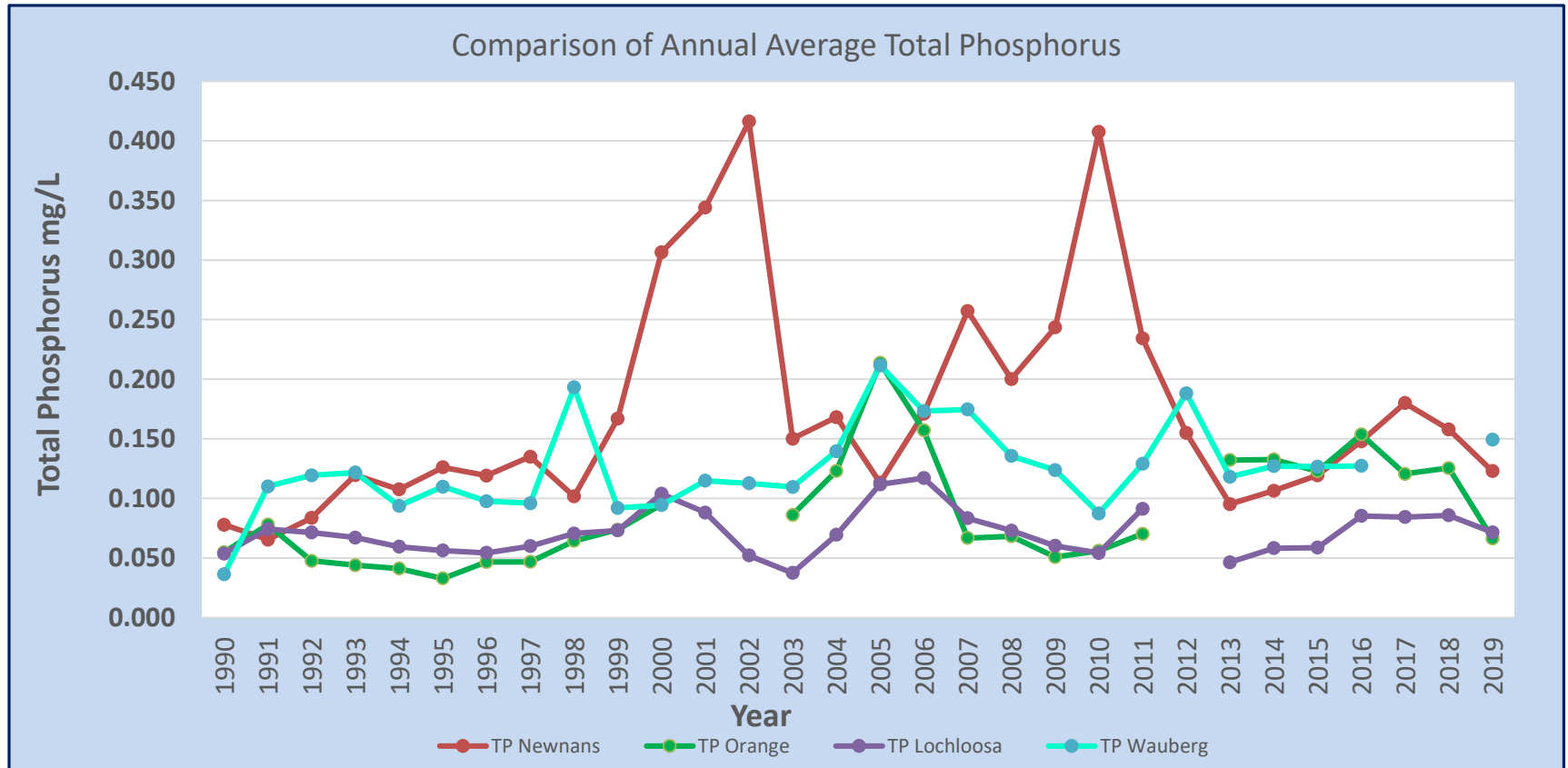
For comparison purposes Lochloosa values are arithmetic means.



Comparison of Annual Averages

Total Phosphorus

Draft data subject to change



For comparison purposes Lochloosa values are arithmetic means.



Questions

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• Any comments or questions???

