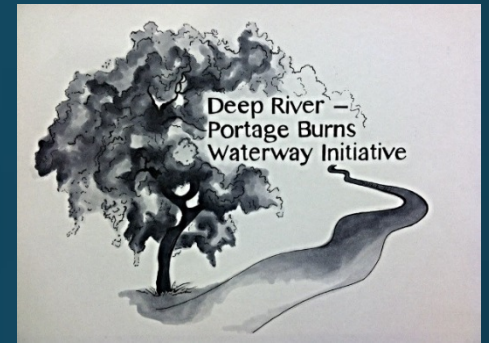
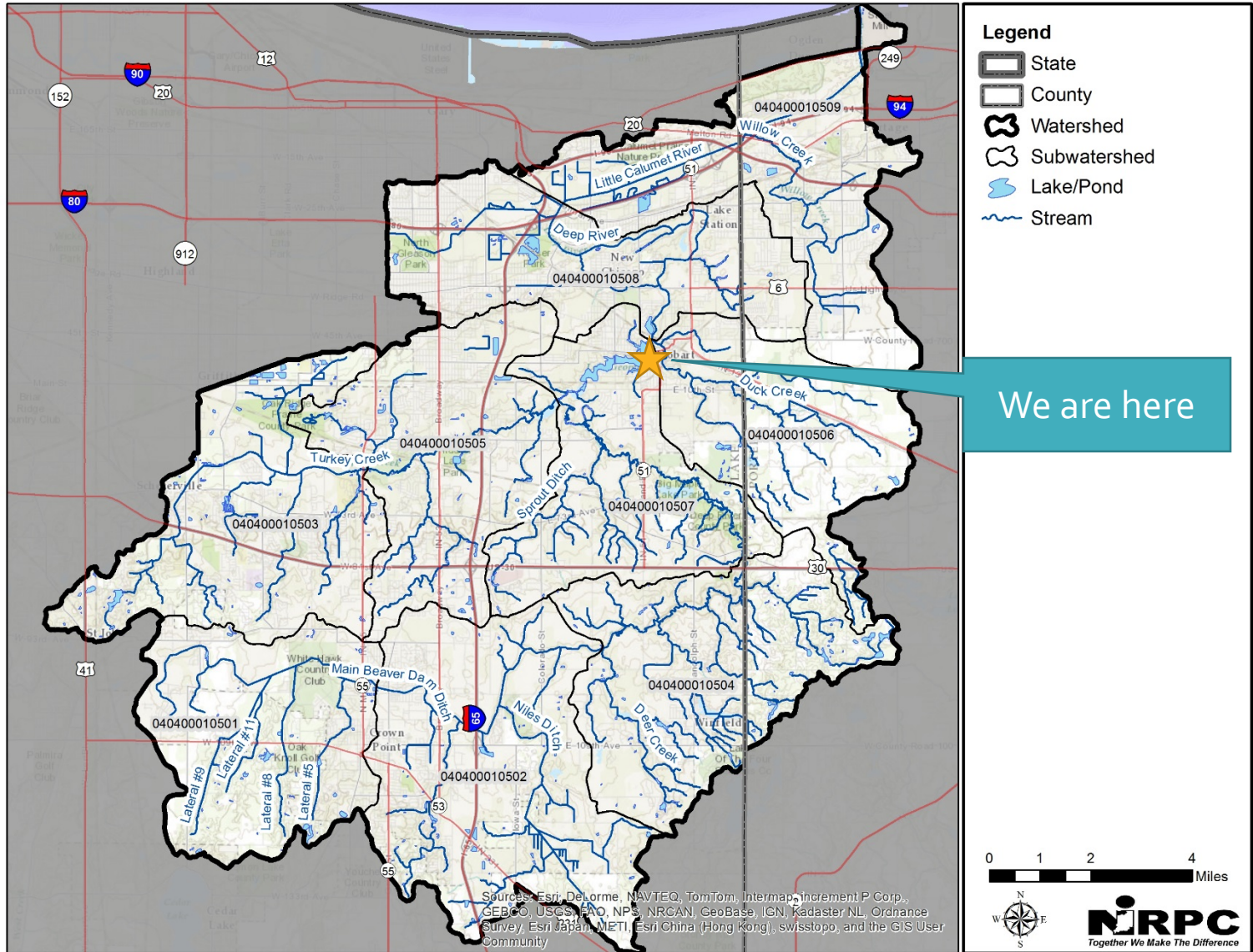


# Deep River-Portage Burns Waterway Initiative



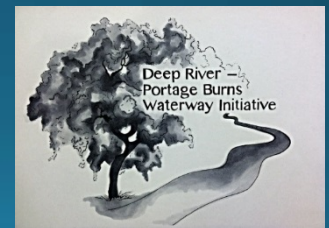
Public Meeting  
Hobart Community Ctr.  
July 15, 2014

# Our Watershed



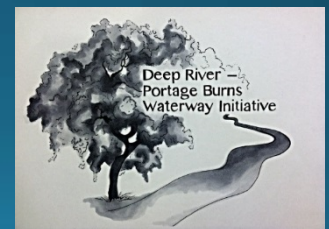
# Agenda

- Introductions
- Review of Work to Date
- Baseline Assessment & TMDL Study Findings
- Setting Target Values to Restore/Protect Stream Health
- Adjourn



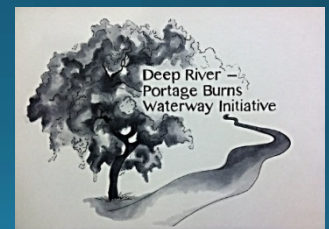
# The Watershed Management Plan

- Watershed Community Initiative (elements 1-3)
- Watershed Inventory (elements 4-16)
- Identify Problems & Causes (elements 17-18)
- Identify Sources & Calculate Loads (elements 19-21)
- Set Goals & Identify Critical Areas (elements 22-24)
- Choose Measures/ Best Management Practices (elements 25-26)
- Action Register & Schedule (element 27-31)
- Tracking Effectiveness (elements 32-33)

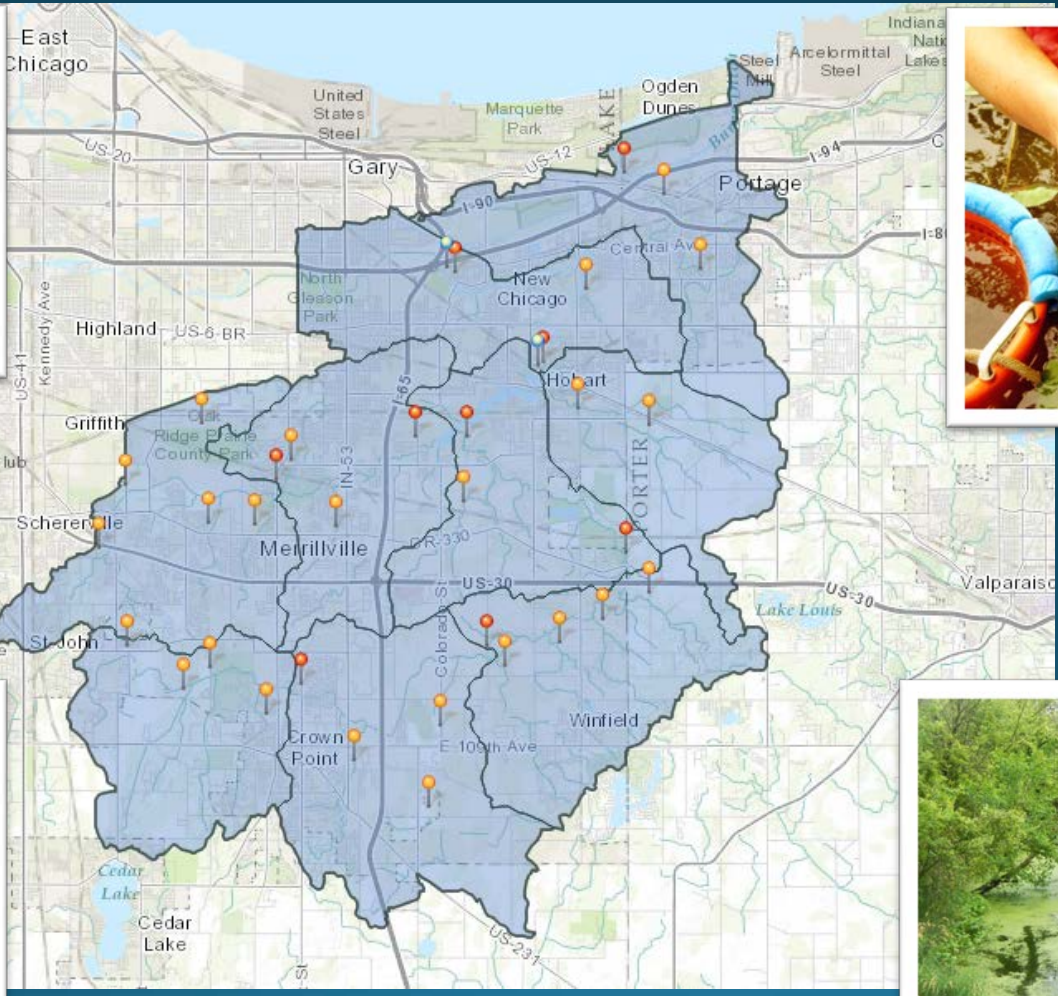


# Watershed Plan- Work Completed to Date

- Why the watershed project was initiated
- Steering committee
- Stakeholder concerns
- Geology/Topography
- Hydrology
- Soil Characteristics
- Land-Use
- Other Planning Efforts
- Endangered/Threatened/Rare Species
- Relevant Relationships



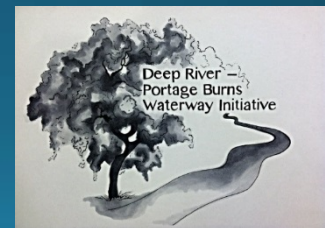
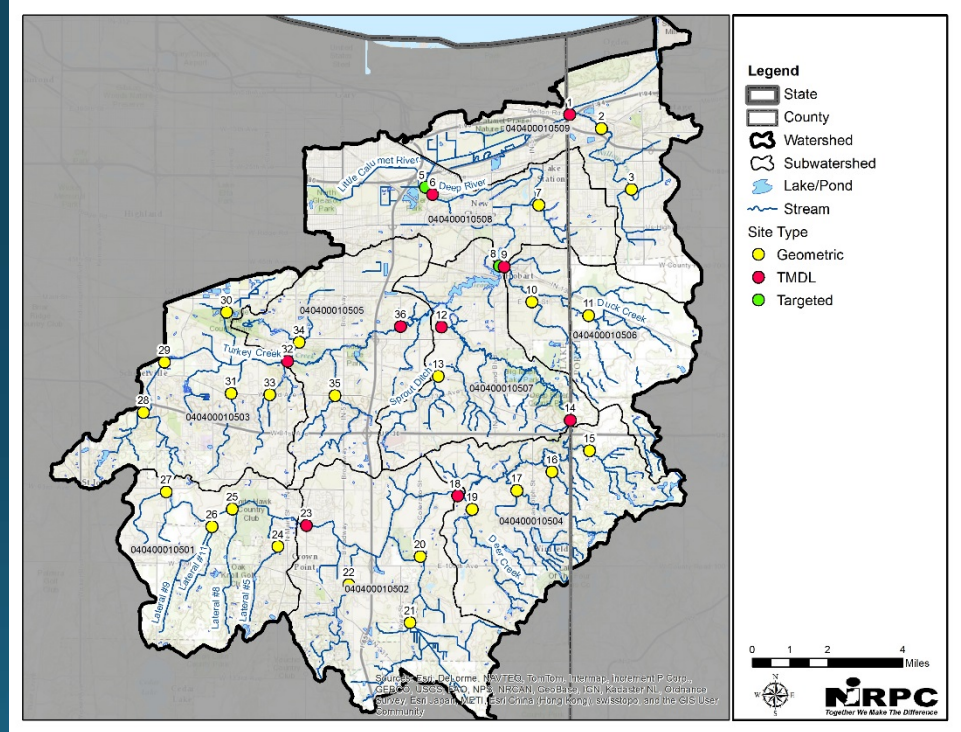
# Deep River-Portage Burns Waterway Baseline Assessment & TMDL Study



<http://www.in.gov/idem/nps/3893.htm>

# Stream Monitoring (April 2013 – March 2014)

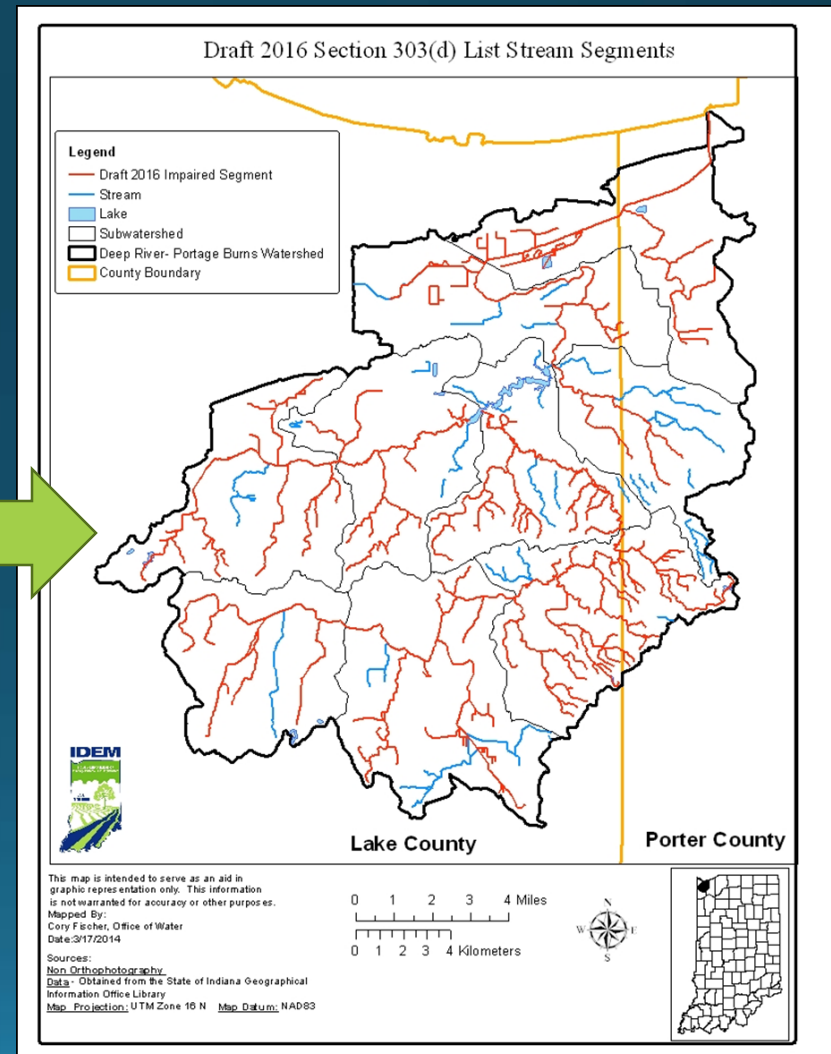
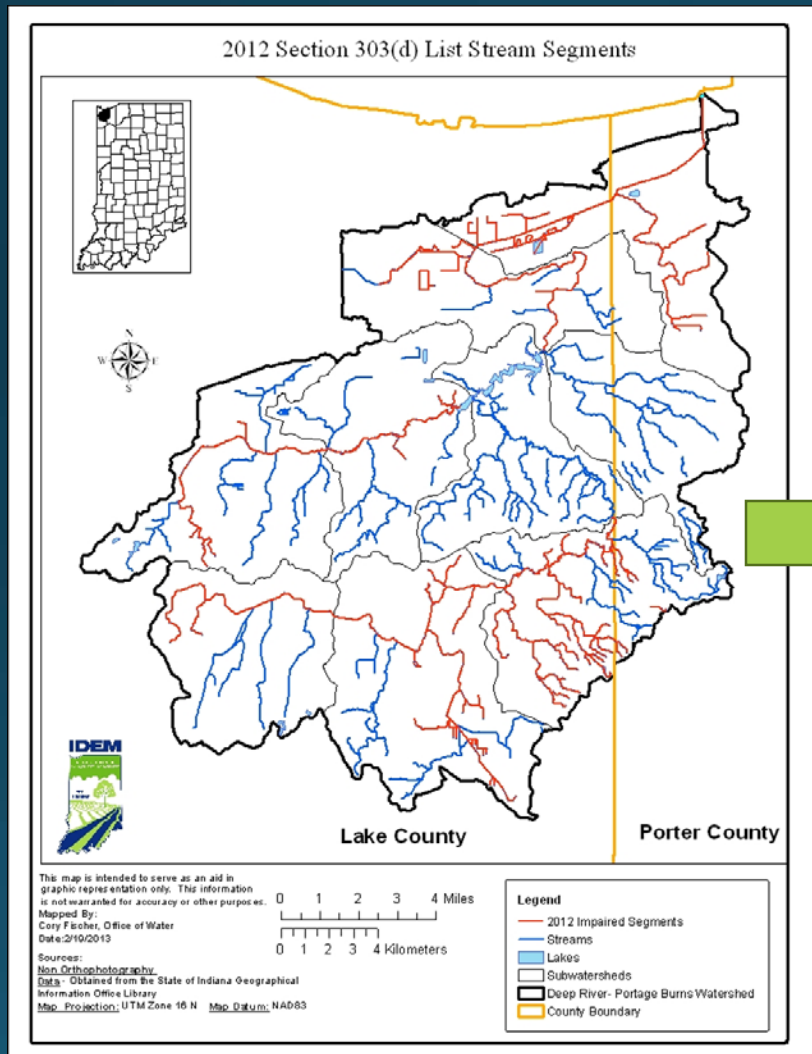
- 35 sites sampled monthly April-October
- 9 pour point (subwatershed) sites sampled for a year
- Parameters
  - E. coli
  - Nutrients
  - Sediment
  - Flow
  - Habitat
  - Fish
  - Macroinvertebrates



Site #	Stream Name	Road Name
1	Burns Ditch	US 20
2	Willow Creek	Clem Road
3	Willow Creek	Stone Ave
5	Deep River	29th Ave
6	Deep River	Liverpool Road
7	Tributary of Deep River	Shelby Street
8	Deep River	Ridge Road
9	Duck Creek	Front Street
10	Tributary of Duck Creek	10th Street
11	Duck Creek	750 W
12	Deep River	Arizona Street
13	Sprout Ditch	70th Ave
14	Deep River	Joliet Road
15	Tributary of Deep River	750 W
16	Tributary of Deep River	89th Avenue
17	Tributary of Deep River	93rd Avenue
18	Deep River	Clay Street
19	Deer Creek	97th Street
20	Niles Ditch	Colorado Street
21	Niles Ditch	121st Avenue
22	Smith Ditch	113th Street
23	Main Beaver Dam Ditch	Grant Street
24	Tributary of Main Beaver Dam Ditch	Summit Street
25	Main Beaver Dam Ditch	Clark Road
26	Tributary of Main Beaver Dam Ditch	77th Avenue
27	Main Beaver Dam Ditch	Blaine Street
28	Tributary of Turkey Creek	77th Avenue
29	Turkey Creek	Broad Street
30	Johnson Ditch	Oak Ridge Praire Park
31	Tributary of Turkey Creek	W Old Lincoln Highway
32	Turkey Creek	SR55
33	Tributary of Turkey Creek	73rd Avenue
34	Tributary of Turkey Creek	Arthur Street
35	Tributary of Turkey Creek	73rd Avenue
36	Turkey Creek	Liverpool Road



# Impaired Waterbodies



# Impairment Summary

Impairment	2012 Impaired Miles	2016 Impaired Miles	Impaired Stream Miles Changed
IBC	92	225	+133
E. coli	51	210	+159
Nutrients	0	61	+61
Dissolved Oxygen	15	97	+82
PCBs Fish Tissue	34	34	0
Siltation	12	12	0
Free Cyanide	9	9	0

# TMDL Allocations

$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$

- Wasteload allocations (WLA) for “point sources” (regulated under NPDES)
- Load allocations (LA) for nonpoint sources and
- MOS for margin of safety

# TMDL Target Values

- E. coli 125 counts/100mL (geo. mean)
- Total Phosphorus 0.30 mg/L
- Total Nitrogen 10mg/L
- Total Suspended Solids 30mg/L

# Percent Reductions Needed

HUC 12	E. coli	TP	TN	TSS
Headwaters Main Beaver Dam Ditch	82%	59%	0%	66%
Main Beaver Dam Ditch	70%	82%	51%	89%
Headwaters Turkey Creek	71%	89%	0%	77%
Deer Creek- Deep River	67%	35%	0%	73%
City of Merrillville- Turkey Creek	82%	23%	0%	80%
Duck Creek	81%	65%	0%	69%
Lake George- Deep River	75%	57%	0%	89%
Little Calumet River- Deep River	64%	0%	0%	9%
Willow Creek- Burns Ditch	82%	0%	0%	62%

# LDC Zone & Contributing Sources Relationship

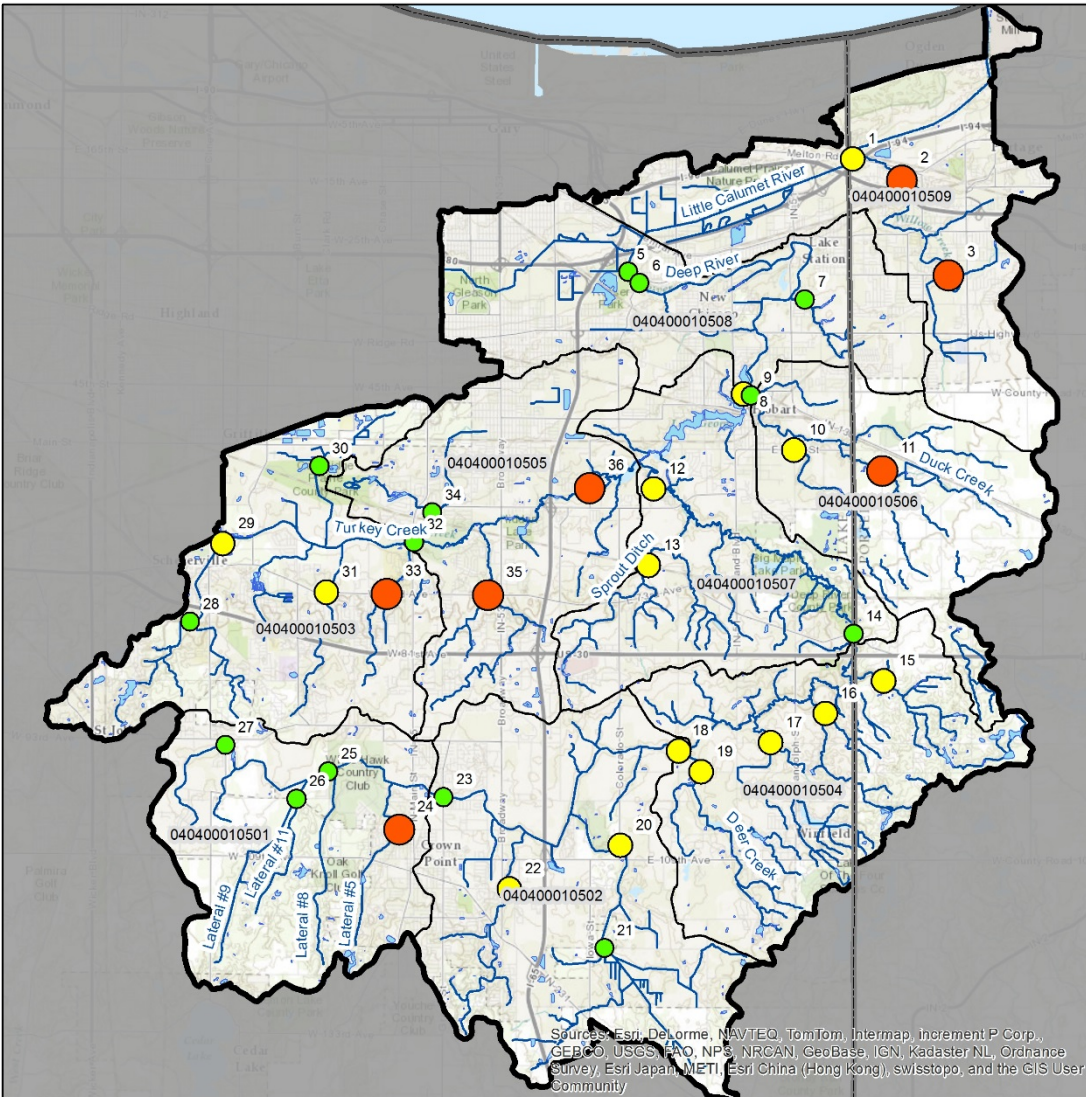
Contributing Source Area	Duration Curve Zone				
	Very High	Moist	Mid-Range	Dry	Very Low
Wastewater treatment plants				M	H
Livestock direct access to streams				M	H
Wildlife direct access to streams				M	H
On-site wastewater systems/Unsewered Areas	M	M-H	H	H	H
Riparian areas		H	H	M	
Abandoned mines	H	H	H	H	H
Storm water: Impervious		H	H	H	
Combined sewer overflows	H	H	H		
Storm water: Upland	H	H	M		
Field drainage: Natural condition	H	M			
Field drainage: Tile system	H	H	M-H	L-M	
Bank erosion	H	M			

Note: Potential relative importance of source area to contribute loads under given hydrologic condition (H: High; M: Medium; L: Low)

# Establishing Target Values to Restore/ Protect Stream Health



# E. coli



**Legend**

- State
- County
- Watershed
- Subwatershed
- Lake/Pond
- Stream

**Median Concentration**

**E. coli**

- 73 - 285
- 286 - 613
- 614 - 1,300

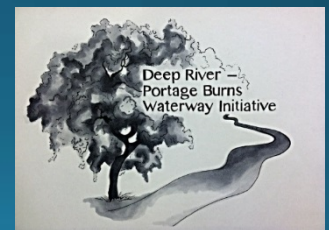
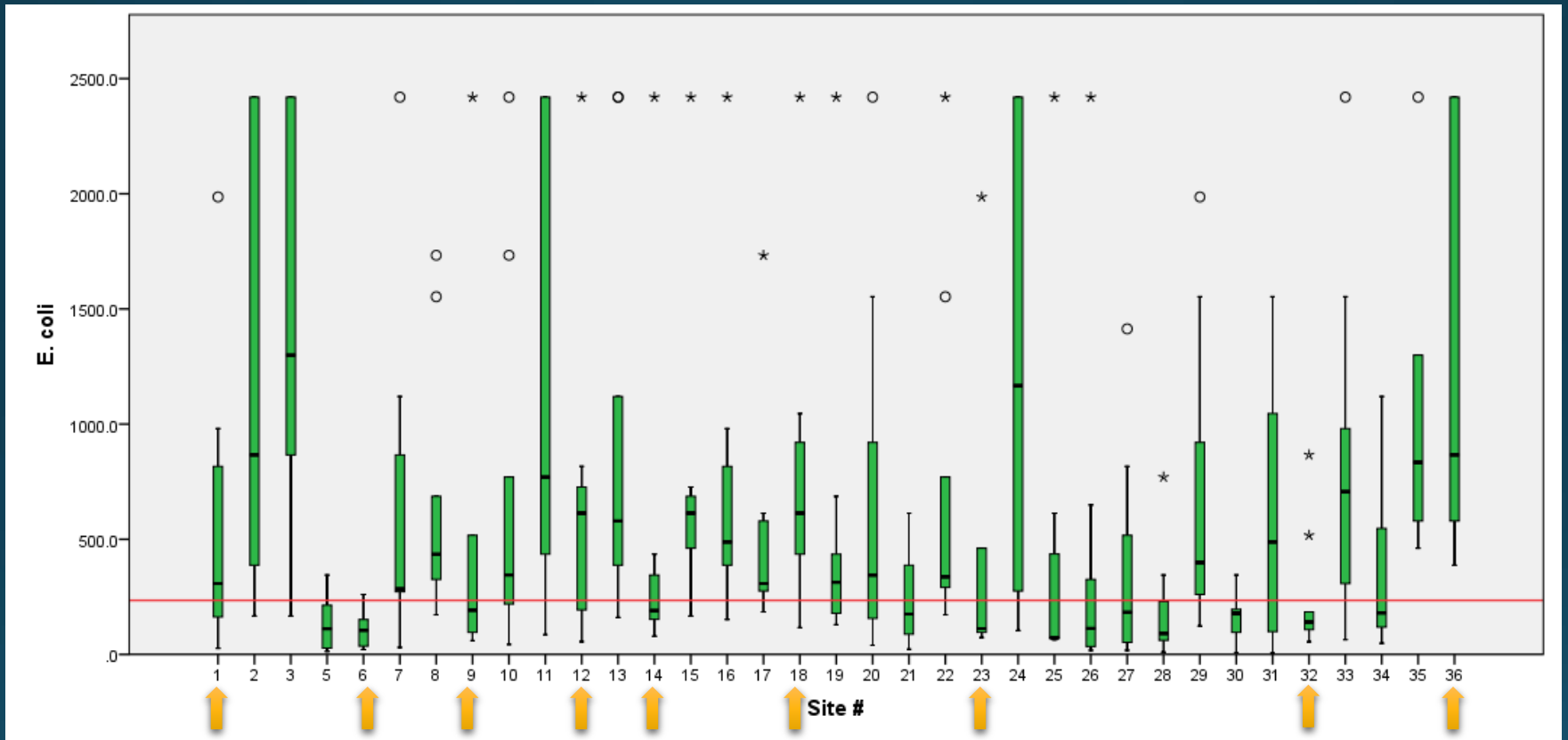
0 1 2 4 Miles

Together We Make The Difference

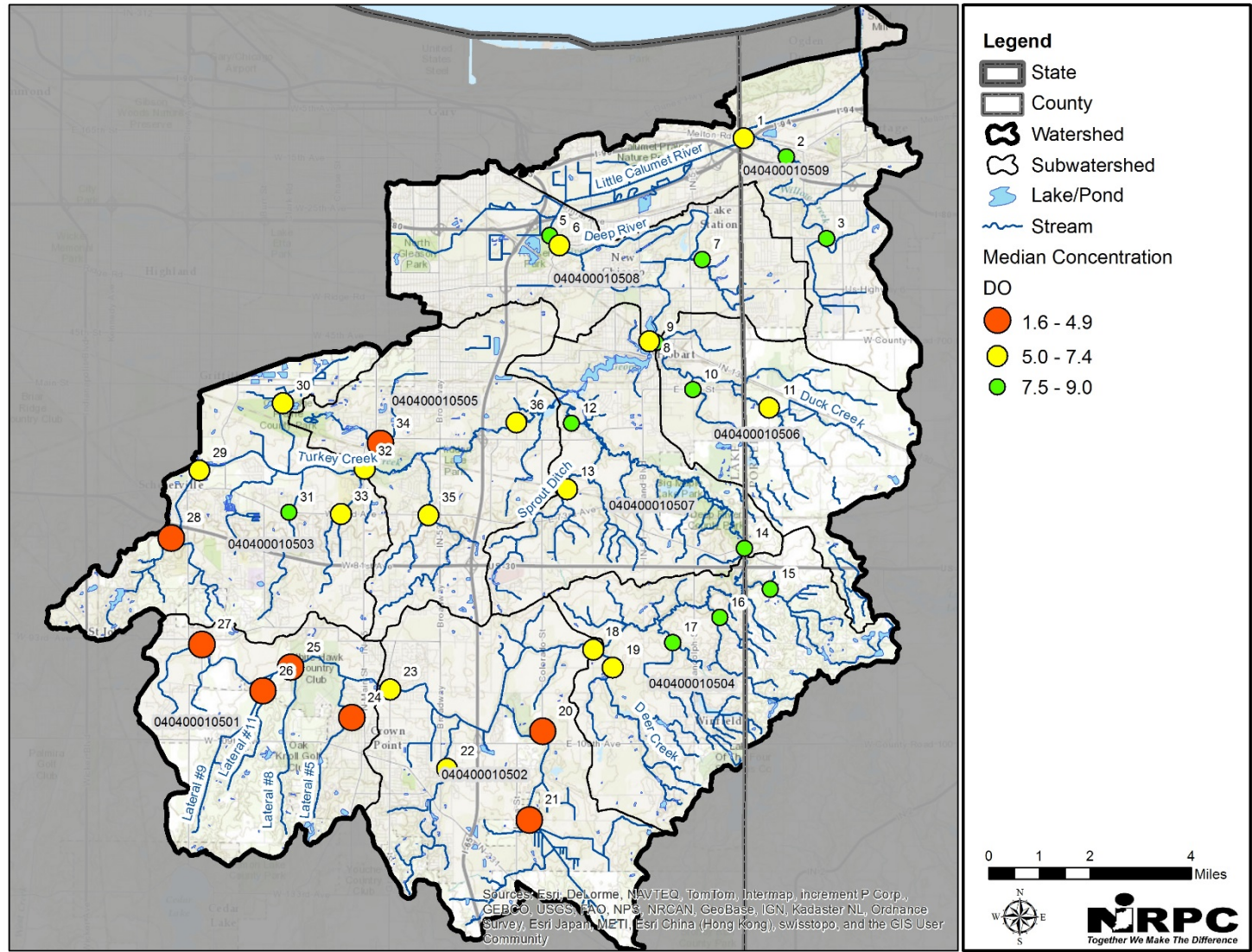
Source: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community



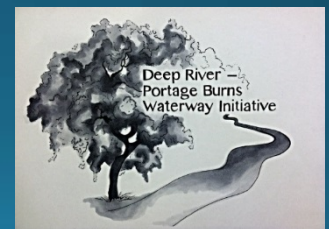
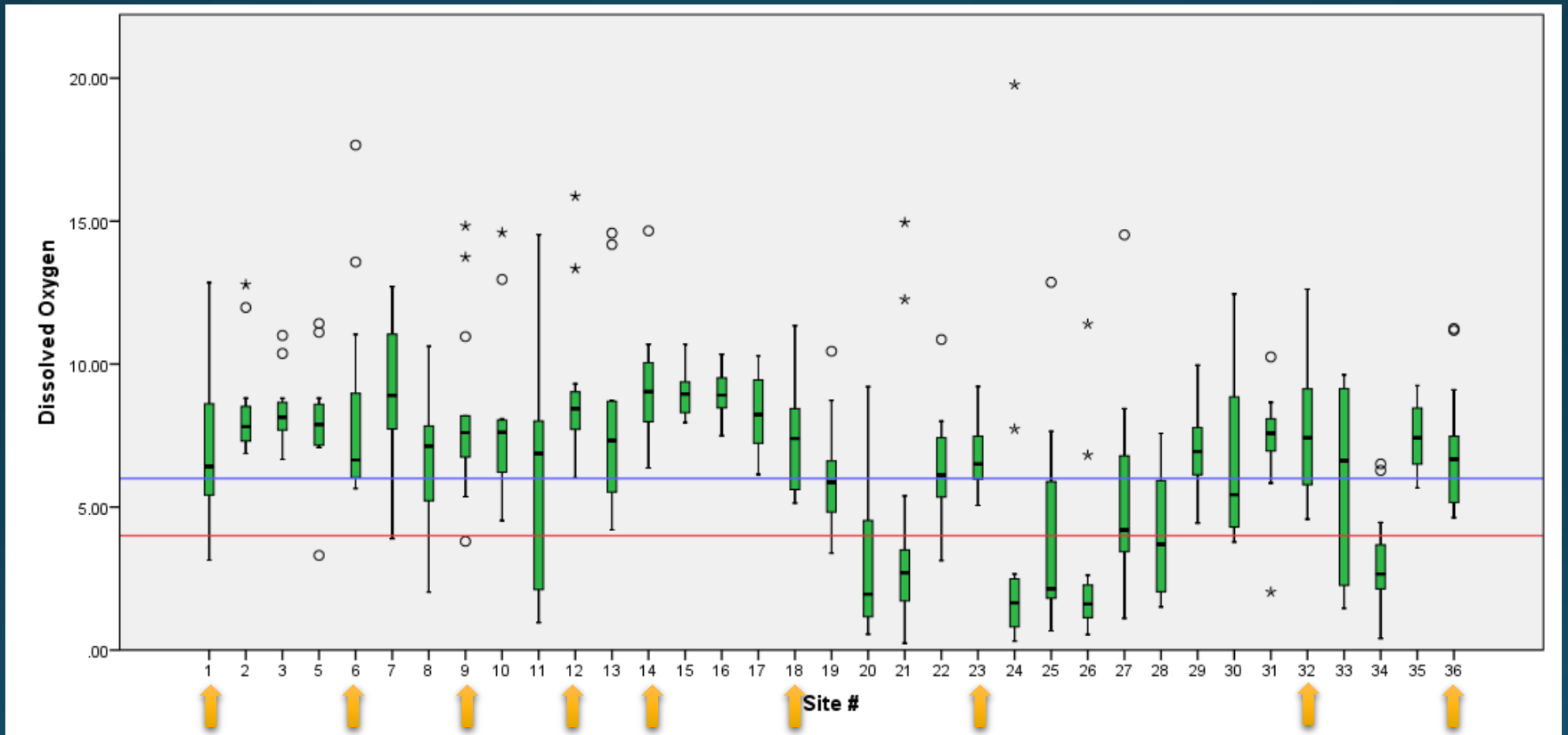
# E. coli



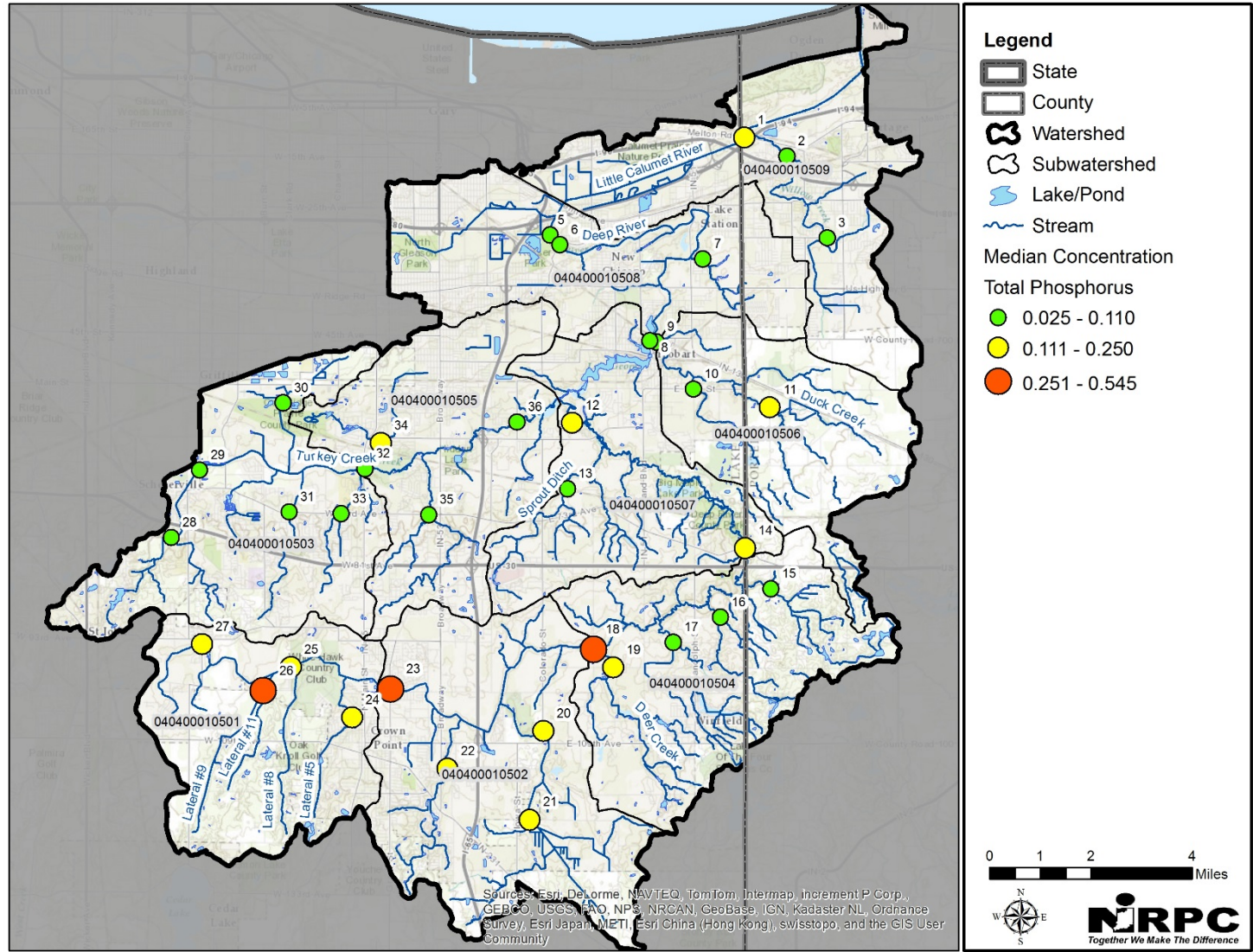
# Dissolved Oxygen



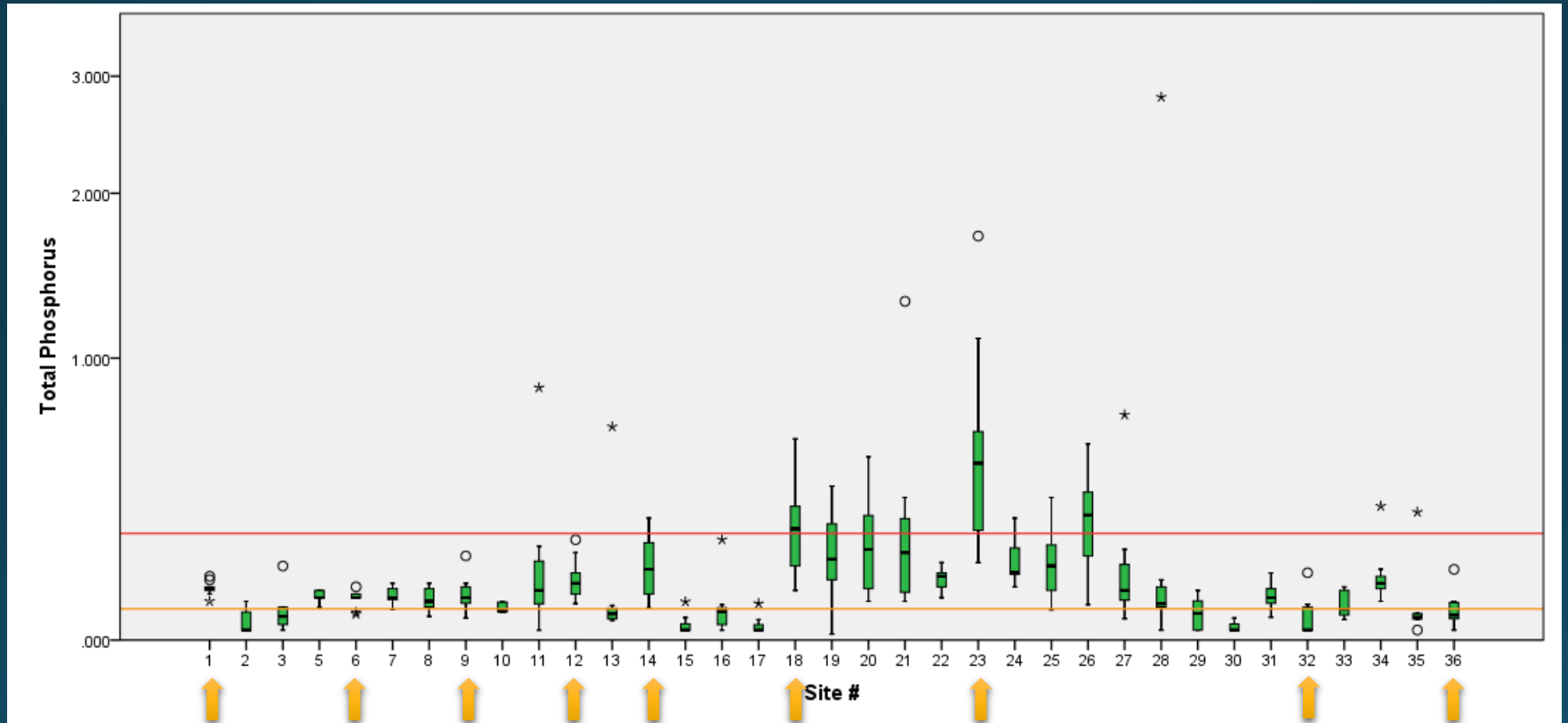
# Dissolved Oxygen



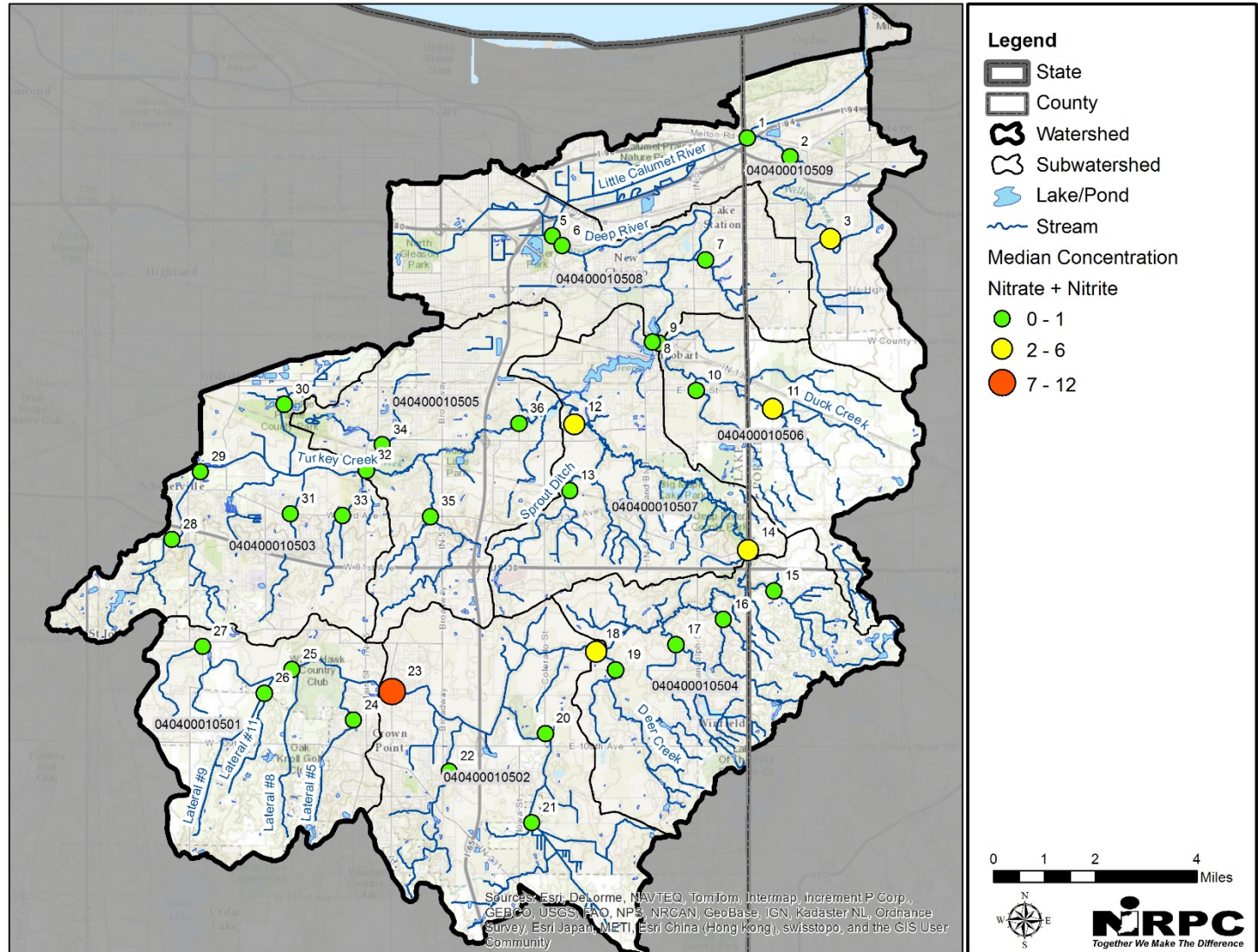
# Total Phosphorus



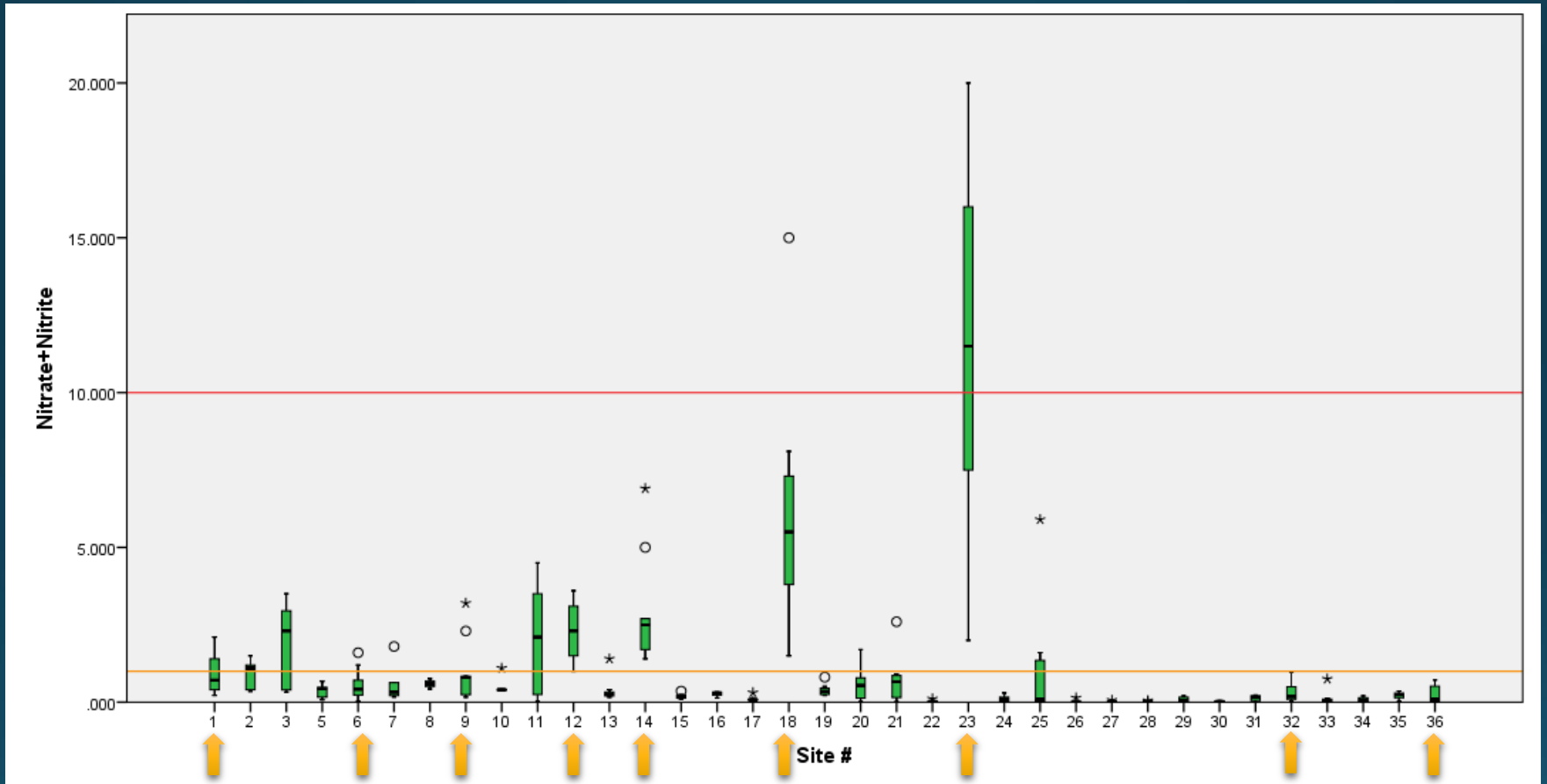
# Total Phosphorus



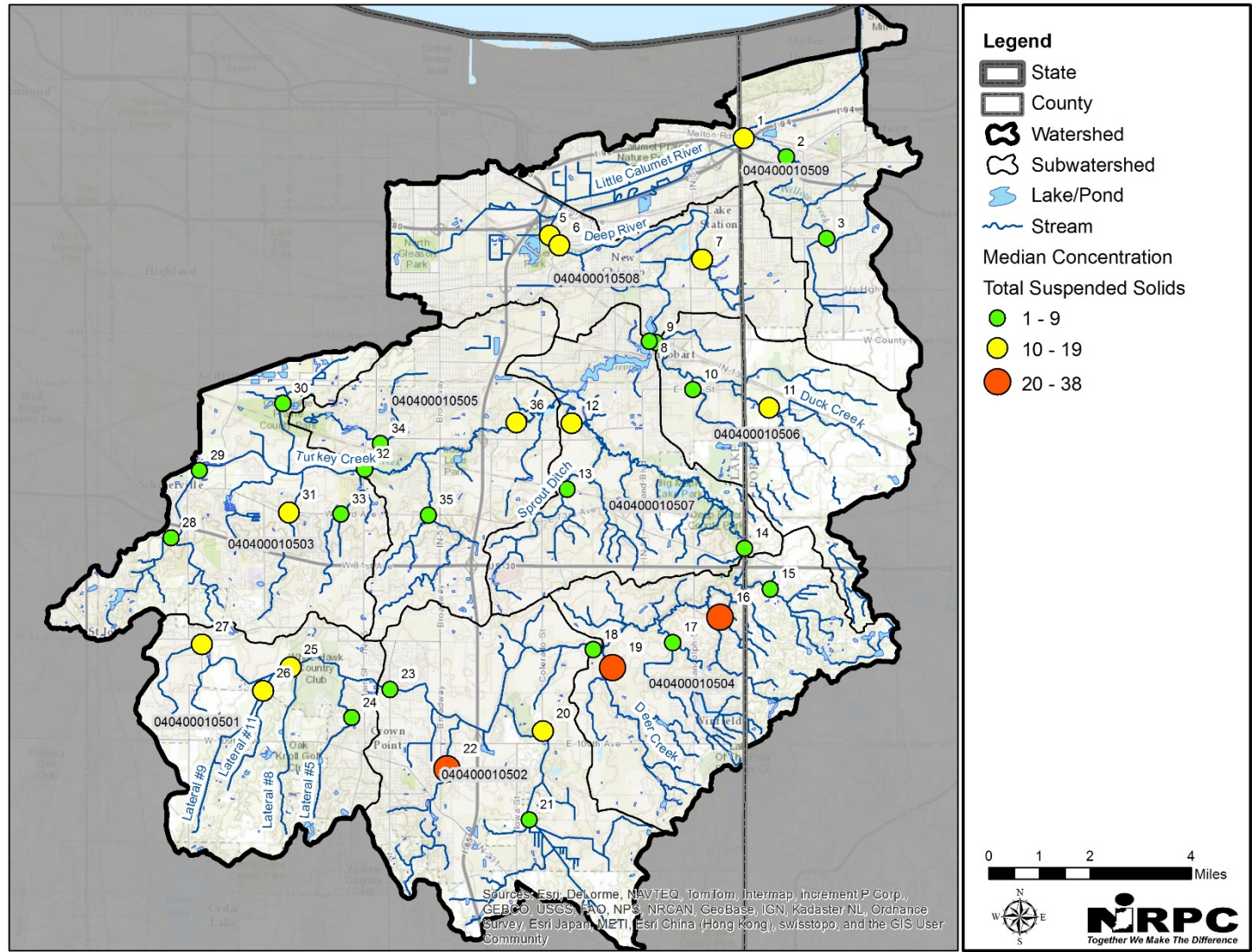
# Nitrate



# Nitrate

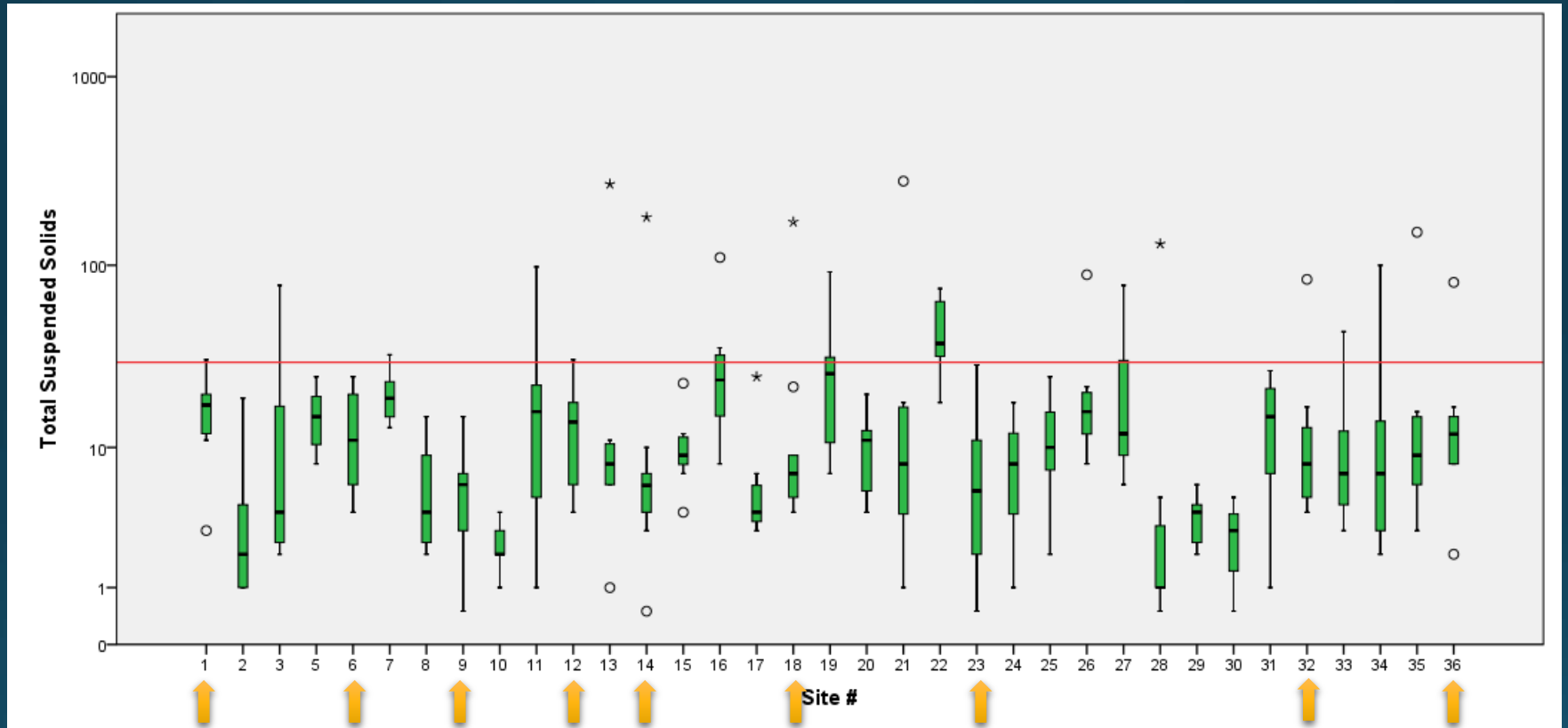


# Total Suspended Solids

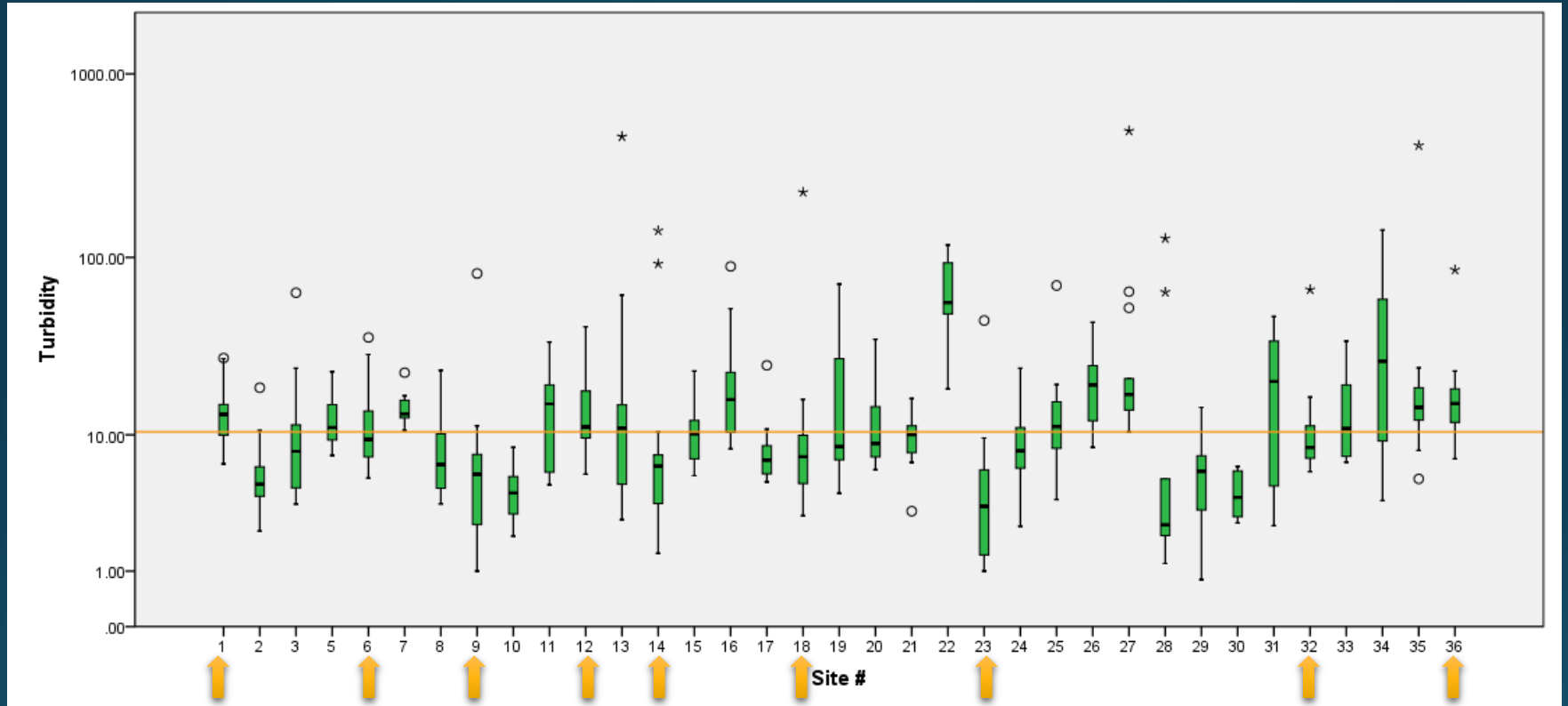




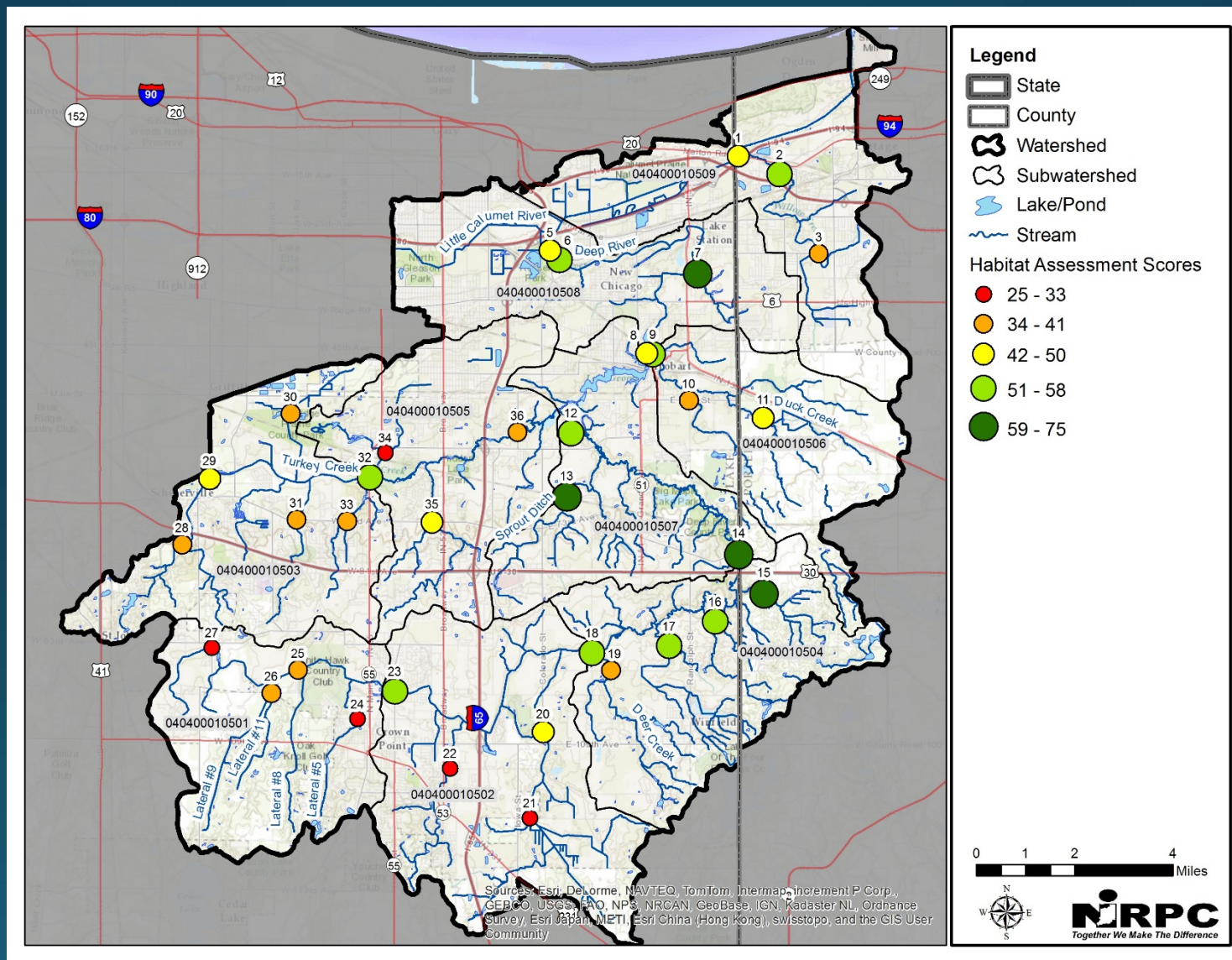
# Total Suspended Solids



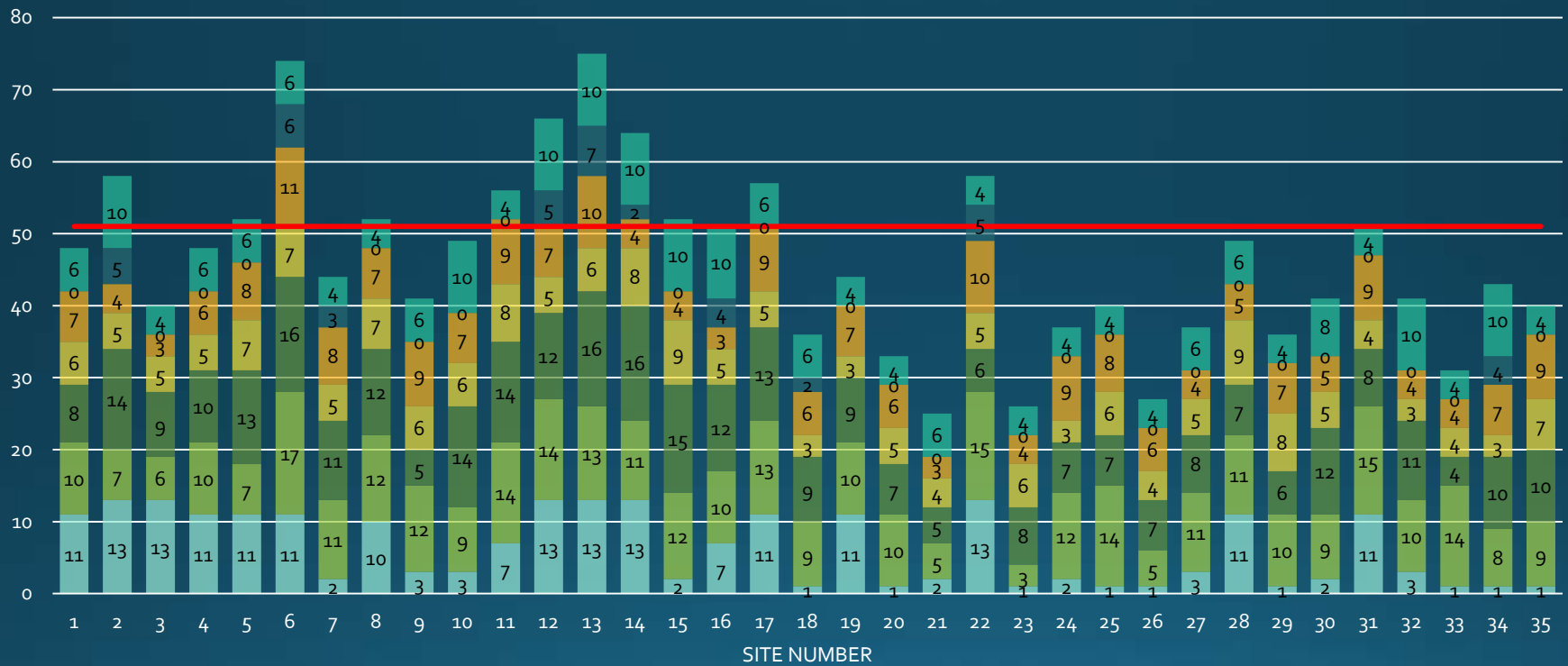
# Turbidity



# Habitat

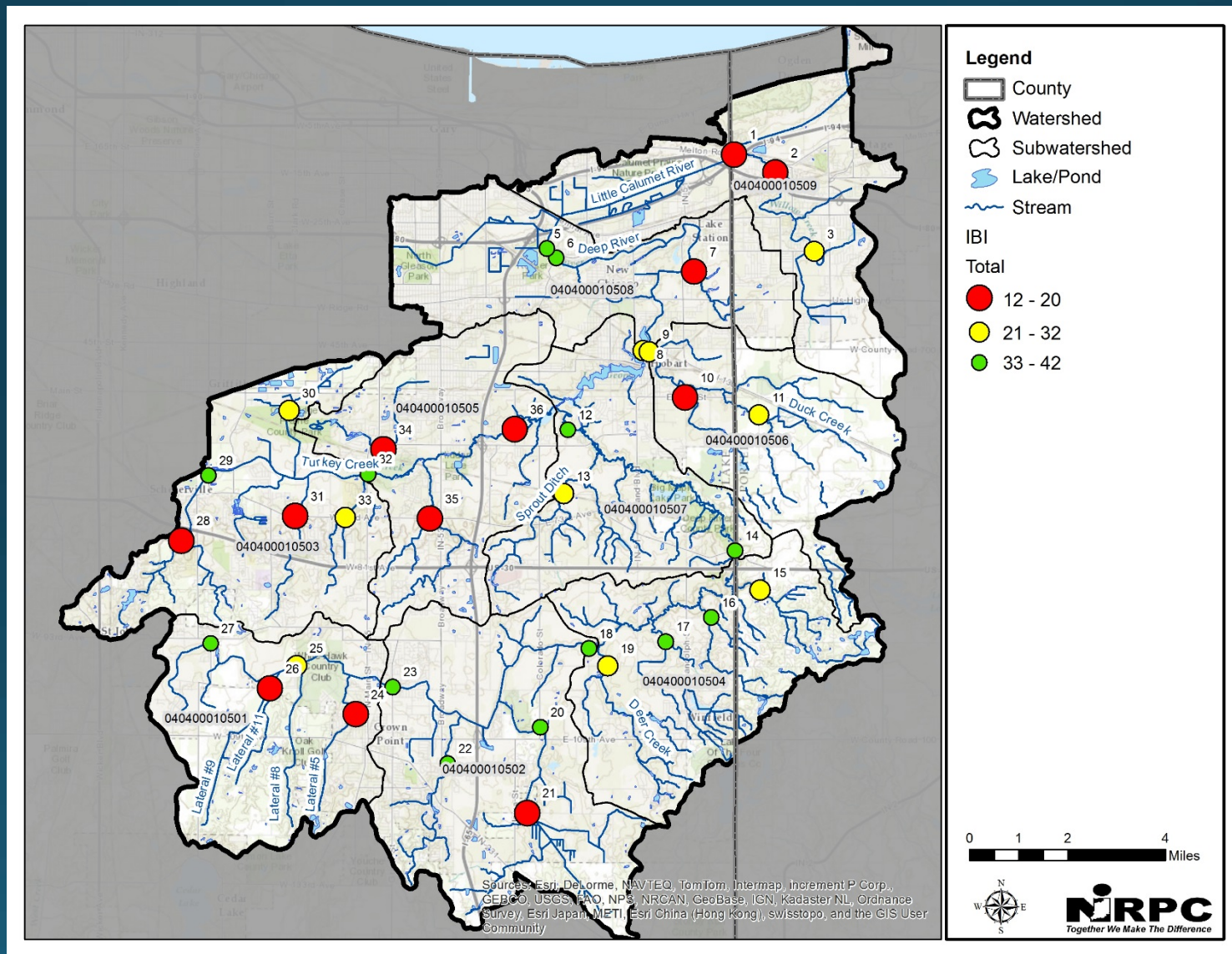


# Habitat Evaluation Scoring



■ Substrate  
 ■ Cover  
 ■ Channel  
 ■ Riparian  
 ■ Pool/Current  
 ■ Riffle/Run  
 ■ Gradient  
 — Minimum

# Fish



# Questions/Comments?

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