Summary of a Large-scale Hydrilla Control Demonstration Project on the Erie Canal : 2013-2015

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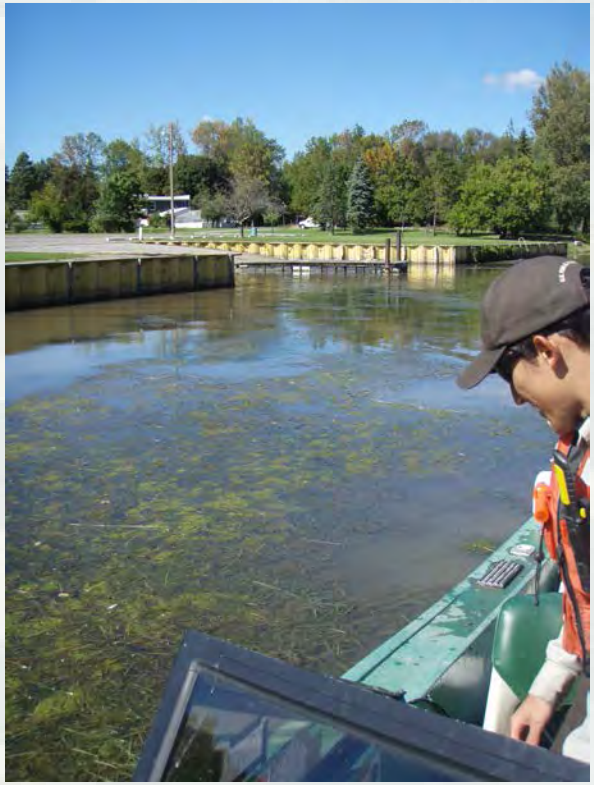
Background

- Hydrilla identified on approximately 15 mile stretch of the Erie Canal near Tonawanda/Buffalo
- Growth was patchy, but extensive beds present
  - Thousands of fragments noted floating in canal!
- Multiagency Team assembled to conduct a large-scale demonstration project
  - Funding: ERDC Aquatic Plant Control Research Program, GLRI, NY DEC, Buffalo District

Large beds of Hydrilla were noted at multiple sites along the length of the Demonstration Area (15 miles)

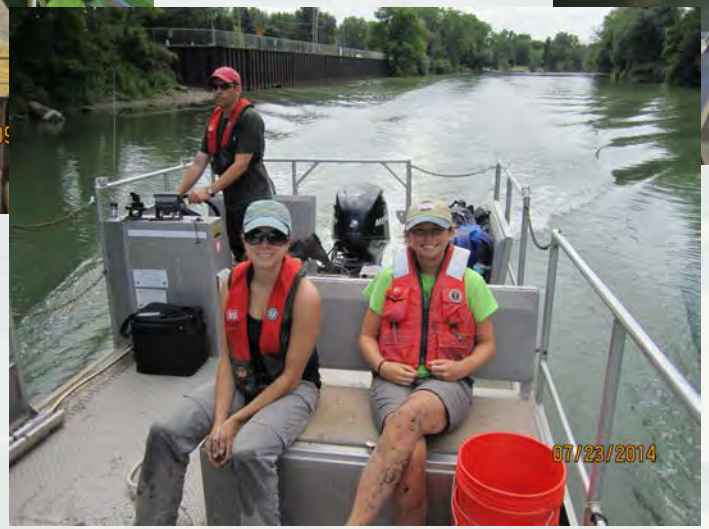


Multi-agency Team Responsible for Conducting the Demonstration

USACE Buffalo District

US FWS

NY DEC



NY State Canal Corp.
Ecology & Environment
Aquatic Control Tech.

Project Area

(Erie Canal Website: http://www.eriecanal.org/index.html)

Technical Challenges for Hydrilla Management in the Canal

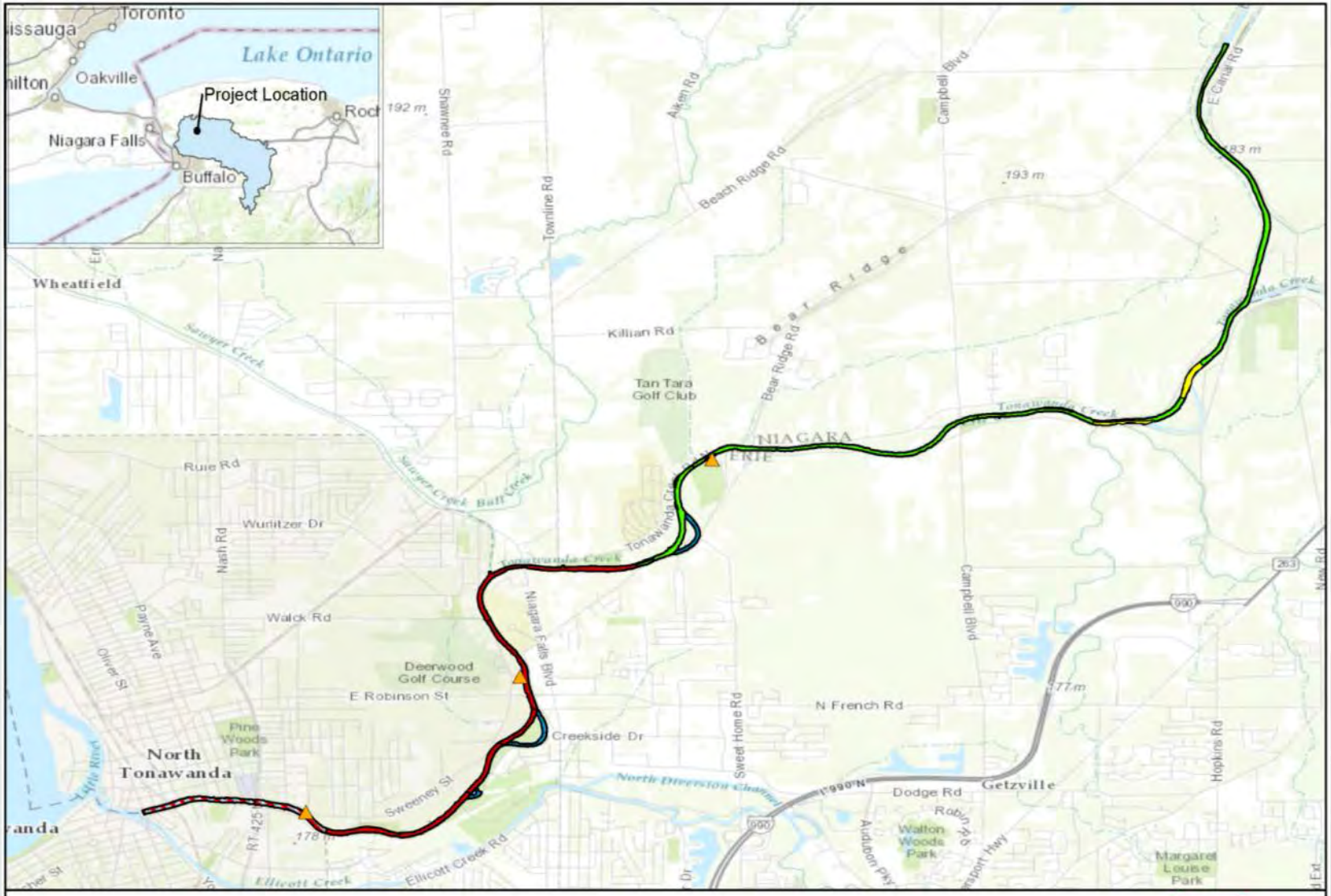
- Canal flow averages 400 to 800 CFS in summer
  - 160 acre Lake x 10 ft deep each day
- Hydrilla distribution: patchy but extensive
  - Threat of spread via fragments: Very High (East and West)
- Proposed use of a contact herbicide
  - Questions regarding timing
  - Will late sprouting tubers confound efficacy
  - Coordinate with NY State Canal Co. to reduce flow for 48 hrs

Results from Year 1 of Demo in 2014

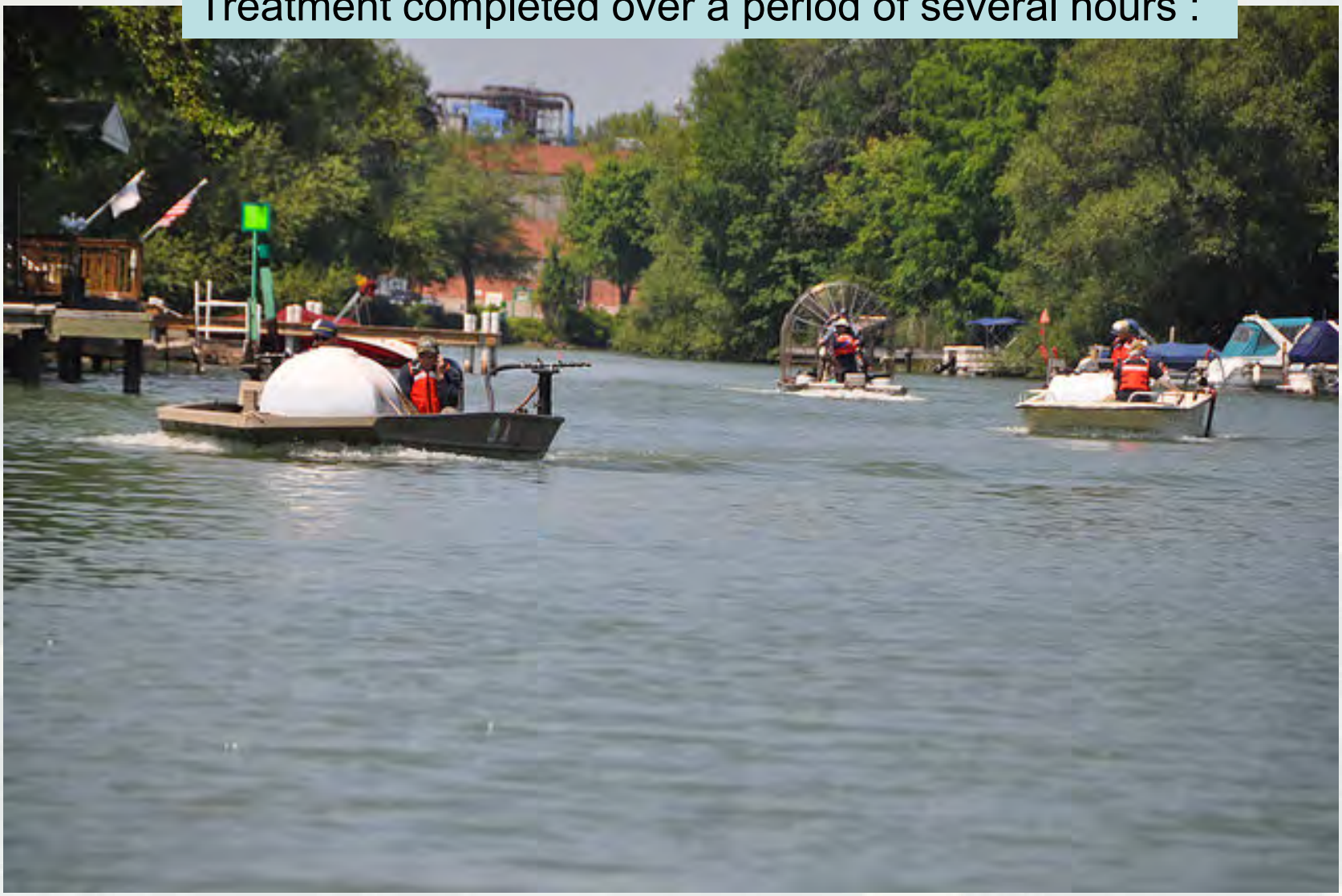
- Treated 7 miles of canal at 1.5 ppm endothall
  - 213 acres
  - Flow reduced for 48 hrs (typically 400 to 800 CFS)
  - Targeted 15 miles of control
- 90% reduction in hydrilla tuber density
  - Sprouting was synchronous (no late season sprouting)
- Hydrilla frequency reduced from 33 to 4%
- Native plant abundance significantly reduced
- One area of the canal proved very difficult to control

Adaptive management in Year 2

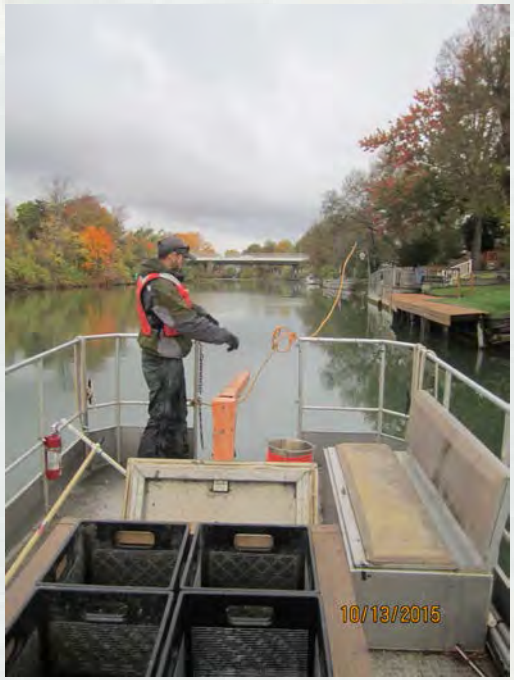
- Treatment block moved 1 mile east towards Niagara River
  - Head pressure from River pushes water to the west
  - Treated this area on back to back days to maintain endothall concentrations
- Continued Monitoring
  - June to Oct - Tuber density/sprouting, SAV frequency , endothall behavior

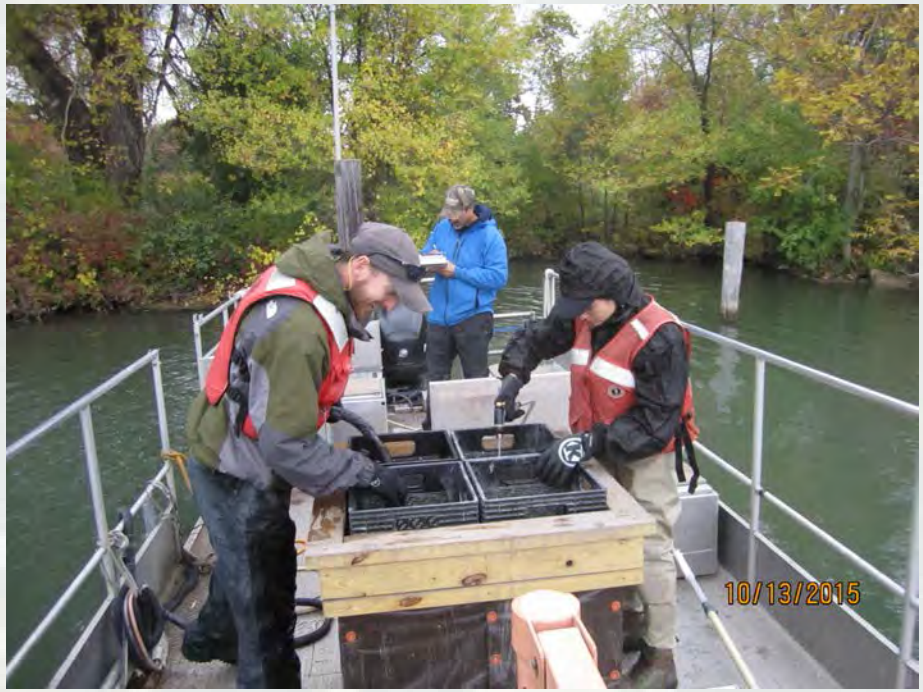

Toronto
Lake Ontario
Oakville
Project Location
Niagara Falls
Buffalo
Wheatfield
Shawnee Rd
Townline Rd
Aiken Rd
Beach Ridge Rd
Campbell Blvd
E Canal Rd
Bear Ridge
Killian Rd
Tan Tara Golf Club
Bear Ridge Rd
NIAGARA
ERIE
Rule Rd
Wurlitzer Dr
Nash Rd
Walck Rd
Payne Ave
Oliver St
Deerwood Golf Course
E Robinson St
Niagara Falls Blvd
Creekside Dr
Sweet Home Rd
N French Rd
Pine Woods Park
North Tonawanda
Sweeney St
RT 425
Ellicott Creek Rd
Ellicott Creek
North Diversion Channel
Dodge Rd
Getzville
Walton Woods Park
Audubon Pkwy
Hopkins Rd
Margaret Louise Park
Tonawanda Creek
Sawyer Creek
Buff Creek
Main Channel Treatment Areas 2015
Service Drive Ramp Area 2015
Supplemental Treatment Areas 2015
Potential Supplemental Treatment Areas 2015
Secondary Treatment Area 2015
Oxbow Treatment Areas 2015
Loading Areas
Hydrilla Treatment Areas
Summer 2015
0
0.75
1.5
3
Miles
N
US Army Corps of Engineers
Buffalo District
BUILDING STRONG

Treatment completed over a period of several hours :



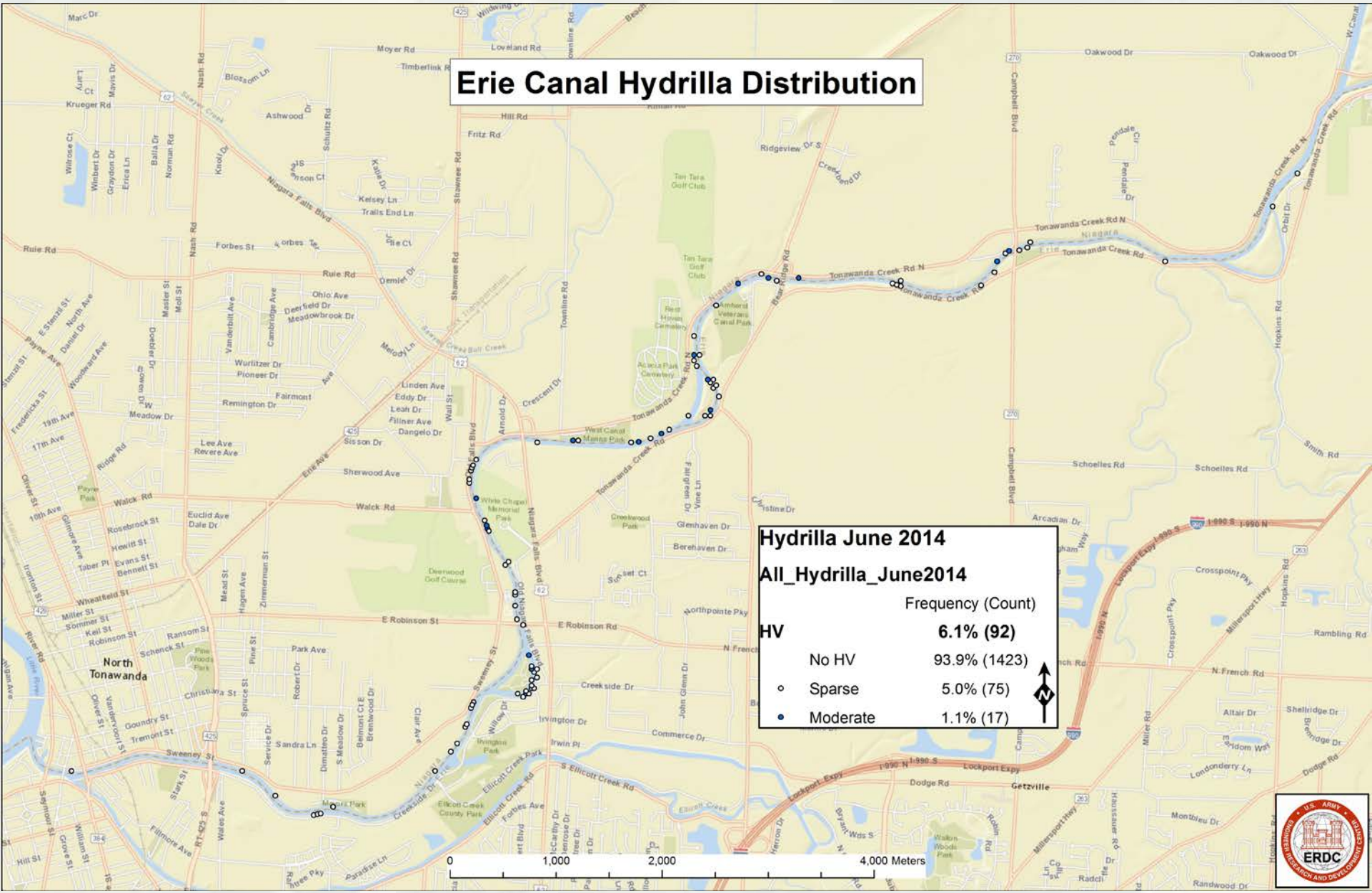
Intensive Monitoring: Herbicide concentrations, plant frequency and distribution, and tuber dynamics

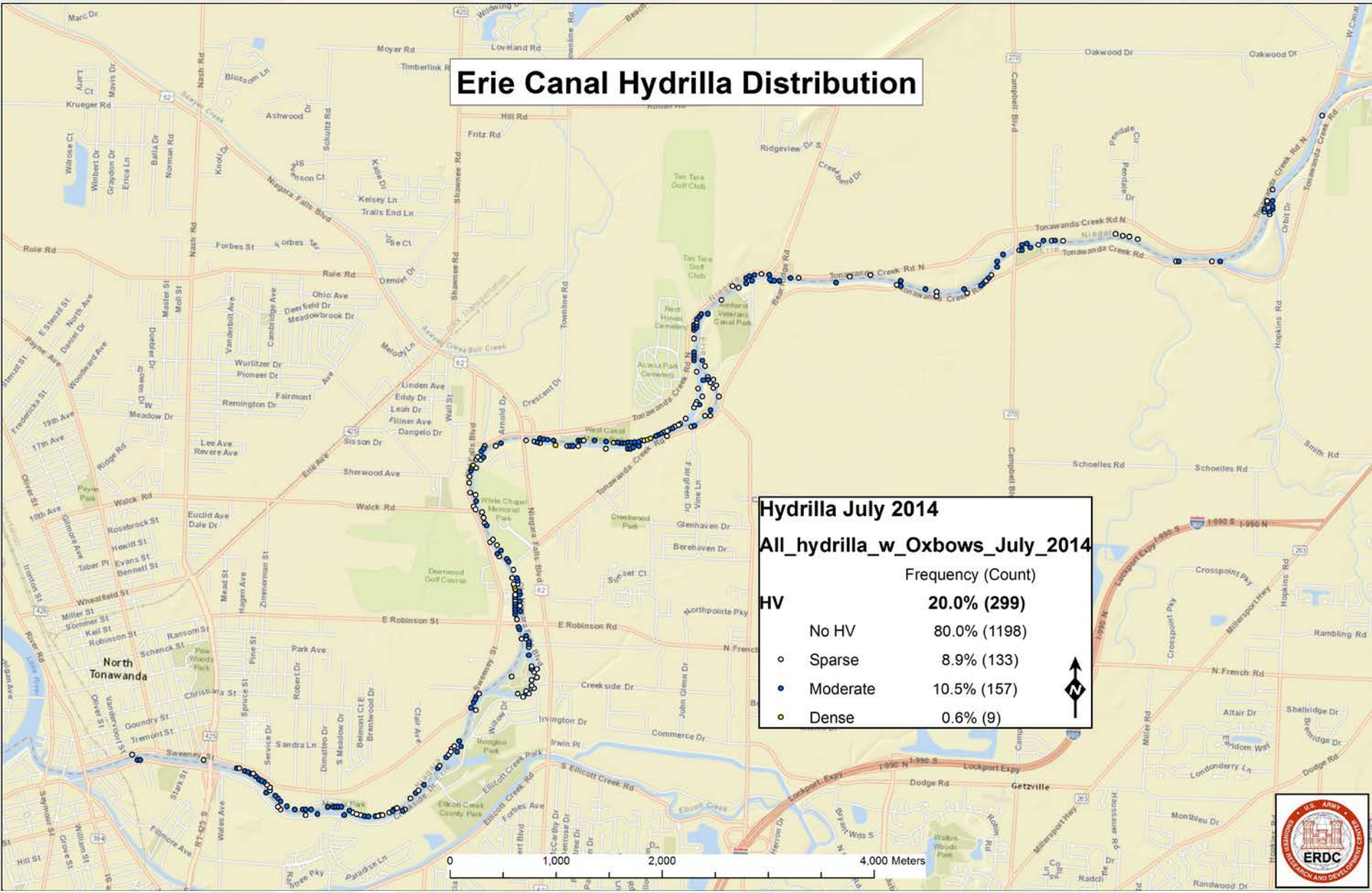


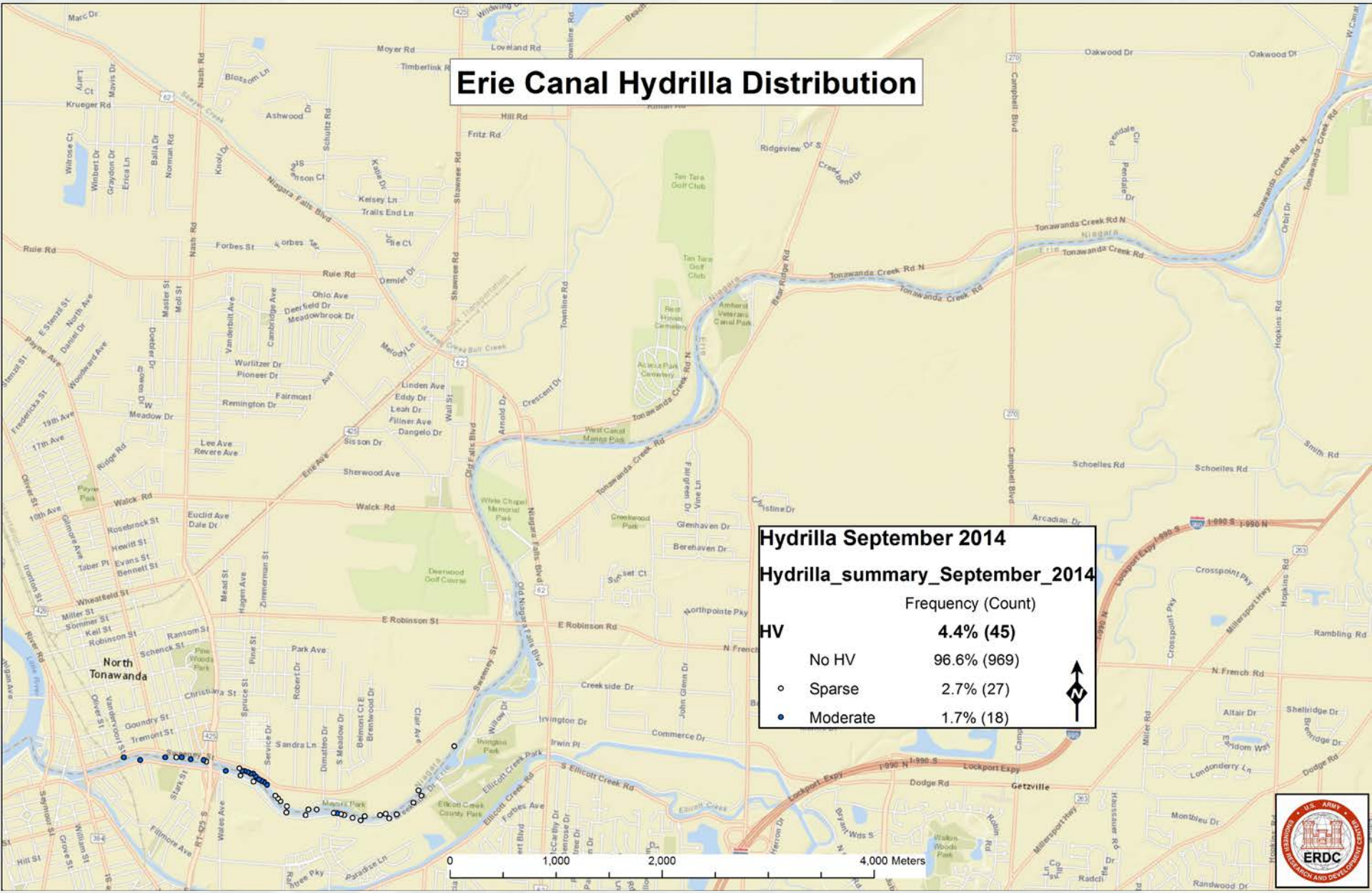


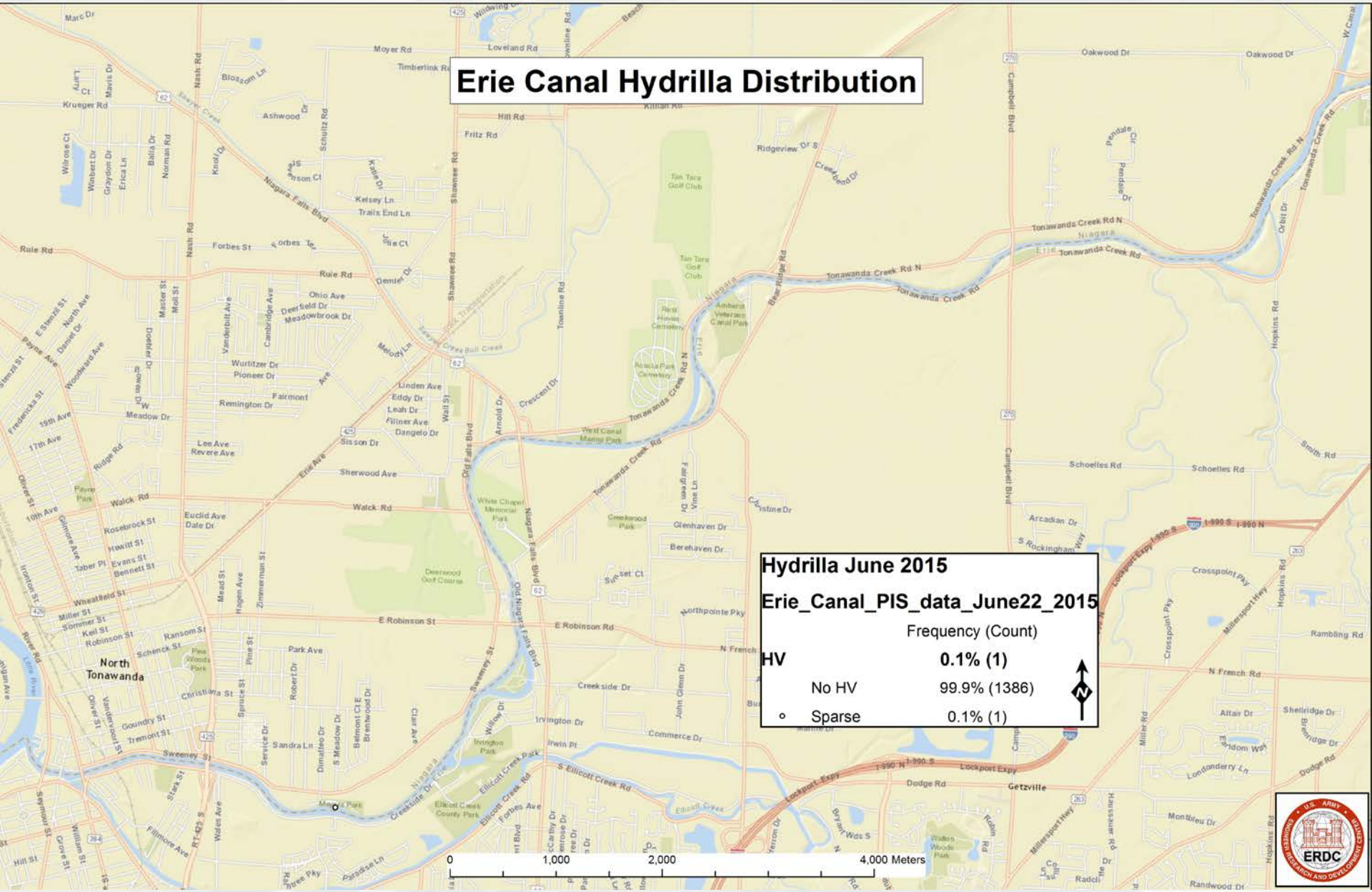
> 12,000 point intercept samples

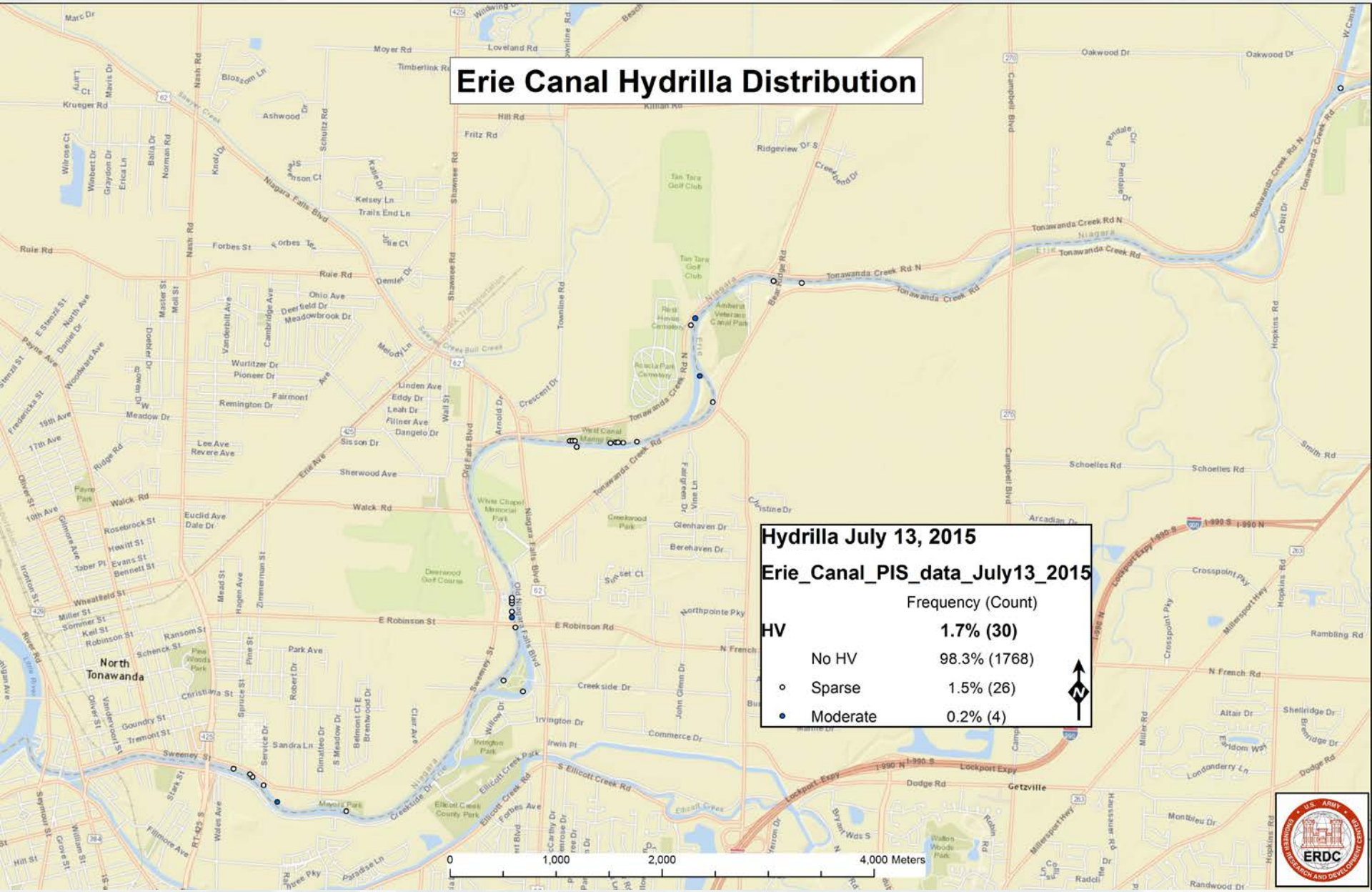
>1500 Core Samples

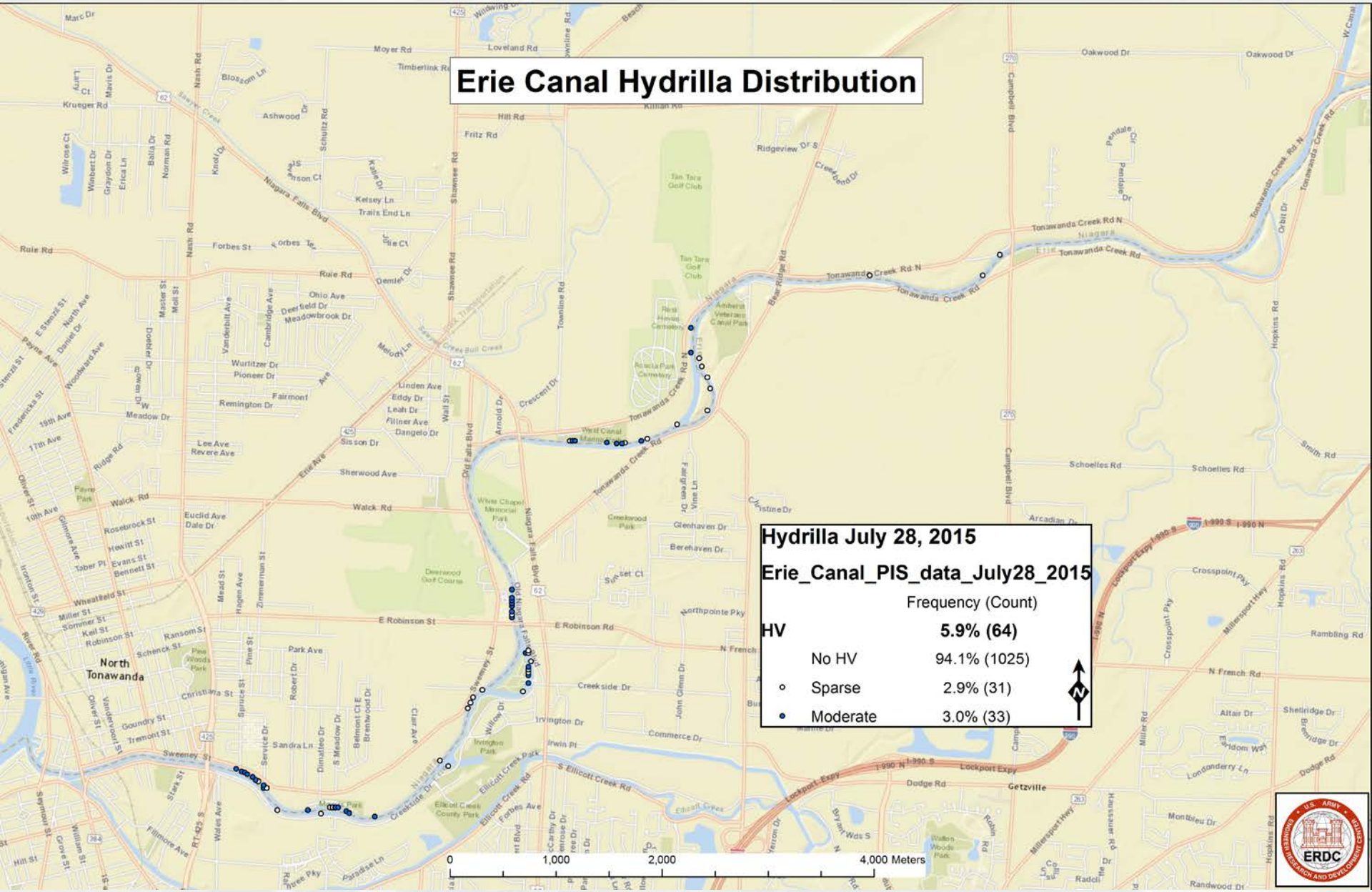

Erie Canal Hydrilla Distribution
Hydrilla June 2014
All_Hydrilla_June2014
Frequency (Count)
HV 6.1% (92)
No HV 93.9% (1423)
Sparse 5.0% (75)
Moderate 1.1% (17)
0 1,000 2,000 4,000 Meters
North Tonawanda
Getzville
ERDC

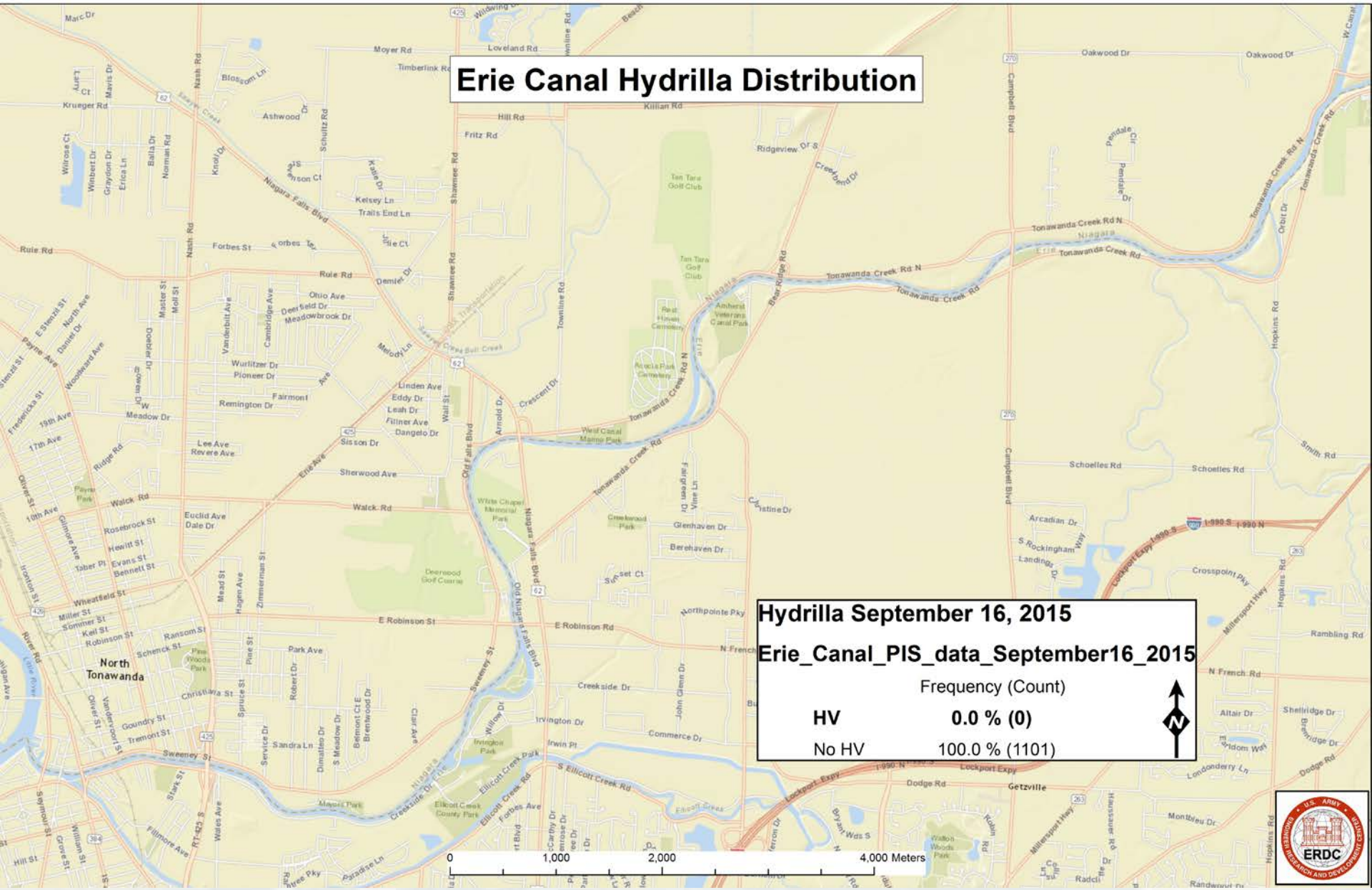

Erie Canal Hydrilla Distribution
Hydrilla July 2014
All_hydrilla_w_Oxbows_July_2014
Frequency (Count)
HV 20.0% (299)
No HV 80.0% (1198)
Sparse 8.9% (133)
Moderate 10.5% (157)
Dense 0.6% (9)
0 1,000 2,000 4,000 Meters
North Tonawanda
Getzville
ERDC


Erie Canal Hydrilla Distribution
Hydrilla September 2014
Hydrilla_summary_September_2014
Frequency (Count)
HV 4.4% (45)
No HV 96.6% (969)
Sparse 2.7% (27)
Moderate 1.7% (18)
0 1,000 2,000 4,000 Meters
North Tonawanda
Getzville
ERDC


Erie Canal Hydrilla Distribution
Hydrilla June 2015
Erie_Canal_PIS_data_June22_2015
Frequency (Count)
HV 0.1% (1)
No HV 99.9% (1386)
Sparse 0.1% (1)
0 1,000 2,000 4,000 Meters
North Tonawanda
Getzville
Niagara Falls Blvd
Tonawanda Creek Rd
Lockport Expy
Erie Canal


Erie Canal Hydrilla Distribution
Hydrilla July 13, 2015
Erie_Canal_PIS_data_July13_2015
Frequency (Count)
HV 1.7% (30)
No HV 98.3% (1768)
Sparse 1.5% (26)
Moderate 0.2% (4)
0 1,000 2,000 4,000 Meters
North Tonawanda
Getzville


Erie Canal Hydrilla Distribution
Hydrilla July 28, 2015
Erie_Canal_PIS_data_July28_2015
Frequency (Count)
HV 5.9% (64)
No HV 94.1% (1025)
Sparse 2.9% (31)
Moderate 3.0% (33)
0 1,000 2,000 4,000 Meters
North Tonawanda
Tonawanda Creek Rd
Niagara Falls Blvd
Lockport Expy
ERDC


Erie Canal Hydrilla Distribution
Hydrilla September 16, 2015
Erie_Canal_PIS_data_September16_2015
Frequency (Count)
HV 0.0 % (0)
No HV 100.0 % (1101)
N
0 1,000 2,000 4,000 Meters
North Tonawanda
Niagara Falls Blvd
Tonawanda Creek Rd
Erie Canal
Lockport Expy

Tuber Dynamics

- Tuber densities reduced by >98%
  - Service Ramp area – Reduction = 93%
- Tuber sprouting remained synchronous
  - Sprouting occurred in late May
  - No growth observed until late June
- **Tuber bank reduction was a key objective of the project**
  - **Essentially no viable hydrilla fragments in 2015**

Rapid Response to a single Hydrilla bed found near inlet of Niagara River
08/27/2015

Native Plant Frequency of Occurrence

	Jul 2014	Sep 2014	Jul 2015	Sep 2015	
Native submersed macrophytes (% Frequency of Occurrence)					
coontail (Ceratophyllum demersum)	35	4	5	7	
wild celery (Vallisneria americana)	63	8	7	7	
water star-grass (Zosterella dubia)	14	4	1	2	
fragrant water-lily (Nymphaea odorata)	11	4	6	8	
elodea (Elodea canadensis)	0.1	0.2	4	8	
Potamogeton species (Potamogeton)	0	0	0.4	2	
Number of sample points	1389	1793[1]	1439	1245	

Species Richness Increased from 2014 to 2015

Lessons Learned and Plans for 2016

- We did not observe extended sprouting of tubers and there was no recovery from initial treatment
  - ► Contact strategy is viable for this site
- Endothall timing = optimal for hydrilla control, but resulted in significant native plant reduction
- 2016 - focus on individual bed management

  Major Shift that will require stakeholder support

2016 Strategy

- Continue to target large discrete beds w/ herbicides
- Develop improved method for targeting small isolated beds
  - Fiber mats, shade cloth, portable herbicide enclosures
  - This will benefit all Mhydrilla eradication projects
  - Requires **MORE** survey and monitoring efforts
- Concern we are playing a game of “whack a mole”
  - Sometimes “you gotta whack moles”