

Central Basin Walleye Spawning, *they spawn here too!*

Samantha Truckly⁴, Peter Jenkins¹

Taylor Hunkins³, Daniel Blake⁶, Ann Marie Gorman¹, Graham Montague⁵,
Matthew Faust², Carey Knight¹, Andrew Gable¹, Amanda Popovich¹

ODNR DOW

¹Fairport Fisheries Research Station

²Sandusky Fisheries Research Station

³Inland Fisheries Research Station

⁴OSU

Aquatic Ecology Laboratory

⁵University of Vermont

⁶ODNR Division of Geological Survey
Collins Laboratory



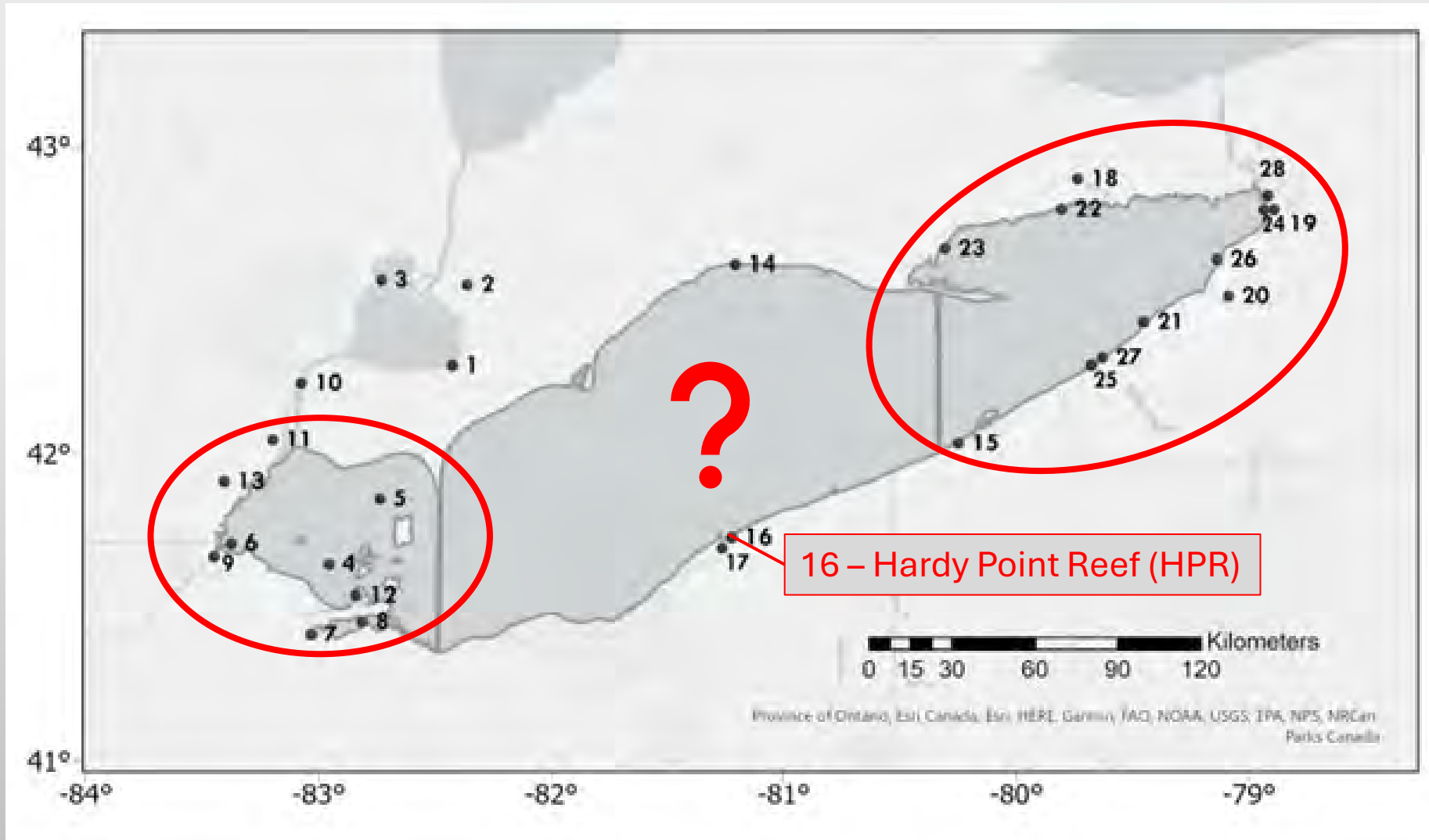
THE OHIO STATE UNIVERSITY



EVOLUTION, ECOLOGY AND ORGANISMAL BIOLOGY
AQUATIC ECOLOGY LABORATORY



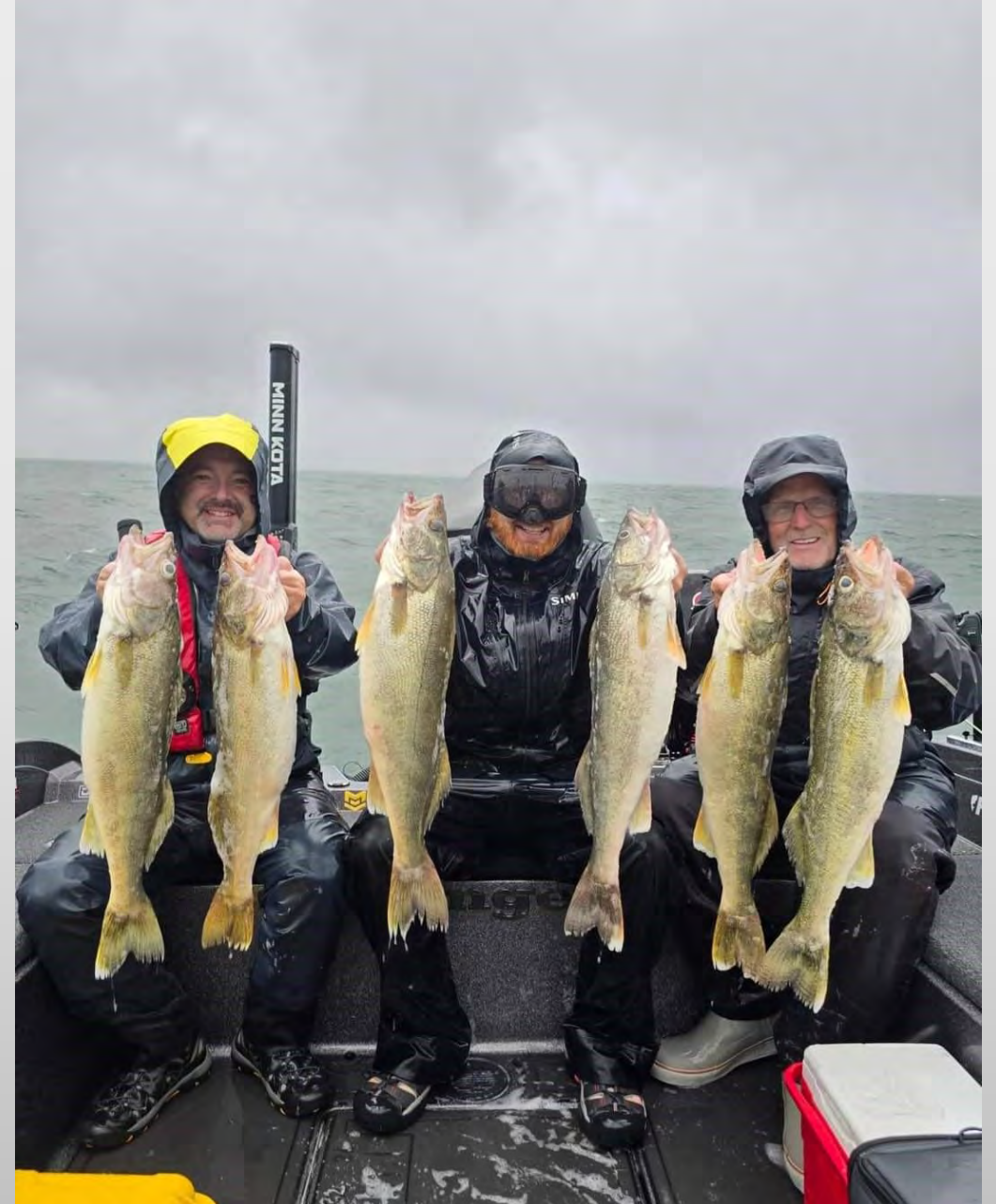
The importance of understanding central basin (CB) Walleye spawning



- ↑ of YOY Walleye in bottom trawl sampling
- Knight et al. (2011) discovers Hardy Point Reef (HPR)
- Strong portfolio effects = stable population
- We do not want to “put all of our eggs in one basket.” (Dufour et al.)

Why does it matter?

- Lake Erie Walleye are important
- Increase angler opportunities
 - Expands season
 - Alternative target species



Outline

- Overview of Hardy Point Reef
 - Description
 - Past research
- This research and Hardy Point
 - Objectives
 - Methods
 - Outcomes
- Additional Reefs
 - Methods
 - Outcomes
- What we've learned and where we're going

Hardy Point Reef



- ~ 3 miles East from mouth of the Grand River
- Ranges < 1 – 12 ft deep
- ~ 80 meters from shore
- 1.5 hectares
 - (~ 3 OSU Football Fields)

Assessing Hardy Point Reef



— Gill Net

✓ 281 adult Walleye

■ Egg Mats, with WAL

□ Egg Mats, no WAL



✓ 5 Walleye eggs

● Light Traps, with WAL

○ Light Traps, no WAL



✓ 3 larval Walleye

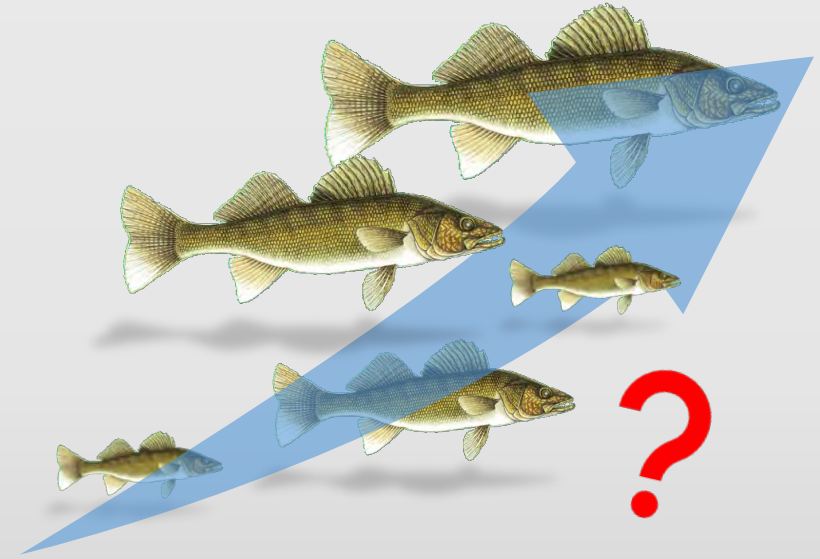
Assessing Hardy Point Reef



1. Characterize habitat at HPR to locate additional reefs



2. Assess acoustic telemetry of inter annual movements of HPR adult Walleye



3. Estimate amount of production the central basin contributes to annual Walleye stocks

Outline

- Overview of Hardy Point Reef
 - Description
 - Past research
- This research and Hardy Point
 - Objectives
 - Methods
 - Outcomes
- Additional Reefs
 - Methods
 - Outcomes
- What we've learned and where we're going

Objectives

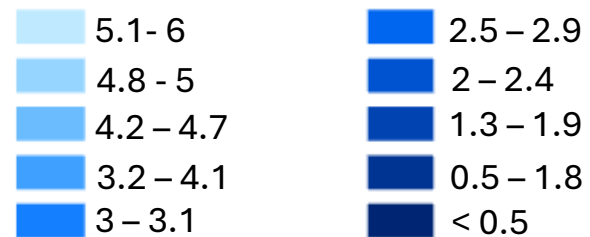
1. Create maps depicting substrate and bathymetry
2. Quantify and compare this habitat to other Great Lakes reefs
3. Use the maps and protocols from HPR to locate additional CB reefs

Surveying HPR

Hardy Point Reef

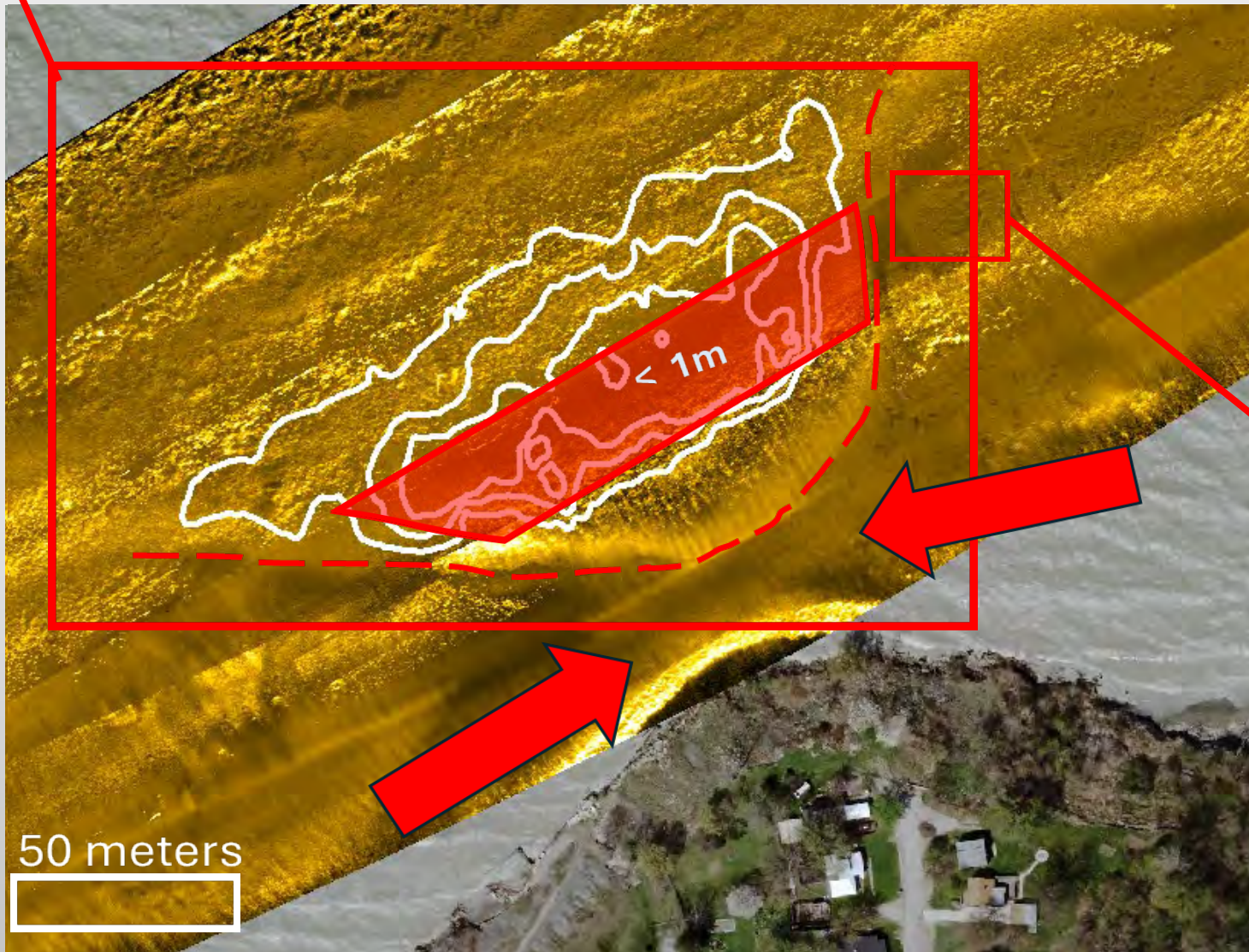


Depth (m)

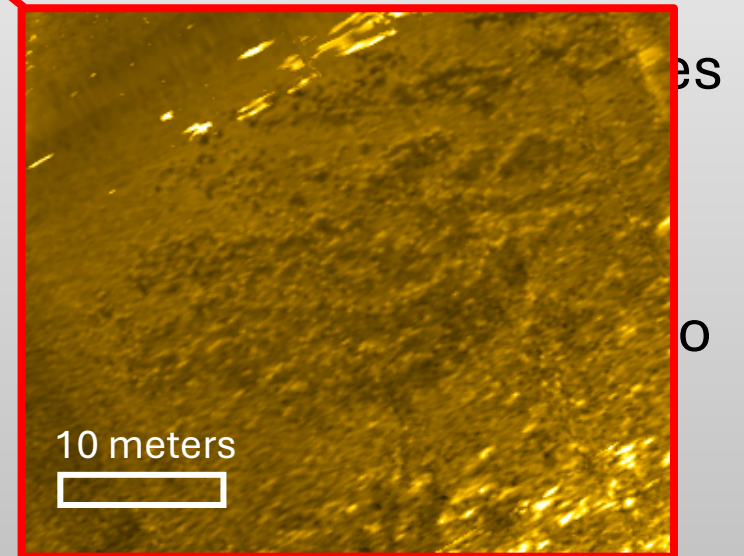


Hardy Point Reef

Surveying HPR



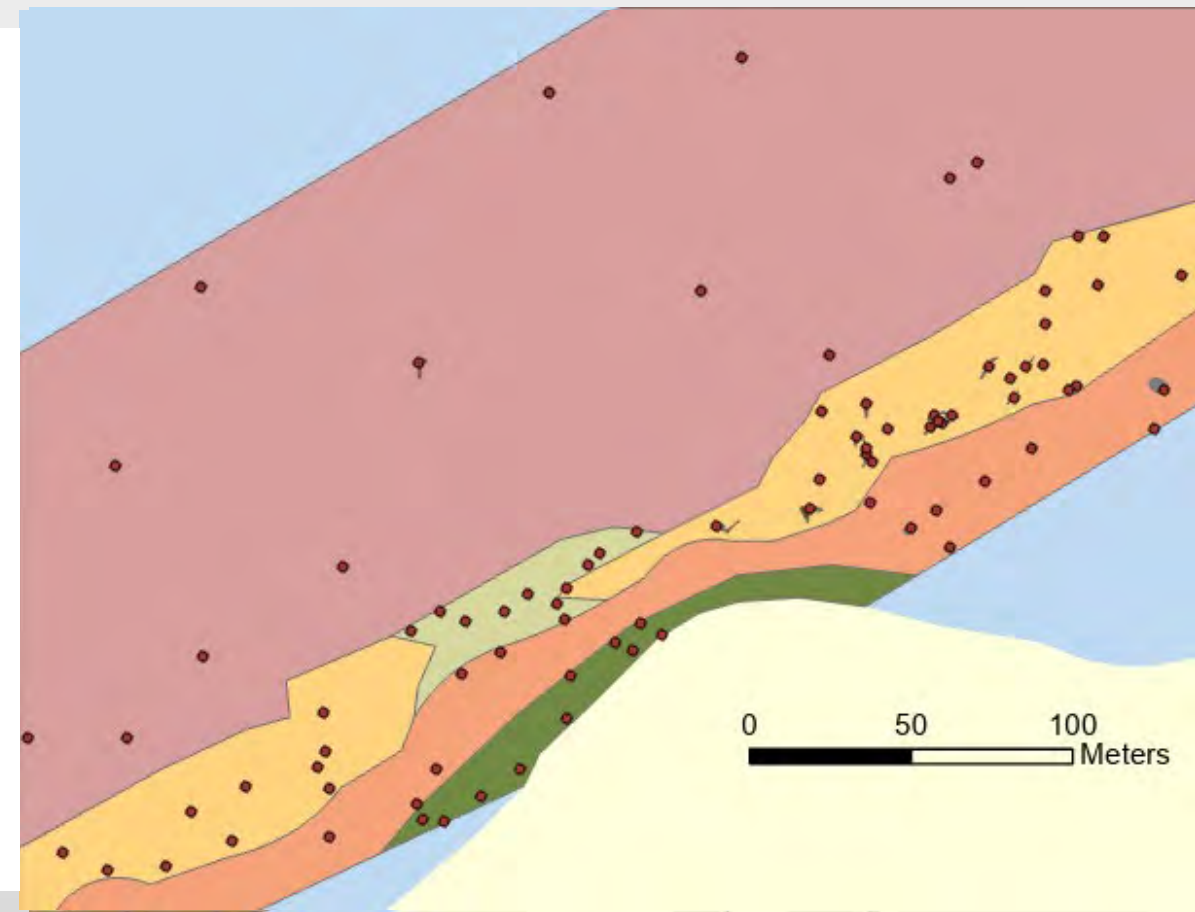
- **Roadblock:** could not get clear imagery of the top of HPR due to shallow water
- Can clearly see bubbly/rocky substrate and outline of HPR



Ground Truthing HPR



Classifications

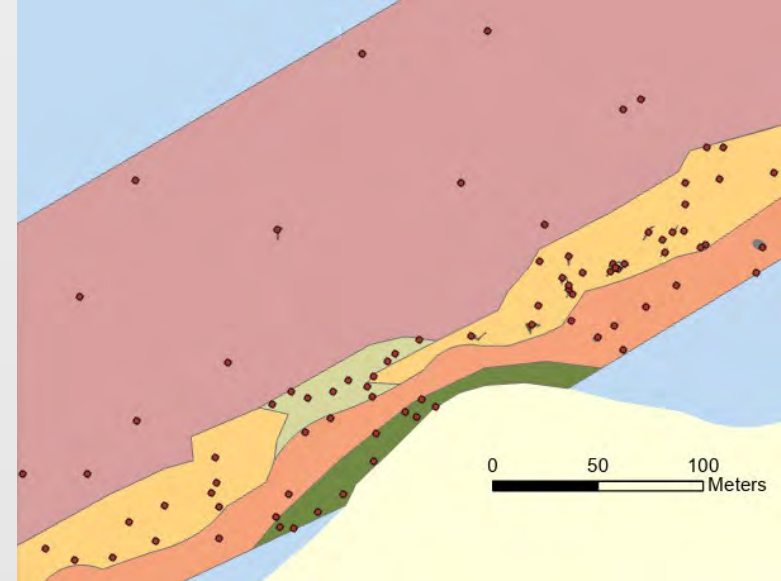
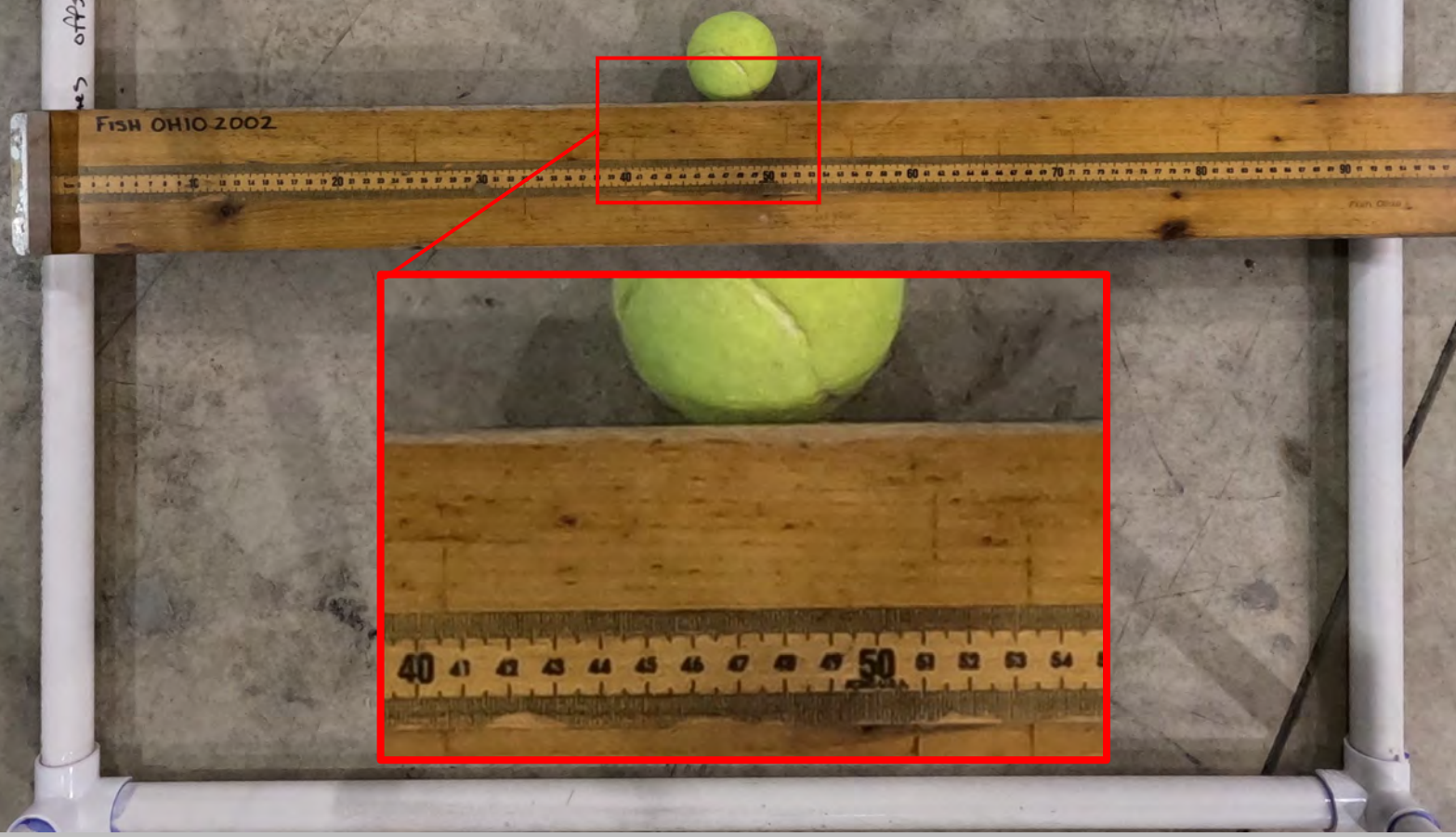


Cobble substrate
and interstitial
spaces!!



Size references:

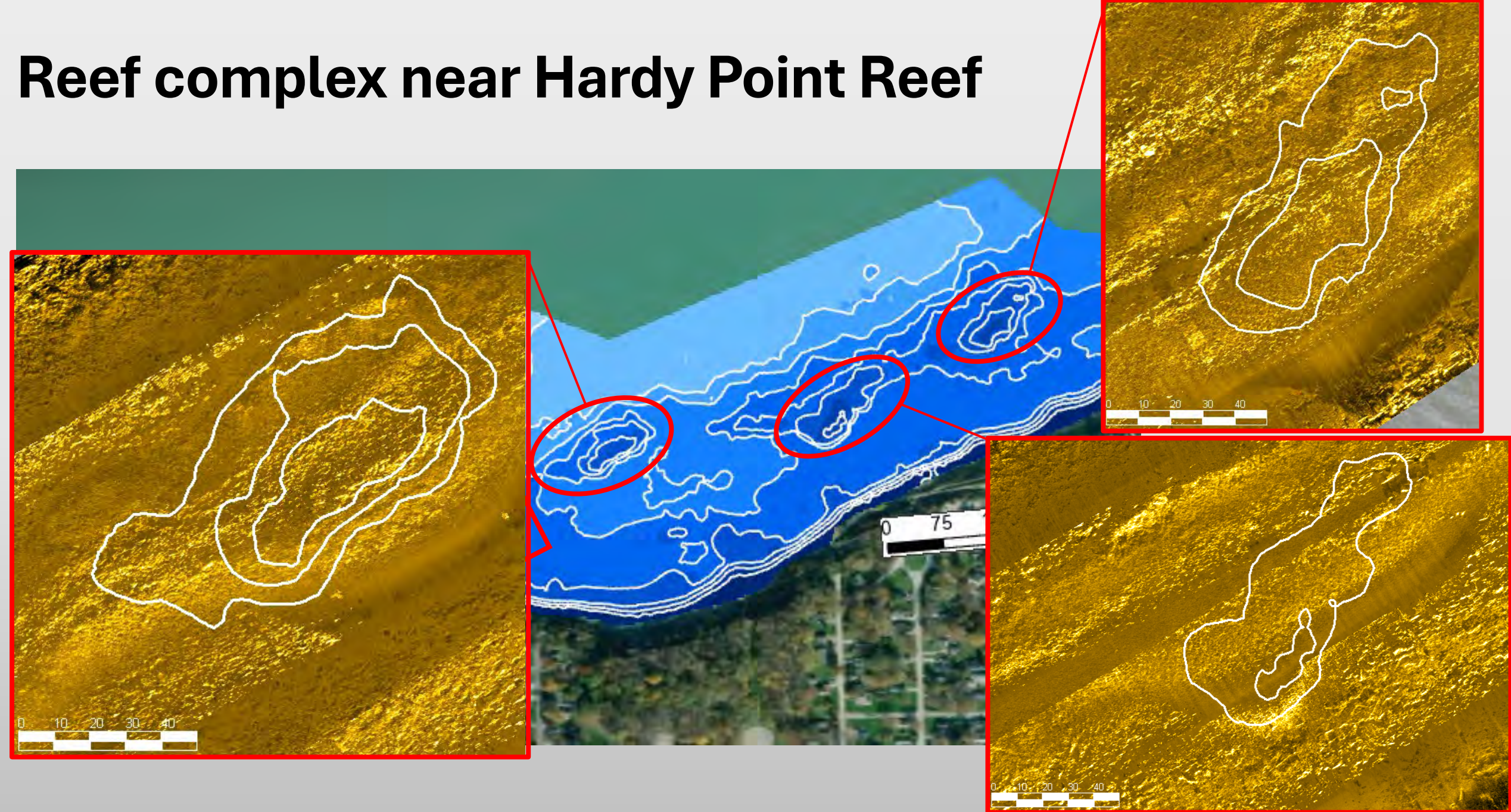
- Marble = gravel
- Tennis ball = cobble
- Basketball = boulder



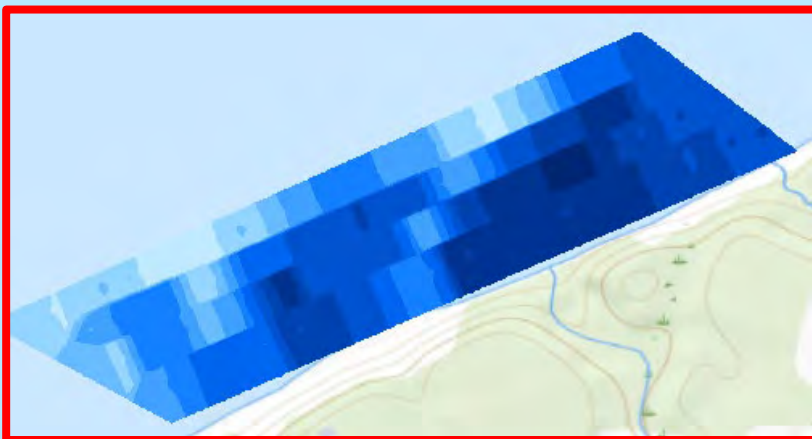
Outline

- Overview of Hardy Point Reef
 - Description
 - Past research
- This research and Hardy Point
 - Objectives
 - Methods
 - Outcomes
- Additional Reefs
 - Methods
 - Outcomes
- What we've learned and where we're going

Reef complex near Hardy Point Reef



0 ½ 1 2 3 Miles



Bluffs

Madison

Geneva-on-the-Lake

North Madison

Geneva

N Ridge Rd

Unionville

Madison

Perry

856 ft

Grand River

HPR

535

20

90

44

Painesville

Additional Reefs (??)

Outline

- Overview of Hardy Point Reef
 - Description
 - Past research
- This research and Hardy Point
 - Objectives
 - Methods
 - Outcomes
- Additional Reefs
 - Methods
 - Outcomes
- What we've learned and where we're going

What we have learned & where we are going

What we learned

- Depth data needs to be collected at a finer scale



- We need better GoPro imagery



- We found more suitable reefs!



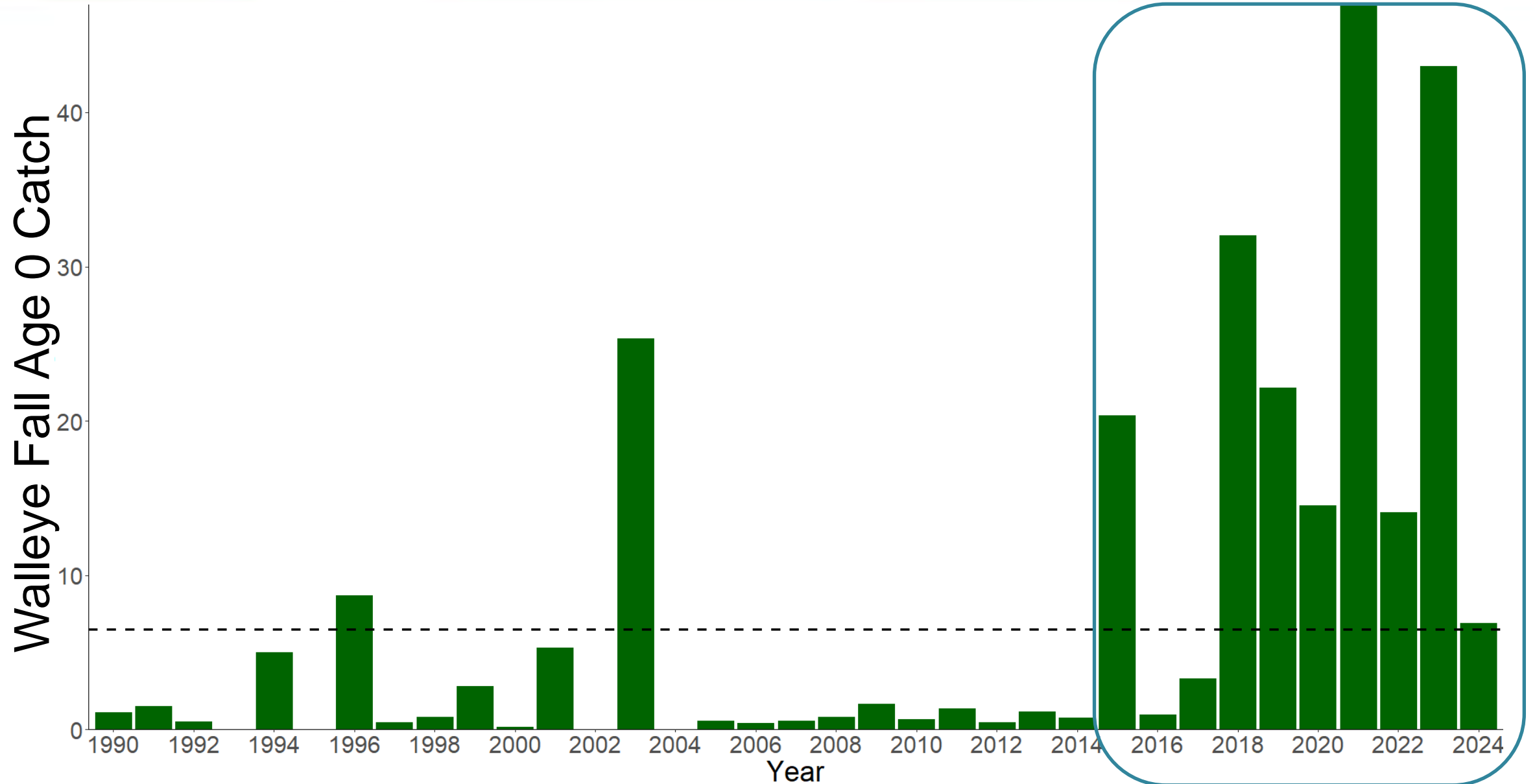
Where we are going

- We will have to revisit these sites to collect more depth data
 - Possibility of using LIDAR data
- Sampling quadrat with ruler for scale
- Repeat Knight et al. assessment of spawning Walleye
 - look for spawning Walleye
 - confirm spawning by egg mats
 - check for survival using light traps
- Assess spawning site fidelity using acoustic telemetry

Why the Central Basin

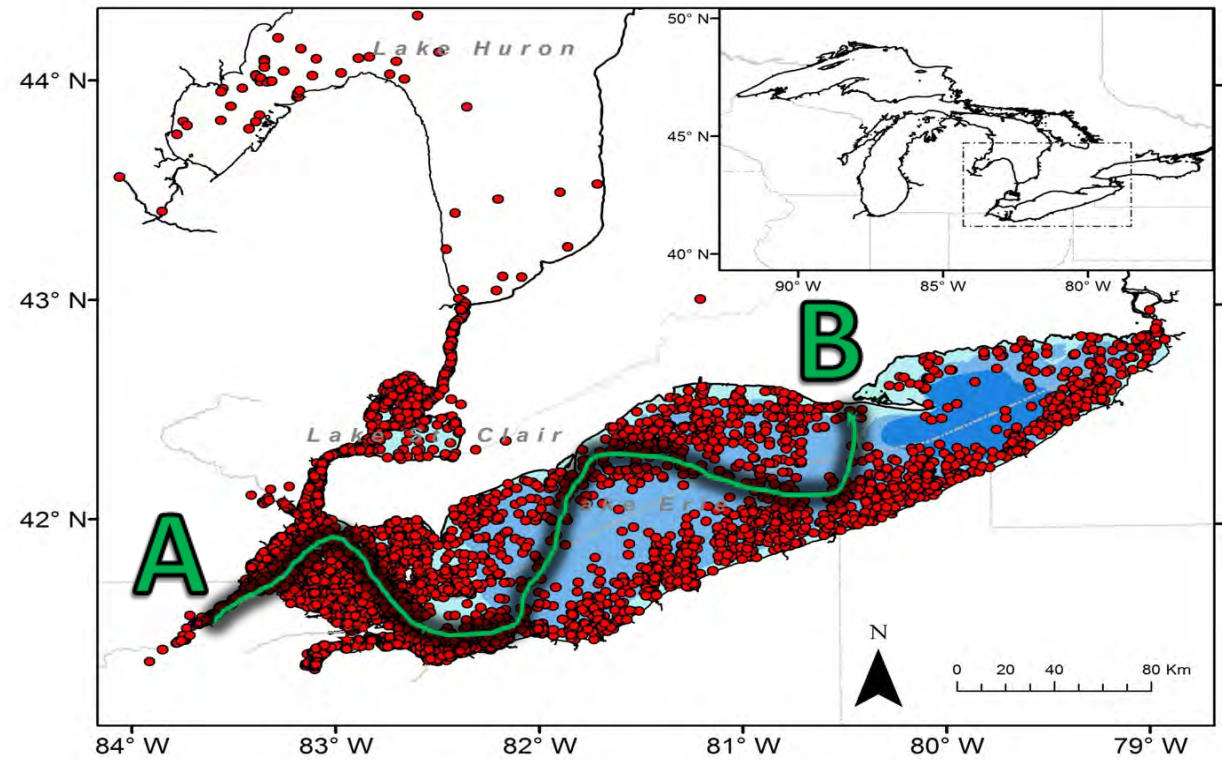
- **Evidence of spawning locations**
 - Grand river
 - Nearshore reefs
 - Genetic difference Stepien et al. 2018
- **Limited Data**
 - Jaw tag
 - Small pilot 2019
 - Interesting movements on short time scale
- **Increasing central basin walleye recruitment?**

Central Basin Trawl Survey Results



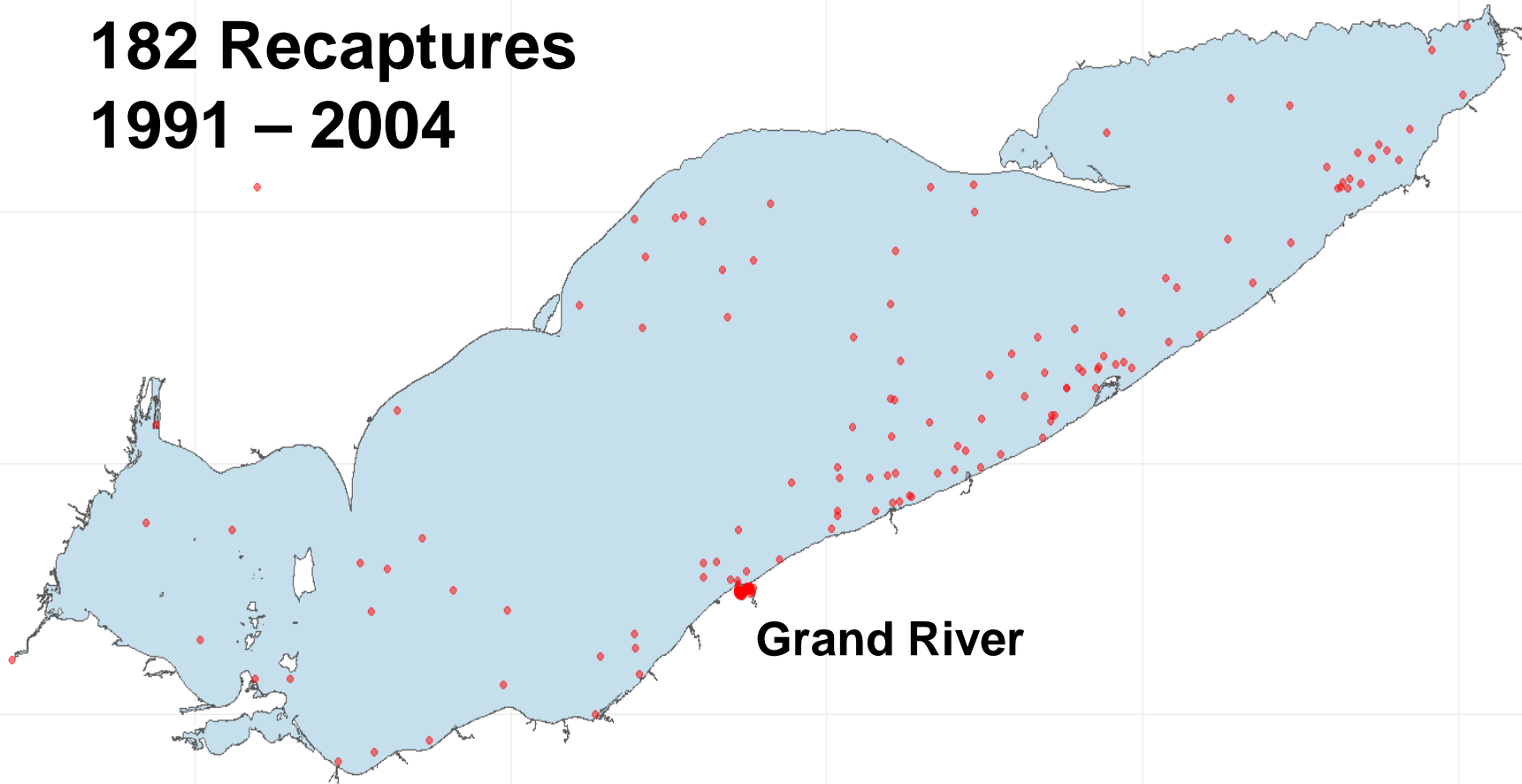
Jaw Tag

- 1990 – 2001
- 2355 Grand River



Jaw Tag Recaptures

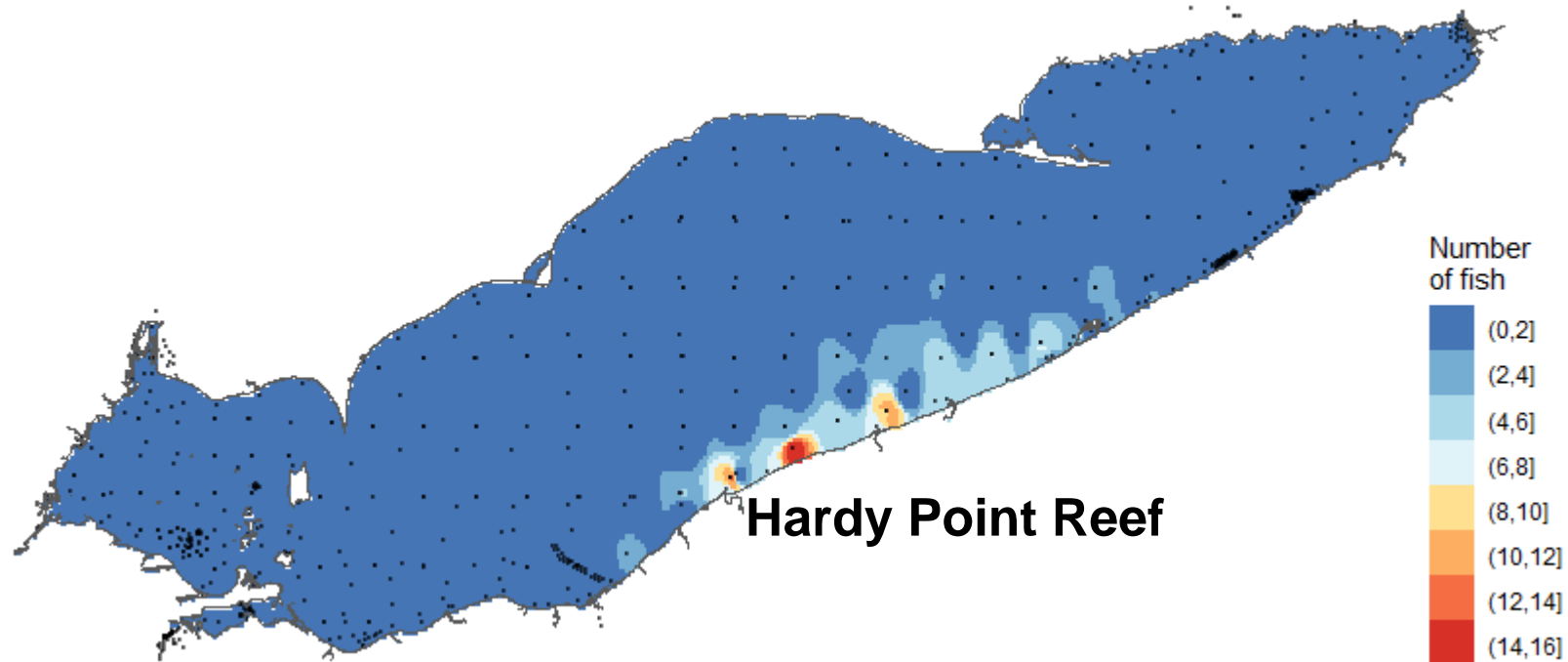
**182 Recaptures
1991 – 2004**



Grand River

2019 HPR Data

- Hardy point reef
- 19 previously used transmitters
- 7 months of detections May - December



2023 Pilot Project

- **Grand River and Hardy Point Reef**
 - Opportunistically utilizing recycled transmitters
 - Electrofishing during spawning events
 - Surgically implanted
 - V16
 - Orange external loop tag
- **3 seasonal receivers**
 - HPR
 - March to September 2024
- **Other receivers covering Grand River**



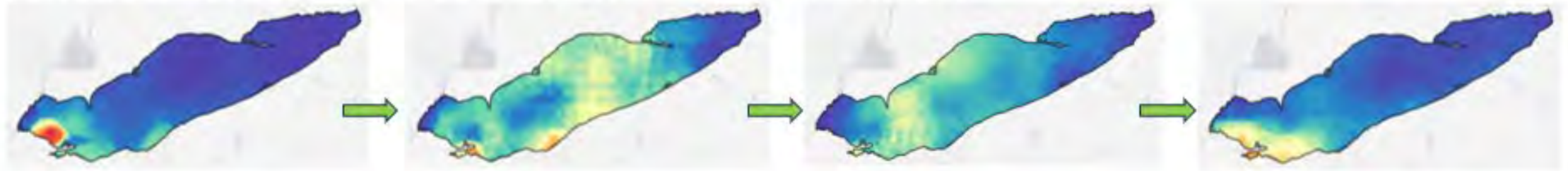
2023 Pilot Project

- **Tagging season 3/15/23 – 4/23/23**
- **28 grand river**
- **25 nearshore reef**
- **15 females, 37 males, 2 unidentified**

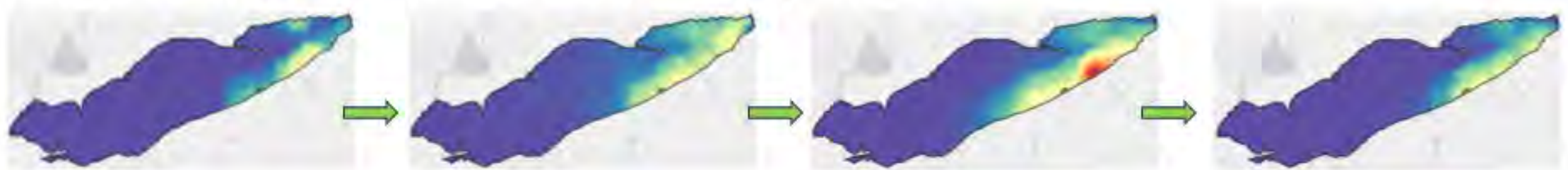
- **High angler exploitation ?**
 - 5 harvests
 - 4 angler reported harvests by July 2023

GLATOS Seasonal Heat Maps

Walleye Characterized as Western Basin Spawners



Walleye Characterized as Eastern Basin Spawners



Spring

Summer

Fall

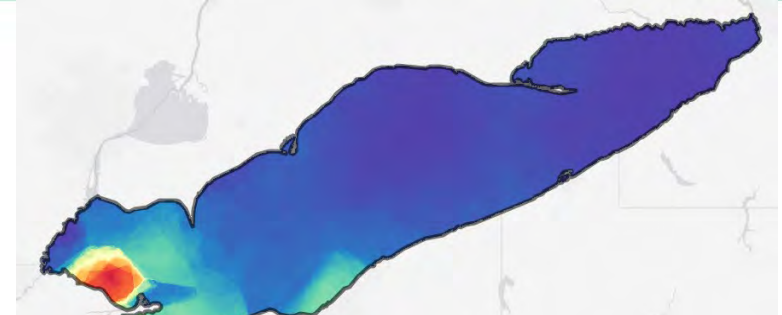
Winter

Prepared by T. Hartman 4/1/2024

Spring Heat Map

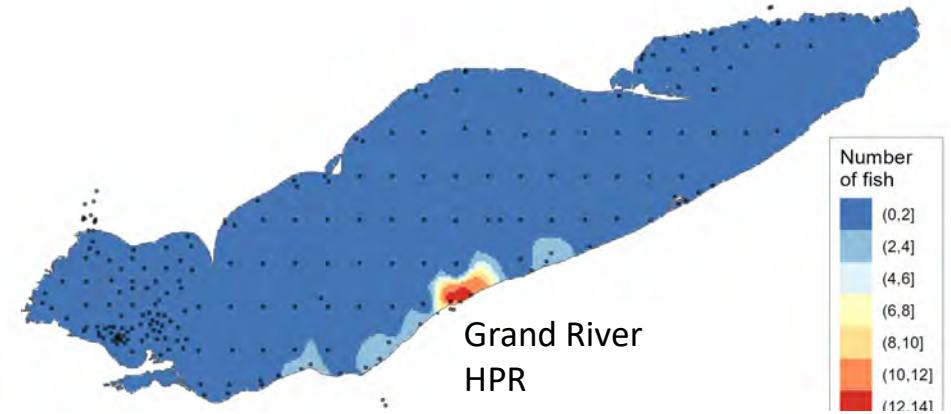
- **Seasonal Data**

Western Basin
Spawners



- **March and April 2024**

Central Basin
Spawners



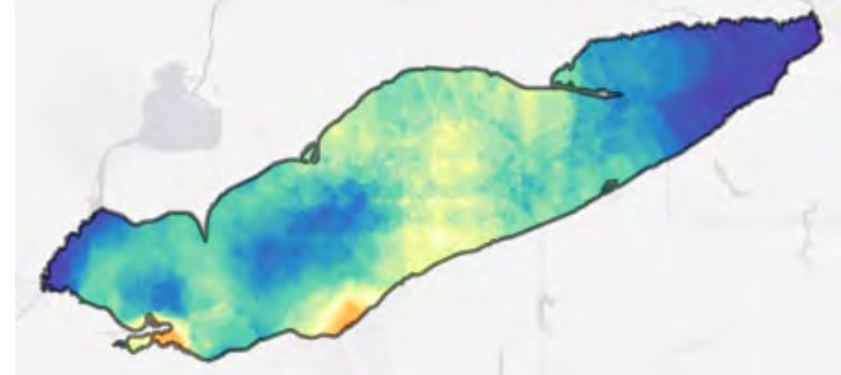
Eastern Basin
Spawners



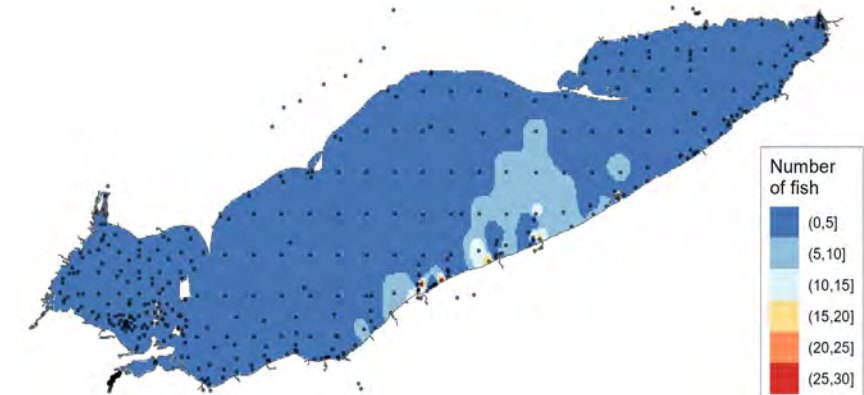
Summer Season Heat Map

- **2023 and 2024**

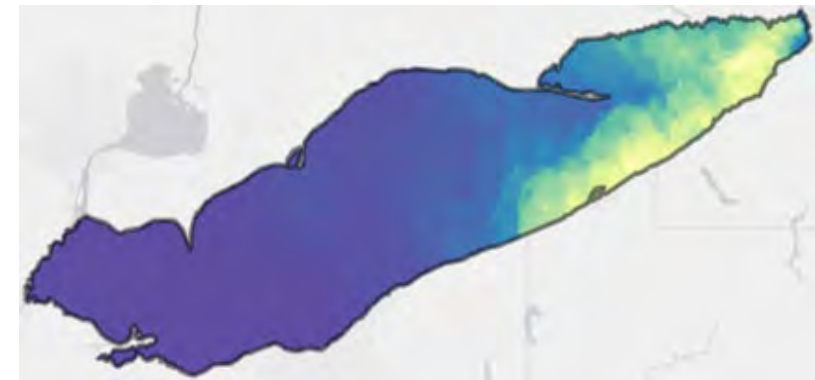
Western Basin
Spawners



Central Basin
Spawners



Eastern Basin
Spawners



Preliminary Return Rates

- **Active transmitters - Summer 2024**
 - 21 Total
- **7 Grand River transmitters**
 - 7 of 7 returned spring 2024
- **14 Hardy Point Reef transmitters**
 - 10 of 14 returned spring 2024

Future Research

- Obtain funding for additional walleye tags
 - Some depth sensor tags
- More nearshore receiver coverage
- Identify stock contribution



Management Importance

- **Unique movements could provide anglers with increased opportunities**
- **Decrease in Central basin yellow perch fishing effort**
 - Could mean increase in angling pressure on walleye
- **Understanding the central basin contribution is important for portfolio effect**

Acknowledgements

- OSU AEL
- Fairport ODNR Research Station
 - Seasonal staff
- Inland ODNR Research Station
 - Taylor Hunkins
- Ohio Geological Survey
 - Daniel Blake



THE OHIO STATE UNIVERSITY



EVOLUTION, ECOLOGY AND ORGANISMAL BIOLOGY
AQUATIC ECOLOGY LABORATORY

Contacts

- **Sam Truckly – ODNR-OSU Research Technician**
truckly.5@osu.edu
- **Peter Jenkins – ODNR Fairport Fisheries Biologist**
peter.jenkins@dnr.ohio.gov