US Steel Superfund Site Update

December 2, 2014

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USS Site Update

Land Activities

- DSPA soil removal
- Petroleum investigation

Sediment Activities

- Feasibility Study
- Public Involvement
- Schedule to implementation

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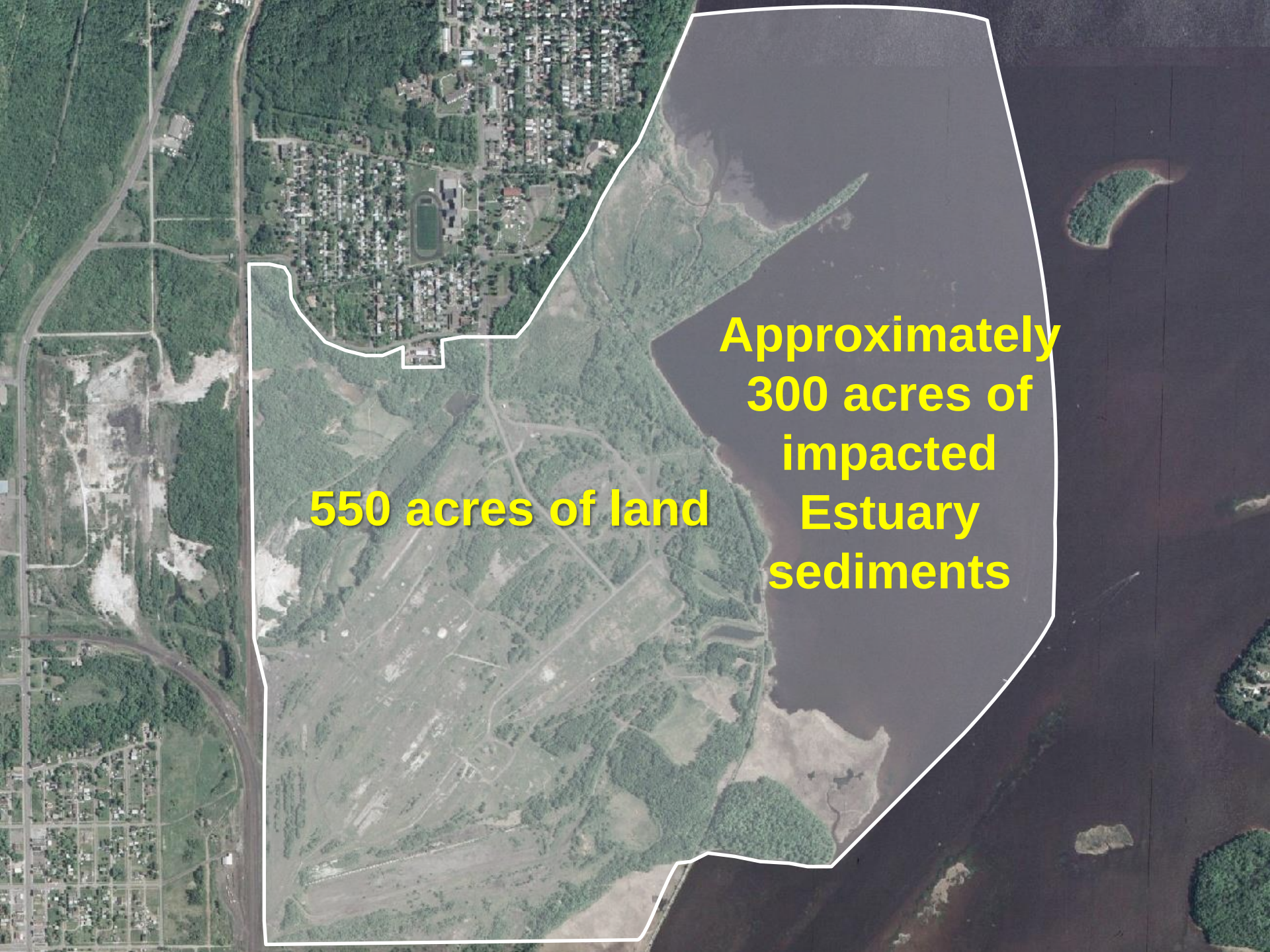
Site Location


Approximately
300 acres of
impacted
Estuary
sediments
550 acres of land

USS Site History

- Operated from 1915-1979
- Steel and coke production with disposal to the St. Louis River
- Contaminants: PAH's (coal tar), oils and heavy metals in soil, sediment, surface water and shallow groundwater
- Site listed on NPL SF list in 1983-MPCA lead agency
- Visual and "free product" contamination cleaned up in the 1990s at a cost of $12 million
  - –Land units-tar, fuels, drums, tanks, pipelines, building removal
  - –Sediment units-Wire Mill Pond and OUJ-1997

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Additional risks to human health and the environment were identified during the 2008 5-year review

USS Site Current Status

90% of the site is undergoing some form of remedial work (RI, FS, RD, RA)

- **132 acre VIC site** (Duluth Seaway Port Authority)
- **Petroleum site** (Release from 1 million gal. tank)
- **Sediment Units**
  - Over 350 acres of sediments >1,650,000 yd^3 of sediments are undergoing a Feasibility Study and Response Action (estuary and tributaries)

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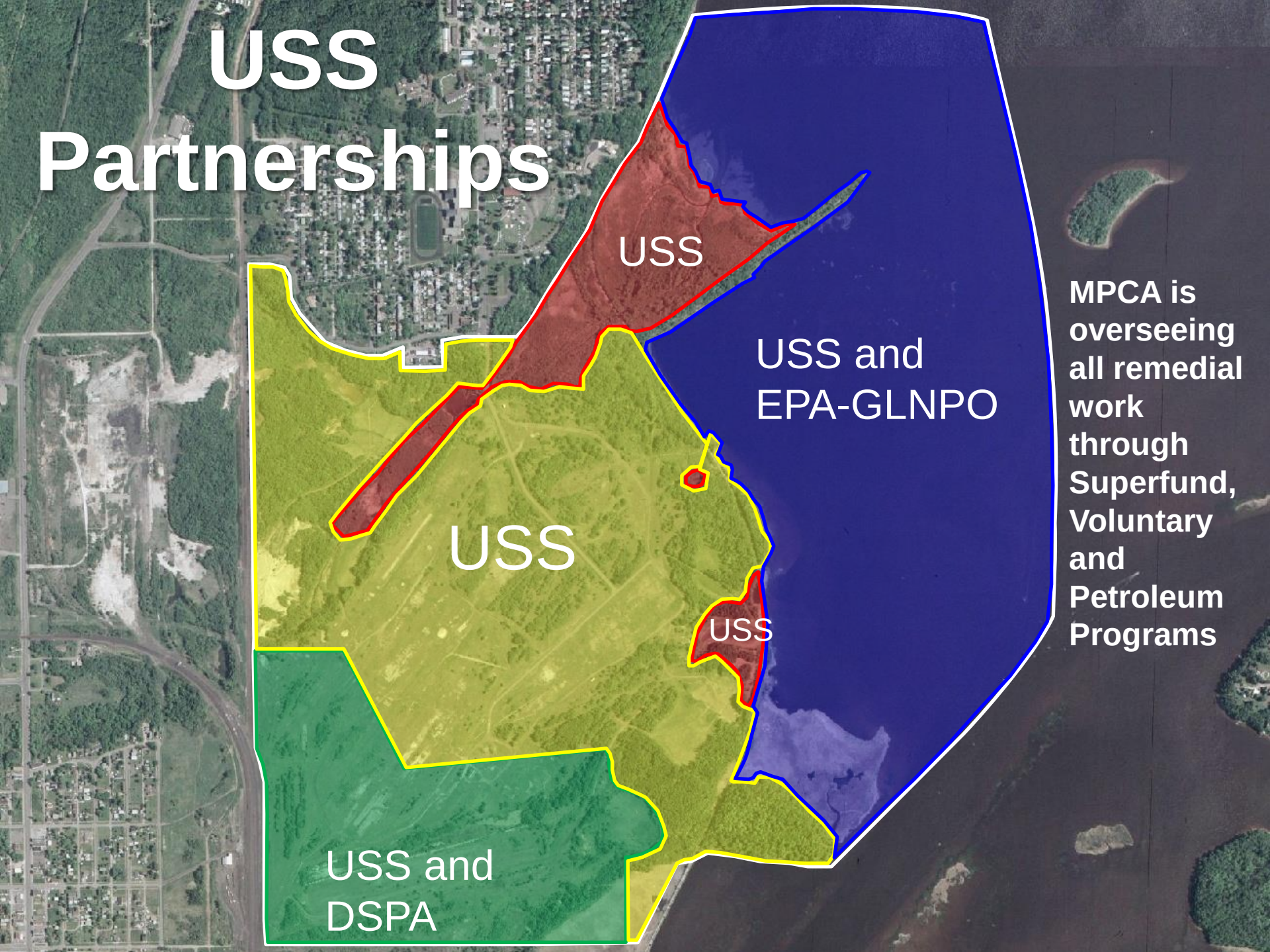
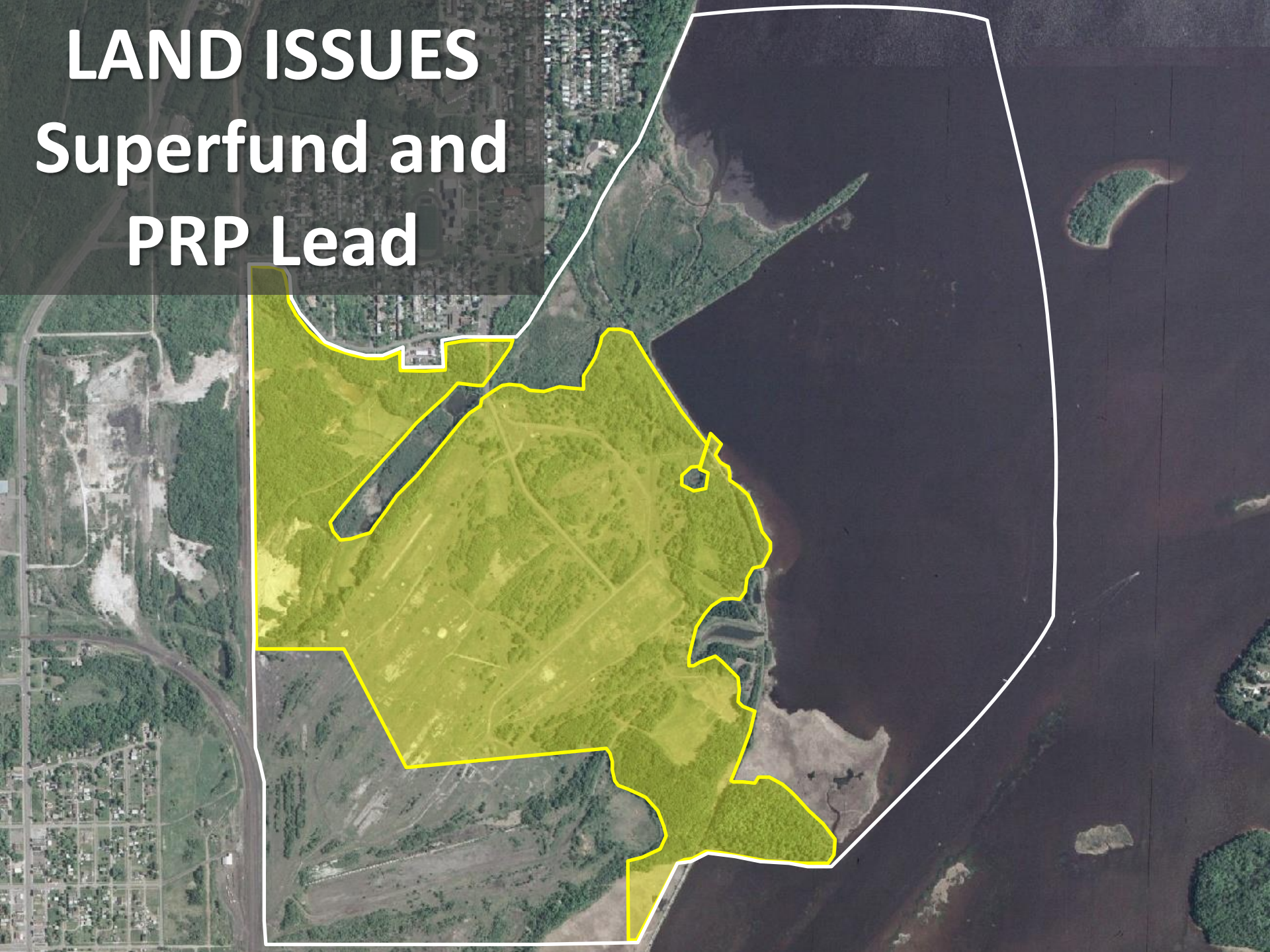
USS Partnerships



MPCA is overseeing all remedial work through Superfund, Voluntary and Petroleum Programs

LAND ISSUES
Superfund and PRP Lead




T1- 4
T10&11
T13
T15


Potential
Development Site
VIC Lead

Potential Development Area Phase II Environmental Assessment

- Investigation work Conducted by
  - Duluth Seaway Port Authority
  - US Steel
- MPCA VIC Program Lead

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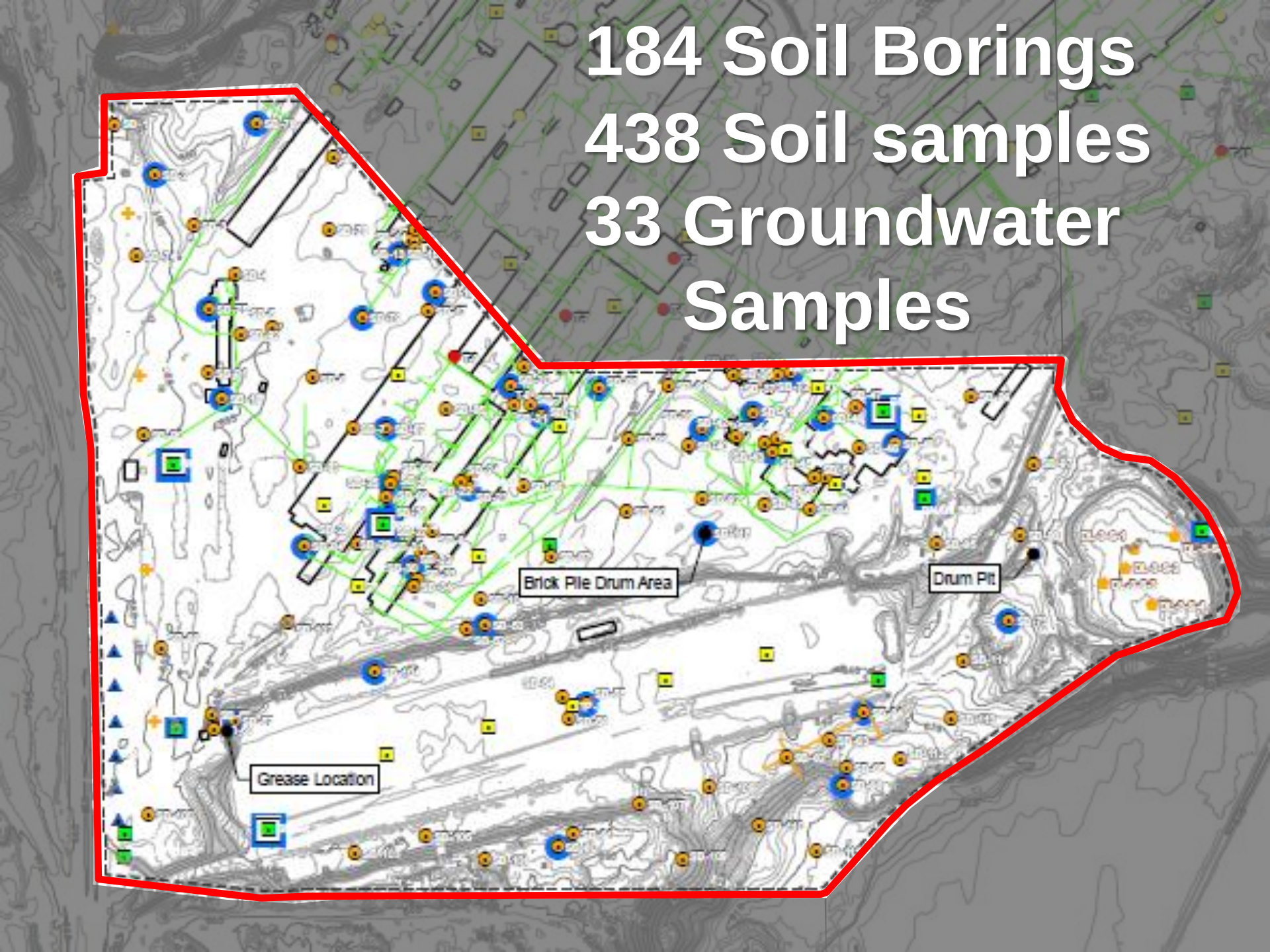
184 Soil Borings
438 Soil samples
33 Groundwater Samples
Brick Pile Drum Area
Drum Pit
Grease Location


CAUTION
15
1916
Geoprobe
6620DT

USS Land Issues Next Steps

1. Tar areas 10 & 11 will be a part of the sediment clean up action
2. Tar areas 13 & 15 are being investigated
3. Tar 1-4 Petroleum site is also being investigated further
   - groundwater plume is stable
4. DSPA-50,000 yds^3 of soil to be excavated
   - all hazardous materials will be disposed of off site ($8,000\ yds^3$)
   - Clean up work will be presented in a Voluntary Response Action Plan

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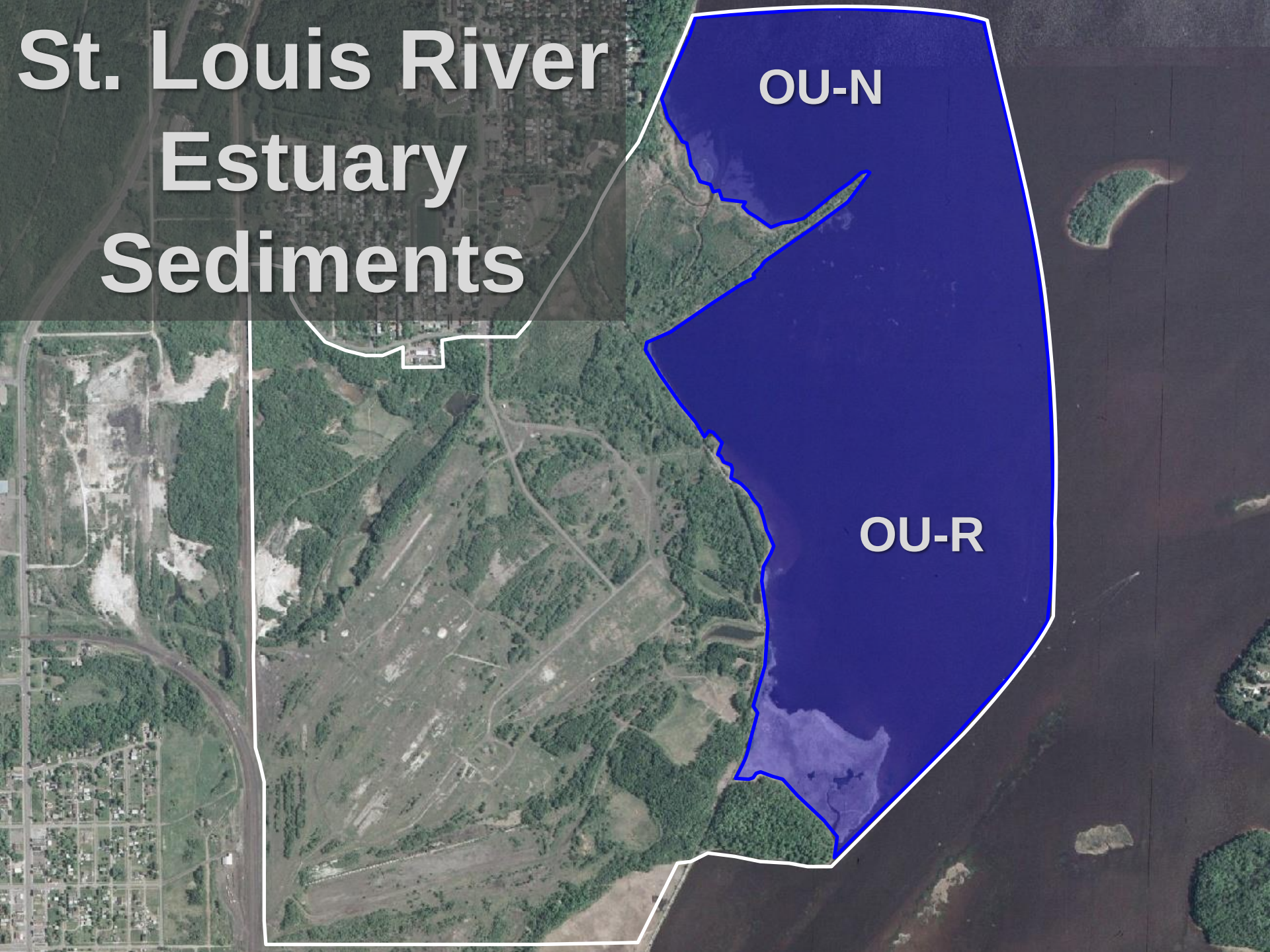
Upland
Stream, Basin
&
Wetland
Sediments
Unnamed Creek
Corridor
OUs I, L, M,
Inbetween I/J
Unnamed
Pond
OUA
Tar
Pits
OUP and
OUQ

Coke Plant Settling Management Area


Wire Mill Settling Basin
Management Area


St. Louis River
Estuary
Sediments
OU-N
OU-R

Feasibility Study

Identifies alternatives that may be feasible for addressing potential risks from site contamination and includes:

- **Site background**
- **Site conceptual model**
- **Project goals**
- **Technology screening**
- **Alternative evaluation**

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Superfund FS Considerations

1. **The cleanup remedy will protect human health and the environment**
2. **FS must consider the estuary sediment remedial actions and Upland source control**
3. **FS must consider land ownership/future use**
   - **Land-zoned industrial; estuary-improve habitat**
4. **Other considerations:**
   - **Preserve upland for future economic redevelopment**
   - **GLNPO involvement will provide habitat betterment**
   - **Input from the resource managers (MNDNR, USFWS, Tribes, City of Duluth, USACE, SRLA)**

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Building a Site Model

- Involves many types of testing
- Data shows site conditions:
  - Extent of contamination-volume
  - Stability of sediments
  - Depth of water
  - Depth of natural deposition cover
  - River flow velocity

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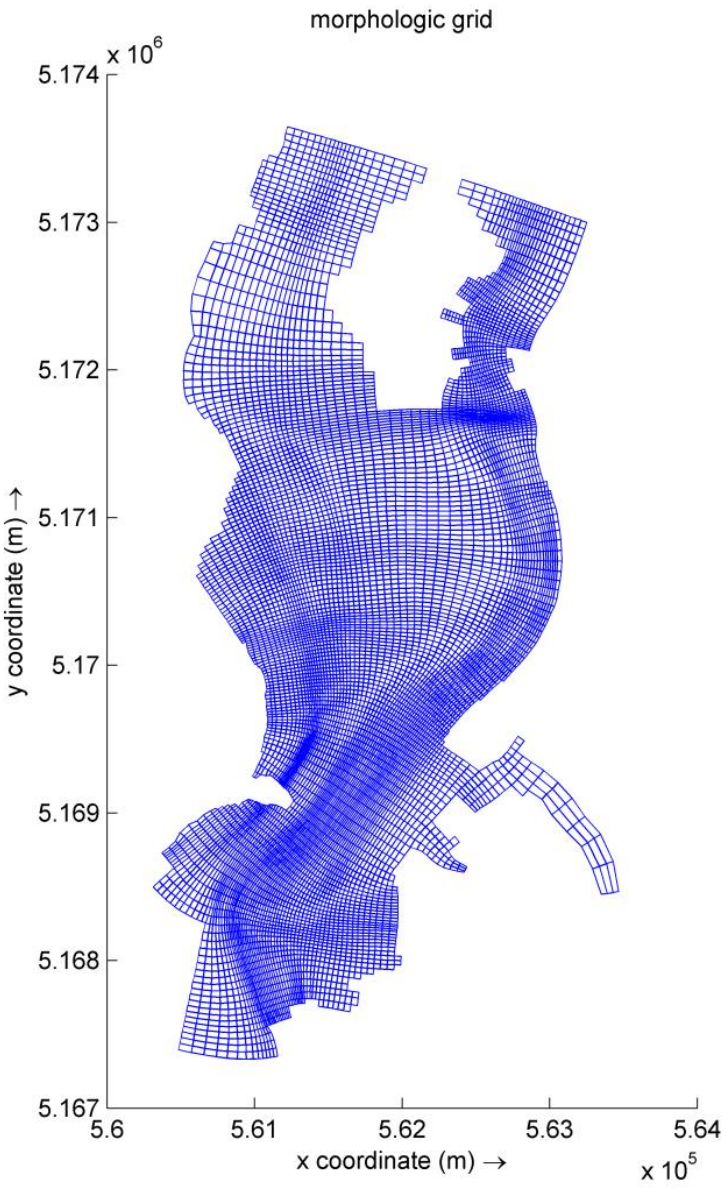
08.06.2013 11:14

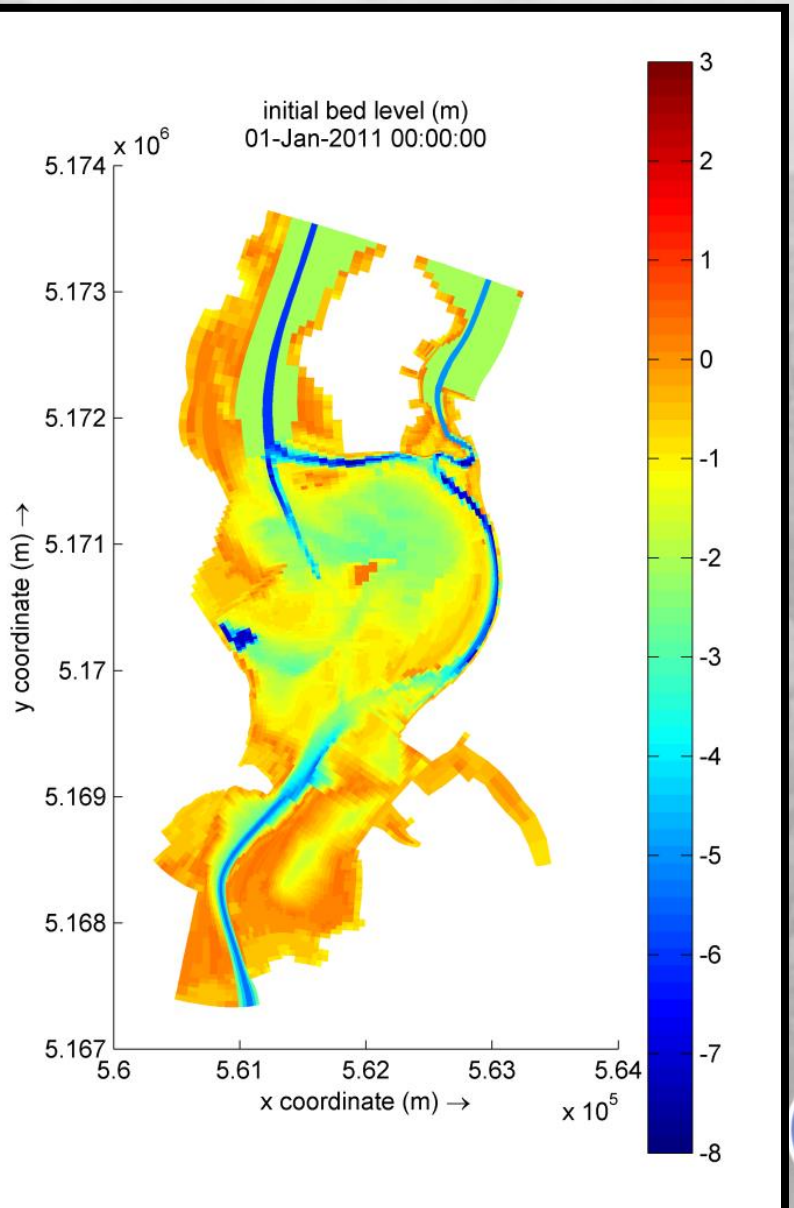

08.05.2013 12:30


08.05.2013 14:24

Investigations: *Surface water flow*

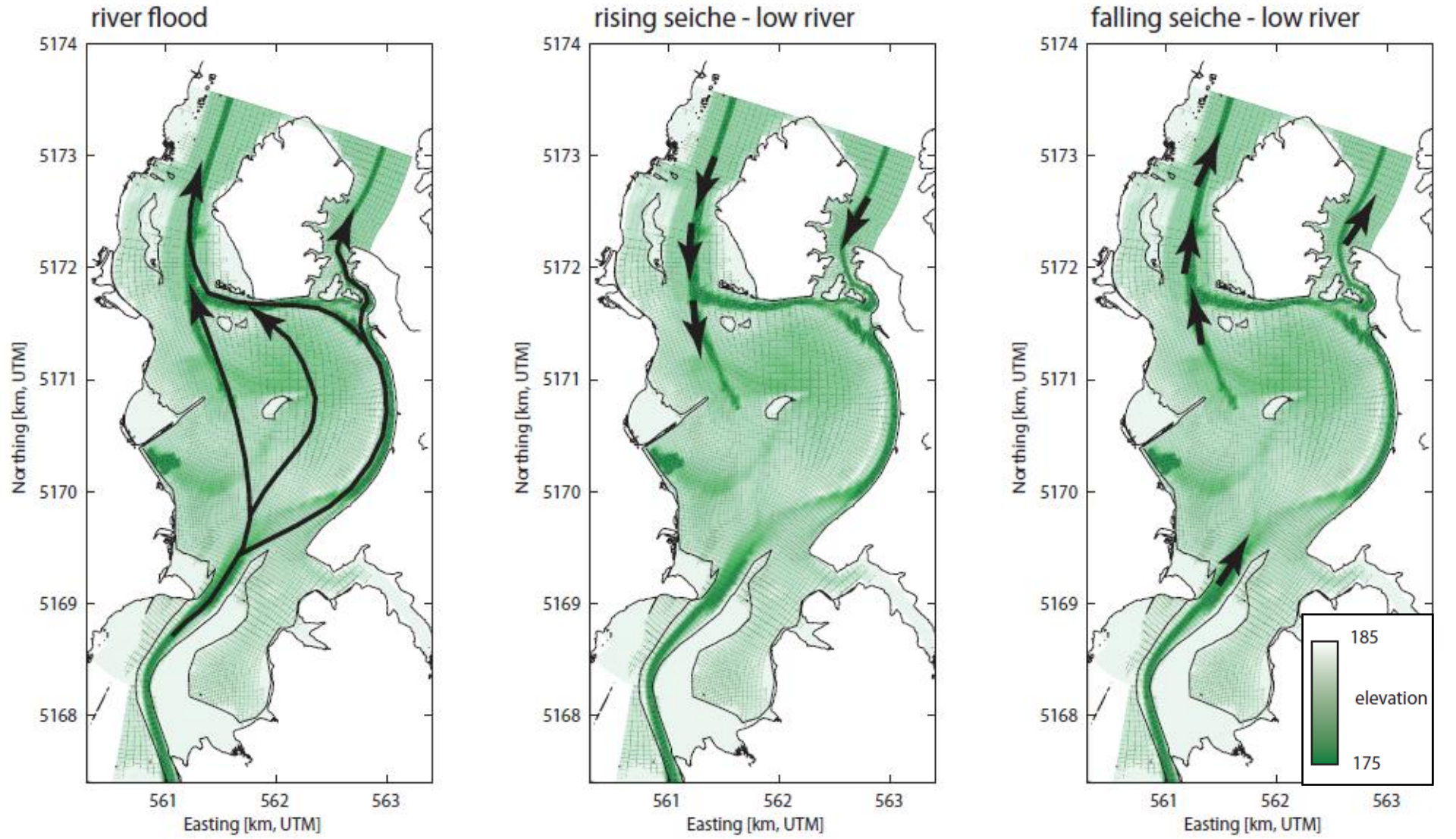
Delft 3D Hydrodynamic Model Grid





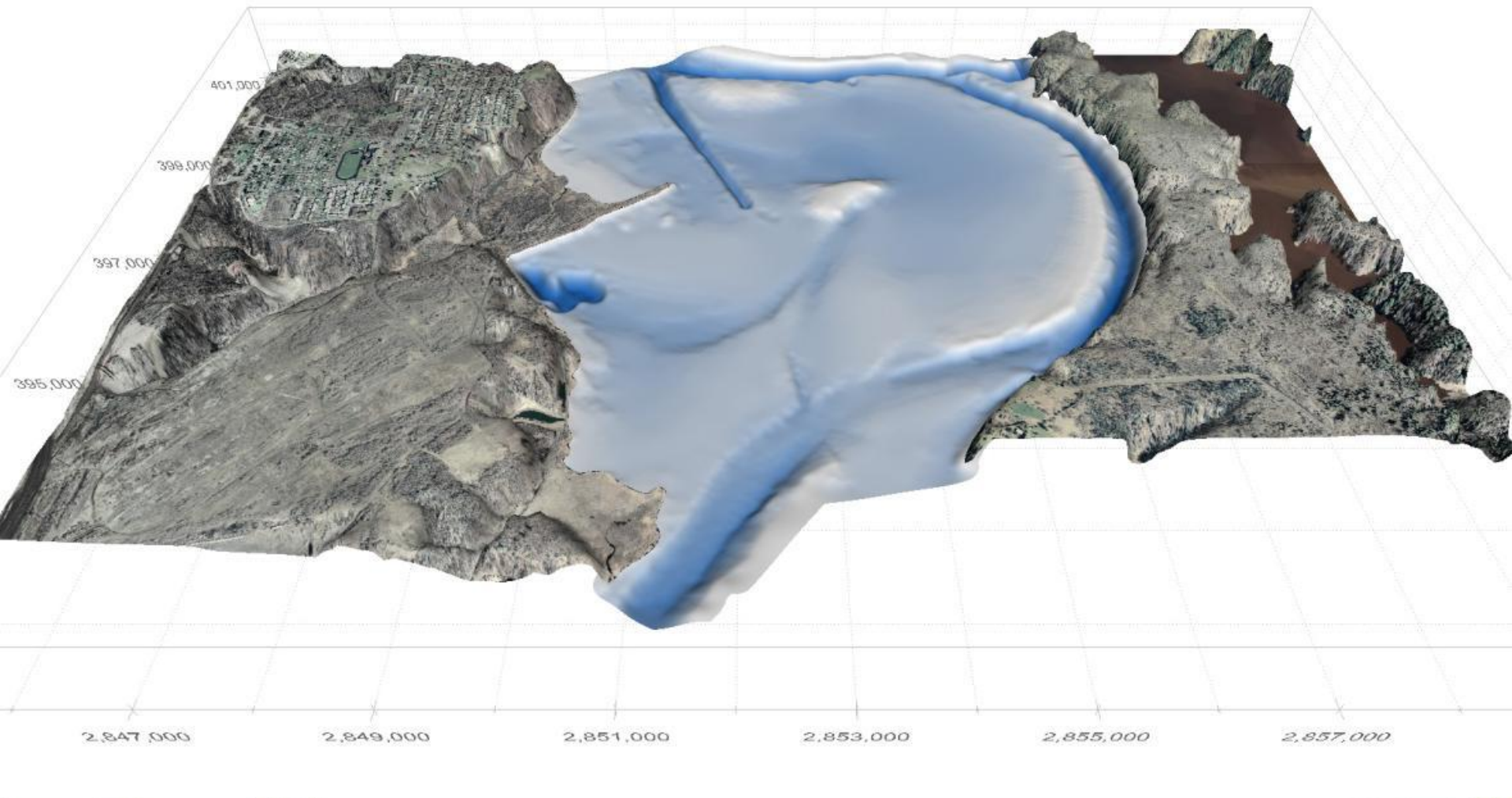
Estuary Hydrodynamics

Dominant flow paths



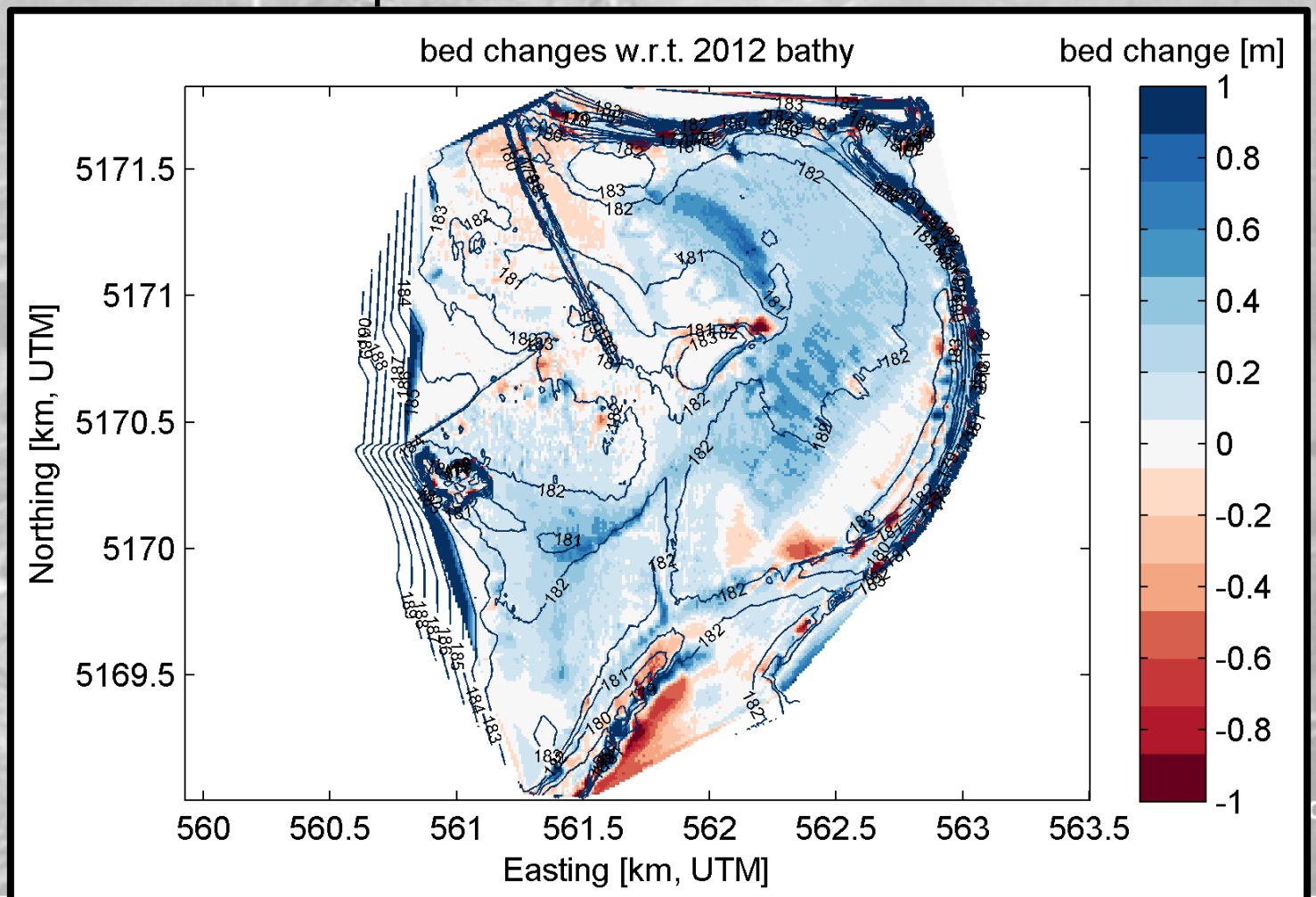
Investigations: *Spirit Lake Site Bathymetry*

DRAFT

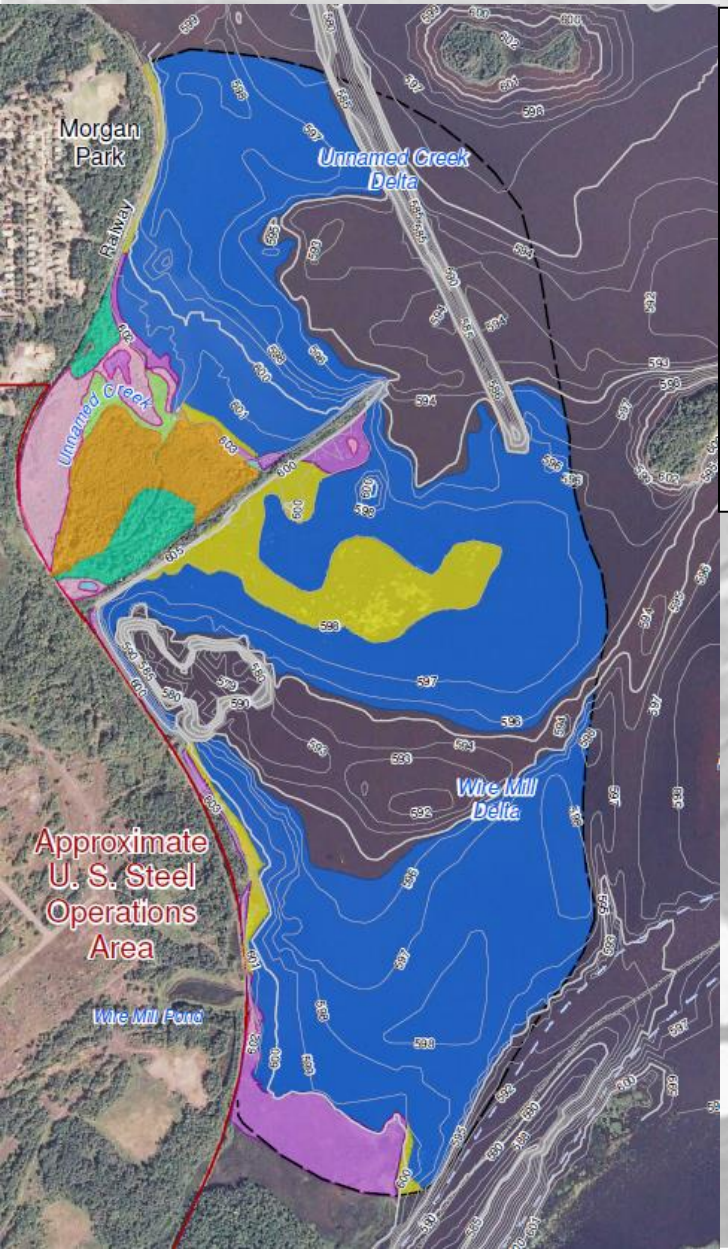


Spirit Lake Sediment Site-Post Flood 2012 Bathymetric Survey Results

- June 20th flood event
- Significant flows and high water
- Difference map



Investigations: *Habitat Characterization and Wetland Delineation*



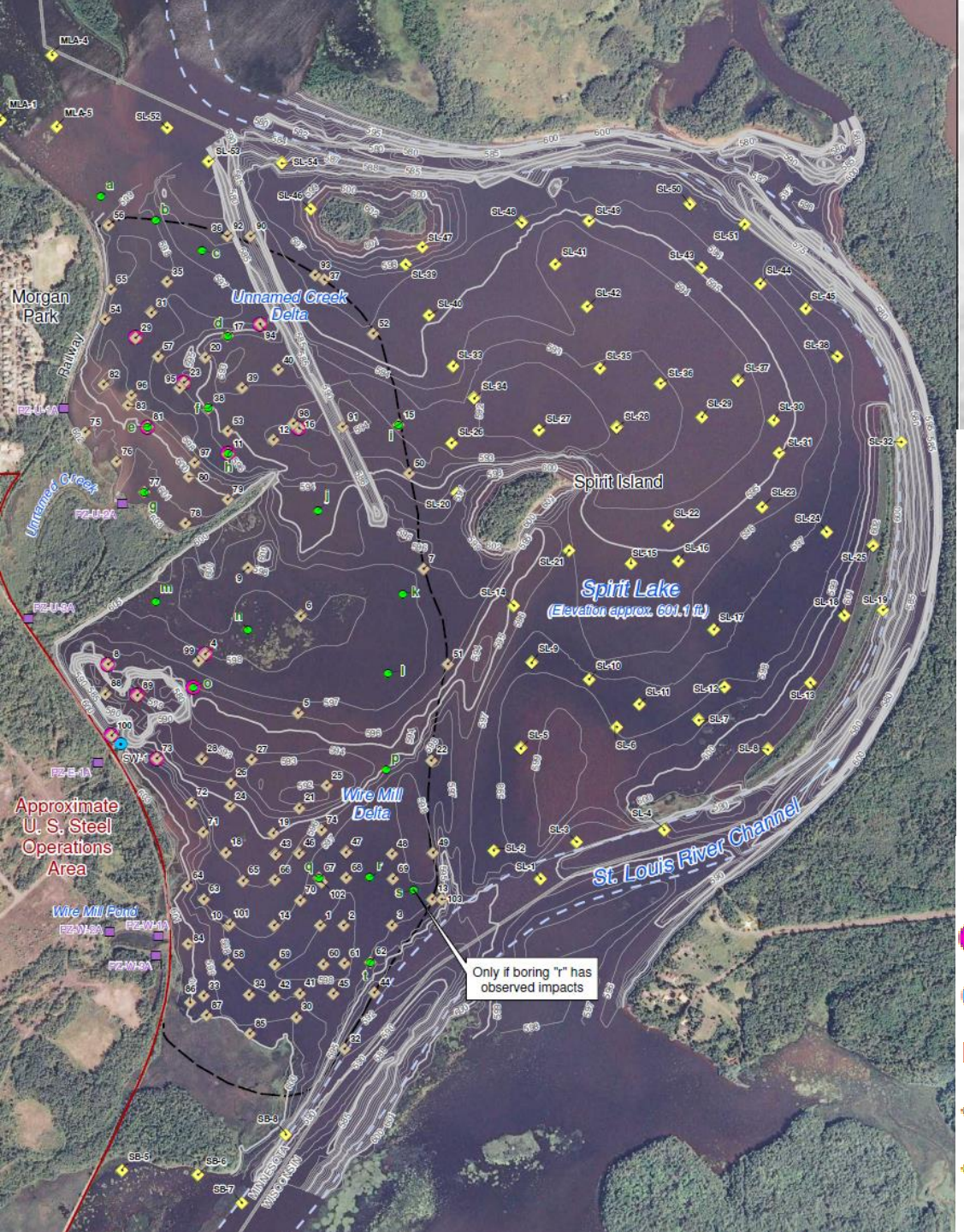
Wetland Communities

- Alder Thicket
- Deep Marsh
- Floodplain Forest
- Open Water
- Sedge Meadow
- Shallow Marsh
- Shrub Carr
- Wet Meadow

Aquatic Vegetation Species at Observation Points (Rake Method)

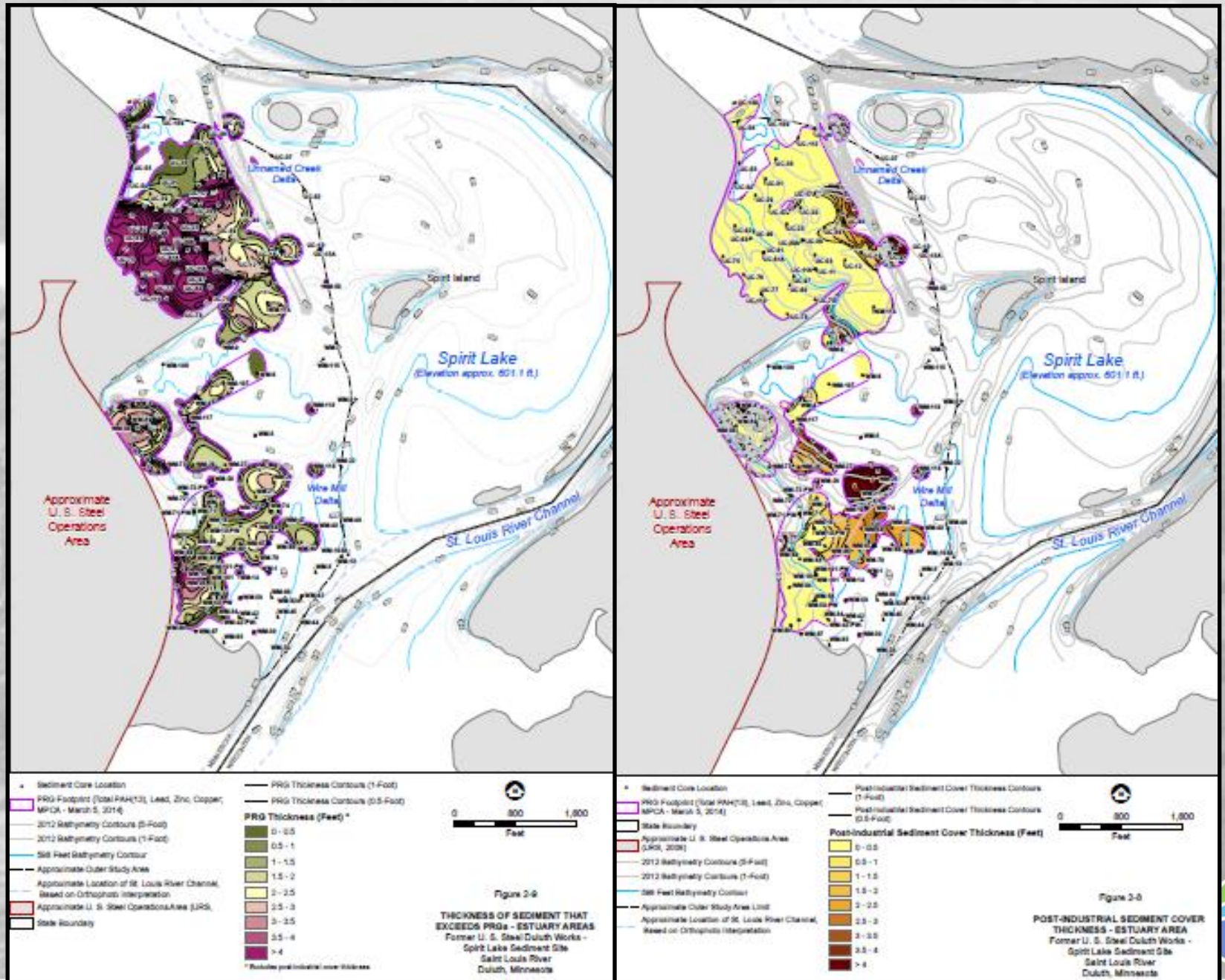
- Vallisneria americana
- Nymphaea odorata
- Other species*
- No observed species

Investigations:
Sediment Chemical Testing



- Approximate U. S. Steel Operations Area (URS, 2008)
- State Boundary
- Bathymetry Contour (1-Foot)
- Bathymetry Contour (5-Foot)
- Approximate Outer Study Area
- Approximate Location of St. Louis River Channel, Based on Orthophoto Interpretation
- Proposed Core/Boring Locations, Fall 2012 (20)
- Proposed Vane Shear Locations, Fall 2012 (12)
- Surface Water Level Gauge
- Piezometers
- Completed Sample Location (Barr)
- Completed Sample Location (Somat/ACE)

Contaminant Thickness/Natural Deposition Cover




1,700,000
cubic yards
Sediment
Contaminant
Extent in
current
Feasibility
Study

Screening Sediment Technical Options

- **Full Depth Dredge/Removal**
- **In-situ Engineered Cap**
  - Cap may include:
    - Reactive Layer, Rooting/Benthic Barriers, Armoring
- **Partial Dredge**
  - to elevation with in-situ engineered cap
- **Enhanced Natural Recovery with Cover/Cap**
- **Monitored Natural Recovery**

- ***Screened out: Bioremediation, chemical treatment (carbon enhancement), phytoremediation***

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Screening Sediment Disposal Options

Off Site Transport and Disposal

- All hazardous waste will be taken offsite
- Screened out for non-hazardous materials
  - Volume 300,000 to 3,000,000 yds^3
- Truck traffic, noise, roads, carbon foot print - 30,000-300,000 trucks
- Rail transport screened out due to high dewatering costs

On Site Storage

- Landfill
  - Upland Areas Confined Storage Facility
  - Consolidate within other contaminated areas

- *Screened out: In water Confined Aquatic Disposal*

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Common Remedy Elements

1. An array of 11 combination alternatives are presented in the draft FS, four are considered in detail
   - Consolidation of contamination on Upland units
   - Dredging, excavation and capping
   - Natural cover and thin covers
2. Unnamed Creek will be reengineered to control storm water
3. Wire Mill Pond and surrounding dredge spoil piles will be completely removed (OUP & OUQ) creating 7 acres open water
4. Unnamed Pond will be completely dredged
5. Habitat betterment considerations

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Superfund FS Analysis Criteria

- Overall Protection of Human Health and the Environment
- Compliance with ARARs (applicable or relevant and appropriate requirement)

- Long Term Effectiveness and Permanence
- Reduction of Toxicity, Mobility, or Volume
- Short Term Effectiveness
- Implementability
- Cost

- State/Support Agency Acceptance
- Community Acceptance

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Estimated Schedule

Feasibility Study:	**Jan 2015**
Proposed Plan:	**Feb 2015**
Public Comment on Proposed Plan:	**Feb/March 2015**
Public Meeting:	**Feb 2015**
Design/Permits:	**Dec - June 2015**
Construction:	**Summer 2015-2017**

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Public Involvement

The approved Feasibility Study (January 2015) will be available at:

- **MPCA webpage**
- **West Duluth Public Library**
- **MPCA Duluth office**

MPCA will be seeking public comment on the Proposed Plan-Feb/March 2015

- **30 day public comment period**
- **Public meeting**
- **Soil and sediment response actions**

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Resources

- **MPCA USS Site Webpage: http://www.pca.state.mn.us/mvri83b**
- **West Duluth Library repository**
- **Documents available on the webpage:**
  - **December 2013 Newsletter**
  - **2013 Five Year Review**
  - **Estuary RI report with appendices**
  - **Habitat Characterization and Wetland Delineation**
  - **Historic reports**
- **Documents in the queue:**
  - **Feasibility Study-January 2015**
  - **Upland RI Report-Dec 2014**

Susan Johnson susan.johnson@state.mn.us
218-302-6601

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