*West Branch Grand Calumet River, Hammond and East Chicago, Indiana*

# The Great Lakes Legacy Act

## Goal:

Accelerate the pace of sediment remediation in U.S. Areas of Concern (AOCs)

## Mechanism:

Use partnerships as an innovative approach to conducting sediment remediation

### Great Lakes Areas of Concern

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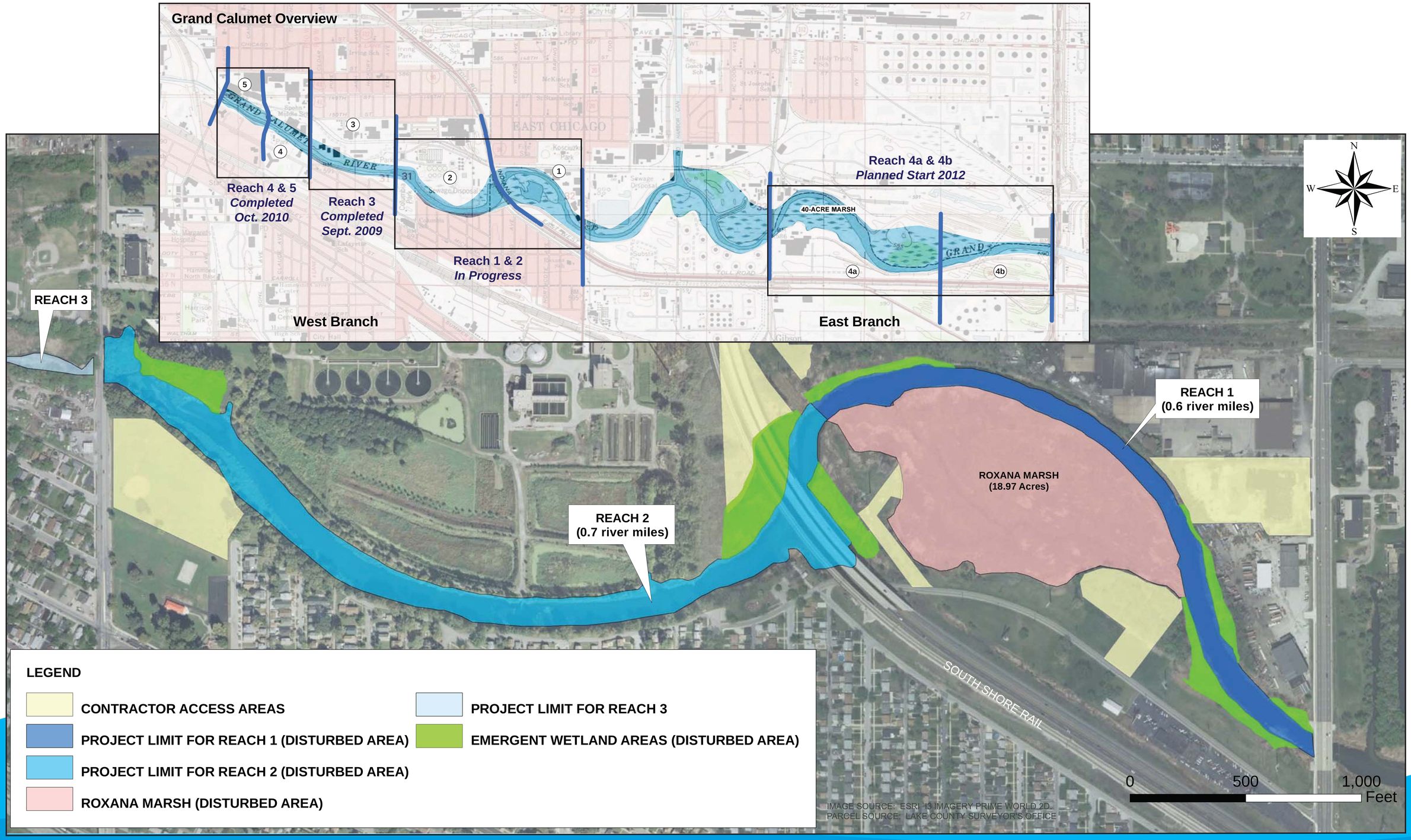
# Reaches 1 and 2 Site Map and Overview



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# Reach 1 and 2 River Dredging and Capping

**Existing Conditions**

**Removing Old Pilings from River**


**Removing Debris from Banks**

**Conducting Pre-Dredge Survey**

**Installing Sheet Pile Weir**


**Unrolling Geotextile Tube**

**Hydraulic Dredging**



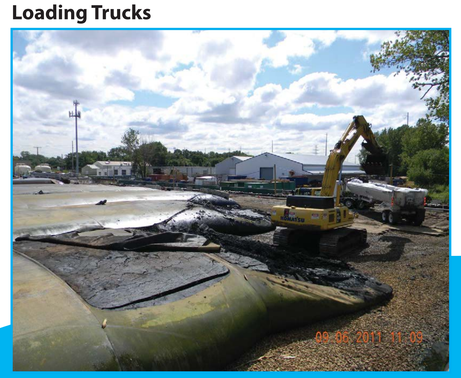
**Sediment Dewatering**



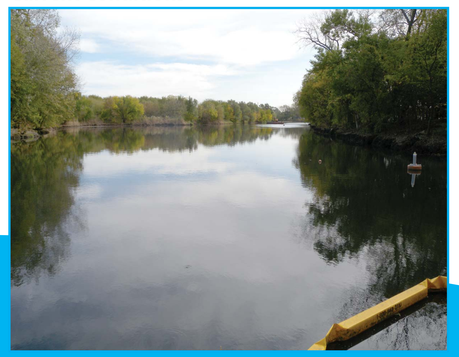
**Sediment in Geotextile Tubes**



**Loading Trucks**



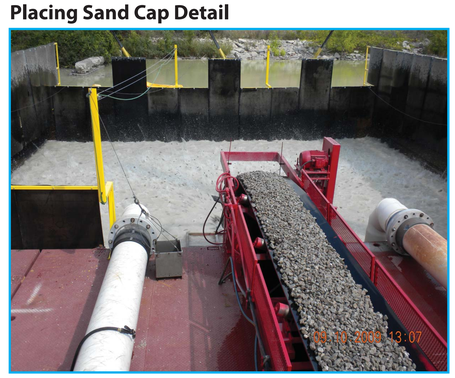
**Current Conditions**



**Installing Cap Plant**

**Placing Sand Cap**

**Placing Sand Cap Detail**



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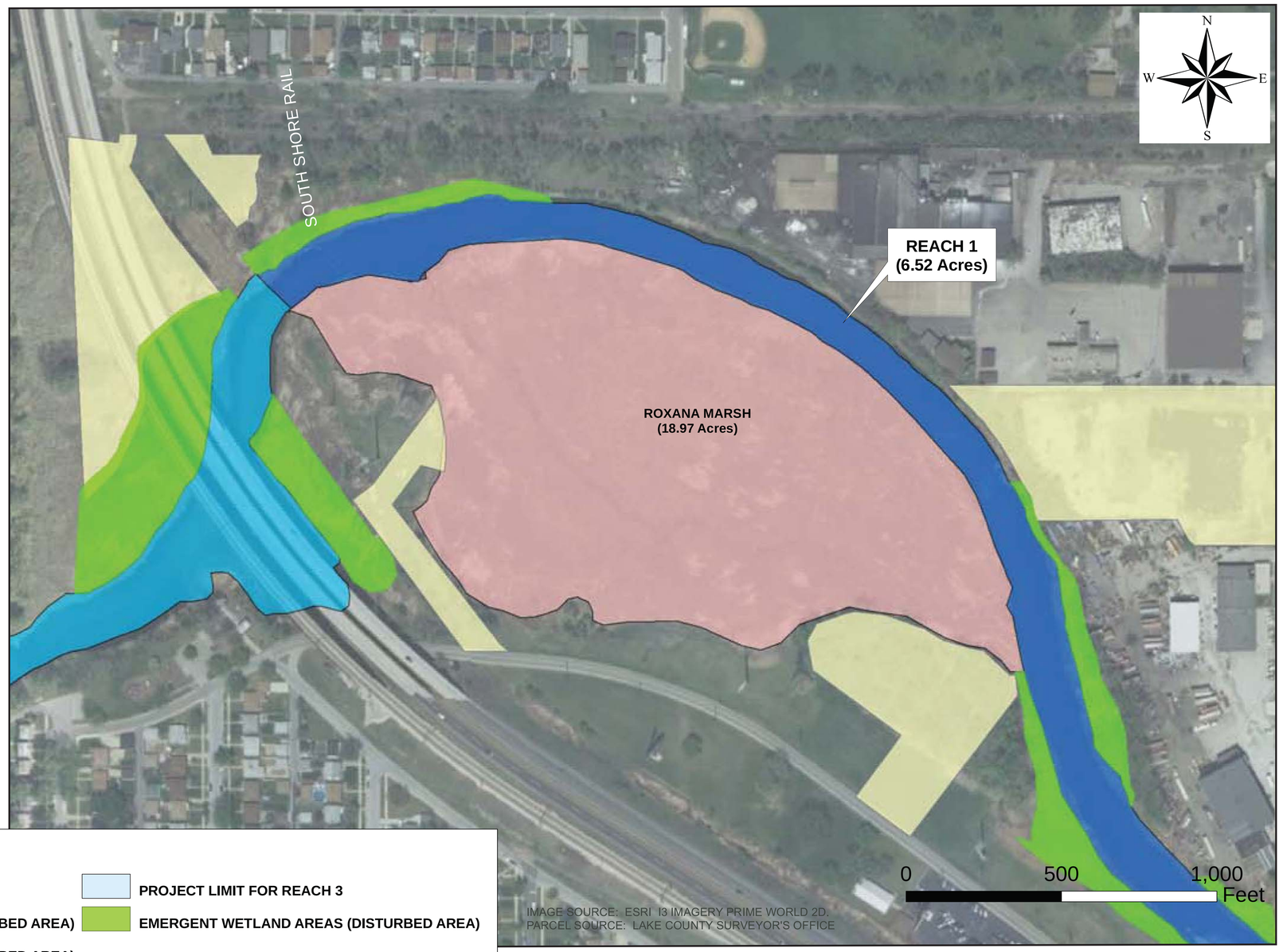
# Roxana Marsh Site Map




**LEGEND**

- CONTRACTOR ACCESS AREAS
- PROJECT LIMIT FOR REACH 1 (DISTURBED AREA)
- PROJECT LIMIT FOR REACH 2 (DISTURBED AREA)
- ROXANA MARSH (DISTURBED AREA)
- PROJECT LIMIT FOR REACH 3
- EMERGENT WETLAND AREAS (DISTURBED AREA)

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# Roxana Marsh Excavation and Restoration

**2010 Site Conditions**

**Constructing Staging Area**


**Preparing Sediment Dewatering Area**


**Spraying Invasive Species**


**Mowing Dead Invasive Species**


**Excavating Marsh Sediment**


**Loading Marsh Sediment**


**Site Conditions as of December 7, 2011**

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# Roxana Marsh Activities

**Before** | **During** | **After**


Contaminated marsh sediment was removed by mechanical dredging and a pond was created to provide habitat for migratory birds and other wildlife.


Invasive plants (Phragmites) were removed from the marsh and native wetland species were planted to restore habitat.


After contaminated sediment and invasive species were removed, clean sand was placed to provide habitat for benthic organisms and fish to enhance the aquatic ecosystem.

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# River Activities

**Before** | **During** | **After**



Contaminated river sediment and invasive species were removed by hydraulic dredging to improve the health of fish and wildlife and to restore native habitat.



Debris along the river, including existing sheet pile wall, was removed to beautify the river and enhance safety for future users.




A bioengineered bank stabilization solution was constructed to prevent erosion and restore native habitat.

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# Site Restoration Activities





## Restore Disturbed Areas

- Remove access ramps to river
- Level areas on banks disturbed during construction
- Cover with 6 inches of top soil

## Seed River Banks

- Seed with native grasses and flowers
- Apply mulch and water
- Cover seeded area with erosion control blankets
- Maintain until grasses are established

## Plant Trees and Shrubs

- Focus on areas of bank where trees were removed during construction
- Plant over 150 small trees and shrubs
- Maintain trees and shrubs for 1 year following construction

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# Restoration Takes Time

## Examples of Restored Sites Over Several Years

| | Danada, Illinois | Nantucket, Illinois | Wolf Lake, Indiana |
|---|---|---|---|
| **Plant Plugs and Seed** ***(0-1 years)*** |  |  |  |
| **Plants Establishing** ***(1-3 years)*** |  |  |  |
| **Restoration Complete** ***(3-5 years)*** |  |  |  |

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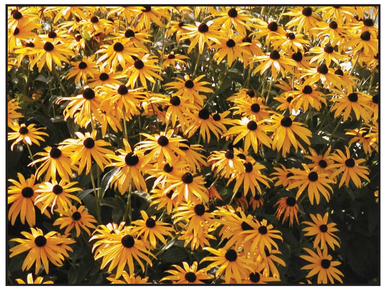
# View of the Completed Restoration

## Artist's Rendering of the Restored Roxana Marsh

Pickerelweed

Water Lilies



Black-eyed Susans

Blue Flag Iris

**2010 Site Conditions**

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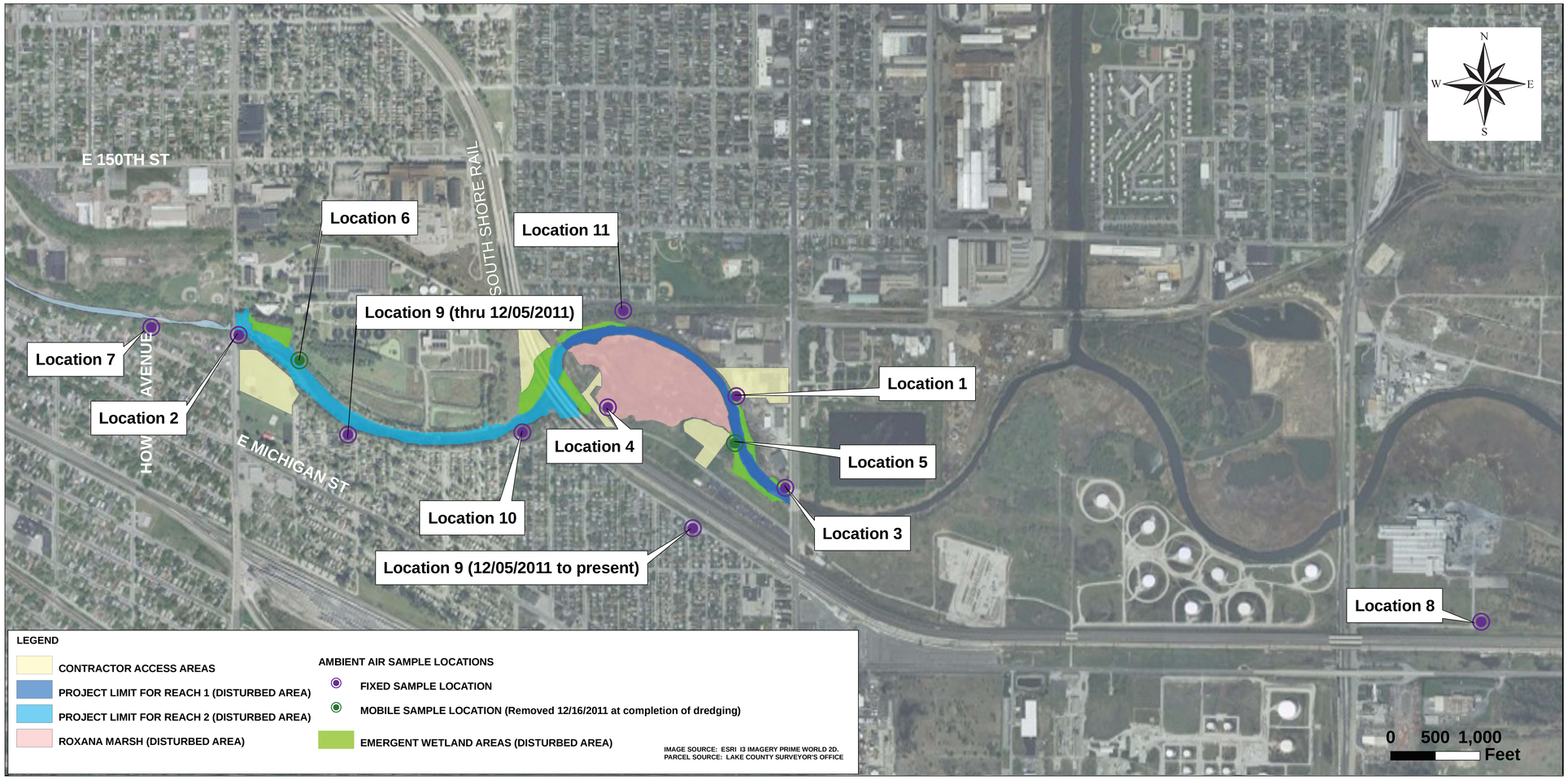
# Air Monitoring




## Real-time monitoring

- Performed around active work areas
- Provides instantaneous readings of dust and organic vapor levels
- Construction activities adjusted or changed if readings exceed acceptable levels

## Fixed location monitoring

- Collect air samples over daily work shift
- Reported air concentrations for individual chemicals
- Results provide a more complete picture of longer-term air impacts from construction

## Odor control system

- Implemented as needed based on odor levels at the site and surrounding residential areas.


## Air monitoring results

***There is no evidence of the dredging activities causing an unacceptable increase of air toxics.***

- Over 1200 samples collected in 2011
- Samples analyzed for VOCs, PAHs, metals, mercury, PCBs, and pesticides
- Monitoring will continue and changes will be made if a problem becomes apparent.

**For more detailed air monitoring results,**
visit https://partners.ttemi.com/sites/RoxanaMarsh
(**user name:** clients\Roxanamarsh.epa; **password:** Roxanamarsh)