



CHAIN O' LAKES MONITORING

Diane Tancil

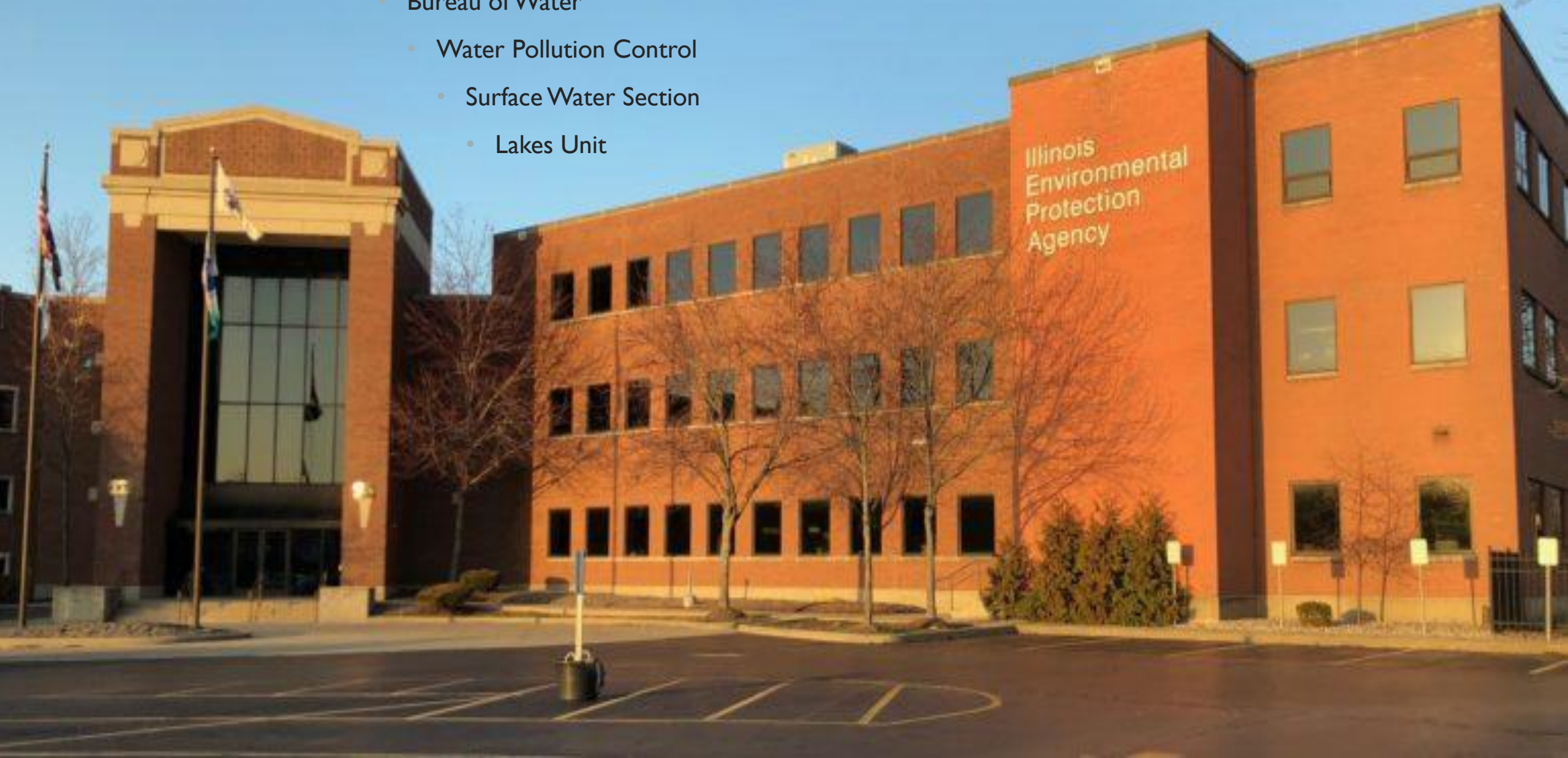
Illinois EPA-Surface Water Section

Lakes Unit

Diane.Tancil@illinois.gov

847-294-4105

- Illinois Environmental Protection Agency
 - Bureau of Water
 - Water Pollution Control
 - Surface Water Section
 - Lakes Unit



- Monitoring Data-Regulation
 - 305(b) Assessments
 - 303(d) List
 - 314 (a)(1)
 - TMDL development
 - 319 Watershed plans
 - Standards Development



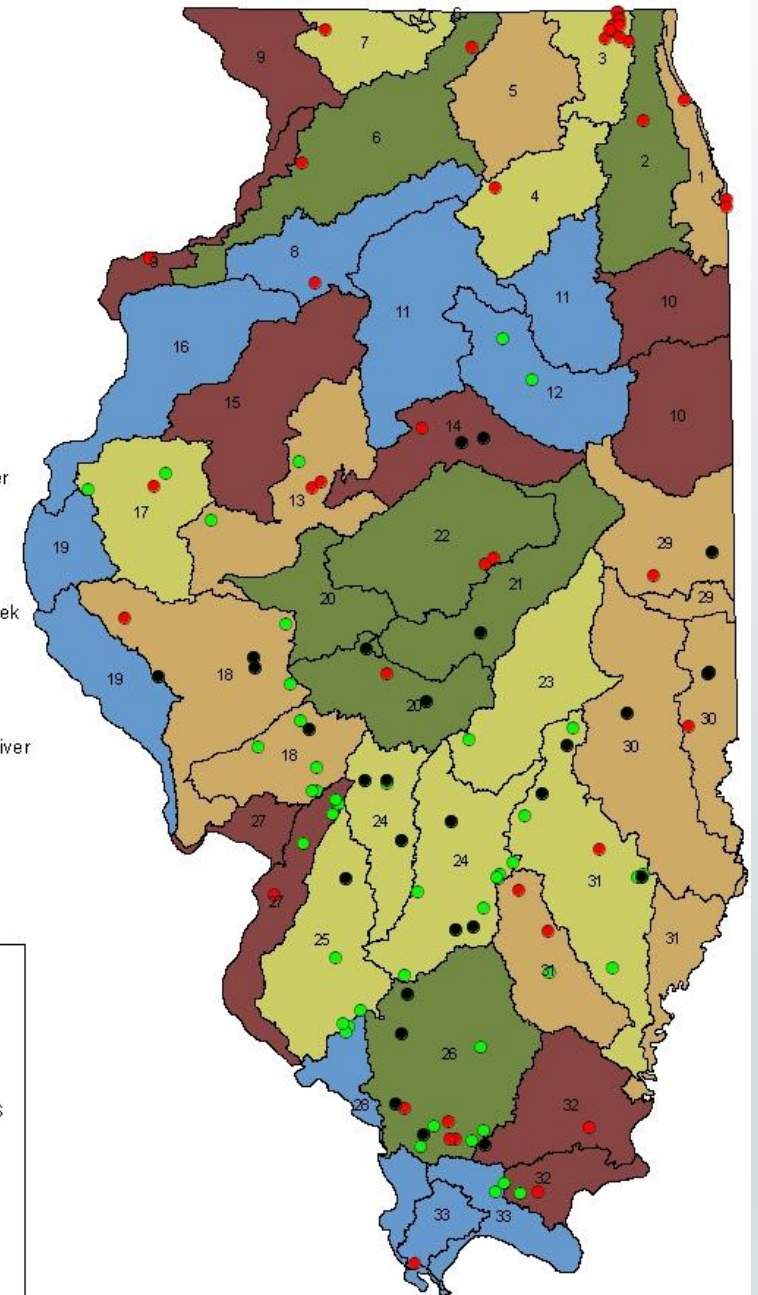
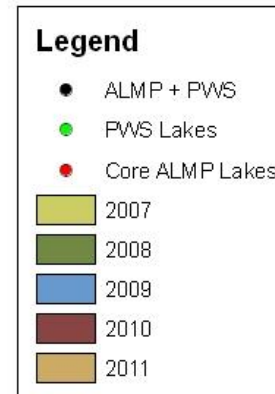
- **Ambient Lake Monitoring Program**

- 5 year Basin Rotation
- 45 lakes per year
- 3 regional offices
 - Des Plaines, Springfield, and Marion

- **Chain O' Lakes**

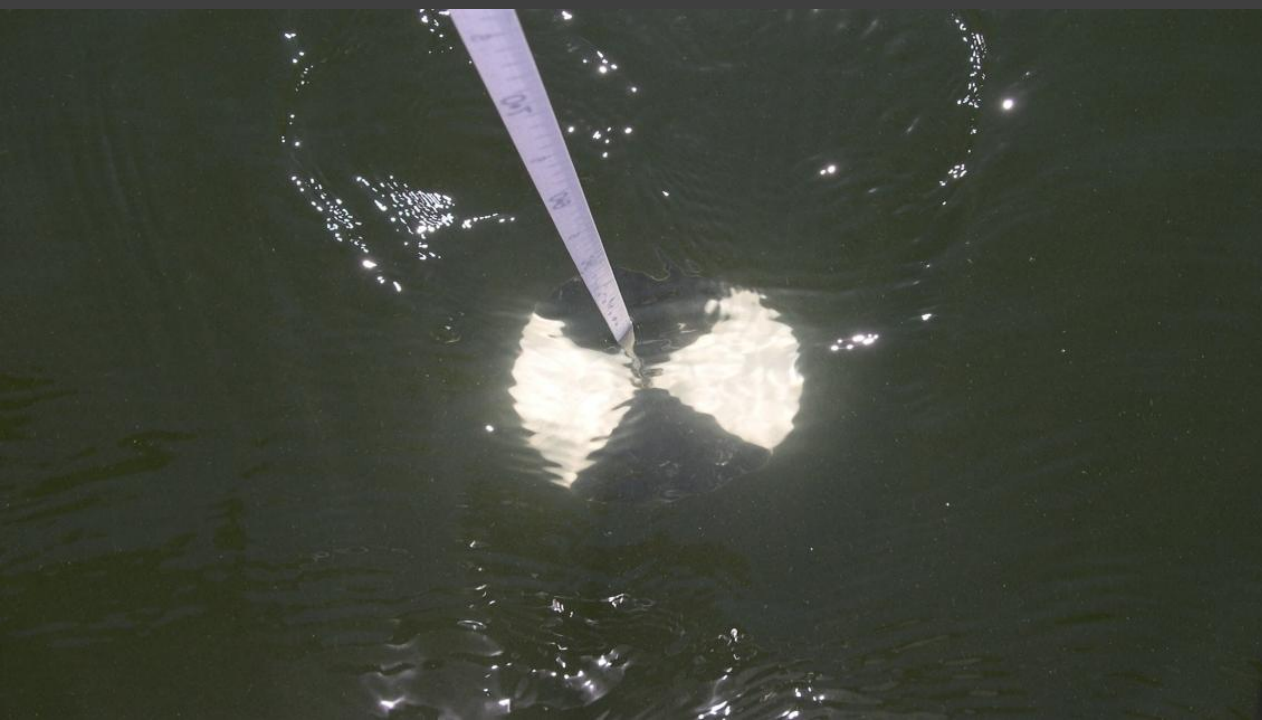
- 9 main lakes are Core Lakes
 - Channel, Catherine, Marie, Bluff, Petite, Grass, Nippersink, Fox, and Pistakee
- Dunns, Redhead, and Spring are additional

Basin #	Basin Name
1	Great Lakes/Calumet River
2	Des Plaines River
3	Upper Fox River
4	Lower Fox River
5	Kishwaukee River
6	Rock River
7	Pecatonica River
8	Green River
9	Mississippi River North
10	Kankakee River/Aroquois River
11	Upper Illinois River/Mazon River
12	Vermilion River (Illinois R.)
13	Middle Illinois River
14	Mackinaw River
15	Spoon River
16	Mississippi River North Central
17	La Moine River
18	Lower Illinois River/Macoupin River
19	Mississippi River Central
20	Lower Sangamon River
21	Upper Sangamon River
22	Salt Creek of Sangamon
23	Upper Kaskaskia River
24	Middle Kaskaskia River/Shoal Creek
25	Lower Kaskaskia River
26	Big Muddy River
27	Mississippi River South Central
28	Mississippi River South
29	Vermilion River (Wabash R.)
30	Embaras River/Middle Wabash River
31	Little Wabash River
32	Saline River/Bay Creek
33	Cache River



- Use Attainment
 - Aquatic Life Use
 - Fish Consumption
 - Aesthetic Quality Use
 - Primary Contact





- What do we collect?
 - Multiparameter meters
 - Water chemistry samples
 - Biological Samples
 - Physical observations

MULTIPARAMETER METERS

Fox Lake						
RTF-1						
Date / Time	Temp [°C]	pH [Units]	SpCond [µS/cm]	Dep25 [feet]	LDO% [Sat]	LDO [mg/l]
6/29/2022 12:32	25.87	8.47	921	0.6	151.7	12.12
6/29/2022 12:33	25.41	8.47	920	1.3	151.4	12.21
6/29/2022 12:34	24.4	8.44	920	2.9	142.2	11.67
6/29/2022 12:34	23.99	8.33	924	5.3	117.1	9.69
6/29/2022 12:35	23.91	8.26	926	7	102.5	8.49
6/29/2022 12:36	23.84	8.18	928	8.8	89.4	7.41
6/29/2022 12:38	23.6	7.78	936	11.5	34.1	2.84

WATER CHEMISTRY

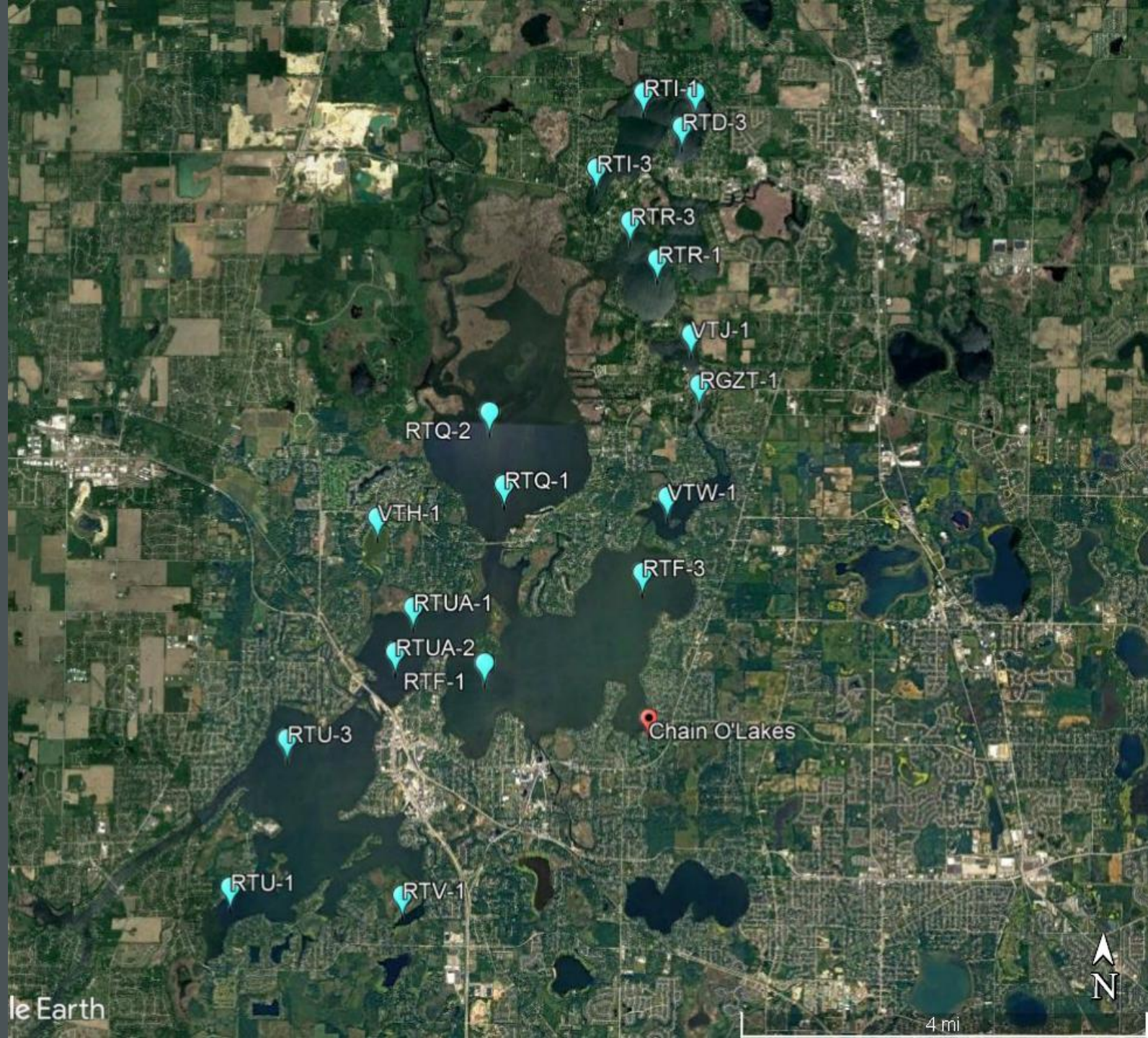
- Phosphorus
- Dissolved Phosphorus
- Total Kjeldahl Nitrogen
- Ammonia, Nitrogen
- Nitrate+Nitrite
- Alkalinity
- Total Suspended Solids
- Volatile Suspended Solids

- Chlorides
- Chlorophyll, a
- Chlorophyll, b
- Chlorophyll, c
- Microcystin
- Cylindrospermopsin

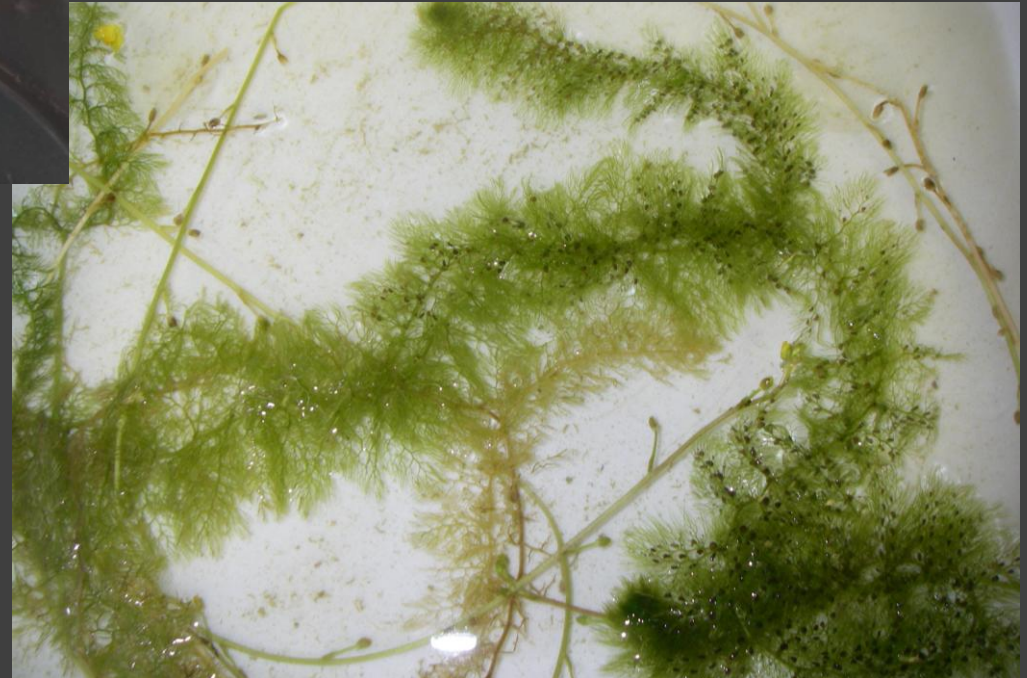


IL EPA WATER STATIONS

- Core Lakes: sampled every 3 years from the 90's until 2007, then every 5 years.
- Channel, Catherine, Bluff, Marie, Petite, Grass, Fox, Nippersink, Pistakee
- Dunns, Redhead, and Spring added when possible



- Sampling Biology
- Macrophyte Surveys
- Macroinvertebrate Surveys







LAKE MACROINVERTEBRATE INDEX

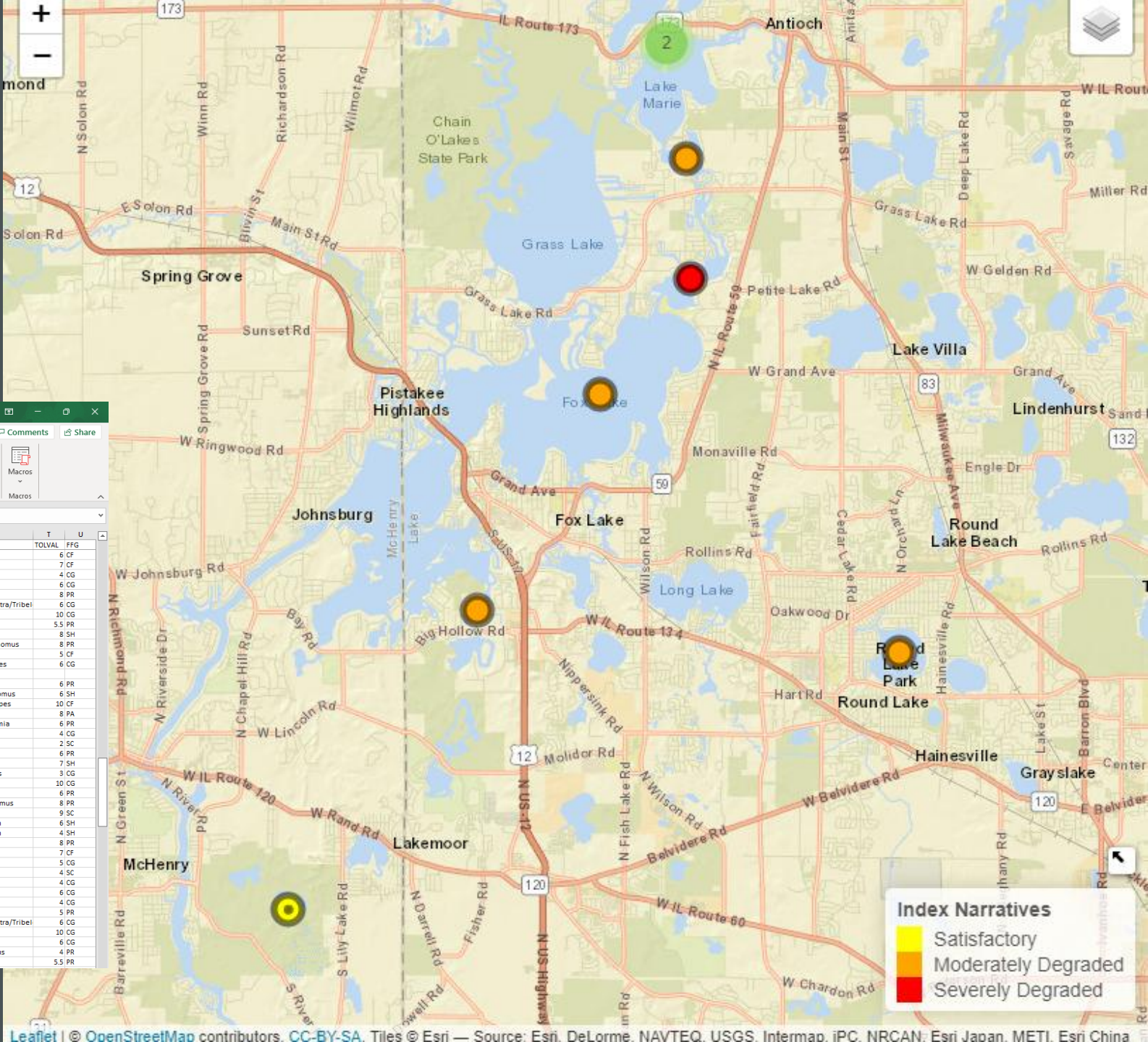
AutoSave

chabugs and surrounding.csv

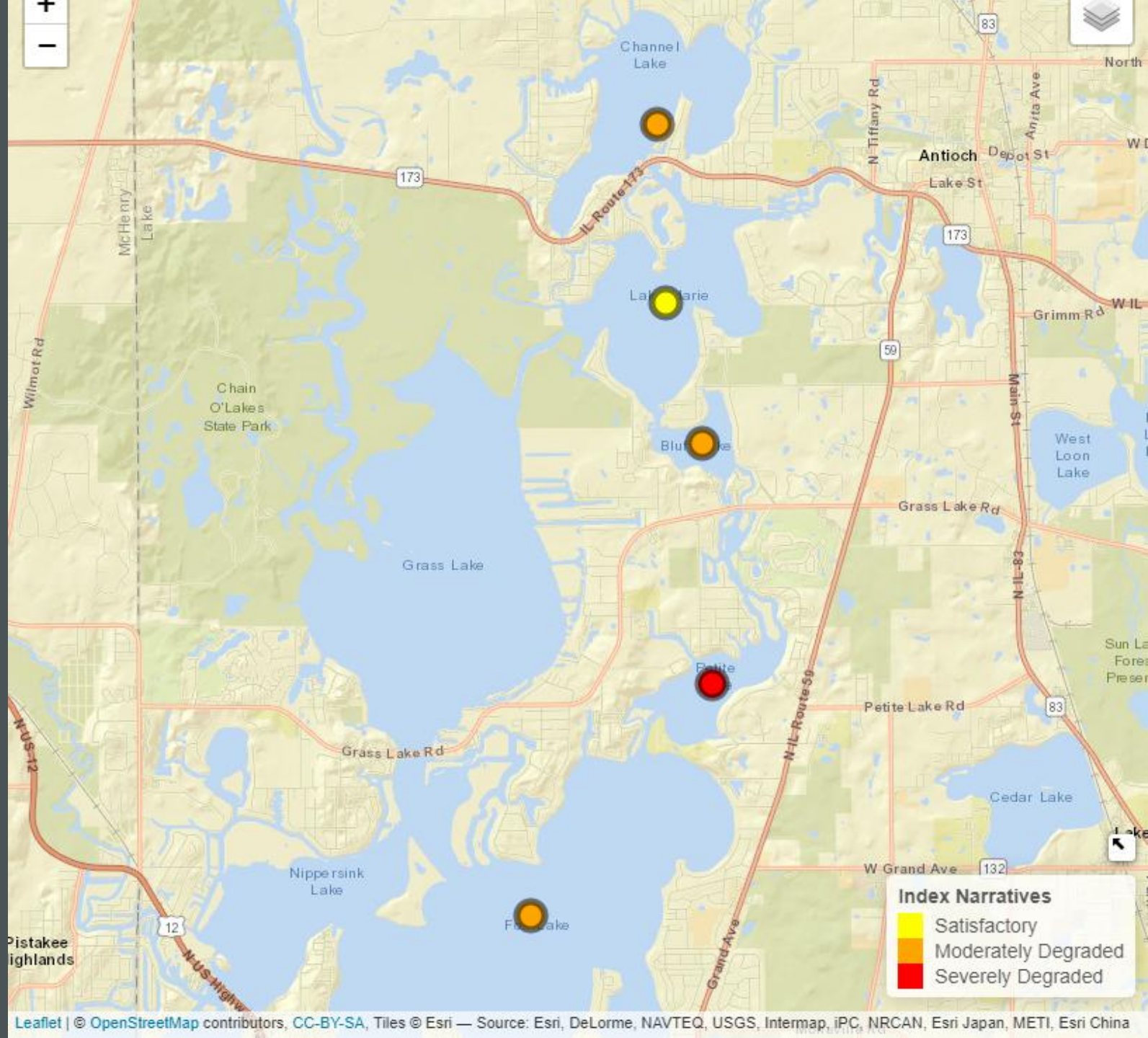
Search (Alt+Q)

TanCl, Diane

File	Home	Insert	Page Layout	Formulas	Data	Review	View	Help	Comments	Share																	
Default	Keep	Exit	New	Options	Normal	Page Break Preview	Page Layout	Custom Views	Gridlines	Headings	Zoom	100%	Zoom to Selection	New Window	Arrange All	Freeze Panes	Split	Hide	Switch Windows	Macros	Macros						
Sheet View		Workbook Views		Show		Zoom		Window		Macros																	
N27																											
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
INDEX	N_INDEX	RELAT	LONG	SAMPLE	LAKECODI	COLDATE	COLMETI	TANVID	N_TAKA	EXCLUDE	NONTARI	PHYLLUM	CLASS	ORDER	FAMILY	SUBFAMI	TRIBE	GENUS	TOLVAL	FIG							
137	1FEA_2022_North	42.118637	-88.22662	RTB	7/20/2017	RTF	7/20/2017	Composi	TANTRAR	3.62E	TRUE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Tanytarsus	Tanytarsini				6	CF						
138	1FEA_2022_North	42.118637	-88.22662	RTB	7/20/2017	RTF	7/20/2017	Composi	TANTRAR	31.875	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Tanytarsus	Tanytarsus				7	CF						
139	1FEA_2022_North	42.118637	-88.22662	RTB	7/20/2017	RTF	7/20/2017	Composi	TRIBELOES	9.375	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	TRIBELOES				4	CG						
140	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	CAENIS	21	FALSE	FALSE	Arthropod Insecta	Ephemera	Caenidae					6	CG						
141	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	CHAORBOF	3	TRUE	FALSE	Arthropod Insecta	Diptera	Chaoborid	Chaoboridae				8	PR						
142	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	CHIROHO	63	TRUE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Phaeospectra	Phaeospectra/Tribel				6	CG						
143	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	CHIROHO	9	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	Chironomus				10	CG						
144	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	COENAGR	60	TRUE	FALSE	Arthropod Insecta	Odonata	Coenagrionidae					5	5.5	PR					
145	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	CRIOTICOT	15	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Orthocla	Orthocla	Criotocopus				8	SH					
146	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	CRYPTOC	6	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	Cryptocryptus				8	PR						
147	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	CYRNELLU	3	FALSE	FALSE	Arthropod Insecta	Trichoptera	Polycentropod	Polycentropodinae	Cyrrnellus				5	CF					
148	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	DICROTET	3	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom	Dicretodiptera				6	CG						
149	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	DREISEN	87	FALSE	FALSE	Mollusca Bivalvia	Veneridae	Dreissenidae						6	CG					
150	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	ENALLAGI	3	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom	Enallagma				6	CG						
151	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	ENDOCHIR	462	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	Endochironomus				6	SH						
152	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	GLYPTODI	300	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	Glyptodontes				10	CF						
153	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	HELOBELO	3	FALSE	FALSE	Annelida HIRUDIN	Rhynchoglossiph	Haememterinae					8	PA						
154	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	HEMERODI	3	FALSE	FALSE	Arthropod Insecta	Diptera	Empididae	Haememter	Hemerodromia				6	PR					
155	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	HYALELLA	87	FALSE	FALSE	Arthropod Malacostr	Amphipoda	Hyalellidae						4	CG					
156	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	HYDROPT	21	FALSE	FALSE	Arthropod Insecta	Trichoptera	Hydroptilidae	Hydroptilini				2	SC						
157	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	ISCHNUR	3	FALSE	FALSE	Arthropod Insecta	Odonata	Coenagrionidae												
158	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	LEPIDOPT	3	FALSE	FALSE	Arthropod Insecta	Lepidoptera							7	SH					
159	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	NANODIUS	15	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Orthocla	Orthocla	Nanodius				3	CG					
160	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	OLIGOCH	78	FALSE	FALSE	Annelida OLIGOCH	Haplotaxidae													
161	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	PALMOPY	9	FALSE	FALSE	Arthropod Insecta	Diptera	Ceratopod	Ceratopod	Palmyria				10	CG					
162	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	PARACHIR	126	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	Parachironomus				8	CF						
163	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	PHYSELLA	6	FALSE	FALSE	Mollusca Gastropoda	Baculiformia	Physellidae						9	SC					
164	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	POLYPED	6	TRUE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	Polydipedium					6	SH					
165	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	POLYPED	27	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	Polydipedium					4	SH					
166	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	PROCLAD	24	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Tanypod	Procladidae	Procladus				8	PR					
167	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	TANTRAR	3	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Tanytarsus	Tanytarsus				7	CF						
168	1FEA_2022_North	42.111177	-88.15092	RTF	8/23/2017	RTF	8/23/2017	Composi	TRIBELOES	3	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	TRIBELOES				3	CG						
169	1FEA_2022_North	42.37257	-88.18071	RTV	9/19/2018	RTV	9/19/2018	Composi	AMNICUL	90	FALSE	FALSE	Mollusca Gastropoda	Neothauro	Hydrobia	Amniculidae											
170	1FEA_2022_North	42.37257	-88.18071	RTV	9/19/2018	RTV	9/19/2018	Composi	BATIEDIA	12	TRUE	FALSE	Arthropod Insecta	Ephemera	Batiedidae						4	CG					
171	1FEA_2022_North	42.37257	-88.18071	RTV	9/19/2018	RTV	9/19/2018	Composi	CAENIS	117	FALSE	FALSE	Arthropod Insecta	Ephemera	Caenidae						6	CG					
172	1FEA_2022_North	42.37257	-88.18071	RTV	9/19/2018	RTV	9/19/2018	Composi	CALLIBAE	6	FALSE	FALSE	Arthropod Insecta	Ephemera	Batiedidae						4	CG					
173	1FEA_2022_North	42.37257	-88.18071	RTV	9/19/2018	RTV	9/19/2018	Composi	CERATOP	3	TRUE	FALSE	Arthropod Insecta	Diptera	Ceratopogonidae						5	PR					
174	1FEA_2022_North	42.37257	-88.18071	RTV	9/19/2018	RTV	9/19/2018	Composi	CHIRONOM	57	TRUE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	Phaeospectra/Tribel				6	CG						
175	1FEA_2022_North	42.37257	-88.18071	RTV	9/19/2018	RTV	9/19/2018	Composi	CHIRONOM	30	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	Chironomus				10	CG						
176	1FEA_2022_North	42.37257	-88.18071	RTV	9/19/2018	RTV	9/19/2018	Composi	CLADOPED	3	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Chironom Chironom	Cladopelmidae					6	CG					
177	1FEA_2022_North	42.37257	-88.18071	RTV	9/19/2018	RTV	9/19/2018	Composi	COELOLAT	3	FALSE	FALSE	Arthropod Insecta	Diptera	Chironom Tanypod	Coeletotus	Coeletotus				4	PR					
178	1FEA_2022_North	42.37257	-88.18071	RTV	9/19/2018	RTV	9/19/2018	Composi	COENAGR	48	TRUE	FALSE	Arthropod Insecta	Odonata	Coenagrionidae						5	5.5	PR				



LAKE MACROINVERTEBRATE INDEX



Data Explorer - Explore Your Results!

The map and plot below will be generated once metric values and scores have been calculated.

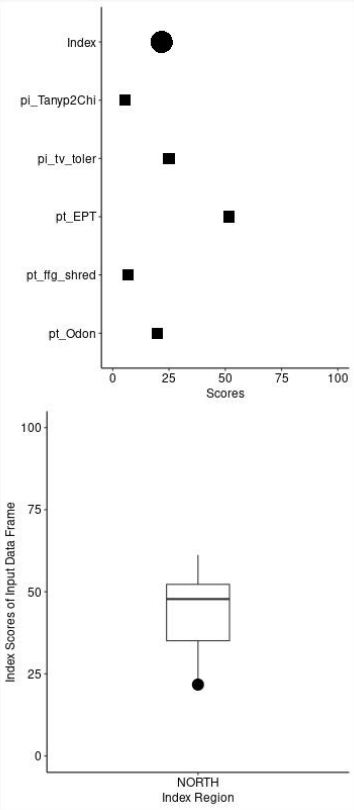
Sites are clustered when zoomed out for increased visibility - zoom in for added detail!

Use the drop down menu to select a Sample ID.

Select Sample ID:

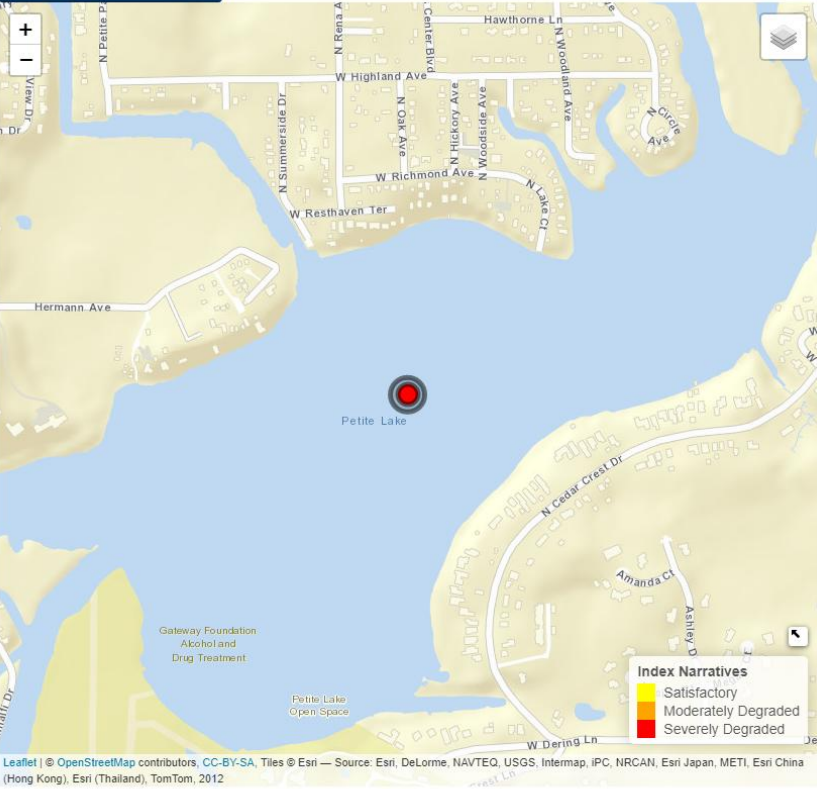
VTW_8/23/2017

After choosing a Sample ID, the map will zoom to its location and the plot will display scoring.



Take screenshot of entire page

Take screenshot of map only



Data Explorer - Explore Your Results!

The map and plot below will be generated once metric values and scores have been calculated.

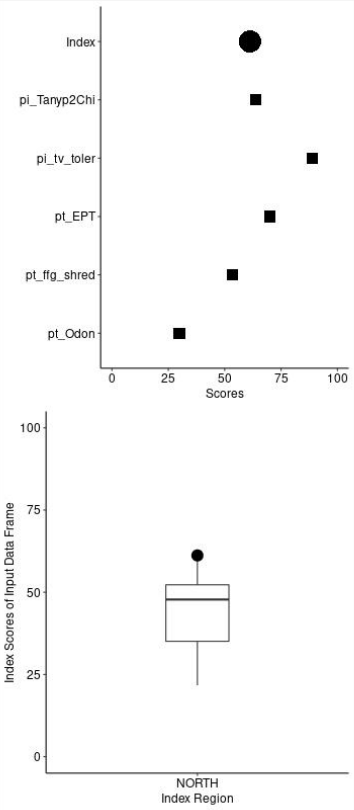
Sites are clustered when zoomed out for increased visibility - zoom in for added detail!

Use the drop down menu to select a Sample ID.

Select Sample ID:

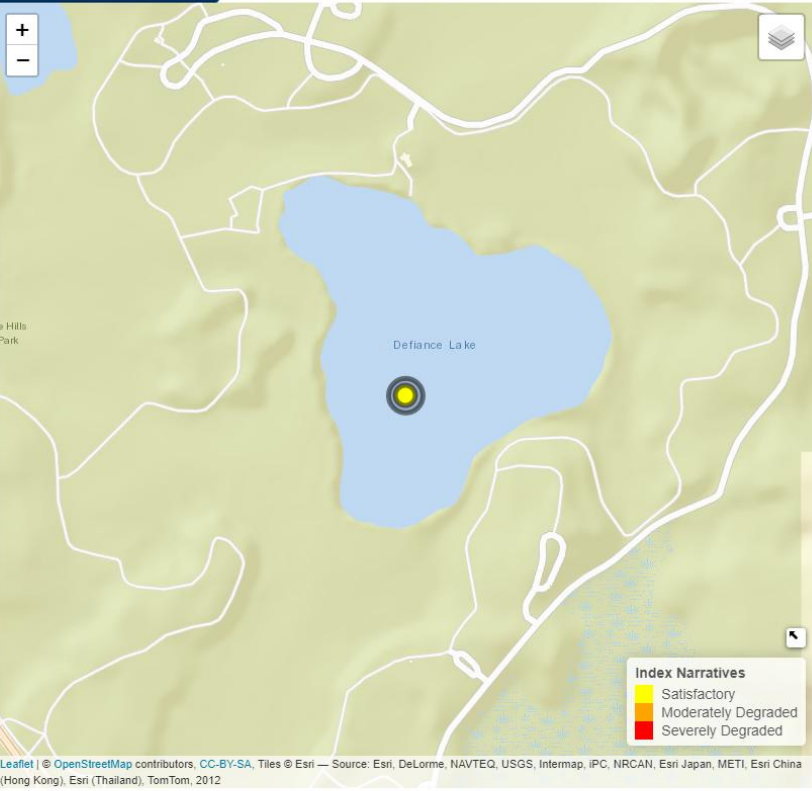
RTB_7/20/2017

After choosing a Sample ID, the map will zoom to its location and the plot will display scoring.



Take screenshot of entire page

Take screenshot of map only







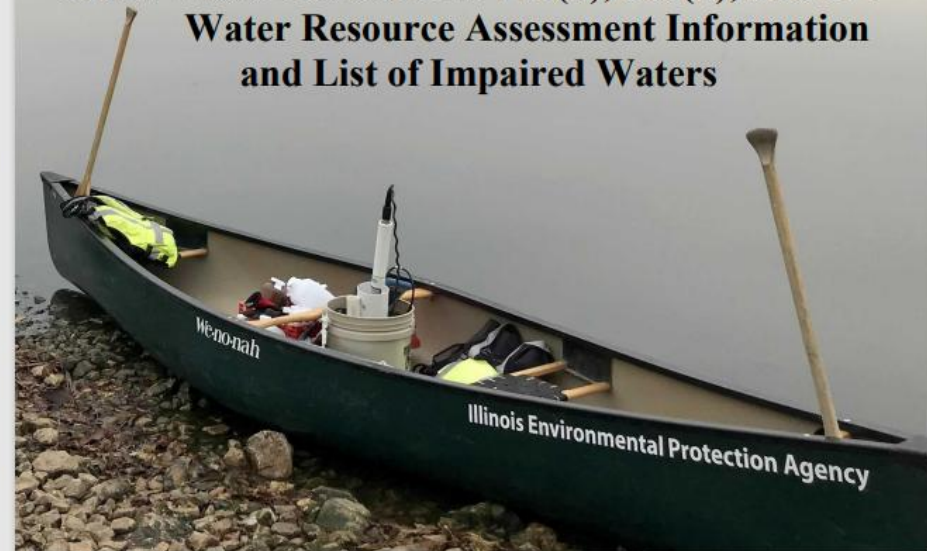
ASSESSMENTS

- Use Attainability
 - Aquatic Life Use
 - Aesthetic Quality Use
 - Primary Contact
 - Fish Consumption
- Causes
 - Phosphorus
 - Suspended Solids
 - Algae
 - Plants
- 303(d) and 319

Illinois Integrated Water Quality Report and Section 303(d) List, 2020/2022

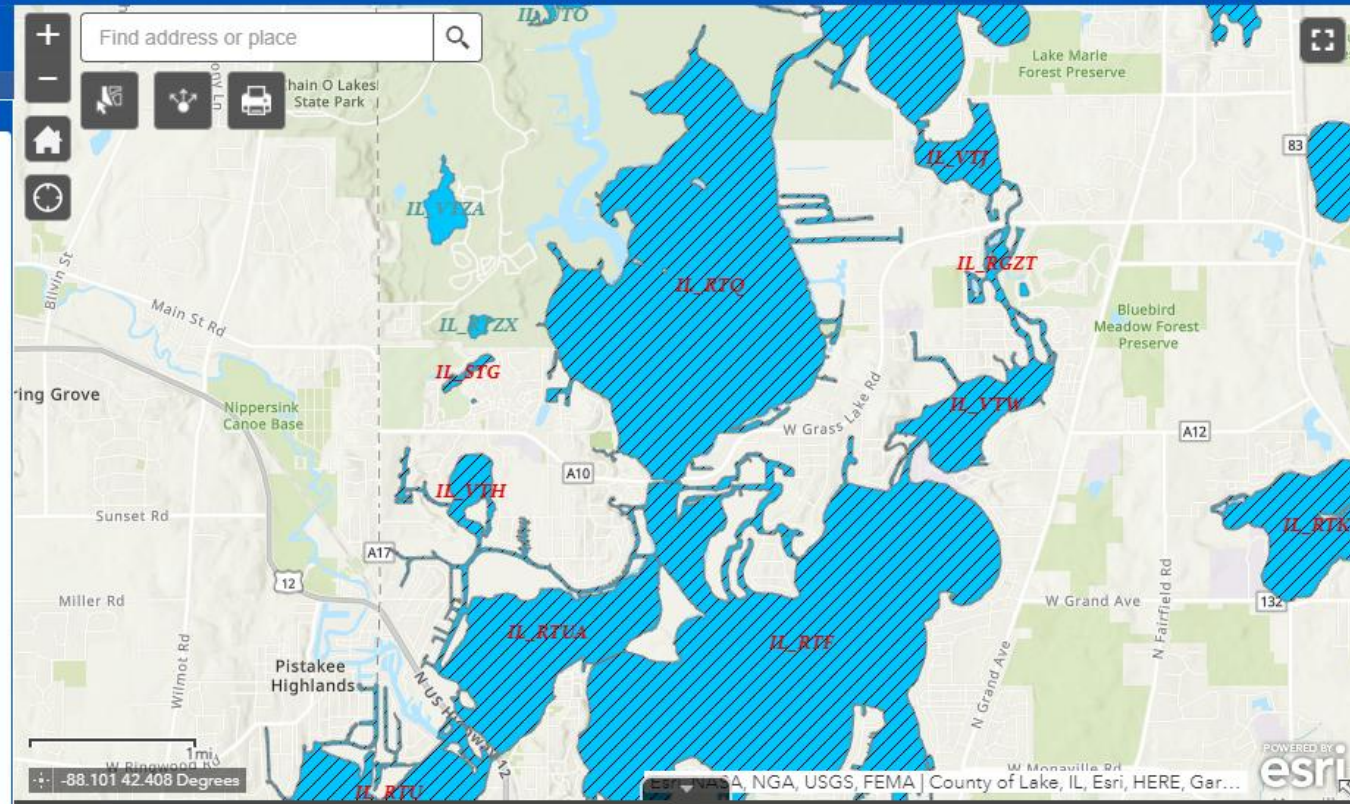
June 2022

**Clean Water Act Sections 303(d), 305(b), and 314
Water Resource Assessment Information
and List of Impaired Waters**



**Illinois Environmental Protection Agency
Bureau of Water**

[IEPA Bureau of Water](#) [About 303\(d\)](#) [Contact Us \(Web App Support\)](#)



Options Filter by map extent Zoom to Clear selection Refresh

Assessment Unit ID	Water Body Name	Water Size*	Designated Use	Cause	GlobalID
IL_RTR	MARIE (LAKE)	516.00	Fish Consumption	MERCURY POLYCHLORINATED BIPHENYLS (PCBS)	da2481bf-67db-46e4- 891e-c81ab8be7774
IL_VTJ	BLUFF	86.00	Fish Consumption	MERCURY POLYCHLORINATED BIPHENYLS (PCBS)	caabb7da-eb75-4de0- a28e-1609dd25fa13
IL_VTH	DUNNS	68.00	Aesthetic Quality	TOTAL SUSPENDED SOLIDS (TSS)	77e35788-88eb-4150- aeca-dd2ba3965db7
IL_RTT	ANTIOCH	88.00	Aesthetic Quality	TOTAL SUSPENDED SOLIDS (TSS)	628ffefc-2cd8-43c3- a76e-6d472b503cf1

1.3 features 0 selected

Assessments from 2018 IR cyle

	ALU	AQU	FCU
Channel	Full	NS (TP)	NS (PCB, MERC)2018
Catherine	Full	NS (TP)	NS (PCB, MERC)2018
Petite	Full	NS (TP)	NS (PCB, MERC)2018
Marie	Full	NS (TP)(TSS)	NS (PCB, MERC)2018
Nippersink	Full	NS (TP)(TSS)	NS (PCB, MERC)2018
Bluff	Full	NS (TP)(TSS)	NS (PCB, MERC)2018
Grass	Full	NS (TP)(TSS)	NS (PCB, MERC, ALDRIN, DIELDRIN, ENDRIN, HEPTACHLOR, MIREX, TOXAPHENE)2018
Fox	Full	NS (TP)(TSS)	NS (PCB, MERC, ALDRIN, DIELDRIN, ENDRIN, HEPTACHLOR, MIREX, TOXAPHENE)2018
Pistakee	Full	NS (TP)(TSS)	NS (PCB, MERC)2018
Redhead	Full	NS (TP)(TSS)	not assessed
Dunns	NS (TP)	NS (TP)(TSS)	not assessed
Spring	Full	NS (TP)(TSS)	not assessed

Assessments last updated for the 2020 IR cycle, using data collected in 2017

	ALU	AQU	FCU
Channel	Full	NS (TP)	NS (PCB, MERC)2018
Catherine	Full	NS (TP)	NS (PCB, MERC)2018
Petite	Full	NS (TP)	NS (PCB, MERC)2018
Marie	Full	NS (TP), delisted TSS	NS (PCB, MERC)2018
Nippersink	Full	NS (TP)(TSS)	NS (PCB, MERC)2018
Bluff	Full	NS (TP), delisted TSS	NS (PCB, MERC)2018
Grass	Full	NS (TP)(TSS)	NS (PCB, MERC, ALDRIN, DIELDRIN, ENDRIN, HEPTACHLOR, MIREX, TOXAPHENE)2018
Fox	Full	NS (TP)(TSS)	NS (PCB, MERC, ALDRIN, DIELDRIN, ENDRIN, HEPTACHLOR, MIREX, TOXAPHENE)2018
Pistakee	Full	NS (TP)(TSS)	NS (PCB,MERC)2018

Assessments last updated for the 2022 IR cycle using data collected in 2018

Redhead	Full	NS (TP), delisted TSS	not assessed
Dunns	Full	NS (TP)(TSS)	not assessed
Spring	Full	NS (TP)(TSS)	not assessed

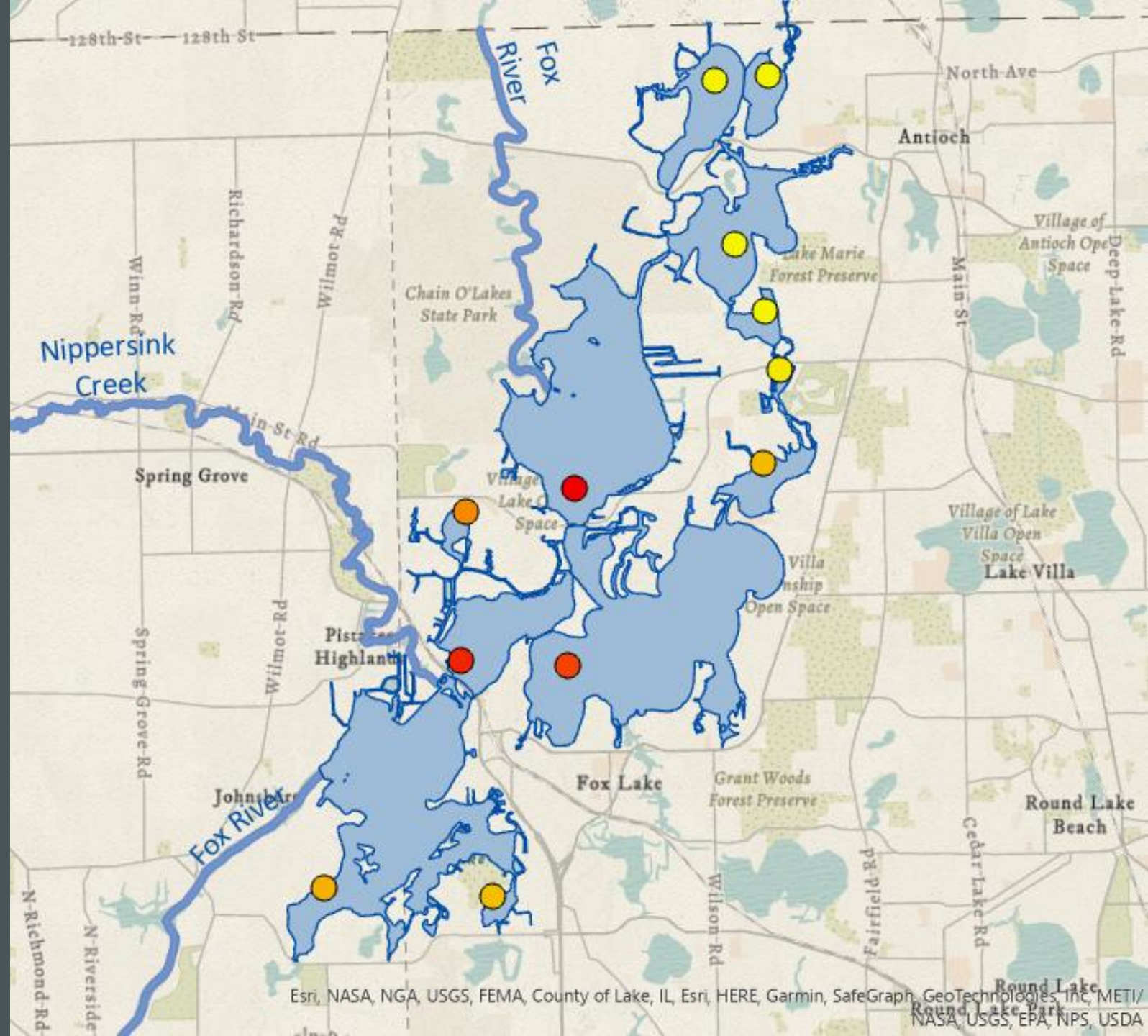
SECCHI TRANSPARENCY

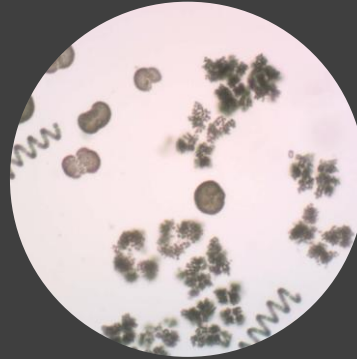
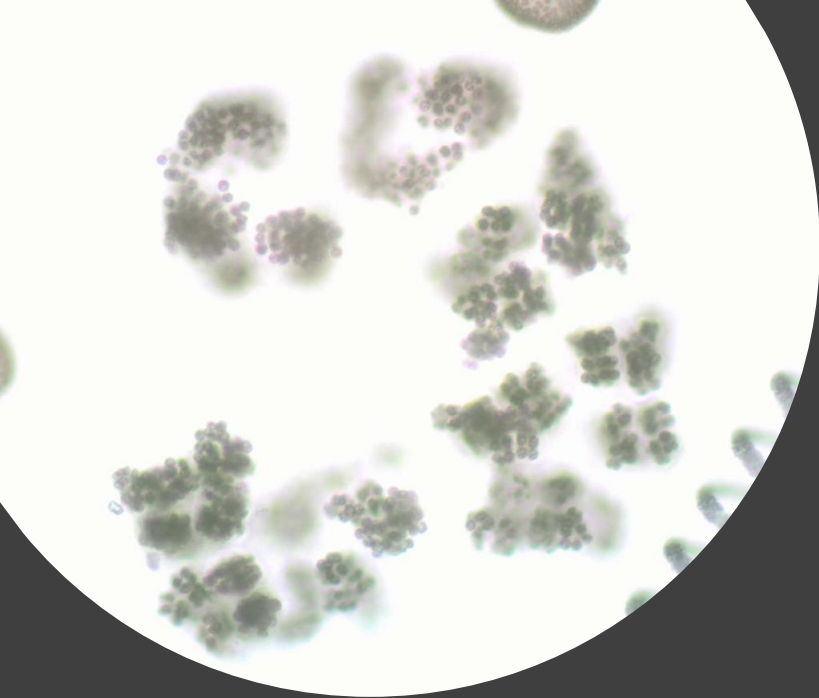
- Measure of water clarity
- Calculate TSI



AVERAGE SECCHI

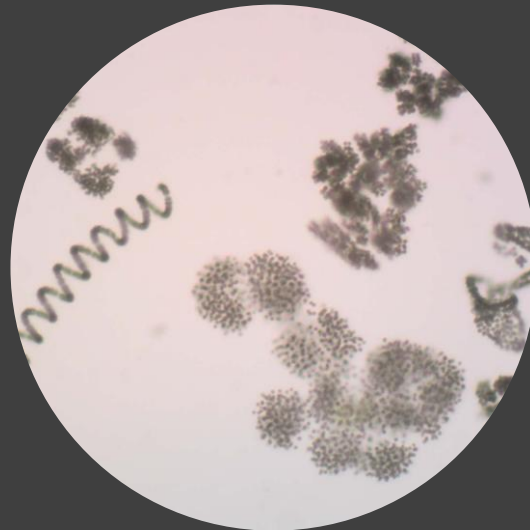
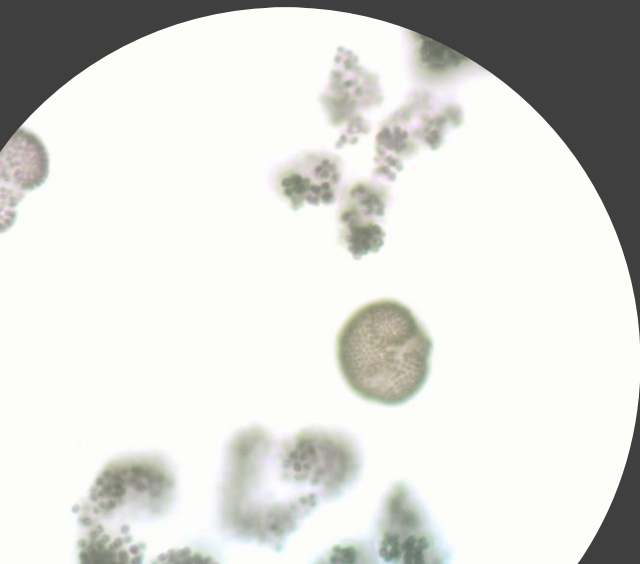
- Gradient shown is red to yellow
 - Red indicates low clarity
 - Orange has mid-high clarity
 - Yellow has the highest clarity





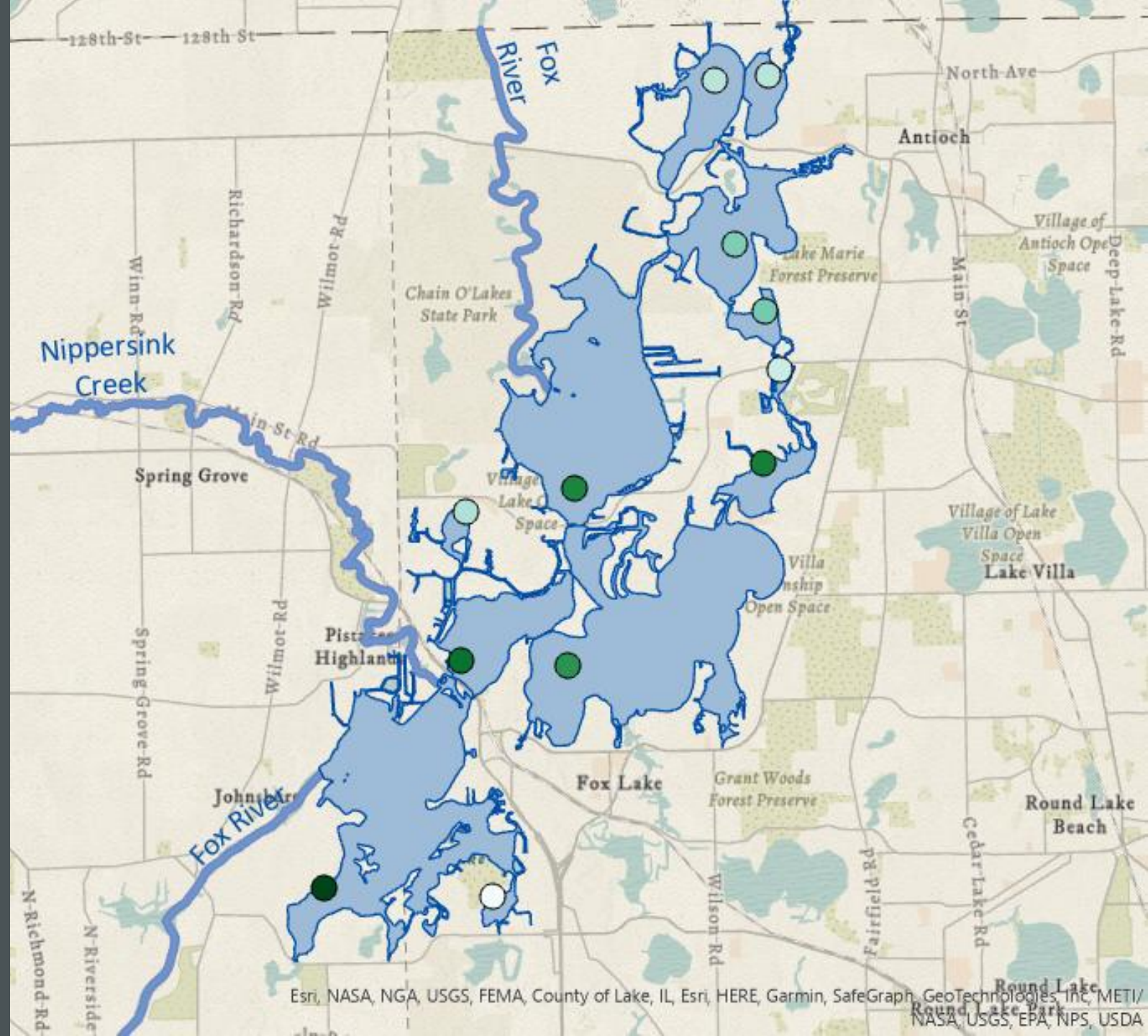
CHLOROPHYLL A

- Indicates algae biomass



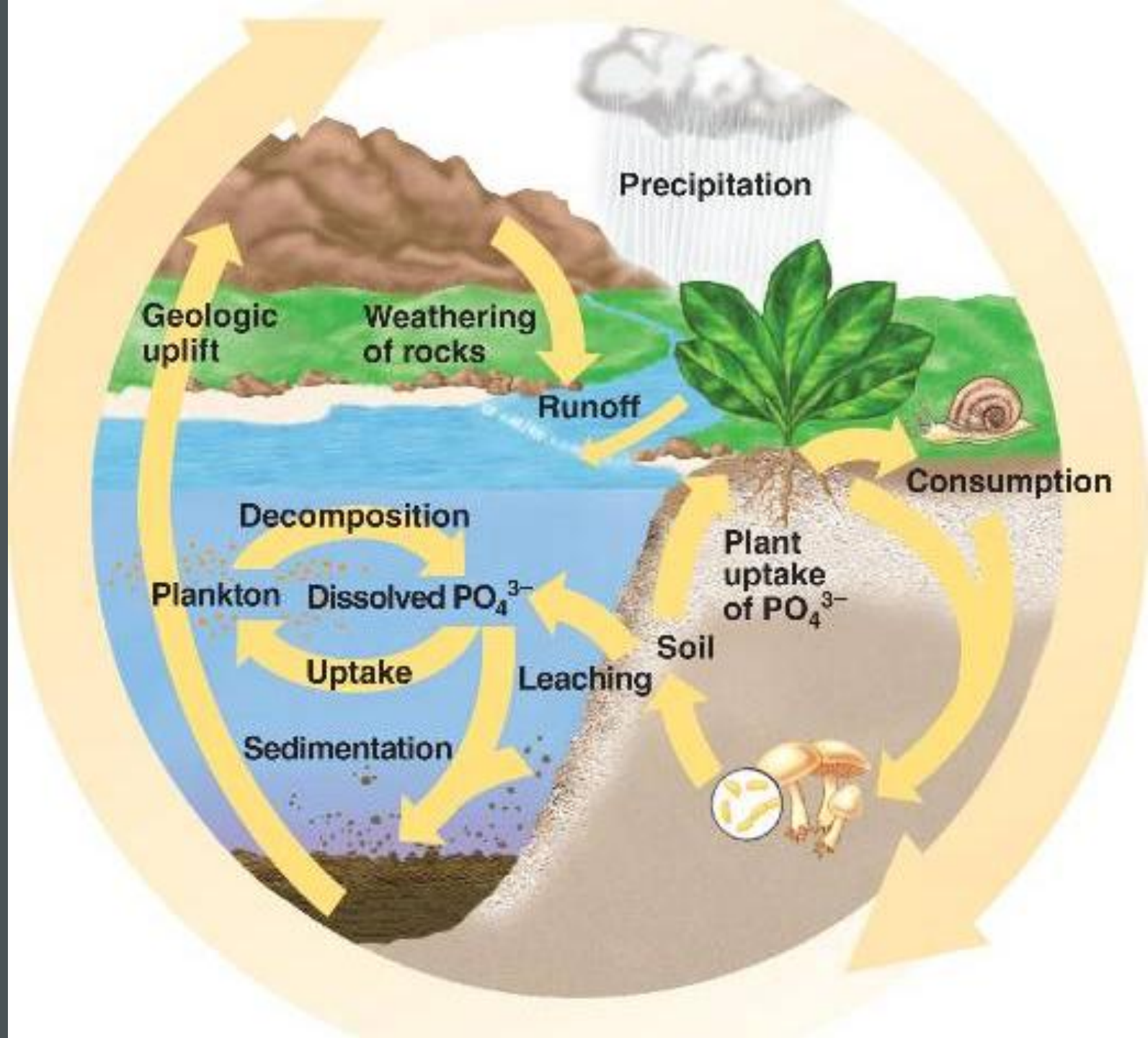
AVERAGE CHLOROPHYLL

- Most recent Chlorophyll a data
- Gradient shows white to dark green
 - Dark green indicates higher chlorophyll a concentration
 - Lighter greens show scale of medium concentrations
 - Lightest green to white shows low chlorophyll



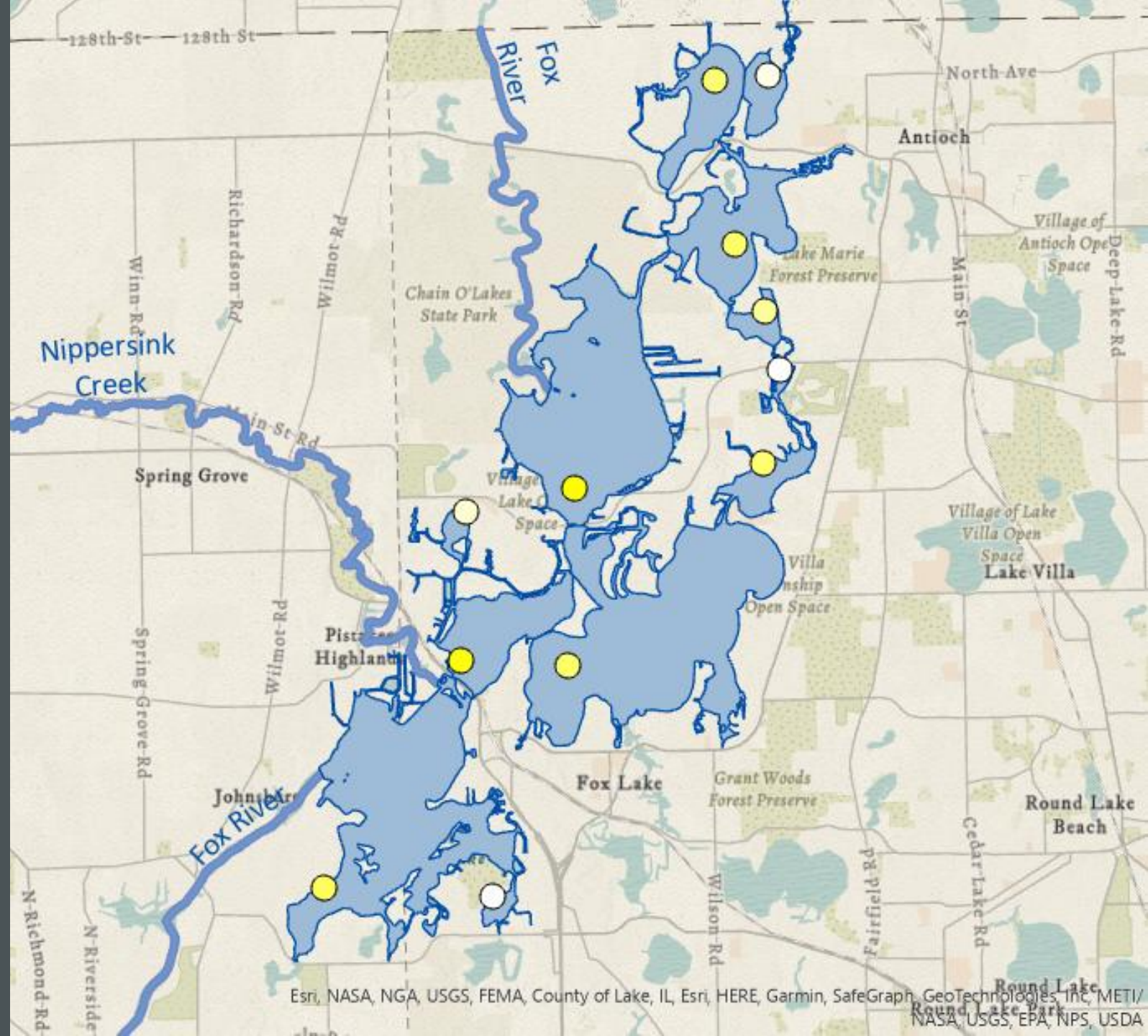
TOTAL PHOSPHORUS

- Used to generate TSIs
- Water Quality standard is .05 $\mu\text{g/L}$



AVERAGE PHOSPHORUS

- Average phosphorus concentrations from most recent data
- Gradient is white to **dark yellow**
- **Darker yellow** indicates higher concentrations of phosphorus



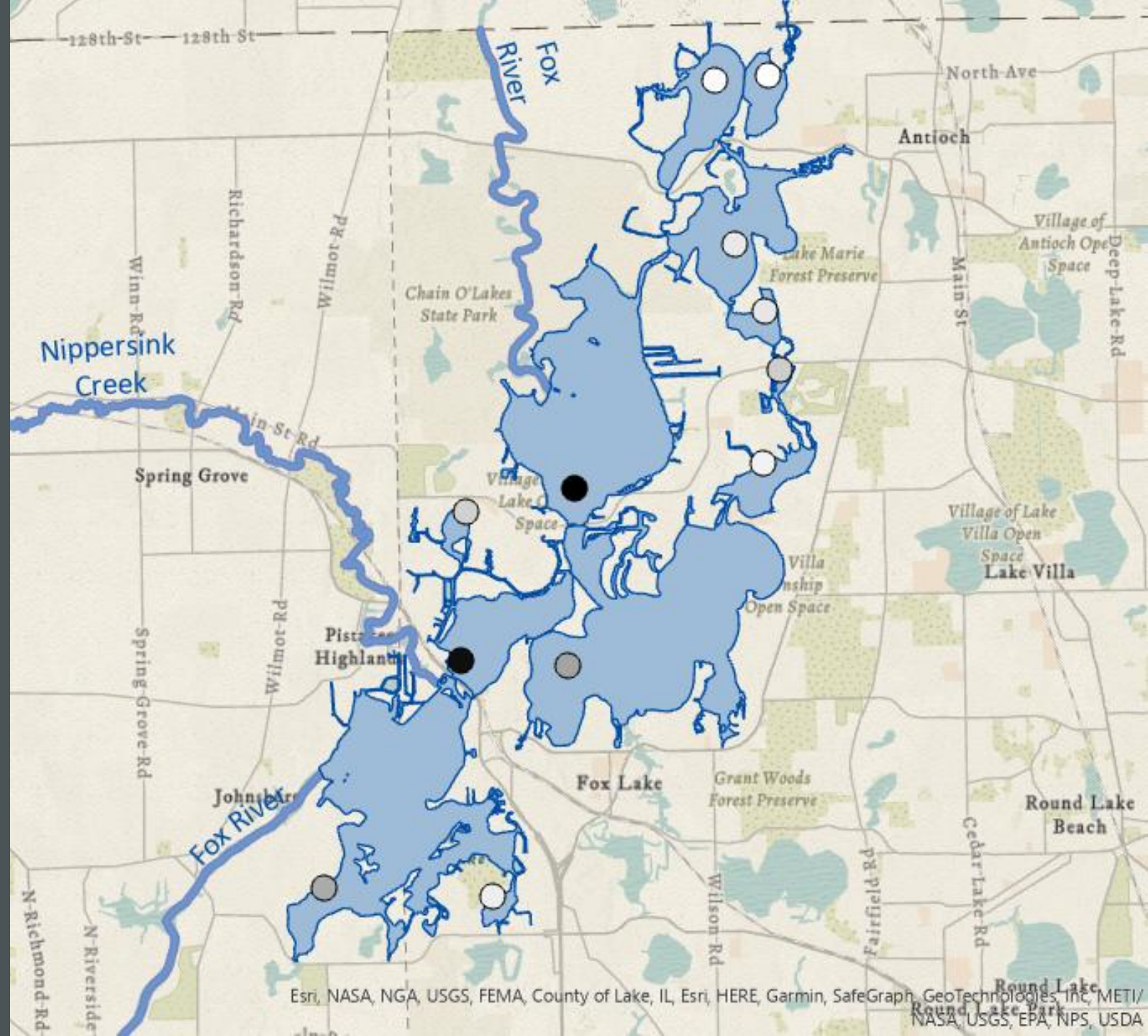
SUSPENDED SOLIDS

- Inorganic solids
- Cause of impairment



SUSPENDED SOLIDS

- Average Suspended Solids from most recent data
- Gradient shows white to black
- Darker gray to black indicates higher concentrations of suspended solids
- White to light gray shows low concentrations of suspended solids



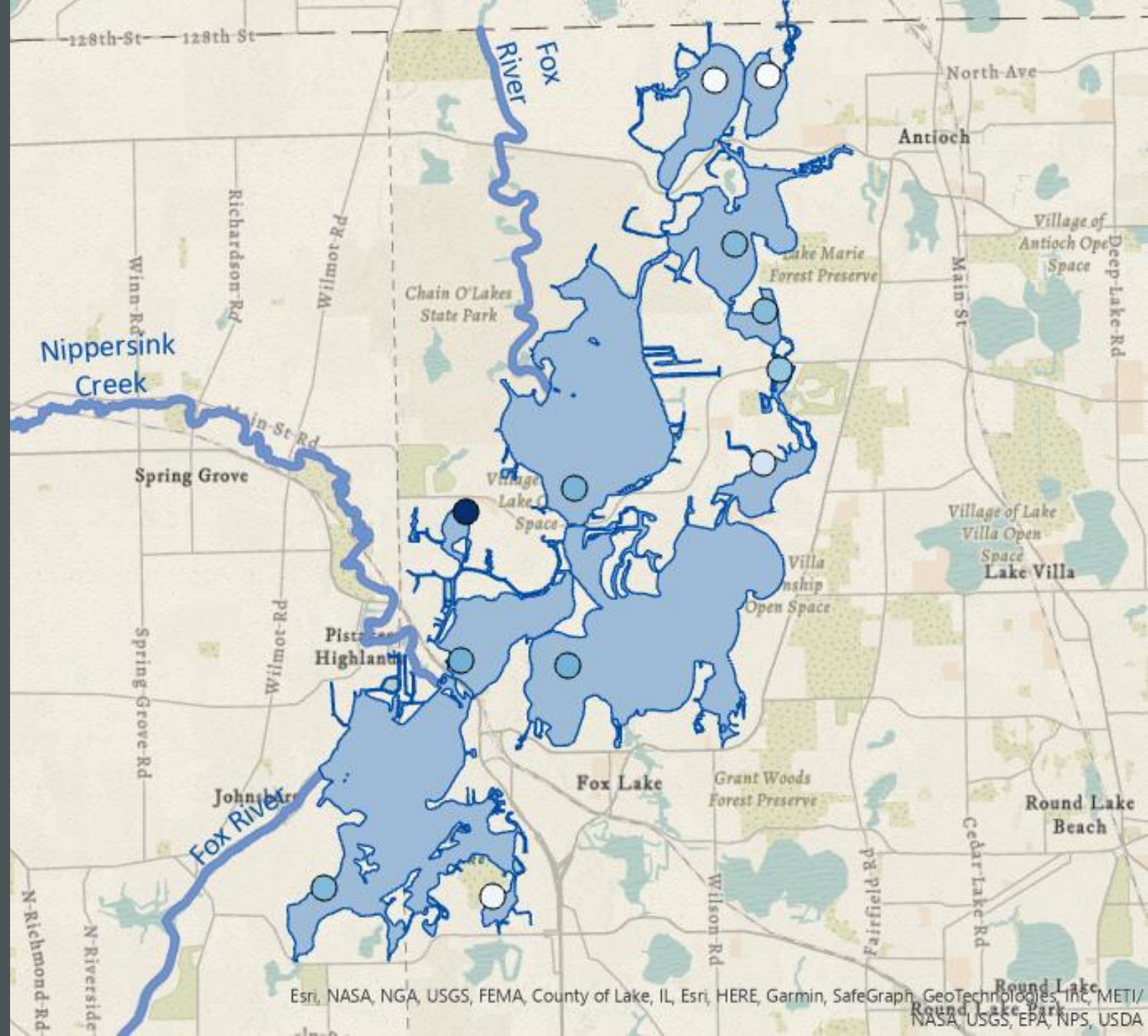


CHLORIDES

- Salt concentrations in the water
- Water quality standard: 500 mg/L

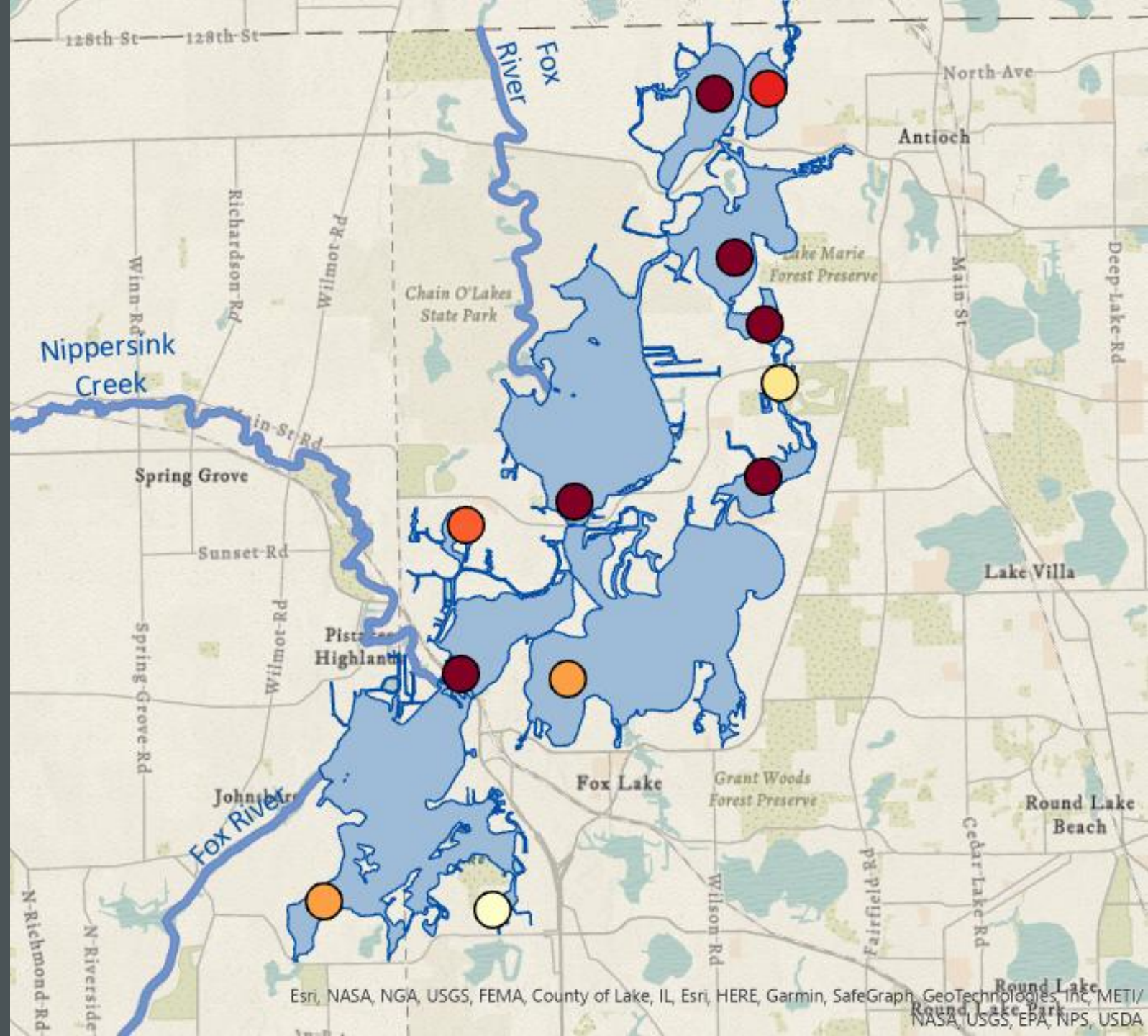
AVERAGE CHLORIDE

- Average Chloride from most recent data
- Gradient showing white to blue
- White to light blue, low concentrations of Chloride
- Dark blue highest levels



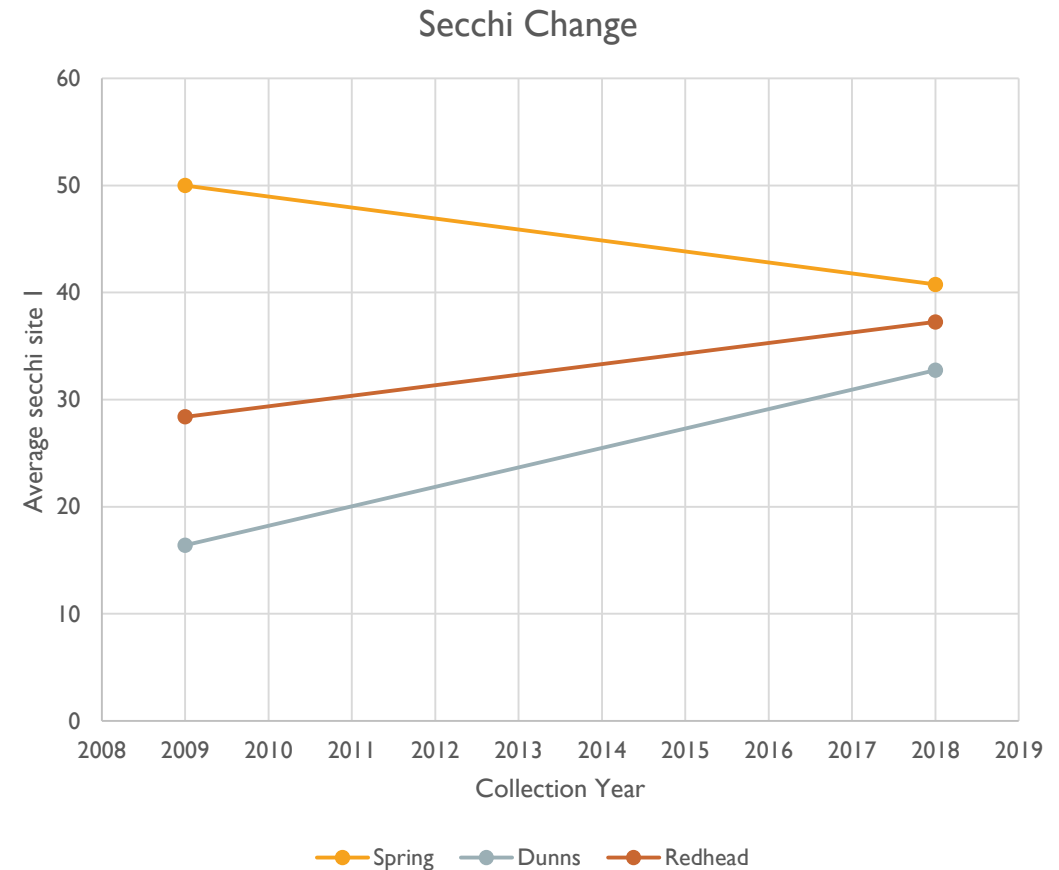
PERCENT PHOSPHORUS VIOLATIONS

- Dark brown color represents 100% violations
- Lighter colors indicate fewer violations
- Redhead had only one violation of the water quality standard



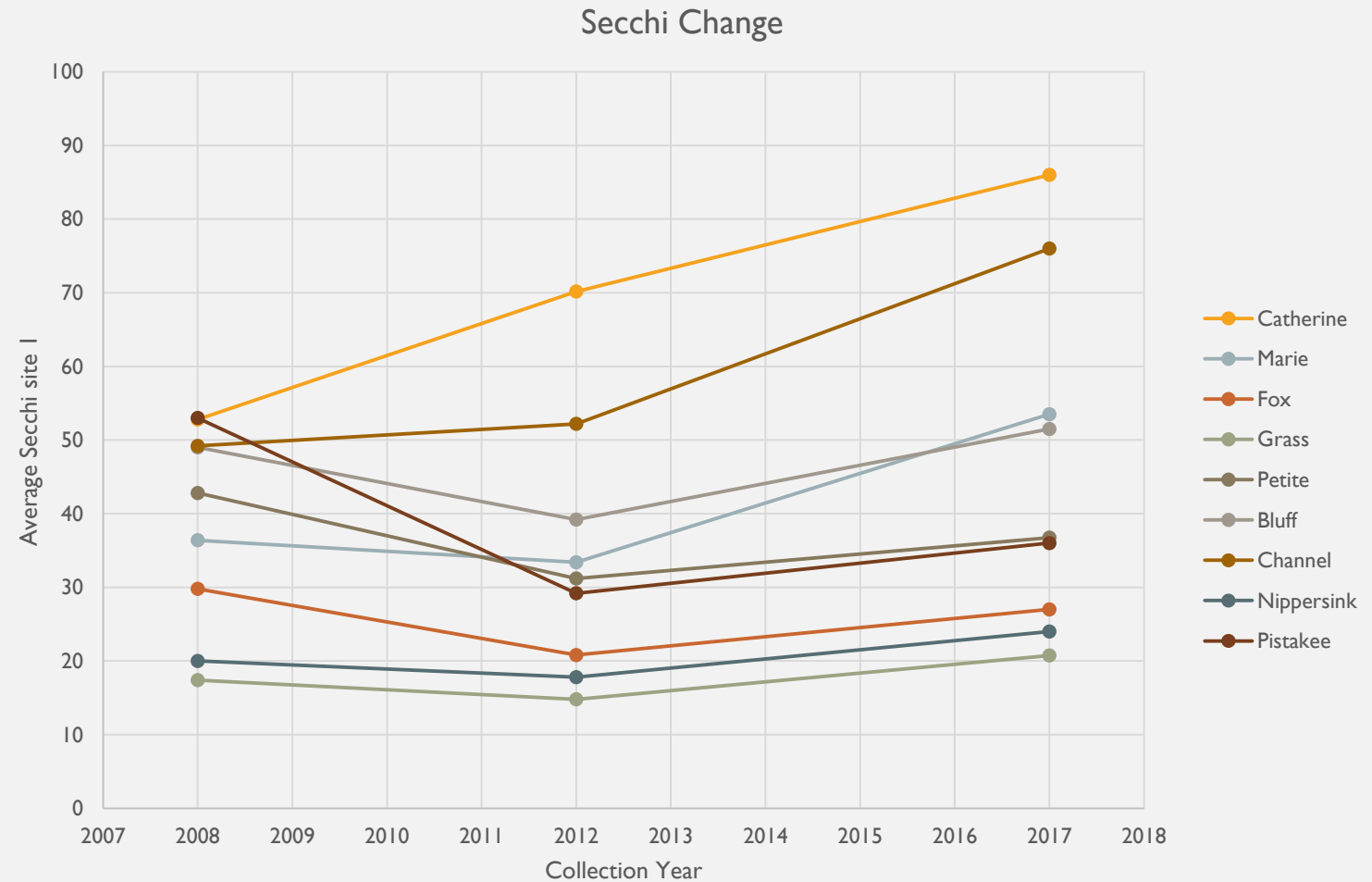
CHANGES OVER TIME

- Redhead, Dunns, and Spring
- Collection Year 2009 and 2018
- Average secchi transparency over time



CHANGES OVER TIME

- Catherine, Channel, Petite, Marie, Grass, Fox, Nippersink. Bluff, and Pistakee
- Collection Year 2008, 2012, and 2017
- Average secchi transparency over time





We-no-nah

Illinois Environmental Protection Agency