

Dude, where's my *Culex?*

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Where are the *Culex pipiens* larvae?

- July to September: Hugemungous numbers of *Culex pipiens* adults

but...

...where are the larvae?

- Catch basins/storm drains
- Ditches
- Artificial containers
- Natural vs manmade
- Sunny vs shaded



14 Years of Larval Surveillance

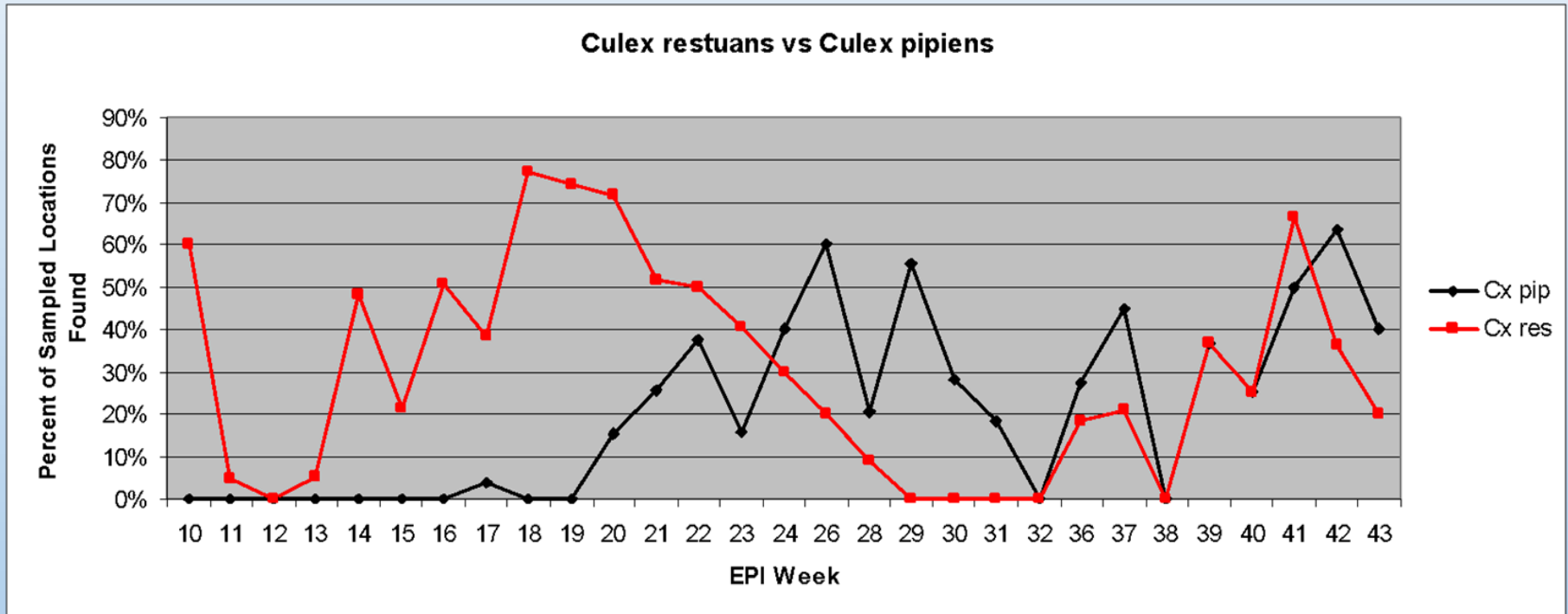
- 2008
 - Learning to ID larvae
 - City wide surveillance
- 2009 – 2017
 - City wide surveillance
 - Lack of consistency
 - More samples is slower times of the season
 - More samples from particular habitats
- 2018-2019
 - Consistent weekly surveillance of same habitats
- 2020
 - Catch basin study
 - Consistent weekly surveillance of same
- 2021
 - Artificial container study
 - Consistent weekly surveillance of same

Identification of Larvae

- Pros
 - ID in real time
 - No breeding chambers
 - Less space and clutter
 - Less larval death
 - Different species
 - Discerning characteristics
 - Species not attracted to traps
- Cons
 - Time
 - Learning curve



2008 Seasonal distribution of *Culex restuans* and *Culex pipiens*



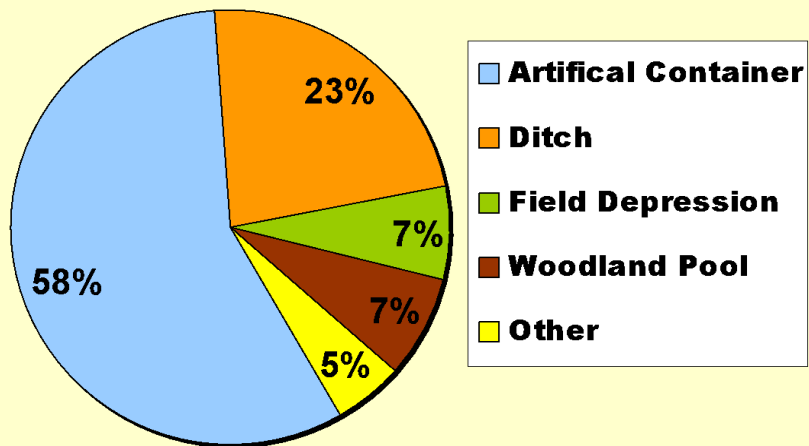
Out of 674

- 229 samples contained *Culex restuans*
- 102 samples contained *Culex pipiens*

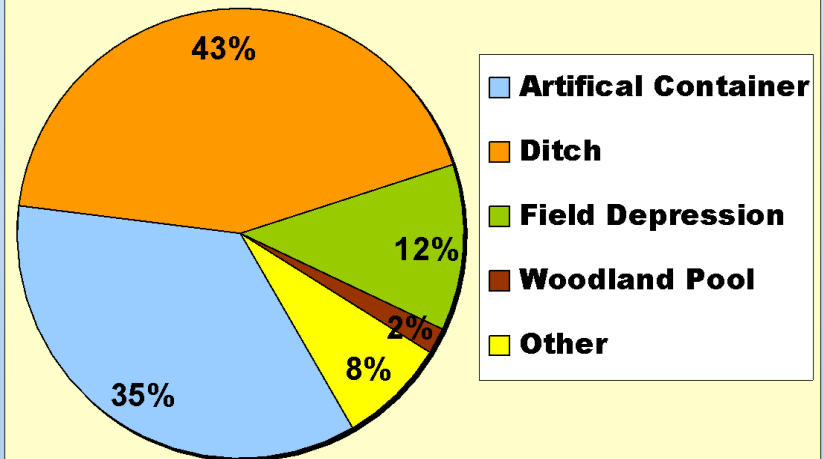
Larval Habitat of *Culex restuans* and *Culex pipiens*

(Catch Basins/Storm Drains Not Included in Surveillance)

Habitats Where *Cx restuans* Were Found



Habitats Where *Cx pipiens* Were Found



229 *Cx. restuans* samples

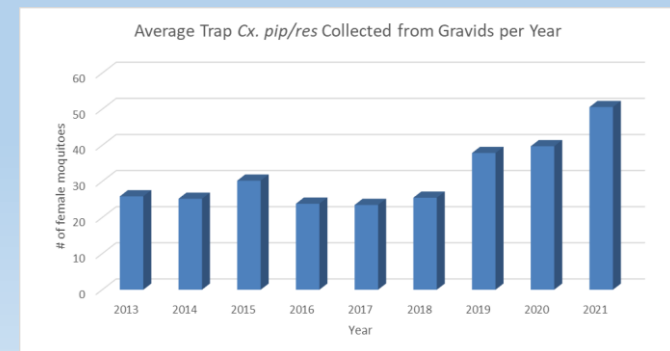
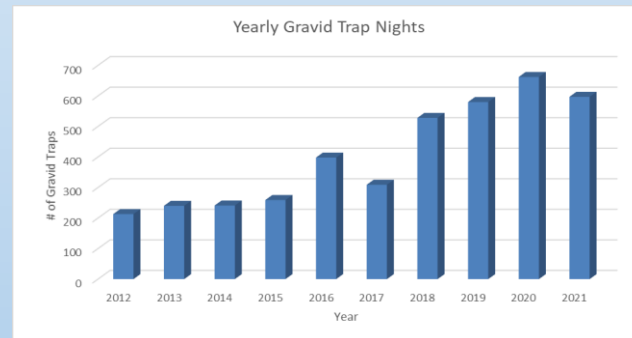
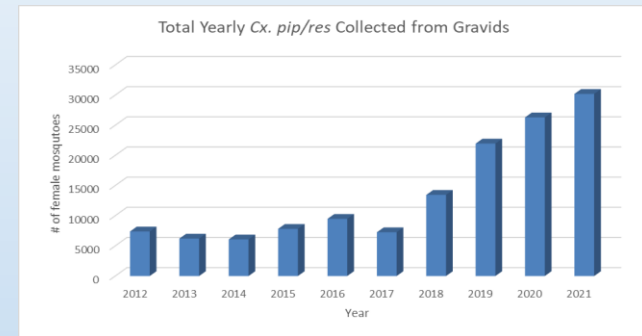
102 *Cx. pipiens* samples

Ditches and Artificial Containers



Growing *Culex pipiens* Populations

- City wide populations exploded over the last 10 years
- Downtown populations even more so
- We set more gravid traps each year, but this bottom graph shows the average per trap night
 - Doubling city wide



Catch Basin Programs



- Catch Basins:
 - Thought to be a main habitat for *Culex pipiens* and *restuans* larvae
- When adult populations are high, some programs will automatically treat

Catch Basin Programs

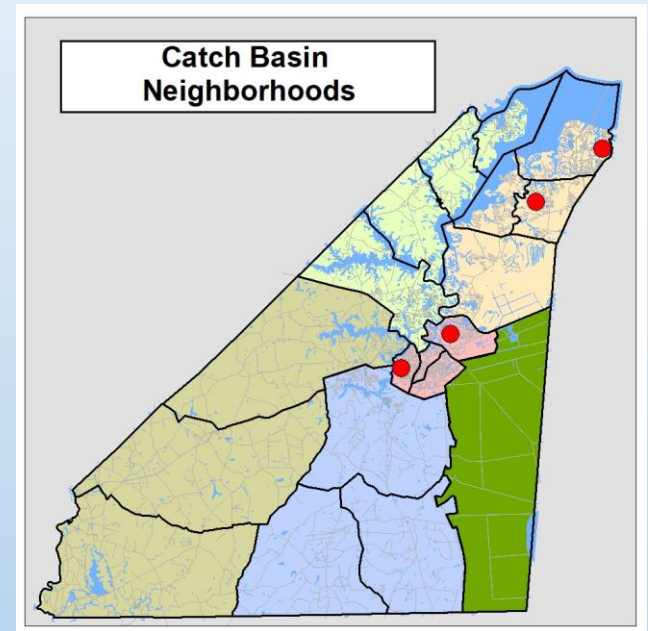
100's or 1000's of catch basins

- Treat all
 - not efficient
 - not VDACS approved
- Treat wet basins
 - record ones holding water
 - always changing
- Treat basins with larvae
 - labor intensive



Catch Basin Project 2020

- June 1 - August 30
- Daily dipping of 4 neighborhoods
 - 2 catch basins each
 - 1 treated w/ Coco Bear
 - 1 not treated
- 5 dips or 25 larvae
- Monitored rain events
 - HRSD local weather stations
 - manual rain gauges



Catch Basin Project 2020

Results

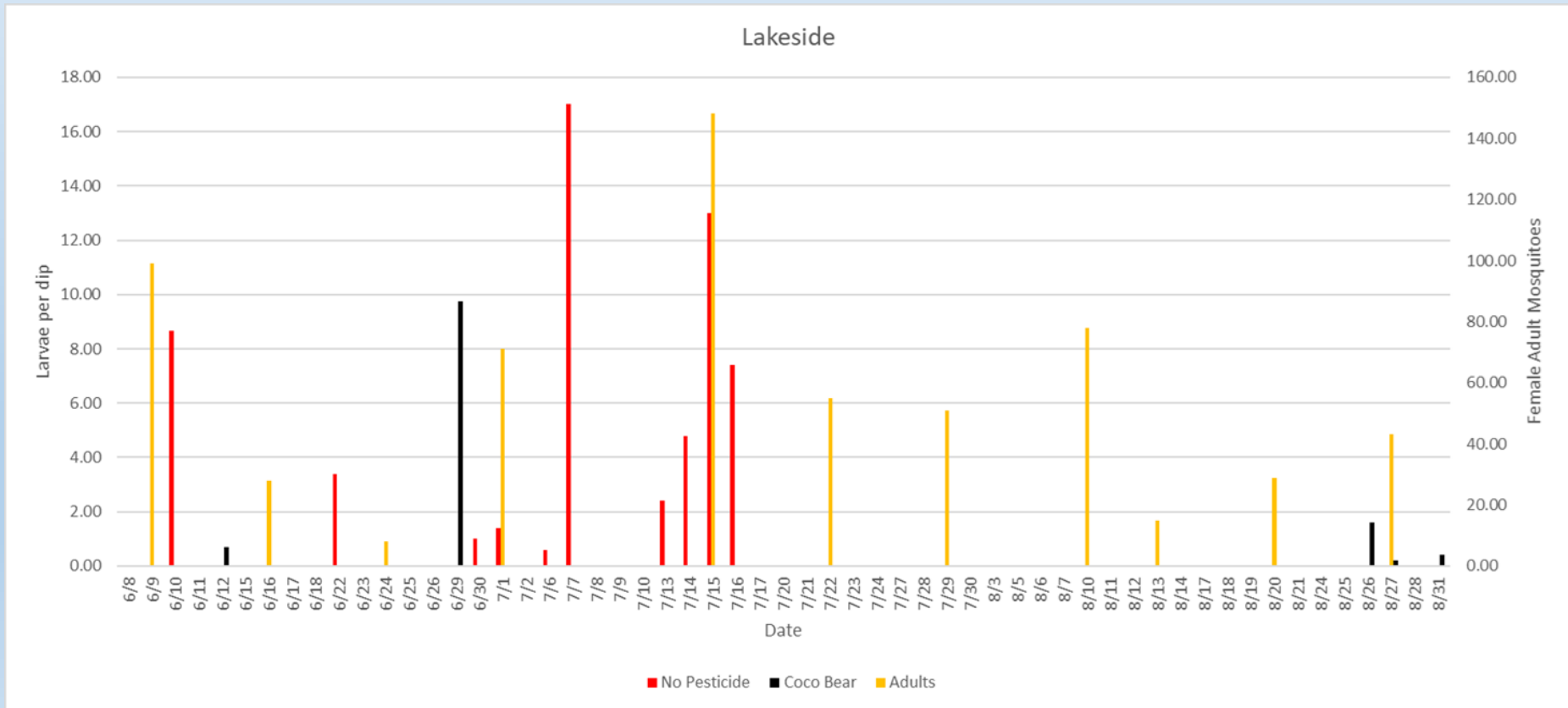
- 65 days of dipping
 - no weekends or holidays
- 480 samples collected
 - 58 samples with larvae (12.1%)
 - 422 samples empty (87.9%)
- 680 larvae and pupae collected
 - 493 were 1st and 2nd instar
 - 603 were *Culex*
 - 492 (72%) of all came from 12 samples

Mosquito Species	No.	% of Total
<i>Culex species</i>	443	65.1%
<i>Culex pipiens</i>	116	17.1%
Unidentifiable	51	7.5%
<i>Culex restuans</i>	29	4.3%
<i>Anopheles quadrimaculatus</i>	16	2.4%
<i>Culex territans</i>	12	1.8%
<i>Anopheles species</i>	5	0.7%
<i>Aedes vexans</i>	4	0.6%
<i>Culex salinarius</i>	3	0.4%
<i>Psorophora columbiae</i>	1	0.1%
TOTAL	680	100.0%

Catch Basin Project 2020

Lakeside Neighborhood

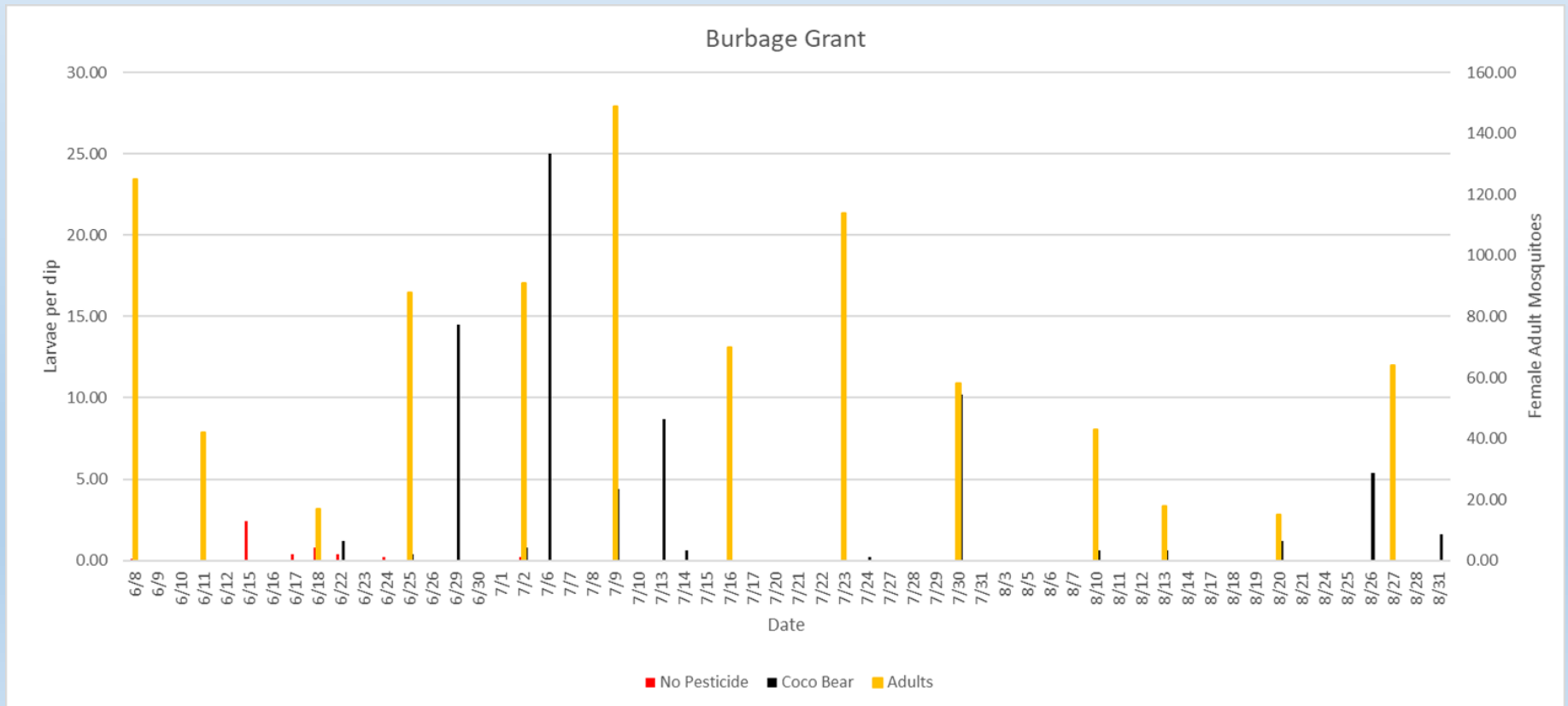
Larvae in catch basins vs Adults trapped in Neighborhood



Catch Basin Project 2020

Burbage Neighborhood

Larvae in catch basins vs Adults trapped in Neighborhood



Artificial Container Project 2021

2021: Samples collected from artificial containers

- Collect from May-October
- 6-10 samples a week
- Strive for variety of containers
- Record:
 - Container material
 - Depth of water
 - Amount of sunlight
 - Type/amount of vegetation



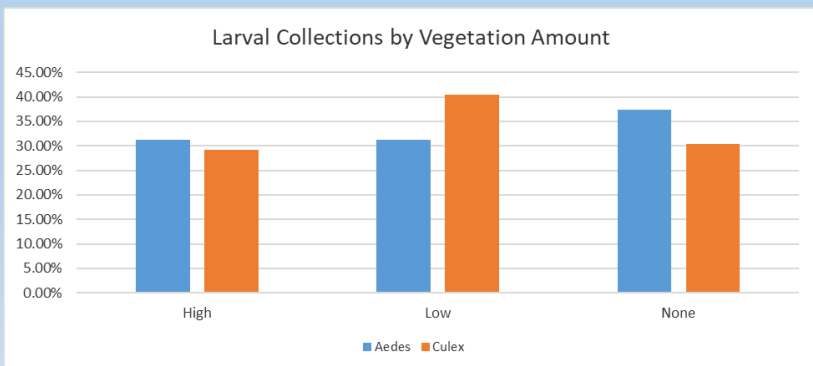
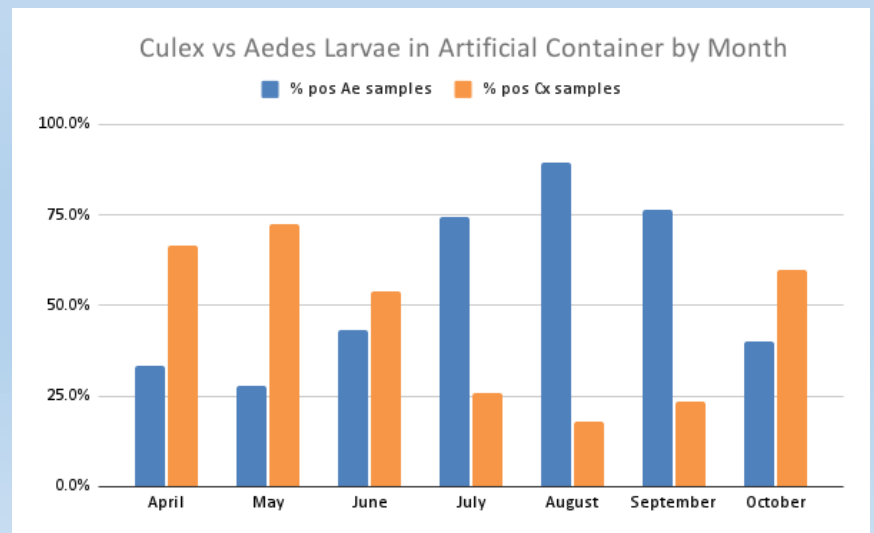
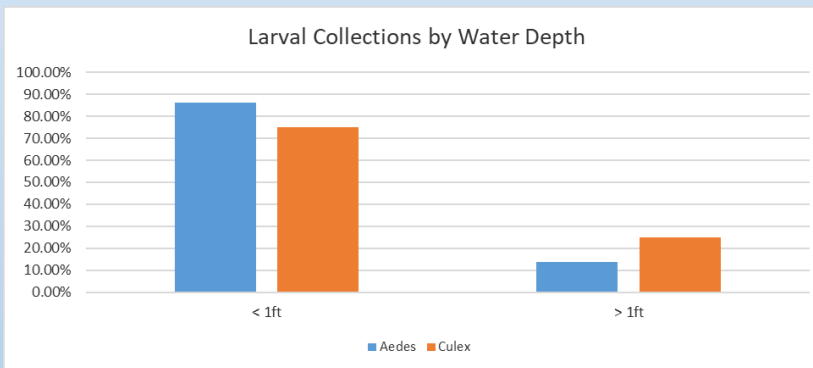
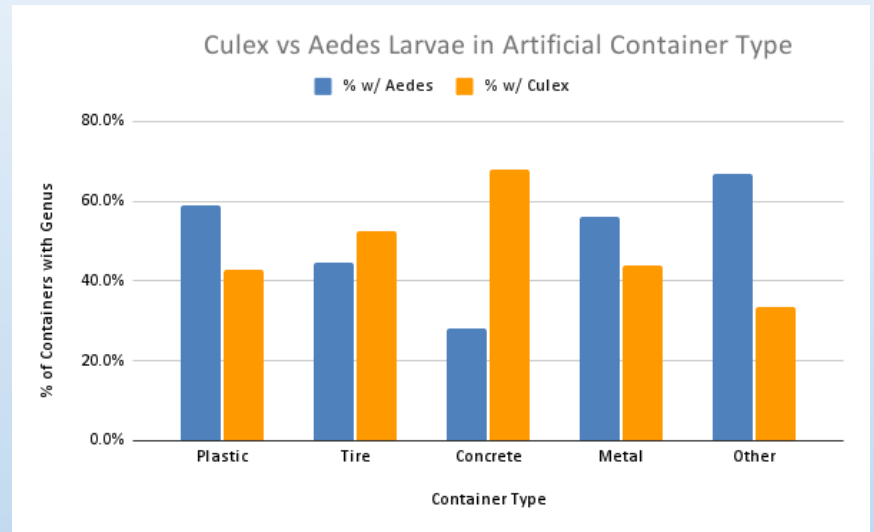
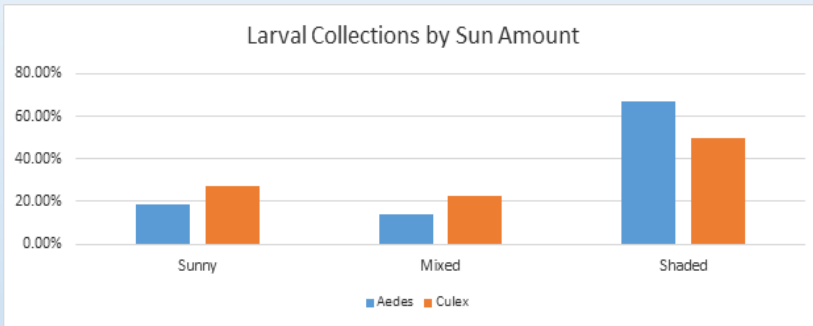
Artificial Container Project 2021



Results

- 199 samples taken
 - 110 Plastic
 - 38 Tires
 - 25 Concrete
 - 25 Other/mix
- 6,866 Larvae
 - 4,470 *Culex* species in 94 samples
 - 45 per sample
 - *pipiens*
 - *Restuans*
 - 2,219 *Aedes* species in 123 samples
 - 18 per sample
 - *albopictus*
 - *japonicus*
 - *triseriatus*

Artificial Container Project 2021

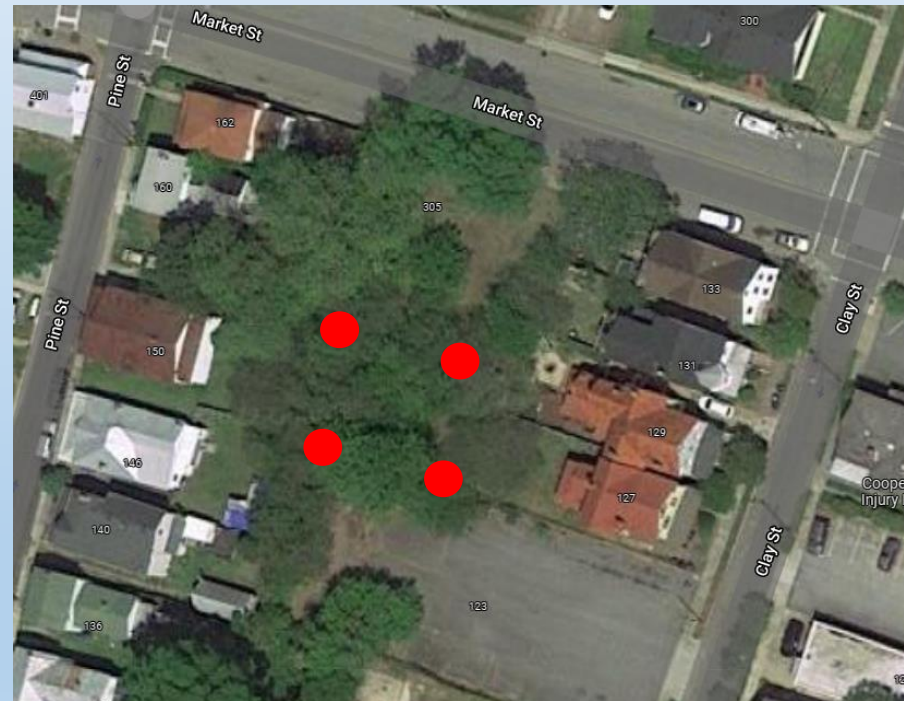


In2Care Project 2021



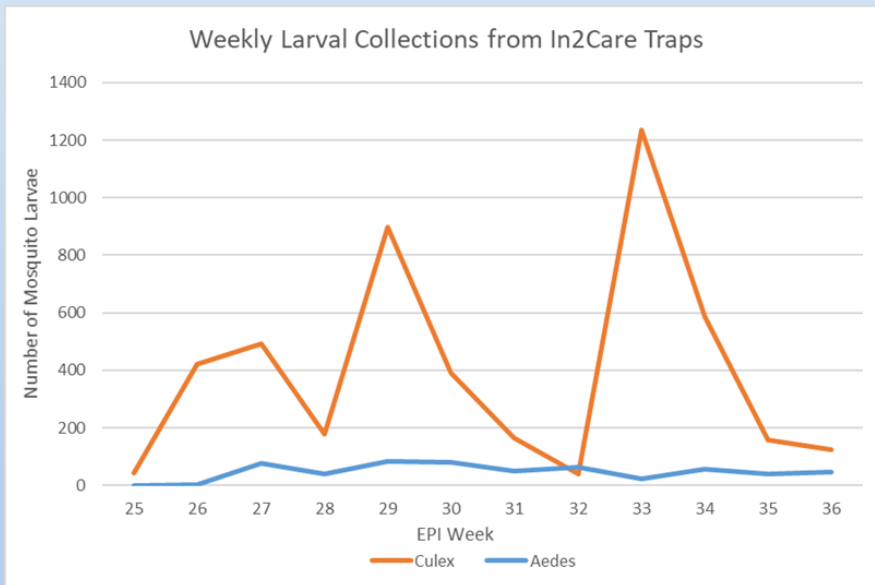
In2Care Project 2021

- 12 Weeks:
 - June 14 – September 7
- 4 In2Cares 20m apart
- Collect samples weekly
 - Dipper and baster
 - Tape
- ID and count larvae
- Switch out pesticide every 4 weeks



In2Care Project 2021

Results



- 5,499 mosquitoes collected
 - 5,308 larvae
- 4,734 *Culex*
 - Over 1,200 in one week
- 574 *Aedes*

Project 2022

- Exploring more with In2Care
 - Deploy more in an area.
 - Will there be population reduction?
 - Will larvae numbers remain high on average?
- Artificial Containers
 - How many are empty?
 - How many are positive?
- WALS
 - Can we make this work?

Thank You!

- Suffolk Tech Team
 - Ann Herring
 - Alex Riley
 - Richard White
 - Junior Harald
- Suffolk Bio Team
 - Karen Akaratovic
 - Cassidy McKelvie
 - Kaitlyn Price
- Suffolk Superintendent
 - Charles Abadam



Questions?



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