



Larvicide Study 2019

Lisa Wagenbrenner, Biologist
Chesapeake Mosquito Control Commission

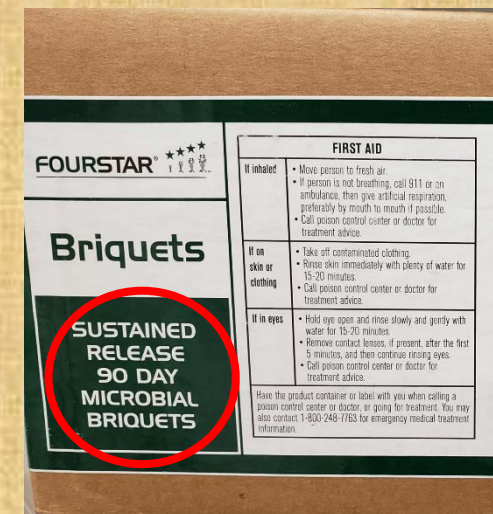
Objective

- Test efficacy of current/future larvicide products
 - Vectomax WSP (6-8 weeks)- Bs 2.7% & Bti 4.5%
 - Fourstar (180 day)- Bs 6.0% & Bti 1.0%
 - Fourstar (45 day)- Bs 6.0% & Bti 1.0%
 - Altosid xr (150 day)- S-Methoprene 2.1%



Things to Consider

- Available space for pools- need some shade & area to construct the pools
- What larvicides to test
- Time constraints
- Species of mosquitoes- Cx pip/res easy to collect egg rafts
- Materials-Cost



Materials

- **2- 100 sq ft pools and 1- 49 sq ft pool**
 - 1X2 8ft treated wood qty 44= \$87.12
 - 1x6 10ft treated wood qty 14= \$99.22
 - 1X6 8ft treated wood qty 4= \$15.92
 - 4x4 6ft treated wood qty 2= \$13.54
 - 20' x 100' 6mil clear poly sheeting qty 1= \$98.00
 - 72" x 25' pool & patio screen qty 3= \$104.94
 - Cedar/Pine wood screws 3in 5lb box qty 2= \$35.96
 - Drywall screws 1 1/4in 1lb box qty 2= \$9.96
 - Drill and staple gun
 - **Approximate total: \$464.66**



Construction Begins



Attaching the corner 4x4 for support



Smooth edge to protect liner



100ft bottom frame-
inserting middle 1X6 for
support

Construction Continues



Screen top made with 1x2 plywood



Top frame attached to bottom frame for stability while attaching screen and 2nd 1X2.



Stapled screen- 2 pcs- attached in the middle- 6ft each

Construction Continues



8ft 1x2 with added 2ft section to make 10ft piece.
Screws were backed out one side at a time



Center of top screen



Top frame support beam (used 1x6- 10ft)



Support post attached to underside of top screen

Are we finished yet?



Completed 49sq ft top & bottom



Plastic laid inside and cut to size

Time to roll out!



Rolling table worked great!



The 49ft easy to roll out!

Time to roll out!



Needed some help with the 100sq ft! Thanks Mike!



Plastic laid inside ready for water

Fill'er Up!!



Tap water-deep enough to use dipper



Then bucket of gravid water and wait at least 24hrs



Our Protocol

- Set gravid tubs to collect *Cx pip/res* egg rafts (**25-49sq ft** & **50-100sq ft**) + **1 control** (5 gal bucket)
- Raised to **1st/2nd** instars- added to pool treated with product
- Checked pools **3** times per week (**Mon-Wed-Fri**)
- **10** dips- averaged what we saw each time- instars, % alive, % dead etc.
- **Methoprene** products- **removed pupa** to check for emergence.
- Simple-easy to repeat-not time consuming



Adding Product



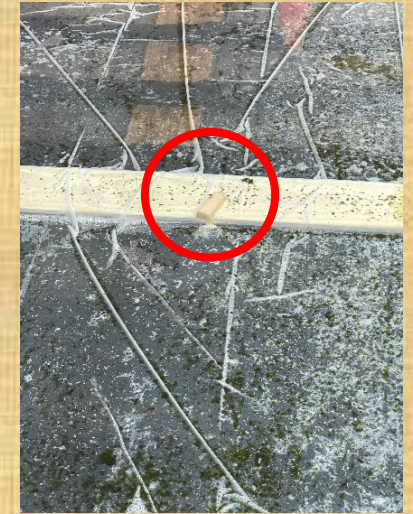
Always added in the middle



WSP dissolving



Adding Product



Blocks placed in the middle



Adding Larvae

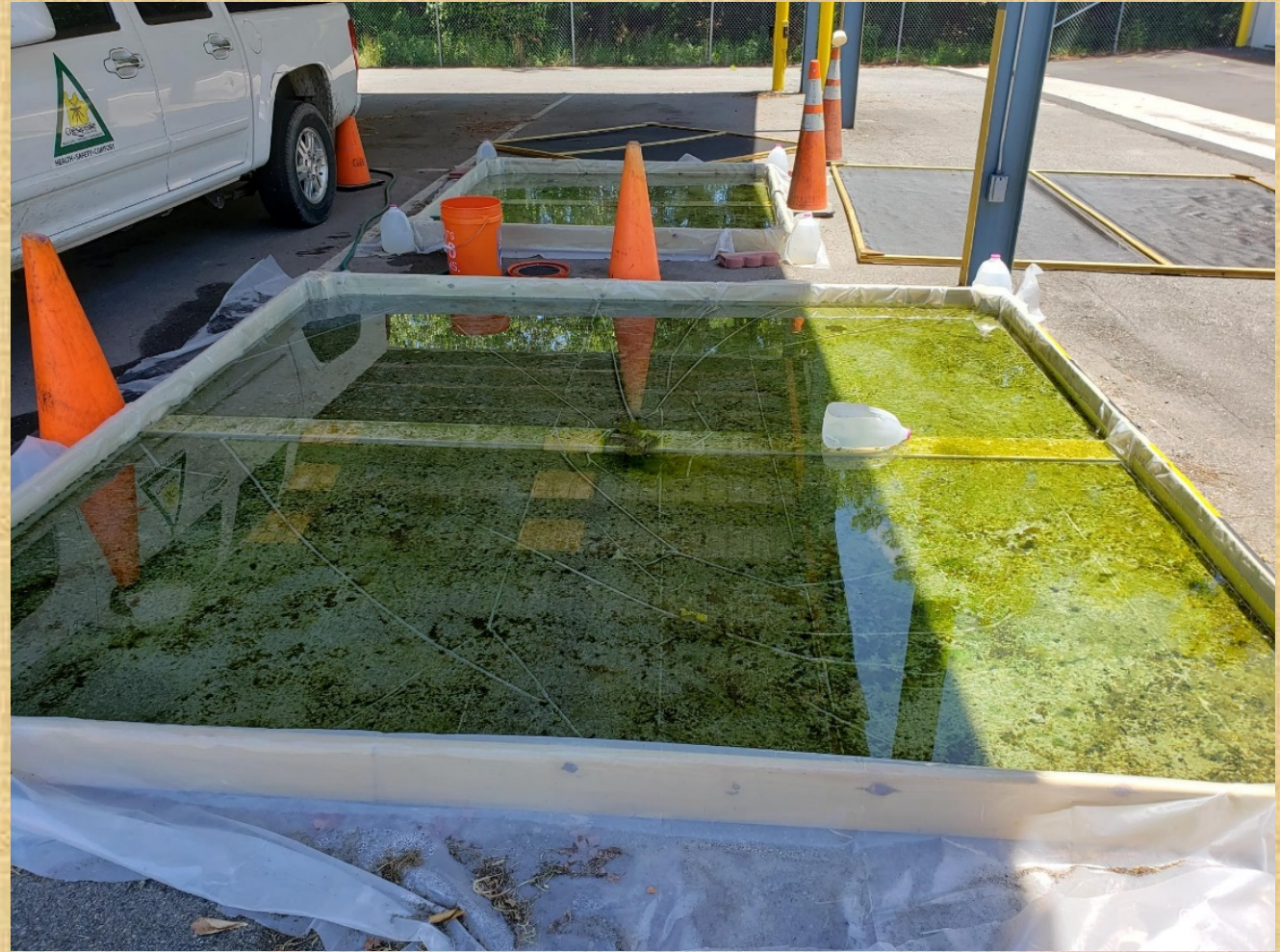


First/Second instars



Larvae spread evenly around the pool

Lots of natural algae growth

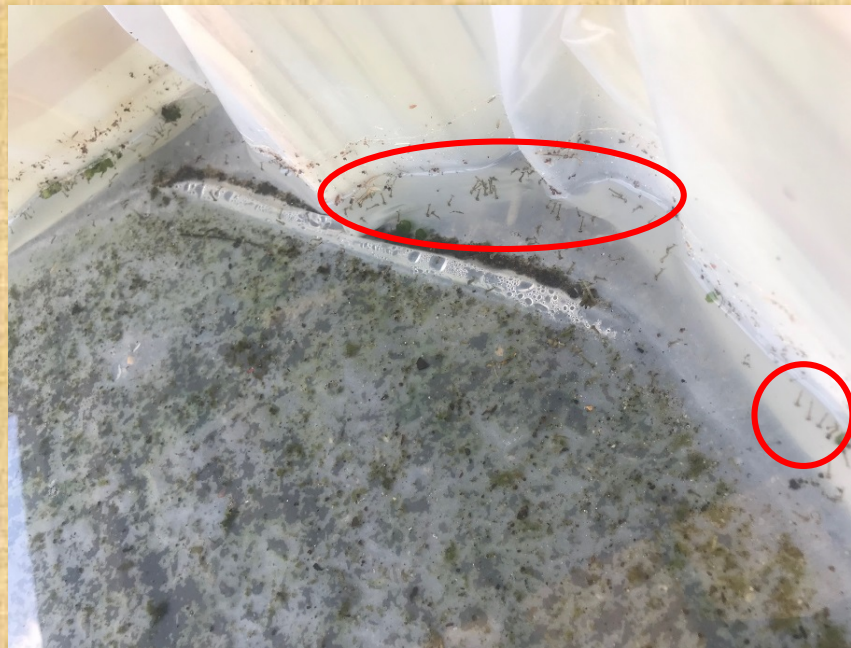


Side note: What are the water jugs for?

Dipping Pools-Checking Larvae Development



Dipping the pool



Methoprene product-larvae alive



Bti/Bs product-dead larvae



Pupa removed to monitor for death/emergence

Results, Discoveries and What's Next

- Results- Some great, some not so great
 - **Vectomax WSP (6-8wks)- Bti 4.5% & Bs 2.7%**
 - **June 21-** Added 2nd instar larvae approx. 5,000 + 1 Vectomax WSP (49 sq ft pool)
 - June 24- (Day 3) **All larvae dead**- Control alive
 - **June 28-** Added 2nd instar larvae approx. 5,000
 - July 1- 1% alive
 - July 3- Only 2 larvae found alive
 - Holiday weekend 5 days
 - July 8- **All larvae dead**
 - **July 12-** Added 2nd instar larvae approx.. 5,000- **Noted lots of algae growth**
 - July 15- 60% dead 40% alive
 - July 16- **All larvae dead**
 - **July 19-** Added 2nd instar larvae approx. 5,000- **Product 4 wks old**
 - July 22- **All larvae dead**
 - **Did not add larvae again until product at 7 wks old-Pushed to the max!**
 - **Aug 12-** Added 2nd instar larvae approx. 5,000
 - Aug 14- only a few dead
 - Aug 15- 1% dead 3rd & 4 instars
 - Aug 16- **4th instars & pupa- Applied Agnique MMF- Ended trial**



Kip applying Agnique MMF

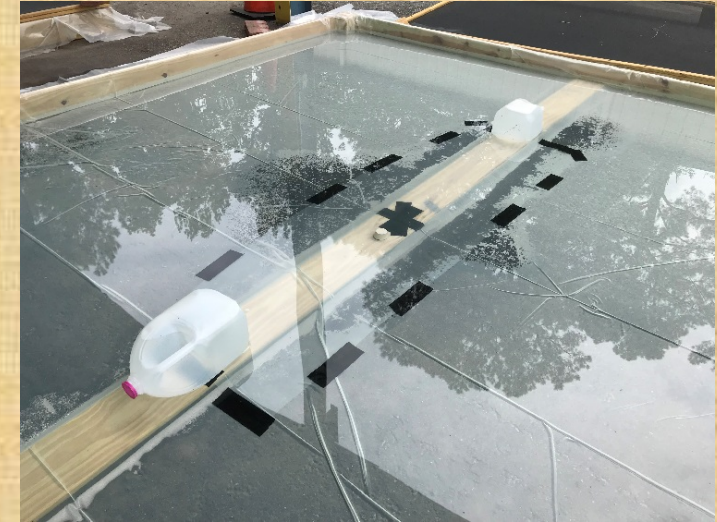


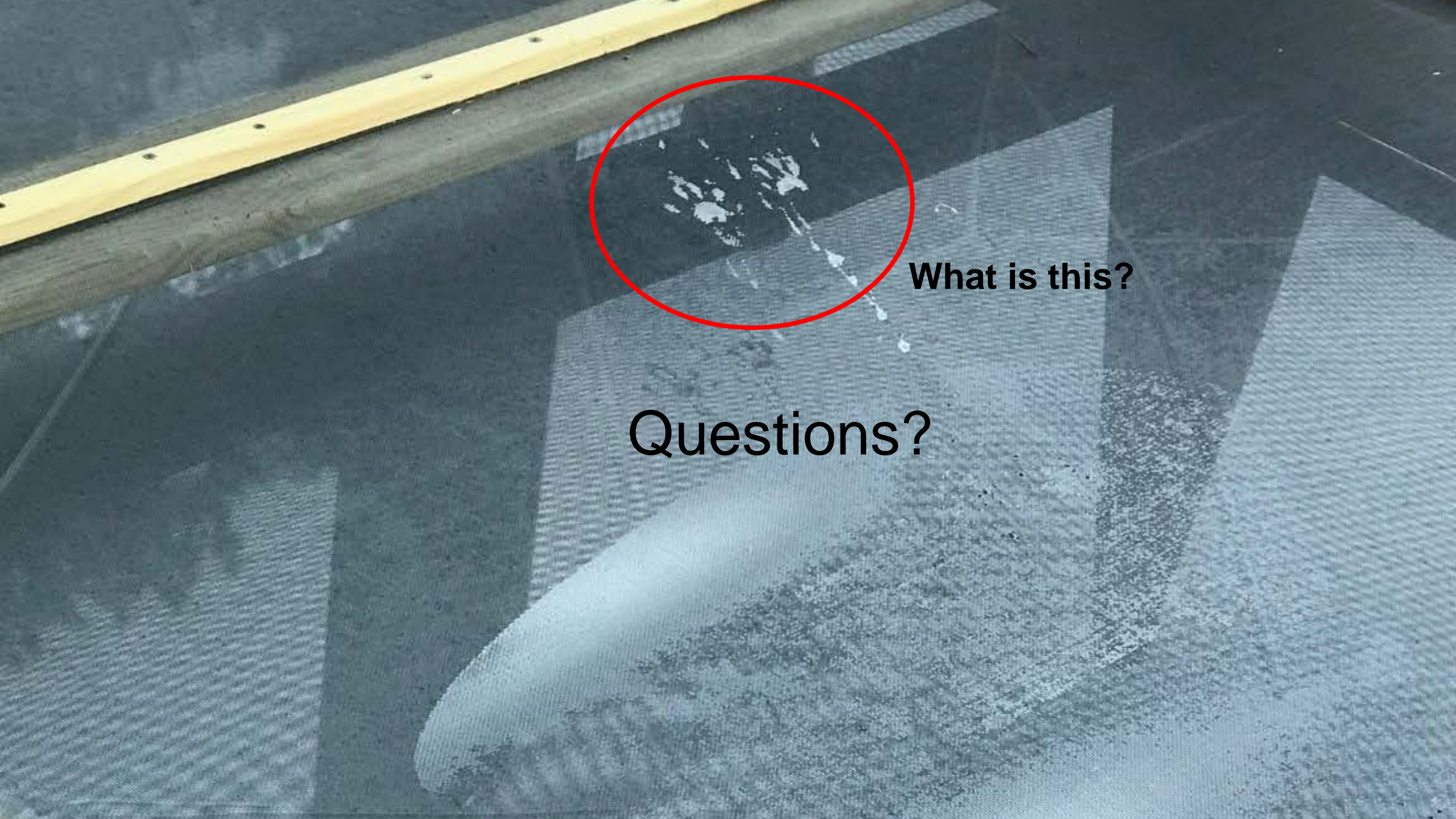
Results, Discoveries and What's Next

- Used City water to fill pools- bill a little elevated- opt for well water
- Used 6mil plastic- gets holes easily and brittle in sun
- But Duck tape works underwater!
- Trial and error experiment
- Developed protocol as we went along
- What % dead are we happy with?
- 97% dead is operationally good for us.
- All trials will be duplicated starting this spring 2020



Duck tape underwater!





What is this?

Questions?