Reproduction of Grass Carp in Lake Erie Tributaries
Fall 2018 Update

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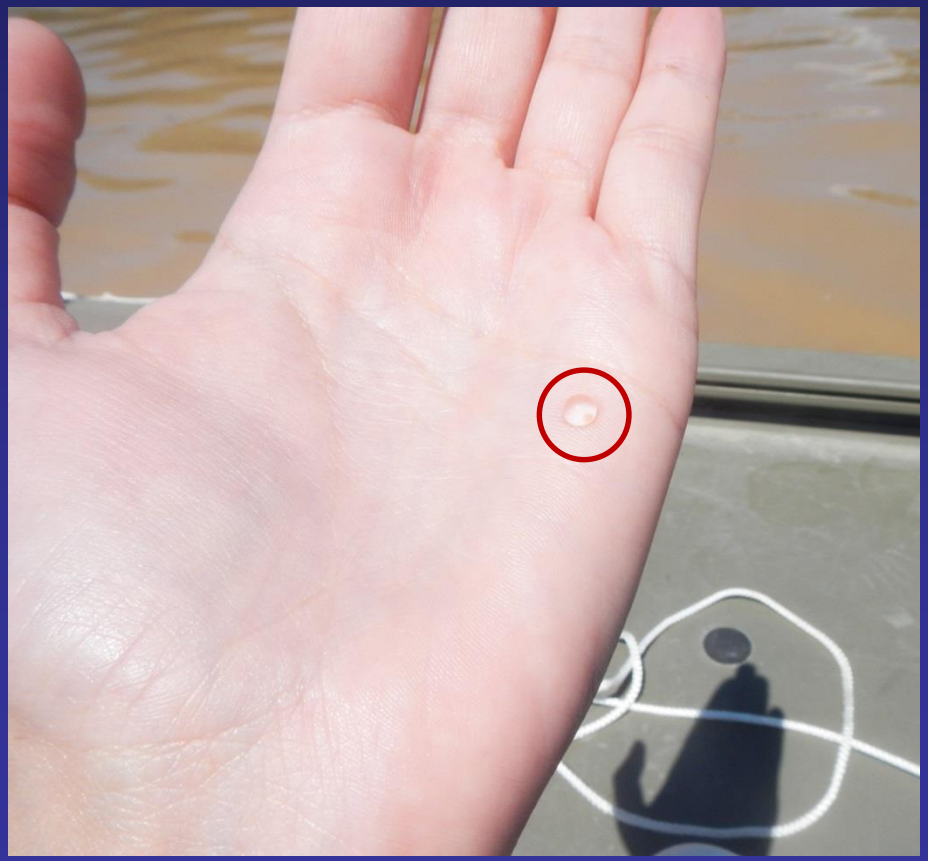
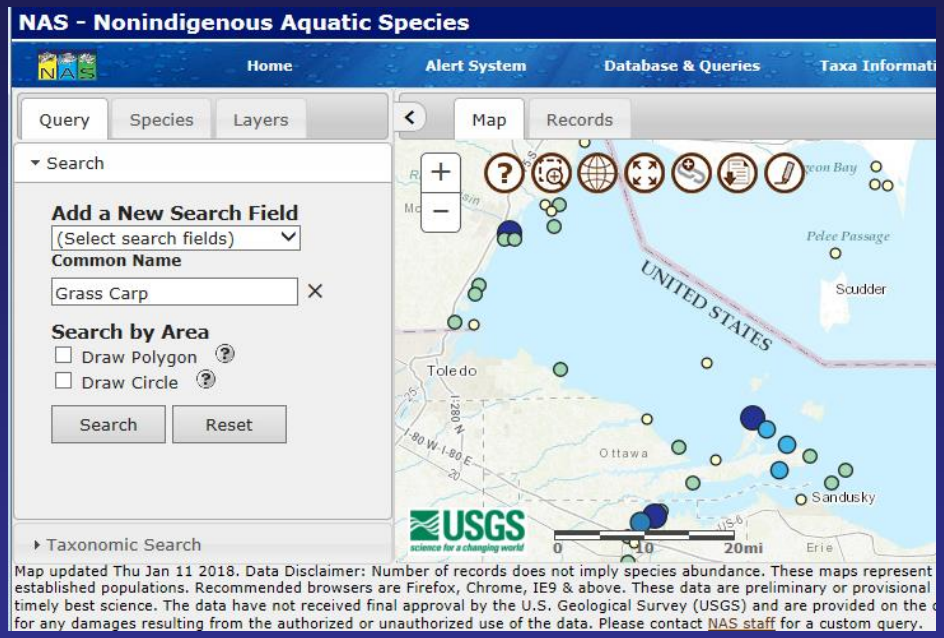


History of Grass Carp in Lake Erie

- First Grass Carp captured in Lake Erie in 1985



1986:
OSUM 69227, 845 mm SL
OSUM 65221, 880 mm SL

- Method for inducing triploidy developed by J.M. Malone and Son in 1983

First GC captured in Lake Erie were diploid

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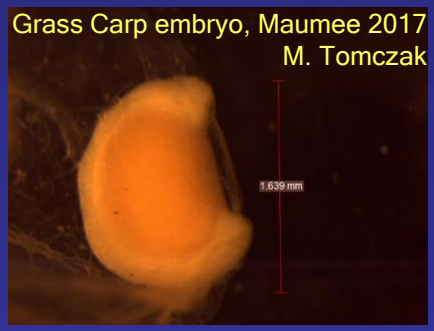
Spawning in Lake Erie tributaries

- 10 captured in the Sandusky River Oct 2012
  - Age 1+, 4 verified diploid
  - Otoliths: Sandusky spawned

- 2015: caught them in the act!
  - Holly Embke MS work – fertilized eggs
  - Otoliths: Sandusky spawned

- 2017: Double-trouble…
  - Spawned twice in Sandusky
  - First fertilized eggs from Maumee



- Have they spawned before?
  - Probably…age estimation of wild-spawned diploid fish underway

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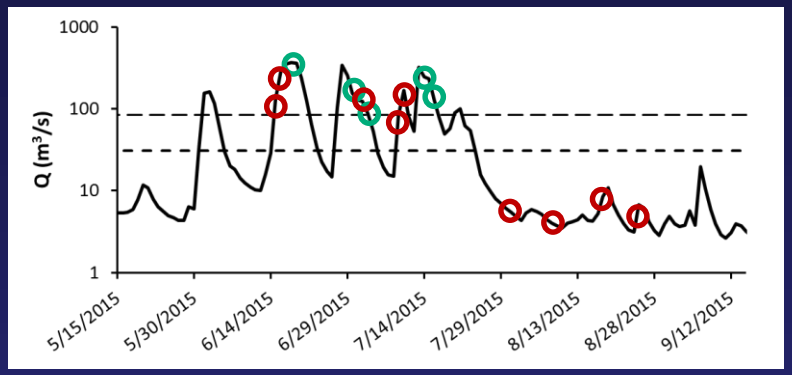
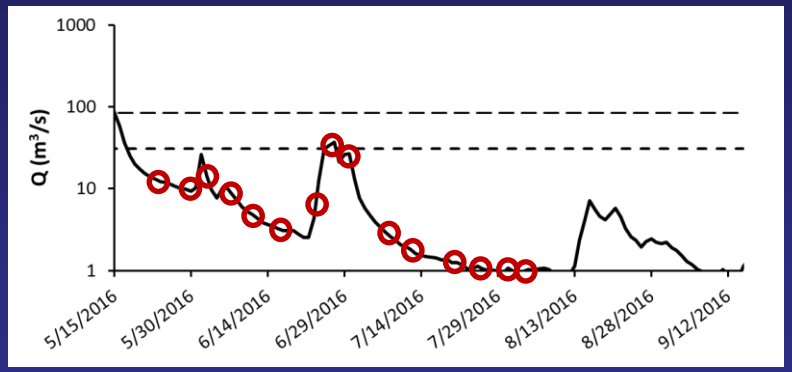
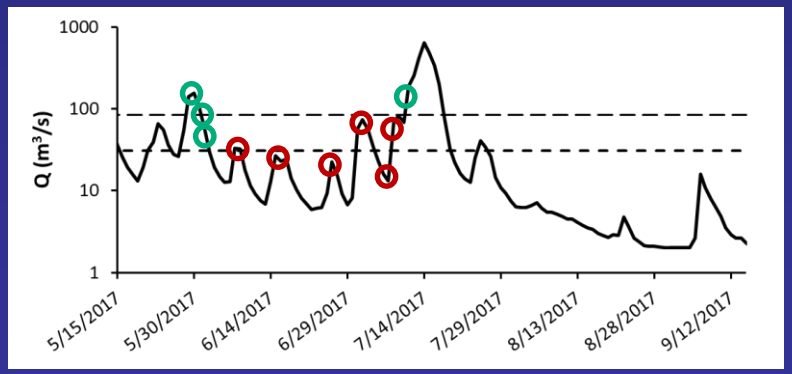
When do they spawn?







- High flow events, mid-May – Mid July
- Peaks or Descending limbs of hydrographs

Sampled, collected eggs
Sampled, did not collect eggs

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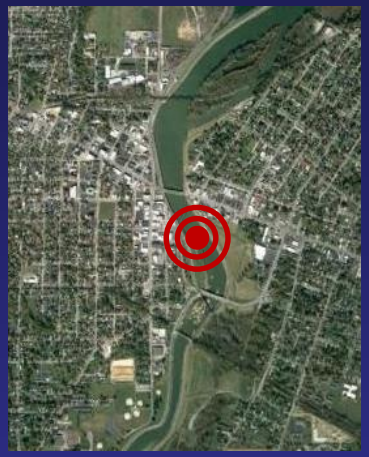
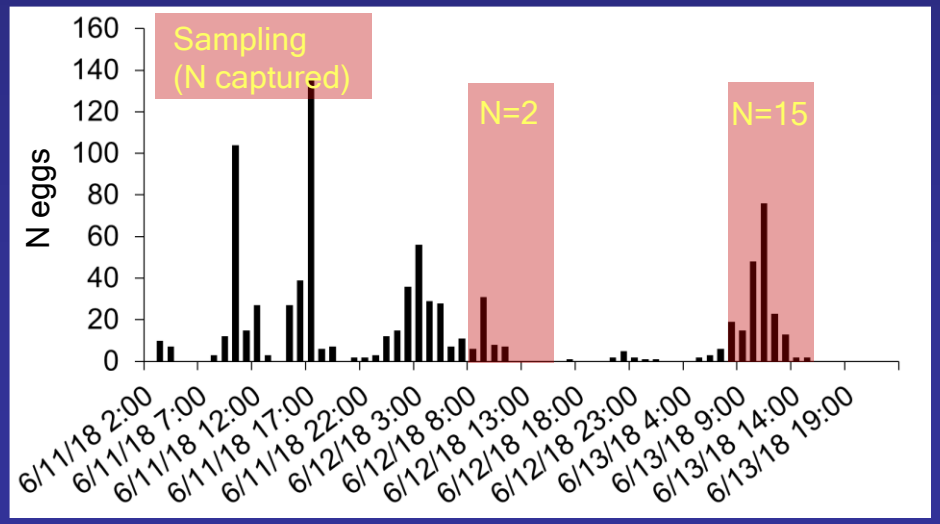
Where do they spawn?

Sandusky: Fremont, OH



- 2018 control event corresponded with spawning event
- Spawning area verified; modeling method validated



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What *else* did we learn from 2018?

Sandusky

- **Two spawning events: May 23-25, June 11-14**
  - **May event 1 week earlier than 2017**
  - **Further expansion of spawning window**
  - **Egg count incomplete, but probably several thousand comparable to 2017**

Maumee

- **Two spawning events: June 11-14, June 23-27**
  - **Egg count incomplete, but probably in the hundreds higher than 2017**

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What are we doing about it?

- **Verification** of spawning area and **validation** of method supports further actions:
  - Modeling spawning areas in the Maumee
    - **requires developing hydraulic model**
  - Coordinated Electrofishing during spawning works

- Sampling other rivers
  - **No eggs in Portage or Huron**
  - Otolith microchemistry/oxygen isotope analysis will inform where else to look

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What are we doing about it?

- Larval sampling
  Only life stage not captured

- Determine if sampling occurs upstream of former site of Ballville dam

- Identify control strategies and where and when to use them

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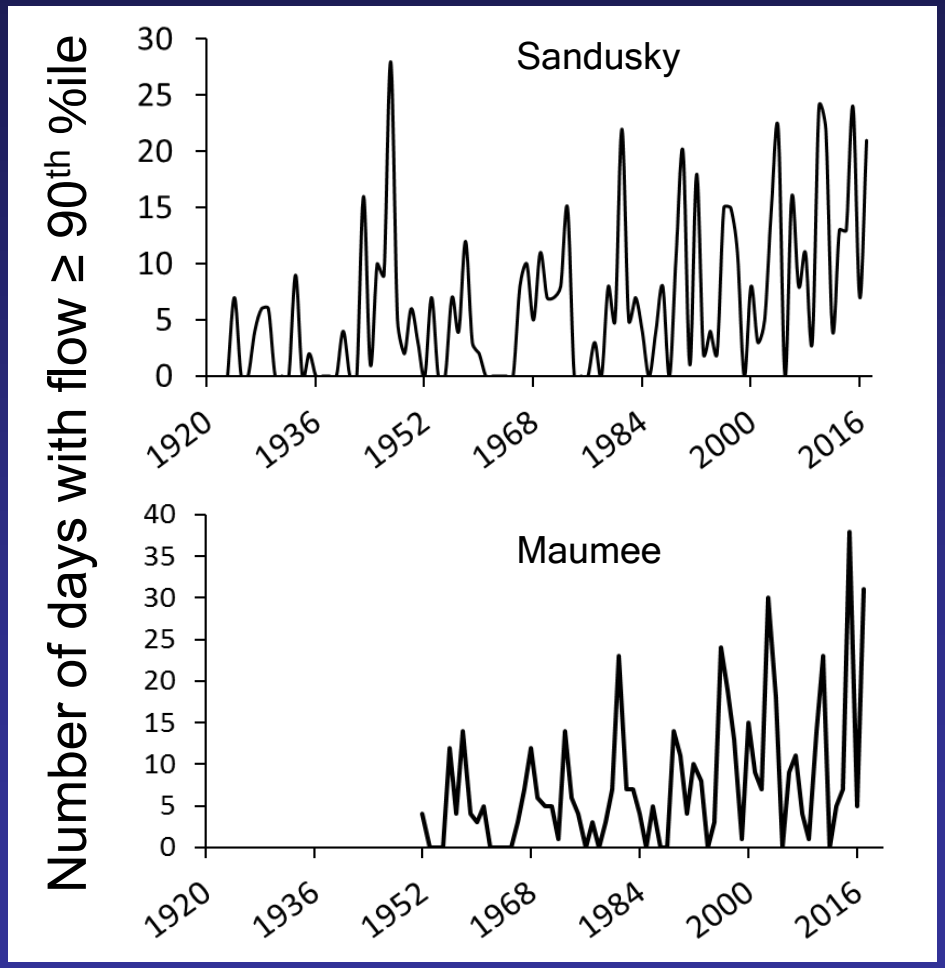
What does the future hold?

Frequency of high-flow events is increasing



Likely culprits

- **Tiling**
- **Increased field size**
  no buffers
- **Separation of storm and sanitary sewers**
- **Climate change?**

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MIDNR: Francis, Harris, Herbst
FWS: Thompson, Briggs
DFO: Colm, Cudmore, Marson

USGS Ecosystems Mission Area, Invasive Species Program
Great Lakes Restoration Initiative

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