2012 Mosquito Control Season Summary
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Cumberland County MCD

The mild weather most of the state experienced in the winter of 2011-2012 had most of us fearing the worst of springtime mosquito populations. We were given a reprieve by the absence of the perennial “spring showers” and also summer precipitation. Most counties experienced a decrease or plateau in overall mosquito population levels. Virus activity was another matter. Many counties saw near record WNV activity, which most attribute to the proliferation of *Ae. albopictus*, an increase in the populations of most *Culex* species, and just enough precipitation to keep permanent water sources and containers viable for ovipositioning. The extreme weather events of the summer and fall challenged all of the county and state agencies, but we showed a strong resolve and cooperated in intra and intercounty recovery efforts.

Atlantic County

The number one question asked of us by the citizens of our fair county every spring is “How will the mosquitos be this year”. And the only honest answer I can give them is “I don’t know”. This is the nature of our business. A future driven by uncertain environmental variables that bring to our doorstep, unpredictable mosquito populations. Although I can say with certainty that if your property is a mess of containers, you will experience the wrath of the tiger mosquito. This years’ season, like all before it, was again a new experience for our office, rainfall for the season was not beyond moderate at any time but enough to fill containers from time to time. Complaints were low and most associated to those container species. Usually our greatest population of nuisance mosquitoes comes from salt marsh activity which this year was severely limited. We only did two larvicides on the salt marsh. Both occurred early in the season treating areas half the size of what we have done historically. For the rest of the season, we experienced small isolated broods of salt marsh species that we managed with a handful of truck adulticides. As the state faced increased viral activity, ours was a mixed bag of goods. For Eastern Equine Encephalitis, we had a horse case and a positive pool of *Cs. melanura* from the same area, yet our resting box collections yielded no positives.
For West Nile Virus, we did have one human and also one horse but only five positive pools for the year with all coming from *Culex* species. We had the third highest number of birds submitted for viral testing but the lowest percent of positives (4 of 30). Since flood water was not a problem for much of the year, we were able to treat a record number of catch basins which I would like to think limited our human populations to exposure of WNV. Alas, our greatest challenges came from non-mosquito related events. A July storm devastated our county reducing it to a war zone thus relegating most of our staff to unfamiliar duties. And again in November, Hurricane Sandy brought similar challenges. Last year I did mention that we would be moving our office. We are no closer to this happening then we were last year.

This year’s service requests out-paced last year’s by more than 120 calls and nearly 150 ahead of 2010. Even though the attention given to WNV by the media undoubtedly raised public concern and contributed to the increase of complaints, the underlying problem is most certainly due to the further entrenchment of the Asian Tiger mosquito to the county and region. It is by far our biggest complaint generator and the solution remains a great challenge.

We had five county residents contract WNV in late August and early September, ranging in age from 39 to 75 years. One resident suspects he was infected while fishing at the Jersey shore, although there is no way of confirming that. No positive pools were found near his residence.

Light trap counts were fairly typical this year. *Culex* populations were higher, characterized by a nearly 5 fold increase in *erraticus*, while *pipiens* levels stayed about the same. The amount of *Aedes albopictus* trapped rose more than 50% over the previous year. We also saw a near doubling of *Cq. perturbans* but a large drop in the number of flood water species.

We made a net gain of one employee with the rehiring this summer of an inspector originally laid off in 2010. This gain may be short-lived though, as 36-year employee, Senior Inspector Tim Forest is retiring at the end of the year. Although there has been some discussion of hiring a replacement, as of now, no concrete steps have been taken by the commissioners or county administration.

**Cape May County**

Mosquito populations were higher and more diverse in the 2012 season as compared to the previous mosquito season. Various trapping methods combined collected 127,044 female mosquitoes, almost 25% more than the populations trapped in the previous year. The average precipitation of 3.2 inches, and higher temperatures made the differences. New Jersey light traps collected 76.4% mosquitoes from 25 sites, gravid traps 14.7% from 25 sites, resting boxes 7.9% from 5 sites, and CDC traps collected 1.0% mosquitoes from various sites. Fresh and salt marsh mosquito ratio stayed at 55.4% and 44.6% respectively. We collected 22 freshwater species of mosquitoes (two more than the previous season) and five species of saltwater mosquitoes during the 2012 season. Mosquito species of particular interest were *Cx. salinarius* (19.8%), *An. bradleyi* (17.5%), *Cx. pipiens* (10.1%), *Ae. cantator* (7.8%), *Ae. vexans* (7.4%), *Cx. erraticus* (6.9%), *Ae. taeniorhynchus* (6.1%), *Cs. melanura* (5.0%) and *Ae. sollicitans* (4.2%). Unlike previous years, *Ae. albopictus* showed widespread presence throughout the county in higher numbers. Other mosquito species trapped during the 2012 mosquito season were *An. quadrimaculatus*, *An. punctipennis*, *Ae. atlanticus*, *Ae. canadensis*, *Ae. japonicus*, *Ae. triseriatus*, *Cx. territans*, *Cx. restuans*, *Cq. perturbans*, *Or. signifera*, *Ps. ferox*, *Ps. ciliata*, *Ps. columbiana*, *Ps. howardii* and *Ur. sapphirina*.
We tested 4,028 mosquito pools for WNV, 1,863 for EEE, and 181 pools for LAC from Cape May County in our BSL3 Laboratory. Twenty-four pools for WNV and five for EEE were positive from these collections. Additionally, five of the 444 pools sent to the state laboratory tested positive for WNV. All 48 pools sent to the state laboratory for EEE tested negative. During 2012, our contract with the State Mosquito Control Commission was renewed to collect, identify, and test *Cs. melanura* for EEE. Cape May, Camden, Gloucester and Salem counties were the four resting box locations for the State’s Vector Surveillance Program. We tested 112 pools of *Cs. melanura* for WNV and the same number of pools for EEE from the four state resting box locations. Vector surveillance data collected by us and submitted to the State Mosquito Control Commission is not reported here. Our BSL3 laboratory also tested mosquito pools sent by other client counties. Our first WNV positive pool was collected more than three weeks earlier (07/02/2012) than it was collected in the last season (07/28/2011). The first mosquito pool tested positive for EEE was on 07/11/2012 and the last on 10/15/2012. Two blue jays collected from Cape May County also tested positive for WNV. We are aware of only one human WNV case in our county this season. Our inspectors traveled 17,439 miles to treat 77,007 catch basins with *Golden Bear Oil, Vectolex CG or Altosid pellets*. Additional inspectors traveled over 34,979 miles to treat larval habitats with *AquaBac 200G, VectoBac 12AS, VectoBac G, Abate 5BG or Golden Bear Oil*. ULV mounted trucks sprayed Scourge, Zenivez E20 and Aqua-Reslin to contain adult mosquito populations.

Drs. Bosak and Bilgrami, Mathew Diem, Diane McNelly, Karen Hedstrom, Edward Sokorai, and Chris Frame attended and/or presented research findings at the NJMCA meeting and Dr. Bilgrami presented a poster on parasitic mites. Drs. Bosak and Bilgrami, Edward Sokorai, Chris Frame, Diane McNelly and William Daughenbaugh, participated in several public events and workshops held within the county including School Career Day, Earth Day, County 4-H Fair, National Night Out, and the Ocean City Air Fest. Department staff also visited schools for one to one interactions with the students and teachers.

**Cumberland County**

The 2012 season was an interesting one for the Cumberland County Mosquito Control Division. Cumberland County was struck by two extraordinary weather events in 2012. We were among the southern counties impacted by a “super derecho” on the night of June 29. A derecho is defined as a widespread and long-lived wind storm that accompanies rapidly moving showers or thunderstorms. A super derecho is one of extraordinary scope and intensity. Winds in excess of 60 mph were recorded in Cumberland County with 80 to 90 mph gusts recorded elsewhere in the storm path. This event toppled thousands of trees and directly damaged many structures. The downed trees crushed cars and buildings, created many new blockages in every watercourse in the county and caused power outages lasting over a week. Several of our light traps were out of commission and trapping routes were altered. We were also impacted by super storm Sandy; however, the storm tracked so that most of the impact in Cumberland County was due to storm surge along the Delaware Bayshore. All of our personnel participated in removing houses and debris from the marsh. We were lucky precipitation levels were well below normal throughout most of the year. This resulted in service requests for 2012 decreasing by 15.3% from those of 2011.
We commenced the light trap season on May 2 and ended the adult surveillance program on October 31. All told, light trap collections decreased from 2011 numbers by 42.7%, with the number of female mosquitoes totaling 28,012 and averaging 10.26 mosquitoes per trap night. Our trap count remained at 15 New Jersey Light Traps. The top five mosquito species caught were: Cx. salinarius, An. bradleyi, Ae. taeniorhynchus, Ae. vexans and Ae. sollicitans.

Collections from our resting boxes, CDC traps, and gravid traps commenced the fourth week of May. On average, the resting box site and gravid/CDC trap sites were sampled once each week. Vector surveillance efforts remained well below historic and ideal levels, due to inadequate staffing. The number of mosquitoes submitted for testing fell by 57.1% and total pools submitted fell 23.8% from 2011. As of October 10th, 1,807 mosquitoes were submitted to PHEL, in 205 pools. Fifty-seven of these pools were duplexed for WNV and EEE and 8 were duplexed for WNV and LAC. Two pools of mosquitoes were positive for EEE virus activity. One Cs. melanura and one Cx. erraticus.

Cumberland County’s tire collection program was shelved for the 2011-2012 winter. We hope to restart the program, but are awaiting approval from our cooperating organization, the Cumberland County Improvement Authority. While we await that correspondence, the inspectors are busy refurbishing the wooden console and seat in our Boston Whaler and preparing to respond to winter storm events.

The Heavy Equipment Operators also remained busy in 2012. Five water management projects were completed; two were aimed at restoring flow to ditch networks and three were stream cleaning efforts completed under permits-by-rule. Two ditch maintenance projects are currently in progress.

Hudson County

For the 2012 season; 16,109 adult mosquitoes were trapped from 9 New Jersey light traps over 1,416 trap nights. The average for the season was 11.4 mosquitoes per trap night, down 5.2% from 2011 due to the loss of one trapping location. The predominant species were Culex salinarius (40.4% of the total), mixed Culex species (34.9%), Cx. pipiens (8.7%), Aedes vexans (7.4%), and Cx. restuans (2.8%). We made a total of 5,388 inspections to nearly 300 larval sites. Our office received 59 service requests in 2012, mostly due to abandoned pools and backyard albopictus problems. The yearly rainfall total through October was about 50% less than 2011. Average temperatures were slightly higher than the 2012 average through October. As part of the WNV surveillance program, we submitted 260 pools for testing consisting of 14,085 mosquitoes, a 20% increase in the number of mosquitoes tested in 2011. Of those, 79 pools of mixed Culex spp. tested positive from 19 different locations. The overall infection rate was up from 3.66 infected mosquitoes per 1,000 in 2011 to 6.78/1,000 in 2012. We collected positive mosquito pools every week from weeks 26-38 and found our earliest positive mosquito pool ever in week 23. We cooperated with the Rutgers Center for Vector Biology on two research projects investigating spinosad and pyriproxyfen.

Hunterdon County

This past year was somewhat unusual. We received the fewest mosquito complaints in recent memory. A lack of spring-time precipitation coupled with few substantive rain events in the summer resulted in few flood water mosquito problems. However, virus activity in mosquitoes reached levels never documented in our county. We tested 465 mosquito pools for West Nile virus and 96 were positive – a positivity rate of 20%. Virus activity in 2012 was the most extensive ever recorded in Hunterdon. Meanwhile, both larviciding and adulticiding were lower than in recent years because of the lack of mosquito production.
There was one exception – *Aedes albopictus*. This mosquito continued to spread throughout the county. In most areas populations were relatively small, so we haven’t yet experienced the level of problems that other jurisdictions in New Jersey have.

**Mercer County**

If we could sum up the 2012 mosquito season in one word, it would be “containers”. The early season rains did not manifest, and we had virtually no service opportunities related to univoltine species developing in woodland pools. The majority of our service requests were related to container-inhabiting mosquitoes. With concerns about West Nile virus (WNV) rising in the summer, our call volume increased accordingly, keeping our Mosquito inspectors busy with over 700 service opportunities. In order to help combat the threat of WNV, our vector surveillance team deployed a variety of traps on a daily basis, covering 170 different locations throughout Mercer County. Of those trapping efforts, 364 pools were submitted for WNV testing, with 70 testing positive for WNV (overall MFIR value of 8.12). We also continued operational field trials (and accompanying bioassays) with truck-mounted applications of VectoBac WDG against *Aedes albopictus* in urban habitats using low-volume sprayers. A total of six different VectoBac WDG applications were conducted this year, with efficacy mortality approaching over 90% in the treated area during some applications. Our Asian Tiger Mosquito team once again worked vigorously this season, sampling catch basins and flexible gutter extensions throughout the City of Trenton to better understand how these containers contribute to the production of *Ae. albopictus* populations. With that approaching cold weather and the culmination of this season, we are preparing reports, manuscripts, and presentations for the upcoming meetings. We look forward to the 100th anniversary of the NJMCA and the ensuing celebrations at the AMCA convention in February 2013.

**Monmouth County**

4,459 mosquitoes were trapped by the NJLTs from May 1st through September 30th. This catch represents a seasonal average per trap night of 1.7 mosquitoes. These data rank the 2012 season as the lowest total and average catches in the past thirty years. Light trap collections continued through October but were not evaluated in the seasonal analysis.

The top three species from the May NJLT collections were: 1) *Aedes vexans*, 2) Culex pipiens, and 3) *Culex restuans*. In June the top three species were: 1) Cx. pipiens, 2) *Ae. vexans*, and 3) *Ae. sollicitans*. The July collections saw the top spots occupied by: *Ae. sollicitans*, *Cx. pipiens*, and *Ae. vexans* respectively. In August the order remained the same. It was *Ae. vexans*, *Cx. pipiens*, and *Ae. sollicitans* in September.

431 mosquito pools were submitted to NJDHSS for WNV testing through the end of October. By season’s end twelve pools from nine locations were WNV positive, including one pool of ALB and one of JAP. Additionally, eight positive birds were found. Two horses tested positive for WNV: one was vaccinated and survived, and the other was not vaccinated and was euthanized. There were three WNV positive humans reported for 2012.

Of the pools submitted to NJDHSS for testing, 46 were duplex screened for WNV and EEE. There were three EEE positive samples, including one pool of ERT. No human or equine EEE cases occurred during the season.

Monmouth County received approximately 26.1 inches of rain from April 1st through October 22nd. Inspectors processed 859 Requests for Service for the season.

A significant loss to the MCMEC’s personnel comes with the retirement of Inspector Bill Harris following 25 years of tireless dedication. Bill provided invaluable service through his regular inspections, coordination of adulticiding efforts, surveillance fieldwork, and database management.
Additionally, he was the “Maestro” of equipment troubleshooting and repair. He will be missed as an organizational asset but, more importantly, as a true friend.

The Asian Tiger Mosquito Program evaluated catch basins and flexible gutter extensions as a habitat of *Aedes albopictus* larvae in Monmouth County. Truck mounted applications of FFast Bti were assessed for their efficacy to control *Ae. albopictus* larvae.

**Morris County**

Here at Morris County, 2012 again proved to be another interesting and challenging year. While overall mosquito numbers were reduced due to the lack of any appreciable precipitation, West Nile Virus numbers were up. We collected a record 73 positive mosquito pools this year and were in receipt of 23 positive crows/blue jays.

Water Management Projects: Four major ditch maintenance projects were completed under our FWW GP-1/FHA GP-4 permits. Two additional ditch maintenance proposals have been prepared and will be completed by early 2013.

Trees/Desnagging: 12 tree projects were completed under the Flood Hazard Act, Permit-By-Rule 5. We also aided other county agencies with tree removal following Hurricane Sandy.

Stormwater/GIS: The stormwater basin project continues, with new basins added to the database each winter. Staff members continue to inspect basins and perform minor hand cleaning projects as necessary. We are also continuing to use GIS/GPS to analyze our surveillance data.

Public Education Events: This year we participated in 15 public education events at various locations throughout the county. We also had a travelling exhibit on display for World Malaria Day and Mosquito Control Awareness Week. New this year was a special Asian Tiger Mosquito display set up at two municipalities with high ATM populations.

Mosquito related materials were also given to three organizations for special events and visitors.

Our Facebook page had an increase in traffic this year. Our website continues to be updated with new information.

**Ocean County**

The warm winter of 2011-2012 made for some dire predictions for the beginning of the 2012 mosquito season. Fortunately, preseason surveys showed that only around 18% of all upland mosquito producing sites had larvae present while 39% of all sites were still dry. This gave us a relatively quiet start to the mosquito season.

In general, populations of most key mosquito species continued to stay below average throughout the entire season. The exceptions were *Cx. salinarius* and *An. bradley*, which had population increases of 252% and 86%, respectively, as compared to last year’s totals.

New Jersey Light Traps collected a total of 35,650 female mosquitoes from the 28 light traps located throughout Ocean County. This number is slightly higher than last year’s totals, representing a 9% increase seasonally. *Cx. salinarius* unseated *Ae. sollicitans* as the most abundant species in light trap collections comprising 53% of all collections. *Ae. sollicitans* (13.8%), *Ae. cantator* (11.8%) *Ae. vexans*(8.2%) and *An. bradleyi* (7.6%) were the other most common species in light trap collections. *Cs. melanura* and *Cq. perturbans* populations remained far below their monthly and seasonal averages. A total of 29 different mosquito species were collected in light traps.

The Aerial Larviciding Program treated a total of 21,118 acres in 2012. This is the third lowest seasonal total in the programs 29 year history and indicates a 60% decrease in acres treated when compared to the program’s long term average. Additionally, upland granular aerial larviciding activity had greatly increased contributing 4,720 acres to the treatment totals.
Continued OMWM projects occurring on some of Ocean County’s heaviest mosquito producing salt marshes can account for some population trends and attests to the success of the marsh management program. To date, a total of 60 acres of salt marsh have been managed in 2012.

The Yard Audit Program continued to expand in 2012. Once again, we were able to dedicate a person to this program. The majority of mosquito complaints dealt with the increasing *Ae. albopictus* problems.

Field trials were conducted on Metalarv S-PT and the use of copepods to control *Culex* mosquito production in newly created bioretention stormwater facilities.

West Nile Virus activity increased in 2012. A total of 16 positive mosquito pools were detected out of the 570 submitted to NJDHSS. Positive pools were mostly *Culex complex* however, *Ae. albopictus* and *Ae. vexans* samples had positive results. Human activity increased, with 9 confirmed cases in Ocean County. A total of 29 positive birds were found out of the 121 accepted for virus testing.

There was little or no EEE activity in 2012. *Cs. melanura* numbers were far below average for most of the season for all sampling methods. Still, 2 *Cs. melanura* pools tested positive for EEE.

**Salem County**

The warm winter coupled with a dry spring left Salem County without our usual springtime hatch-off. The dry weather continued through most of the summer as well.

There were 14,891 mosquitoes caught in 18 traps, as opposed to 28,374 from 2011. We have had more than usual light trap property owners deciding to forgo the light trap for next year. We are hoping to keep the traps in the general vicinity of where they are.

Vector Surveillance was more eventful than last year. We had 1 WNV positive pool from the county run traps, and 1 from the state run resting boxes.

There were 3 EEE positives from the resting box site. We had one WNV positive horse, with history of vaccination. We also had one confirmed WNV positive human who, thankfully, recovered.

Water management projects completed this year include Kansas Drive and Erie Avenue in Pennsville Township, Delaware Avenue in Elsinboro Township, and Sawmill Road in Alloway Township. The Canton Drain project in Lower Alloways Creek Township and the Walnut Street project in Elsinboro Township are ongoing.

Inspector, Anthony Hall was moved to the road department full time in lieu of a layoff. We are hoping that he will be able to return for the mosquito season.

We had 343 service requests during the season, a drastic decrease from last years’ 1,056 calls. Our public outreach continued this year, focusing on biology. We visited schools and set up a booth at our county fair.

We are currently working on renewing our blanket permit, and extending our GP 15 permit.

**Somerset County**

In 2012 we endured the most intense year of West Nile virus on record, documenting more than 60 positive mosquito pools and three human cases of disease. Virus activity was particularly heavy along the eastern and northeastern border of the county. Sporadic rain throughout the season produced only small broods of mosquitoes. Species such as *Ae. trivittatus* were virtually undetectable. Dry conditions early in the season appeared to keep *Culex* populations to a minimum, so while virus activity was high throughout the season mosquito populations were below average in virtually every category.
Aedes albopictus continued to spread throughout the county although nuisance levels were not as high as anticipated. Initial collections from gravid traps were June 5, 2012 from Bound Brook, which is the earliest we have ever collected adults. Trap collections lasted until October 1, 2012 from Peapack, and this is the latest we have collected this species. We sent our Psorophora cyanescens as well as “Ps. ferox morphs” to the Smithsonian Institute for further evaluation (these specimens were collected in 2011). Our Ps. cyanescens specimens were confirmed. The Ps. ferox morph specimens were inconclusive, but evidence suggested they were probably Ps. cyanescens. Lack of habitat made collections unattainable in 2012.

SMCC and OMCC

Last spring the Office of Mosquito Control Coordination (OMCC) staff was solicited by the Division of Fish & Wildlife to create a mosquito control exhibit for the 100th Anniversary of the Charles O. Hayford Fish Hatchery at Hackettstown which was to be held on June 2 & 3. The Hackettstown Hatchery works under a memorandum of agreement with the State Mosquito Control Commission (SMCC) and is responsible for the production of the five fish species used in the State Commission’s Bio-Control program. In early March, staff at the Hackettstown Hatchery informed the OMCC that fish overwintered indoors, were ready to be stocked by county agencies. The program supplied thirteen county agencies with approximately 135,700 Gambusia and Fathead Minnows. The copepod field trials continued to evolve as 5 counties stocked over 70,000 copepods this past season. Examples of some sites stocked were tires, ornamental ponds, abandoned swimming pools and select storm water basins known to be producing mosquitoes.

The OMCC staff also created a mosquito control exhibit for the Division of Fish & Wildlife’s “Outdoors Expo” held during the weekend of September 15 & 16. The exhibit included the state-owned “Marsh Master”. Also last spring the members of the State Mosquito Control Commission passed a resolution to acknowledge the service of Mr. Bruce Wolf, of the State Health Department’s Public Health and Environmental Lab, upon his retirement after many, many years of dedicated service.

Mr. Wolf was responsible for supervising the testing of every West Nile virus sample sent through the State Health Department Public Health and Environmental Lab (PHEAL) from every county agency since the beginning of West Nile virus surveillance in New Jersey. The State Commission continued its support and testing for West Nile virus, Eastern Equine Encephalitis (EEE), Saint Louis Encephalitis (SLE), and La Crosse Encephalitis (LAC) at the new Public Health Environmental and Agricultural Lab in 2012. By agreement with the SMCC, PHEAL tested approximately 11,600 mosquito pools for West Nile virus. PHEAL also tested 2,661 mosquito pools for EEE. The Office of Mosquito Control Coordination, through the State Department of Agriculture, received information associated with the testing of 11 horse specimens from 6 counties for West Nile virus, 6 horse specimens for EEE and 300 ring-neck pheasants for EEE. This information was made available to the appropriate county agencies by the staff of the OMCC. The toll free mosquito directory, which was created in 2005 to assist state residents in finding contact information for their local county mosquito control agency during those hours when offices were closed, handled 362 calls in the first nine months of the year. In addition, countless numbers of calls to the state office redirected state residents who were seeking information about their local mosquito control agency.
These calls were handled in person by Office of Mosquito Control Coordination staff. Additionally the OMCC fielded approximately 40+ calls, during regular business hours last season from individuals with very unique or problematic mosquito related questions throughout the state. Finally office staff continued to maintain a positive public relations image by way of interviews with print, radio, television and internet media.

Several meetings were held with many different state level officials regarding such topics as surveillance and control on state-owned lands, the predicted necessary reconstruction of the Department of Health’s West Nile virus data management website, increased funding for West Nile virus testing, the New Jersey Pollutant Discharge Elimination System (NJPDES) permit procedures as required by the Clean Water Act and ‘due to attrition’ the future staffing of the Office of Mosquito Control Coordination OMCC staff also attended a meeting with the State Office of Emergency Management and initiated the process regarding FEMA reimbursement for the costs of mosquito control operations due to Hurricane Irene. The expenditure of significant resources in both insecticides and aircraft time were necessary to control the mosquitoes produced in the wake of the hurricane. Members of the office staff also attended several meetings with multiple county agencies to discuss mosquito surveillance and control issues and what state aid was, and in the future would be, of value to operational mosquito control agencies. In 2012 the State Commission decided not to continue funding the “Monitoring the Efficacy of Insecticides for Mosquito Control in New Jersey” contracted to Rutgers University. This contract renewed annually, the first of which began in 1999, primarily monitored the toxicity of temephos and methoprene on *Aedes sollicitans* larvae from Atlantic, Cape May, Cumberland and Ocean Counties. Many years of excellent data was derived from these studies much of which contributed to the document “Insecticides Recommended for Mosquito Control in New Jersey” produced annually by the New Jersey Agricultural Experiment Station. The State Equipment Use Program responded to the needs from several county agencies with regard to the use and repair of state-owned equipment. The State Commission responded to several requests to transfer, surrender or replace several pieces of equipment in its inventory.

Eleven pieces of equipment were surrendered and either replaced, re-assigned to other agencies, placed in storage or sold at auction. Examples of this included rolling stock, spray equipment or laboratory apparatus. The State Airspray Program operations began in 2012 with the annual pre-season meeting which was held at the New Jersey State Department of Environmental Protection’s Conservation Education Center located at the Division of Fish and Wildlife’s Assunpink Wildlife Management Area. At this meeting participants were updated on program procedures and the new NJPDES permit requirements made necessary by the Clean Water Act. Under the Airspray Program, fourteen larvicides in three counties were performed which treated 13,227 acres. No adulticide applications were performed by the program in 2012. The “Chemical and Insecticides for Mosquito Control Contract” scheduled to expire this year required a “Request for Proposal” for a new contract to be written. Contract specifications were reviewed, re-written and after several exchanges with the Department of Treasury, the Office of Mosquito Control Coordination OMCC staff also attended a meeting with the State Office of Emergency Management and initiated the process regarding FEMA reimbursement for the costs of mosquito control operations due to Hurricane Irene. The expenditure of significant resources in both insecticides and aircraft time were necessary to control the mosquitoes produced in the wake of the hurricane.
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In summary, the State Mosquito Control Commission and Office of Mosquito Control Coordination continued to assist county mosquito control agencies by way of their many and varied programs. These programs included the Airspray Program that started in 1949, the Equipment Use Program which started after the creation of the State Mosquito Control Commission in 1956 and the Bio-Control Program which began in 1991 and they are just part of what the State offers county agencies in order to serve the citizens of this state. State purchasing contracts useful to county mosquito control agencies, obtaining and testing new types of mosquito control equipment, mosquito biology data exchange and working with state and federal regulatory and service agencies are just a few examples of how the State is involved in order to face the challenges both present and in the future.

**Sussex County**

Field staff conducted approximately 3500 inspections and surveillance operations during 2012. Because of dry conditions throughout the spring and summer months, light trap collections were relatively low compared to past years. Populations of the most aggressive species, such as *Aedes sticticus*, were low throughout the season. *Culex* numbers from New Jersey light traps were lower than average and faded quickly after June. Floodwater species, such as *Ae. vexans*, were present but well below historic averages. *Coquillettidia perturbans* were present during June and July but were low enough that they caused little nuisance. Approximately 3,500 acres were aerially larvicided over the course of the 2012 season.

West Nile virus levels reached levels in 2012 never seen in the county, even during the initial years of virus activity. In 2012, 363 mosquito pools were tested for WNV.

Of these pools, 41 tested positive for virus. This represented 11% of the total. In addition, a total of 14 birds tested positive for WNV within Sussex County. One equine WNV case was reported with onset during the week of October 8th. No human cases of illness were reported in the county.

The Asian tiger mosquito, *Ae. albopictus*, did appear in routine surveillance. The presence of this mosquito even in small numbers is of concern. Asian tiger mosquito collections demonstrate this species can survive in the highest elevations of the state. It will be interesting to see whether this species can spread as it has in other areas of the state.

**Warren County**

The winter of 2011/2012 was extremely mild in Warren County and we started receiving service requests early on for *An.punctipennis* populations that had come out of diapause. However, the mosquito season never really took off, due to below average rainfall throughout the spring and summer. Only one air-spray mission took place in May, treating a minimal amount of acreage. With the lack of floodwater habitat, seasonal staff were readily available to assist the water management program with small hand cleaning projects and tire pick-up throughout the majority of the season.
NEW JERSEY MOSQUITO CONTROL ASSOCIATION, Inc.
NEWSLETTER

Warren County-cont’d

In late August, service requests spiked, despite the lack of significant rainfall. Most of these new service requests were emanating from Phillipsburg, the most urbanized area of the county. One quick landing rate revealed that Ae.albopictus had found us, Warren County was no longer the last hold-out. Follow up trapping showed this species had already become established in a very localized section of town.

Extensive surveillance and mapping occurred to pinpoint Ae.albopictus larval habitat, then Ultra Low Volume (ULV) larviciding coupled with ULV adulticiding missions were performed in an effort to eradicate the populations-while the possibility still existed. Despite the concentrated effort of several seasonal and full-time staff in Phillipsburg, Ae.albopictus spread to neighboring Lopatcong Township late in the season.

Overall, other mosquito species populations were low this summer with Culex populations slightly up and Ae.vexans and other floodwater species way down. NJ Light Trap collections were only 21% of what they were in 2011 and weekly CDC trap collections were only 16% of the 2011 catch. Trap density in the NJ Light Traps went from an average of 28 mosquitoes/trap night in 2011 down to an average of 6 mosquitoes/trap night in 2012. Of the collections made, the prominent mosquitoes caught in the NJ Light Traps were Cx.spp (40%), Ae,vexans (14%), and An.punctipennis (13%). CDC trap collections were also composed primarily of Cx.spp (32%) and Ae.vexans (22%) going from trap densities of an average of 310 mosquitoes/trap night in 2011 to 35/trap night in 2012.

Coming out of such a mild winter, with relatively high Culex populations, 2012 met our expectations of being a very high WNV activity year, state-wide. Warren County MEC had a record high number of mosquito pools test positive for WNV, with 24 positive pools of mixed Culex. Although we also had a high number of crows test positive (23), it was still below our 2003 record of 39. These numbers are relatively low compared to some of the counties in the urban corridor but signaled significant activity for our county. There were no reported human or horse WNV cases in Warren County in 2012.

Several water management projects were completed, including two large ditch maintenance/restoration projects. The ditch system in Pohatcong Twp. at the Pallet Company was maintained as well as the Sheridan Ditch in Alpha. Both handle increasing amounts of stormwater. Flood mitigation projects were aplenty, as Hurricane Irene in 2011 left our inland streams clogged with fallen trees and debris. Numerous projects were completed in the Pequest and Paulins Kill Rivers and several of their connecting brooks and creeks. Superstorm Sandy in October 2012 has provided continued stream work for the coming winter as well. Once again, a trailer has been arranged by the Commission and placed at the main county road garage to accommodate tires picked up by Commission staff and county road department workers throughout the year.

Educational programs utilizing schools and displays at public events continued throughout the year, including the 100th Year Anniversary event at the Charles O.Hayford Fish Hatchery in June of 2012.
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NJLMN (Public Health CE) Credits and
NJ Pesticide Applicator Credits

Unfortunately, no NJLMN (Public Health CE) credits will be issued at the AMCA Annual Meeting to be held in Atlantic City. Due to the complexities of the meeting and the regulations associated with acquiring credits, it will not be feasible to arrange.

The NJMCA Program Committee is working to offer NJ Pesticide Applicator Credits for the AMCA Annual Meeting.

NJLMN (Public Health CE) Credits as well as NJ Pesticide Applicator Credits will also be available at the Annual NJMCA Pesticide Training Session offered in March.
Course at Rutgers: Workshops are beginning on Mosquito Biology and Control, Mosquito Habitat Recognition and Mosquito Identification. These workshops are designed to meet needs of government employees involved in mosquito research, surveillance and abatement. Incorporating a science based approach to mosquito control, stewardship of public health and the environment is a primary focus. Lectures will cover biology, morphology, ecology, and behavior of the Culicidae, along with the most current surveillance and control techniques. The course will be divided into three separate workshops to accommodate requests from agencies seeking information tailored to a particular discipline. Each workshop will complement information offered in the section preceding it, thereby completing the information necessary for workers employed in mosquito abatement operations. Entomologists, Biologists, Inspectors, Wetlands and Identification Specialists are encouraged to participate. Students can register for any workshop individually should they wish to gain experience in any one discipline. Students wishing to become certified by the New Jersey Agricultural Experiment Station in Mosquito Identification, Biology and Habitat Recognition will need to satisfactorily complete all three sections and pass a certification examination. To register, either apply online: http://www.cpe.rutgers.edu/ by selecting the link for Pest Control, the clicking on the Mosquito Control tab. You can also contact Scott Crans for further information at scrans@aesop.rutgers.edu.

Potential Course: We are considering a fee based course this August on "Recognizing Pathogens and Parasites of Mosquitoes." Topics include Fungi, Viruses, Bacteria, Protozoa, Microsporidia, Nematodes and Mites affecting mosquitoes. This training event would cost $150 for a day long workshop. The agenda would include lectures by Brian Federici, Ted Andreadis, Greg Williams, Randy Gaugler and others. Lectures would present the biology of the pathogen and how to easily identify them. Lectures would be followed by a laboratory session where students could see firsthand the pathogen. Ideally the class would end with the screening of mosquito samples collected by those attending the course from all over the region to see what pathogens are infecting our local mosquitoes. The cost of the course would help offset workshop expenses and provide refreshments. Let Scott Crans in the Center for Vector Biology know of your interest in this course by sending him a note (scrans@aesop.rutgers.edu) (ASAP). Efforts to gauge interest thus far have yielded eight students which is just shy of the 10-12 number needed to support the effort.

Grants: Congratulations to Randy Gaugler for receiving a grant from USDA/ARS for $130,000 to "Develop practical strategies for using pyriproxyfen against Aedes albopictus."

Congratulations also to Brian Johnson. He is a Ph.D student with Dina Fonseca who recently received a Jobbins Fellowship from the Northeastern Mosquito Control Association for his proposed work titled, “Critical early season drivers of West Nile virus in the northeastern US.”

Recent Awards: Congratulations to Dr. Mark Robson for recently being elected as a Fellow in Biological Sciences from the American Association for the Advancement of Science (which publishes Science).

--Lisa Reed
OBITUARY

John C. Kushke

John C Kuschke passed away on December 14, 2012 at age 86. He was a merchant Marine during WWII and graduated from the University of Rhode Island in 1950. He served in the reserve Officers Corps of the U.S. Public Health Service after graduating from URI. John was hired to establish the Norfolk Mosquito Commission in 1956 where he was the Superintendent until 1967 when he accepted the position of the Superintendent of the Morris County Mosquito Extermination Commission in New Jersey where he remained until he retired in 1992. John was an astute observer of life, with a keen understanding of human relationships. He was raised by a single parent, his mother, who took a faculty position at the University of Rhode Island after John's father died. John was born in Montana, but was only 3 when his family relocated to Rhode Island. As such, he had many of the classy traits of a typical New Englander. He was literally raised on the campus of URI- he actually showed me the house where he grew up after we traveled to a meeting of the Northeast Mosquito Control Association together. That is also where he went to college and where he met his wife of 60 years, Joyce. They had 5 children, 3 girls, 2 boys.

Although I knew John casually when I attended and worked at Rutgers in the 1970s and early 1980s, I got closer to him when I succeeded him as the Superintendent of the Morris County Mosquito Commission. John had retired from the position in 1992, after 25 years of service, and I started there in January of 1993. He was an extremely considerate and helpful mentor, providing guidance on navigating the political waters of the job. I always appreciated that he respected my turf as the new director of the program, never interfering, but offering insight when I asked. This helped me avoid missteps that I would have otherwise had to learn about the hard way. John ran one of the largest mosquito control programs in NJ, and even the US, with dignity and patience. He was always keenly aware of how important the program was to both the residents of Morris County and to the employees of the organization. These were responsibilities that he did not take lightly. He was only the 2nd director of the program, and he cherished the reputation of the Morris Commission.

If I had to sum up John in a single word, I would use, "elegant." Battling a variety of ailments, he always seemed optimistic about overcoming them and forging ahead without complaint. He survived 3 unrelated types of cancer, a colostomy and a hip replacement. After the surgery that resulted in the colostomy, he also suffered a hospital acquired staph infection. When I visited him in the hospital, over 15 years ago, I thought for sure I was saying goodbye. I'm glad that was not the case back then, but saying goodbye now was still painful. John will be missed by many people. He was an active Rotary member and former President of the Morristown Rotary Club, and he was also actively involved in Civil War and Revolutionary War groups here in Morris County.

Marc Slaff
OBITUARY

Leonard Spiegel, Ph.D.

Longtime member of the NJ State Mosquito Control Commission, Dr. Len Spiegel, Monmouth County died on September 22, 2012. He was member of the State Commission from the time it was reorganized in 1976 when he was appointed by Governor Brendan Byrne and confirmed by the Senate, to 2004, serving for 28 years. He served as Vice-Chairman during much of his tenure; he was Chairman during the last two years of his service. Dr. Spiegel provided a great level of professionalism and scientific standard while serving as Chair of the Commission’s Budget Committee and of the Research and Development Committee. He lent his time during several critical events in the Commission’s history which included sincere and qualified testimony during Statehouse Budget Hearings on behalf of the Mosquito Commission when its very existence was threatened by the perennial budget ax.

Len Spiegel was a long time member of the NJ Mosquito Control Association and served the organization as its President from 1989 to 1990. In his Presidential Address Len noted the issues of the time, which still plague us today. He credited the mosquito control community for participating in the resolution of such problems, rather than ignoring them or (even worse) contributing to them.

Dr. Spiegel was a veteran of the Second World War, having served in the United States Air Force. He once worked as a seasonal biology aide at the Morris County Mosquito Commission while a college student in 1950! He earned a Bachelor’s Degree in Botany from Drew University in 1948 and a Masters in Botany from Northwestern University in 1950. In 1954 he received his PhD in Wildlife Management from Cornell University.

Leonard started his professional career as a supervisor in the Ohio Division of Wildlife. He started his teaching career at Michigan’s Alpena College, taught at Central Michigan University and then Cornell University in New York. He taught at Monmouth College for 26 years, where he was affectionately known by his students as “Doc”. He aided his students in many ways on both academic and personal levels. He served as the Chairman of the Biology Dept. for 8 years and retired as Professor of Biology in 1989. He remained as Professor emeritus until his passing.

Len Spiegel was an avid hunter and fisherman, pastimes which afforded him his great appreciation of and application to the science of mosquito control which, he felt was simply another applied wildlife management discipline. Len lived in West Long Branch with his wife Jo An where they raised their children and loved their many grandchildren.
2013 Course Listing & Tentative Dates For
Mosquito Identification, Biology, Ecology, Surveillance and Control

Workshops Include:

Mosquito Biology & Control AE0603CA13 (January 24, – February 21, 2013) 10:00AM – 3:00PM

Mosquito Habitat Recognition AE0604CA13 (April 11, – May 30, 2013) by arrangement

Mosquito Identification AE0605CA13 (June 3, – June 7, 2013) 10:00AM – 3:00PM

Course Descriptions
Training in mosquito biology, mosquito habitat recognition, and mosquito identification will be coordinated through the Office of Continuing Professional Education (OCPE), School of Environmental and Biological Sciences, Rutgers University. These workshops are designed to meet needs of government employees involved in mosquito research, surveillance and abatement. Incorporating a science based approach to mosquito control, stewardship of public health and the environment is a primary focus. Lectures will cover biology, morphology, ecology, and behavior of the Culicidae, along with the most current surveillance and control techniques.

The course will be divided into three separate workshops to accommodate requests from agencies seeking information tailored to a particular discipline. Each workshop will complement information offered in the section preceding it, thereby completing the information necessary for workers employed in mosquito abatement operations. Entomologists, Biologists, Inspectors, Wetlands and Identification Specialists are encouraged to participate. Students can register for any workshop individually should they wish to gain experience in any one discipline. Students wishing to become certified by the New Jersey Agricultural Experiment Station in Mosquito Identification, Biology and Habitat Recognition will need to satisfactorily complete all three sections and pass a certification exam

TO REGISTER:
Online: [http://www.cpe.rutgers.edu/](http://www.cpe.rutgers.edu/) select link for Pest Control then click the Mosquito Control tab

By Mail: Send check, money order or purchase order (payable to Rutgers, The State University of NJ) to:
Office of Continuing Professional Education, Cook College, 102 Ryders Lane, New Brunswick, NJ 08901-8519
Attn: Scott C. Crans course coordinator

By FAX: (732) 932-8726, 24 hours. Please include a copy of check, money order or PO with fax registrations.
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