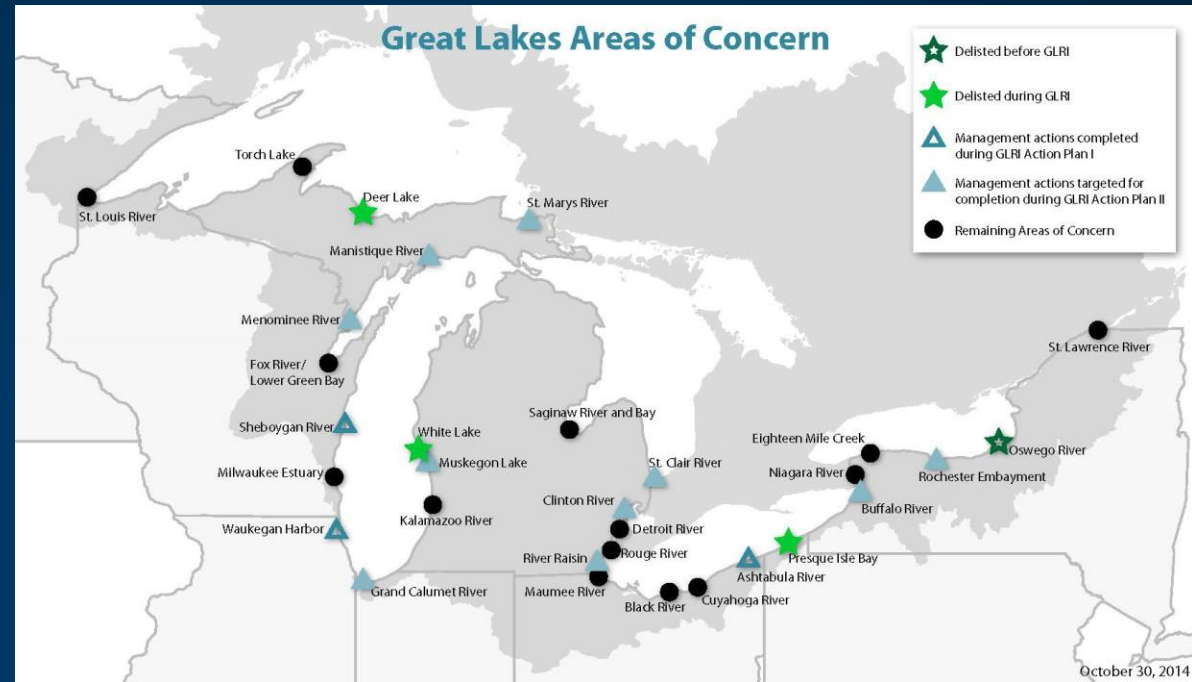


Beneficial Use Opportunities in the St. Louis River Estuary

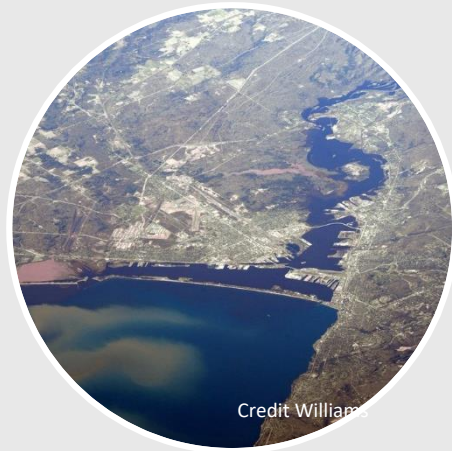
Dan Breneman, MPCA

Outline



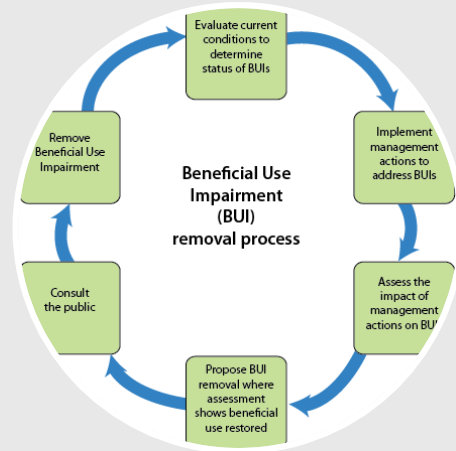
- ❑ Beneficial Use- *justifying alternative placement options*
- ❑ Design-basis Approach- *addressing BUI objectives*
- ❑ Remediation and Restoration- *case study examples*
- ❑ In-water placement- *in a management strategy*

Beneficial Use in the Duluth/Superior Harbor Prioritizing AOC Restoration Opportunities



Credit Williams

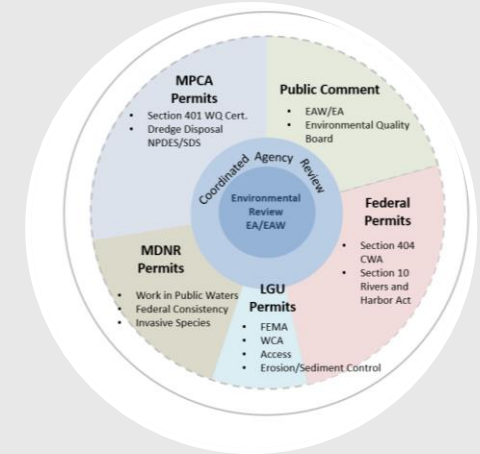
**St. Louis River
Area of Concern**



**Beneficial Use
Impairments**



**Federal and State Funds
*GLRI, GLLA and OHC, CWL***



**Harmonizing Federal and
State Regulations**

- **AOC Program project sites in MN alone covered over 2,000 acres**
- **Funding and material limitations required a sequential approach**

Beneficial Use Minnesota State Guidance In-water placement-

Approving Material

- Sample allocation
- Sediment characterization
- Acceptable Risk

Approving Placement

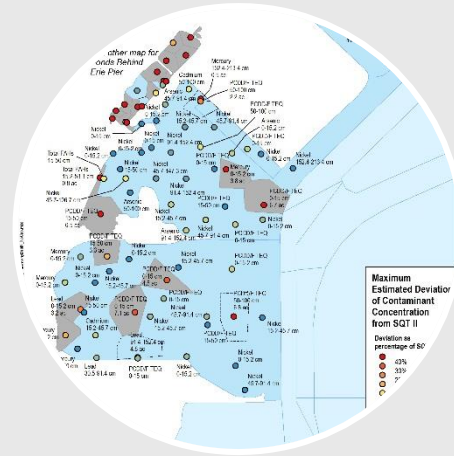
- Ecological/Public benefit



Approving Placement Design-basis approach



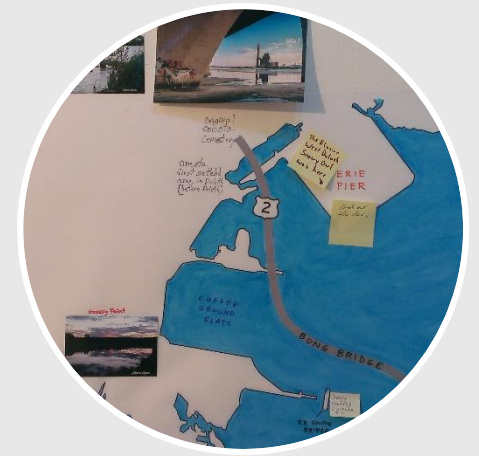
Physical



Chemical



Biological



Economical/Social

- BUI metrics incorporated as design criteria
- Objectives based on reference condition targets

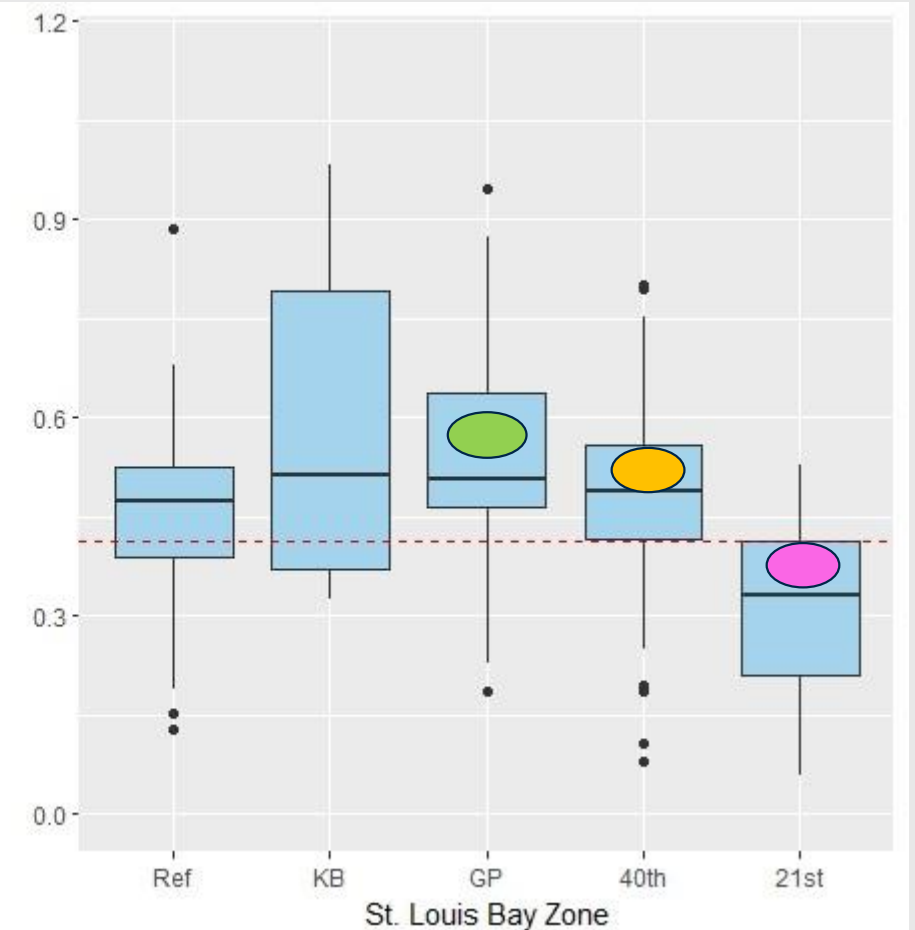
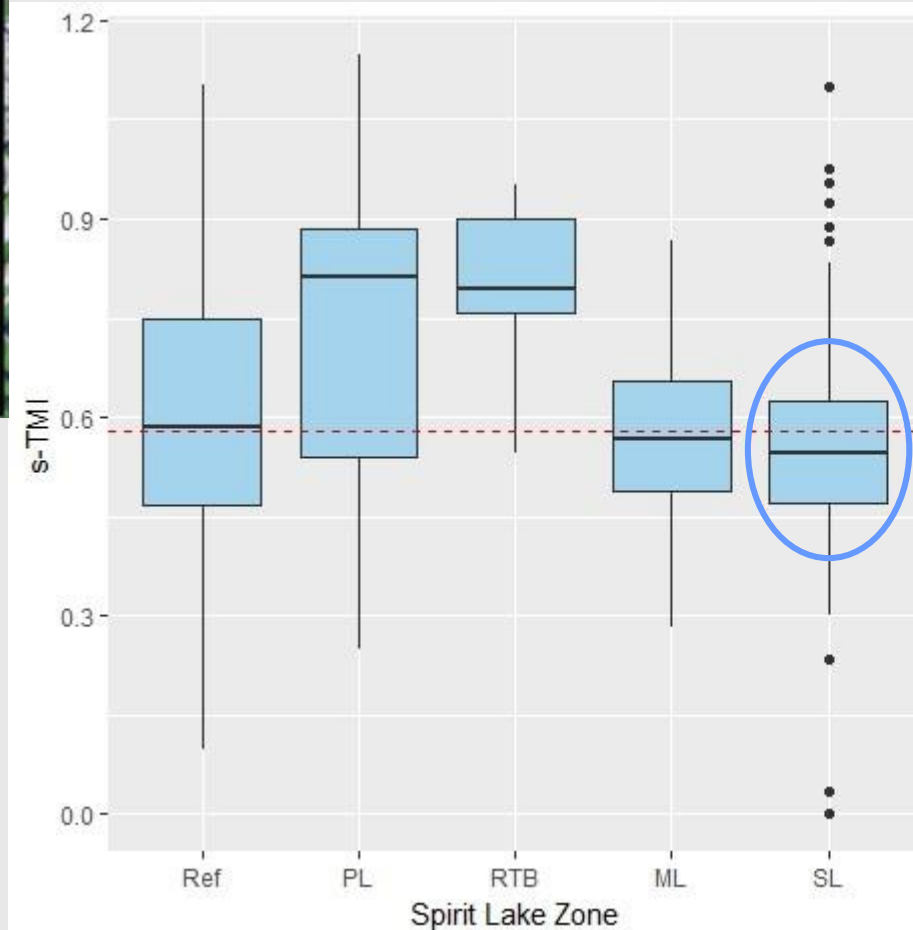
Project Purpose

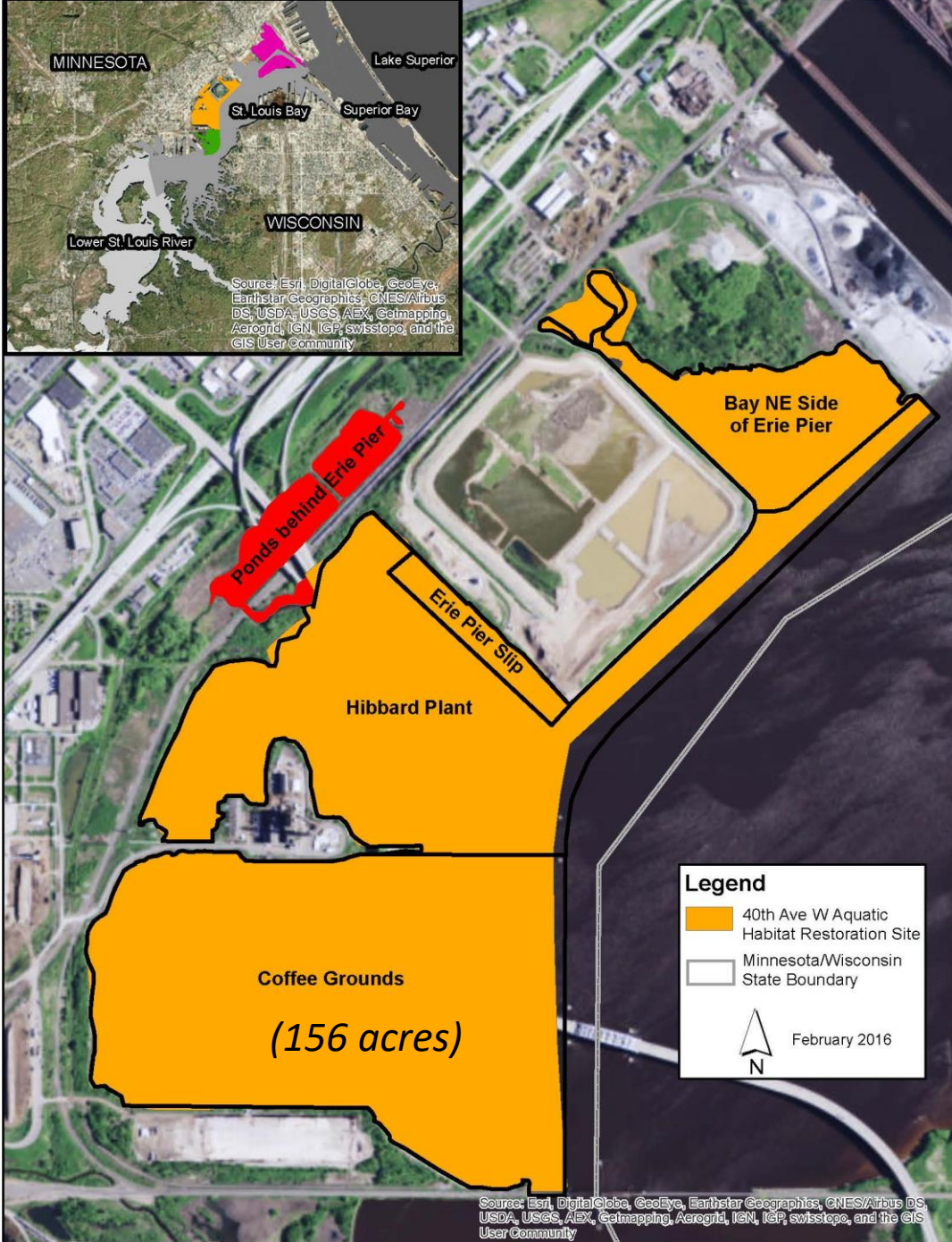
Addressing Beneficial Use Impairments

Pre-construction aquatic macroinvertebrate community within two St. Louis River zones.



Target value

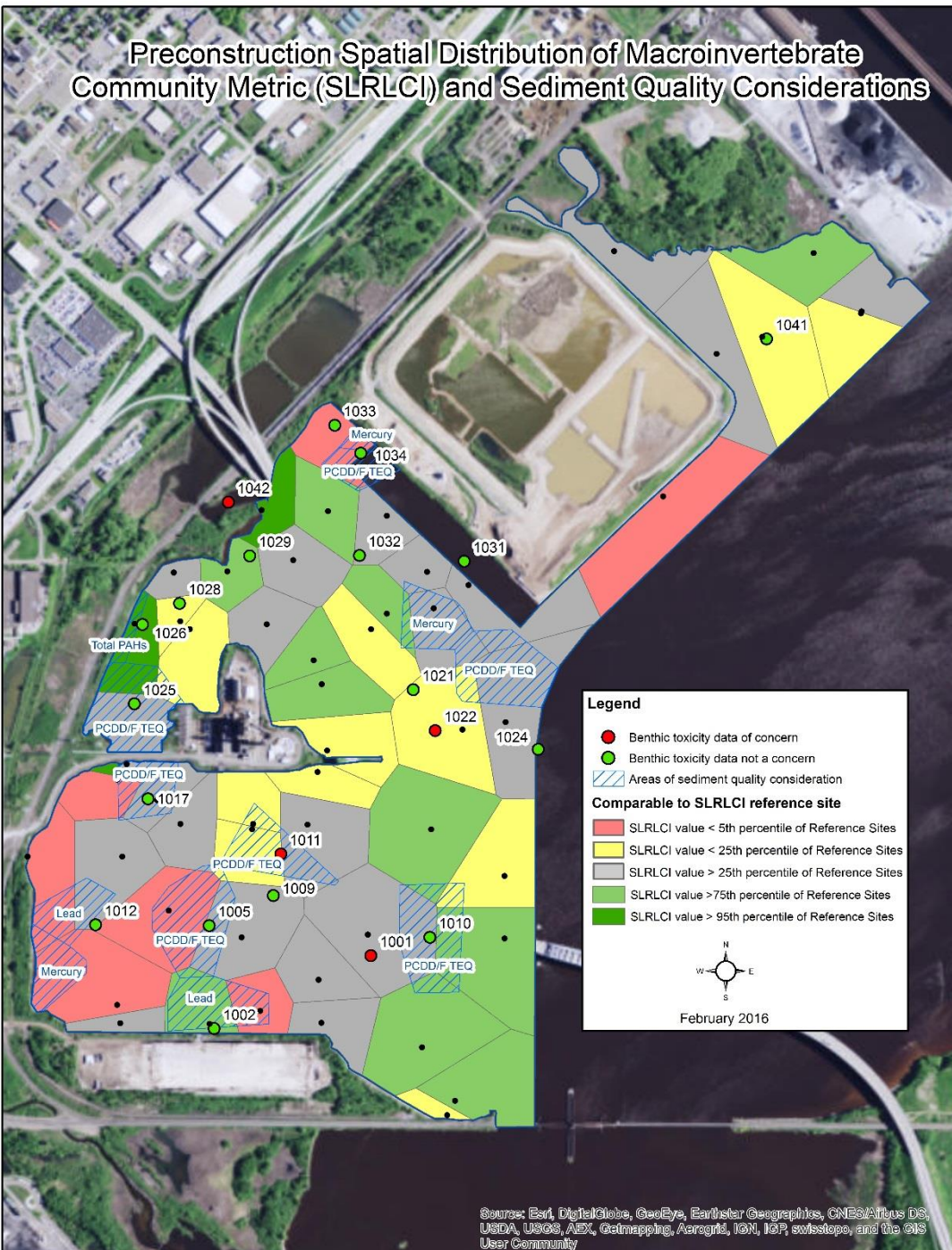




- ❑ Site= 316 acres
- To Address BUIs-
- ❑ Reduce wind/wave energy
- ❑ Further reduce sediment contaminant risk
- ❑ Improve substrate type
- ❑ Create natural shoreline transition

St. Louis River AOC Program- 40th Avenue West Restoration

Preconstruction Spatial Distribution of Macroinvertebrate Community Metric (SLRLCI) and Sediment Quality Considerations

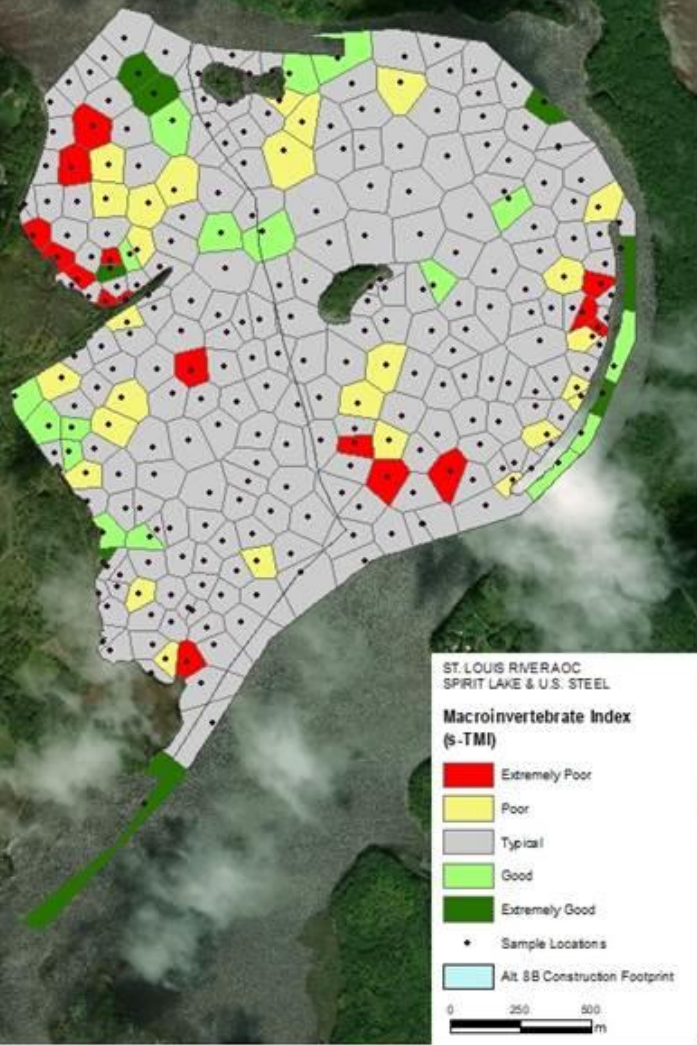


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

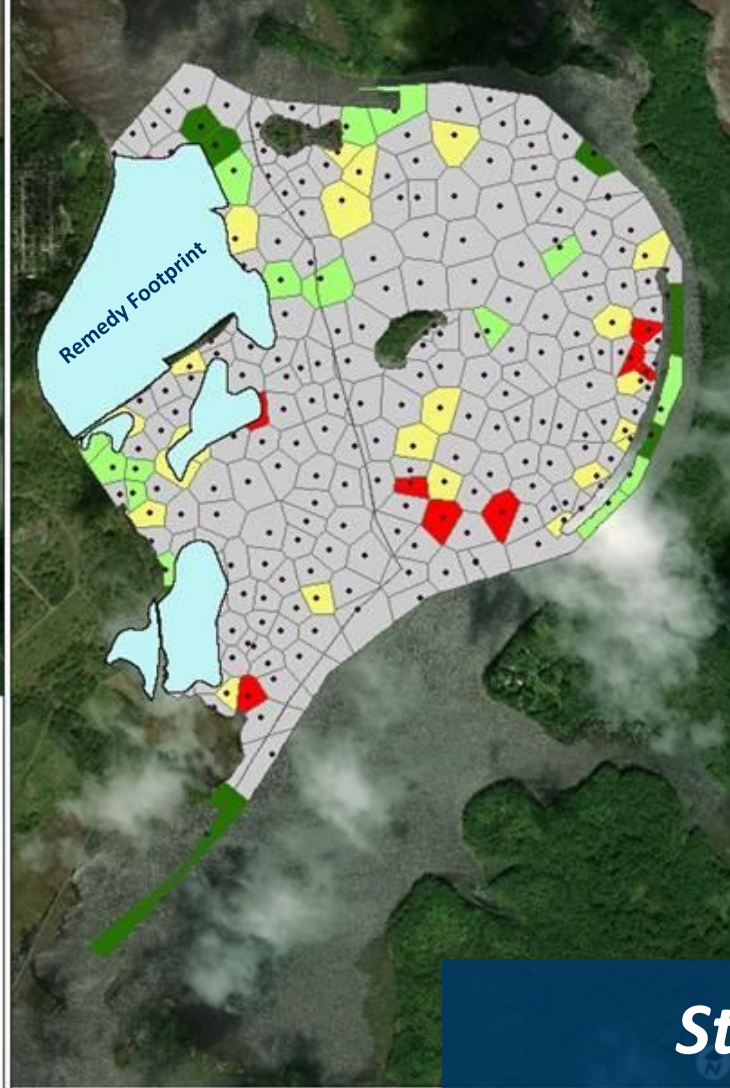
- Surface-area weighted averaging
- GIS Thiessen technique determined polygon shape
- Sample point values compared to established target
- Regressions provided confidence intervals and categorical rankings

St. Louis River AOC Program- 40th Avenue West Restoration

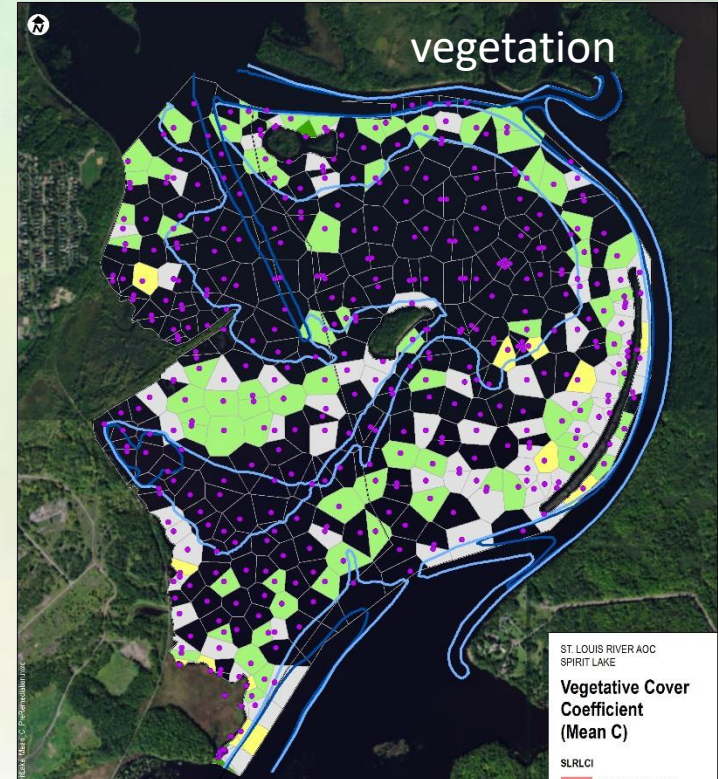
Preconstruction
Invertebrates



Post Construction



□ 940 acre site



St. Louis River AOC Program- Spirit Lake Remediation and Restoration

Beneficial Use Remediation Projects



Slip 2



Minnesota Slip



Slip 3



Slip C

Private and Public supported projects utilized over 75,000 CY

Material management options



Open-Lake disposal



**In-water estuary
habitat maintenance**



**Land-based
Construction**
Processing and Reuse



Mine land reclamation
*State incentives to offset
costs for more options*

Concepts making beneficial use successful

- ✓ partnership agreements that define roles and responsibilities
- ✓ technical experts help identify project goals and objectives
- ✓ pilot projects to address uncertainty and concerns
- ✓ data-driven approach to justify opportunities, analyze alternatives, and demonstrates effectiveness
- ✓ a quality assurance plan to standardize targets and harmonize federal and state regulatory authority

Thank-you

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