



# Skeeter Scanner

October, 2011

Volume 25, Number 1

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PUBLISHED BY THE  
MMCA PUBLIC  
INFORMATION  
AND EDUCATION  
COMMITTEE



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## President's Message

My message for the October issue is "Thank goodness it's October!" Having spent a busy summer simultaneously studying and fighting mosquitoes (at field sites, in my backyard), I'm happy to see the summer wind down and evolve into one of my favorite times of year. Major control and surveillance operations are over and it's time to clean equipment and assess the season. I think most will agree that it's been a near record year for mosquito activity overall. Additionally, arbovirus activity showed a late, but pronounced rise in some districts with many WNV positive mosquito pools, WNV-associated bird deaths, and human cases. In addition, EEE appeared in Midland Co. – an area not necessarily known for the disease, and LAC was found in a pool of *Aedes triseriatus* in Saginaw Co. Thus our work continues to have important public health implications in Michigan.



I recently returned from the annual meeting of the Society for Vector Ecology. As usual, it was comprised of many interesting symposia and presentations (That's why everyone attends meetings, right?), and mosquito control was a prominent topic. There were two symposia that highlighted areas receiving a lot of research effort and, from one perspective, were devoted to methods that are designed to put most traditional mosquito control operations out of business. The use of genetically modified mosquitoes to eliminate mosquito populations or disease transmission in an area, and the potential development of area repellents are compelling ideas with evidence of spectacular success in some initial trials. However, I wouldn't look into selling your backpack sprayers just yet. These new techniques have fairly narrow application windows and are years if not decades away from regular implementation. Most of the speakers acknowledged that the new methods would only be components of a broader, multi-tier approach that includes chemical control. I'm pretty skeptical that any population replacement/elimination approach based on genetically engineered mosquitoes would be effective against the *Aedes vexans* and *Ae. trivittatus* hoards that made life miserable this summer.

Now that I've re-confirmed the continued need for chemical control options, let's turn to some good news/bad news in that arena. The good news is that we finally have a new version of the 7F training manual for mosquito control applicators. My thanks go out to many of you for contributing text and photos to the manual. The bad news is that the manual is only available in printed form and the charge is \$20. To be honest, I'm disappointed that MSU Extension couldn't come up with a mechanism that allowed a pdf/downloadable version of the manual to be available. As it is, we have now have a solid, updated manual, but one that cannot be easily modified to reflect changing control options, disease activity, or regulations. I argued consistently for a pdf version this time, but was outvoted. I will not volunteer to work on the next version unless it is more accessible and more malleable – and please feel free to remind me of that when the time re-do the manual rolls around.

I hope you all enjoy this fall season as much as I plan to. It's also not too early to be thinking about the annual meeting in February and the subtle pleasures of driving on snow-covered roads. I'll see some of you at the 7F training session in Bay County and hopefully the rest of you in Port Huron.

Cheers,

## Better You than Me: Scientists Sicken Mosquitoes to Stop Dengue

Researchers hope to keep the mosquito that transmits dengue, *Aedes aegypti*, from infecting humans using the *Wolbachia* bacterium.

Scientists in Australia are using a bacterium to try to stop a deadly virus in its tracks.

The dengue virus causes a potentially fatal flu-like illness. The World Health Organization says the number of cases of dengue around the world is skyrocketing, and the disease is endemic in more than 100 countries. It has even shown up in Florida recently. There's no vaccine against the virus yet, so control efforts have focused on the mosquito that transmits the disease.

About six years ago, Scott O'Neill of Monash University had an idea about using bacteria called *Wolbachia* to prevent dengue's spread. The idea works like this: Use a strain of *Wolbachia* to shorten the mosquito's life, killing it before it becomes mature enough to transmit the dengue virus. It was a good idea, but it didn't work because the infection didn't spread to enough mosquitoes.

But then O'Neill discovered something surprising. There are many strains of *Wolbachia*. Some do bad things to mosquitoes, such as shortening their lives, while others give them nothing more than the mosquito equivalent of the sniffles. Mosquitoes infected with any of these strains couldn't spread dengue.

With a mild infection, the mosquitoes would live long enough to spread the *Wolbachia* around, but not the dengue.

O'Neill infected hundreds of thousands of mosquitoes with a mild strain of *Wolbachia* in the lab, and released them in two small communities in Northern Queensland near Cairnes, Yorky's Knob and Gordonvale. This time, success: Close to 100 percent of the mosquitoes got infected, which O'Neill says he thinks "greatly reduced ability to transmit dengue between people."

These results appear in the journal *Nature*.

There's very little dengue in Australia, so O'Neill is planning releases in Vietnam, Indonesia and Brazil, countries where the disease is more prevalent.

The bacteria could prevent dengue transmission down the line, and negate the use of pesticides, but there's always the law of unintended consequences. O'Neill says he thinks there won't be any negative ones, since there are a lot of insect species that are naturally infected with *Wolbachia*. He says regulatory authorities in Australia are convinced his plans are safe.

It would be a kind of poetic justice if a bacterial infection in mosquitoes could prevent a viral or parasitic disease in people.

## Politics has Overtaken Science at the EPA

Science depends on rigid observation and independent replication. So what happens when government bureaucrats — seeking to promote a political agenda while acting under the guise of protecting the environment and public health — systematically subordinate sound scientific principles to their own goals?

To answer that question, one need look no further than the Environmental Protection Agency (EPA), where unelected bureaucrats, led by Lisa Jackson, have decided to bypass Congress and avoid the possible change in administration in 2013 by rushing to complete an unprecedented number of major risk assessments ahead of the 2012 election. Those assessments, which will evaluate the danger of various chemicals, will have far-reaching public policy ramifications.

This shouldn't come as a surprise. Science often kowtows to politics in today's policy debates.

Activist groups, sensation-craving media and congressional demagogues have a friendly ear at the EPA when they call for stringent restrictions on safe and useful chemicals and products — products with decades-long histories of harmless, widespread use. The attacks exploit public ignorance of the lack of science behind such terms as "endocrine disruptor," "gender-bender," and the latest mythological danger, "obesigens"— chemicals that allegedly can

cause obesity. Another favorite distortion is the oft-heard claim that sperm counts, or “semen quality,” are declining due to chemicals in our environment. The only problem: Sperm counts are not declining. Cancer rates are declining, however, while longevity increases every year. Scientific groups worldwide confirm that disfavored chemicals like bisphenol-A are safe, but the message does not reach the activists, the media, or the EPA.

In 2009, EPA bureaucrats issued a draft assessment of the toxicity of formaldehyde that warned of the chemical’s dangers. But the agency’s methodology was so shoddy that Sen. David Vitter (R-LA) called for a review by the respected National Academy of Sciences (NAS) as soon as the draft was made public. The NAS panel recently issued a sharply worded criticism of the EPA’s rushed methodology in evaluating formaldehyde’s toxicity. The NAS found the EPA’s practices to be in desperate need of “substantial revision” and expressed concern about “the persistence of problems encountered with [the Integrated Risk Information System] assessments over the years.” The NAS concluded that the EPA’s “criteria to identify evidence for selecting and evaluating studies” are fundamentally flawed.

This week, the EPA announced plans to improve the clarity and transparency of its risk assessment program. It says that in the future the data, methodology and decision criteria will be clearer and easier to understand. But given the serious problems in EPA methodology raised by the NAS, how can the EPA continue to conduct its chemical risk assessments in a business-as-usual manner? One reason is apparent: Politics has overtaken science at the EPA.

It’s easy — and politically correct — to call for chemical bans in order to “protect our children.” But from what, exactly? The Jackson-era EPA seems to love using the precautionary principle (“better safe than sorry”) to play whack-a-mole with various chemical “threats.” The ideologues blame chemicals for any ill that befalls us and for which medicine and science have not yet come up with a specific cause or cure. Their mantra is, “there are 80,000 chemicals in the environment and very few have been ‘tested,’ so how do we know they’re ‘safe?’” But most of these chemicals have been around for 50+ years, so why are we only now

having more obesity or autism? But alarmism attracts media attention; logic doesn’t.

On June 30, Sen. Vitter and Sen. James Inhofe (R-OK) followed up on the NAS report with a highly detailed letter to Jackson asking her to restore “scientific integrity” to the risk assessment process.

“The economy and many of our fellow Americans are suffering,” the senators wrote. “To further perpetuate the problems of high unemployment and poverty without strong scientific and economic support for EPA’s calculated efforts would be unwise.”

### **AMCA Update on NPDES Permitting**

The October 31, deadline for implementation of the National Pollutant Discharge Elimination System (NPDES) permitting system for application of public health pesticides is rapidly approaching. Legislative fixes that might prevent its imposition, although still very much on the table, may not, in fact, come into play prior to the deadline. Thus, it would be prudent for all districts that may apply pesticides that may come into contact with waters of the United States after 31 October of 2011 to contact their respective state water regulators to have the required Notice of Intent (NOI) and Pesticide Discharge Management Plan (PDMP) in place by the deadline. Please contact your state water regulators and determine what they will require by way of an NOI and PDMP, as these may differ slightly for each state. Given the potential for ruinous litigation, it is imperative that districts, at a minimum, have the NOI and PDMP drafted and ready for signature by 31 October in case a legislative fix is not forthcoming.

This entire process has lasted several years now and, despite everyone's hope that it would be resolved by a legislative fix or overturned in the courts, it hasn't happened yet and it would be wise to be fully prepared to proceed on the assumption that the deadline will arrive without a public health exemption. You can be sure that those interests looking to litigate this will point to the opportunities afforded stakeholders over the last few years to review and comment on the proposed permit to rebut any arguments attempting to explain lack of

proper paperwork. Both the EPA and AMCA have continually advised all stakeholders to prepare the paperwork for if/when the mosquito control dimension of the NPDES program comes to fruition. The courts are unlikely to show sympathy to districts that have had 2 years to prepare for the permit and simply chose not to take action - regardless of the reason.

In AMCA presentations at national, regional, and state meetings, we have been continually emphasizing that districts need to initiate and maintain a dialogue with the state agencies having jurisdiction over the NPDES so that respective requirements could be planned for and met if need be. Should your state have a permitting system in place or a plan for doing so, it would behoove you to contact the agency having cognizance over the NPDES and ensure that you are in a position to meet the requirements as of 31 October, 2011. Be advised, though, that you will be held accountable for complying with the fine points of the plan you provide in this document, so do not make it too detailed - provide some operational leeway. As stated above, your state may have a different template, so be sure to check for compatibility. Information on pesticides and the NPDES can be found at:

[http://cfpub.epa.gov/npdes/home.cfm?program\\_id=410](http://cfpub.epa.gov/npdes/home.cfm?program_id=410).

### **West Nile Virus Infection in Killer Whale, Texas, USA, 2007**

In 2007, nonsuppurative encephalitis was identified in a killer whale at a Texas, USA, marine park. Panviral DNA microarray of brain tissue suggested West Nile virus (WNV); WNV was confirmed by reverse transcription PCR and sequencing. Immunohistochemistry demonstrated WNV antigen within neurons. WNV should be considered in cases of encephalitis in *cetaceans*.

It has been demonstrated that WNV can infect and cause disease in killer whales. These findings broaden the known host tropism of WNV to include *cetaceans* in addition to previously known *pinnipeds*. Although we cannot definitively attribute the cause of death of this whale to WNV, the

observed lesions are consistent with those caused by WNV in other animals. The serologic results demonstrate that subclinical infections can occur and that exposure can be variable. Specific dates of exposure had not been determined for these populations. Both Bexar County, Texas, and Orange County, Florida, have had WNV in wildlife since 2002. There will continue to be annual serology on previously negative animals to document seroconversion.

Mosquito management practices are similar in both facilities and have been expanded since this diagnosis. Differences in WNV prevalence or mosquito numbers may have played a role in the different serologic results.

Health evaluations of free-ranging and captive *cetaceans* should include WNV serology to assess exposure rates. This report focuses on killer whales, but the "loafing" behavior (stationary positioning at the water's surface) is commonly seen in many coastal dolphins, thereby increasing the likelihood of mosquito bites and exposure to WNV. Serologic screening of bottlenose dolphins (*Tursiops truncatus*) from the Indian River Lagoon demonstrated WNV titers. WNV-associated disease in these animals has not been reported. Active screening for WNV may enhance diagnostic investigations.

As with many species of birds and mammals, WNV infection carries a risk for zoonotic transmission. Until the implications of this infection in marine mammals are better understood, biologists and veterinarians working with *cetaceans* should consider this possibility. Potential viral shedding can occur through the oropharyngeal cavity and feces as well as through blood and organs during necropsies.

Finally, our study demonstrates the broad applicability of using panviral microarray-based diagnostics. Even though PCR diagnostics are well developed for WNV, the agent was not initially considered as a potential pathogen in this species. Panviral microarray can be used not only to identify novel viruses but also to detect unsuspected agents. This work was funded by National Institutes of Health grant U01 AI070374.

## State Regulators Learn More about Mosquito Control

On August 30, 2011 the MMCA hosted a *State Regulator Tour* at the Saginaw County Mosquito Abatement Commission facility. In attendance were representatives from the Michigan Dept. of Environmental Quality and the Michigan Dept. of Agriculture and Rural Development along with staff from the four county-wide mosquito control programs in Michigan (Bay, Midland, Saginaw, and Tuscola). The genesis of this meeting was the realization while attending NPDES meetings that many of the individuals at the State level that regulate mosquito control actually had very limited understanding how a mosquito control operation was conducted following an IPM strategy. Topics covered included: Best management practices for mosquito control; quality control; disease & mosquito surveillance; larviciding; adulticiding; source reduction; and the role of education in an IPM program. This information was disseminated through PowerPoint presentations and numerous hands-on demonstrations of equipment from all the districts. It is hoped that after attending this tour our regulators will have a better understanding of the professional management and expansive IPM approach to mosquito control in Michigan.



## MMCA Awards & Recognition Committee Request for Nomination

The Awards & Recognition Committee is pleased to request nominations for the following prestigious awards:

### **H. Don Newson Distinguished Service Award**

To give recognition and appreciation to the recipient for his/her meritorious contributions made in the practice of mosquito control, and in support of the MMCA in its endeavor to improve the quality of life of man.

### **George B. Craig, Jr. Mosquito Advocacy Award**

To give recognition and appreciation to the recipient for his/her outstanding contributions of promoting mosquito control and/or MMCA.

Nominations are due on January 6, 2012. Forms are available at: [www.mimosq.org/awards.htm](http://www.mimosq.org/awards.htm)

**Michigan Mosquito Control Association  
William J. Lechel, II Memorial Scholarship  
2012 Annual Student Paper Competition**

The William J. Lechel, II, Memorial Scholarship is sponsored by Advanced Pest Management and Clarke. It is a student presentation competition held in conjunction with the Michigan Mosquito Control Association Annual Conference. Those entering this competition will present findings from their research or a synopsis of existing research at the Annual MMCA Conference.

Presentations on mosquitoes in particular are preferred, but related research may include information in health or pest-related fields; insects, insect control, weather, Lyme Disease, science education, etc. A total of 15 minutes will be allowed for each presentation.

Complete entry information and entry forms are available at:

<http://www.mimosq.org/PDF/LechelStudentPaperCompetitionApplication2012.pdf>

Submission of abstracts may be made electronically to:

Mary McCarry, 2011 Chair, Awards and Recognition Committee  
[mccarrym@baycounty.net](mailto:mccarrym@baycounty.net)

**Kenley Farrel Memorial Scholarship  
2011 Topic  
"Impact of Mosquito-Borne Disease on Society"**

Sponsored by Hatfield's Spraying Services, Nunica, Michigan & the Michigan Mosquito Control Association.

MMCA annually presents a scholarship to encourage interest in mosquito control and to assist a student financially towards a higher education in Natural Science or a related field. An application form and instructions for the scholarship are available at the link below.

Please call us at 989-894-4555 for more information.

The deadline for applications is November 1<sup>st</sup>, 2011. A scholarship application form can be found at:

<http://www.mimosq.org/PDF/ScholarshipApplication2011.pdf>

**MMCA BOARD OF DIRECTORS  
CALL FOR NOMINATIONS**

Positions open for nomination of candidates will be Vice-President, Treasurer, and one Trustee. The office of Vice-President is a 2-year term, serving one year as Vice-President and a second year as President. The Treasurer serves a 2-year term and Trustees serve for 2 years.

Everyone is welcome and urged to participate. You may volunteer your own services or nominate a colleague. To propose a candidate, please contact MMCA's Secretary, Margaret Breasbois (989-755-5751, 211 Congress, Saginaw, Michigan 48602 – [mbreasbois@scmac.org](mailto:mbreasbois@scmac.org)). Candidates must be MMCA members and nominations must be received by January 6, 2012. The election will take place during the General Business Meeting at the twenty-sixth annual MMCA Conference at the Thomas Edison Inn, Port Huron, Michigan February 1-2, 2012.

## Brewing Up Double-Edged Delicacies for Mosquitoes

On what food do mosquitoes live? Orgiastic gouts of human blood that distend their abdomens and render them almost unable to move — right? Well, actually, no.

To lay eggs, females do need blood for its iron and protein. But usually mosquitoes subsist on modest sips of nectar from flowers or from ripe or rotting fruit. And that, according to scientists from Hebrew University in Jerusalem, is an Achilles' heel — or Achilles' proboscis — through which the pests can also be poisoned.

“You can't move flowering trees around,” said Yosef Schlein, a parasitologist at the university's medical school. “So you have to use movable bait. That's how we came up with fruit juice.” Supported by a grant from the Bill and Melinda Gates foundation, Dr. Schlein and his research partner Günter C. Müller concocted an array of nectar poisons known as Attractive Toxic Sugar Baits that are easy to make, environmentally friendly and inexpensive.

In tests in Israel and in West Africa, the baits knocked down mosquito populations by 90 percent. Even better, they nearly eliminated older females.

Kathryn S. Aultman, who oversees the roughly \$1 million the Gates Foundation has put into the work thus far, said: “I'm very pleased and excited about the early results. It's wonderful that we're able to break free our imaginations to try some of these things.”

Dr. Müller and Dr. Schlein tested their idea five years ago at a desert oasis near the Red Sea. Putting out vases of flowering tree branches, they learned that acacias — the thorn trees common in Africa — attracted the most mosquitoes. They sprayed branches with a mixture of sugar water and Spinosad, a bacterial [insecticide](#) considered harmless to humans and most beneficial insects. The mosquitoes feeding on them died.

Their next test was in a Greek Orthodox monastery in the Judean hills where mosquitoes laid their eggs in underground rainwater storage cisterns.

They filled old soda bottles with a solution of brown sugar, the juice of rotting nectarines, Spinosad and a dye. They put each in a sock with a wick that helped keep the sock soaked with the colorful fatal elixir. They suspended a bait at the opening of each cistern.

Trapping later showed that up to 97 percent of all mosquitoes in the area were marked with the dye, meaning they had landed on a toxic sock at least once. Within a week, the female population had crashed to near zero; it stayed there for a month.

Their most recent study, published in *Malaria Journal*, <http://preview.malariajournal.com/content/pdf/1475-2875-9-210.pdf> was done in West Africa, where malaria is a major killer, especially of young children. The scientists chose a rural road in Mali running past ponds where two aggressive mosquito species breed — *Anopheles gambiae* and *Anopheles arabiensis*. They sprayed weeds there with a solution of the fermented juice of local guavas and melons mixed with dye and boric acid. Within a few days, they saw 90 percent die off.

Boric acid is much less expensive than Spinosad. It is also about as harmless to humans as table salt is. It is a chief ingredient in Silly Putty. Dr. Schlein said he had heard that some Malians sampled the alcoholic bait brew, with no ill effects.

But it kills insects that eat it. It is common in cockroach control; when a thin layer is spread on floors, cockroaches take it in when they preen their feet. “You can buy it by the truckload,” Dr. Christensen said. “And it kills in so many ways that there's never been resistance to it. Some authorities think there never will be.”

Two more concepts still need to be tested, experts said. Although it clearly works in arid areas where there are few trees or flowers, will it work in jungles, forests or farms where there are many competing sources of nectar?

And how often does spraying have to take place? The inventors hope as seldom as once a month will do the job. More than one scientist noted that the idea of toxic nectar seemed so simple that it was surprising it hadn't been thought of before. “If you're a university person, you get credit for sophisticated publications,” Dr. Schlein said. “You don't get much credit for simple ideas.”



# News From Around The Districts

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SAGINAW

We have experienced a very busy mosquito season with one large brood in June; another in July; and two in August. Historic New Jersey Light Trap records indicate it was the 2<sup>nd</sup> worst June for mosquitoes since our program began in 1977. We will finalize all our surveillance data this fall but it is clear that this summer will be one for the record books. Thankfully, some of these large hatches were not county-wide but just in regions of the County thus allowing us to focus our control efforts.

It has also been a very active year for mosquito-borne disease detections. Currently we have 10 WNV positive crows; 10 WNV positive mosquito pools; and 1 LAC positive mosquito pool. Most of the positives were from the urban areas of Saginaw County, however an exception was a positive crow from Frankenmuth. With all the disease activity we fought the weather and pushed our control season to the end of September.

In late August our Education Department sent out information packets to schools informing them of our classroom educational programs and encouraging teachers to schedule a presentation as soon as possible as it is often difficult to honor late requests.

This year we have collected 14,554 scrap tires for shredding. Through a grant from the Saginaw County Solid Waste Committee we were able to collect tires from May 1-September 30<sup>th</sup> this year.

We hosted a computer and electronic device scrap drive at our facility on October 12 in cooperation with the Saginaw County Dept. of Public Health.

With the deadline of October 31<sup>st</sup> fast approaching and no legislative fix to date, it appears that we will again be working with the Michigan DEQ to try and finalize a reasonable state NPDES permit that is acceptable to all.

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TUSCOLA

As of this writing, we are still operational. However, most of our seasonal employees have departed, and we are mainly concerned with preparing equipment for the off-season. One last big project remains....our parking lots are being resurfaced in a few days.

It was a good year. We managed to accomplish most of our treatment goals, and the response from our citizens was positive. We were aided by the fact that, unlike some of the other programs, we never had those large hatches of summer mosquitoes. Heavy rains at the start of the season kept us busy, but after that, it was pretty quiet. Also, there was no evidence of arboviral activity to deal with.

Soon, we will begin our summations.....and start to solidify plans for 2012. We hope that our efforts will be unhindered by restrictive processes.

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For the second season in a row Midland County was hit with several late spring - summer rains that produced enormous waves of floodwater mosquitoes. We are still reviewing collections and tabulating the results but we will probably see a record number of mosquitoes in our light trap surveillance program this year.

It was a sad day in Midland County when we learned that a horse from our County succumbed to Eastern Equine Encephalitis. It is interesting to note that we had seen an increased number of *Coquillettidia perturbans* in northern Midland County earlier this year and tested a few mosquito pools with our trivalent VecTest but all tests were negative. Our surveillance efforts were fairly limited because we had not seen evidence of EEE activity in Midland County since 1973. In response to the large number of *perturbans* observed and floodwater mosquitoes related to the rain events described above, we completed much higher than usual number of larvicide and adulticide treatments in the area. After hearing about this horse case we have completed several CDC light trap/night samples in the area and tested all *Coquillettidia* collected (plus some *Aedes vexans*, *Anopheles* species and others); again all negative.

We purchased a Gator ATV this year with which we were able to more quickly and efficiently conduct adulticide operations in some remote park areas and larvicide along highways and rail trails. More information on this new piece of equipment and many other topics of interest will be presented at the MMCA's 26<sup>th</sup> annual conference February 1-2, 2012 in Port Huron. We hope to see you there.

Save the Date! The American Mosquito Control Association's 2012 conference will be held at the Hilton in Austin, Texas February 26 - March 1.

Have a great winter all.

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We all know how important weather is to mosquito control and how often we look at forecasts to help us do our jobs. With that said, the third quarter of 2011 experienced some real extremes. July in Bay County ranked as the 3<sup>rd</sup> warmest in its history with an average temperature of 76.1 degrees. Rainfall in July was minimal (1.53"), but some areas near Flint saw 6 ½ inches of rain fall – evidence of the spotty, intense nature of thunderstorms! August basically returned to normal regarding both temps and rainfall with 2.53" of rain recorded. September saw very little rain to end the season! Our last official treatment day was September 23; CDC traps hung earlier that week averaged only 10 females per trap. Clean-up activities took place the final week of the month.

Our second annual scrap tire drive was held September 24 designed to rid the county of thousands of breeding habitats.

Disease surveillance efforts continued through September. Five hundred eighteen pools (or groups of mosquitoes) were assembled with 9,912 total females (mainly *Coquillettidia perturbans* and *Culex* mosquitoes). These were mosquitoes that were collected in either CDC traps, New Jersey light traps, or gravid traps. The Past few years have seen no disease activity detected in Bay County, but the 2011 season saw resurgence, albeit a small one. Seven mosquito samples and 2 American Crows tested positive for West Nile Virus. Six of the seven mosquito samples were in Monitor Township and the seventh was in Pinconning. The crows were discovered in Essexville and the south end of Bay City. Mosquitoes tested in September and after the initial positives were all negative for WNV, we're happy to report!

Bay County staff participated in the MMCA's State Regulator Tour in August, helping to educate state officials, namely DEQ personnel, about mosquito control activities. We will be following NPDES progress as the fall wears on and as the October 31 deadline looms near!

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## SCMAC Hosts Saginaw Arts and Science Academy Science Classes.

SCMAC staff Randy Knepper, Bill Stanuszek and Margaret Breasbois, presented to Saginaw Arts and Science Academy (SASA) science class at SCMAC facility. The students were studying and collecting insects for their science class. This is the third year the classes have come to SCMAC for a mosquito ID lesson.



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**Fall**