CONTROLLING CULEX

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THE CITY OF NORFOLK

VDH VIRGINIA DEPARTMENT OF HEALTH
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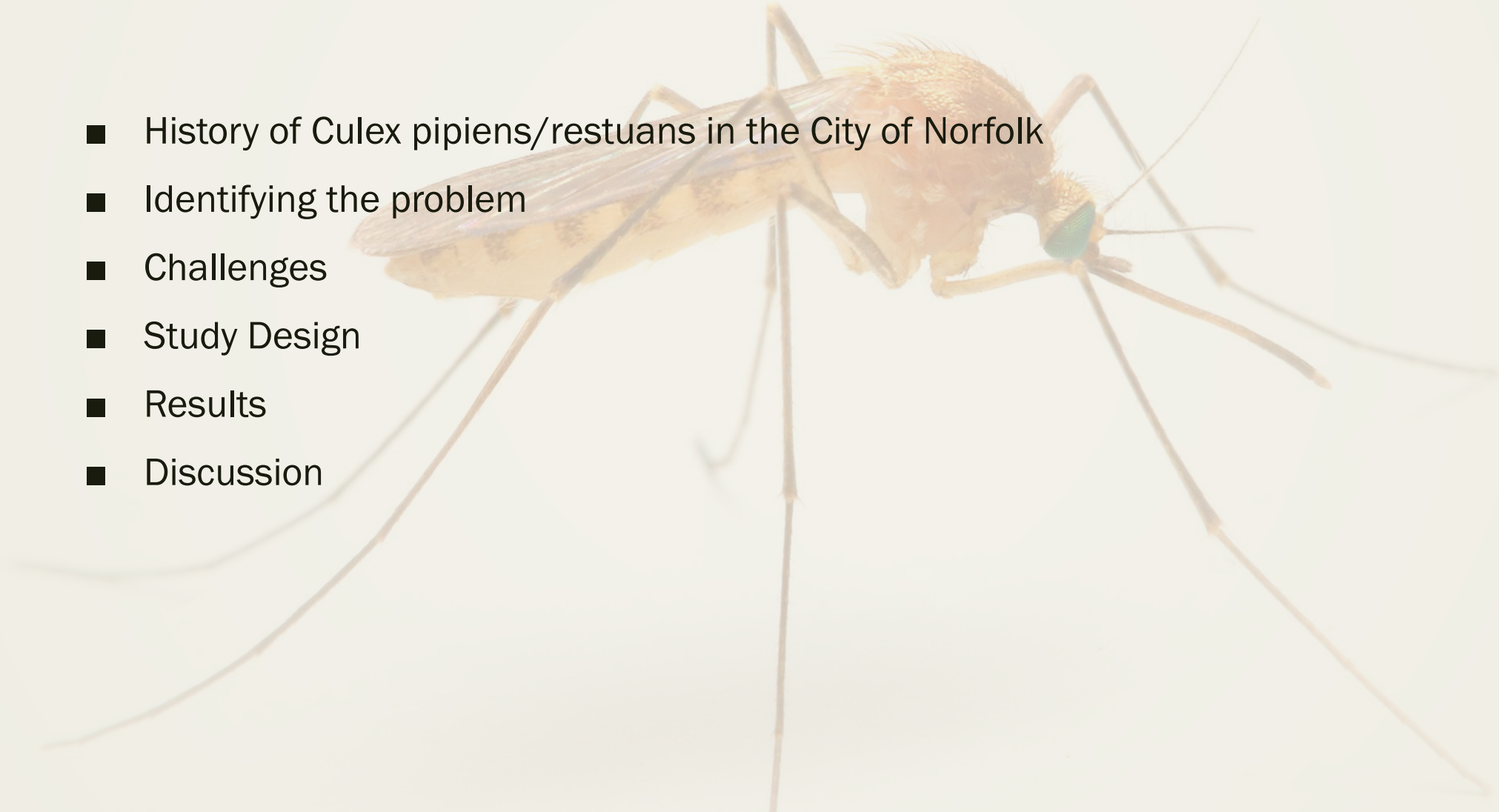
Overview



- History of Culex pipiens/restuans in the City of Norfolk
- Identifying the problem
- Challenges
- Study Design
- Results
- Discussion

Past Data on *Culex pipiens* in Norfolk 2014-2019

Trapping:

- *Of the 307,018 mosquitoes trapped, 203,909 were Cx. pip/res, 66%*
- *Average* Cx. pip/res *per gravid trap: 68*
- *Record high of 1677 collected on May 30, 2018*

West Nile Virus (WNV) Activity

- *6 year average for WNV positive mosquitoes pools: 54*
- *2018 Record setting year for Cx. pip/res WNV positives: 198*

Where are they coming from?

- Urban/Suburban Landscape
  - *Artificial Containers*
  - *Trash and Debris*
  - *Polluted Water*
- Ditches
  - *Stormwater*
  - *Tidal*
- Utility Structures
  - *Pump Stations*
  - *Catch Basins*

Target: Catch Basins

- Majority of catch basin in Norfolk were installed in the 1950s.
- Percentage of drains hold water continuously.
- Mosquito breeding observed in catch basins
- Historically drains were treated as needed.
- Wide-scale treatments have been attempted but poorly tracked and timed.
- Use the City's GIS data to identify and locate all of the catch basins in the City of Norfolk.

Challenges

Approximate # of catch basins: 8,500

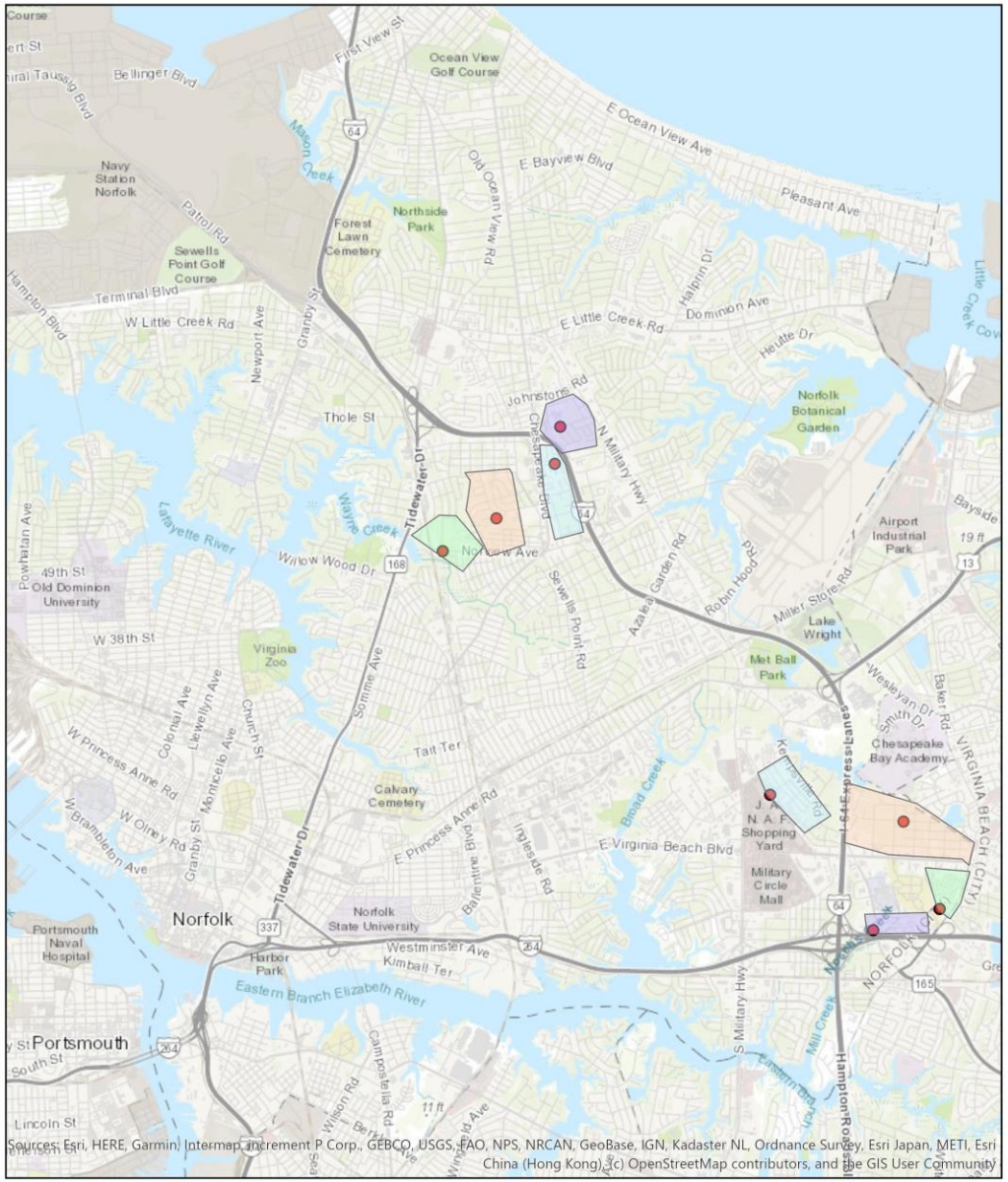
Small Staff: 4 plus Crew Leader

Lifting storm drain lids can lead to injury and accidents.

High Cost

Study Design

- Two replicates
- 3 different treatment methods and a control
- Monitor Culex pipiens/restuans population in each study block
- Evaluate the effectiveness of each treatment on the adult mosquito population



Site Selection

- Two Test Areas: Norview and Kempsville
  - *4 trapping locations each, all pump stations excluding one site.*
  - *Use the City's GIS database to identify all catch basins with ¼ mile of each trap site.*
  - *Drains were pre-marked with green spray paint to alert Vector Control Staff NOT to treat drains located in the study areas.*
- Study sites represented areas of historically moderate mosquito population activity.

Treatment Cost Comparison

Chemical	Duration	Cost Per Drain	No. of Treatments*	Total Cost
Fourstar CRG	60 days	$0.26	34,000	$8,840
Fourstar 180 briquet	180 days	$3.41	17,000	$57,970
Nuvan Prostrip	120 days	$3.51	17,000	$59,670

*Based on treating 8,500 drains from March 1 to November 1 (245 Days).

Methods

Gravid traps placed at trap sites every other week on Thursday and collected on Friday.

Begin trapping on Week 17.

Collect baseline mosquito population data prior to treating storm drains.

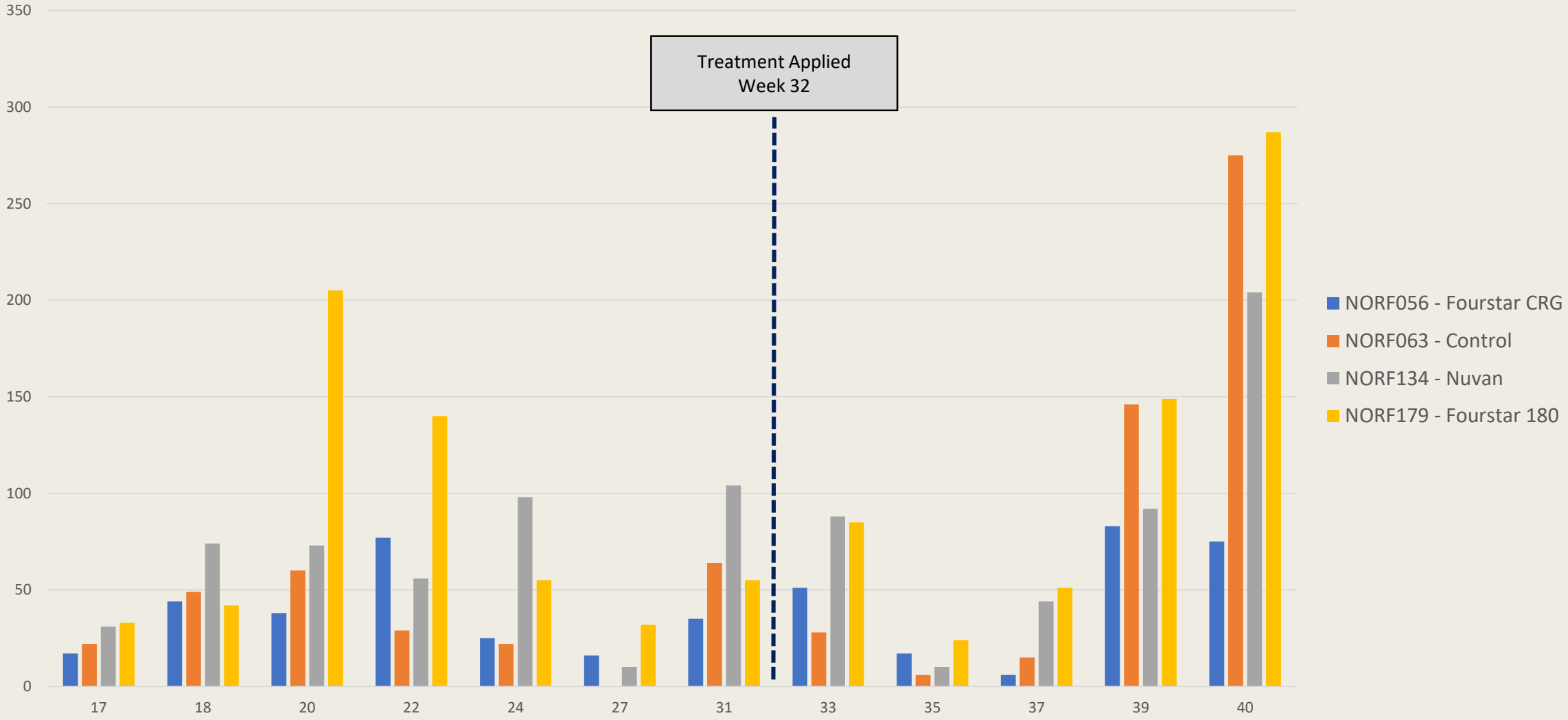
Initially hoped to apply treatments at week 23 but delays pushed it to week 32.

Conclude trapping at week 42.

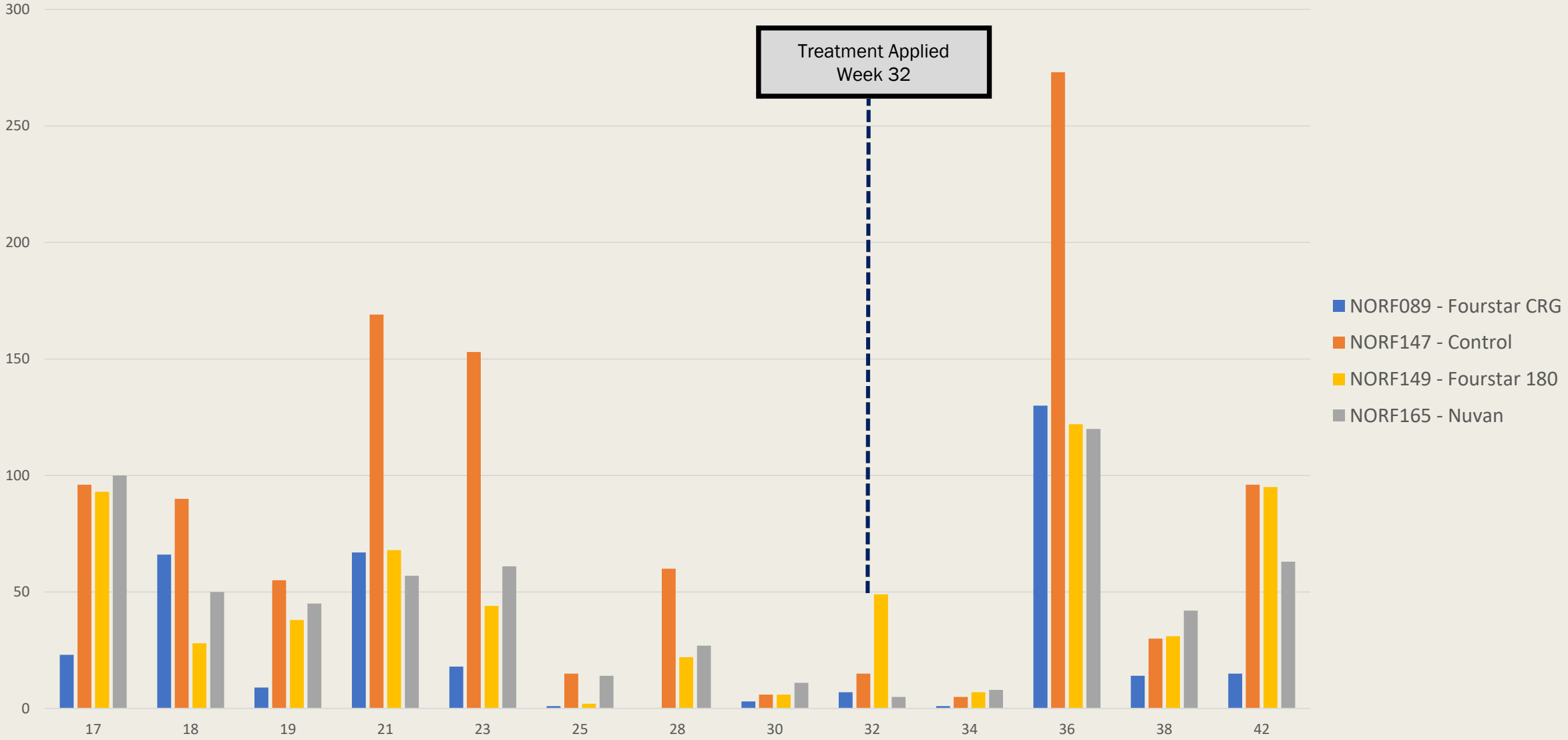

RICH D MACHINE WORKS
NORFOLK VA


City of
Norfolk
WASTEWATER
PUMPING STATION
1300
CAUTION

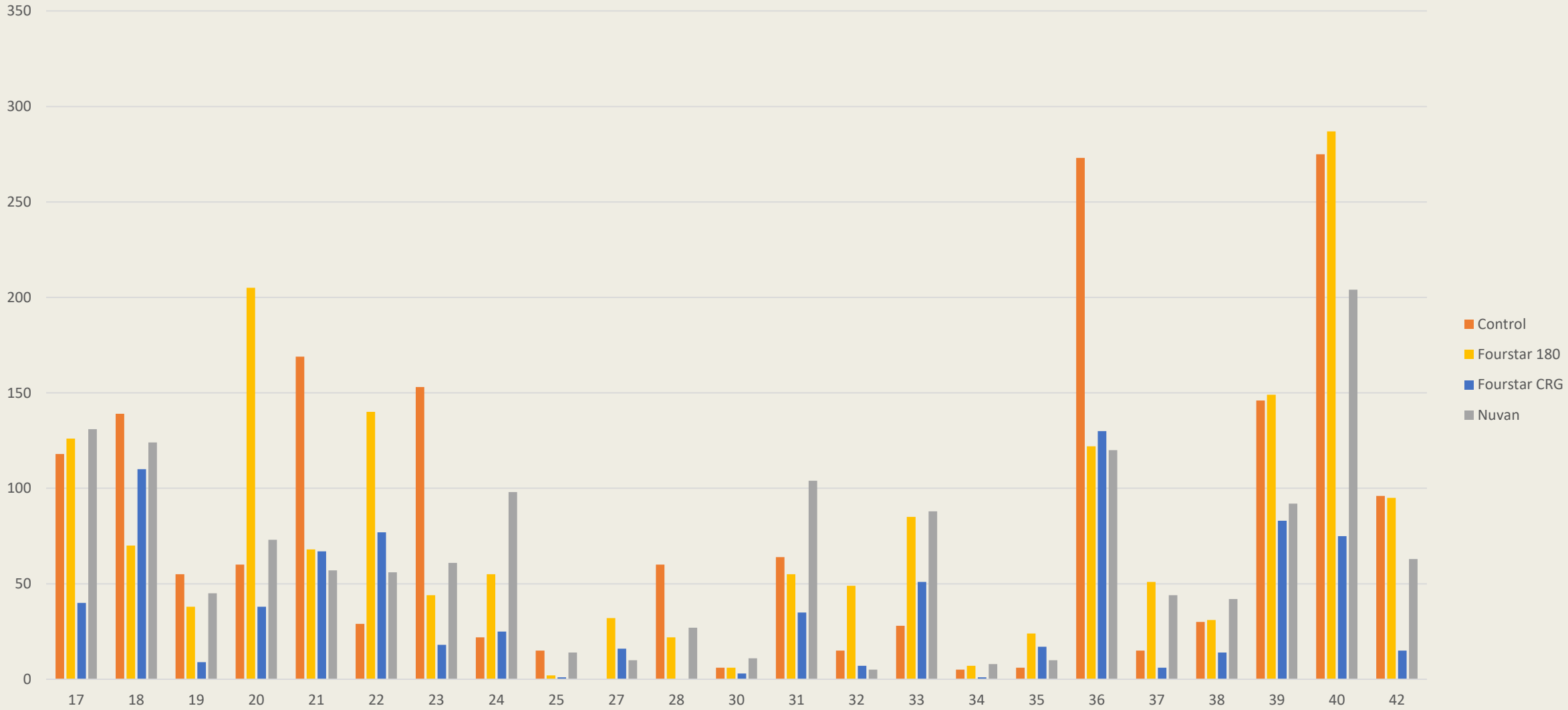
Results - Kempsville



Results - Norview



Results – All Traps



Results

Treatments applied at Week 32

Decrease for 2 weeks post treatment

Sharp Increase at Week 36

Treated areas follow same trends as control areas

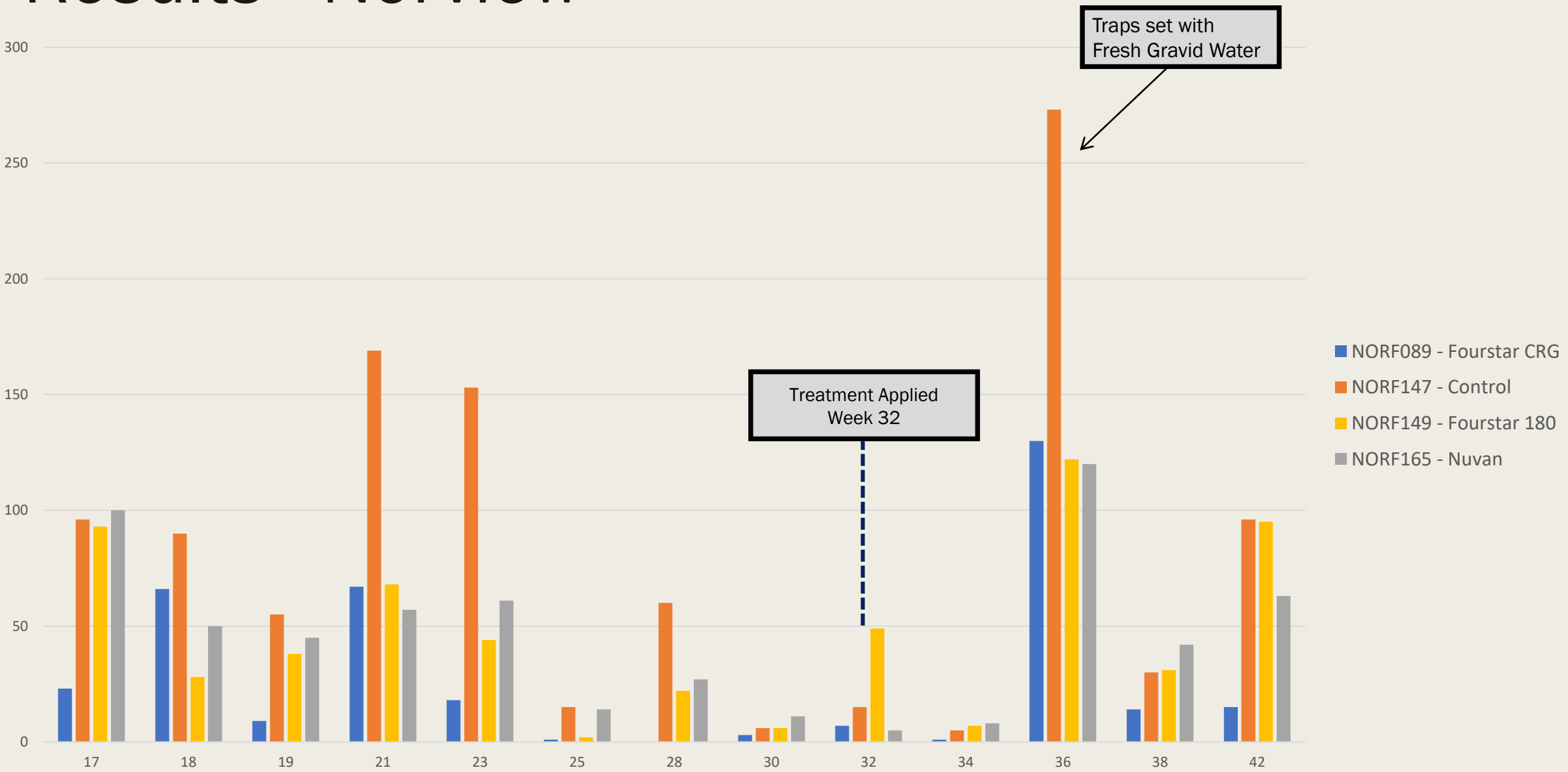
No significant suppression observed

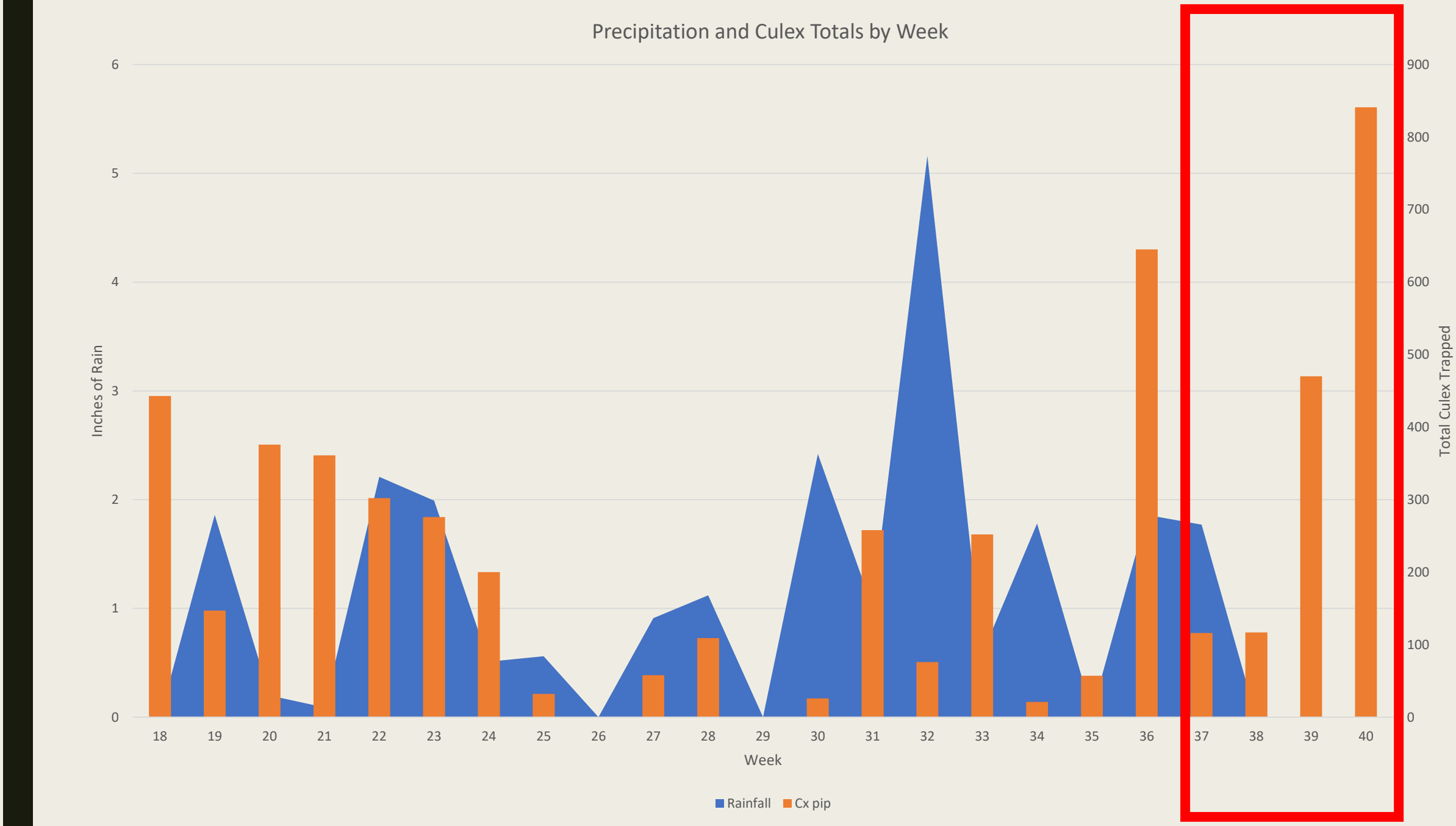
Trapping numbers impacted by other influences

Gravid Water

- Two barrels in rotation when on full scale trapping schedule
  - *Approximately 36 gravid traps set per week*
  - *Gravid water also used by Naval Station for gravid trapping*
- 2019, Reduced trapping schedule due to loss of Environmental Health Assistant
  - *Right barrel regulary updated, left barrel not refreshed.*
  - *Left barrel used for study sites*

Results - Norview




Precipitation and Culex Totals by Week
Inches of Rain
Total Culex Trapped
Week
Rainfall
Cx pip
0
1
2
3
4
5
6
0
100
200
300
400
500
600
700
800
900
18
19
20
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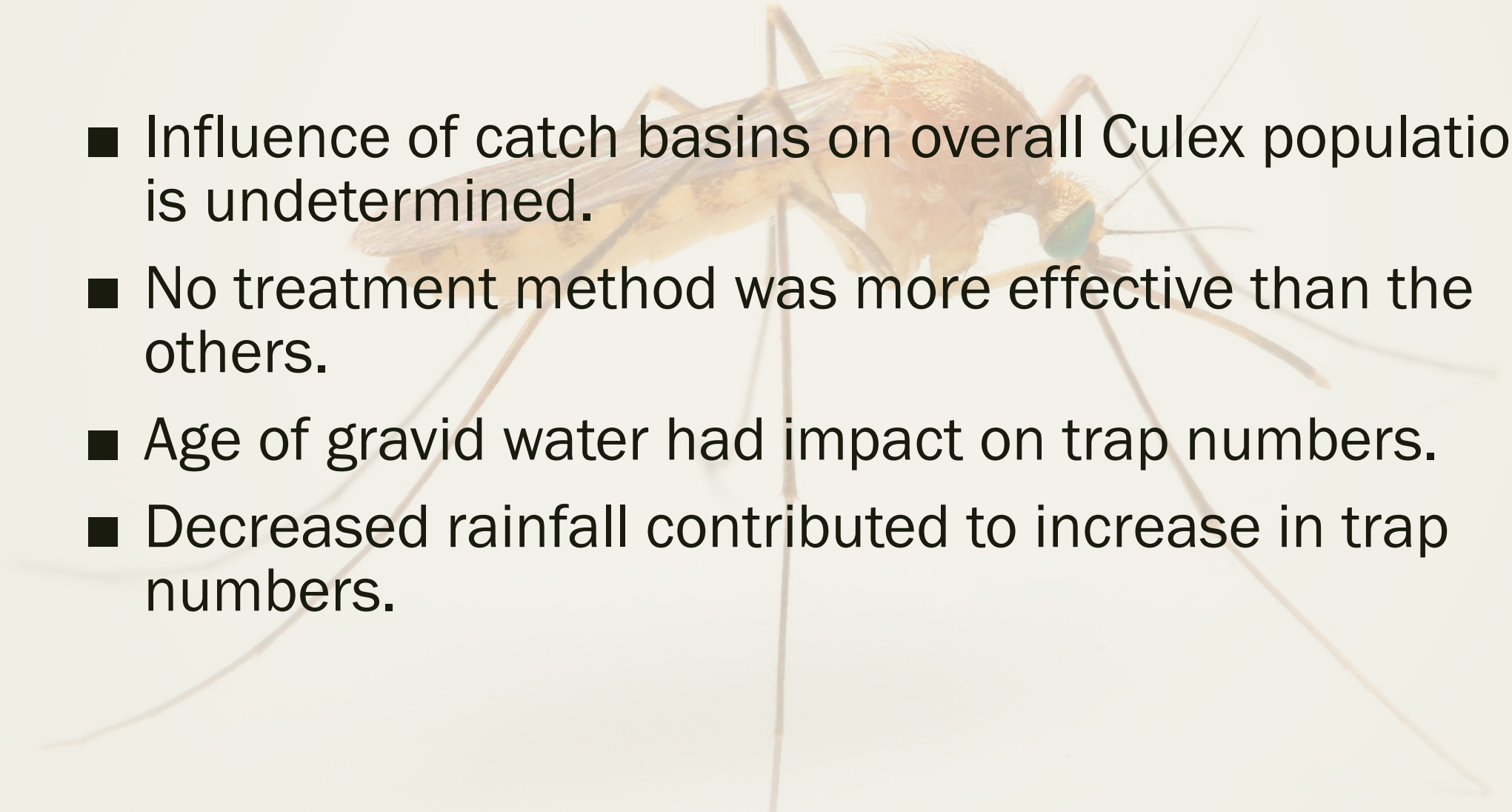
Conclusions



- Influence of catch basins on overall Culex population is undetermined.
- No treatment method was more effective than the others.
- Age of gravid water had impact on trap numbers.
- Decreased rainfall contributed to increase in trap numbers.

Acknowledgements

- Stephen Rehak
- City of Norfolk Vector Control Staff
  - *Al Parker*
  - *Luz Grant*
  - *Kenny Jackson*
  - *Greg Atkinson Sr.*
  - *Mona Smith*
  - *Philip Benton*
- Ted Bean, Adapco Inc.

Any Questions?