



# **Zika and *Aedes* Vector(s) in New Jersey**

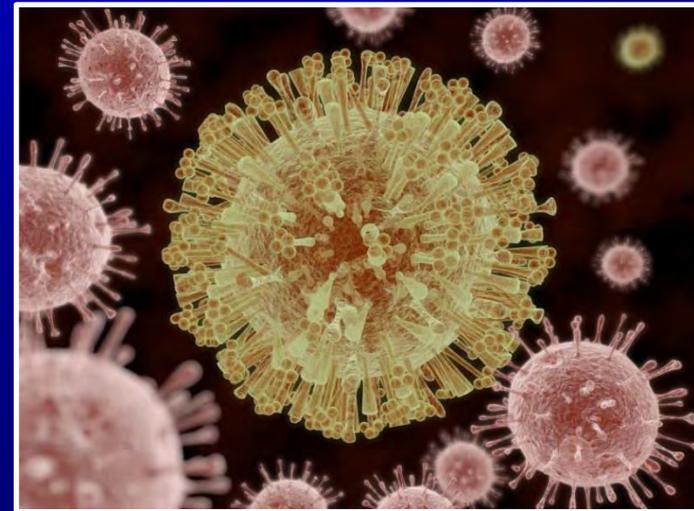
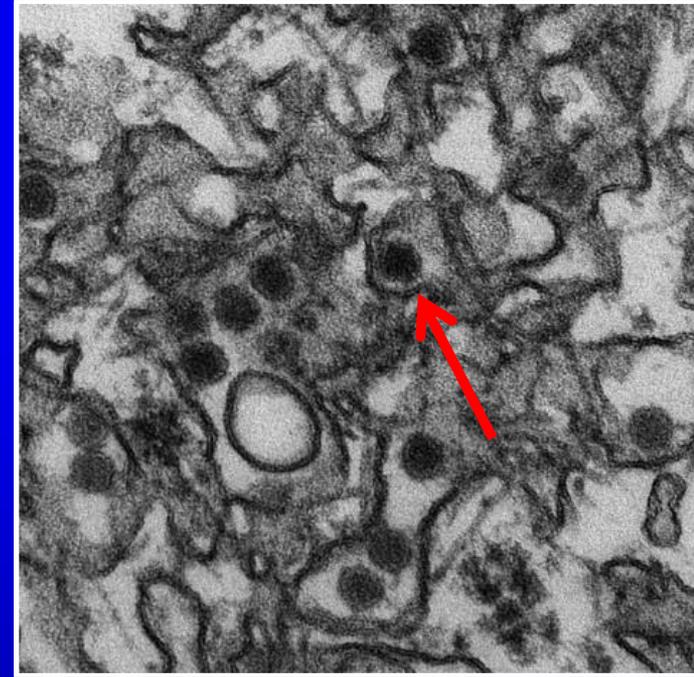
**NJACCHO Zika Virus Workshop  
22-June-2016**

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# Objectives

- Introduction
- Vector species
- Anticipated activity
- Public engagement

**Mosquito control is everybody's responsibility  
It is a big job & everyone needs to do their part!**



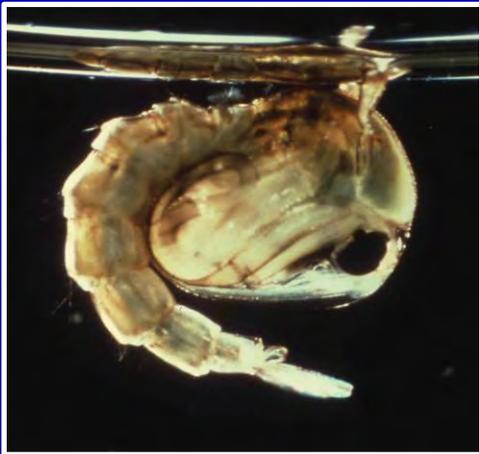
# Mosquito life cycle



**Terrestrial Adult**

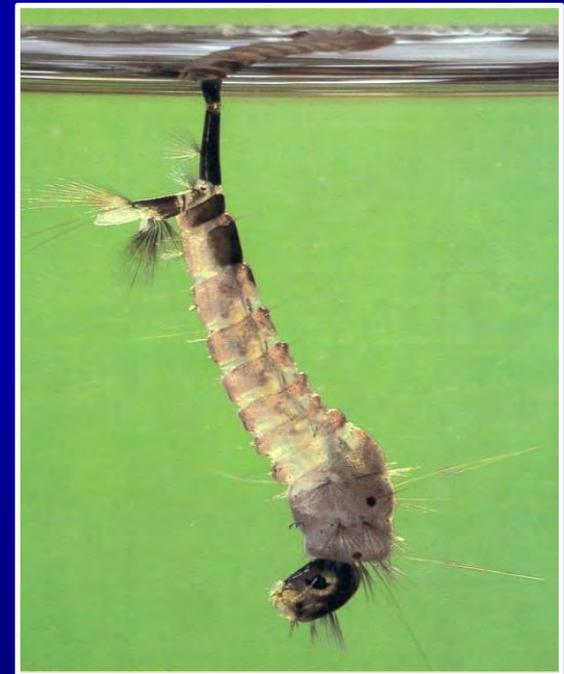


**Egg**



**Aquatic Pupa**

**Remove the water  
Remove the problem**



**Aquatic Larva**



**Female Mosquitoes Bite - Need Blood to Reproduce**



**Use Protein in Blood to Produce Eggs**



**Both Male & Female mosquitoes Require a Sugar Source to Feed on**

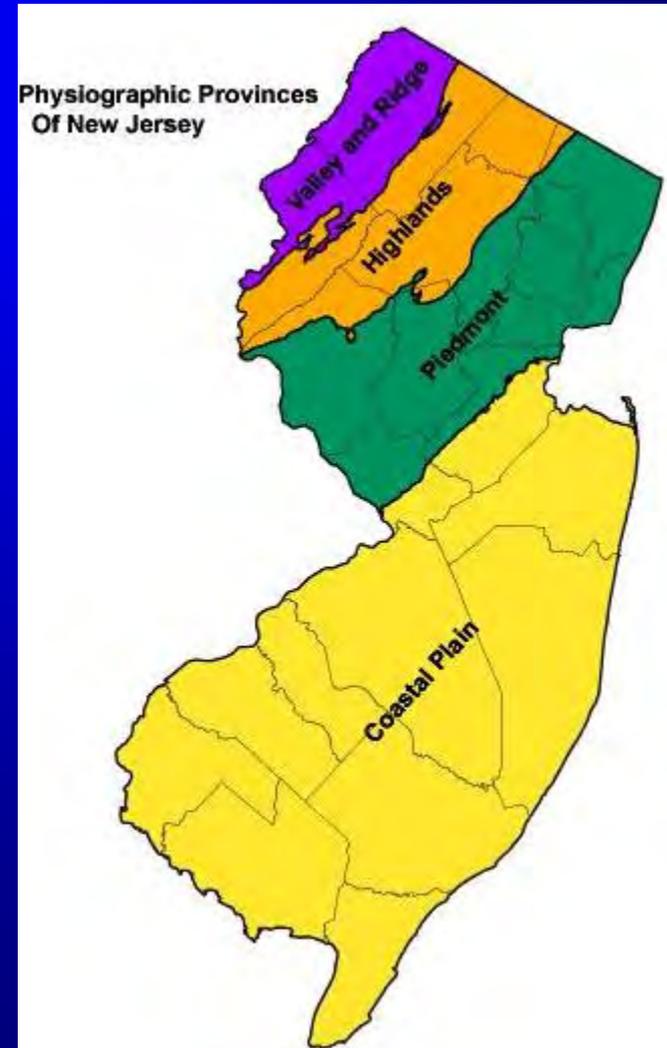
# Mosquito larvae develop in shallow bodies of stagnant water

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# New Jersey mosquitoes

- 63 species
- Preferred larval habitat
- Most harmless
- Species diversity tied to regions
- Domestic mosquitoes



**Knowing the species biology is key to successful control**

# Life cycle types



**Floodwater Life Cycle  
(Aedes Model)**



**Permanent Water Life Cycle  
(Domestic Culex Model)**

# Floodwater mosquitoes

**Eggs must dry down**

**Can wait in a state of  
suspended animation  
until conditions are  
right for hatching**

**Hatch in broods after  
each summer rain**



**Most floodwater mosquitoes are avid human biters**

# Permanent water mosquitoes

Eggs must remain moist

A few have pollution tolerance

Never occur in broods

Tend not to range



**WNV vectors in this group are mainly bird feeders**

# Overwintering mechanisms differ

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**Floodwater Mosquito  
overwinter as Eggs**



**Permanent Water Mosquitoes  
Hibernate as Mated Females**

# Review

**Floodwater mosquitoes  
use temporary pools**

**Permanent water  
mosquitoes use  
bogs & swamps**

**Container habitats  
support both life cycle  
types**

**Containers common in  
backyard setting**

**Containers move  
w/ people**



# Old Maps

Approximate distribution of *Aedes aegypti* in the United States\*



Approximate distribution of *Aedes albopictus* in the United States\*



Maps were developed by CDC using currently available information. Mosquito populations may be detected in areas not shaded on this map, and may not be consistently found in all shaded areas.

## CDC Survey widely distributed

<https://docs.google.com/forms/d/1eqWDzmFw7AEGDyooZwpUXsebz8qrUkzQJ82PDiYLPI/viewform?c=0&w=1>

**NJAES encouraged local NJ programs fill out survey based on county records**

# Estimated Range of *Aedes aegypti* and *Aedes albopictus* in the United States

Estimated range of *Aedes aegypti* in the United States, 2016\*



Estimated range of *Aedes albopictus* in the United States, 2016\*



\*These maps **DO NOT** show:

- Exact locations or numbers of mosquitoes living in an area
- Risk or likelihood that these mosquitoes will spread viruses

These maps show:

- CDC's best estimate of the potential range of *Aedes aegypti* and *Aedes albopictus* in the United States
- Areas where mosquitoes are or have been previously found

**Actual distribution of both species is patchy**

*Aedes aegypti* mosquitoes are more likely to spread viruses like Zika, dengue, chikungunya, and other viruses than other types of mosquitoes like *Aedes albopictus* mosquitoes.

**New maps (*Aedes aegypti*)  
generated considerable attention!**

**Information likely being misinterpreted**



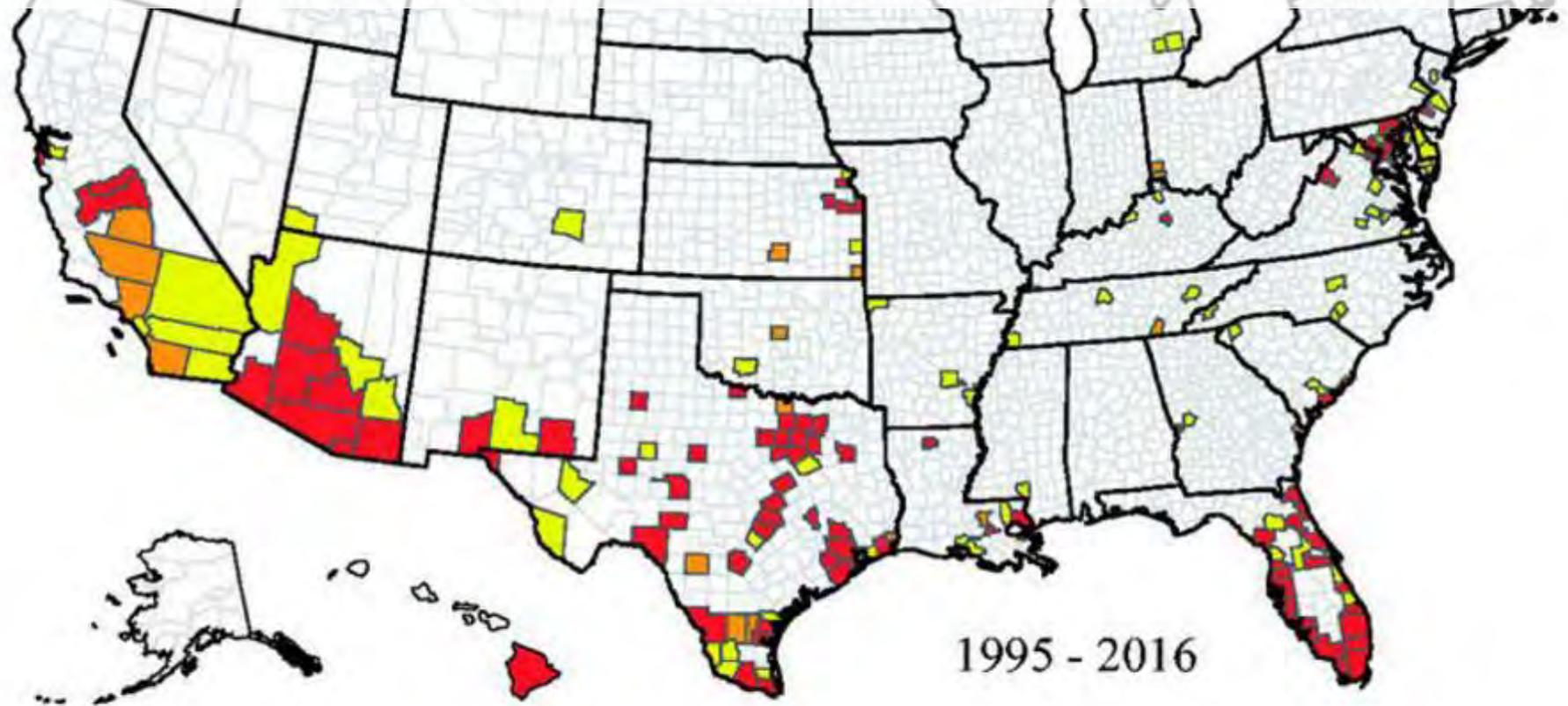


# ZIKA

## FEAR

## Caution:

- 1) Not all counties collect/report mosquito surveillance data across the US. Local programs not supported.
- 2) Surveillance effort that is in place significantly varies



Counties where *Aedes aegypti* was reported between Jan. 1, 1995, and March 2016. Counties in yellow recorded one year of *A. aegypti* being present; those shown in orange recorded two years; and those shown in red, three or more years.

# Zika vectors

- Container mosquitoes
- Develop in <1L of water



# Endless examples





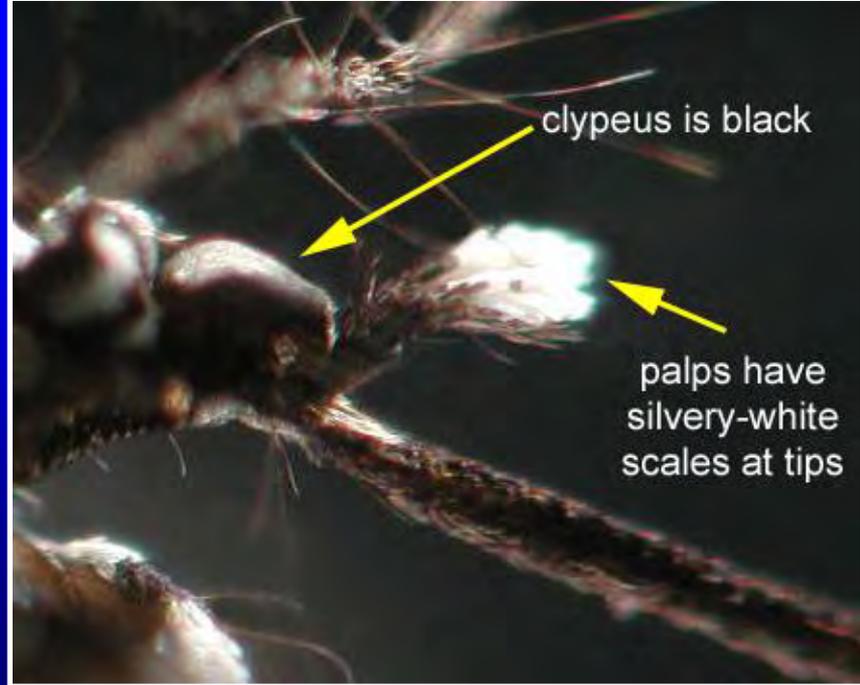
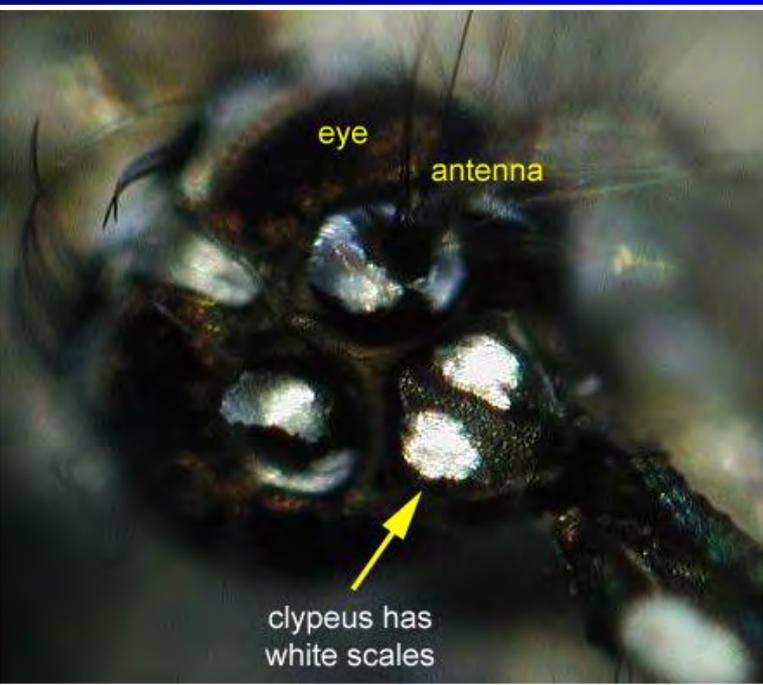
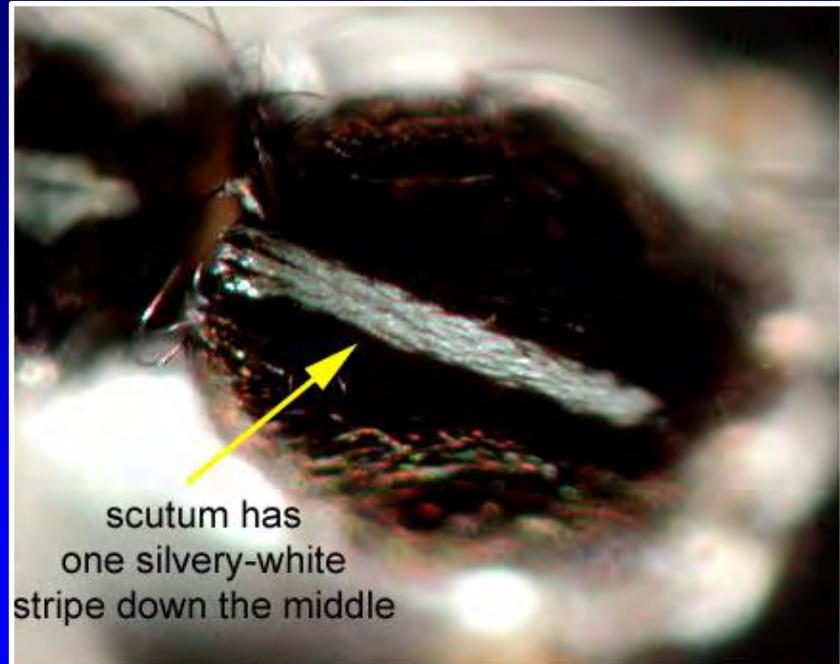
# *Aedes aegypti*

- Urban mosquito
- Container habitats
- Stealthy day biting mosquito (dusk & dawn)
- Multiple bloodmeals
- Endophilic
- Anthropophilic
- Cannot survive winter (cold kills eggs)
- Not established in NJ
- Must be reintroduced
- Occasional problem inside the house and in the backyard
- 1991 last confirmed population in NJ

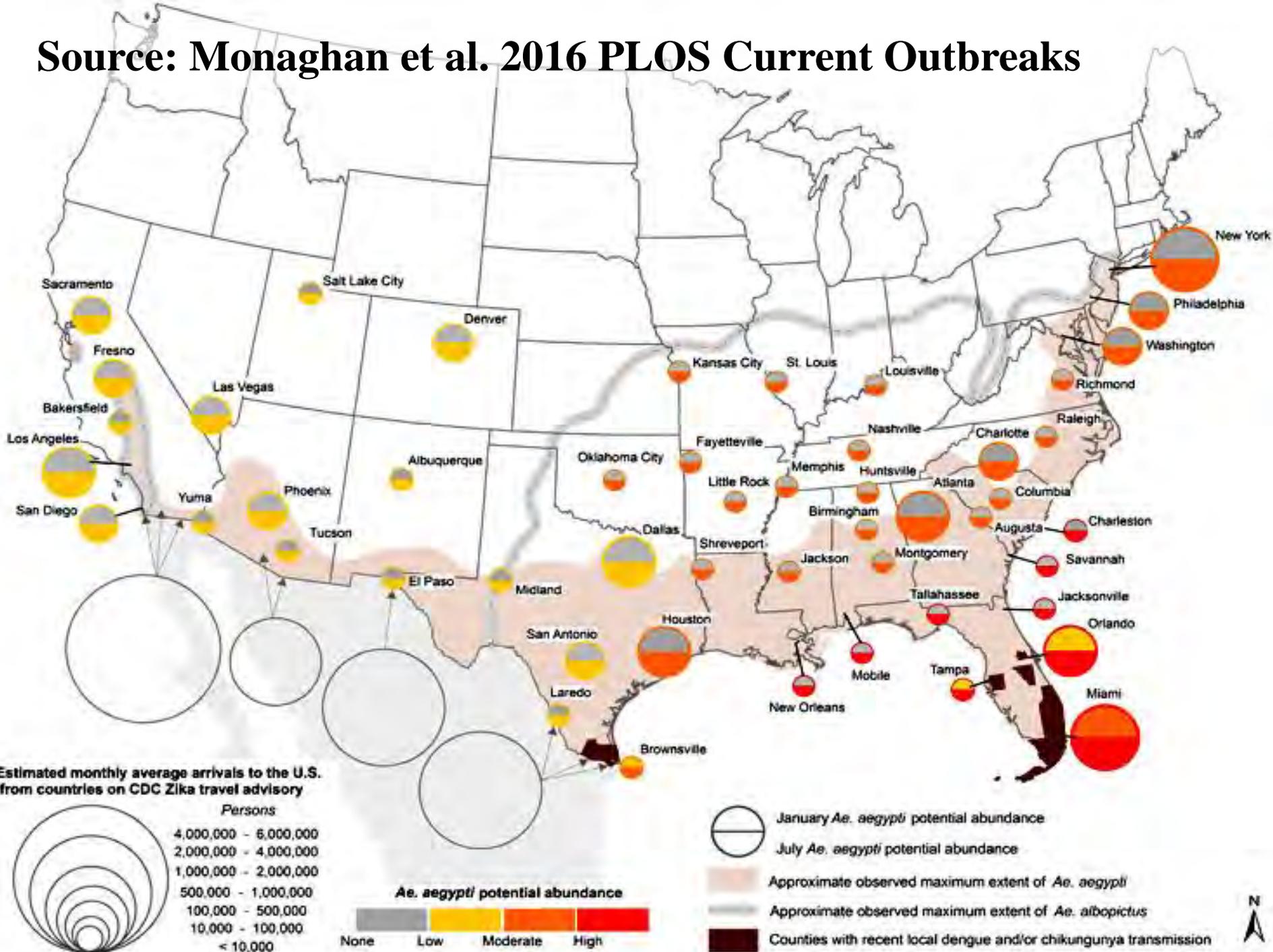


# ***Aedes albopictus***

- **Highly adaptive**
- **Natural & artificial containers**
- **Rural & suburban populations**
- **Opportunistic day biting** (dusk & dawn)
- **Will feed at night**
- **Outside & inside**
- **Wider host range**
- **Established in NJ, 95**
- **Eggs survive winter**
- **Annual backyard problem**



# Source: Monaghan et al. 2016 PLOS Current Outbreaks





**ZIKA**  
**Action Plan**  
**SUMMIT**  
CDC Atlanta, GA

April 1, 2016

# Recipe for producing mosquitoes

1. Water + 7 d
2. Sugar source
3. Suitable host



# Contact information

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