NEW JERSEY ADULT MOSQUITO SURVEILLANCE

Report for 29 July to 4 August, 2007, Week 31
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Center for Vector Biology
Rutgers University

Purpose: Samples from New Jersey light traps throughout the state are collected by county mosquito control agencies for use in their IPM programs. A portion of this data (about 82 traps) is sent to Rutgers and re-calculated to show statewide trends in mosquito populations for species of nuisance or health concerns.

Calculations are based on regional distributions, with emphasis on mosquito habitat and land use. Trends will allow a statewide evaluation of changing mosquito populations, in response to control and/or changes in habitat.

This New Jersey Agricultural Experiment Station report is supported by Rutgers University, Hatch funds, funding from the NJ State Mosquito Control Commission and with the participation of county mosquito control agencies in New Jersey.

Figure 1: Ten regions selected for the New Jersey Adult Mosquito Surveillance Program overlaid with county borders. Trap locations indicated by red-filled circles.
<table>
<thead>
<tr>
<th>Region</th>
<th>Aedes vexans This Week</th>
<th>Average*</th>
<th>Increase</th>
<th>Culex Mix This Week</th>
<th>Average*</th>
<th>Increase</th>
<th>Coquillettidia perturbans This Week</th>
<th>Average*</th>
<th>Increase</th>
<th>Aedes sollicitans This Week</th>
<th>Average*</th>
<th>Increase</th>
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</table>

* Averages represent data from, at most, the previous 5 years. Increase is a scale of current values from historical values where no difference or a decrease is represented by 0 (blue), up to 50% greater difference by 1 (green), up to 100% greater difference by 2 (yellow), up to 150% greater difference by 3 (orange) and greater than 150% increase by 4 (red).

State Summary: *Culex Mix* populations in the New York Metro continue to be above historical trends. This is during a time where amplification of WN virus is occurring, with most of the positive *Culex* pools coming from the Suburban Corridor and New York Metro regions. *Coquillettidia perturbans*, an epizootic vector of eastern equine encephalitis, is also above historical values in the New York Metro region.
This figure shows historical average maximum and minimum temperatures and average precipitation recorded in the New Brunswick, NJ weather station over a recent 30 year period. Also graphed are the current year's minimum and maximum temperatures as recorded at the Hillsborough NJ weather station (a station close to central NJ which recorded all three parameters and was available online at the NJ state climatologist).
**The Species Graphs**: The species graph pages include a graph with two plots for each of the ten regions defined on the first page (Agricultural, Coastal, Delaware Bayshore, Delaware River, New York Metro, North-Central, Northwestern, Philadelphia Metro, Pinelands, and Suburban Corridor). Below is an example of one graph from one species within one region. The bar plot shows the average number of mosquitoes per trap within the region (weekly means) and line plots show the historical trend as the average number of mosquitoes from the previous 5 years (5-year average). In general, historical data are running means from the previous 5 years, but on occasion, will include data from fewer years. Adjustments are made to account for year discrepancies. Data for Week 29 are from Atlantic, Bergen, Burlington, Camden, Cape May, Cumberland, Essex, Hudson, Hunterdon, Mercer, Middlesex, Morris, Ocean, Somerset, Sussex, Union and Warren counties.
**Aedes vexans - Fresh Floodwater Species**

<table>
<thead>
<tr>
<th>Region</th>
<th>Graph</th>
<th>Graph</th>
<th>Graph</th>
<th>Graph</th>
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<tbody>
<tr>
<td>Agricultural</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
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<tr>
<td>Coastal</td>
<td><img src="image" alt="Graph" /></td>
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<td><img src="image" alt="Graph" /></td>
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<tr>
<td>Delaware Bayshore</td>
<td><img src="image" alt="Graph" /></td>
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<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
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<tr>
<td>Delaware River Basin</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>New York Metro</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
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<tr>
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<td><img src="image" alt="Graph" /></td>
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<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
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<td><img src="image" alt="Graph" /></td>
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<tr>
<td>Pinelands</td>
<td><img src="image" alt="Graph" /></td>
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<tr>
<td>Suburban Corridor</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
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<tr>
<td><strong>Comments</strong></td>
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<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
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</tbody>
</table>

*Aedes vexans* populations continue to be lower than historical trends in several regions, particularly in the southern half of the state where rainfall has been less than in the north. A large emergence in the Northwest Rural region occurred at one site known for sizeable broods during flooding, where the confluence of three streams can overflow and provide substantial larval habitat. Rainfall from upstream sites can have an impact on local populations, even if the local site has received no rainfall.
### Culex Mix - Multivoltine Culex Species

<table>
<thead>
<tr>
<th>Region</th>
<th>Date Range</th>
<th>Chart</th>
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<tbody>
<tr>
<td>Agricultural</td>
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</tr>
<tr>
<td>Coastal</td>
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<td>Delaware Bayshore</td>
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<td>Delaware River Basin</td>
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<td>New York Metro</td>
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<td>North Central Rural</td>
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<tr>
<td>Suburban Corridor</td>
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<td><img src="chart10.png" alt="Chart" /></td>
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</tbody>
</table>

### Comments

*Culex* species (*Cx. pipiens*, *restuans*, and *salinarius*) continue to be at greater than the historical means in the New York Metropolitan region. These late-peaking populations are contributing to the amplification cycle of West Nile and WN-positive pools of *Culex* have been concentrated primarily around the New York Metro and the Suburban Corridor regions. All three species are in the mixed pools submitted for WN testing but the relative contribution of each species toward infection is unclear. *Cx. salinarius* has been implicated as playing a major role in the WN cycle elsewhere in the northeast. *Culex* populations for most regions should start to slowly decline as the season progresses.
**Culiseta melanura** – Miscellaneous Group

<table>
<thead>
<tr>
<th>Agricultural</th>
<th>Coastal</th>
<th>Delaware Bayshore</th>
<th>Delaware River Basin</th>
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</thead>
<tbody>
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<table>
<thead>
<tr>
<th>New York Metro</th>
<th>North Central Rural</th>
<th>Northwestern Rural</th>
<th>Philadelphia Metro</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image5.png" alt="Graph" /></td>
<td><img src="image6.png" alt="Graph" /></td>
<td><img src="image7.png" alt="Graph" /></td>
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<table>
<thead>
<tr>
<th>Pinelands</th>
<th>Suburban Corridor</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image9.png" alt="Graph" /></td>
<td><img src="image10.png" alt="Graph" /></td>
<td><em>Culiseta melanura</em> populations in the Pinelands are at historical levels. This is in contrast to resting box data which is normally more attractive to this bird-feeder than the light trap. Populations in most regions should build up during the next two months as the second generation joins the general population. These include offspring from mosquitoes that overwintered as several different instars.</td>
</tr>
</tbody>
</table>
The third emergence of *Aedes sollicitans* in the Coastal region is well underway and is the largest to date this year. Yet populations along the coast up through the New York Metropolitan region are still lower than recent historical data. Migration inland to the Agricultural region remains low.

The current emergence in the Coastal region may mark the population high for the season. While the population may seem to decrease (the light traps become less effective), the complaints may increase as *Ae. sollicitans* shifts from evening to day for bloodmeals.
**Coquillettidia perturbans** – Unique Life History

<table>
<thead>
<tr>
<th>Region</th>
<th>Weekly Data</th>
<th>Comments</th>
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<tr>
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</tr>
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*Coquillettidia perturbans* numbers decreased through most regions, except for the New York Metropolitan region. This species should be on the decrease through most regions, although a late-season emergence sometimes occurs.
Top Ten cumulative species for each region to date.

**Agricultural**

- *Culex Mix*
- *Ae. vexans*
- *Ae. cantator*
- *Coq. perturbans*
- *Ae. canadensis*
- *An. punctipennis*
- *Ae. sollicitans*
- *An. quadrimaculatus*
- *Cs. melanura*
- *Ae. japonicus*

**Total # mosquitoes**

**Coastal**

- *Ae. cantator*
- *Ae. sollicitans*
- *Culex Mix*
- *Ae. vexans*
- *Coq. perturbans*
- *An. bradleyi*
- *An. quadrimaculatus*
- *Cs. melanura*
- *Ae. canadensis*
- *Ae. taeniorhynchus*