

Seasonal Distribution of *Culex coronator* in South East North Carolina in 2016-2017

Presented by: Marie Hemmen
Environmental Health Supervisor



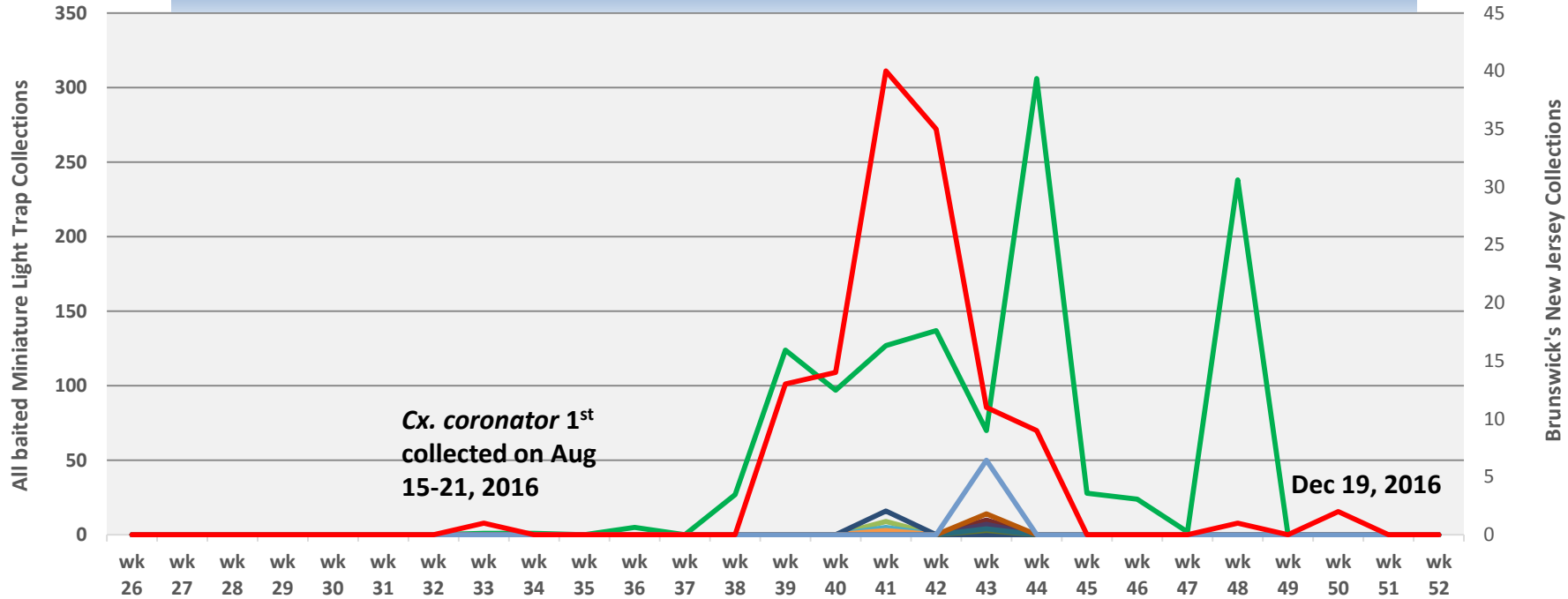
Overview

1. Previous *Cx. coronator* collections
2. Current Distribution of *Cx. coronator* in SE North Carolina
3. Habitats
4. Environmental Factors
 - a. Local and regional temperature
 - b. Local and regional precipitation
5. Conclusions

Previous known *Cx. coronator* collections

1. Louisiana in May- Aug, 2004 (Debboun et al. (2005))
2. Mississippi in Aug-Oct, 2005 (Goddard et al. (2006))
3. Alabama, Post Hurricane Katrina, Sep-Nov, 2005 (McNelly et al. (2007))
4. Florida, 17 separate collections Aug-Nov, 2005 (Smith et al. (2006))
5. Georgia and S. Carolina, Oct-Dec, 2007 (Moulis et al. (2008)).
6. SE North Carolina in Sept 2008, Oct 2012, Nov 2013, and Nov 2015

Cx. coronator Collected in South East North Carolina 2016



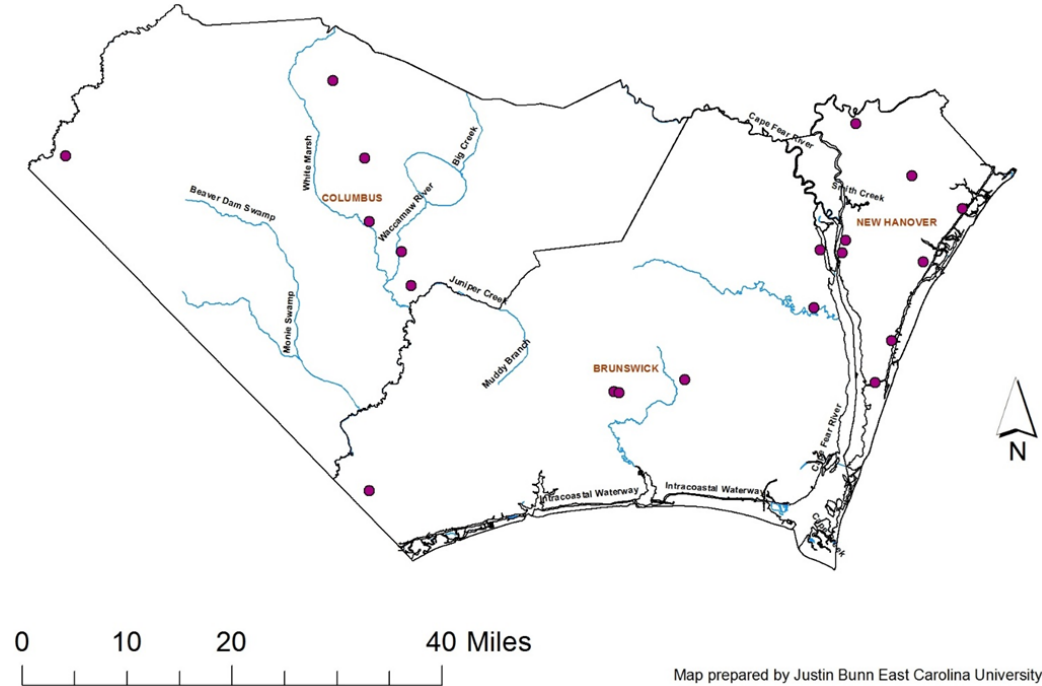
Cx. coronator 1st collected on Aug 15-21, 2016

Dec 19, 2016

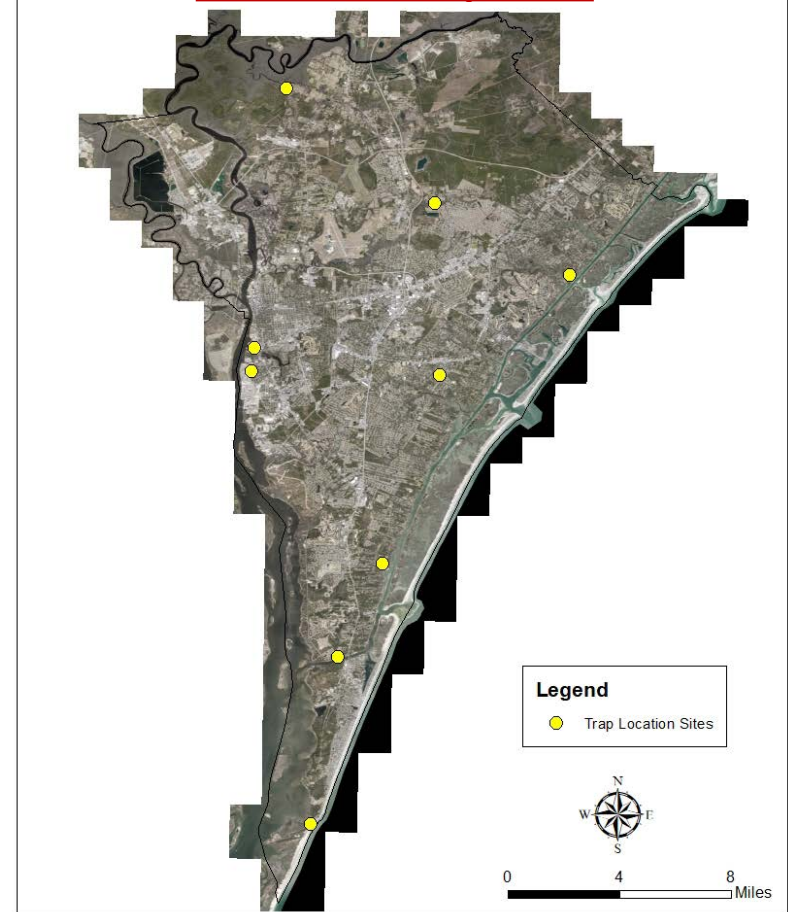
- NHC Miniature Light Trap Totals
- BRU Highland Shores
- BRU 2601 RIVER RD SE
- BRU Galloway Road
- BRU 179 March 9, 1764
- BRU Shingletree
- Col-3
- Col-1
- Col-5
- Col-4
- Col-8
- Col-6
- Brunswick New Jersey Light Trap Totals

Location of *Cx. coronator* Trapped in SE North Carolina

2016 Columbus, Brunswick County & NHC Trap Sites

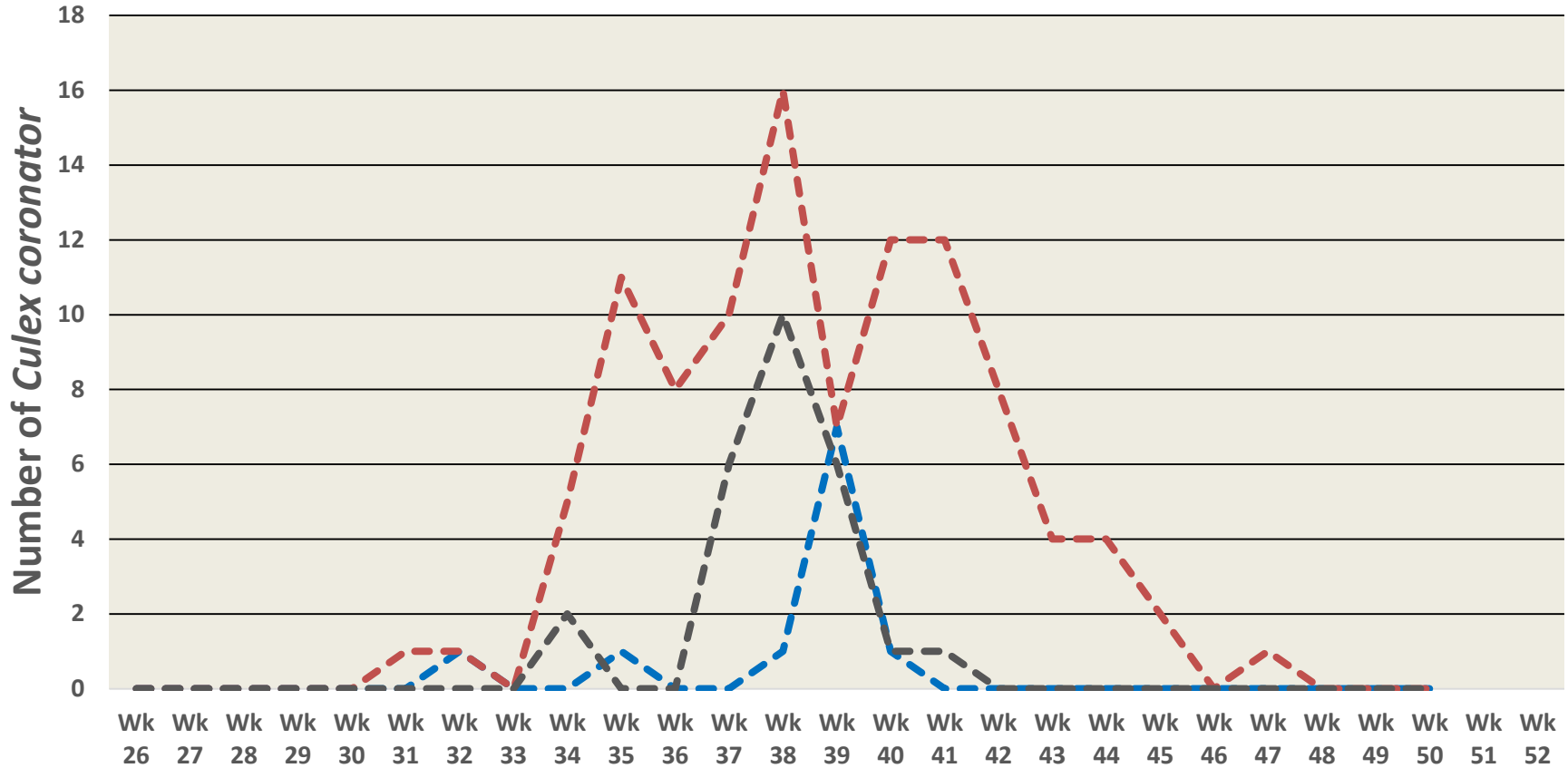


2017 NHC Trap Sites

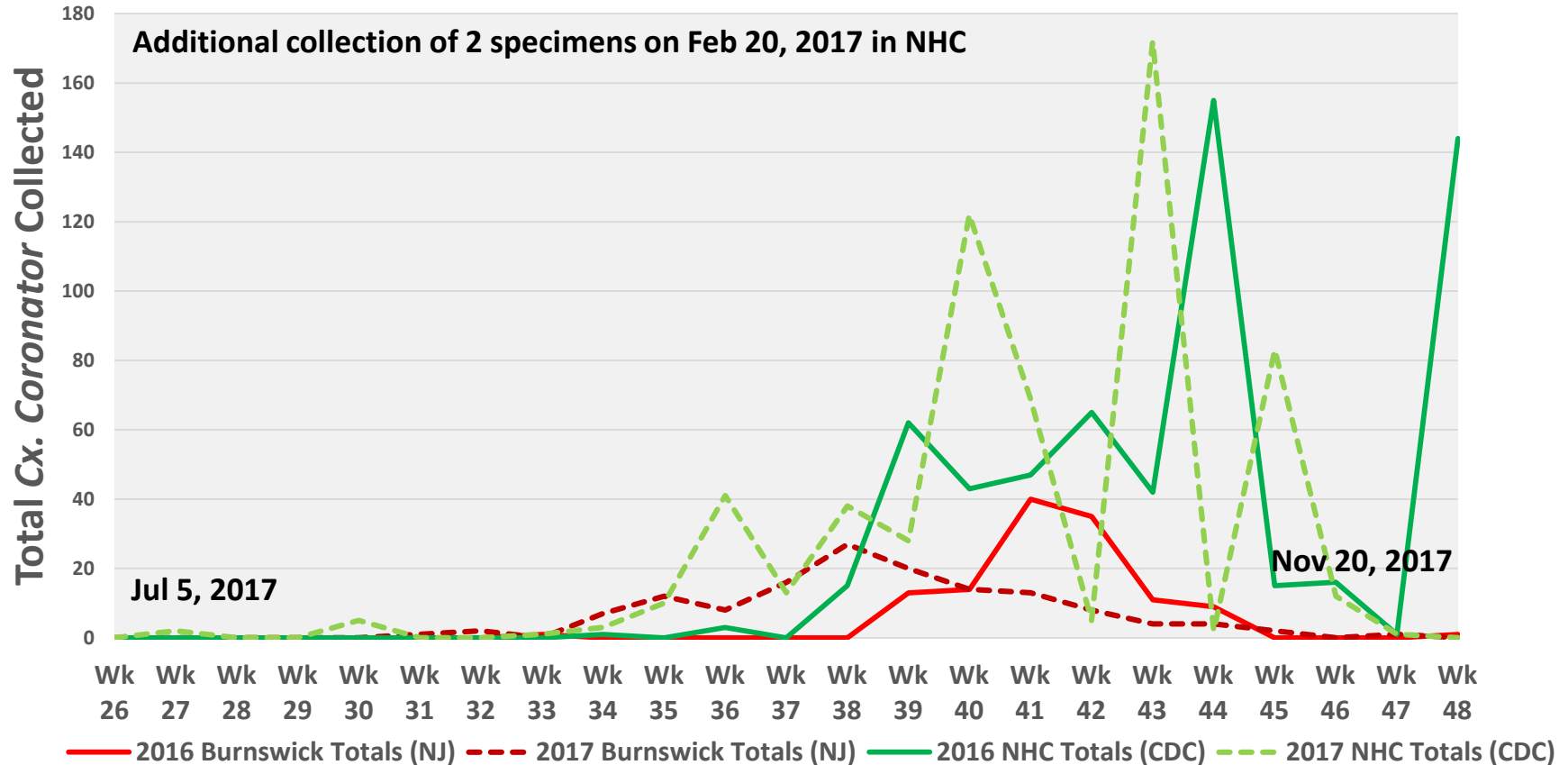


Cx. coronator Collected in Brunswick Co, NC - 2017

2017 Chix Cx.coronator 2017 Fox Cx.coronator 2017 X-Roads Cx.coronator



Cx. coronator 2016-2017 in NHC and Brunswick Co.



Cx. coronator Habitat and Characteristics

1. Larva found in semi-permanent to permanent pools of water.
 - a. clear, highly organic, stained, turbid and/or slightly brackish.
 - b. lows, ruts, ditches, seepage pools, concrete troughs, various containers.
2. Primarily large-sized mammal feeder; will feed on smaller mammals and birds.
3. Specimens tested positive in past for West Nile Virus in U.S..
4. Adults primarily active between dusk to dawn.

Brunswick County Larval Collections

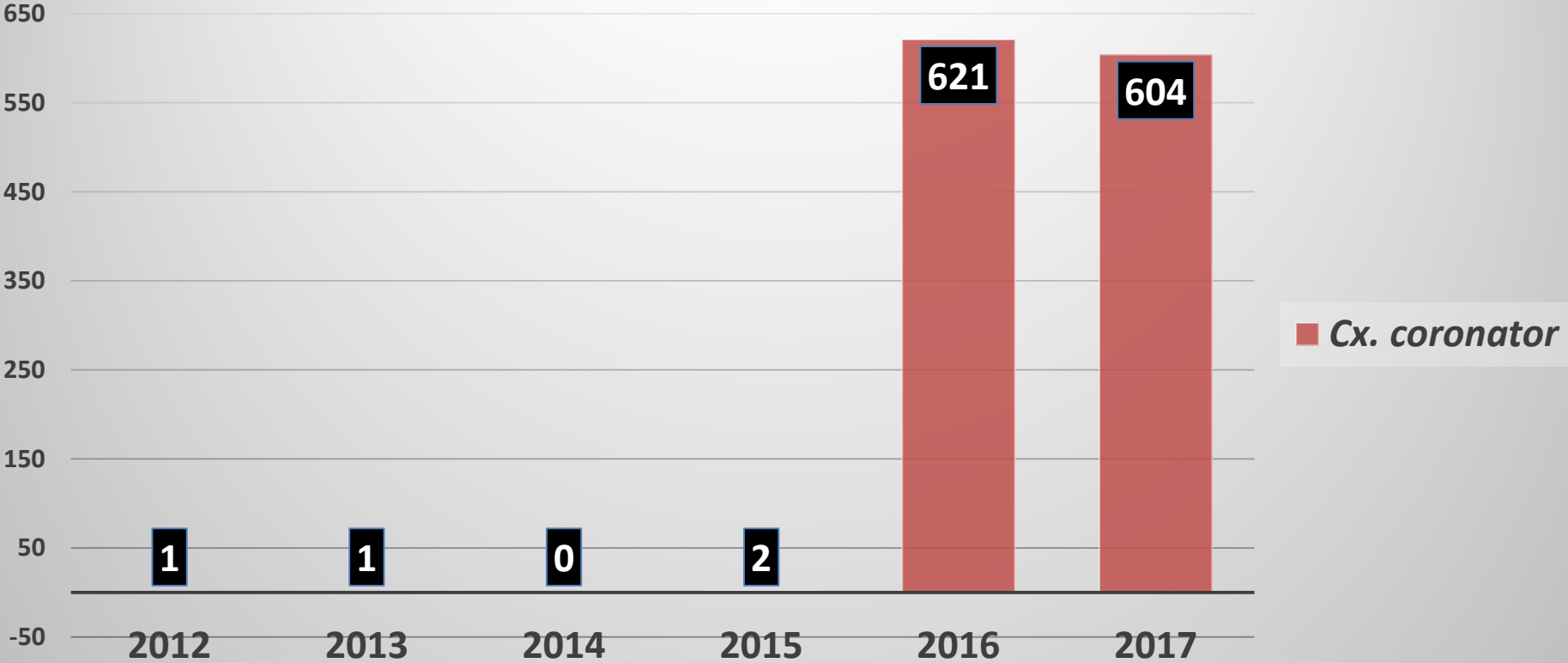


- 93 (4th instar) *Cx. coronator* larvae collected Oct. 5th-Oct 16th, 2017 at Gov. Complex in Brunswick Co. (initial collection on 10-5-17 had tadpoles).



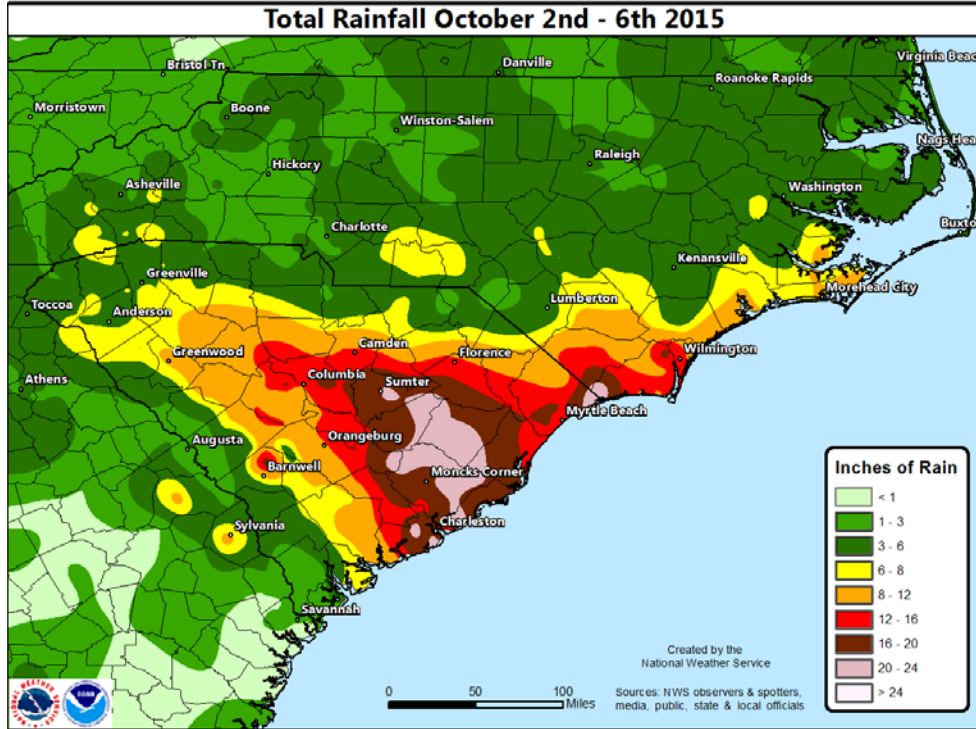
- 13 *Cx. coronator* larvae collected 30 miles Bolivia in S. Brunswick Co. Water lilies and tadpoles were present.

2012-2017 Total *Cx. coronator* Caught in NHC CDC Light Traps



Historical Rainfall Event of Oct, 2015

12-16 inches fell in NHC & > 16 + inches in Brunswick Co.

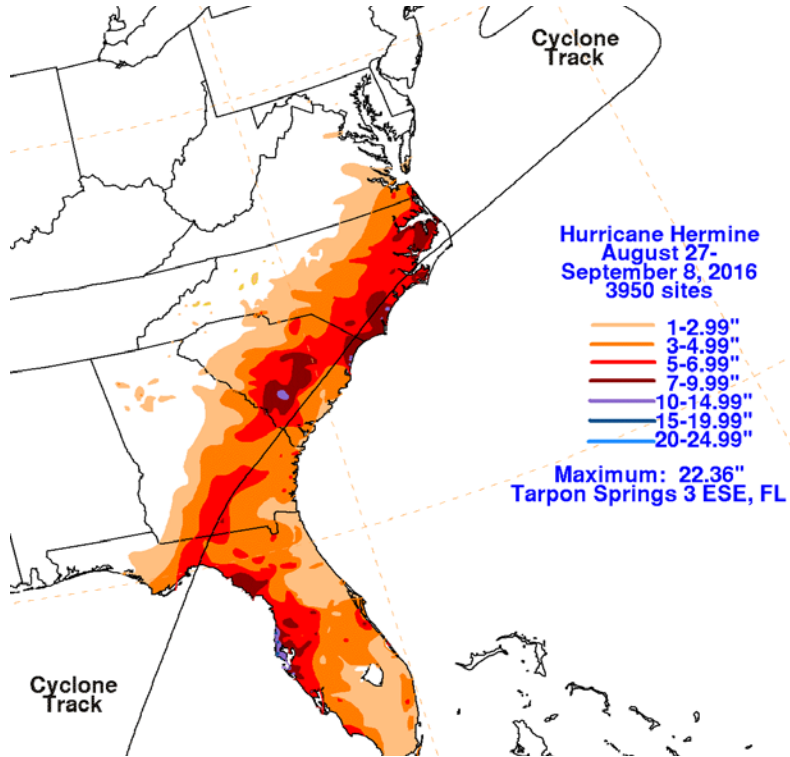


- Hurricane Joaquin passing well to the east.
- Upper level low pressure system off the Southeast U.S. coast.
- Stalled cold front causing major coastal flooding.

Tropical Storm Hermine

Aug. 27-Sept. 8, 2016 (week 35)

9 inches fell in NHC



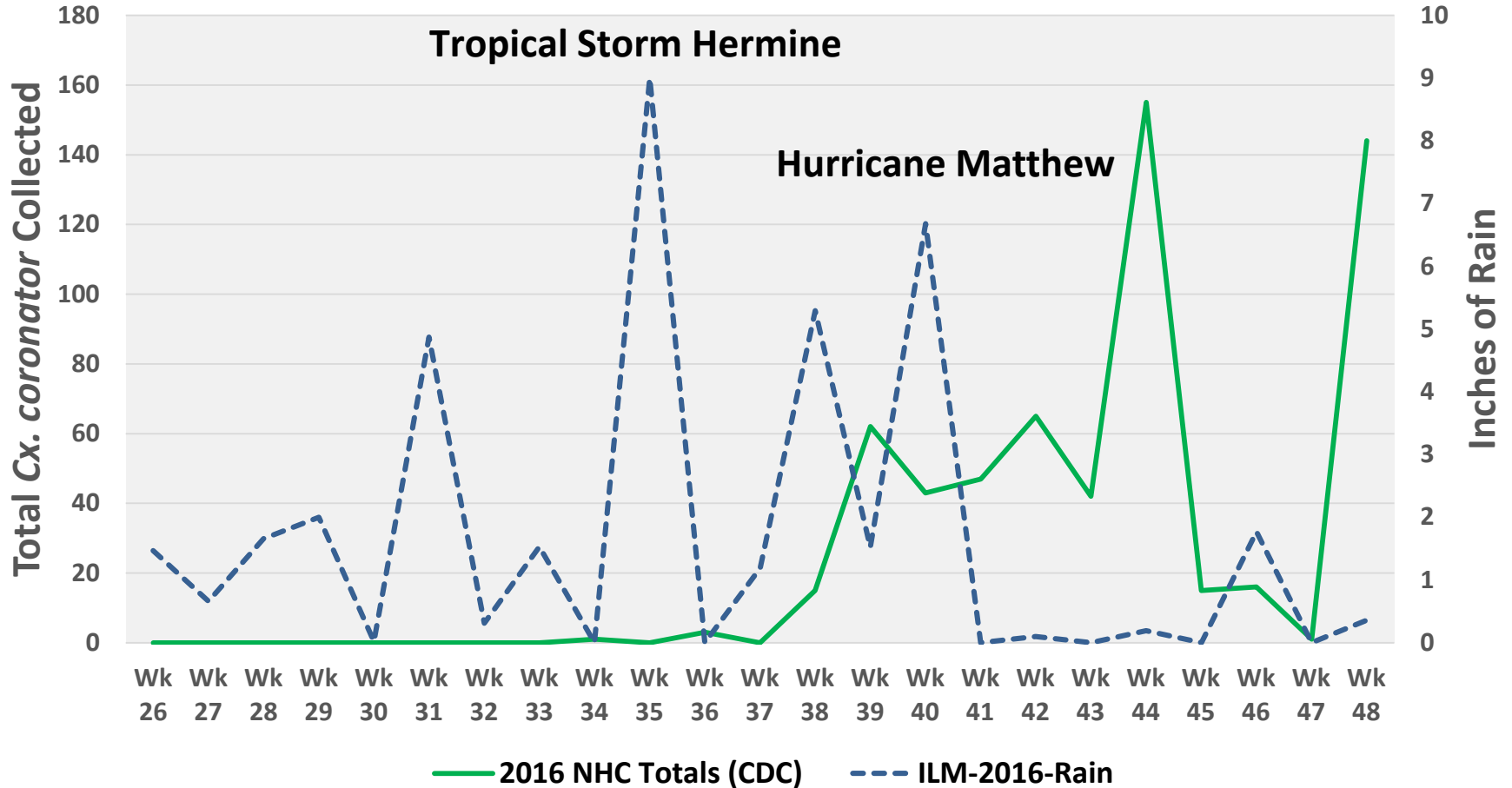
Hurricane Matthew

Made landfall Oct 8, 2016

6-7 inches fell in NHC



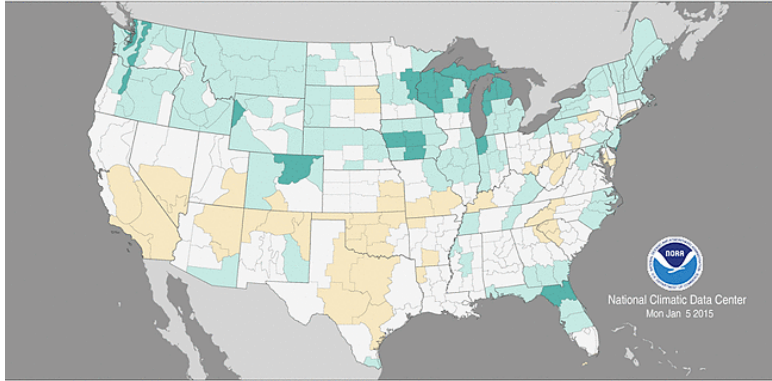
Cx. coronator vs. Rain 2016 New Hanover Co.



Divisional Precipitation Ranks

January–December 2014

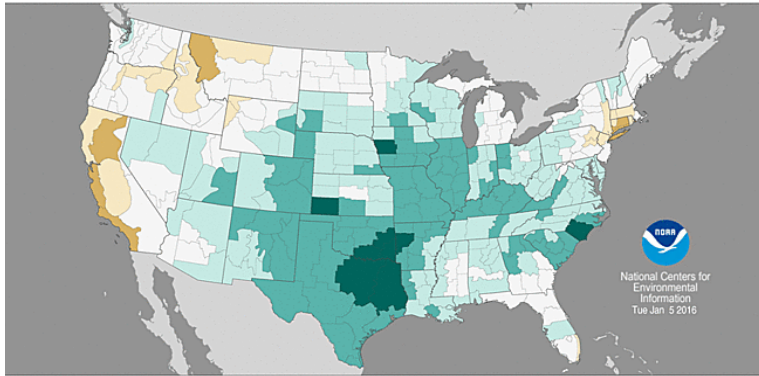
Period: 1895–2014



Divisional Precipitation Ranks

January–December 2015

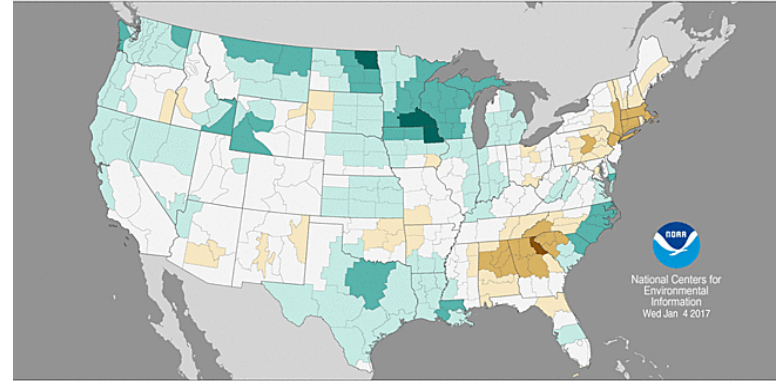
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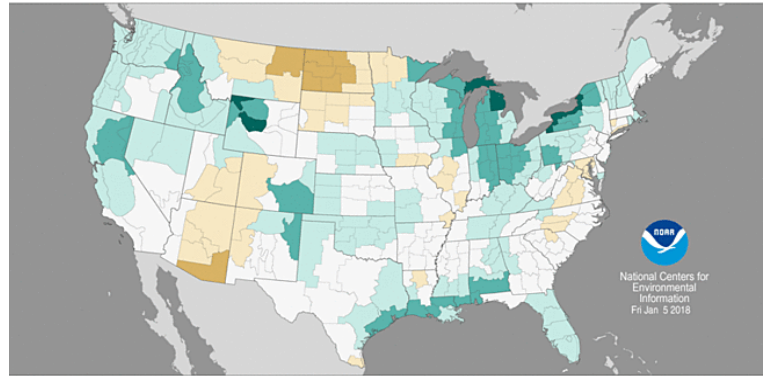
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Divisional Precipitation Ranks

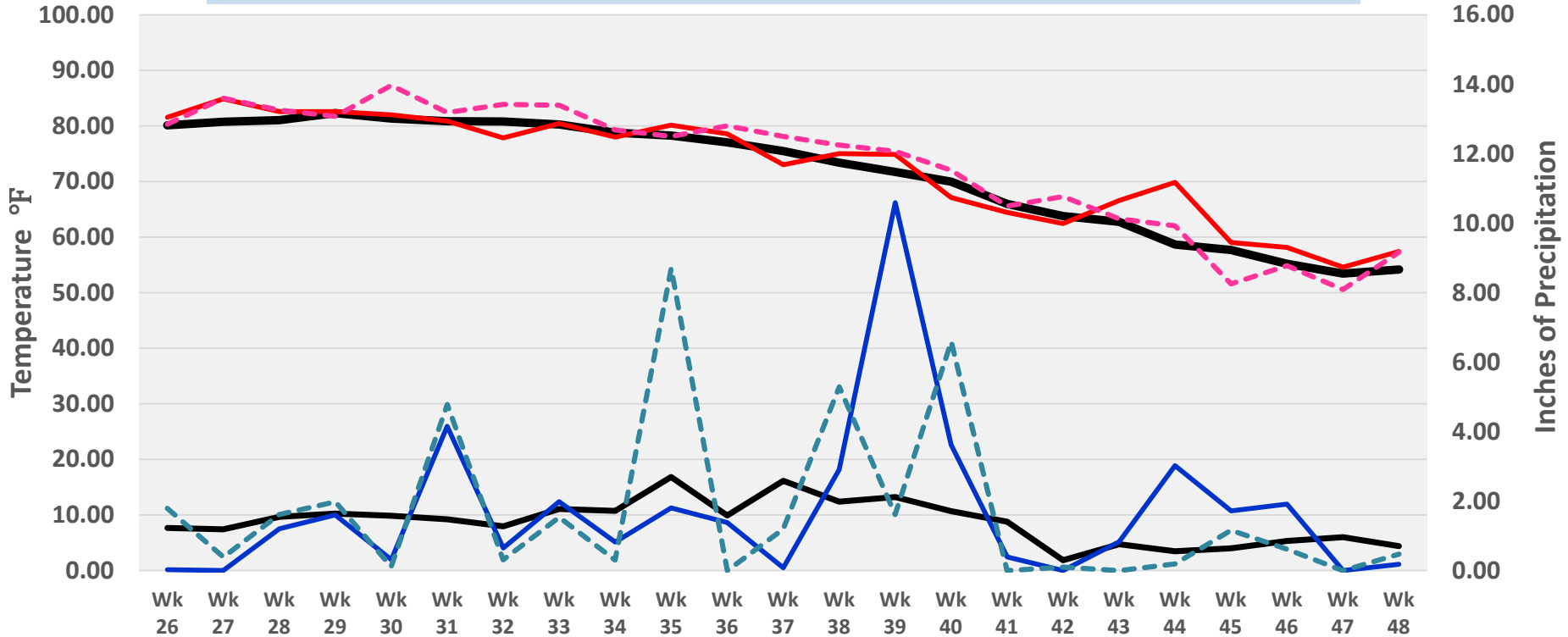
January–December 2017

Period: 1895–2017



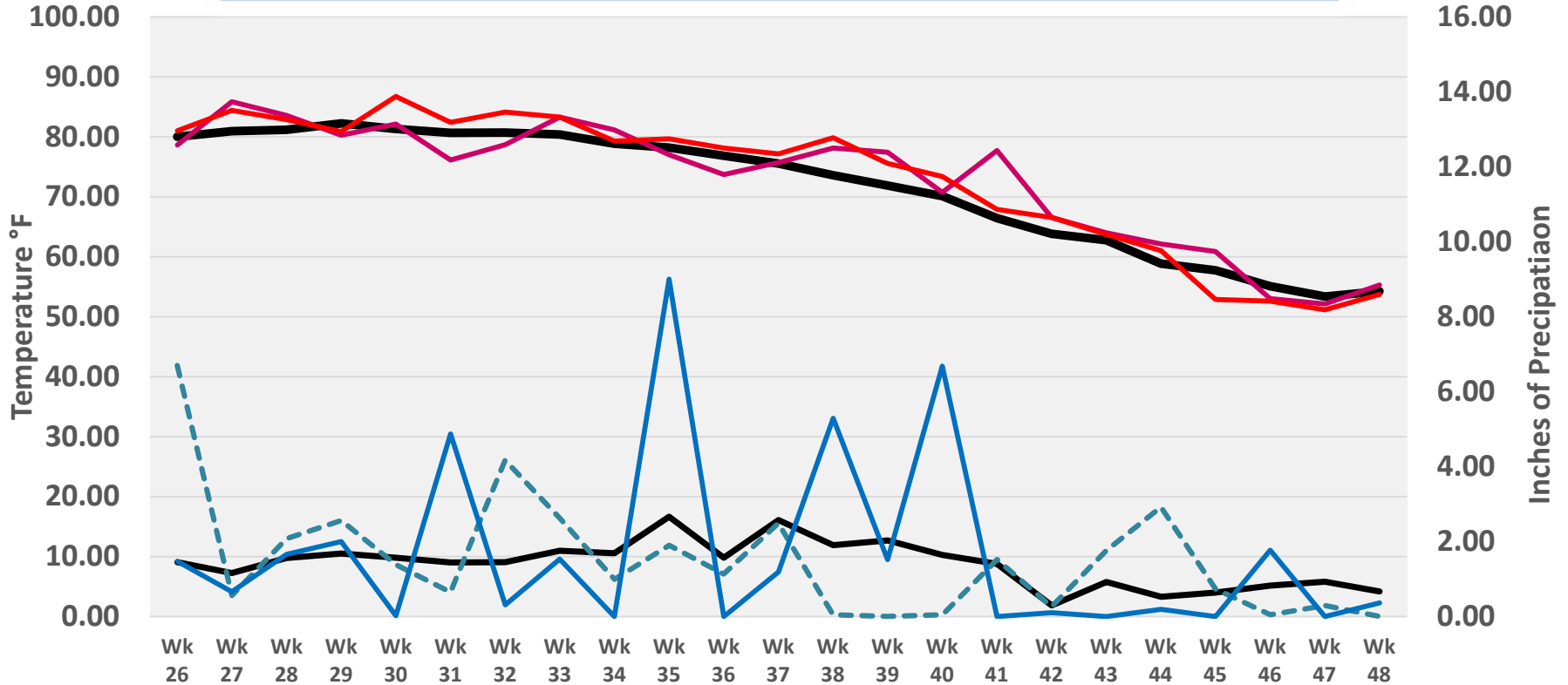
2015-2016 Temperature and Precipitation Data Wilmington

ILM Weekly Temp Average Wilmington Temp 2015 Wilmington Temp 2016
Weekly Precip Average ILM Wilmington Precip 2015 Wilmington Precip 2016



2016-2017 Temperature and Precipitation Data Wilmington

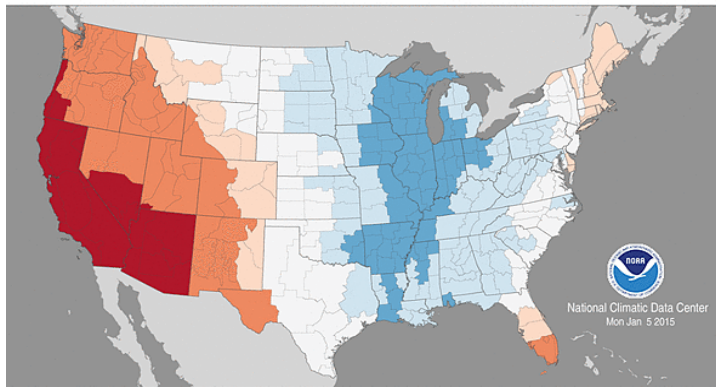
ILM-AVG-Temp ILM-2017-Temp ILM-2016-Temp
ILM-AVG Rain ILM-2017-Rain ILM-2016-Rain



Divisional Average Temperature Ranks

January–December 2014

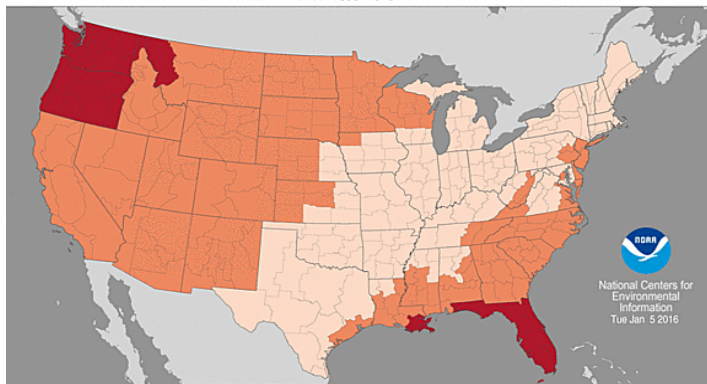
Period: 1895–2014



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January–December 2015

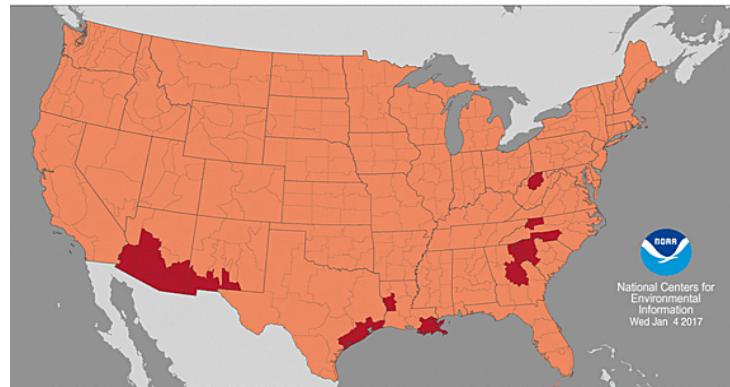
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January–December 2016

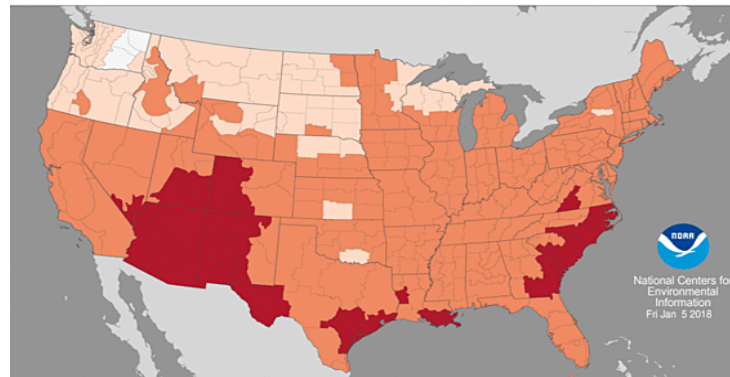
Period: 1895–2016



Divisional Average Temperature Ranks

January–December 2017

Period: 1895–2017



2014-2017 Most Common 10 Species collected in NHC in CDC Light Traps

2014

Cx. salinarius - 13,038
Ae. infirmatus - 10,066
Cs. melanura - 6,082
***Ae. taeniorhynchus* - 5,103**
Ae. vexans - 3,710
An. crucians complex - 3,202
Ae. c. canadensis - 2,579
Ps. ferox - 1,711
Cx. erraticus - 1,585
Cq. perturbans - 1,326

2015

***Ae. taeniorhynchus* - 23,592**
Cx. salinarius - 11,358
Ae. vexans - 9,490
Ae. infirmatus - 6,971
Cs. melanura - 2,828
An. crucians complex - 2,655
Cq. perturbans - 2,429
Cx. erraticus - 1,608
Ae. c. canadensis - 1,343
Ps. columbiae - 1,052

2016

Cx. salinarius - 19,837
***Ae. taeniorhynchus* - 6,583**
Ae. vexans - 6,085
An. crucians complex - 5,704
Ae. infirmatus - 4,047
Cs. melanura - 1,782
***Cx. nigripalpus* - 1,301**
Cq. perturbans - 941
***Cx. coronator* - 615**
Ae. c. canadensis - 489

2017

Cx. salinarius, 6,812
***Cx. nigripalpus* - 6,682**
An. crucians complex - 6,137
Ae. vexans - 4,586
Ae. infirmatus - 4,184
***Ae. taeniorhynchus* - 4,174**
Cs. melanura - 2,567
Ae. atlanticus/tormentor 1,136
Ps. ferox - 1,047
***Cx. coronator* - 604**

Culex coronator distribution Conclusions

1. Populations dramatically increased in 2016 in SE NC.
2. Historical and ongoing weekly surveillance will allow for better understanding of environ. conditions.
3. They will over winter.
4. Rainfall a factor-Heavy rains and a saturated floodplain caused areas normally dry, to be flooded high on the landscape.
5. Temperature a factor -Warm winter in 2015-2016 after major flooding.
6. Follow same seasonal distribution as *Cx. nigripalpus*.
7. This species is here to stay.

Acknowledgements

- Jeff Brown, Brunswick County Mosquito Control District (data)
- Justin Bunn, East Carolina University (maps and graphs)
- New Hanover County Vector Control Staff (surveillance)
- NOAA website (temp and precip. data)
- Bruce A. Harrison “Culex coronator is coming your way!” Presentation

