CITIZEN SCIENTISTS IN ACTION

STRAITS POND MIDGE LARVA AND BATHYMETRIC SURVEY

In July the call went out for volunteers to hunt down midge larva in Straits Pond.

- **Seventeen people responded.**
- **SPWA held three orientation meetings beside the Pond to train sample crews consisting of two people, a navigator and a sampler**
- **SPWA developed an app to record data that was uploaded to a database in the Cloud**
- **SPWA developed a sample plan of 170 randomly distributed sample sites where basic parameters were collected and core samples were taken**
- **Samples were rinsed in a kitchen sieve and any midge larva were tallied**
- **Sample locations and midge larva counts were entered into a Geographic Information System.**

Then the fun began

The teams used the GPS on their mobile phone to navigate to each sample site, collect a core sample, record the water depth, the sample temperature, the presence of aquatic plants, the sample aroma, the sample composition, and the time, date and geographic coordinates where they took the sample.

Taking a core is sloppy business

Each sample was a composite of three, two inch diameter cores, where only the top two inches was collected.

Processing core is a delicate task

Most of the samples consisted of decayed organic matter that blankets large areas of the bottom of the Pond.

Midge larva prefer to live in this type of sediment.

After a gentle rinse, what remains is inspected

There is more to see than midge larvae.

Clams, snails, and sea worms are common.

Partially decayed reeds are common in shallow nearshore samples.

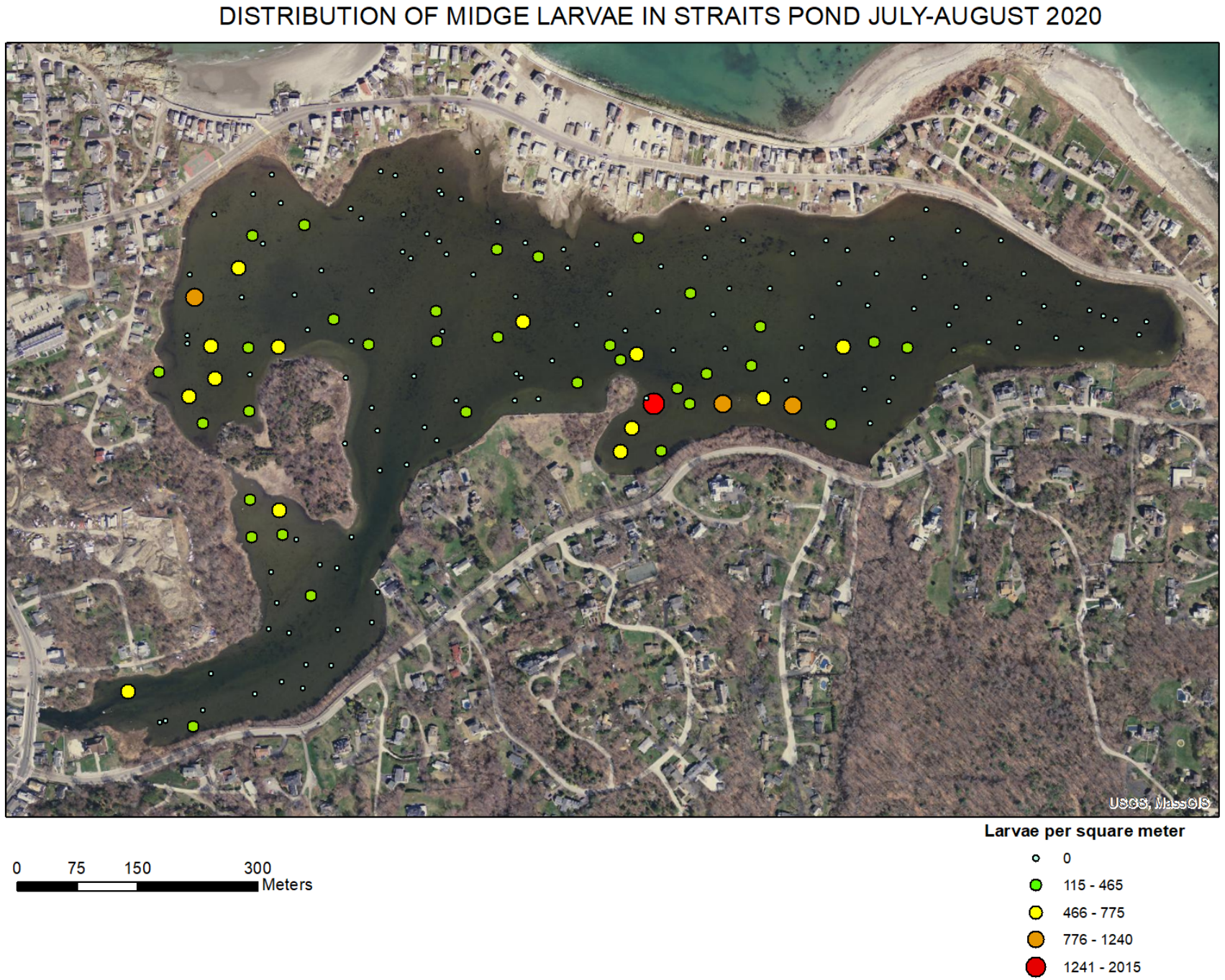
Some samples contained midge larvae

Midge larvae were found in samples that had indications of low oxygen.

The blood red color of midge larvae is hemoglobin, their means of storing oxygen to use when times get tough.

Midge larvae are more common in some spots

Protected coves appear to be more favorable than open water



What we learned

- **All midge larvae were observed in reduced very fine-grained organic sediment.**
- **Midge larvae were never observed in core with oxidized degraded phragmites debris.**
- **Few midge larvae were observed in samples from the intertidal zone.**
- **Below depths of about one meter, no pattern of larvae presence by depth was observed.**
- **Midge larvae were frequently accompanied by juvenile softshell clams and snails of all sizes.**
- **Most samples with clams and snails did not contain midge larvae.**
- **Midge larvae ranged in length from 3 to 8mm.**

SPWA has explored some abatement strategies

- One strategy would employ the organic biologic control Bti. This has been tried in the Back River in Baltimore County Maryland. It was shown to be effective when applied every 2-4 weeks at an application rate of 5 lbs/acre. Bti is a bacteria that infects the adults and larva. The infection is fatal for some insects but safe for other plants and animals.
- Another strategy to explore is aeration of the Pond. SPWA has just received a proposal from XIOM to install four solar powered aerators which will add oxygen to the low oxygen sediments. The Town of Mashpee is using this technology to abate algae, a problem we share with them. It also works to reduce midges.

How deep is the Pond?

Based on depth measurements at 170 sites, corrected for the tide phase when taken, and an air photo taken when the Pond water was exceptionally clear we were able to make a new bathymetric map of the Pond.

Thank you citizen scientist volunteers!

Click the bird to join SPWA today