

Report of the ORSANCO Biological Water Quality Subcommittee

FEBRUARY 7-8, 2017



2015

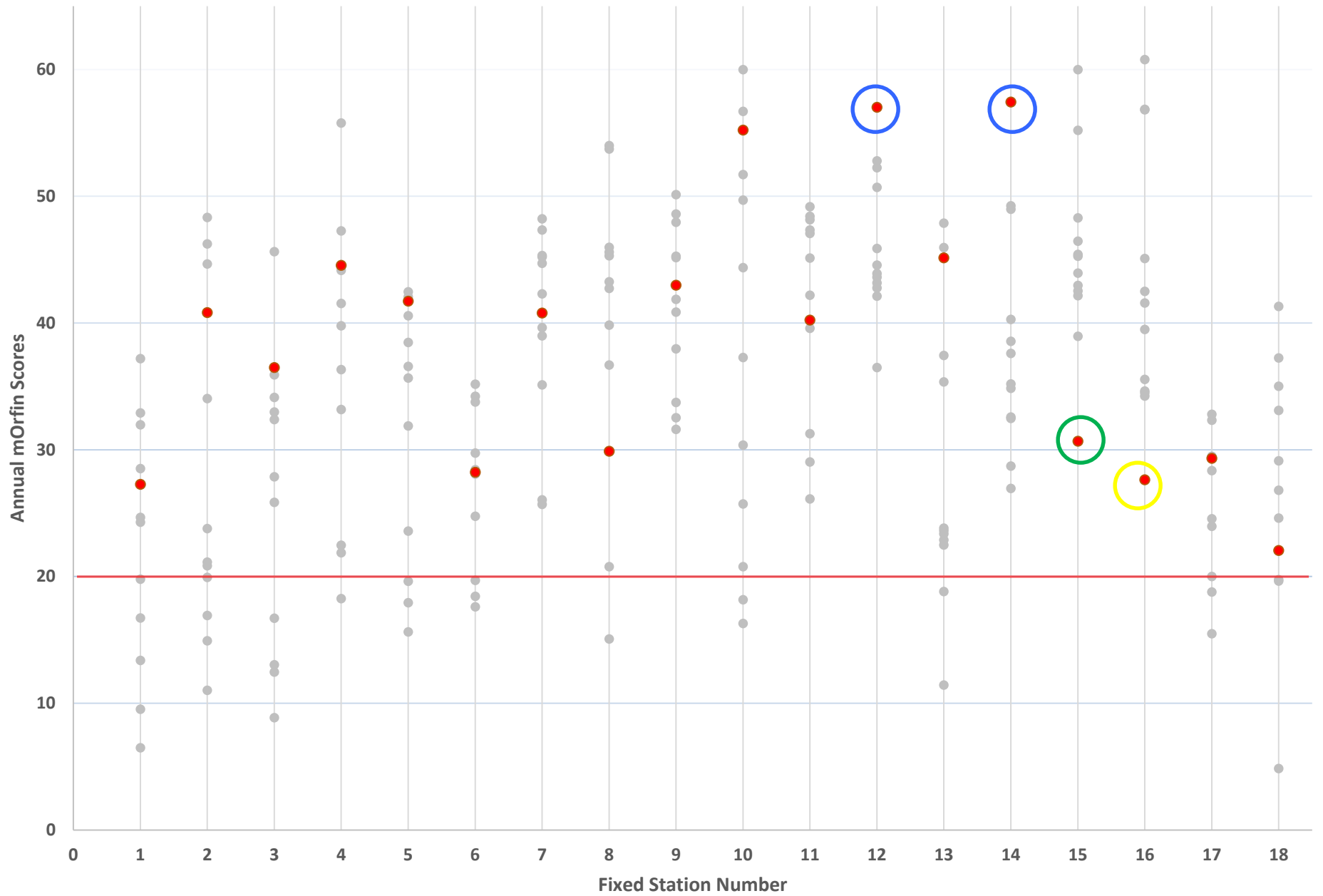


2016



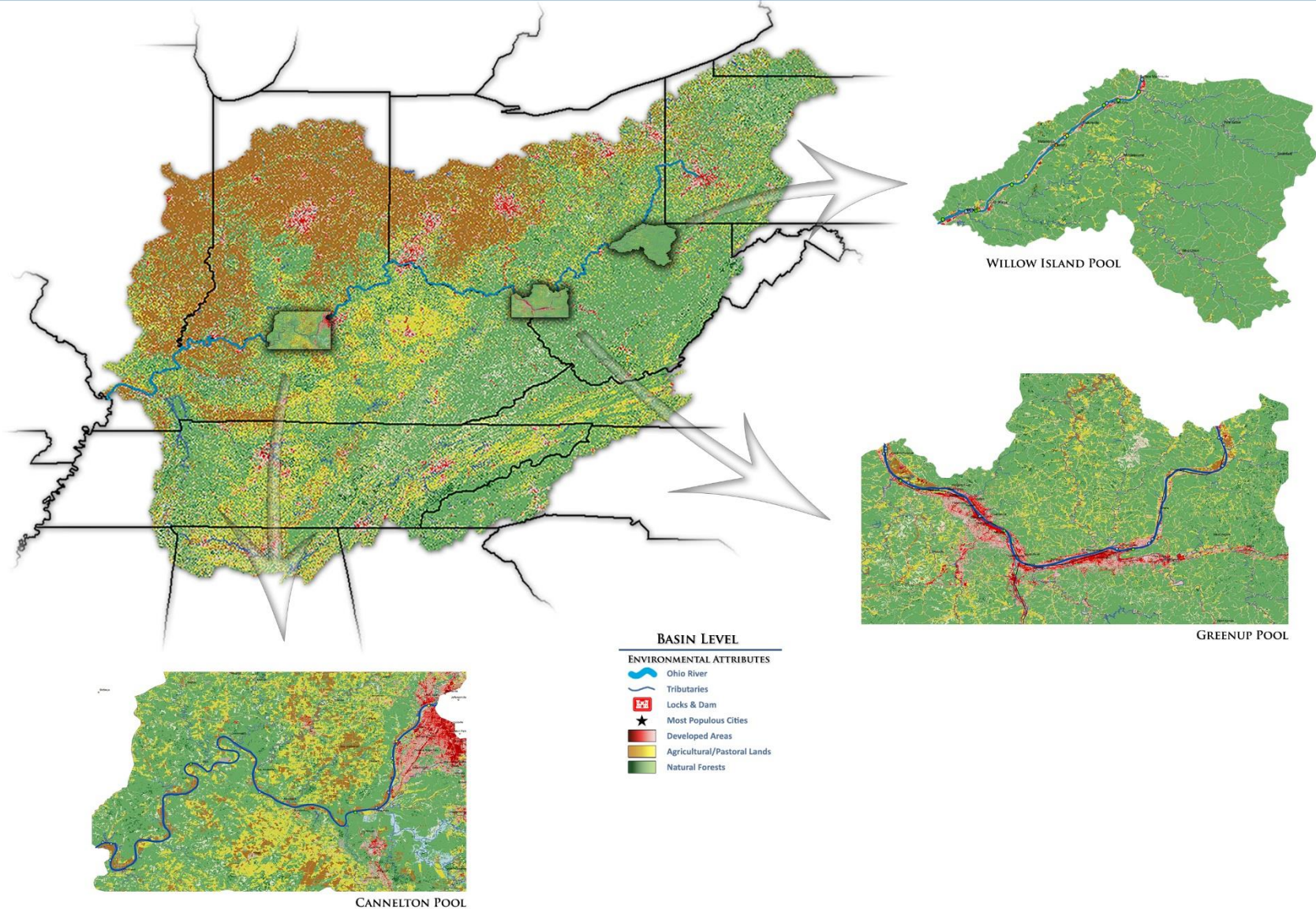
Fixed Station *mORFIn* Performance

● 2005 - 2015
● 2016



2016 POOL SURVEY RESULTS

The results of the 2016 biological surveys are detailed in the following pages (relative pool locations shown below). Included are brief descriptions of the land use & hydrology, site level mORFIn & ORMIn ratings, summaries of notable catches & instream habitat, and the overall biological condition of each pool.



For more detailed catch, metric, and index scores visit www.orsanco.org/programs/biological-programs

WILLOW ISLAND

AVG 35.8 = GOOD

OH

Matamoras

Paden City

New Martinsville

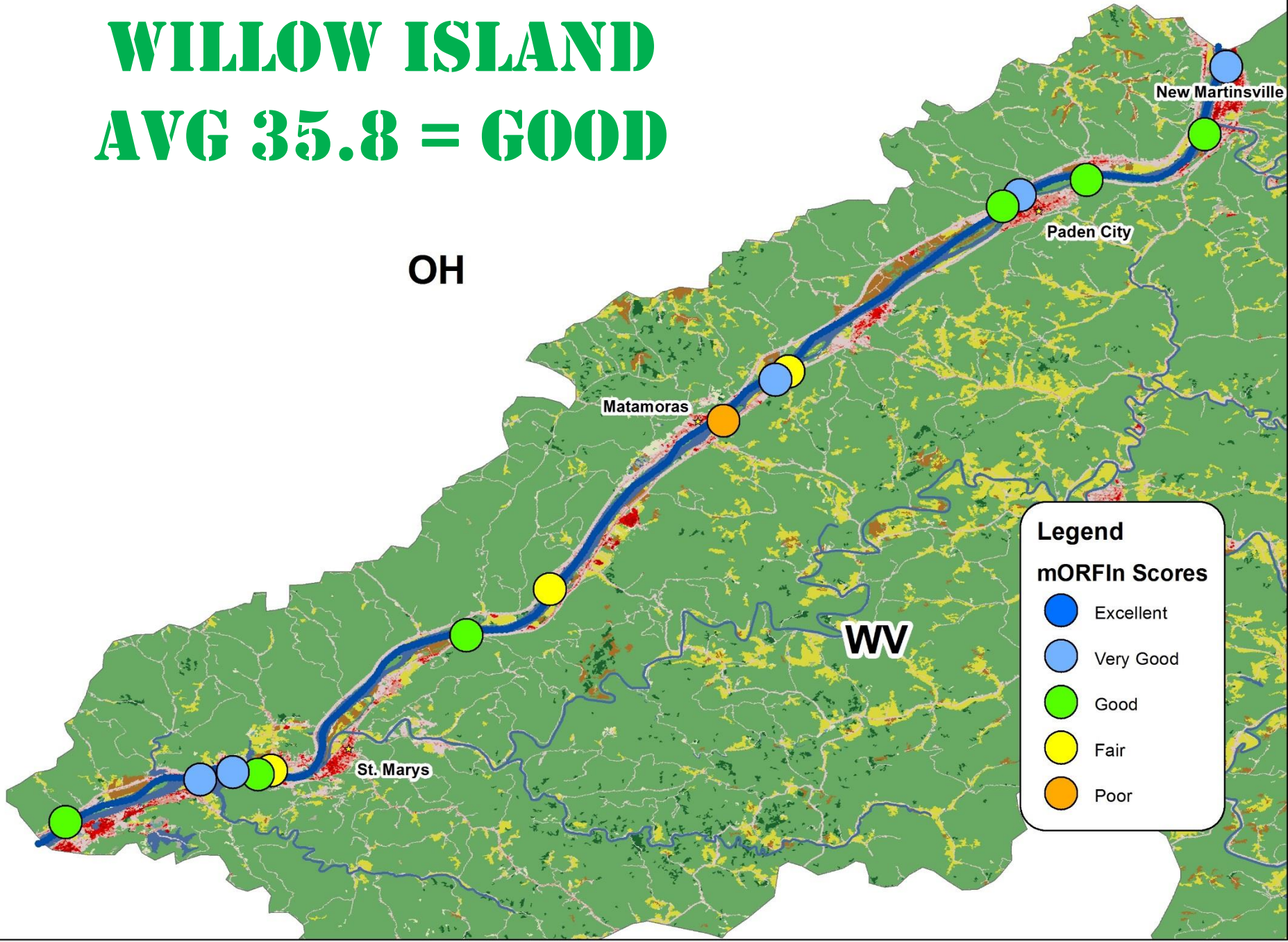
WV

St. Marys

Legend

mORFIn Scores

- Excellent
- Very Good
- Good
- Fair
- Poor



Willow Island Pool (2006 – 2011 - 2016)

Variable	2006	2011	2016
<i>Environmental Factors</i>			
Avg. seasonal flow (cfs)	low	moderate	very low
Avg. Conductivity	350	412	482
Avg. Secchi Depth (inches)	48.3	42.6	58.3
<i>Avg. Sucker Score</i>	75.2	49.6	66.5
Golden Redhorse	277	63	219
<i>Avg. Species Score</i>	78.8	77.4	81.7
<i>Avg. % Non-Native Score</i>	86.8	66.3	92.7
Banded Killifish	1	30	14
Common Carp	22	40	11
<i>Avg. Intolerant Score</i>	59.4	45.7	57.3
Logperch	306	532	1173
<i>Avg. % Simple Lithophyl Score</i>	65.5	8.6	18.8
Logperch	108	16	73
Golden Redhorse	277	63	219
Silver Redhorse	51	12	42
<i>Assessment Result</i>			
<i>Avg. mORFIn Score</i>	39.4	27.7	35.8
Fish Condition Rating	Good	Fair	Good

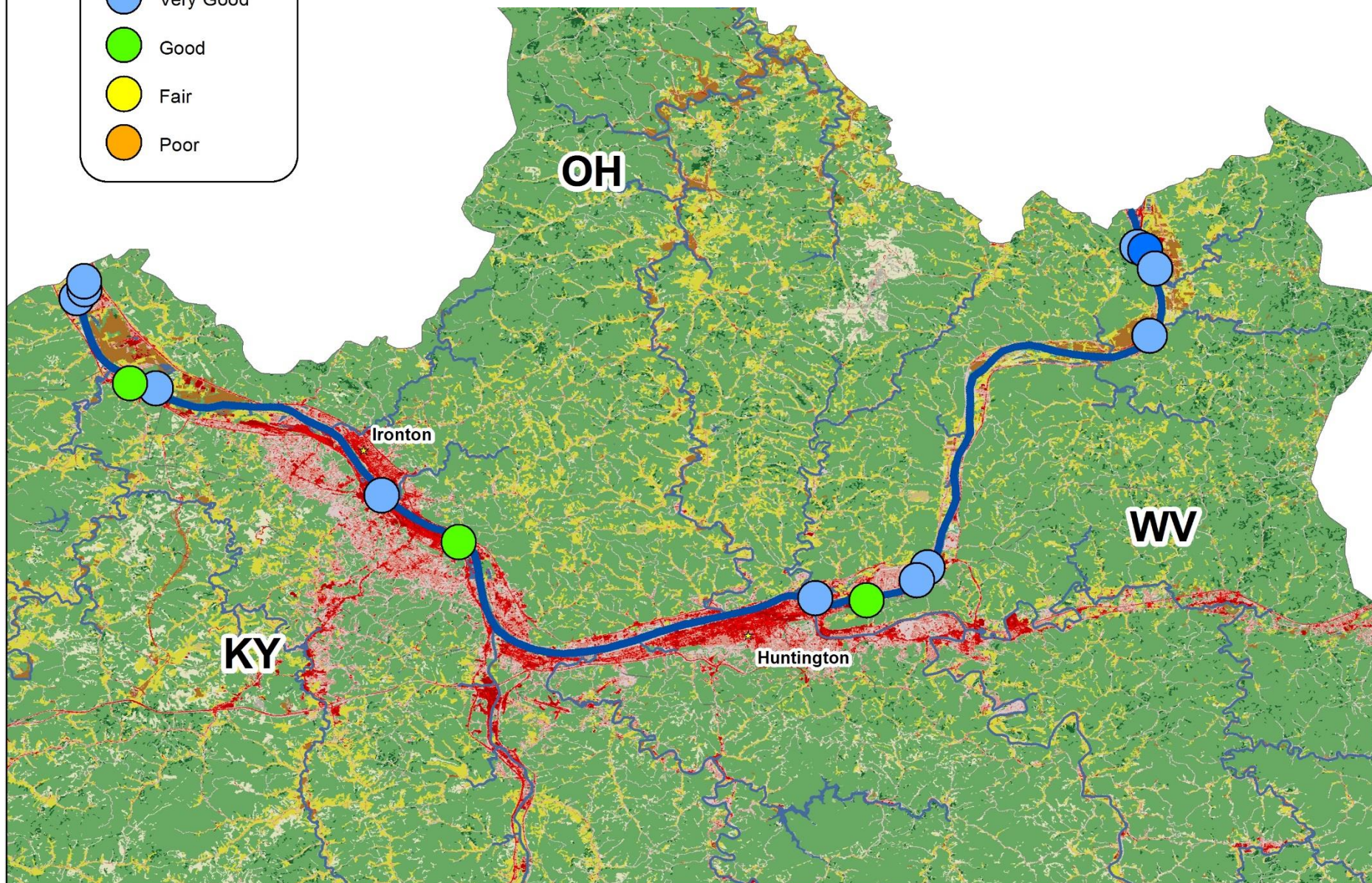
Legend

mORFIn Scores

- Excellent
- Very Good
- Good
- Fair
- Poor

GREENUP

AVG 44.5 = VERY GOOD

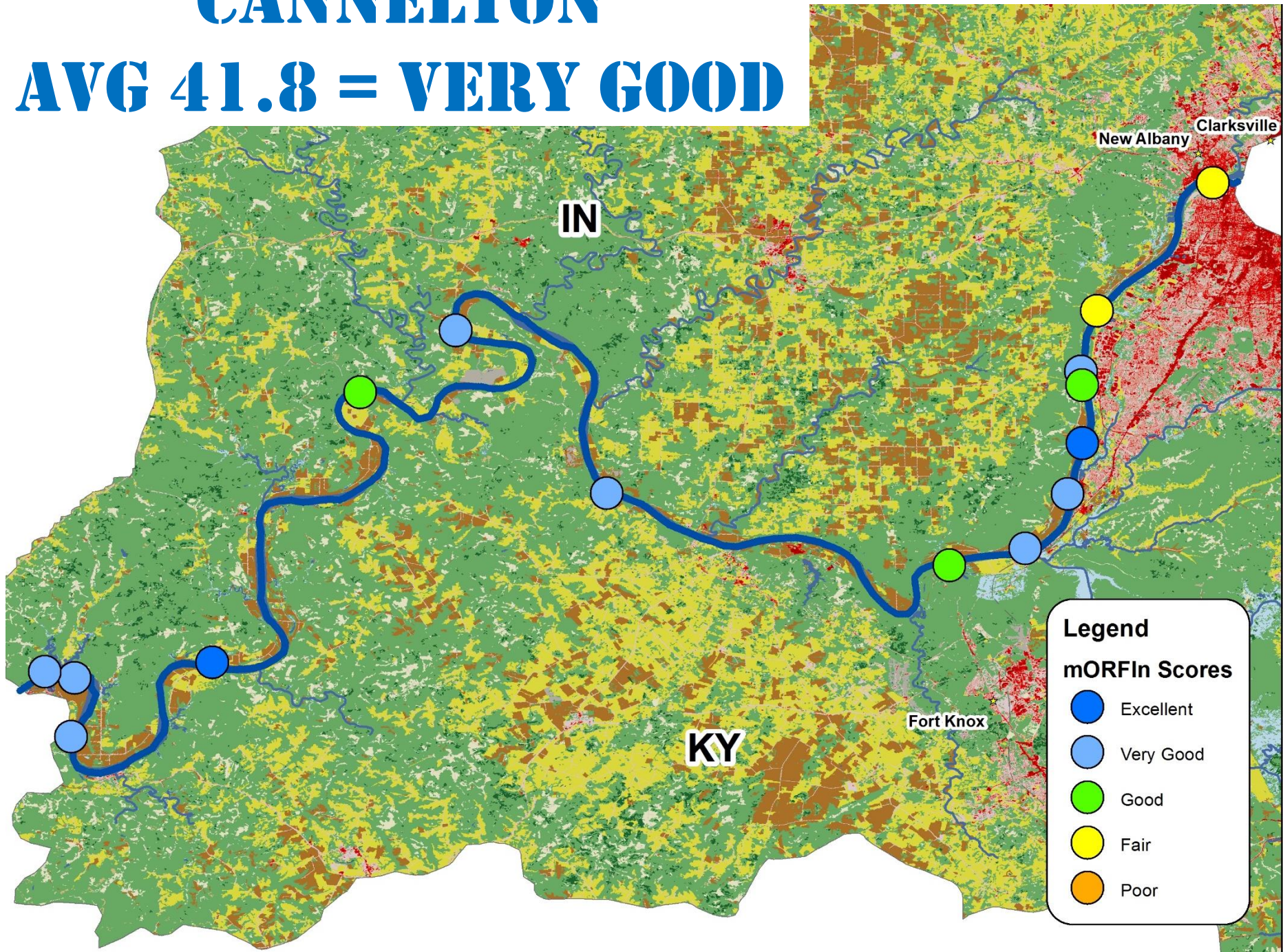


Greenup Pool (2006 – 2011 - 2016)

Variable	2006	2011	2016
<i>Environmental Factors</i>			
Avg. seasonal flow (cfs)	moderate	low	high
Avg. Conductivity	352	423	333
Avg. Secchi Depth (inches)	24.1	40.2	19.4
<i>Avg. CPUE Score (0-100)</i>	9.4	41.4	32.8
Channel Shiner	61	944	2017
Emerald Shiners	50	1557	221
Golden Redhorse	39	34	124
<i>Avg. Species Score</i>	46.8	70.9	76.8
<i>Avg. Centrarchid Score</i>	51.1	75.6	72.2
Bluegill	112	337	205
Spotted Bass	43	127	59
<i>Avg. Intolerant Score</i>	34.4	41.2	53.6
Channel Shiner	61	944	2017
<i>Avg. % Invertivore Score</i>	35.5	63.8	91.1
Channel Shiner	61	944	2017
Redhorses	87	101	227
<i>Assessment Result</i>			
<i>Avg. mORFIn Score</i>	32.3	38.0	44.5
Fish Condition Rating	Good	Good	Very Good

CANNELTON

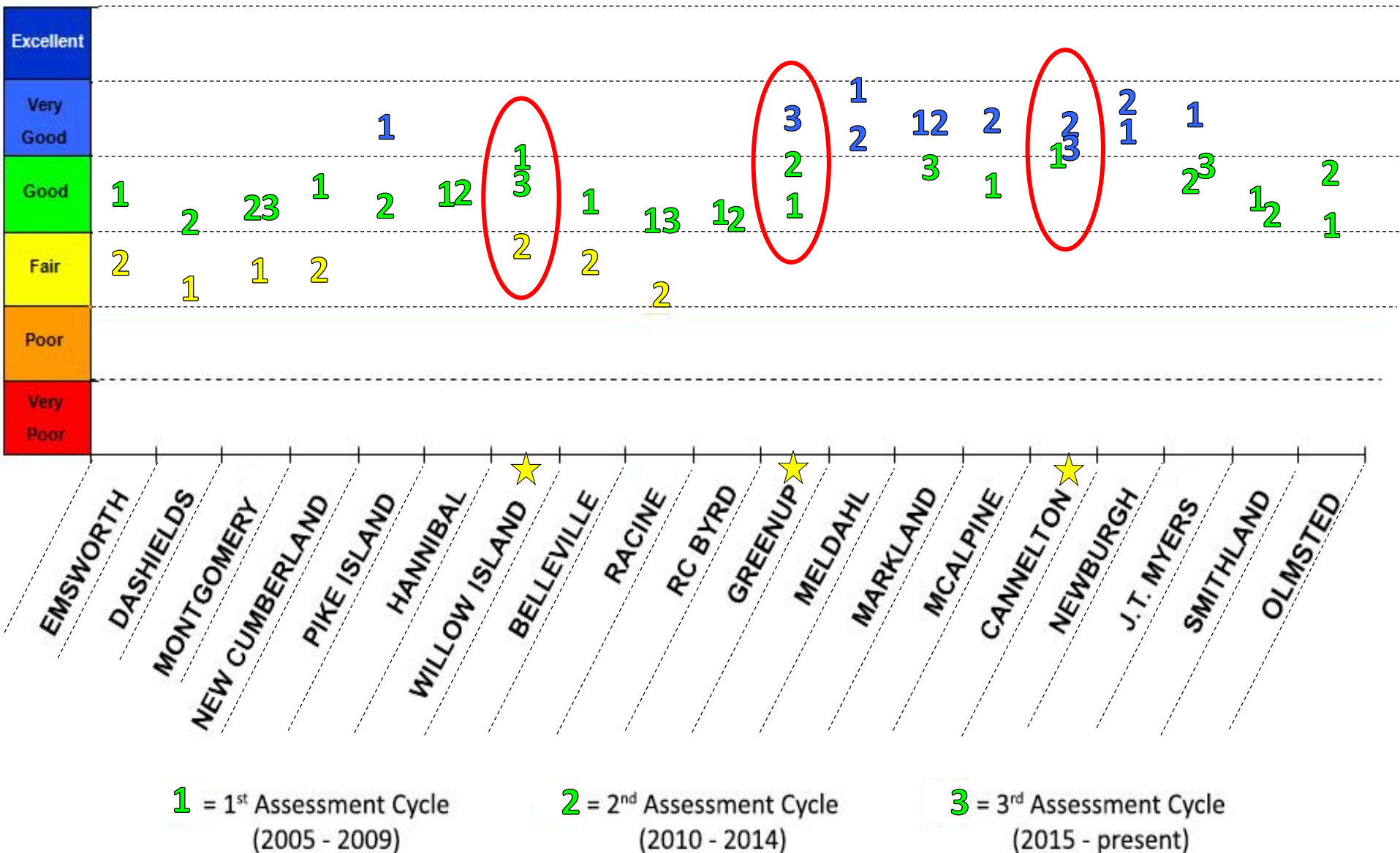
AVG 41.8 = VERY GOOD



Cannelton Pool (2006/2007 – 2011 - 2016)

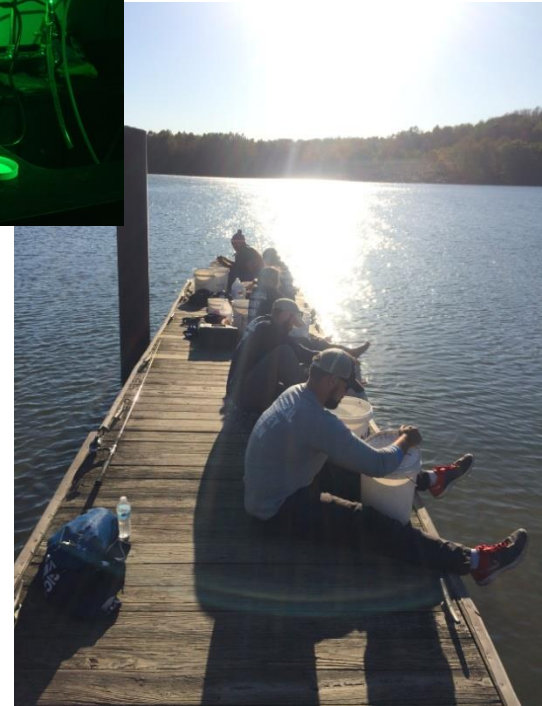
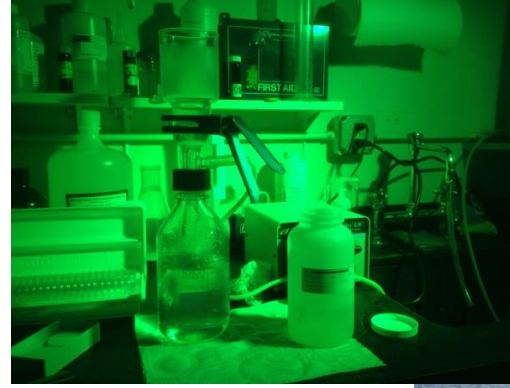
Variable	2006/2007	2011	2016
<i>Environmental Factors</i>			
Avg. seasonal flow (cfs)	high/low	moderate	moderate
Avg. Conductivity	494	461	347
Avg. Secchi Depth (inches)	55.6	29.7	24.9
<i>Avg. CPUE Score (0-100)</i>	38.9	75.0	39.5
Gizzard Shad	3527	709	378
Emerald Shiners	1331	2195	407
<i>Avg. % Non-Native Score</i>	89.8	94.4	77.0
Common Carp	5	4	3
Redear Sunfish	16	15	20
Silver Carp	0	0	3
<i>Avg. % Invertivore Score</i>	37.2	81.3	96.7
Channel Shiner	195	2787	1822
Bluegill	103	247	65
<i>Avg. Species Score</i>	47.7	75.8	60.8
<i>Assessment Result</i>			
<i>Avg. mORFIn Score</i>	39.6	43.6	41.8
Fish Condition Rating	Good	Very Good	Very Good

Past vs. Present



Macroinvertebrates*

- Sampled at each EF site
 - Deep Hester-Dendy and Kicks



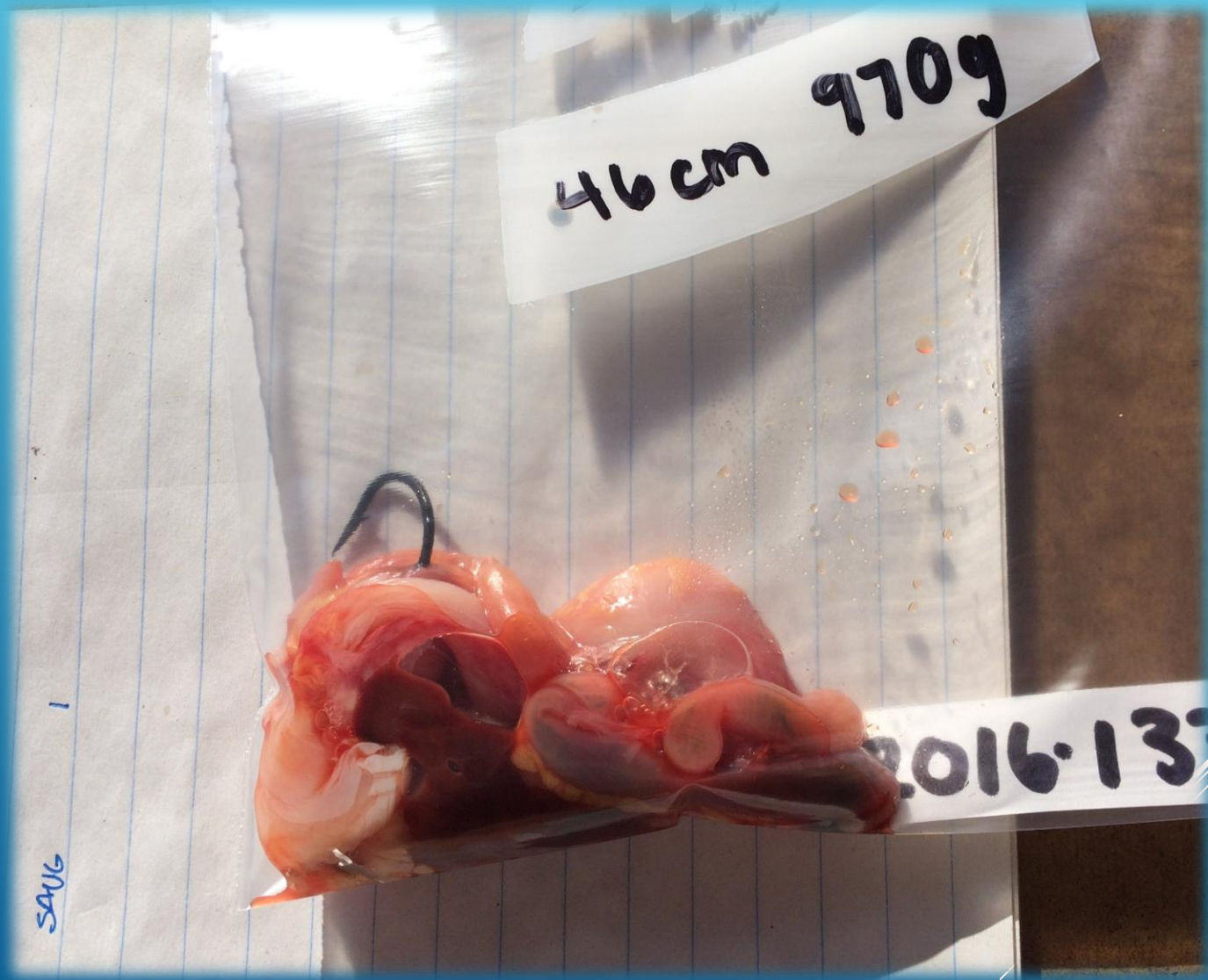
Nutrient Criteria Development*

- Continuous DO/Temp loggers
 - Every 30 min from June-Oct
- Chlorophyll-a, TN, TP, & BOD samples



***Both Supported by USACE Louisville Co-op**

BIO SPECIAL STUDIES: MICROPLASTICS

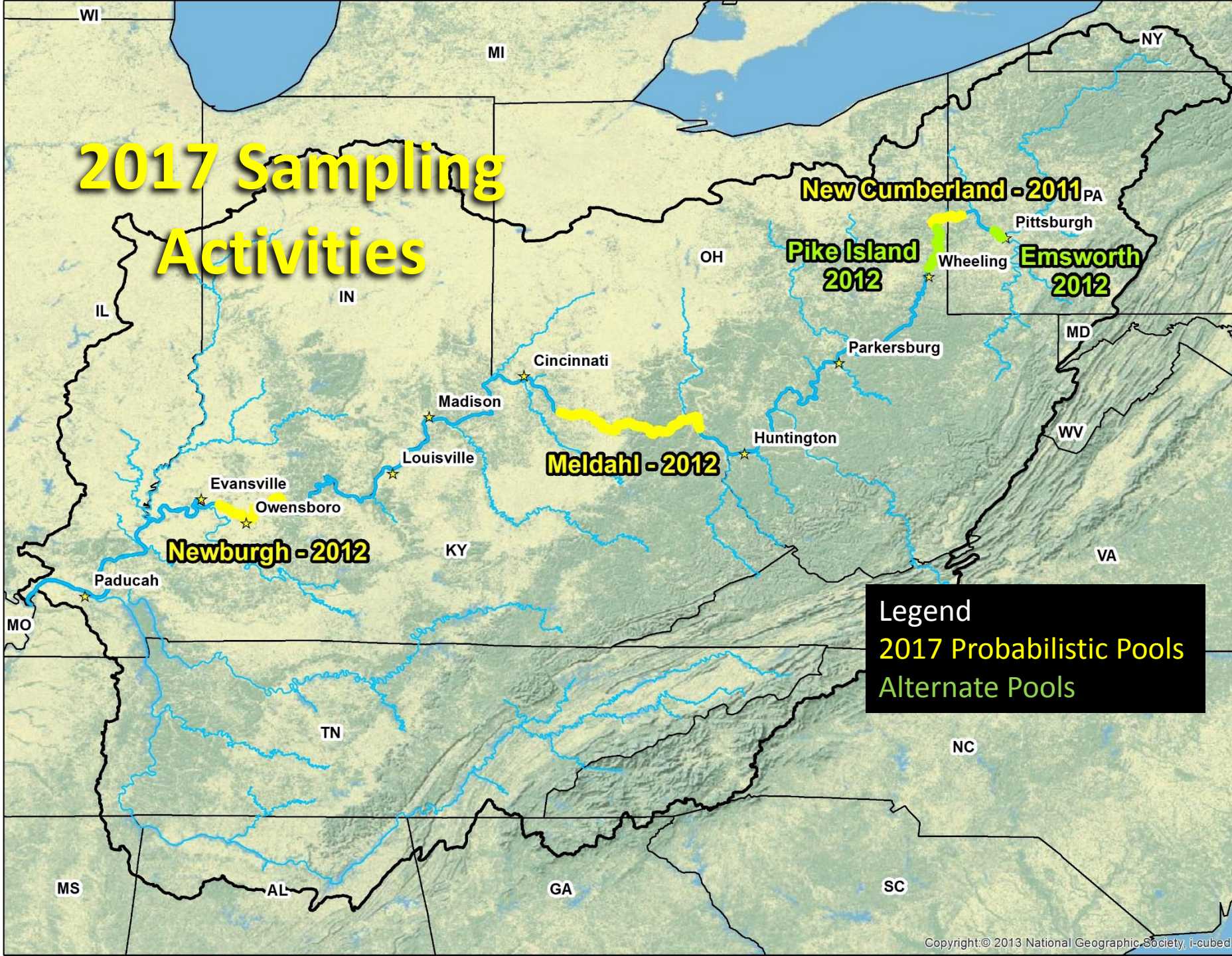


WV Large River Fish Contaminants Study

- Beginning in spring 2016 ORSANCO biological staff has operated on the Monongahela and Kanawha rivers on behalf of WVDEP.
- To date, 21 of the required 24 samples have been collected from the Monongahela River's 2 sampling locations.
- 49 of the required 60 samples have been collected from the Kanawha River's 5 sampling locations.

Taxa	KAN1	KAN2	KAN3	KAN4	KAN5	MON1	MON2
Channel Catfish (large)	5	2	5	0	1	5	5
Channel Catfish (small)	5	5	5	4	5	3	5
Common Carp	3	3	1	2	5	5	5
Crappie	1	5	3	1	0	4	2
Flathead Catfish	5	5	3	0	0	1	0
Freshwater Drum	5	4	5	5	3	5	5
Hybrid Striped Bass	2	2	1	3	1	0	1
Largemouth Bass	0	3	3	0	0	4	5
Sauger	5	0	0	3	2	5	2
Smallmouth Bass	5	4	5	5	5	5	5
Walleye	0	0	2	3	2	2	0
White Bass	5	4	5	2	1	5	3

2017 Sampling Activities



Bio Studies Prioritization

- ___ A) Determine impacts of **Hydrilla** on fish/bug index scores (Year 2)
- ___ B) Collect **water/sediment chemistry** at fish/bug sites
- ___ C) **Revisit** pool from previous year with borderline results
- ___ D) Determine effects of **seasonal influences** on mORFI scores
- ___ E) Incorporate **targeted sampling**
- ___ F) Conduct **Asian Carp surveys** to determine upstream breeding extent
- ___ G) Contract out **Mussel surveys**
- ___ H) Impacts of **microplastics/microbeads** on aquatic life
- ___ I) Explore applications of eDNA
- ___ I) Biological surveys of lower reaches of direct **tributaries**
- ___ J) Targeted sampling to determine **Hydropower** impacts
- ___ K) **4th Probabilistic Pool Survey**

Final Rankings

- 1 Write-in: Collect **water chemistry** from **fixed stations**
- 2 Collect **water/sediment chemistry** at fish/bug sites
- 3 Targeted sampling to determine **hydropower** impacts
- 4 Determine effects of **Hydrilla** on biotic indices - 2nd Year
- 5 Biological surveys of lower reaches of direct **tributaries**
- 6 Conduct same-year **revisits** to estimate mORFI precision
- 7 Conduct **targeted** biological sampling
- 8 Coordinate **mussel surveys** at fish/bug sites
- 9 **4th Probabilistic Pool Survey**
- 10 Determine impacts of **microplastics** on aquatic life
- 11 Conduct **next-year revisits** to a pool with a borderline results
- 12 Determine upstream extent of **Asian Carp** reproduction

2017 Special Study Proposal

- 1 Write-in: Collect **water chemistry** from **fixed stations**
 - Can add at all 18 sites for ~\$1,800
- 2 Collect **water/sediment chemistry** at fish/bug sites
 - Will add at as many sites as resources allow (~\$400/site)
- 3 Targeted sampling to determine **hydropower** impacts
 - Incorporate some sites into pool surveys
- 4 Determine effects of **Hydrilla** on biotic indices - 2nd Year
 - Should be able to provide more insight with routine efforts
- 5 Biological surveys of lower reaches of direct **tributaries**
 - Incorporate some sites into pool surveys
- 6 Conduct same-year **revisits** to estimate mORFI precision
 - Should be able to provide insight with existing data

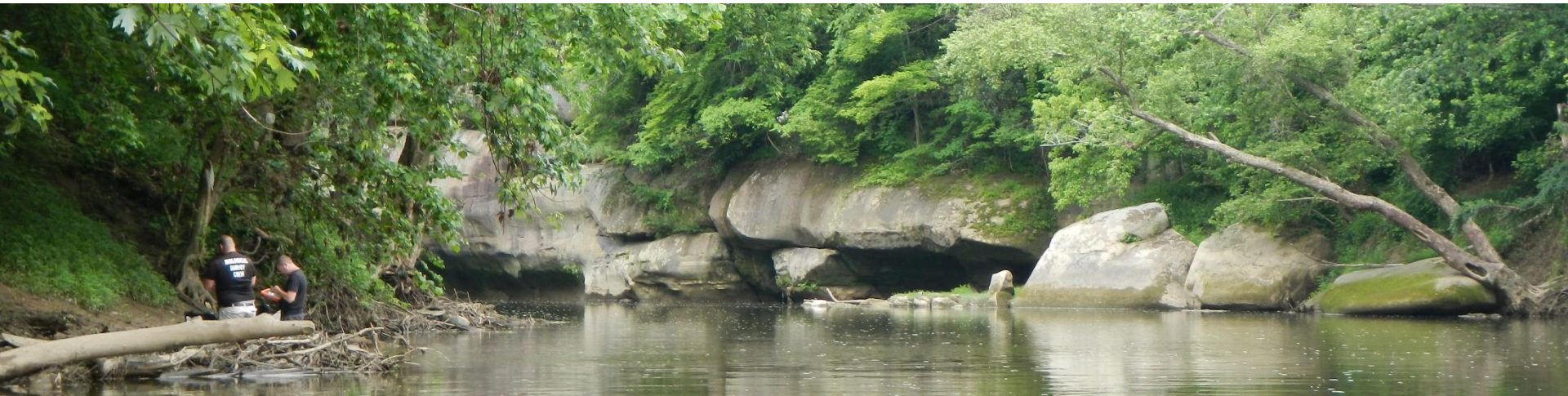
National Rivers and Streams Assessment 2018-2019

- 2004-2006 - Assisted with design of EMAP-Great Rivers Ecosystems
- 2008-2009 – sampled NRSA sites in IN, KY, PA, WV
 - “Boatable” sites within the Ohio River Basin
- 2013-2014 – sampled NRSA sites in KY, OH, PA
 - Boatable and wadeable within 2 hours of Cincinnati



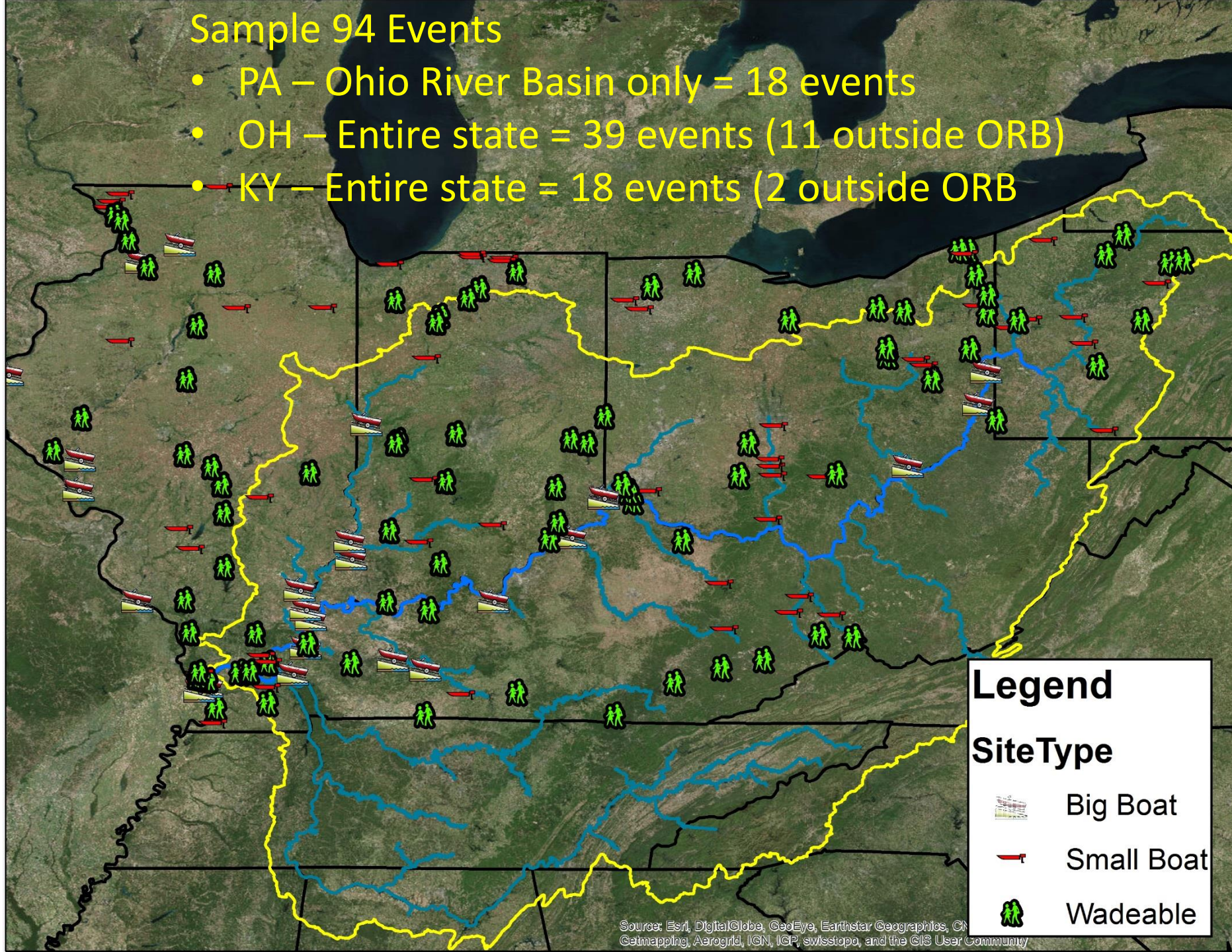
NRSA 2018-2019

- 2018-2019
 - USEPA R3 invited us to do Ohio River Basin sites in PA
 - N = 18 (boatable + wadeable)
 - OH, IN, IL, KY also not participating



Sample 94 Events

- PA – Ohio River Basin only = 18 events
- OH – Entire state = 39 events (11 outside ORB)
- KY – Entire state = 18 events (2 outside ORB)



NRSA 2018-2019: Proposal

94 Events @ \$6,000/event = \$564,000

- Estimated Expenditures = \$483,000
 - Existing Staff = \$173,000
 - Contractual = \$161,000
 - Equipment = \$40,000
 - Supplies = \$30,000
 - Travel = \$80,000
- Estimated Remainder = \$81,000
- **Estimated Remainder + Staff Time = \$253,000**

Summary of BWQSC Recommendations

1. Accept results of the **2016 fish surveys** indicating Willow Island, Greenup, and Cannelton as being in 'Good' or better condition.
2. Incorporate the new **SAV** survey technique into routine monitoring efforts & continue to observe and quantify its effect on biological indices.
3. Pursue sampling **NRSA** sites in 2018-2019, even at the expense of reducing routine efforts, and consider including sites outside of the Ohio River Basin as warranted.

Summary of BWQSC Recommendations

4. Continue to consider **Biological Condition Gradient** applications for the Ohio River and the basin, but do not expend resources to pursue at this time.
5. Conduct probabilistic sampling in New Cumberland, Meldahl, and Newburgh in **2017** and conduct the highest ranking special study as determined by a review of the BWQSC