

# **In Hot Pursuit:**

## What We are Learning About Mosquito and Tick Abundance on Cape Cod

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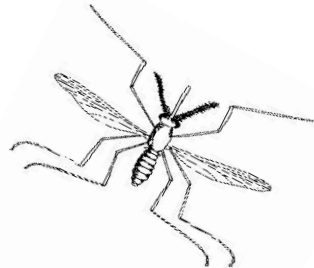
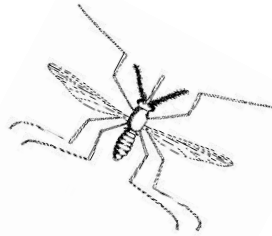
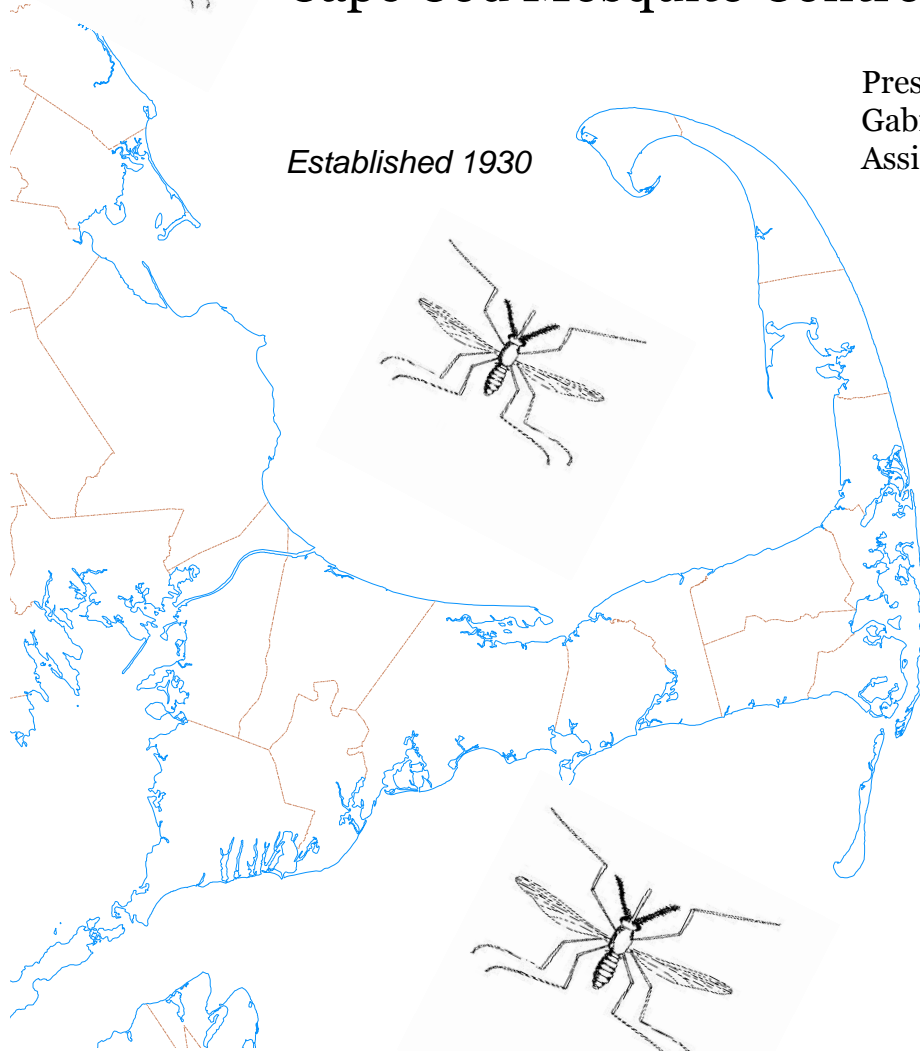


# Cape Cod Mosquito Control Project

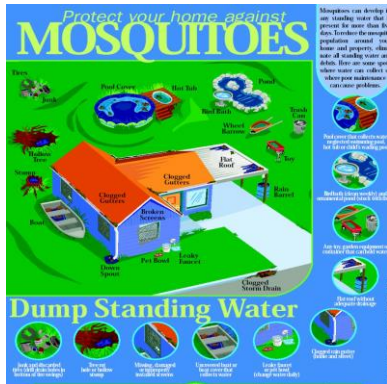
*Established 1930*

Presenter

Gabrielle Sakolsky, Entomologist  
Assistant Superintendent



# Cape Cod Mosquito Control- Integrated Pest Management



Education  
Year round



# Water Management October-March

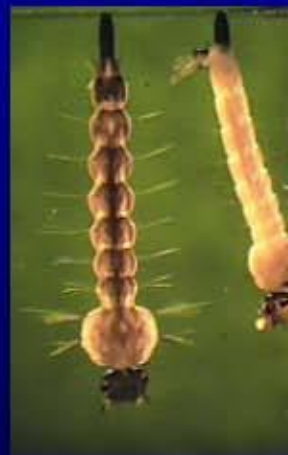


Larvicide  
April-September

# Mosquito Life Cycle



**Egg**



**Larva**



**Pupa**

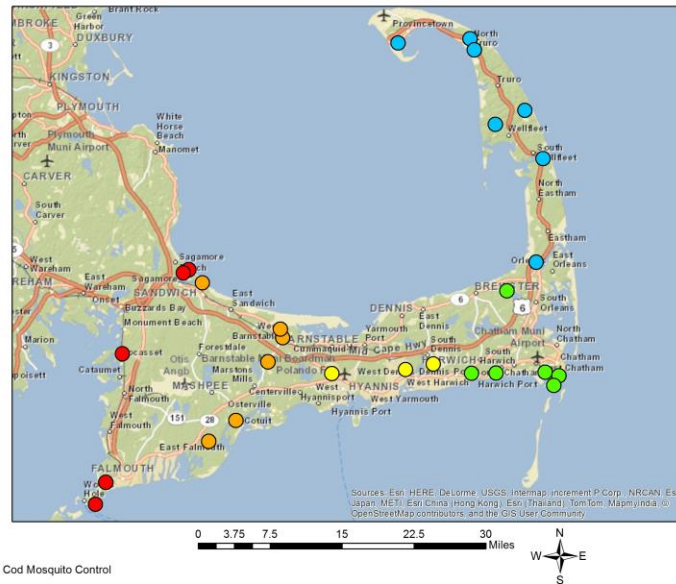


# Surveillance is key!



Arbovirus Trapping

Cape Cod Mosquito Control Trap Sites



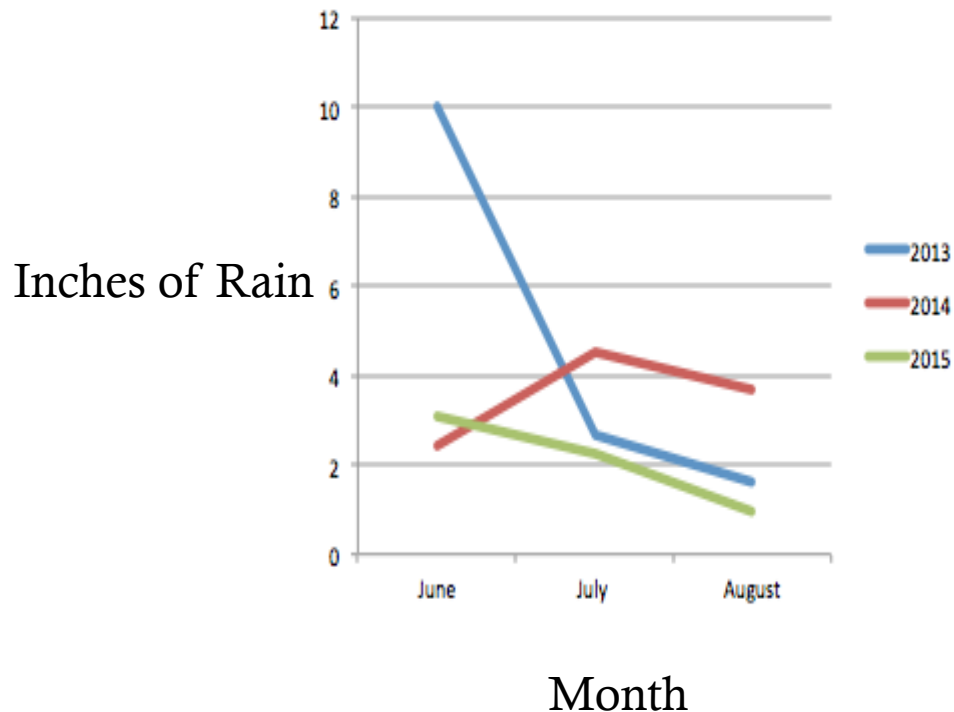
Data: Cape Cod Mosquito Control



Efficacy Trapping

# So what happened in the field?

💧 Another DRY year!!!!



\*Data from  
NOAA  
Hyannis Station

# West Nile Virus....

2013

7/23/2013	Gravid	43	<i>Cx pipiens/restuans</i>	Falmouth	WNV
7/30/2013	Gravid	47	<i>Cx pipiens/restuans</i>	Barnstable	WNV
8/6/2013	Gravid	52	<i>Cx pipiens/restuans</i>	Yarmouth	WNV
8/9/2013	Gravid	17	<i>Cx pipiens/restuans</i>	Sandwich	WNV
8/13/2013	Gravid	35	<i>Cx pipiens/restuans</i>	Yarmouth	WNV
8/13/2013	Gravid	25	<i>Cx pipiens/restuans</i>	Barnstable	WNV
8/20/2013	Gravid	36	<i>Cx pipiens/restuans</i>	Yarmouth	WNV
8/27/2013	Gravid	50	<i>Cx pipiens/restuans</i>	Bourne	WNV
8/30/2013	Resting Box	10	<i>Cs melanura</i>	Dennis	WNV
8/30/2013	Gravid	54	<i>Cx pipiens/restuans</i>	Bourne	WNV
9/9/2013	Resting Box	5	<i>Cs melanura</i>	Dennis	WNV
9/10/2013	Gravid	25	<i>Cx pipiens/restuans</i>	Yarmouth	WNV
9/17/2013	Gravid	20	<i>Cx pipiens/restuans</i>	Barnstable	WNV

2014

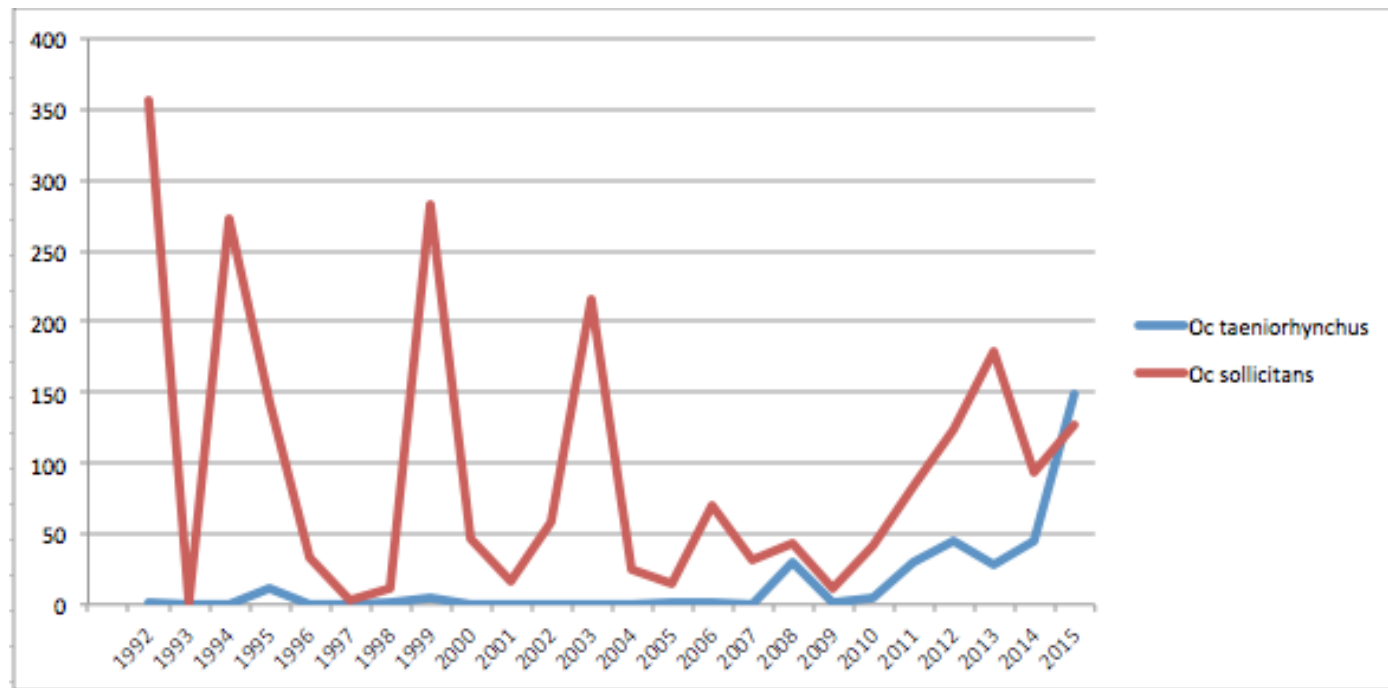
Collection Date	Trap Type	Pool Size	Species	Town	Test
9/3/2014	Gravid	40	<i>Cx. pipiens/restuans</i>	Falmouth	WNV

2015

Collection Date	Trap Type	Pool size	Species	Town	Test
8/18/15	Gravid	46	<u><i>Cx. pipiens/restuans</i></u>	Barnstable	WNV
8/18/15	Gravid	50	<u><i>Cx. pipiens/restuans</i></u>	Falmouth	WNV

# What's new?

Number of  
Mosquitoes



Year



# Changing Times

- ◆ West Nile Virus (2000) – focus on mosquitoes in man made containers and additional surveillance techniques.
- ◆ Introduction of Asian tiger mosquito into MA (2011) – changes in surveillance techniques
- ◆ Increasing salt marsh mosquito populations (2015) – continued maintenance with assistance from Barnstable County Extension Service's drone.



**Deer Tick Feeding Stages**

**Range Expansion  
Host Animal Dispersal  
Degree Days above base 0 C**

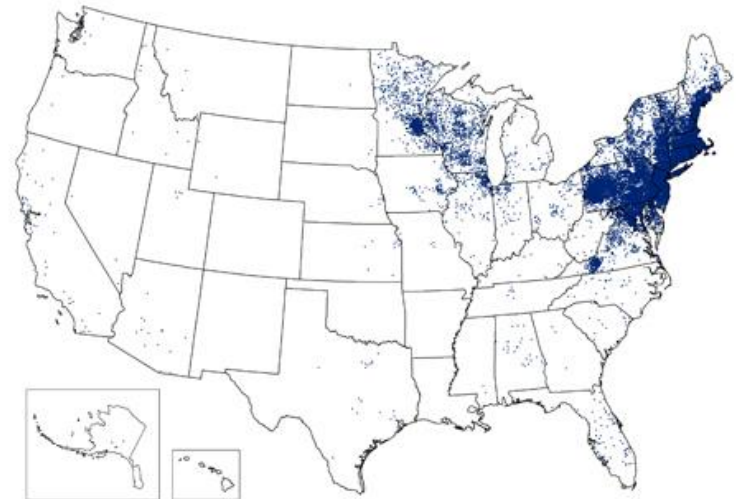
**Leighton et al. 2012**

**Reported Cases of Lyme Disease -- United States, 2001**



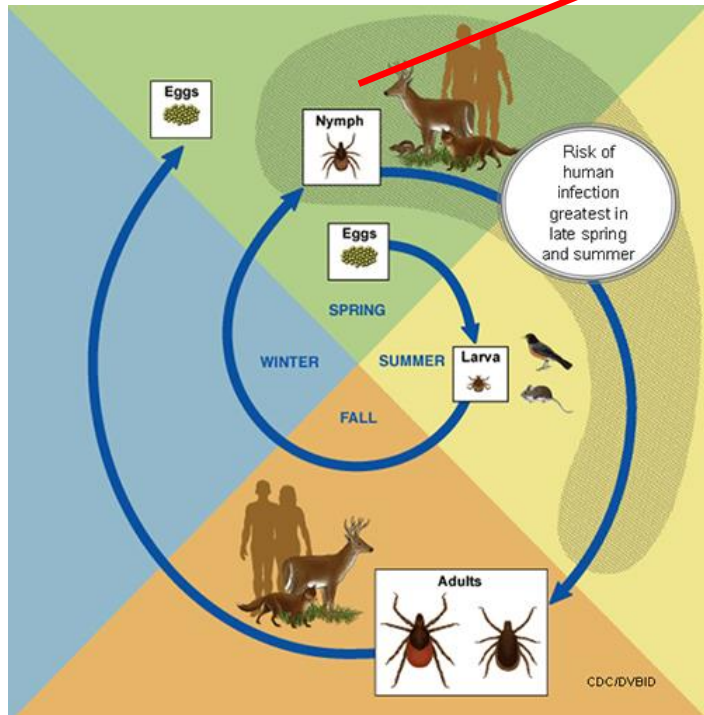
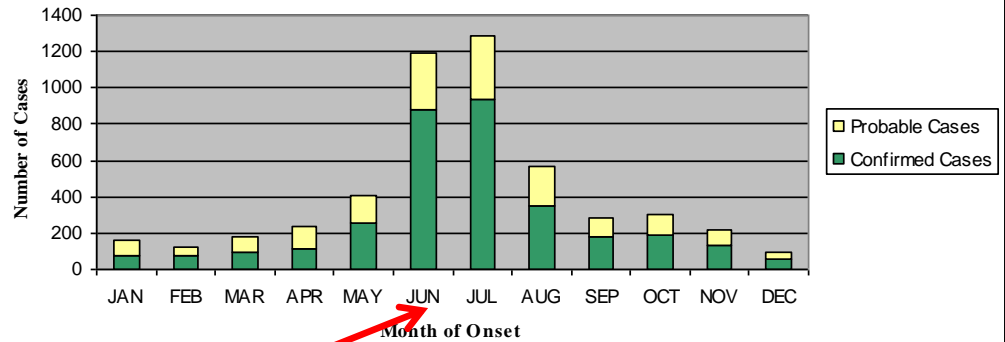
1 dot placed randomly within county of residence for each reported case

**Reported Cases of Lyme Disease -- United States, 2014**

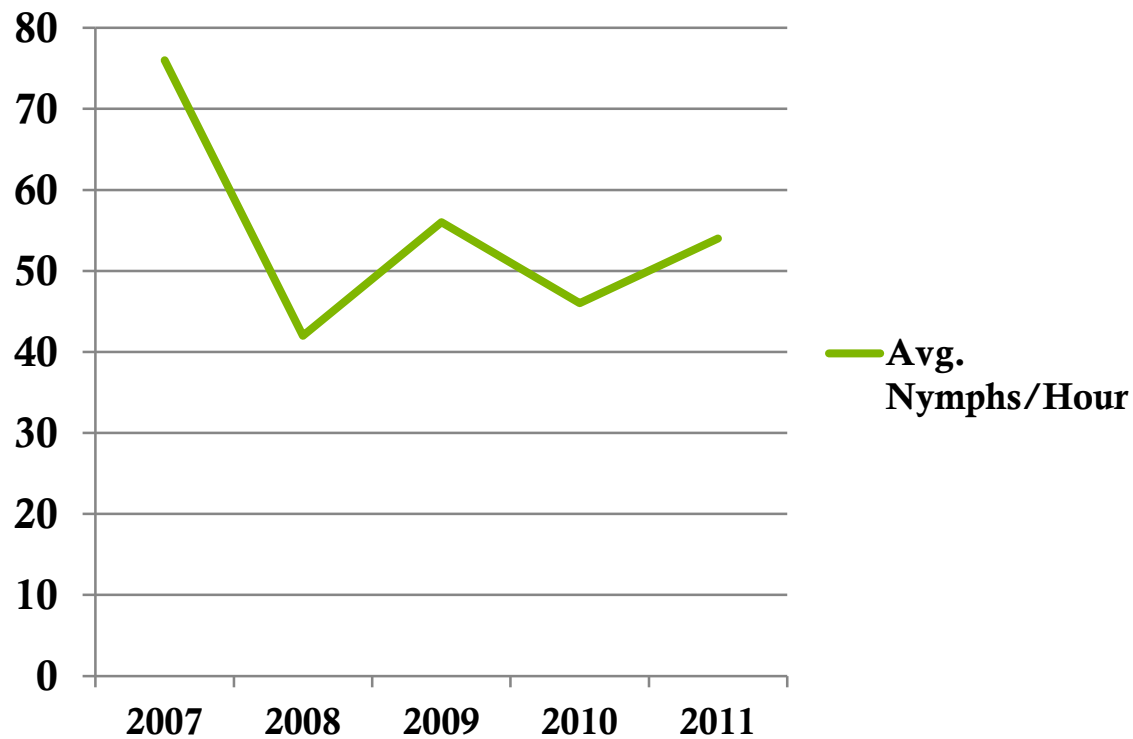


1 dot placed randomly within county of residence for each confirmed case

Number of Confirmed and Probable Lyme Disease Cases Reported in Massachusetts by Month of Onset, 2012



## Deer Tick Sampling – Cape & Islands





# Climate Change and Tick Abundance/Survival

## ◆ Macroclimate

- ◆ Overall precipitation/drought measurements inconsistently related to tick populations

## ◆ Microclimate

- ◆ RH measurements within leaf litter habitat provided a more accurate prediction of nymph stage tick abundance (Berger et al. 2014)

# Lone Star Tick Distribution



1990's



2006

# Lone Star Tick on Cape Cod



- **Erlichiosis**
- **STARI**
- **Tularemia**
- **Red Meat Allergy**



# Questions?

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