

## **Application of Geospatially Enabled Geographic Response Plans to Oil Spill Response in the Western Basin of Lake Erie**

*Dave Dean, Michigan Tech Research Institute  
Ann Arbor, MI*

*ASPRS-CaGIS Fall Conference  
San Antonio, TX*



Fred A. and Barbara M.  
Erb Family Foundation



**WATER CENTER**  
UNIVERSITY OF MICHIGAN



[www.mtri.org](http://www.mtri.org)



# MTRI Overview

- Michigan Tech Research Institute (MTRI)
  - Located in Ann Arbor, MI
  - Research Center of Michigan Technological University, Houghton, MI
- Dr Robert Schuchman and Dr Nikola Subotic - Institute Co-Directors
- Full time staff ~40
  - as many as 20 interns over the summer
- Applied research focus
  - environmental, transportation, signals and sensors



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# Abstract / What is a GRP?

- Area Contingency Plans (ACPs) and their associated Geographic Response Plans are site-specific documents designed to outline steps to be taken in response to an oil or chemical spill.
- Designed to improve the speed and efficiency of a response during the critical first few hours after an incident, when quick action on the part of responders can keep a small incident from becoming much larger or limit the damage caused by the incident while a broader response is initiated.
- Western Lake Erie contingency plans old, on paper, difficult to update, not very flexible.

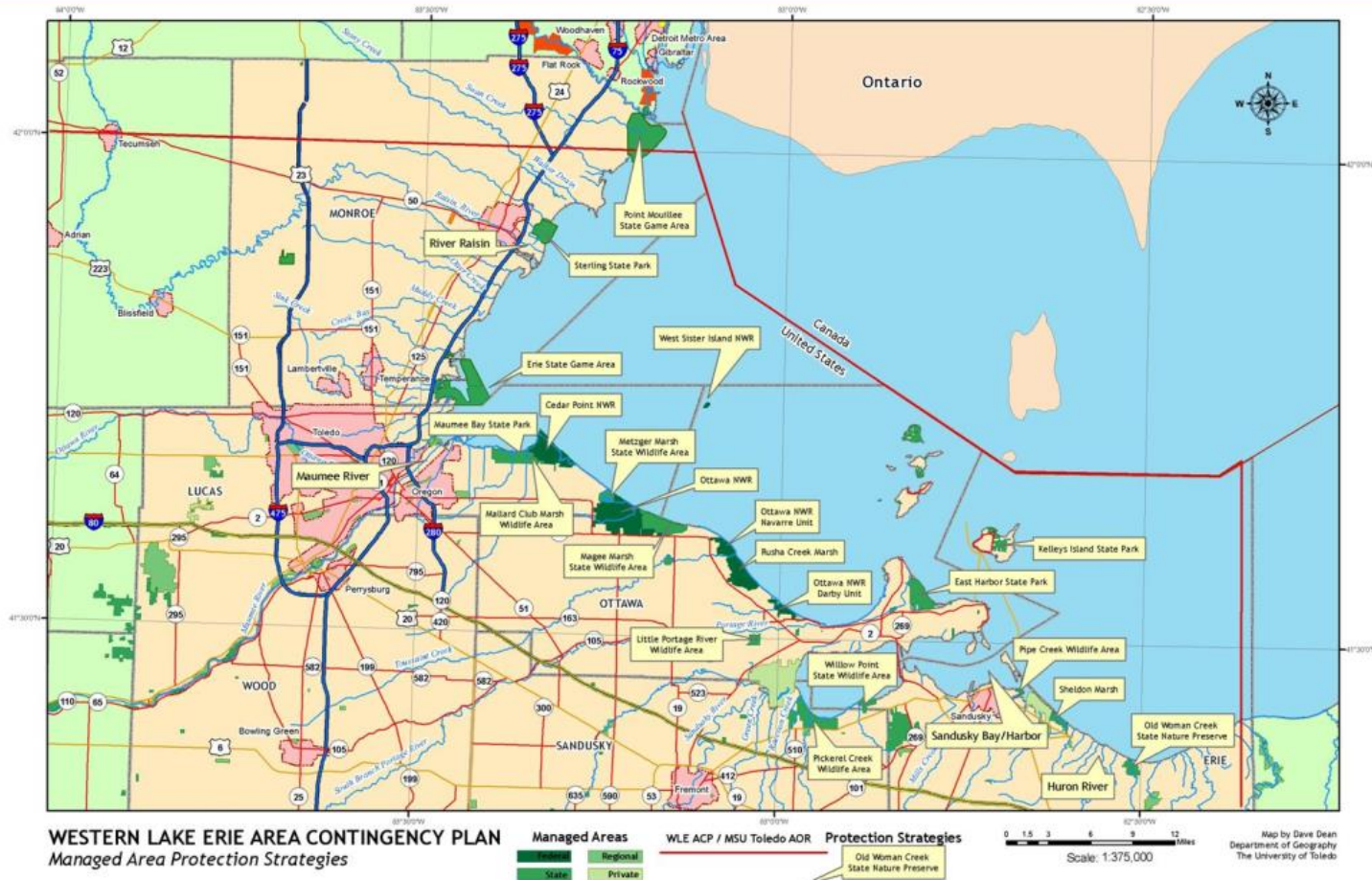
# Project genesis:

- Whole project began as a result of a chance meeting with Herb Oertli (USCG) at my parents' neighbors' 100th birthday party
- Discussions became topic for Masters thesis. Focus evolved over time with input from Area Committee members.
- Eventually settled on applying geospatial technology to Geographic Response Plans

# Study Area

## Western Lake Erie Area Contingency Plan

Appendix F, Page 1

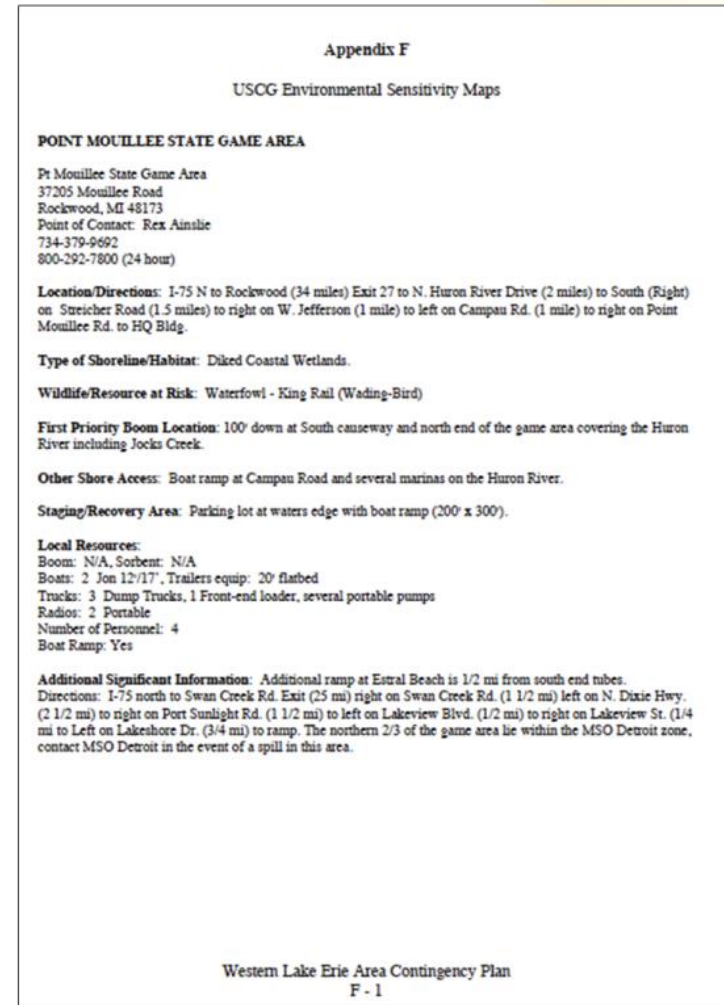


## WESTERN LAKE ERIE PROTECTION STRATEGY INDEX MAP



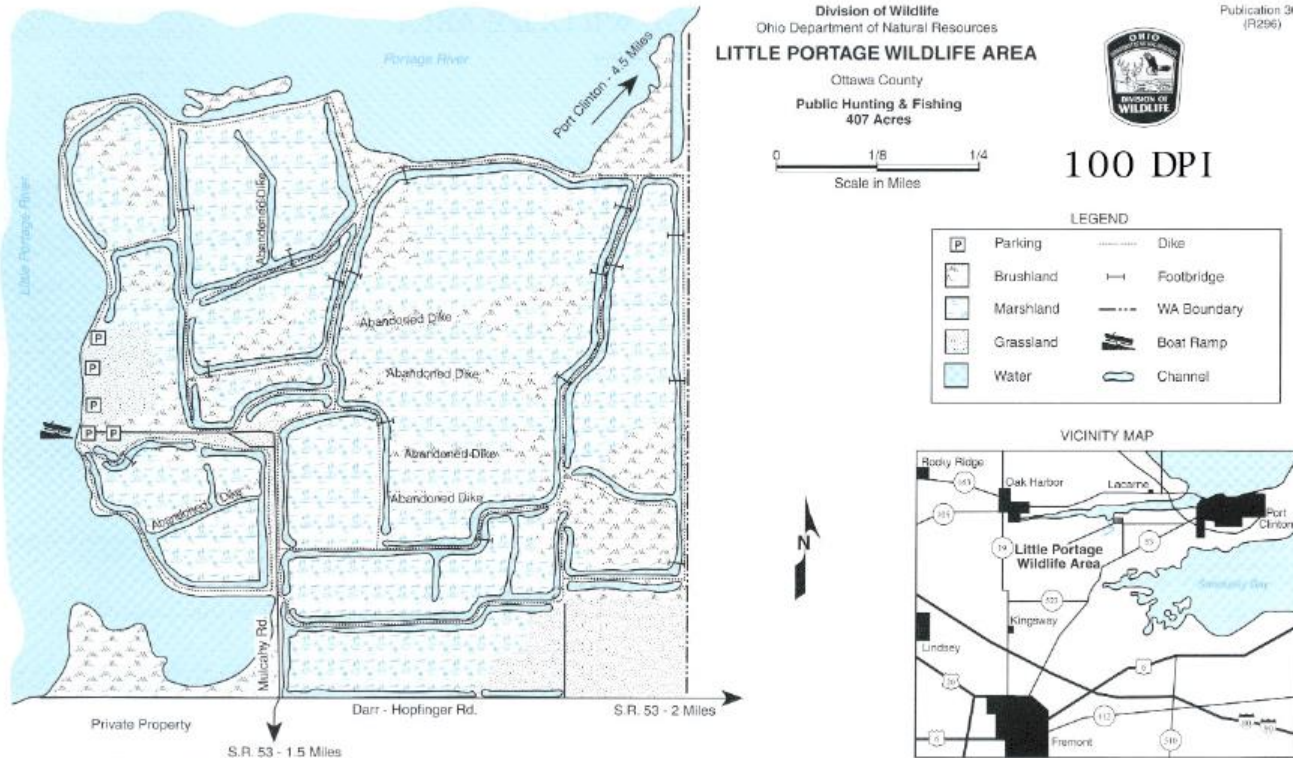
# Existing GRPs in Western Lake Erie

- Geographic Response Plans (GRPs or protection strategies) are the local component of the contingency planning process. Mandated by OPA 90.
- Existing paper based plans and their associated maps, tables and graphics can be difficult to update and can be expensive to distribute on paper.
- The result can be response maps and supporting data tables that may not be kept up to date, potentially leaving response and command personnel with an incomplete picture of conditions during an incident.



# Existing GRPs in Western Lake Erie

## LITTLE PORTAGE RIVER WILDLIFE AREA



Western Lake Erie Area Contingency Plan  
F - 24



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# Existing GRPs in Western Lake Erie



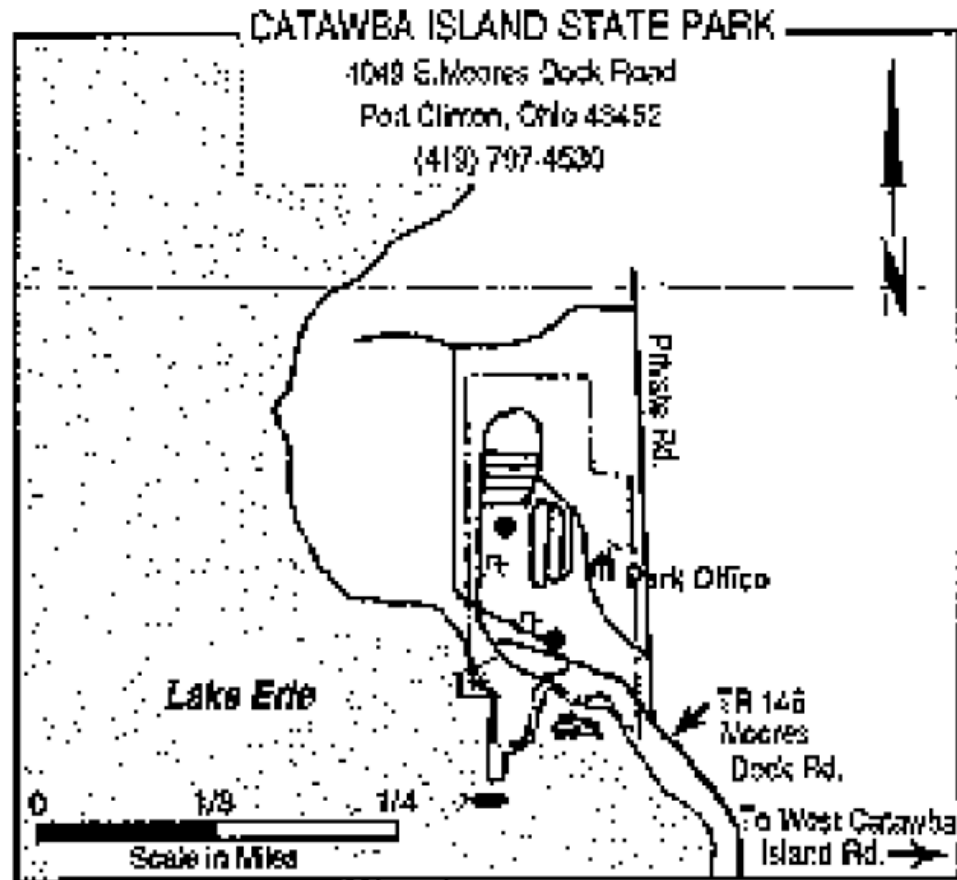
Publication 158  
(R696)

**Division of Wildlife**  
Ohio Department of Natural Resources  
**METZGER MARSH WILDLIFE AREA**  
Lucas County  
Public Hunting & Fishing  
558 Acres  
**100 DPI**  
**LEGEND**

<b>P</b>	Parking	<b>L</b>	Latrine
	Marshland		Dike
	Brushland		Stone Breakwall
	Woodland		WA Boundary
	Openland		Accessible Pier
	Water		Boat Launch



# Existing GRPs in Western Lake Erie



REV 12/00

# Other approaches to GRPs

- Reviewed GRPs from:
  - San Francisco
  - Buzzards Bay MA
  - Central Puget Sound & Snohomish River
  - Tampa FL
  - Jacksonville FL
- Presented different mapping approaches to Area Committee at a regular meeting for evaluation
- Consensus was the Northwest Area Committee approach was preferred

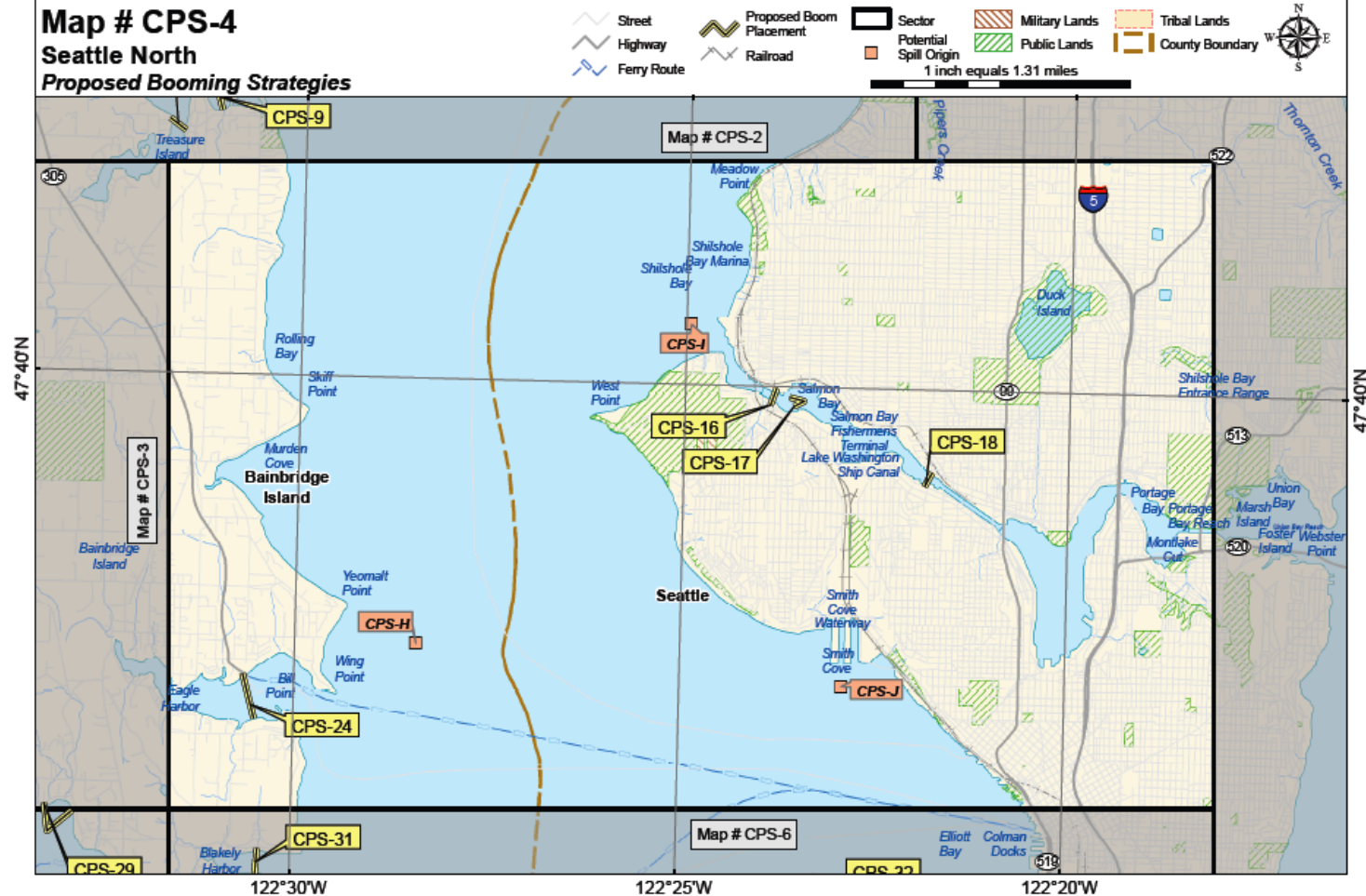
# Northwest Area Committee Response Plan Map Samples – Marine

4-25

**Map # CPS-4**

**Seattle North**

**Proposed Booming Strategies**





# Northwest Area Committee

## Response Plan Map Samples - Marine

4-41








### 4.5 Proposed Booming and Collection Strategies - Matrices

Table 4-21: Proposed Booming Strategies and Resources Targeted (Cont)

Strategy	Current Status	Location (NAD83 HARN)	Response Objective	Feet of Boom	Strategy Implementation	Shoreline Oblique Photo	Resources Targeted
<b>IF FIELD CONDITIONS REQUIRE MODIFICATION NOTIFY COMMAND</b>							
CPS-21	Visited and Not Tested 05/01/2006	Lagoon near Clear Creek  N 47° 38.847' W 122° 41.021'  map page 4-24	Exclusion - Prevent oil from entering lagoon.	100ft Contractor Boom	Close off small lagoon to SE of Clear Creek.	<a href="http://apps.ecy.wa.gov/shorephotos/scripts/bigphoto.asp?id=KIT0175">http://apps.ecy.wa.gov/shorephotos/scripts/bigphoto.asp?id=KIT0175</a>	sensitive habitat, waterfowl
CPS-22	Visited and Not Tested 05/01/2006	Strawberry Creek  N 47° 38.759' W 122° 41.477'  map page 4-24	Exclusion - Prevent oil from entering creek estuary	200ft Contractor Boom	Close off flat in front of creek; High water deploy from boat, Low water from road.	<a href="http://apps.ecy.wa.gov/shorephotos/scripts/bigphoto.asp?id=KIT0173">http://apps.ecy.wa.gov/shorephotos/scripts/bigphoto.asp?id=KIT0173</a>	salmonids (anadromous)
CPS-23	Visited and Not Tested 05/01/2006	Fletcher Bay  N 47° 38.609' W 122° 34.909'  map page 4-24	Exclusion - Keep oil out of Fletcher Bay	600ft Contractor Boom	Deploy boom in a chevron configuration across the entrance to the bay.	<a href="http://apps.ecy.wa.gov/shorephotos/scripts/bigphoto.asp?id=KIT0578">http://apps.ecy.wa.gov/shorephotos/scripts/bigphoto.asp?id=KIT0578</a>	sensitive habitat, salmonids (anadromous)
CPS-24	Visited and Not Tested 05/01/2006	Eagle Harbor  N 47° 37.178' W 122° 30.586'  map page 4-25	Exclusion - Keep oil out of harbor.	3000ft Contractor Boom	Close off harbor at ferry dock; deploy boom from west side of ferry dock to pilings just west of old creosote plant.	<a href="http://apps.ecy.wa.gov/shorephotos/scripts/bigphoto.asp?id=KIT0635">http://apps.ecy.wa.gov/shorephotos/scripts/bigphoto.asp?id=KIT0635</a>	sensitive habitat, baitfish, marine birds, waterfowl

# Northwest Area Committee

## Response Plan Map Samples - Riverine

Snohomish River near Shorts School Rd (N)		SNH-16.11-B-Average 4-179																															
Site Lat/Long:	N 47° 51.518' / W 122° 4.872', Sector Map 7-6																																
Strategy Objective:	Collection - Collect product at LB.																																
Implementation:	Use in stream SARCA anchor, bring boom back to shore, anchor to natural anchors. Extend boom up shoreline (~90 ft) for protection in collection area. Use lines to maintain maximum boom angle. Use sorbent boom downstream of river boom for sheen control. Use in conjunction with SNH-16.11-A to cover entire river. Could continue shoreline protection boom to exclude product at 16.11-C.																																
Site Safety Note:	Other boats, steep and slippery bank at LB, slippery cobbles at RB, fast current.																																
Staging Area:	Boat and operator go to (BL-339) SNH-11.99-staging, laborers and equipment go to site. Snohomish County owns property on right and left bank. Stage from Shorts School Road on RB, from Connelly Rd. on LB. Stage equipment for 16.11 A, B, and C together.																																
Field Notes:	Jet boat required to access site from BL-339.																																
Resources Targeted:	salmonids (anadromous)																																
Watercourse Description:	Snohomish River, Field Visit Width ~ 450.00ft, Field Velocity ~ 2.40MPH																																
<div><div></div><div><div> Flow Direction</div><div> Boom Location</div><div> Staging Area</div><div> Staging Locations</div><div> Photo Point</div><div> Pipelines</div></div><div><div>02505001,000</div><div>Feet</div></div></div>																																	
<div><div><div>Recommended Equipment</div><table><thead><tr><th>Quantity</th><th>Description</th></tr></thead><tbody><tr><td>775 ft</td><td>1/2" Dbl Braided Propylene Line w Safety Clasps</td></tr><tr><td>80 ft</td><td>Chain</td></tr><tr><td>3 each</td><td>Hand Bridle(s)</td></tr><tr><td>2</td><td>Jet Boat</td></tr><tr><td>1 each</td><td>Paravane(s)</td></tr><tr><td>650 ft</td><td>River Boom</td></tr><tr><td>1 each</td><td>SARCA Anchor(s)</td></tr><tr><td>200 ft</td><td>Sorbent Boom</td></tr><tr><td>1 each</td><td>Towing Bridle(s)</td></tr><tr><td>1 each</td><td>Universal Skimmer(s)</td></tr><tr><td>1 each</td><td>Vac Truck(s)</td></tr></tbody></table><div><div>Recommended Personnel</div><table><tbody><tr><td>2</td><td>Boat Operator (s)</td></tr><tr><td>9</td><td>Laborer (s)</td></tr><tr><td>1</td><td>Supervisor (s)</td></tr></tbody></table></div></div><div>Status: Visited and Not Tested 10/20/2006</div></div>				Quantity	Description	775 ft	1/2" Dbl Braided Propylene Line w Safety Clasps	80 ft	Chain	3 each	Hand Bridle(s)	2	Jet Boat	1 each	Paravane(s)	650 ft	River Boom	1 each	SARCA Anchor(s)	200 ft	Sorbent Boom	1 each	Towing Bridle(s)	1 each	Universal Skimmer(s)	1 each	Vac Truck(s)	2	Boat Operator (s)	9	Laborer (s)	1	Supervisor (s)
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1	Supervisor (s)																																

# Northwest Area Committee

## Response Plan Map Samples - Riverine

Snohomish River near Shorts School Rd (N) (cont)

SNH-16.11-B-Average 4-180



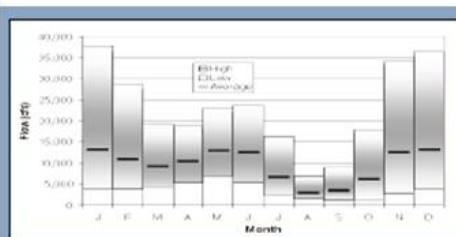
Image-35: Snohomish River looking downstream from left bank



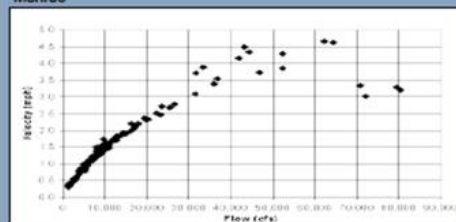
Image-30: Snohomish River looking downstream

### Site Contact Information

Responsible party or alternate contact:  
Snohomish County Parks  
Department, (W) 425-388-3411,  
General Parks Department  
Contact Information



Monthly Average Flow, 12150800 Snohomish River near Monroe



Average Velocity vs. Flow, 12150800 Snohomish River near Monroe



### Closest Address:

15106 Shorts School Road (RB),  
Snohomish, 98290

### Driving Directions:

- Depart State Rte 9 & 164th St SE
1. Go East on 164th St SE (Union St) toward STHY 9 (0.03 Mile(s))
  2. Turn left on STHY 9 (Snohomish Woodinville Hwy) (3.47 Mile(s))
  3. Bear right on Airport Way (0.62 Mile(s))
  4. Turn left at 99th Ave SE to stay on Airport Way (99th Ave SE) (0.65 Mile(s))
  5. Bear right on AVE D (0.06 Mile(s))
  6. Turn right on 1st St (0.64 Mile(s))
  7. Continue on Lincoln Ave (0.27 Mile(s))
  8. Bear right on Old Snohomish Monroe Rd (1.38 Mile(s))
  9. Turn right on Treesti Rd (Treesti Rd) (0.3 Mile(s))
  10. Turn left on Shorts School Rd (115th Ave SE) (1.79 Mile(s))
- Arrive at Point (N 47° 51.518' / W 122° 4.872'), on the left







# Proposed WLE GRP Layout

Western Lake Erie Area Contingency Plan

Appendix F, Page 16



## Required Resources:

Quantity	Resource Description
XXX ft.	Line
1500 ft.	Cascade boom
2 ea.	Boats
XX ea.	Hardware (bridles, pins, etc.)
XX ea.	Skimmers (type) or vacuum trucks, etc.
XX ea	Boat operators
XX ea	laborers
XX ea	Supervisors

Site visited or tested [date]. (or strategy reviewed/updated [date], reviewer)

Site/CP/Entrance Lat/Lon [DATUM]	[Parking Lot/HQ Bldg.] 41 37 28.07 N[WGS84]
Location/Directions to site	East side of the Maumee River
Strategy Objective/First Priority Boom Location	1500' cascade boom to divert oil into Sun Oil dock collection point whether movement is upstream or downstream
Type of Shoreline/Habitat to be protected	Sheet pile shoreline,
Wildlife/Resources at risk	
Shoreline access/Backshore access	access to Sun docks from end of Consaul Street; contact Sun Oil for access to docks
Staging/Recovery Area	Collection point at the end of the Sun Oil docks, may be on north or south side of docks depending on direction of product movement
Field Notes	Strategy suitable for upriver or downriver product movement. Toledo Fire Division station at the end of Consaul street near Sun docks

MAUMEE RIVER BOOM DEPLOYMENT STRATEGY E: Sun Oil Docks

Map Layout and design by: Dave Dean  
Department of Geography, The University of Toledo

# ERMA: A geospatial framework for the project

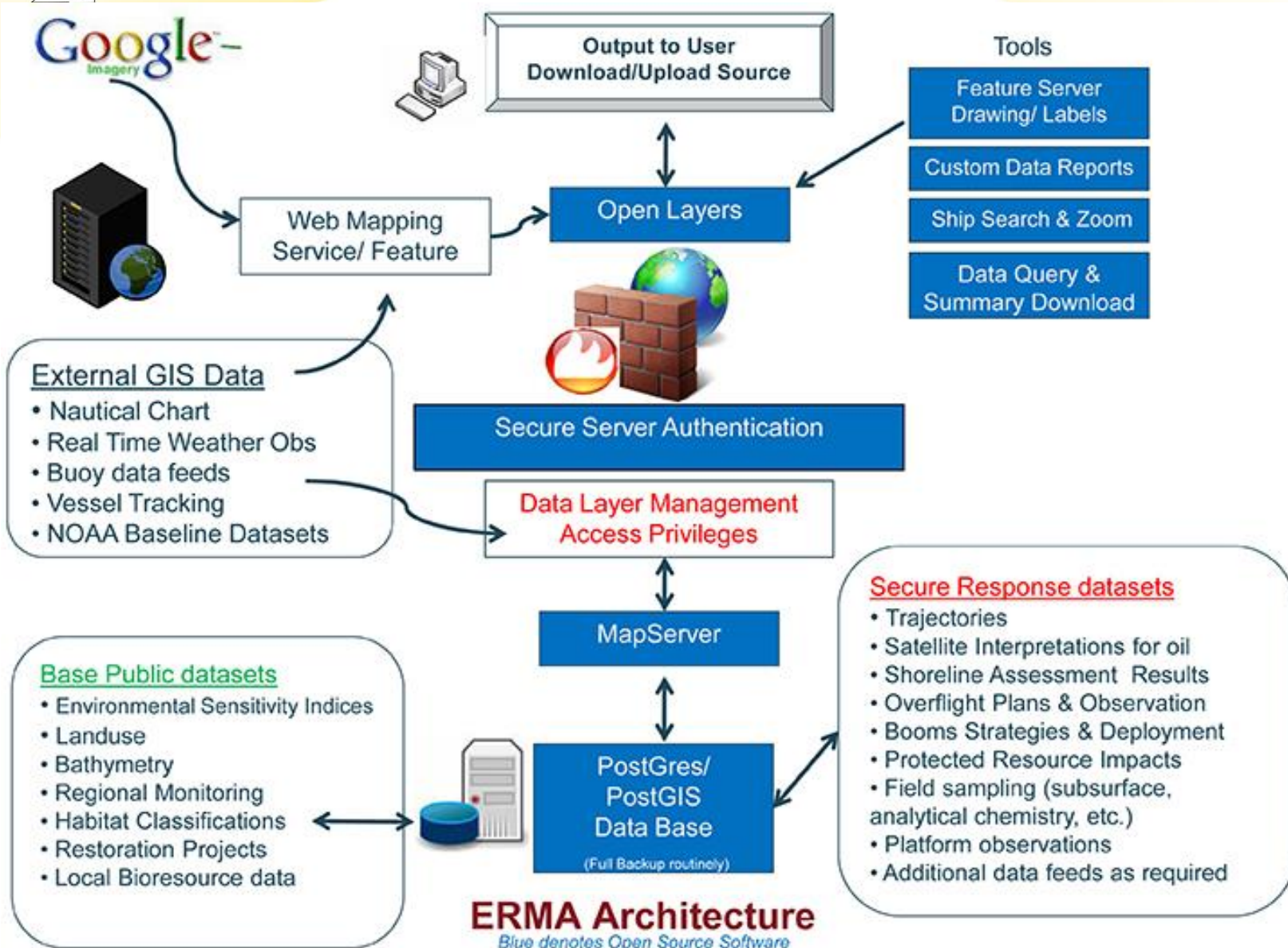
- ERMA – Environmental Response Management Application
- Developed by NOAA Office of Response and Restoration (OR&R) in Seattle, WA and UNH Coastal Response Research Center (CRRC) with USEPA, USCG
- Regional focus
  - Great Lakes, New England, Atlantic, Gulf of Mexico, Southwest (CA), Pacific Northwest (WA, OR), Caribbean (PR, USVI) Pacific Islands, Arctic (AK)
  - Each region requires locally generated fine resolution data for stakeholders to take advantage of ERMA's analysis and data management capability

## ERMA:

# A geospatial framework for the project

- ERMA :
  - Designed as an aid in spill preparedness and planning
    - Can assist in coordination emergency response efforts and situational awareness
    - Support NRDA process, recovery and restoration efforts post-incident.
  - [Great Lakes ERMA](#) went live 7-10-13
  - Base layers only in application at this time

# ERMA Structure





# Northwest ERMA

ERMA Environmental Response Management Application

Identify

Washington Booming Strategies (WDOE, 2009)

gid	site_id	mapscale_i	strategy_o	objective	implementa	active	created_dt	modified_d	created_by	modified_b	label	shape_leng
197	3012	1		Keep oil out of harbor.	Deploy three overlapping booms 1000' long each to deflect the oil past the entrance to the harbor. Current through the harbor entrance is very strong. Likely to work only with 12" fast water boom.	1	2007-01-01	2007-02-09	JOWI464	McGuire	AI-11	966.524540323

Washington Strategy, Staging, and Potential Spill Locations (WDOE 2009)

gid	sectormap	lilid_id	startlocat	old_id	nhd_id	river_mile	marine_sit	site_nm	site_organ	site_lat_d	site_long_	line_1_ad	line_2_ad	city_nm	state_cd	zip_cd	county_nm	country_cd	spill_orig	field_ds	site_safet	staging_ds	ac
2	66	0.000000000000	0	AI-11	0	0	11	Killsut Harbor - N entrance		48.0913800000	-122.734089000				WA			US	0	By boat from Fort Flagler or Mystery Bay			1

Scale: 1: 14K Zoom Level: 15 Location: 48.08504° -122.75042°

US DOC | NOAA | NOS | NOAA Office of Response & Restoration  
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# Northwest ERMA

ERMA | Environmental Response Management Application  
Pacific Northwest

Information Help Recent Data Find

Layers Legend Query Tools Zoom Download Print Login

Identify

Washington Booming Strategies (WDOE, 2009)

gid	site_id	mapscale_i	strategy_o	objective	implementa	active	created_dt	modified_d	created_by	modified_b	label	shape_leng
33	3129	1		Keep oil in or out of waterway	Deploy boom from the rip-rap shoreline at the north end of the Valero Pier on the east shore across the waterway to a suitable anchor point on the west shore.	1	2007-01-01	2007-07-17	JOW581	smarxen	CPS-85	849.255095552

Washington Strategy, Staging, and Potential Spill Locations (WDOE 2009)

gid	sectormap	lilid_id	startlocat	old_id	nhd_id	river_mile	marine_sit	site_nm	site_organ	site_lat_d	site_long	line_1_ad	line_2_ad	city_nm	state_cd	zip_cd	county_nm	country_cd	spill_orig	field_ds	site_safet
113	7	0.000000000000	0	CPS-82	0	0	85	Thea Foss Waterway		47.2617490000	-122.437910000				WA			US	0	Land access from Superior Oil. Road access on both	

Scale: 1: 14K Zoom Level: 15 Location: 47.26522° -122.44606°

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- Washington Emergency Medical Service Stations
- Washington Hospitals
- Transportation
  - Washington Railroads
  - Washington Streets & Roads (scale dependent)
  - Washington Major Highways and State Routes
  - Washington Airports
  - Puget Sound Bridges
  - Washington Bridges
- Response Planning
  - NOAA ORR Incident News
- Flooding
  - Washington Flood Zones (FEMA)
- Oil & Chemical Spills
  - Geographic Response Plans (GRPs)
    - Washington Potential Spill Origins (WDOE 2009)
    - Washington Strategy, Staging, and Potential Spill Locations (WDOE 2009)
    - Washington Booming Strategies (WDOE, 2009)
    - Inland Washington Geographic Response Plan Strategies (WDOE)
    - Washington Geographic Response Plans Boundaries (WDOE)
    - Inland Washington Geographic Response Plans Boundaries (WDOE)
- Restoration
  - Restoration Projects (points)

Report a map error

Bookmark Views: Expand

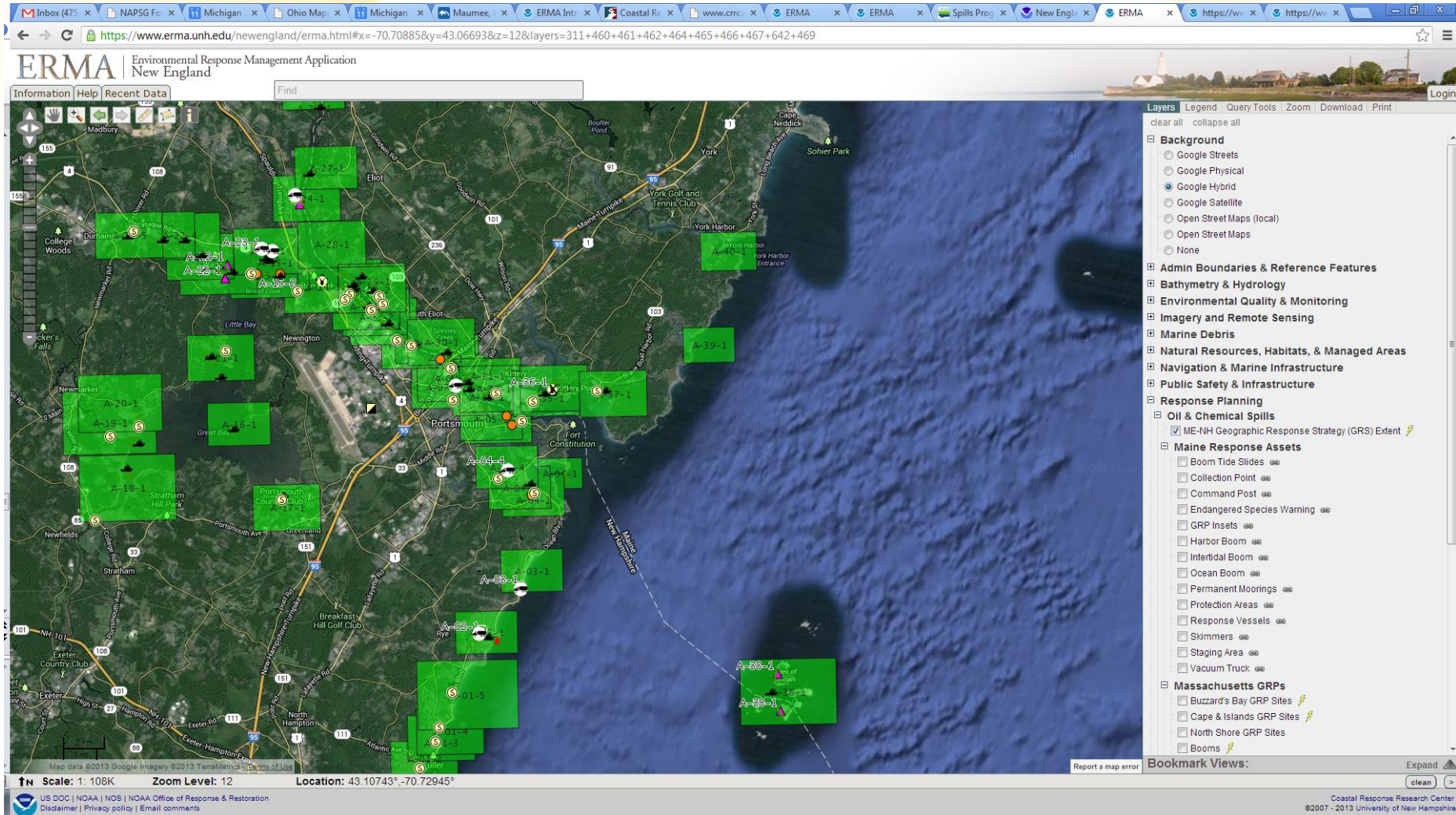
clean

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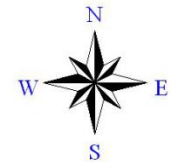
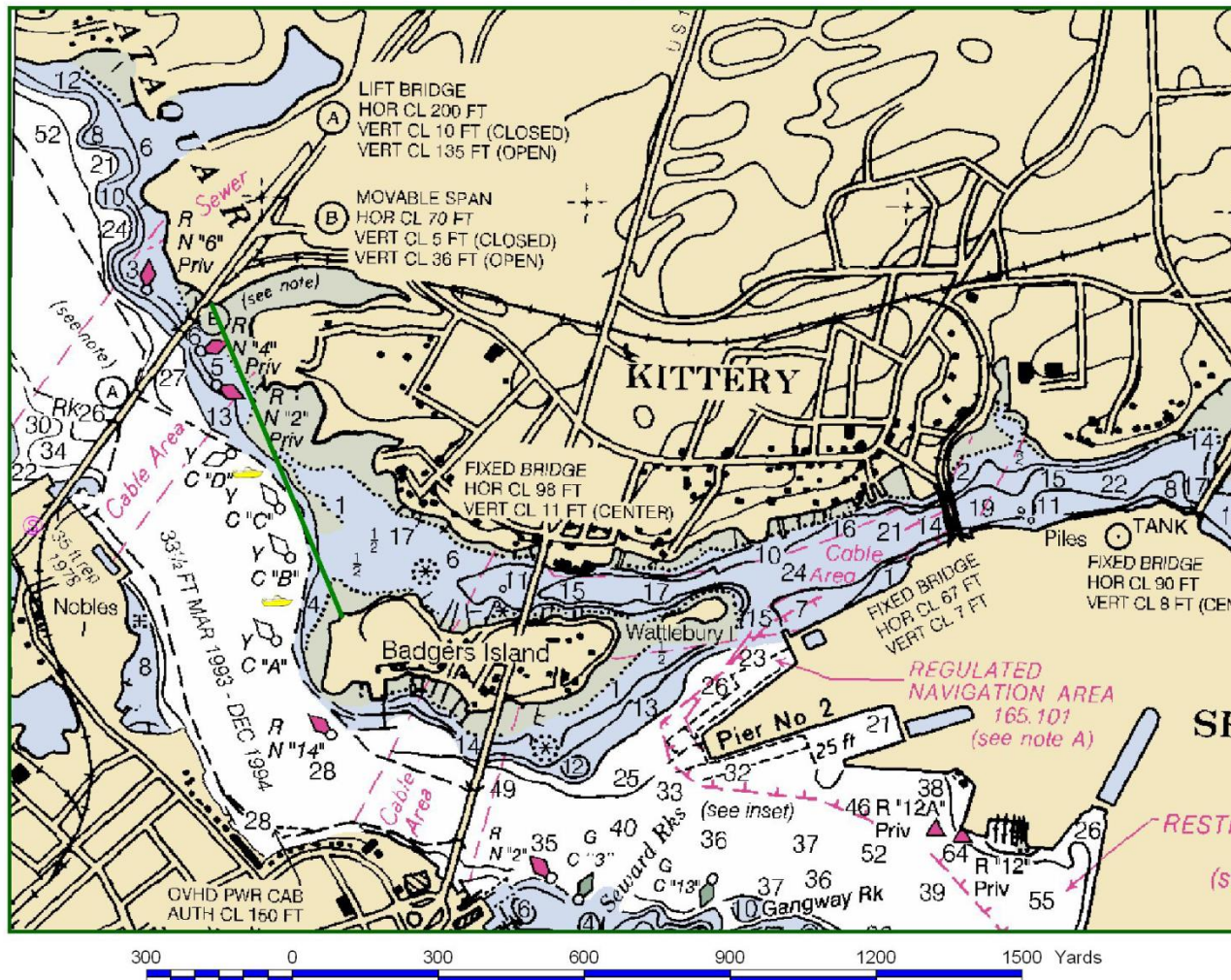
# New England ERMA





# New England ERMA

## A-31-1 Between Kittery and Badgers Island



### LEGEND

- Harbor Boom
- Intertidal Boom
- Ocean Boom
- Permanent Moorings
- Staging Area
- Command Post
- Collection Recovery Point
- Skimmer
- Response Vessel
- Vacuum Truck



**Note: Not to be used for navigational purposes**

Issued by the  
Maine and New Hampshire  
Area Committee  
Printed copies are uncontrolled

Created: February 15, 2008 @ 16:09



# New England ERMA

## Between Kittery and Badgers Island

Site, Strategy & Chart #	A-31	A-31-1	13283_1
Port Region	New Hampshire and Southern Maine	Town	Kittery
Latitude & Longitude	43° 05.049 N	70° 45.377 W	
Water Depth Range	0 - 40	feet	
Max Current (knots)	Flood	Ebb	1.1
Nearest Boat Ramp	Eliot	Source	
Response Strategy Type	Deflection		
Type of Boom	Harbor Boom		
Total Length of Boom	2000	feet	<small>Unless otherwise indicated, the boom length given is straight line distance as measured on the map. Actual length required will vary with conditions, and increase with current.</small>

### Strategy Implementation

Deploy 2,000 feet of harbor boom between the Kittery pier of the route 1 Sarah Long bridge and the west shore of Badgers Island.

Site Access	Route 1 Bypass
Staging Areas	Irving Oil Terminal
Collection Points	NA

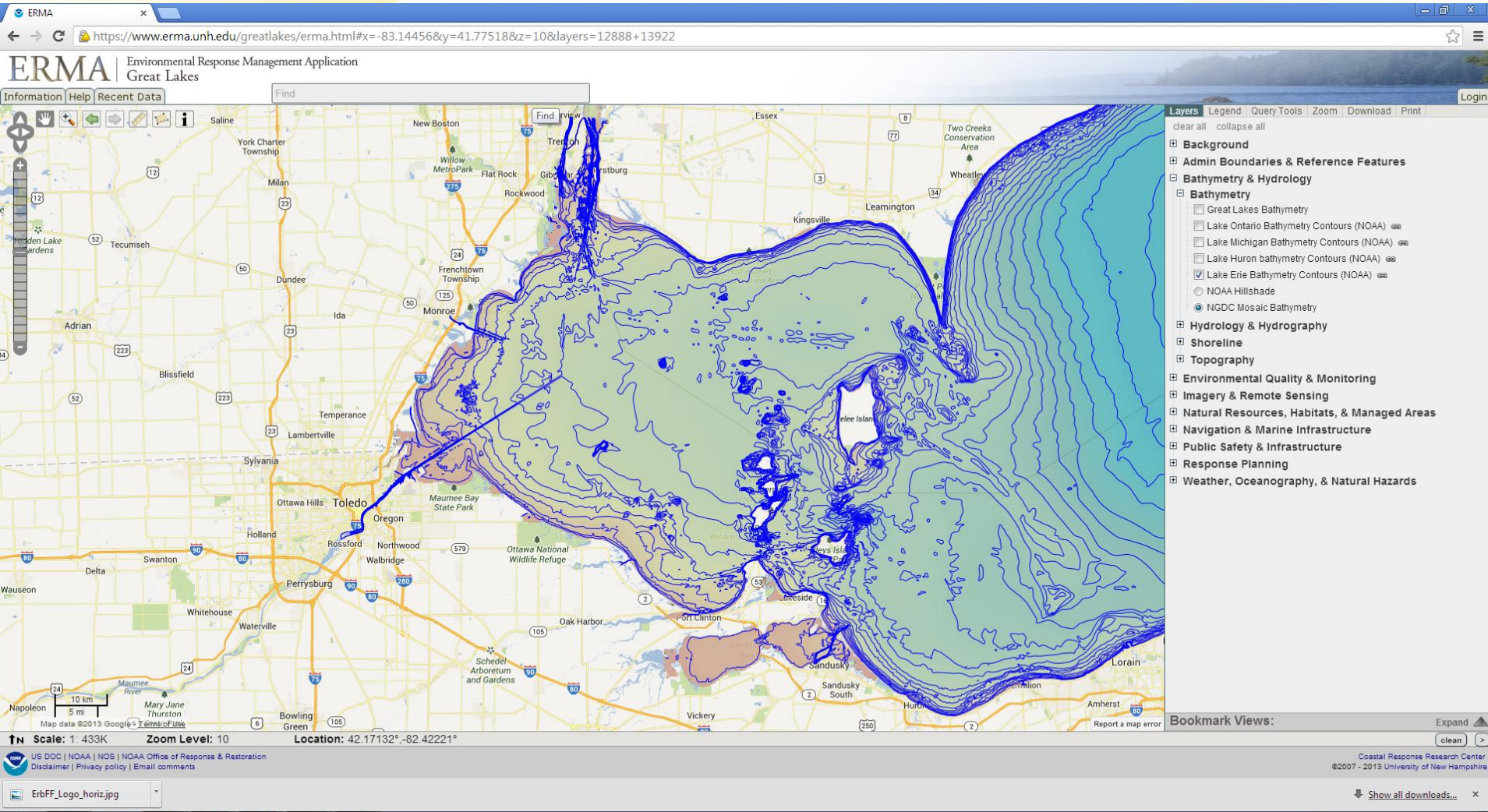
### Environmental Concerns

ESI/EVI Map #	2
Shoreline Types	EVI 2 - Mud flats, sheltered
	EVI 7 - Rocky shores

### Other Comments



# Great Lakes ERMA



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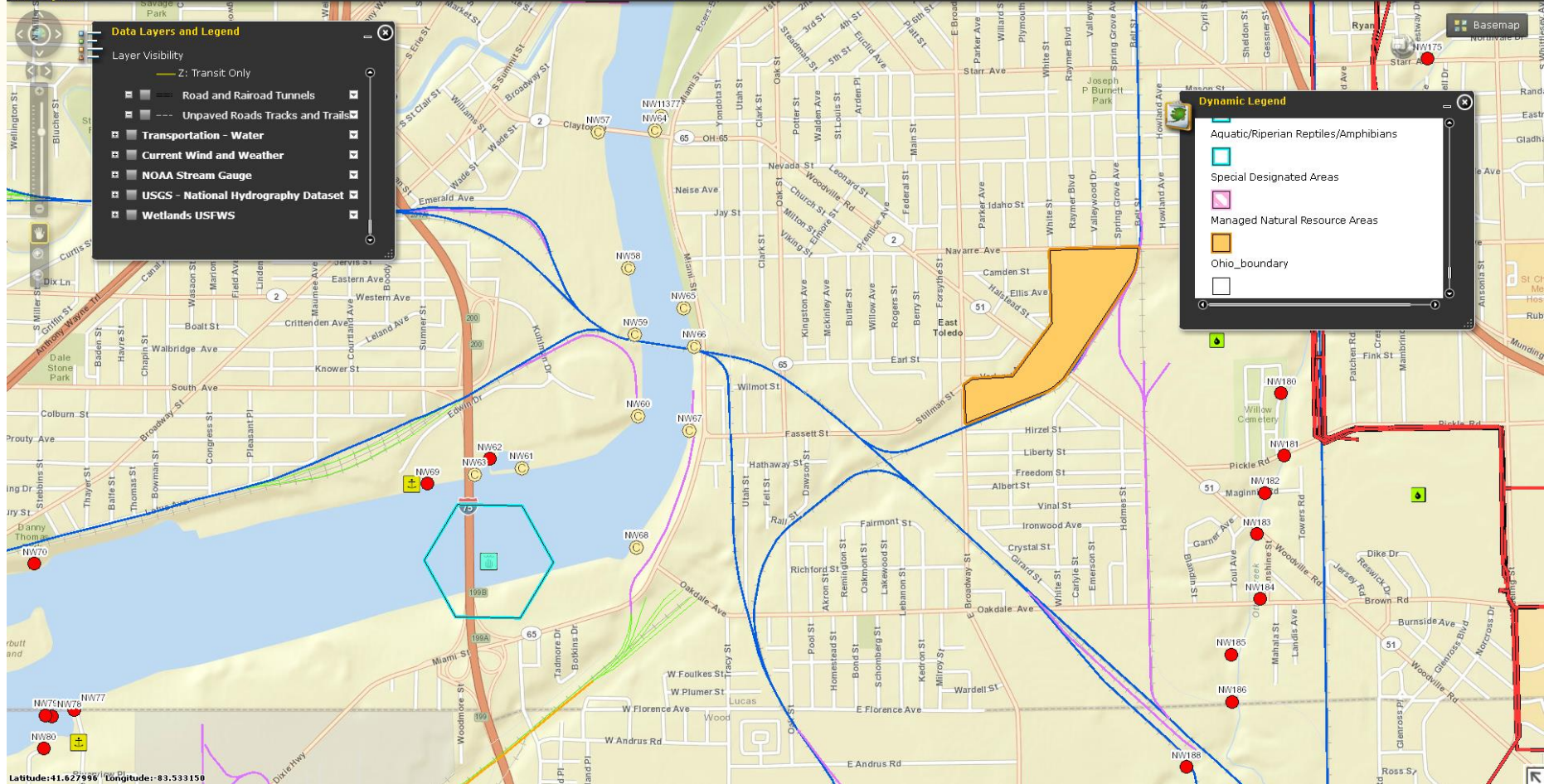
# Existing GIS framework

- Ohio Mapping Project
  - developed by US EPA/Ohio EPA
  - Demonstrated by Jon Gulch and Mike Gerber at PREP TTX 7-10-13
  - Has inland response focus
  - Lots of useful response data layers
  - GRPs developed at some locations
  - Cooperative project between Ohio EPA, US EPA and potential responsible parties
  - Substantial amount of data developed for Ohio, need Michigan data



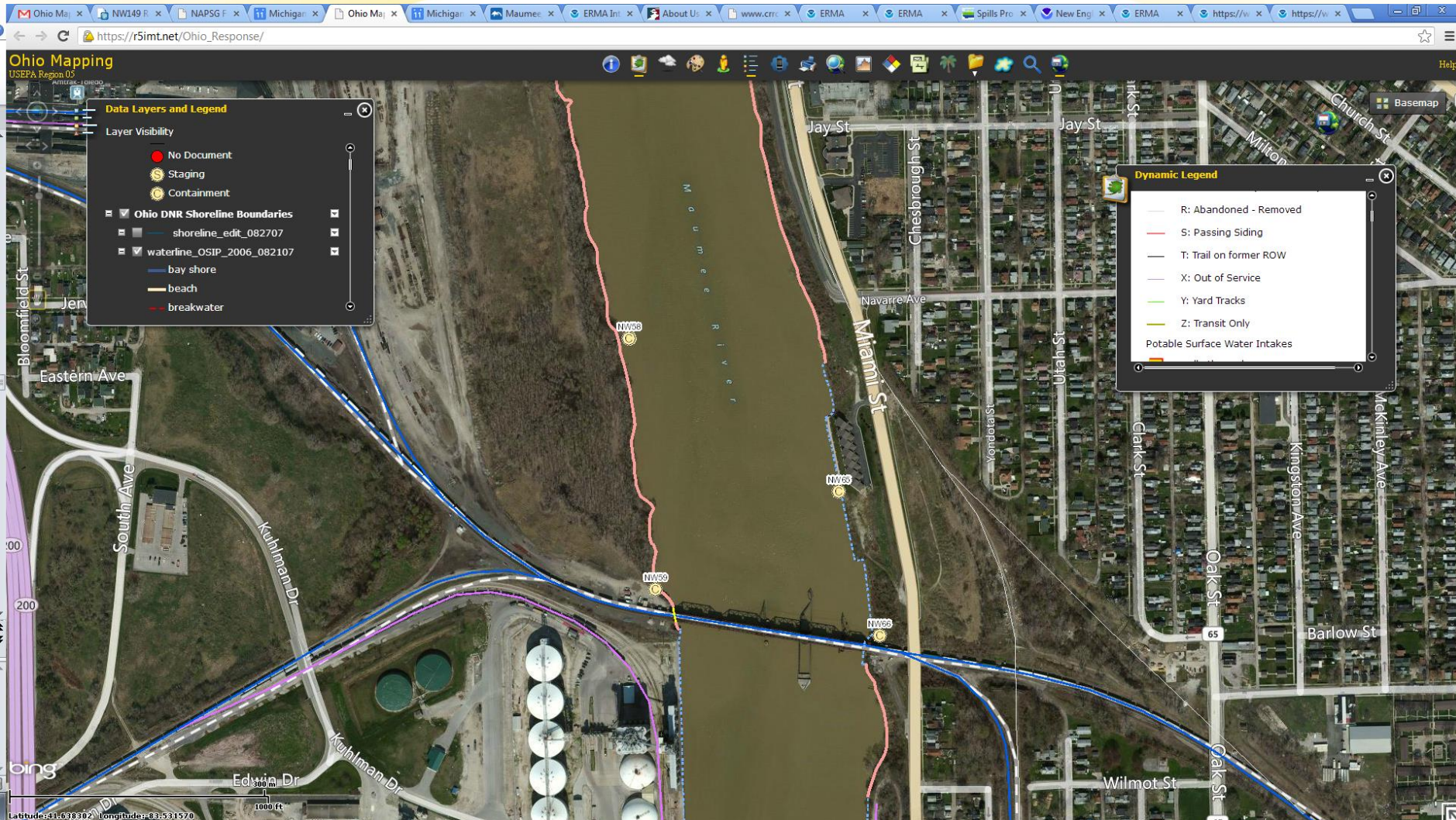
# Ohio Mapping Project

Ohio Mapping  
USEPA Region 05





# Ohio Mapping Project







# Ohio Mapping Project

## Sample Response Sheets

### PHYSICAL LOCATION INFORMATION

Location ID NW58 Location Name Metro Park Property West Bank - Maumee River

Location Description ☐ Coastal ☐ Open Water ☐ Harbor / Bay ☐ Open Channel or Culvert  
☐ Small Stream or Creek ☒ Riverine ☐ Inland/Upland  
☐ Sewer Choose Sewer Type ☐ Other (describe)

Property Type Private

Detailed Location Description Fire District Toledo  
Downstream side of Norfolk Southern Rail Bridge on west bank. Note property is located along Toledo Metro Park Property with poor access, but open space for staging equipment. Field data collected by WLEA.

Location County Lucas Location Township  Location City/Town/Village Toledo

Adj. Property Ownership	Name (1) <u>Metropolitan Park District</u>	Name (2) <input type="text"/>
	Mailing Address <u>111 Ottawa St. Rear</u>	Mailing Address <input type="text"/>
	City/State/Zip <u>Toledo, Ohio 43602</u>	City/State/Zip <input type="text"/>
	Phone <u>419-407-9700</u>	Phone <input type="text"/>
	24 hr Phone <input type="text"/>	24 hr Phone <input type="text"/>
	Parcel ID # <u>18-99221</u>	Parcel ID # <input type="text"/>

#### Property Comments

Access to property off of Ottawa Street and Williams Street north of Union Rail Station. Any containment actions are by use of boats for installation of boom sections to anchor points in the river. Note: River is affected by Lake Erie seich. Property is owned by Norfolk Southern and you must also pass through Metroparks property to access the river. The point is located on NS parcels 1899227 and 1899223. No address is listed for Norfolk Southern so it must be combined somehow with other parcels, but the Metroparks property is listed as 101 Emerald Avenue.

ROW Agreement No Is copy attached? ☐ YES ☒ NO

GPS Coordinates Latitude / Longitude  
41.63558 Latitude Decimal Degrees, N -83.53345 Longitude Decimal Degrees, W

Describe access to location from major landmarks, roads, bridges, etc.

Land access off of Ottawa St. and Williams St. north of Union Rail Station/Norfolk Southern property. There is fence at Ottawa Street and Williams Street then a wire barrier farther into the property so vehicle access will not be possible without removal by the Metroparks. Beyond the fence and barrier there is a dirt pathway and plenty of grassy areas for staging. The path goes all the way along the river and directly out to the stone wall we saw from the boat.

Describe parking access, staging access, etc. at location

Large open area.

List Structures and/or Utilities in Area

#### Upstream of Containment Location

Average Depth of Water 40 Feet Average Width of Water 695 Feet

#### Downstream of Containment Location

Average Depth of Water 40 Feet Average Width of Water 695 Feet

Upstream Risks Other (describe) Fixed Facility Railroad Choose Upstream Risk Other: Hwy I-75 & Ohio Turnpike Overpasses & releases from ships.

Upstream Concerns Debris Other (describe) Choose Upstream Concern

Other: Shipping channel & recreational boating area. Also note major fish spawn migration in spring season upstream.

Location Purpose Containment Booming (for recovery) Skimming Monitoring

Other: Also direction of water flow can change due to seich effected of Lake Erie.

### Upstream & Downstream Photo

Photograph #1 Direction Photograph Taken South Date Photograph Taken 6-27-2013

Photograph #2 Direction Photograph Taken North Date Photograph Taken 6-27-2013

Upst. #1



Dnst. #2



Site Location#3



Site Watershed Map





# Ohio Mapping Project

## Sample Response Sheets

### MOVING WATERS

**\*\* NOTE: Right bank or left bank orientation is determined by looking downstream. \*\***

#### Substrate

##### Waterway Bottom Type

Upstream of Containment Location: Muck  
Downstream of Containment Location: Muck

##### Bank Type

Upstream of Containment Location:

Right Bank: Choose Bank Type Left Bank: Vegetative

##### Bank Profile (in feet)

Right Bank:  Left Bank:

Downstream of Containment Location:

Right Bank: Choose Bank Type Left Bank: Vegetative

##### Bank Profile (in feet)

Right Bank:  Left Bank:

##### Quality (Siltation)

Upstream of Containment Location: Moderate Silt

Downstream of Containment Location: Moderate Silt

Substrate Comments: Note due to wide width of river at this location, there is no right bank information provided.

#### In Stream Cover

Upstream of Containment Location: Logs or Woody Debris

Downstream of Containment Location: Logs or Woody Debris

Instream Cover Comments: deep water.

#### Amount of Instream Cover

Upstream of Containment Location: Moderate (25% - 75%)

Downstream of Containment Location: Moderate (25% - 75%)

Habitat Type (NOAA)

Large River

Shoreline Type (NOAA)

Choose Shoreline Type

#### WLEAC Response Strategies

4. Large River (50' to 100'): Containment and deflection booming is the only option to collect spilled product. Collection points should be easily accessed and able to accommodate product and equipment staging. Debris management will also be a major issue. If the oil has a low API (>10), oils will sink and structures (gabion baskets, fencing, skirt, etc.) will need to be placed on the bottom of the River to stop the movement of oil along the bottom. For polar solvents in Rivers, downstream monitoring and sampling will need to be used to determine impact on potential downstream water users and sensitive populations.

Information Provided by: Name: Mike Gerber Phone: 419-373-3031 Date: 6/10/2013

Verified by: Name: Jon Gulch Phone: 734-692-7600 Date: 6-27-2013

# Moving forward with the project

- ERMA likely to provide GIS framework for this project
  - Share data between Ohio Mapping project and ERMA
- What functions/focus for GIS?
  - Identify datasets for
  - Mitigation, Preparedness, Response, Recovery
- Provide Common Operating Picture at CP
- Provide multiple options for GRP data display and distribution (GRP as pdf, etc.)
- Initial collection of GRP data for sensitive habitat in WLE basin
  - Identify data to be included in GRPs
  - Ohio Coastal Atlas useful for base data
  - Find Michigan data
  - Ohio Mapping project data a good place to start
  - Start with data for strategies at locations identified in existing WLE Area Contingency Plan



# Moving forward with the project

- Integrate existing data, work with WLE Area Committee, other stakeholders (USFWS, ODNR, .... to identify/collect response data
  - Data sharing as appropriate between Ohio Mapping Project and GRPs
- Maintain communication with stakeholders
  - Regular reporting of progress to sponsor and Area Committee
  - ***Input from stakeholders to ensure the final result is useful to the response community***
- Make framework available to others who may be able to use it (USFWS, ODNR etc...) within their operations



***Thank You!***

***Questions, Comments,  
Suggestions?***



Fred A. and Barbara M.  
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