2015 Mosquito Control Season Summary
Doug Abdill, Superintendent
Atlantic County Office of Mosquito Control

2015 was a busy year for most counties. It started out looking like a mosquito tsunami was on its way, but dry weather set in for the summer and kept most nuisance species at moderate levels. This dry weather produced ideal conditions for WNV vector species across the state and created quite a problem for most counties.

Atlantic County

The winter of 2014-2015 was quite cold and full of frozen precipitation. Lots of time was spent performing snow removal. This elevated precipitation continued into the spring and early summer. Our nuisance mosquito levels increased accordingly. Inspectors responded to 125 service requests. Elevated mosquito populations led to an active virus season, as well.

New Jersey Light Trap collections increased by about 10%. A grand total of 37,573 female mosquitoes were collected. Our five most prevalent species were Cx. spp, Ae. sollicitans, Ae. vexans, An. quadrimaculatus and Cs. melanura. Vector surveillance efforts were increased in 2015. Collections were made over 112 trap nights and resulted in a 50% increase to 283 pools submitted to PHEL. 75 of these pools were duplexed for CHIKV and DENV. 17 of these pools tested positive for WNV. Despite the significant increase in trap nights and pools submitted, we did not experience an increase in WNV detection. There were no other viruses isolated from Atlantic County mosquitoes. The Atlantic County Health Department submitted 15 birds for WNV testing, with 1 American Crow testing positive.

Adult control efforts increased this year and caused increased press coverage. This was the result of WNV positive pools in Ventnor City. Residents of this area had not seen an adulticide application in over 30 years. The long held belief that they were safe from the terrible effects of pesticide application led some misinformed residents to spread propaganda that the area was being poisoned and we were using a banned chemical. Much time was spent explaining the concept and financial impacts of reregistering commercial pesticides and reinforcing the need to cut off the virus transmission cycle before the susceptible local population could be negatively impacted. These obstacles were overcome and we had safe and effective operations in 5 municipalities.

Patrick McGrath and Michael Gustray attended the Mosquito Biology, Identification and Habitat Recognition course offered by the Rutgers University Office of Continuing Professional Education. We are anticipating successful completion of their examinations, in the near future. Doug Abdill presented at the NEAAA Convention and 9 employees attended the NJMCA Training Session and the NJMCA Annual Meeting. The Office also had a presence at 4 outreach events this year.
The inspectors completed hand cleaning over 20,742 linear feet of ditches and streams and collected 830 illegally discarded tires, as part of our ongoing source reduction program. They also applied larvicide to 330 sites and 18,704 catch basins.

**Cape May County**

Mosquito populations were lower this season compared to 2014. Total female mosquitoes collected from various traps are 127,379. Of this total 61% were freshwater species and 39% were salt marsh/brackish species. The 5 prominent species collected this year (highest to lowest) from all traps are *Cq. perturbans, Cx. salinarius, An. quadrimaculatus, Oc. cantator, and Oc. sollicitans*. Our *Cx. erraticus* collection this year was higher than last year although still quite low on average. We collected 2,023 for 2015 as compared to 414 for 2014. Our 26 New Jersey light traps collected 103,290 individuals, gravid traps from 26 sites collected 15,837 individuals and from 5 sites our resting boxes collected 6,634 individuals. CDC and BGS traps collected a total of 1,386 individuals.

In total, we tested 3,787 mosquito pools for WNV, 1,679 for EEE, 1,074 pools for SLE, 256 pools for LAC, and 456 pools for CHIKV. From these collections, 36 pools were positive for WNV and 6 pools were positive for EEE. Our contract with the State Mosquito Control Commission was renewed to collect, identify, and test *Cs. melanura* for WNV and EEE, totaling 3,354 mosquitoes from all 4 sites. From the state resting b pools tested positive for WNV and 10 pools tested positive for EEE. We had no reported human, avian or equine cases of any mosquito borne diseases this season.

The total monthly average rainfall this year was 0.91 inches with the highest rainfall being in June with an average of 0.42 inches. Our average temperature this season was at 73.6 degrees compared to 72.5 degrees in 2014.

On the water management side, we continue to benefit from the 2012-2013 Cox Hall Creek Restoration Project through reduced larvicide and adulticide applications in 2015. Our Fishing Creek Pumping Station (a NJ State Mosquito Commission Project in the mid-1960s) was supposedly under an engineering study to determine the best course of action for refurbishment and efficiency upgrades. A cooperative storm water outfall cleaning effort with our County Road Department and local municipalities that started in late 2014 continued through May 2015.

In February our NJDEP Permits were modified to include a Flood Hazard Area Individual Permit, Freshwater Wetlands GP #1 & 15 and Waterfront Development IP Inwater. We finally received our Army Corps of Engineers (Philadelphia District) Permit in early August 2015, two years after the initial application. We appreciate the Office of Mosquito Control Coordination strongly convincing the Corps to authorize mosquito water management work in non-tidal and freshwater wetlands under federal jurisdiction, in addition to the typical tidal wetlands.

Since the Corps permit was authorized for 10 years, the drawn-out application period should be worth the effort. OMCC continued negotiations with the Corps on streamlining the permit process and reducing redundant regulations through the end of 2015. The 8.5-metric ton amphibious excavator with rotary bucket went out to bid in December 2014 and was delivered in June 2015. Wetland Equipment Company in Thibodaux, LA, partnered with Farm-Rite Inc. in Shiloh, NJ to convert a standard JCB 85 Z-1 excavator into an amphibious rotary ditcher. With our two existing JCB excavators and two Link Belt excavators from the State Mosquito Commission equipment lease program, we are poised to get our water management program back on track in 2016 and beyond. The Water Management Network, coordinated by Ed Sokorai, met 3 times in 2015.

We received a 1981 Bell 206 B-3 Jet Ranger in late-June of this year, after a mid-May bid advertisement. The Jet Ranger cost $460,000 minus an $80,000 insurance payment on our crashed Hiller and $170,000 auction sale of our second Hiller, for a net cost of $210,000. Sterling Helicopter Inc. in Croydon, PA performed an annual/12 month inspection and installed Isolair spray equipment and AgNav GPS guidance system this fall. We will spend considerable time characterizing and calibrating the Jet Ranger in 2016, in an effort to maximize efficiency and minimize maintenance costs. We utilized Gov Deals to sell other pieces of obsolete equipment as well.

We have been slowly renovating the main office building with newly paved parking areas and roads, new drainage systems, all new office furniture and a large flat screen monitor to post county information and educational materials. On October 23rd we celebrated our 100th anniversary that included several speakers, great food, fellow mosquito control agency representatives and a surprise dedication of our building to former superintendent Judy Hansen.
Several of our employees attended and participated in the NJMCA conference held in Atlantic City. Dr. Bosak, Edward Sokorai, Chris Frame, Diane McNelly and our pilot participated in several public events and workshops held within the county including Harborfest, Earth Day, County 4-H Fair, National Night Out, Pledge 2 Fledge and the Ocean City Air Fest.

All in all it was a great year. We are thankful for the relationships with our fellow state and county mosquito control agencies and wish everyone a safe and productive 2016 season.

Cumberland County

For the Cumberland County Mosquito Control Division, the 2015 season began with a large quantity of water due to the above average amount of precipitation received during the 2014/2015 winter season, particularly in February and March. During the spring and summer, Cumberland County received seven inches more precipitation than is normal for that time of year, resulting in a large amount of standing water throughout the mosquito season. In fact, there were 613 service requests during that time period, an 18.57% increase over last year. The season ended with a total of 619 requests.

The light trap season began on May 1st and ended on October 30th, with 15 traps placed throughout the County. Overall, collection numbers increased 157% from 2014. Female mosquitoes totaled 38,026; an average of 13.93 mosquitoes per trap night. This was a large increase from the previous year’s average of 5.63. The top five mosquito species caught were: *Cx. salinarius*, *An. bradleyi*, *Ae. vexans*, *Ps. columbiiae*, and *Cx. pipiens*.

Collections from our resting boxes, CDC, BGS, and gravid traps commenced the third week of June. The resting box sites were sampled once each week, and collections from CDC, BGS, and gravid traps were made three times per week. A total of 33 different sites were sampled. As of October 14th, 4,138 mosquitoes were submitted to PHEL in 307 pools. Of these, 66 were duplexed for WNV and EEE, and 46 were submitted for Chik/Dengue testing. Cumberland County had one pool test positive for EEE and 12 pools test positive for WNV. EEE was sampled from a resting box located in the Union Lake Wildlife Management Area. All WNV positive pools were found in Vineland. The county also had five WNV positive human cases and five WNV positive birds.

Our biological control program decreased this year (16,000 fish). Approximately 14,000 *Gambusia affinis* (mosquito fish) and 2,000 *Pimephales promelas* (fathead minnows) were acquired from Hackettstown State Fish Hatchery. These fish were introduced into 13 sites in four municipalities. Those municipalities were Vineland, Millville, Bridgeton, and Fairfield.

The Division did not receive permission to engage in the tire retrieval program in 2014, so no tires were collected during the winter of 2014/2015; however, permission has been granted to reinstate the program for the 2015/2016 fall/winter season. So far this year, the inspectors have retrieved 822 tires.

The Heavy Equipment Operators remained busy in 2015. A ditch maintenance project in Lawrence Township ended in April due to timing restrictions, this project will pick up again in 2016. Two stream maintenance projects in Vineland began, one in May and one in October. Work continues on both of them. One ditch maintenance project in Millville began in November. Unfortunately, the two machines that went down in 2014 were still down for much of 2015, hampering efforts of the water management crew in completing more projects; however, the Division purchased another excavator, received in August, to help decrease the amount of time spent on each project. This excavator is smaller than the others, allowing for easier maneuverability through the heavily wooded areas in which many of the Division’s projects take place.

Hunterdon County

Heavy rains in spring set the stage for a busy mosquito season; however, floodwater mosquito problems did not materialize throughout much of the summer. Onset of virus activity in mosquitoes was somewhat delayed compared to previous years. Our first positive West Nile virus (WNV) pool appeared on July 27, 2015. There appeared to be a lull in virus activity following this but activity picked up considerably late in the season. Three quarters of West Nile positive samples were recorded from August 19th on, and WNV activity lingered into October. In 2015 a total of 267 mosquito pools were tested for WNV and 21 were positive.

Black fly problems have increased in the county over the past three years. Larvae of the pest species *Simulium jenningsi* have expanded their reach in several Hunterdon County rivers. As to the question of whether cold winter temperatures affect egg mortality of this species, the answer appears to be no. The initial spring brood in 2015 was one of the largest ever documented in nearly 20 years of surveillance. This followed one of the coldest winters during that same time period.
**Mercer County**

Following a cold and prolonged winter, 2015 was a relatively dry summer with drought like conditions, at one point having gone 18 days without measurable rainfall. There were 1,050 inspections conducted with only 223 being service requests from residents, most of which originated from Hamilton township. July and August were our busiest months this year. The predictability of our floodwater habitats and routine larval surveillance campaigns enabled us to initiate proactive measures which target larval mosquitoes minimizing adult emergence, thereby reducing the presence disease vectors and nuisance mosquitoes.

During the 2015 season, we carried out extensive vector surveillance operations. Three hundred seventy-one pools were submitted for West Nile Virus (WNV) testing from 232 locations throughout the county. Of the pools submitted, 54 returned positive giving us an overall minimum field infection rate of 5.462 (MFIR = the number of infected mosquitoes per 1,000) which is among the highest of the counties. Chikungunya and dengue virus surveillance continued this year with 175 *Aedes albopictus* (Asian tiger mosquito) pools submitted, all of which returned negative. All Eastern equine encephalitis (EEE) pools returned negative as well. A total of 9,886 mosquitoes were submitted for testing as part of our arbovirus surveillance in 2015.

Under the guidance of the Superintendent, the staff has continued to disseminate operational and biological information on mosquitoes through scientific publications and presentations. This year we attended six national and regional meetings in order to present the findings of scientific research. Three manuscripts were published this year:

Meetings attended:
- New Jersey Mosquito Control Association (NJMCA)
- American Mosquito Control Association (AMCA)
- Northeast Mosquito Control Association (NMCA)
- Society of Vector Ecologists (SOVE)
- Rutgers Center for Vector Biology Pesticide Applicator Recertification Course
- Rutgers Entomology Seminars

Publications:
- Ary Faraji, Isik Unlu, Taryn Crepeau, Sean P. Healy, Scott P. Crans, Griffith Lizarraga, Dina M. Fonseca, and Randy Gaugler. Droplet characterization and penetration of an ultra-low volume mosquito adulticide spray within urban and suburban environments of northeastern USA, accepted PLOS ONE

The staff attended public events helping to increase public awareness and emphasizing the importance of mosquito control empowering them to take corrective actions to reduce mosquito populations on their own properties.

Functions attended include:
- City of Trenton’s Youth Fishing Derby
- Mercer County’s 4H Fair
- Master Gardeners of Mercer County’s 13th annual Insect Festival
- MCIA’s Touch a Truck Day
- Valley Forge Educational Services’ Community Day

We continued partnership with Rutgers University, NIH, SpringStar and Hudson County to use auto dissemination stations for the control of *Aedes albopictus*. The use of auto dissemination will continue in 2016. We have also partnered with Biogents using newly designed traps to reduce adult *Aedes albopictus* populations.

Superintendent Dr. Isik Unlu has joined the faculty of Rutgers University Entomology Department as an Adjunct Professor. Dr. Unlu was also appointed as chair of the American Mosquito Control Association’s member training and education committee as well as becoming a member of the Northeast board of directors for the Society of Vector Ecology.

We would like to send our best wishes to Theodore "Ted" Manzke who retired on October 31st of this year after serving the County of Mercer for 25 years. Ted was a valuable asset to our department and he will be missed. We would also like to take the opportunity to welcome Madison Rittley to our department as an Inspector Trainee/Biologist.
Monmouth County’s First Mosquito Species List

During the 2015 mosquito season, Monmouth County’s surveillance field and laboratory technician, Taylor Rodenberg, painstakingly examined New Jersey light trap and vector surveillance data for the initial record of each species in the county. In doing so, she compiled the county’s first full species list. This list is accurate and complete except for the possibility of any initial collection(s) made during bite counts or landing rate counts conducted over the decades. Unlike the NJLT data, which date back to 1956, permanent records for these activities were unfortunately not retained. These listings are unofficial and represent the various skills of numerous identification specialists over nearly 60 years.

<table>
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<th>Monmouth County Mosquito Species List</th>
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<td>Aedes canadensis 1956</td>
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<td>Psorophora ferox 1959</td>
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<td>Aedes thibaulti 1960</td>
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Submitted
By:
Anthony Aquaviva

Middlesex County

The 2015 mosquito control season in Middlesex County began with warm, dry weather in the spring with no major rain events until the second week of June. Inspectors were able to inspect and treat the majority of early-season mosquito habitats. Low precipitation in the spring produced minor populations of early season floodwater mosquitoes.

Heavy rains were experienced in June and initiated many of our major floodwater mosquito species. However, from July through September, rainfall was sparse and conditions were extremely dry. As a result, floodwater mosquito populations were very low and much of our efforts were directed towards controlling Culex species in permanent stagnant water habitats and Asian tiger mosquitoes in container habitats.
Overall, 39,492 catch basin treatments were carried out. Forty-eight (48) truck ULV missions were conducted in 22 municipalities using Zenivex® E4 RTU adulticides. Our air spray program flew 24 days this season and applied approximately 36,236 lbs of granular larvicides. Larvicides used for aerial applications were Vectobac GS (28,036 lbs), and Abate 5BG (8,200 lbs). Finally, the Commission participated in 11 public education/outreach events. Eight of these were fairs, festivals, or other public events; three were presentations and workshops provided to students at public schools.

Monmouth County

2015 posed significant challenges to the staff and program of the Monmouth County Mosquito Extermination Commission. In January, we were formally decommissioned and absorbed by the County of Monmouth. Now operating as the Monmouth County Mosquito Control Division under the temporary auspices of the County Administrator’s Office, we essentially had to learn all new policies and procedures. Furthermore, we were now required to obtain property owners’ written permissions for inspection and treatment access. Although these changes could have become serious impediments to operations, our dedicated staff (both permanent and seasonal) rose to the occasion and completed an exemplary mosquito control season.

The light trap component employed 20 units operating seven days a week (with M through F collections) from the first week of May through the final week of October. A total of 15,718 specimens were collected over 2,442 trap nights for an average catch from each site of 6.4 mosquitoes/trap-night. The collections were comprised of 31 species representing eight genera. On the season, saltmarsh species constituted just over 8% of the overall catch. Aedes vexans and Culex pipiens accounted for nearly three quarters of the total catch.

The vector surveillance component utilized gravid, CDC, and BGS traps. Traps were set weekly from early May until the end of October. A total of 966 mosquito pools were WNV tested for the season. Of these 966 samples, 192 were tested at the MCMCD’s laboratory via RAMP apparatus, 51 were duplex tested for EEE, and 325 were also screened for both DEN and CHIKV. The season’s results were: 35 Taqman RT-PCR WNV+, 15 RAMP WNV+, and no EEE, DEN, or CHIKV positives.

Additional surveillance parameters presented conflicting scenarios. While there were no EEE/WNV equine cases and minimal (5/7) WNV+ avian samples, we experienced three confirmed human WNV+ cases, sadly including one fatality. In each human case, persistent surveillance and adulticiding operations were conducted.

Continued on page 10
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Knowledge Transfer: A one credit “Tropical Pest Management” course will be offered next month by Prof. Gaugler at Musha Cay, the Bahamian island resort of David Copperfield and the same island where drone technology for mosquito control was previously examined. The new course will look at the unique challenges of managing insect pests in the tropics. CVB member Dr. Isik Unlu will lead the student team which includes Mercer County biologist Nick Indelicato. All expenses will be met by Copperfield. The hope is to offer the course next year as well.

Several presentations from the Center will be offered at the upcoming AMCA Annual Meeting, including “Development of unmanned aerial systems for mosquito control - Part I,” presented by Randy Gaugler; Part II presented by Greg Williams, “Design and role of pyriproxyfen autodissemination stations for dengue vector control” presented by Yi Wang, “Vector biology and control in Iran: Challenges and opportunities” presented by Ary Faraji and “An experimental design to test the effectiveness of autodissemination stations containing pyriproxyfen in reducing juvenile *Aedes albopictus* populations” presented by Isik Unlu.

Professor Gaugler will be delivering the Keynote Address for the West Central Mosquito and Vector Control Association annual meeting in Grand Junction, Colorado. He will also continue the Rutgers mission of international reach through lecture series on his research at universities in Pakistan and India later this year.

Scott Crans will be offering a webinar for AMCA about trap use called “Everyone seems to have a better mosquito trap: Making sense of mosquito trapping” on Tuesday, February 23rd, 2016. Registration is free for AMCA members, or $100 for non-members.

Recent Publications: Alexandra Villiard’s doctoral work produced a new article in 2015: Villiard A and R Gaugler. 2015 Long-term effects of carbohydrate availability on mating success of newly eclosed *Aedes albopictus* (Diptera: Culicidae) males. Journal of Medical Entomology, 52(3): 308-314, DOI: http://dx.doi.org/10.1093/jme/tjv030 Sugar access is important for newly emerged males with regard to fitness and should be considered under any laboratory conditions, such as sterile male releases. Also Isik Unlu and cohorts had several articles on Asian tiger mosquitoes, including one on suppression using a “hot spot” approach. See more publications at http://vectorbio.rutgers.edu/publications/
Graduation: Scott Crans completed his MS thesis on “Spinosad: Efficacy and persistence against container-inhabiting mosquitoes.” Also graduating from the Entomology Department is Richard Cooper, completing his Ph.D on “Behavioral ecology and control of bed bug, *Cimex lectularius* L., in multifamily housing communities,” Paul Frandsen finished his PhD on “Large datasets and *Trichoptera* phylogenetics: DNA barcodes, partitioned phylogenetic models, and the evolution of Phryganeidae” and Lauren Weidner completed her Ph.D on “Biology and ecology of forensically important blow flies (Diptera: Calliphoridae) in New Jersey with a focus on the black blow fly *Phormia regina*. Congratulations to all on a job well done!

Grants/Awards: Congratulations to Devi Suman for receiving the Noreastern Mosquito Control Association’s John L McColgan Grant In Aid for his design on a non-insecticidal lethal trap for container mosquito surveillance.

Recent Awards: Congratulations to Dr. Mark Robson for being recognized by Rutgers University Board of Governors as Distinguished Service Professor. This “designation recognizes Mark’s decades of faculty and leadership service, both here and abroad, to the university, his profession, and humanity….Dr. Robson has been acclaimed for his contributions to world health through his basic research in sustainable agriculture and environmental health, his ability to work with local communities to forge translational projects, and his highly successful efforts to provide training for young scientists both in the US and internationally.” From EOSHI release.

Blog: Read all about what we’re up to!

— Lisa Reed
Monmouth County cont’d

During the winter-spring of 2014-2015, letters went out to property owners in our database requesting formal, written permission for access to continue inspection and treatment. Despite initially slow returns, the vast majority of recipients responded positively.

As a result, our existing larviciding routes received service without any delays or difficulties. On the season, the inspectors responded to over 330 Requests for Service.

The aerial treatment program saw a different helicopter and pilot (from our County Shade Tree Division), a new larvicide (VectoPrime FG), and an additional inspection technique (landing on the marsh for air block inspections). Results from these changes were highly encouraging and may account for saltmarsh populations remaining under 10% each month all season long.

During 2015 the MCMCD applied for and was granted a Freshwater Wetlands General Permit 15 for Mosquito Control Activities. Along with the FWW GP15 the MCMCD also renewed its Waterfront Development Permit and Water Quality Certificate. When these two permits were issued, MCMCD’s other Water Management related permits were revoked and re-issued. All NJDEP permits issued to MCMCD for Water Management projects now expire/ come up for renewal at the same time.

Throughout the 2015 season, surveillance and trapping were conducted on a routine basis for potential Water Management projects as a condition of Freshwater Wetlands General Permit 15. One trapping site, Thompson (County) Park Ponds, became the first project with a component to be conducted under the FWW GP15 permit. While still ongoing, this project has allowed us to see the value and potential uses for the FWW GP15 permit at other sites throughout the county.

Morris County

The 2015 mosquito control season was a below average nuisance year but an exceptional West Nile Virus one. Given the drought conditions for most of the year this outcome really wasn’t a surprise.

Light trap surveillance for 2015 had a noticeable decrease from the previous year, collecting a total of 12,959 adult female mosquitoes as compared to just 27,218 in 2014. The lack of precipitation during the active season was no doubt the driving force behind these reduced figures.

The Division submitted a total of 304 mosquito pools for West Nile Virus testing. Of these a total of 71 pools tested positive for the virus with a minimum field infection rate of 3.28 which is up from last season’s .992.

A total of 2,000 Gambusia affinis were stocked at 3 separate locations while a total of 38,740 Pimephales promelas (fathead minnows) were stocked at 11 locations. In August we had a nice article written about the bio-control program in the Daily Record.

A total of 1,041 tires have been collected in 2015 as of this report. This is part of an ongoing program where over 60,000 illegally discarded tires have been collected and recycled by mosquito control staff.

Teresa Duckworth reports, seven water management projects were completed under our NJDEP Freshwater Wetlands GP-1/Flood Hazard Act GP-4 Blanket Permit. The scope of these projects varied from ditch maintenance to storm water pond restoration. In addition 3 tree de-snagging projects were completed.

The water management staff performed numerous hand-cleaning jobs located throughout the county.

Our public education program continues to grow and invitations to participate in community events increase yearly. We participated in 25 community events including summer recreation and summer reading programs.

This year, we continued with our Asian tiger mosquito travelling display, 18 municipalities hosted the display for one or two week time periods in municipal buildings, senior centers or libraries. This is a stand alone display has materials available about the Asian tiger mosquito and their source reduction.

Our Facebook page and website continued to be a great avenue for us to educate and alert citizens regarding mosquitoes and mosquito control activity.

Ocean County

In the beginning of the 2015 mosquito season, weather conditions were making it look like we were headed to another active mosquito year. However, as the season progressed, drought-like conditions were to prevail and a more "normal" mosquito season was experienced in Ocean County.
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Ocean cont’d

Several key species, in particular, *Ae. cantator, Cs. melanura* and *Cq. perturbans* showed significant increases as compared to the 35 year long term average. *Ae. cantator* had shown a 245% increase in August, but that value came down to 18% seasonally. Also, *Cs. melanura* increased 150% and *Cq. perturbans* increased 105% for the 2015 season. In addition, *Ae. sollicitans* populations seemed to rebound 2015. Population numbers were up 87% as compared to 2014 levels, but still 62% below long term averages. *Ae. vexans* was down 50% and *Cx. salinarius* was down 17% when compared to last years populations.

New Jersey Light Traps collected a total of 51,189 adult female mosquitoes from the 28 Light Traps spread throughout Ocean County. This represents a slight increase from last year's totals, 8%. *Ae. sollicitans* was the most commonly caught species comprising 27% of all light trap collections followed by *Ae. vexans* (14%) and *Cx. salinarius* (13%). A total of 31 different mosquito species were collected in 2015.

The Aerial Larviciding Program treated a total of 18,765 acres during the 2015 season. This total is a 17% decrease from the previous year's total and represents a 63% reduction from the long term averages. Typical salt marsh treatments had increased in 2015 and, additionally, the treatment of storm affected woodline habitat accounted for 2454 acres of the total.

Continued marsh management projects in some of Ocean County’s heaviest mosquito producing salt marshes can account for the reduction in *Ae. sollicitans* populations. To date a total of 27 acres of salt marsh have been managed in 2015. Additionally, crews have been on several stream desnagging and stormwater basin restoration projects.

Through a grant program with OMCC, we were able to hire 2 seasonal technicians to deal with mosquito issues from Superstorm Sandy. They were responsible for inspection of affected woodline areas and mitigating mosquito producing sites at abandoned homes in Ocean County. The program met with great success and was able to eliminate several thousand mosquito production sites associated with abandoned homes.

West Nile Virus activity had increased in 2015 although fortunately, human and horse activity remained low or nonexistent. A total of 24 positive mosquito pools were detected from the 386 submitted to NJDHSS. Most positive pools were *Cx*. complex, however several pools of *Ae. japonicus, Ae. triseriatus* and *Cx. erraticus* were also positive. A total of 7 positive birds were found out of the 16 submitted for testing. EEE activity was lower in 2015, with only 2 positive pools of *Cs. melanura*.

OMCC

During the summer of 2015 the Office of Mosquito Control Coordination (OMCC) continued to fund and oversee an ongoing collaboration between the NJ Department of Health’s Public Health and Environmental Laboratory, the Cape May County Department of Mosquito Control, and Rutgers University Center for Vector Biology to test mosquito samples from across the State for multiple arboviruses of interest to public health. County mosquito control agencies collected over 6,300 mosquito samples across the state, which were tested at the Public Health and Environmental Laboratory and the Cape May County Department of Mosquito Control. The OMCC thanks all counties involved in the program for their active surveillance programs, and in helping deal with testing limits that were needed thru parts of the summer. In total 859 samples of mosquito tested positive for West Nile virus, and twenty five samples tested positive for Eastern Equine encephalitis. This surveillance would not be possible without the dedicated work of county mosquito control agencies across the State, and the Office of Mosquito Control Coordination continues to work closely with all county agencies to provide support and funding for their efforts in any way possible.

During 2015, the OMCC continued to work in collaboration with the Divisions Bureau of Fisheries Production to supply multiple species of fish to county mosquito control agencies to serve as predators of mosquito larvae. This biological control of mosquito populations is part of the State’s Integrated Mosquito Management plan and helps to reduce mosquito larvicide use in target areas. In 2015 over 238,000 fish were stocked across the State by county mosquito control agencies. The OMCC continues our outreach to county mosquito control agencies to increase the programs usage and do all we can to make the program more convenient for county agencies. To help facilitate this, the OMCC worked in conjunction with the Middlesex County Mosquito Extermination Commission to conduct a pilot study examining the efficacy of different fish species as mosquito larvae predators. The long term goal of this study is to determine which available species are most effective and efficient to best utilize the State’s resources in this program.
The OMCC also worked with several county mosquito control agencies, Downstown Aero Crop Services, and Helicopter Applicators to evaluate a new biorational product for the control of mosquito larvae. These tests involved calibrating equipment to ensure the proper application of a new product and efficacy testing to ensure the product can effectively control mosquito larvae across the State in different habitat types. This ongoing project will help to bring new products to the State and give county mosquito control agencies more tools to use as they combat mosquito populations across the State. After showing that our application equipment could properly apply the new product, OMCC in conjunction with multiple county agencies had planned to do field trials to test the products efficacy against mosquito found in various habitats. Unfortunately we were not able to complete this part of the project but we thank all the counties who planned to be involved and are excited to evaluate the new product during the next mosquito season.

Also in 2015, the OMCC’s Superstorm Sandy grant programs were finalized and work has started. These programs are provided in collaboration with the State’s Department Of Community Affairs using federal funding sources. So far eleven counties across the State have taken advantage of multiple programs from aerial surveillance of mosquito habitat created by Superstorm Sandy, to funding for temporary employees specifically tasked with finding and treating habitats created by the storm. These programs will continue into 2016 and will expand to as many counties as possible. Again we thank all counties who have been involved, while there have been delays and issues in getting these programs started, we could not have solved any of the issues we have without the counties help. We are glad to be able to provide unique services that each county would not have been able to do in response to the damage done by Superstorm Sandy.

Passaic County

In March, Eric Green resigned from his role as superintendent. He had been employed by Passaic County Department of Health since May 2000. Joseph Pezzillo immediately filled in as ‘acting superintendent,’ and officially became superintendent in October.

In May, Joseph Santo, laborer for Passaic County Mosquito Control for over fifteen years, passed away. He was a wonderful coworker and friend to all of us in the mosquito division and is sorely missed.

Throughout the winter and spring, Joseph Pezzillo presented several lectures on topics including ‘integrated pest management’ and ‘mosquito-borne diseases.’ These talks were given to Passaic County Master Gardeners, nursing staff at Preakness Healthcare Center, and to the Sustainable West Milford environmental group.

In August, Passaic County Mosquito Control participated in the annual Passaic County Fair, and provided information on the county mosquito control program to the thousands of attendees. A table was set up with an informational display board, handouts, and models of an adult mosquito and a crow. Special thanks go out to Warren County and Bergen County for their assistance in getting us set up with what turned out to be the highlight of the mosquito table -- a small tank of live, mosquito larvae-eating Gambusia fish.

Larval activity was first detected on March 31, in a woodland pool in North Haledon. Adult mosquitoes were first detected on April 14. About 200 requests for service were received in 2015. This is a significant drop-off from the typical number of complaints received each year (which is usually in the 350 to 400 range). In all likeliness, this was a direct result of the very dry season we experienced.

PCMC submitted 20 mosquito pools to PHEAL for West Nile virus testing; four (4) of these tested positive for West Nile virus. Noteworthy in these positives was a pool of Aedes japonicus. [Please note: It is my belief – and I think many would agree – that the backbone to a mosquito control program is its surveillance component. Due to the change in personnel in 2015, the PCMC surveillance efforts were, for the most part, absent. We are currently working towards hiring a biologist to bring our surveillance efforts back up to previous levels.]
At the end of August, a 65-year old Passaic County man died of West Nile virus. Given the very high minimum field infection rates that we were seeing in mosquito pools in the ‘New York Metro’ and ‘Suburban Corridor’ regions of New Jersey, learning of a human case in our county did not entirely surprise us. Nevertheless, it is never something that any of us want to learn of happening in any of our counties, and we were truly disheartened by the news.

In November, we the mosquito control division parted ways with Kurt Spicer, mosquito control laborer, in a transfer to another division in the county. However, we brought on board a new laborer, John Rossi, a couple of weeks later.

Also in November, Passaic County Mosquito Control coordinated with Passaic County Office of Recycling and Natural Resources to remove and recycle hundreds of tires found discarded throughout the county. As the cold weather is approaching, Joseph Pezzillo is returning to his role as a first responder on the county’s Hazardous Materials Response Team. The mosquito control staff has turned their attention toward ‘water management’ projects, and is also preparing for the winter, as they are now essential employees and responsible for snow removal on bridges throughout the county.

Salem County

Salem County received quite a lot of rain in the 2015 season. Total rainfall from March through October was 30.76". The light trap numbers from 15 traps totaled: 74,776 mosquitoes. Species diversity in all traps was fairly limited due to massive amounts of rainfall early in the season coupled with a very dry late season. Most numerous species consisted of Ae. vexans, Ps. colombiae, and other floodwater species. Ae. sollicitatans were more abundant than in the last few years. In many locations, Culex species were numerous leading to an uptick in disease positives.

Vector surveillance returned 7 WNV positive mosquito pools out of the 154 pools submitted to PHEL. The positives included: Ae. japonicus (1), Ae. triseriatus (1), Cx. erraticus (1), Culex mix (3), and Cs. melanura (1). There were 27 pools Aedes albopictus submitted for Dengue/ChikV/WNV testing, yielding 0 positives. Two EEE positive pools (Cs. melanura) were returned from the state-run resting box sites at Centerton.

Salem County MC was able to hire a seasonal employee, Michele, from May 11th to October 31st. She was an asset, assisting in the lab and the office.

There were 403 requests for service, down slightly compared to last year. Each was inspected and treated, as necessary. More frequent adulticiding was necessary due to the high populations of voracious & long-lived species such as Psorophora ferox. Most service requests are found to be container- mosquito related.

Public education included: setting up a display at the County fair, municipal meeting visits, & presentations to various private groups.

A new chipper was received in November for use on water management projects. SCMC plans to apply for a USACE nationwide permit in the near future.

Somerset County

In Somerset County early season precipitation produced sizable broods of mosquitoes. This was accompanied by drought-like conditions in the latter part of the season and made way for low mosquito populations for the remainder of the year. A total of 239 mosquito pools were tested in 2015. Fourteen pools tested positive for West Nile virus (WNV). All positive pools consisted of Culex mosquitoes. In addition to mixed Culex pools, we tested the following species for WNV: Ae. albopictus, Ae. japonicus, Ae. triseriatus, Cq. perturbans and Anopheles punctipennis.

Aedes albopictus numbers remained low during the 2015 season. We attribute this to extensive cold temperatures during the 2014/2015 winter, which likely caused egg mortality. This is the same pattern that had been seen the year before. Adult Asian tiger mosquito numbers were low in traps, even during peak periods of the season. Nuisance complaints associated this mosquito were virtually nonexistent during the 2015 season. Small numbers of adult Asian tiger mosquitoes appeared in traps in late June and gradually increased into September. These numbers were apparently low enough that they caused little nuisance to residents.

No WNV human cases were recorded for the season. West Nile virus activity appeared to be similar to 2014. Positive mosquito pools totaled 14 for the year compared to 13 in the previous year. Virus activity was particularly low during September, a time when historically virus activity is high in the environment.
Baby/Youth Photo Contest

Submit your photo from long ago and be eligible to win prizes. Correctly guess the mosquito control person associated with the baby/youth photos and win a prize also.

There will be prizes for:
- cutest picture
- funniest picture
- picture that looks most like the present day person.
- most correct name matchups

Photos will be displayed in the Vendor area at the Annual Meeting in March. Voting and name guessing will take place while the pictures are displayed in the vendor area.

Please send submissions by email attachment to bduryea@warrencountymosquito.org or by USPS mail (copies of photos only) to:
Robert Duryea
Warren County Mosquito Commission
PO BOX 388
Oxford, NJ 07863

Our first submission is in:

Can you guess who this long time mosquito control person is?
I will give you a hint: He is a lot cuter in this picture than he is now.
2016 Silent Auction

NJMCA Annual Meeting
Golden Nugget, Atlantic City
March 3, 2016

A request for your donations

*Insect themed items* *Gift certificates*

*Themed prize baskets* *Tools* *Apparel*

*Artwork* *Treasures*

Accepting donations of new or gently used items of good quality.

Group donations by committee or agency are encouraged.

Drop off at the registration desk by Noon, March 3, 2016

For more information contact:
Heather @ heatherlo@co.cumberland.nj.us
Teresa @ tduckworth@co.morris.nj.us

All proceeds benefit NJMCA Scholarships
For the second year in a row, Warren County experienced a particularly cold and snowy winter. The difference this year was a relatively dry spring. In March only 4.5 inches of rain fell, just enough to keep the sites wet but no flooding was seen. April was very dry with only 2.5 inches of rain so most sites began to dry up. Then in May was had almost 4 inches, which ended up soaking into the ground and being taken up by the leavin trees. So, spring species were not seen in any high numbers. Things changed quickly in June as 10 inches of rain fell through the month, sites were well flooded and began producing summer species of nuisance mosquitoes. Slowly, things calmed down and for the remainder of the summer 4-5 inches of rain fell each month through October, keeping us busy but not overwhelmed at any point.

Three aerial larvicide operations were performed (April, June, and July) totaling 1102 acres. Fish were obtained from the Hackettstown Fish Hatchery through the SMCC’s bio-control program on 5 occasions throughout the year, and over 40,000 mosquito-eating fish were stocked. The majority of our ground larviciding was done by four seasonal staff (late May-August) with hand pump sprayers filled with liquid Bti formulations. Early and late season applications were completed by full-time staff.

For the third year in a row, a retired postal worker was hired for the season as the Disease Surveillance/ATM Inspector. A former seasonal was hired as the SMCC courier for the north route mosquito pick-ups. None of the four route seasonals from the previous year were able to return, so four new hires were trained for the season to do inspections and larviciding. In addition to the regular seasonal staff, a college student was hired to locate and perform larval and adult surveillance at Rootball Well Craters throughout the County. These extra activities were funded through the Community Development Block Grant, funding administered by the NJ DEP and to address mosquito habitat created by Superstorm Sandy.

NJ Light Traps collected 19,348 mosquito specimens representing 25 species. Over 32% of the NJLT collections were Aedes vexans. Mixed Culex species represented about 28% of the collections. This trend was mirrored in the CO2-baited traps.

Culiseta minnesotae was found in Warren County for the first time on record. Adults were found in a gravid trap sample from the Kasper Rd. area of Allamuchy Township on July 14, 2015. Additional adult sampling and a search for larval habit were both successful in turning up more Cs. minnesotae samples. This species has only been found in NJ on a few occasions.

Over the course of the season 213 pools of mosquitoes were submitted to PHEAL for WNV testing through the SMCC virus surveillance program. Only 11 pools tested positive, so it was a relatively low WNV activity year for Warren County. Only 2 birds out of the 5 submitted tested WNV positive and once again, there were no confirmed human cases of WNV in the County. The State offered Dengue and Chikungunya virus testing, which we took advantage of. Unfortunately for the testing but fortunate in all other respects, we had a very low year for Aedes albopictus, so we did not have many specimens to submit. Fifty-seven Ae. albopictus were submitted and tested for WNV/DENV/CHIKV and all tested negative.

Water Management projects for the year consisted of pond and storm water facility restorations. The low rainfall in the late summer freed up seasonal staff to assist on hand cleaning projects throughout the County. Twenty-six hand cleaning projects in 13 townships were completed. Access brush clearing and trail mowing was also done as needed.

The Commission is still in the process of replacing the aging pesticide storage facility with assistance from the County Buildings & Grounds Department. The item has gone out to bid twice in the last year and the bid was awarded; however, there have been complications with the original bid specifications and completion of the project is delayed. A new Commissioner, Robert Eriksen, was appointed to replace Mayor James Kern who resigned early in the year. Mr. Eriksen brings a wealth of wildlife knowledge to the Commission as former director of the Wild Turkey Federation and retired Fish and Wildlife Biologist.
Hello everyone!!! That’s right; it’s time to start thinking about the annual NJMCA Annual Meeting and Recertification Seminar and the HIGHLIGHT of the week: The Photo Salon.

I know that you look forward to seeing the “beautiful” artwork that some of our colleagues produce and laughing at those pitiful attempts to channel Ansel Adams that always show up.

You too can make the Photo Salon fun by submitting your photos. Submit early and often for an entertaining “Awards Presentation”.

You can submit a masterpiece like this:

Or accept the inevitable and send a picture like one of these:

Submit ‘em if you got ‘em!!

Doug Abdill, Chair
2016 Photo Salon Committee
NJMCA Photo Salon Entry Form

Please Note: Only digital photos will be accepted.

Submissions are due by noon, Thursday of the Convention at the Registration desk. It would be appreciated if entries could be emailed to abdill_john@aclink.org prior to the start of the Convention.

Categories (Circle one. Use one sheet per photo- copy this page if needed)
- Mosquito Biology/Habitat
- Water Management
- Operational Mosquito Control
- General
- Humorous
- Nature’s Beauty
- Digitally Altered

Use the following file name format: last name+category+number of photo in category
ie: reinertgeneral2.jpg

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By way of this form I give permission for this photograph to be printed for use in the New Jersey Mosquito Control Association’s display. Category titles and number of accepted photographs are subject to change depending on the number of entries received.
Cape May County Mosquito Control Celebrates 100 years

Mosquitoes – the most studied insect in the world, known as a nuisance factor to us all. Between 1800 and 1900, there was no organized form of mosquito control in New Jersey, leaving huge mosquito hoards to attack the East Coast, especially Cape May County.

The “patriarch” of the beginning of mosquito control in New Jersey is known as Dr. John B. Smith of Rutgers University. Smith was not a classically trained entomologist; he began his professional career in law, but he got tired of this quickly. His intense interest in all things entomological eventually led to his employment at Rutgers where he first tackled agricultural pest problems facing New Jersey’s farmers, creating his vision of mosquito control in New Jersey.

The mosquito scourge in New Jersey was so vast in the late 1800s that most individuals at the time believed that controlling mosquitoes was preposterous. But Smith believed otherwise, and in 1900 he successfully secured a small sum of money from the New Jersey Agricultural Experiment Station (NJAES) for a preliminary investigation into the mosquito problem.

In 1904, Smith presented the New Jersey Senate with his research findings on mosquitoes’ habits, life history and more. An important revelation emerging from this work was the ecology of the salt marsh mosquito (Aedes sollicitans), aka the state bird of New Jersey. Dr. Smith discovered, mostly through studies in Cape May County, that this species traveled far inland, making contact with nearly three-fourths of the state’s population.

Through this discovery, the idea of ditching and draining the salt marsh was developed as a means of controlling the salt marsh mosquito. It is unknown who developed this idea specifically, but Smith was without a doubt one of its greatest proponents. By the time of Smith’s death in 1912, nearly 40,000 acres of salt marsh had been drained involving five million feet of ditch. In the same year, the State Legislature passed a bill known as the County Mosquito Extermination Commission Law.

This new law allowed the formation of a non-paid mosquito commission in each of New Jersey’s counties that would create and operate a mosquito control agency under the direction of the NJAES. This led to the creation of the Cape May County Mosquito Extermination Commission in 1915, along with a number of other county mosquito control agencies, in an attempt to control the mosquito plague.

The first official organizational meeting of the Commission was held on October 15, 1915 at the old Bellevue Hotel in Cape May Court House. To this day, Dr. Peter Bosak, the current superintendent of what is now known as the Cape May County Department of Mosquito Control, has the documented minutes from the original meeting and every meeting since.

The Commission grew quickly through the 1920s and 1930s, expending most of its efforts on ditching the salt marsh. The Commission’s efforts along with other East Coast counties’ efforts became a huge part of the development of shore communities; land once uninhabitable soon became prime real estate and so began the annual summer pilgrimage to the Jersey shore. The history of mosquito control in Cape May County and its contribution to developing the community is so important that it is referenced multiple times in the book “The Mosquito Crusades” by Gordon Patterson.
After many years of rapid expansion, in early 1943, the U.S. Army requested the use of a building owned by the Commission, leading to the resolution of the U.S. Government leasing the building known as Barracks #1. From 1943 to 1945, the U.S. Army operated a German prisoner of war camp on the grounds of the Commission, which led to prison labor being used in mosquito work in the spring of 1945.

If you were a Baby Boomer growing up on the East Coast, you may share Dr. Bosak’s childhood memory of hearing the mosquito control spray truck and running through the fog as the truck made its way down the street. But despite all the efforts of the Cape May County Mosquito Extermination Commission and other counties, in 1959, New Jersey first recorded an outbreak of the mosquito-borne virus eastern equine encephalitis (EEE), resulting in 33 known cases and 21 deaths.

Over the next few years, the Commission’s continued mosquito research and control efforts served to keep mosquito-borne disease at low levels. In 1973, the Commission hired Judy Hansen as superintendent of the Commission. Judy has served on the Commission for 45 years, receiving much recognition and praise. In addition to her many duties as superintendent, Judy served twice as president of the New Jersey Mosquito Control Association, and in 1989 was the first woman elected president of the American Mosquito Control Association.

Around the time of Judy’s hire, Open Marsh Water Management (OMWM) became an integral part of the mosquito control program in Cape May County, and it remains that way today. OMWM came with mixed reviews when it was first debuted in Cape May County in 1969, but after much contention and working out the difficulties that came with OMWM, it slowly became the new method of mosquito control.

Also around the time of Judy’s hire, it became evident that the Commission needed more aerial support, both in terms of mosquito surveillance and control, in addition to the State Air Spray Program already in place. So from 1974 through 1982, the Commission contracted with private companies to make this possible. However, contracting became prohibitively expensive, and Judy convinced the Freeholders that purchasing rather than contracting helicopters would actually save the county money. So in 1983, the Commission purchased two Hiller helicopters that remained in use until 2015.

Today, the Commission is known as the Cape May County Department of Mosquito Control. While the Department is fortunate to have several university trained specialists on staff covering a multitude of disciplines, much of its strength lies in the employees’ immeasurable practical knowledge gained from many years of experience in the field. With the recent introduction of West Nile Virus into New Jersey, we are once again reminded of the importance of the Department’s work. The Cape May County Department of Mosquito Control continues to work with an unwavering focus: to provide residents and visitors with an enjoyable outdoor experience, free of mosquitoes and the diseases they transmit, in a safe, economical manner.

On October 23rd we celebrated our 100th anniversary that included several speakers, great food, fellow mosquito control agency representatives and a surprise dedication of our building to former superintendent Judy Hansen.

Reprint in part from Tuesday, October 13, 2015 Cape May County Herald
New Jersey Mosquito Control Association Inc.

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