Floodwater Mosquito Control in New Jersey Freshwater Species

Eastern US Floodwater Summit: Solutions for Floodwater Mosquito Control via Zoom
21-January-2021

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Objectives

- Review species
- Life cycle types
- NJ pest species
- Organization
- State programs
  - Contracts
- Setup talks

Mosquito control is everybody's responsibility

It's a big job & everyone needs to do their part!

Species life cycle type groupings

- Where eggs are laid
- Typical larval habitat
- # generations / yr.
- Life stage that overwinters

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Distinguished Achievement Award Presentation at the 2003 Society for Vector Ecology Meeting

A classification system for mosquito life cycles: life cycle types for mosquitoes of the northeastern United States

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ABSTRACT: A system for the classification of mosquito life cycle types is presented for mosquito species found in the northeastern United States. Primary subdivisions include Univoltine Aedine, Multivoltine Aedine, Multivoltine *Culex/Anopheles,* and Unique Life Cycle Types. A montotypic subdivision groups life cycle types restricted to single species. The classification system recognizes 11 shared life cycle types and three that are limited to single species. Criteria for assignments include: 1) where the eggs are laid, 2) typical larval habitat, 3) number of generations per year, and 4) stage of the life cycle that overwinters. The 14 types in the northeast have been named for common model species. A list of species for each life cycle type is provided to serve as a teaching aid for students of mosquito biology. ***Journal of Vector Ecology* 29 (1): 1-10. 2004.**

Classify 64 species into 11 groupings and 3 monotypic

Univoltine Aedine Life Cycle Types	Multivoltine Aedine Life Cycle Types	Culex/Anopheles Life Cycle Types	Unique Life Cycle Types	Monotypic Life Cycle Types
Ae. stimulans	***Ae. vexans***	***An. quadrimaculatus***	***Cs. melanura***	***Cq. perturbans***
Ae. communis	*Ae. atlanticus*	*An. earlei*	*An. crucians*	
Ae. excrucians	*Ae. dupreei*	*Ur. sapphirinna*		***An. walkeri***
Ae. grossbeckii	*Ae. flavescens*	*Cx. erraticus*	***Or. signifera***	
Ae. implicatus	*Ae. infirmatus*	*Cx. territans*	*An. barberi*	***Wy. smithii***
Ae. intrudens	*Ae. mitchellae*		*Or. alba*	
Ae. provocans	*Ae. spenceri*	***Cx. salinarius***	*Tx. rutilus septentrionalis*	
Ae. punctor	*Ae. tormentor*	*An. bradleyi*		
	Ae. trivittatus	*An. atropos*		
Ae. abserratus	*Ps. columbiae*			
Ae. aurifer	*Ps. ciliata*	***Cx. pipiens***		
Ae. fitchii	*Ps. discolor*	*An. punctipennis*		
Ae. thibaulti	*Ps. cyanescens*	*Cs. inornata*		
Cs. minnesotae	*Ps. ferox*	*Cx. restuans*		
Cs. morsitans	*Ps. howardii*	*Cx. tarsalis*		
	Ps. mathesoni			
Ae. canadensis				
Ae. cinereus	***Ae. sollicitans***			
Ae. sticticus	*Ae. cantator*			
	Ae. dorsalis			
	Ae. taeniorhynchus			
	Ae. triseriatus			
	Ae. albopictus			
	Ae. atropalpus			
	Ae. hendersoni			
	Ae. japonicus			

Same/similar

1. **Oviposition location**
2. **Larval habitat**
3. **# Generations**
4. **Life stage overwintering**

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Floodwater mosquitoes

Eggs can dry down

Wait in suspended animation

Freezing

Hatch in broods after summer rains and or flooding tides

Most floodwater mosquitoes are avid human biters

Genera that use the Floodwater life cycle type

- Aedes
- Psorophora

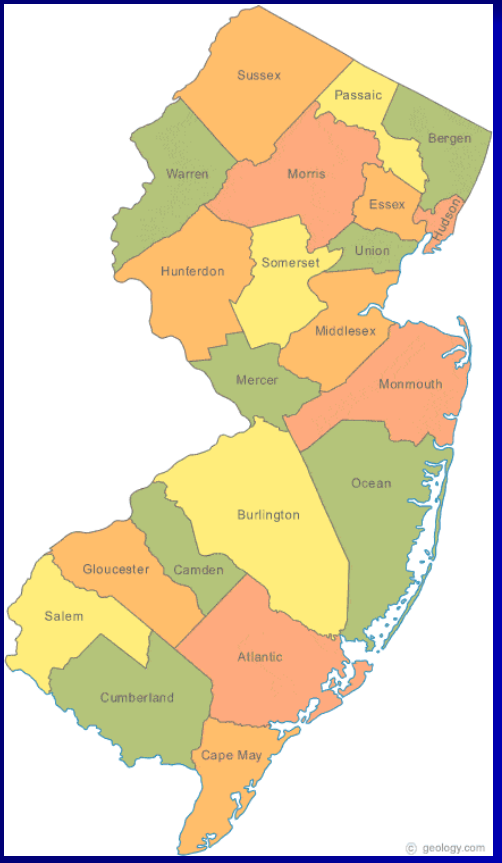
Ongoing debate - All but 3 of our 32 Aedes were temporarily grouped in genus Ochlerotatus

Mosquito control mandated by law: Title 26

- Mosquitoes transmit disease
- Cause nuisance
- Impact state economy

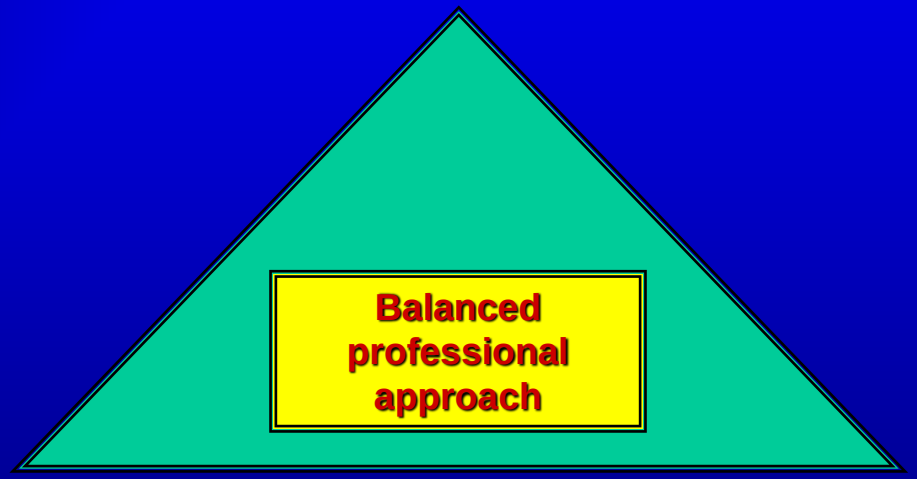
WNV, DEN, CHIK, ZIKA … only reminders

Organization



County Control Programs

Do the work



Agricultural Experiment Station

Research, Review P&E, Recommendations, Training

State Mosquito Control Commission

RU, DEP, DOH, AG, 6 Public

Advise Governor, Funding, Guidance, Enforcement

Rain & tides

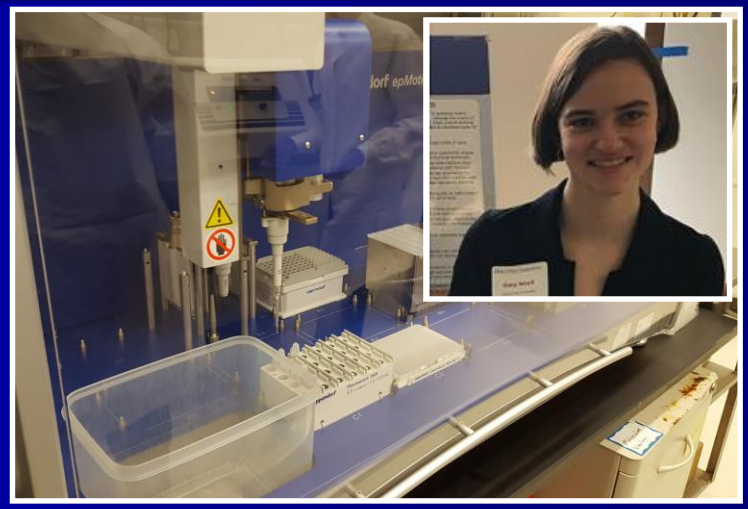
Primary factors driving floodwater mosquito production

Monitoring local patterns determine need for service

Increase in trap counts & complaints 8-10 days post storm events

Surveillance

- Adult Mosquito & Vector Surveillance reporting
  - Contract w/ NJAES CVB
  - Exotic *Aedes* surveillance, BGS traps – JerseySurv data
  - Expand EEE monitoring sites
- Cape May & DOH
  - Laboratory testing resources
- IR monitoring & WNV genotyping projects
- Data drive floodwater control



Aerial program operations

- Aerial contract
  - Fixed & rotary wing
  - Surveillance/observation
  - Application
- Primarily Atlantic coast
  - Expanded over time
  - Essex & Morris floodplain
  - Funding
- Insecticide contract
  - Service state operations
  - Open to all programs
  - Access to public health tools

Equipment use

- Lease agreements
  - State buys
  - County maintenance
  - State repair
- Reassignments
- Auction equipment
  - Surplus equipment
- Test new equipment
  - Sprayers
  - Mini excavators

Insecticide resistance

- Partnered w/ Counties, CDC, NEVBD, DOH
  - Reviewed needs, supplies, protocols…
  - Addressed egg collection and larval rearing
- Coordinate annual workshop
  - Work/training session
  - Programs supplied mosquitoes
  - CDC kits w/ tech. A.I.
  - Shared data
  - Programs left w\treated btls.
- COVID -19 “break” 2020
- Plans are to continue

Acknowledgements

NJ Agencies Cooperating in Mosquito Control

- NJ State Mosquito Control Commission
- NJ Dept. of Environmental Protection
  - OMCC
- NJ Dept. of Health
- NJ Dept. of Agriculture
- NJ Agricultural Experiment Station
  - Rutgers CVB
- The 21 County Mosquito Control Agencies

Contact information

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- Web site http://www.state.nj.us/dep/mosquito/

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