Asian Clam Survey

Owasco Lake

July 27, 2016

Thanks to:

- Ed Wagner, diver and driver
- Drew Snell, Owasco Lake Watershed Specialist
- Tim Schneider, Kathryn Velone and Kerry McElroy, Owasco Lake Watershed Inspectors
- Bruce Natale, Michele Wunderlich and Gary Duckett, WQMA
- Boat provided by Dave Wasileski at Owasco Marine
- Partially funded by FLLOWPA

Asian Clams

- From Eastern and Southern Asia
- Filter feeders
- Prefer sandy sediments
- Found in Owasco Lake off of the Emerson Park beaches in September 2010
- Also in Otisco, Seneca, Keuka and Canandaigua Lakes as well as Lake George

Asian Clams

- Can self fertilize.
- Single adult can produce 1,000 to 100,000 juveniles per year.
- Juveniles can disperse using a mucus balloon or attach to objects with a byssal thread.
- Settle to the bottom when 0.25 mm in size.
- First year growth rates after initial spawn through the summer to early fall of about 4mm a month.
- Asian clams can reach 10-30 mm in size during their first year depending on food availability and temperatures.
- In Lake George clams were not identified as reproductive until they reached a minimum size of 12.7mm.
- Timing of reproduction in Lake George is mid June through mid October.

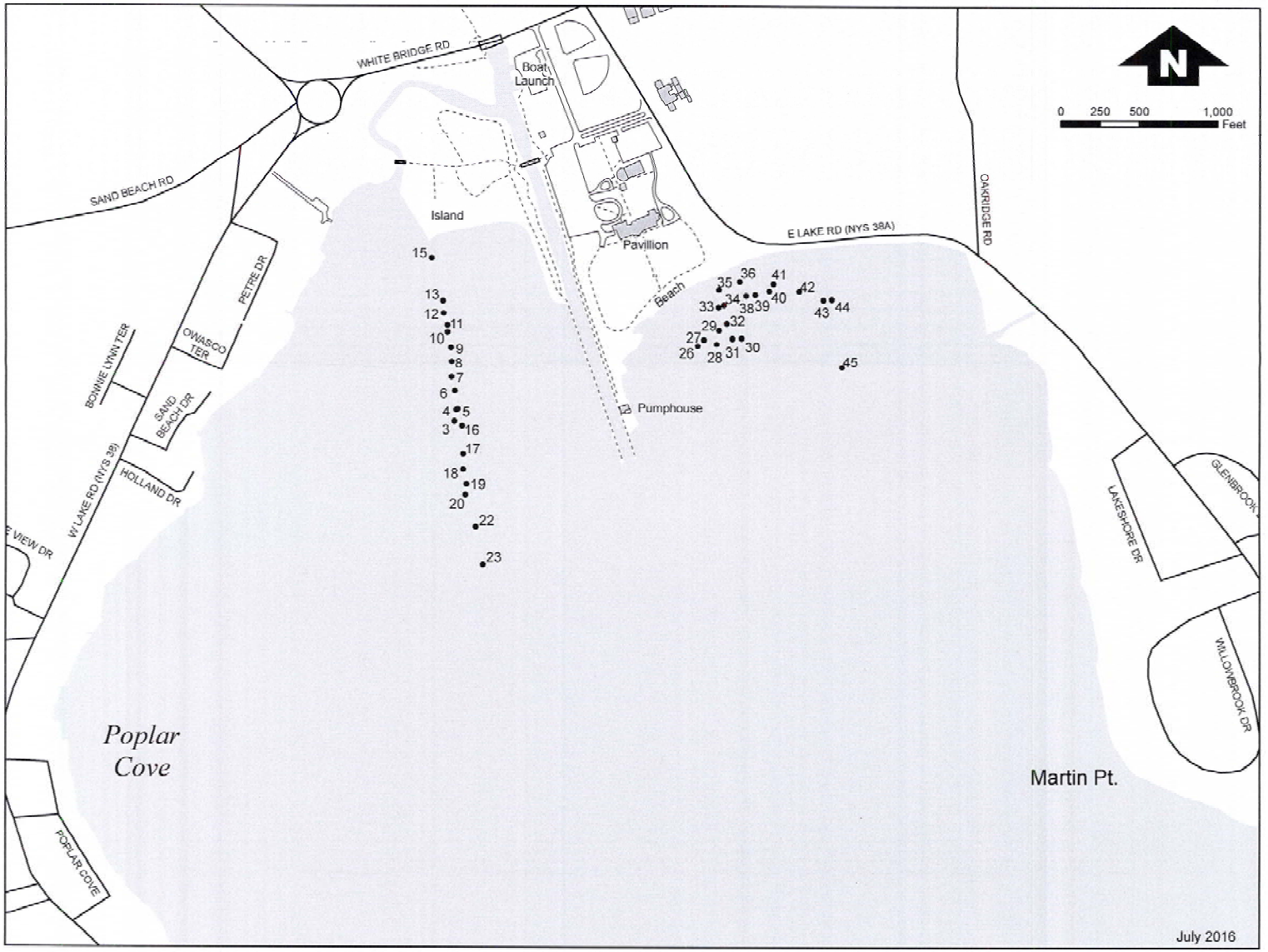
Asian Clams Effects

- Displace native bivalves and compete with native mussels for food.
- Excrete elevated levels of nitrogen and phosphorus in the lake-sediment interface, leading to green algae blooms and dissolved oxygen depletion.
- Dieoffs can cause oxygen depletion and algal blooms.
- Change water chemistry allowing species requiring more calcium like zebra and quagga mussels to survive.
- Can clog pipes.

Asian Clams Control

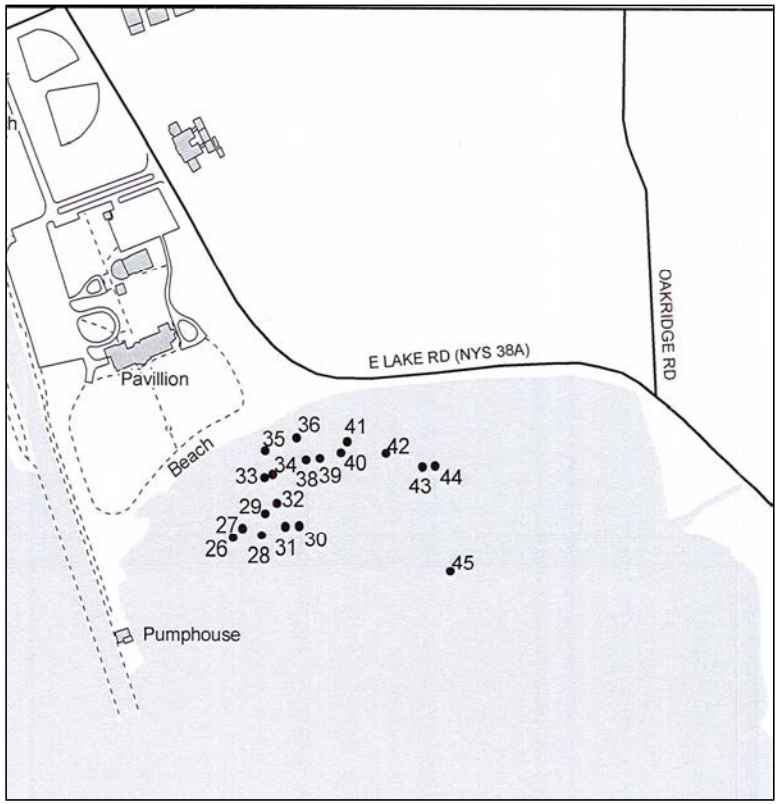
- Lake George researchers have observed that winter ice contact with sediments killed Asian Clams.
- Lowest lake level during a cold snap: Owasco Lake was at 709.88 feet (above sea level) with low temperatures of -23 degrees F on February 14, 2016.

2016


WHITE BRIDGE RD
Boat Launch
SAND BEACH RD
Island
Pavillion
E LAKE RD (NYS 38A)
OAKRIDGE RD
PETRE DR
ONAWOCO TER
BONNIE LYNN TER
SAND BEACH DR
HOLLAND DR
W LAKE RD (NYS 38)
Beach
Pumphouse
LAKESHORE DR
GLENBROOK
WILLOWBROOK DR
POPLAR COVE
Poplar Cove
Martin Pt.
N
0 250 500 1,000 Feet
July 2016

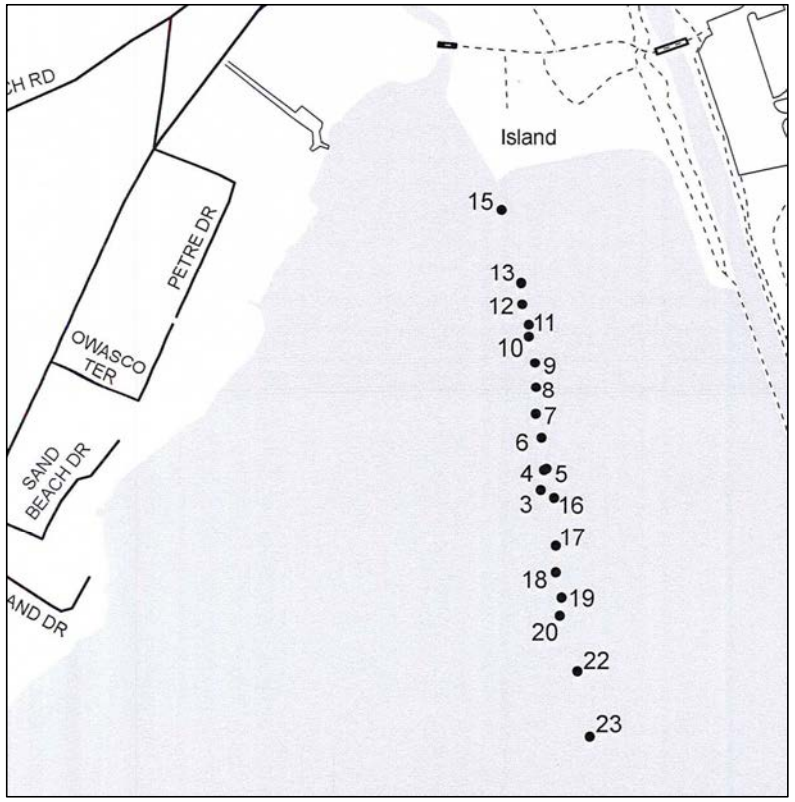
East Side off of Pavilion Beach, 2016

- Sample sites 32-36 had no clams
- 100% of the clams were less than 10 mm. In 2015, 83% were less than 10 mm. In 2014, over 50% were larger than 10 mm.
- No clams were larger than 10 mm. 40% were larger than 16 mm in 2014.
- No clams found of reproductive age.
- Seems like adults did not survive the 2015-2016 winter, or in an unknown sandy area.

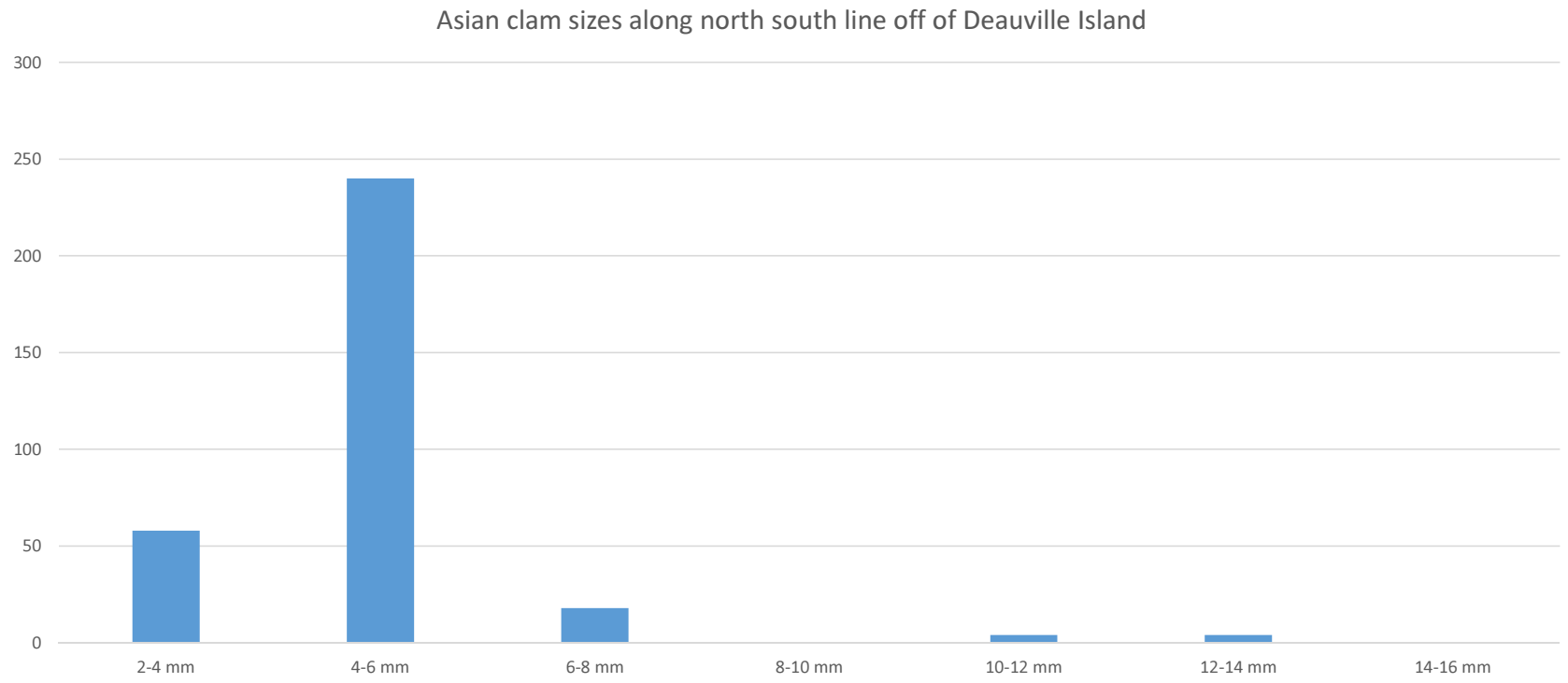


West Side off of Deauville Island

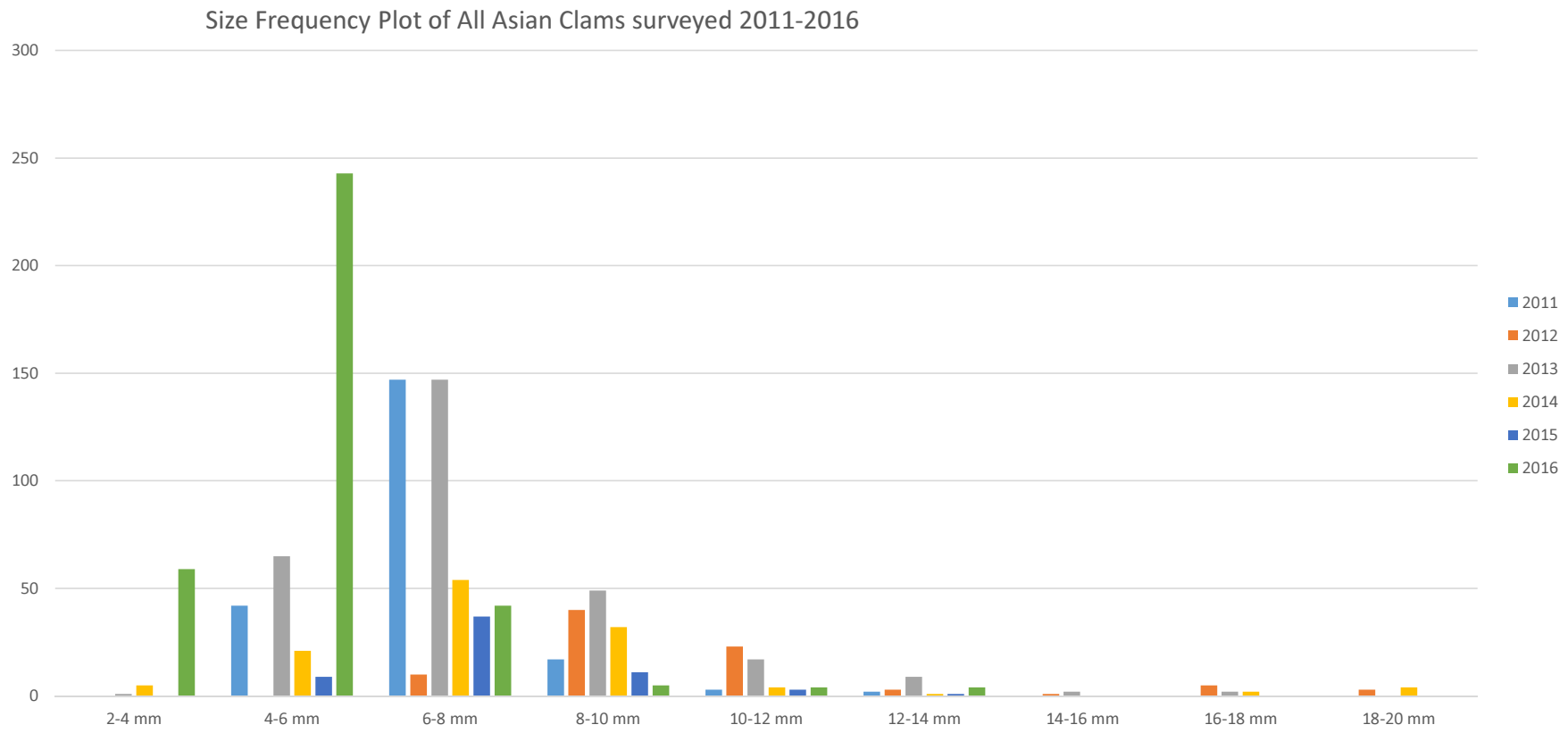
- Transect to shore.
- 97.5% were smaller than 10 mm. Similar to 2014 and 2015. Largest clams found in same area (sample sites 7, 8 and 11) that had some algae and weeds.
- 1% were of reproductive size.
- One sample had 96 clams in a bare sand area and most were 4-6 mm. All samples in 2015 had less than 6 clams.
- Poor survival of adults.



West Side off of Deauville Island, 2016



Size Frequency Plot of All Asian Clams



Asian Clams, Size Vs Water Depth, 2016

Quantitative Samples

- 2011: 1018 clams per m^2
- 2012: 429 clams per m^2
- 2013: 1,462 clams per m^2
- 2014: 1,018 clams per m^2
- 2015: 511 clams per m^2
- 2016: 2,632 clams per m^2

- Lake George: up to 6,000 per m^2

Observations

- The clams on the both sides are mostly young of the year.
- Only the west side had clams that were of reproductive size.
- It appears young of the year clams are transported into the shallow areas by wind and wave action since there are no mature clams there to reproduce.
- Highest density of clams and young clams ever seen in Owasco Lake.
- Some occasionally denser population areas but less dense than Lake George.
- Drawdown appears to cause 100% mortality of clams in areas where the substrate was exposed during the winter.

Darrin Freshwater Institute Research

- Hypothesis: *Chaetogaster limnaei* adversely affect the Asian clam population with respect to size distribution and relative abundance.
  - Have been observed eating the offspring of Asian clams inside adult clams
  - May alter the population structure of Asian clams
  - Will infect Asian clam within a short time period in a scale experiment
  - Can transfer from one clam to another in a small scale lab experiment
- County Planning staff took clam samples last year and sent them to Darrin Freshwater Institute for research and DNA analysis. None of the parasites were found in Owasco Lake samples.
- Trying to find someone who would be willing to look this year.