

# NEW ORLEANS MOSQUITO & TERMITE CONTROL BOARD

## 2011 Annual Report



*Aedes aegypti*

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### **CITY OF NEW ORLEANS**

**Mayor Mitchell Landrieu**  
**Mr. Andrew Kopplin, CAO**  
**Col. Jerry Sneed, Deputy Mayor**  
**Dr. Claudia Riegel, Director**  
**Mr. Edgar Bordes, Director Emeritus**  
**Dr. Michael K. Carroll, Director Emeritus**

### **BOARD MEMBERS**

**Mr. Gary C. Meadows,**  
*Chairman*  
**Mr. Reginald Glass,**  
*Vice Chairman*  
**Dr. Rodney Jung,**  
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**Dr. Kenneth Boutte**  
**Dr. Karen DeSalvo**  
**Ms. Cynthia Hedge-Morell**  
**Dr. Warren Jones**  
**Ms. Ann Macdonald**  
**Dr. Dawn Wesson**



*Coptotermes formosanus*

## **DIRECTOR'S REPORT**

### ***Report on the activities of the City of New Orleans Mosquito, Termite and Rodent Control Board during 2011***

We hit a milestone in 2011 with the completion of the City of New Orleans Mosquito, Termite, and Rodent Control Administration Building. The new building consolidated our group into one location. This has increased our efficiency and allowed for better management of our operations. Despite the challenges and our staff being so fragmented, we have been able to accomplish so much in the past six years. In fact, our responsibilities have significantly increased. It is a true testament of the dedication and hard work of our employees.

Mayor Landrieu officially opened the building December 13, 2011. Council members Cynthia Hedge-Morrell and Eric Granderson, in addition Deputy Mayors Col. Jerry Sneed and Cedric Grant also attended. It was a great honor to have them at the ceremony. Our employees were able to showcase the different roles we play at the City of New Orleans.

Details of our 2011 activities and accomplishments follow in this report.

Respectfully submitted,

Claudia Riegel, Ph.D.  
Director

# **OPERATIONS AND FACILITIES**

## **CLAUDIA RIEGEL, Ph.D.**

### **Director**

#### **Employees**

Mr. Steve Sackett retired in January after working with the City of New Orleans Mosquito and Termite Control Board for 32 years. Steve was a valuable part of the NOMTCB family and he brought a tremendous amount of experience and knowledge to our department.

The City of New Orleans Mosquito and Termite Control Board (NOMTCB) hired Sarah Michaels (Figure 1) July 5, 2011 to oversee mosquito operations. Sarah grew up in upstate New York, graduated from high school in Syracuse and attended the University of Rochester in Rochester, NY, earning a B.A. in Environmental Studies. While there, she worked in Dr. Jack Werren's lab studying *Wolbachia* bacteria in the parasitoid jewel wasp, *Nasonia*. She spent a semester in Adelaide, Australia studying Entomology at the Waite Campus at the University of Adelaide. In 1998, she moved to New Orleans for the first time, completing a Master's of Science in Public Health in Parasitology from the Tulane University School of Public Health and Tropical Medicine. She then moved to Portland, Oregon to work on pesticide exposure studies of migrant farm workers at the Center for Occupational and Environmental Toxicology at Oregon Health Sciences University.

She returned to New Orleans in 2002, serving as West Nile virus (WNV) Surveillance Coordinator for the Louisiana Office of Public Health from 2002-2006. She assisted in conducting research studies of WNV human cases in Louisiana. She is a coauthor of several publications produced during that time.

In 2006, she returned to Tulane as Dr. Dawn Weson's laboratory coordinator. Sarah managed field studies of mosquitoes and kissing bugs, including lethal ovitrap studies for *Aedes aegypti* control funded by the National Institute of Health and Gates Foundation. She is currently pursuing a

Ph.D. in Tropical Medicine at Tulane University, examining *Aedes aegypti* and *Ae. albopictus* populations in New Orleans, and bloodfeeding behaviors and vector competence of these species in Louisiana. Sarah is expected to graduate from Tulane in the winter of 2013.



Figure 1. Sarah Michaels surveys containers in cemeteries for the presence of mosquito larvae.



Figure 2. Dr. Michael K. Carroll retired February 27, 2011 after three decades of service to the City of New Orleans.

February 27<sup>th</sup> brought another retirement. Dr. Michael K. Carroll (Figure 2), our Director since 2006, started working for the City of New Orleans as a Laborer with Parks and Parkways in the

summer of 1966. He began his career with New Orleans Mosquito Control as a Transient Summer Inspector in 1972 and returned for several summers while attending college. In 1977, he was hired full-time as a Mosquito Control Inspector 2 and since that time he has had several titles at NOMTCB including Entomologist, Aerial Spray Program Coordinator, Field Operations Supervisor, Assistant Administrator and then Director. Dr. Carroll is recognized nationally and internationally for his pioneer work with droplets. He has also travelled around the world to provide his expertise regarding malaria, West Nile virus, and dengue to governments and other organizations.

Dr. Carroll will remain employed half-time in order to lend his expertise in mosquito control and work on special projects. For example, since Dr. Carroll retired, he wrote a dengue response plan for the state of Louisiana. The response plan has been reviewed by the Centers for Disease Control, Harris County Mosquito Control District in Houston, Texas, Dr. Dawn Wesson at Tulane University, and by the board members of the Louisiana Mosquito Control Association.

The plan was presented to the Louisiana Mosquito Control Association board members and it was adopted in July.

In the 2011 budget, the Mayor Landrieu’s Administration approved a new position for our department. We presented an offer (budget and rational) to expand the pest control program for City of New Orleans’ properties. The offer was accepted and funded. The offer added a position to manage and conduct pest control at city properties. Dr. Carroll has been working with Civil Service to write a new job description for a Pest Control Specialist 4. We will continue to seek approval of this position in 2012. The position was not filled in 2011.

NOMTCB has seven and a half positions vacant (Figure 3). Ben Smith, our Aviation Supervisor (pilot/mechanic) left at the end of the second quarter. Employees retired, resigned, and an employee was terminated. A position was added and I was promoted to Director, leaving the Assistant Director position vacant.

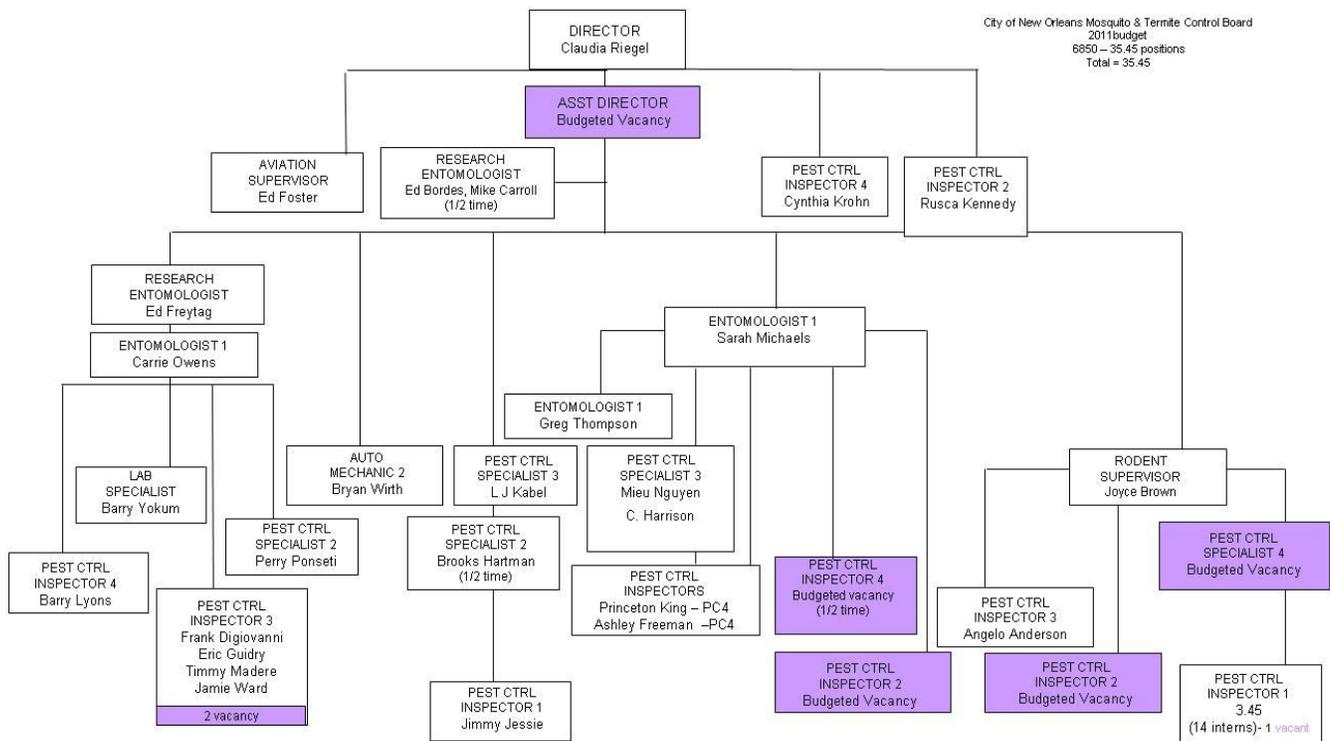


Figure 3. New Orleans Mosquito and Termite Control Board’s (NOMTCB) organizational chart as of December 31, 2011. NOMTCB has 7.5 positions vacant (depicted in purple) and two summer intern positions (half a position) that are currently vacant.

Mr. Ed Freytag, Research Entomologist, (Figure 4) took the initiative to assume additional responsibilities since the beginning of the year. He managed the termite division and assisted in personnel management. He has done an outstanding job ensuring that the daily work commitments and operational research projects were completed.

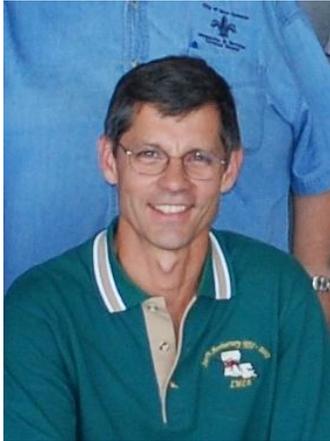


Figure 4. Ed Freytag, Research Entomologist, has done an outstanding job ensuring our responsibilities are met despite the large number of vacant positions.

Ed is an expert in the use of termite detection tools such as the infrared camera and the resistograph. In 2010, Ed and our termite inspectors started working with building contractors to evaluate beams and other wooden structures for voids. This is a revenue generating activity and it has continued in 2011. Since NOMTCB started doing this type of work last year, more than \$30,000 has been generated.

Ben Smith (pilot/aircraft mechanic) returned to Portland, OR. We advertised for a Aviation Supervisor, and the job announcement was placed in a trade journal. There were more than 50 applicants. Mr. Ben Smith, the current Aviation Supervisor at the time assisted in the job search. Ben stayed at NOMTCB until the candidate was hired and trained. Dr. Mike Carroll (Director Emeritus), Ben Smith and I reviewed applicants for the aviation supervisor position. Dr. Mike Carroll, a long time pilot himself, lead the effort, and we narrowed down the candidates to three applicants. Two pilots were brought to New Orleans for a two-day interview.



Figure 5. Mr. Ed Foster checks on the insecticide tanks that are secured to the wings of NOMTCB's Britton Norman airplane.

We offered the position to Mr. Ed Foster (Figure 5) and he started in early September. Ed is a native of New Orleans but lived in Titusville, FL. He was currently employed by a company that worked on the space shuttle program. Ed earned an A.S. in Aviation Maintenance Technology from Delgado, a B.S. in Aviation Science from Everglades University, and an M.S. in Professional Aeronautics from Embry-Riddle Aeronautical University. He is a FAA commercial pilot and has multi-engine, instrument, and seaplane ratings. In addition, he is an FAA mechanic with airframe and power plant ratings with inspection authorization.

We had 12 outstanding interns this summer. Most of the interns were students at UNO, LSU, a recent graduate of Ben Franklin High School, and Delgado. Many of these interns have worked with us before and have experience. These interns are fantastic because they are excellent employees and require minimal training. The summer interns allow our staff to complete numerous projects each summer.

## Facilities

### *Administration building*

The occupancy permit for the new building (Appendix A) was issued in September and our staff began moving in right away. The office trailer located at the Levee Board (our home for the last 6 years) was returned to the vendor. The physical address of the building is 2100 Leon C. Simon Drive, New Orleans, LA 70122 (Figure 6). We worked closely with the contractor, Woodward Design Build, and Capital Projects to ensure that there were no additional delays. Our department had a tremendous amount of input on the layout, colors, and overall look of the building. The original design of the building was not adequate for our operation so we made and self-funded the changes (Figure 7).



Figure 6. The front of the new NOMTCB administration building on April 14, 2011.



Figure 7. Mr. L.J. Kabel (Maintenance Supervisor) inspects the plans in the future audio/visual room.

### *Warehouses*

In order to complete consolidation of NOMTCB Project Worksheets (PWs), FEMA requires that NOMTCB move our warehouse operations to another building. We are still operating from the middleshop and the backshop but these facilities will eventually need to be demolished. Dr. Mike Carroll located an existing warehouse in the Harbor Circle area. NOMTCB, Capital Projects, and Property Management employees inspected the building and it was determined it was suitable for purchase. An appraisal was conducted but a suitable offer could not be negotiated with the owner of the property. We will continue of search for a warehouse in 2012.

### *Hanger*

No progress was made on permanent repair of our hanger. However, we met with Capital Projects to discuss the version that is necessary. The architectural drawings were completed. FEMA employees inspected the hanger in March and we are hopeful the building will be repaired in 2012.

### *Collaborations and Extramural Funding*

A significant portion of my time is spent on personnel, essential operation matters, and obtaining extramural funding. Unfortunately, the USDA-ARS terminated the French Quarter component of Operation FullStop. The loss in funding will be significant for our department.

We have added new cooperators such as DuPont to offset the loss of Operation FullStop. We are charging for termite inspections for the pest control industry. In addition, we are continuing to work with our other partners. These projects are all applied and we are able to control pests in and around city facilities at no treatment cost to the city of New Orleans. We are also able to supplement our budget and therefore provide many other services to the citizens of New Orleans. We also have submitted competitive grants and hope they will be funded.

Another area of operational research we have been expanding in is wood treatment/wood preservative studies. Throughout the years, NOMTCB has worked with several organizations to test wood treated with a variety of products in New Orleans. Currently, Hawaii is the center for wood treatment tests for Formosan subterranean termites (FST). Companies spend a significant amount of money in transportation and shipping when testing their products in Hawaii. Our goal is to shift testing to New Orleans where the in-ground pressure of FST is higher than in Hawaii and the cost to test their products is less. Additionally, our soil make up, high water table, climate, and humidity, prove challenging to wood products.

We sent Timmy Madere (Pest Control Inspector 4) and Ed Freytag to the American Wood Protection Association (AWPA) 107<sup>th</sup> Annual Meeting held at the Marriott Harbor Beach Resort in Fort Lauderdale, Florida, from May 15-17. The main purposes of attending this meeting was to meet the wood protection industry leaders and to try to initiate interest in bringing treated wood studies to New Orleans. We are one of the few places in the continental US that has enough Formosan subterranean pressure to make field tests similar to those conducted in Hawaii. We met with representatives of Osmose, Borax, Viance, Rio Tinto Minerals, Arch, and several other companies and exchanged information and ideas on the possibility of testing their products in New Orleans. We have been in communication with two of the companies for possible testing.

We have been working with Dr. Peter Laks and Mr. Glen Larkin (Figure 8) from Michigan Technical University for two years developing field sites (Figure 9). In the summer of 2011, they offered us to work under their AWPA accreditation. This is a direct saving of \$30,000 and it will allow us to conduct field and laboratory studies for a variety of organizations. Timmy Madere, Ed Freytag, and I visited Dr. Peter Laks' laboratory at Michigan Technical University in October for training. We are now part of their wood treatment group and can operate under their AWPA accreditation. We will

begin generating revenue for conducting field and laboratory studies in 2012.

We have been in contact with Mr. Shawn Grushecky. He is the Assistant Director at the West Virginia Appalachian Hardwood Center. His group requested the use of testing sites and our trained staff to manage field trials. We have the protocol and we have located sites for the study. We are in the process of working out a formal agreement. NOMTCB is planning on purchasing a Bobcat in order to assist installation of these treatments and it can also be used for source reduction. The funding from these studies and the Michigan Tech. University projects will easily cover the cost of the Bobcat.



Figure 8. Timmy Madere (Pest Control Inspector 4) and Glen Larkin (right) inspect the field sites that will be used for a study in 2012.



Figure 9. Glen Larkin (left) and Timmy Madere (right) inspect a field site located at the Audubon Zoo.

## **Professional Associations**

### ***Division of Health and Hospitals***

Timmy Madere (Pest Control Inspector 4), Ashley Freeman (Pest Control Inspector 4), and Ed Freytag (Research Entomologist) participated in the Louisiana Public Health Association (LPHA) Annual Conference in Lake Charles March 16-17, 2011. We were asked to discuss pests of public health importance. The workshop was well received and we have been requested to conduct additional training. We have a good working relationship with the state sanitarians that service New Orleans.

### ***Louisiana Mosquito Control Association***

I am a member of the LMCA Board. The LMCA Board meets every quarter to discuss topics that relate to mosquito control districts in the state of Louisiana. In addition, federal legislation as it relates to mosquito districts are discussed. I am on the committee that organized the LMCA workshop. This year's workshop was in March and our department prepared the literature packet. Ms. Cindy Krohn (Pest Control Inspector 4) did an outstanding job gathering all the presentations for the workshop.

### ***Greater New Orleans Pest Control Association***

It takes several months to plan and schedule speakers for the academies. Our Pest Control Academy was held October 11-13, 2011. The academy was held in the training room in our new building. Mike Herring (Centers for Disease Control), Dr. Phil Koehler (University of Florida), and Janet Hurley (Texas AgriLife) were featured speakers.

Mr. Jeff Addison, GNOPCA board member and owner of Pied Piper Pest Control invited me to be a guest on his show, "What's Bugging You" on AM 990 twice. The hour long show focused on termite biology and treatment and rodent control.

NOMTCB has been called in for technical assistance with rodent and termite problems in the French Quarter and throughout Orleans Parish. We assist by conducting inspections with the pest control professional and by providing feedback to the property owners.

### ***National Pest Management Association***

I was invited to give a presentation at the National Pest Management (NPMA) meeting in Tunica, Mississippi on February 10, 2011. The topic was backyard mosquito control. This is a meeting for the southern states and there are several hundred attendees.

National Pest Management Association's annual Pest World conference was in New Orleans October 19-22. Our department provided a French Quarter pest walking tour for the meeting. I was invited to present three presentations covering a variety of topics. Mr. Ed Bordes (Director Emeritus) organized a charity 5K run along a French Quarter stretch of the Mississippi River for NPMA. We had several conference calls with NPMA. NPMA gave us booth space at the meeting so we were able showcase the activities of our organization.

### ***Tulane University***

NOMTCB continues to work with Dr. Dan Bausch and Dr. Tom Voss at Tulane University. Ashley Freeman (Pest Control Inspector) is completing her MS in public health from Tulane. Our group has been trapping rats and mice for the last three years to look for rodent-borne pathogens. Ashley is projected to graduate in the summer of 2012.

Ashley completed a survey of the public's perception about mice and problems they can cause under the guidance of Dr. Assaf Abdelghani. The survey targeted four geographic areas of New Orleans. The survey was disseminated in June 2011. The survey was available online at [www.surveymonkey.com/s/rodentsurvey](http://www.surveymonkey.com/s/rodentsurvey) and the results of the survey were presented at the Louisiana Mosquito Control Association Meeting November 30th.

### ***Chinese Delegates***

Dr. Nan-Yao Su, professor from the University of Florida, requested that NOMTCB host three groups of Chinese delegates (Figure 10) from the Foreign Economic Cooperation Office of the Ministry of Environmental Protection (FECO/MEP) in order to

tour the City of New Orleans and our facilities. This group was sponsored by the World Bank with the goal of learning about pesticide applications that are considered reduced risk. The Formosan subterranean termite is native to Taiwan and China has severe Formosan subterranean termite problems. China commonly uses chlorinated hydrocarbons for managing termites and other pests. Dr. Su was hired by the World Bank to assist the Chinese government in eliminating the use of chlorinated hydrocarbons and other toxic pesticides for termite use. Dr. Su invented the Sentricon System which is an eco-friendly, target specific, reduced risk termite management system. NOMTCB has a tremendous amount of experience fighting FST with this technology.



Figure 10. NOMTCB hosted Chinese delegates and gave them a Formosan subterranean tour of the city.

## Cooperative City Projects

### *Fight the Blight*

NOMTCB has been involved in Fight the Blight campaigns throughout New Orleans. Rodent and mosquito control supervisors and inspectors have inspected areas of priorities. Joyce Brown (Rodent Control Supervisor) attends the meetings and organizes the campaigns. Storm drain treatments in the area are done and mosquito inspectors check the area for standing water.

### *Mayor's Community Meetings*

This summer, the Mayor scheduled seven community meetings in each of the council districts. Due

to the size and location (east and west bank) of district C and D, two meetings were held in these districts. Every department head attended the meetings. Citizens had an opportunity to voice their concerns, questions, or comments and then at the end of the session, the Mayor addressed each question or concern. We had a booth at each meeting which gave the opportunity for people to ask questions or file a complaint. New Orleans East and the Lower Ninth ward produced the most comments about rodents, mosquitoes, and nuisance wildlife. Unfortunately, these areas have a tremendous number of abandoned lots and houses that produce the conducive conditions to allow these pests to proliferate. The service requests we received at the meeting were addressed by our inspectors.

### *Marsh Fire*

NOMTCB was asked by the New Orleans Homeland Security Department and the New Orleans Fire Department to fly over the marsh fire to take pictures. We used our Britten-Norman Islander airplane several times and we used a rental helicopter. Chief Bob Eiserloh was our main point of contact with the Fire Department.

### *Tropical Storm Lee*

Tropical Storm Lee made landfall in New Orleans Labor Day weekend. Our staff did an excellent job preparing for the tropical storm the week before the holiday weekend. Our assets located at 6601 Stars and Stripes Blvd were elevated and secured. All the pesticides were elevated and secured. The vehicles were moved to the Levee Board property and out of the velocity zone. The airplane was moved to a secure hanger owned by Aero Premier located at the Lakefront Airport.

NOMTCB is now part of the group that must stay for tropical events or other Homeland Security events. The core group of people that would stay for a storm includes Ed Freytag, Princeton King, and Claudia Riegel. For Tropical Storm Lee no one was expected to evacuate and the Emergency Operations Center (EOC) was only partially activated. There were daily briefings in which either Ed Bordes or I attended.

The new building was officially opened by Mayor Landrieu on December 13, 2011 (Figure 11).

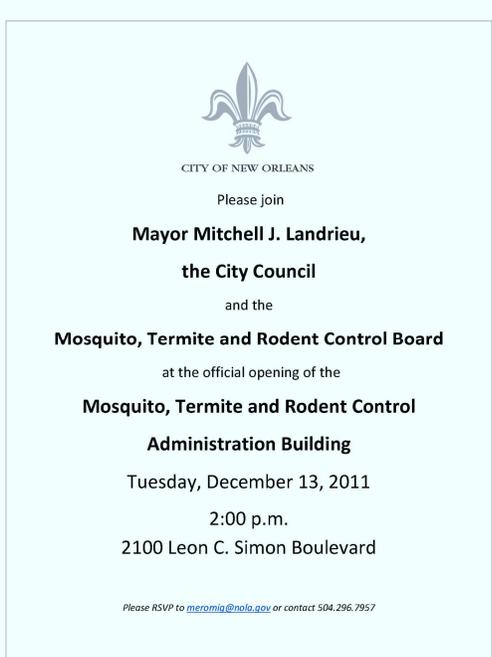


Figure 11. The official invitation for the grand opening of the Mosquito, Termite and Rodent Control Administration building held December 13, 2011.

A press conference was called and we had the honor of Councilperson Cynthia Hedge Morrell participate in the event. She has been a strong supporter of our program and the construction of the new building. Councilperson Eric Granderson and Deputy Mayors Col. Sneed and Cedric Grant attended (Figure 12).

Our employees prepared different stations throughout the building featuring all of our different roles. Many of employees had the opportunity to speak with the Mayor about their jobs at NOMTCB (Figure 13).



Figure 12. Official from City Hall and the City Council attended the grand opening of the Mosquito, Termite, and Rodent Control Administration. Pictured left to right, Cedric Grant, Mayor Mitchell Landrieu, Eric Granderson, Cynthia Hedge Morrell,



Figure 13. Eric Guidry shows Mayor Landrieu pinned specimens as he tours the administration building during the grand opening.

# **MOSQUITO FIELD OPERATIONS**

## **MIKE CARROLL, Ph.D. and SARAH MICHAELS**

### **Dr. Micheal K. Carroll: January to June**

Before reporting on mosquito activities, I'd like to recognize Mr. Stephen R. Sackett (Figures 14-15). Steve retired from our program after 32 years. He began his career as a Mosquito Control Inspector 2 and quickly rose through the ranks as Mosquito Control Specialist, Entomologist, Senior Entomologist, Field Operations Supervisor, and retired as Research Entomologist. Steve was a biologist working in Grand Terre for the Department of Louisiana Wildlife and Fisheries before coming on board with NOMTCB.



Figure 14. Mr. Steve Sackett began his career at Mosquito Control in 1979. At the time of his retirement, he was a Research Entomologist and supervisor of mosquito operations.

Steve was exceptionally well versed in the workings of both operational mosquito control as well as the operational research end. He was our primary scientist working with Dr. Gerry Marten, Mieu Nguyen, and Cynthia Harrison during the development of the “cannibal” mosquito project (*Toxorhynchites*) and the development of the use of copepods as a successful biological control agent of *Aedes aegypti*. The copepod project also involved our biologists Mieu Nguyen and Cynthia Harrison. We wish Steve well and encourage his life long ambition as a past Wildlife and Fisheries Biologist to help control the speckled trout populations of South Louisiana.

As with 2010, mosquito activity was very low, at least until the first week of April. A substantial



Figure 15. Steve showed Mike Rowe of *Dirty Jobs* with Mike Rowe how to catch mosquitofish used to treat abandoned pools after Katrina.

brood of the fresh floodwater mosquito, *Aedes vexans*, (Figure 16) came off the first week of April after moderate rainfall. This was particularly pronounced in park areas, especially in City Park. Two nights of ULV ground spraying with Scourge® (Bayer Environmental Sciences) (resmethrin) helped suppress the population. This species has a history of peaking from late May through early July. However, since Katrina, we have not seen New Jersey light trap catch numbers this high.

As is expected, the Asian Tiger mosquito, *Aedes albopictus*, has recently begun to reach numbers



Figure 16. The fresh floodwater mosquito, *Aedes vexans*.

high enough to trigger complaints from persons involved in backyard activities. Service requests indicated the presence of this species. We responded to each service request with thorough inspection. Our staff is doing local residual adulticiding and/or informing the residents how to eliminate breeding in containers.

In 2011, we saw the lowest West Nile virus activity since it first appeared in 2002, when 204 human cases were reported statewide. Last year we had no human activity reported and only one positive mosquito pool. As this disease appears to be tailing off, as has St. Louis encephalitis, we are now focusing more on the possibility of recurring dengue fever and the possibility of chikungunya appearing in New Orleans. Both of these viral diseases are potentially transmitted by both *Aedes aegypti* and *Aedes albopictus*. Our scientists are taking the lead to cooperate with our board, members of the Louisiana Mosquito Control Association board, and scientists at the Centers for Disease Control to develop a response plan. The last continental U.S. epidemic of dengue was near Armstrong International Airport in 1945. It is inevitable that dengue fever will return to the New Orleans metropolitan area.



Figure 17. A ditch leading to a storm drain was covered with vegetation and debris. The ditch was not draining properly which caused mosquito problems.

We completed most of the laboratory and field susceptibility testing of Scourge® (54% resmethrin and 18% PBOT) against the southern house mosquito (*Culex quinquefasciatus*) and against the yellow

fever mosquito (*Aedes aegypti*). All of the local populations of *Culex quinquefasciatus* that we have tested have shown to be fairly resistant to Scourge®, and we are discontinuing the use of this insecticide. Unfortunately, all of the pyrethroids that we have tested are not effective against this species. All pyrethroids appear to be effective against *Aedes aegypti*. We are now in the process of using our remaining stock against *Aedes* species and replacing this with malathion, which has been effective against all species that we have tested so far.

**Sarah Michaels: June to December**

In 2011 mosquito populations were generally low, but substantial broods of the fresh floodwater mosquitos, *Aedes vexans* came off following rain events in April and September. Moderate rainfall in April produced particularly large broods in park areas, especially City Park. Two nights of ULV ground spraying with Scourge® (Bayer Environmental Sciences) (resmethrin) helped suppress the population.

In September, following the heavy rains from Tropical Storm Lee, ULV ground spraying with Fyfanon® (Cheminova) (malathion) and aerial applications of Dibrom® (AMVAC) (naled) helped to reduce service requests. We had 434 service requests called in or sent by email, with 148 (35%) in the 2 weeks following Tropical Storm Lee. The remaining service requests were often related to abandoned properties and leaking water from hydrants and broken water mains. While such conditions have improved dramatically since Katrina, they continue to be potential mosquito breeding sites. However, we have been able to work with the city’s Code Enforcement Division and accompanied inspectors to address specific problematic properties (Figure 18).

This year we completed ULV ground spraying of 95 zones based on service requests and surveillance indicators, a small increase over 2010. In addition, for many service requests we responded with a thorough inspection, informing residents on how to reduce mosquito breeding and performing localized residual adulticiding

and/or larviciding. We also worked with NORD and City Park to treat parks prior to evening events such as Movies in the Park and Love in the Garden. I would like to commend our Pest Control Inspector, Princeton King, on his tireless efforts this summer, particularly following Tropical Storm Lee.



Figure 18 . Property visited jointly by NOMTCB employees and inspectors from Code Enforcement Division to address conditions contributing to mosquito breeding and rodent harborage.

We continued laboratory and field susceptibility testing of Scourge® against the southern house mosquito, *Culex quinquefasciatus*, and against the yellow fever mosquito, *Aedes aegypti*. Local populations of *Culex quinquefasciatus* continued to show resistance to Scourge® and other pyrethroids, but remains effective against *Aedes aegypti*.

### Surveillance Activities

We have continued our ongoing surveillance activities using New Jersey light traps and gravid traps throughout Orleans Parish. We have also begun using dry-ice baited CDC miniature light traps in a few areas to determine the source of homeowner complaints. In partnership with ongoing studies at Tulane, we have increased monitoring for *Aedes albopictus* and *Aedes aegypti* by collecting mosquito larvae from cemetery vases and by placing ovitraps in locations throughout the city. These mosquitoes are urban container-breeding species and are often pests, but can also be vectors of diseases such as dengue fever and chikungunya fever.

In July, one mosquito pool tested positive for West Nile virus (WNV) out of 459 pools submitted between April and November. This year, over 42,000 female *Culex quinquefasciatus* were collected by gravid traps. No human cases were reported. This

was the same as 2010, which also had only one positive mosquito pool and no human activity.

### Source Reduction

This spring our source reduction crew, Brooks Hartman (Figure 19) and Jimmie Jessie, were active in the clearing of dense vegetation along existing ditches in wooded areas along Bullard Avenue to Michoud Boulevard and the I-10 Service Road at Paris Road (Figure 20).

Source reduction personnel also continue regular inspections of City Park. Crews applied larvacides and oils to swales to combat *Aedes vexans*, and also applied herbicides to lagoons in order to suppress aquatic plant growth, including alligator weed, to combat the return of species such as *Mansonia titillians*.

In December, we presented a poster outlining the population changes of *Aedes albopictus* and *Ae. aegypti* in New Orleans, in addition to the dengue response plan at the annual meeting of the American Society of Tropical Medicine and Hygiene in Philadelphia, Pennsylvania.



Figure 19. Brooks Hartman cleared debris in Eastshore subdivision.



Figure 20. Area in Eastshore subdivision after clearing debris.

We are happy to report that virtually 95% of once-abandoned swimming pools are now maintained, have been filled, or removed since our initial visits following Hurricane Katrina (Figures 21A-B). Using an initial treatment of Vectorex® (*Bacillus sphericus*), followed with placement and monitoring of the introduced mosquitofish *Gambusia affinis*, we have accomplished nearly 100% control. The manuscript has been prepared by Dr. Gerald Marten and is in final review by our staff.



Figures 21 A-B. Green and black swimming pools were abundant in New Orleans following Katrina. These pools make perfect habitats for mosquitoes to lay their eggs.

We need to purchase new spray equipment for our fog trucks, as we are no longer able to repair our units due to a lack of replacement parts. We would like to thank Jeanine Tessmer, Director of Livingston Parish Mosquito Control District, who took time to show Bryan Wirth (Automotive Mechanic 2), Princeton King (Pest Control Inspector 4), and I, her truck fleet which has some of the newest equipment in the state (Figure 22).



Figure 22. Princeton King, Pest Control Inspector 4, (left) and Bryan Wirth, Automotive Mechanic 2, (right) inspect the truck ULV units in Livingston Parish.



Figure 23. Mieu Nguyen conducted the Aquatain test in our biocontrol laboratory.

### Research and Education

We continue to maintain colonies of *Culex quinquefasciatus*, *Aedes aegypti* and *Toxorhynchites*, both for our use and to share with collaborators. This year, we supplied *Toxorhynchites* eggs to Dr. Wasserberg at the University of North Carolina for his research.

Cynthia Harrison and Mieu Nguyen (Figure 23) conducted a laboratory trial to evaluate the efficacy of the larvicide Aquatain. The results of the trial were presented at the annual LMCA meeting held in Covington.

### Buck Moth

Buck moths and caterpillars were surveyed in 2011. This spring had a 96% incidence of buck moth caterpillars on trees that were surveyed. In December of 2010, areas of the city where trees are treated averaged around one adult moth/trap while untreated areas had more than 6 adults/trap.

# AVIATION ED FOSTER

The year began with the completion of scheduled inspections and non-routine repairs to the aircraft by Ben Smith, former Aviation Supervisor in January. Following this, Ben worked toward completing the fabrication of two new polypropylene lined spray tanks (Figure 24) to replace the original fiberglass lined Micronair tanks. As the tanks were completed and installed (Figure 25), Ben also repaired and/or replaced the entire spray system as required. A chemical reaction over the years between the mosquito adulticide and the fiberglass resin had resulted in numerous clogged spray lines and nozzles. The polypropylene lined tanks are much less susceptible to the negative effects of the adulticide and should provide many years of reliable service.

Upon completion of the tank and spray system installation, a system validation and calibration was conducted with the cooperation of the St. Tammany Parish Mosquito Abatement District. This involved an actual aircraft spray mission over a designated field where chemical droplet collectors were pre-positioned (Figure 26).



Figure 26. Britten-Norman Islander spraying naled to determine droplet size.

After the spray run, the droplet collectors were analyzed by microscope for droplet size and deposition patterns (Figure 27) to verify that the chemical is being applied safely, effectively, and in compliance with the labeling requirements.



Figure 24. The spray tanks were completely rebuilt.



Figure 27. Vicki Taylor from St. Tammany MAD operates the DropVision system to count droplet size of the insecticide.

After all of that hard work by Ben, several aerial spray missions were successfully completed during the 2011 mosquito season. Proficiency flights were conducted as well as flights to locate towers and other hazards. The proliferation of cellular phone towers continues to present a challenge.



Figure 25. The spray tanks were mounted on the underside of the wing of the Britten-Norman Islander.

Additionally, throughout the year we conducted over 11 aerial surveillance flights in support of the New Orleans Fire Department in their effort to monitor marsh fires near the Bayou Sauvage National Wildlife Refuge (Figures 28 A-C). Chief Robert Eiserloh was our main point of contact and these flights are continuing into 2012.

Mid-year saw the Aviation Supervisor position transition from Ben to me. Many thanks to Ben for working diligently in easing the transition and making it seamless. With the transition came some required training and certifications. In October I attended Flying Tiger agricultural aviation school in Rayville, LA. This is one of the few flying schools that teach pilots to become aerial applicators, sometimes referred to as “crop dusters.” While aerial mosquito control is very different from agricultural aviation, there are similarities which the FAA and insurance underwriters recognize. The most common element is use of GPS technology for precision guidance when applying chemicals and the majority of my training time was spent learning these techniques.

Next on the agenda was obtaining the required certifications, and so after some study time it was off to Baton Rouge to see our friends at the Louisiana Department of Agriculture and Forestry. Three examinations were required, General Standards, Mosquito Control Applicator and Aerial Applicator. I can report that the drive home was much more pleasant than the drive up.

Following that, preparations began for the annual required major inspection of the Islander airplane. This involved sourcing replacement parts and researching the aircraft records. The exhaust systems from both engines were removed and sent for overhaul. The inspection will continue into 2012 and should be completed in February to have us well positioned to support whatever 2012 may bring.



Figures 28A-C. Ben Smith, Ed Foster, and Ed Freytag flew on several missions to take photos of the marsh fire with Chief Eiserloh.

# **FLEET MAINTENANCE**

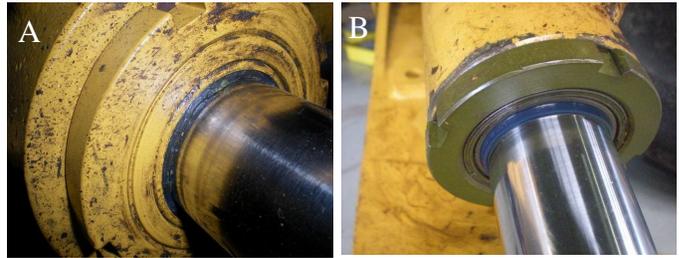
## **BRYAN WIRTH**

Since joining NOMTCB in June of 2010, the majority of my time has been spent servicing the fleet vehicles and heavy equipment. Basic maintenance on all the vehicles began in January. This includes changing oil, oil filters, fuel filters, transmission filters, spark plugs, spark plug wires, wheel bearings, brakes and windshield wipers. Diagnostics were also run on all the vehicles to determine what other issues needed to be addressed in 2011.

Preventative maintenance, as well as repairs, were done on both diesel and gas run equipment and excavation equipment. With assistance from Plant Maintenance Supervisor, L.J. Kabel, maintenance and repairs were also completed on one of two backhoes. This included disassembling, cleaning, and rebuilding all of the hydraulic cylinders (Figures 29-30) and valve control block, changing the hydraulic oil, and replacing the digging claws. All preventative maintenance, such as changing filters and oil, was performed as well.



Figure 29. Bryan Wirth removes a hydraulic cylinder from a backhoe for cleaning and repair.



Figures 30A,B. A hydraulic cylinder before cleaning (A) and after cleaning (B).

Repairs were completed on all the fog trucks and their fogging units. Repairs were also completed on small engine equipment, such as small engine driven drills, lawn mowers, weed eaters, and spray units.

The entire shop has been organized and inventoried (Figure 31) and all necessary parts and equipment have been ordered to allow NOMTCB's fleet to be maintained without having to send vehicles to an outside shop to be repaired. I am currently trying to find fleet system software that will efficiently keep records organized and up to date. The NOMTCB fleet is on the way to being up to date and running well. In the future, I would like to continue to improve the shop repair capabilities to include a hydraulic department, auto body work, and painting.



Figure 31. NOMTCB's auto maintenance shop located at 6601 Stars and Stripes Blvd.

# ***VECTOR/RODENT CONTROL***

## ***JOYCE BROWN***

**Service Requests**

In 2011, New Orleans Vector/Rodent Control program received 873 rodent service requests by e-mails and calls to the office (Table 1). Of the 873 rodent service requests, 66 residents had rodent activity and 222 burrows were found and treated. Fifty-seven residents were re-inspected. All complaints were followed up with inspections and treatment as required.

There were 262 bait packs placed in rat burrows, and 2,308 storm drains were treated, using 8,743 bait blocks. Fact sheets were given to the residents of each service request. Inspectors also took the time to talk to residents about conducive conditions.

Rodent Control continues the inspection and treatment of storm drains, burrows and ant mounds on vacant houses and vacant lots, and all violations are e-mailed to Code Enforcement.

**Residential Inspections**

This period, several service requests came in with heavy rodent activity, but when inspected, no rat burrows could be found on the properties. Rodent inspectors placed a total of 16 bait stations on 6 residential properties throughout the city (Figure 32). These residents usually live next to vacant houses or vacant lots with trash, debris, high grass or other city code violations (Figure 33) and needed extra attention because of the conducive conditions.



Figure 32. A resident where bait stations were placed.



Figure 33. Bait stations are placed next to abandon houses or vacant lots where code violations like tall grass can create conducive conditions for rodents.

<b>2011 Requests for Service by Month</b>			
<b>Month</b>	<b>Inspection</b>	<b>Re-Inspection</b>	<b>Total</b>
<b>January</b>	41	1	42
<b>February</b>	28	0	28
<b>March</b>	60	0	60
<b>April</b>	38	7	45
<b>May</b>	70	8	78
<b>June</b>	52	7	59
<b>July</b>	100	13	113
<b>August</b>	89	1	90
<b>September</b>	122	6	128
<b>October</b>	81	10	91
<b>November</b>	51	0	51
<b>December</b>	84	4	88
<b>Total</b>	<b>816</b>	<b>57</b>	<b>873</b>

Table 1. Rodent service requests received by NOMTCB in 2011.

**Monthly Inspections**

Inspectors continued to inspect and treat 18 scheduled treatment sites. Bait stations were used when needed and the sites were inspected at least twice a month. Bait was replaced as needed.

City facilities were serviced for unwanted pests both inside and out (Table 2). Inspectors surveyed, took pictures, analyzed the infestation data, made recommendations, and educated the staff on pest proofing, clutter removal, and administering the proper treatment to eliminate the pests. These sites included the New Orleans Police Department, New Orleans Fire Department, City Hall, multi-purpose centers, Criminal and Juvenile Court, Public Works, Sanitation Department building, and others.

### Rodent Treatments

In February, NOMTCB inspectors also inspected and treated the storm drains in the French Quarter. This treatment is done twice a year or as needed. There are 668 storm drains that were inspected and treated with the active ingredient bromadiolone. We are constantly inspecting sites in the French Quarter (Figure 34) and we try to remediate conducive conditions. We have an aggressive rodent management program at the French Market.

Inspectors inspected and treated several areas of the French Market for mice, rats and other general pests. These areas include Latrobe Park, Auxiliary Park, the Flea

other general pests. These areas include Latrobe Park, Auxiliary Park, the Flea Market and other commercial retailers. Open garbage cans in the French Market provide available food for rodents (Figure 35). There are many openings that should be closed (Figure 36) and pest-proofing is an effective tool to keep rodents from entering buildings (Figure 37). Timmy Madere closed many openings in walls and under doors. The French Market is finding the funding to begin changing out their open trash cans to closed cans.



Figure 34. Timmy Madere inspects a site in the French Quarter.



Figure 35. One of many overrun trash cans in the French Quarter.



Figure 36. A gap observed under a door in a building at the French Market.



Figure 37. A NOMTCB inspector sealed the opening with a concrete patch. This will prevent rodent from entering under the door.

### **Red Imported Fire Ants**

In January, NOMTCB inspectors treated Digby Playground located at 6500 Virgilian St. for red imported fire ants. Two different ant baits were used, 75 lbs of Esteem ant bait and 30 lbs of Over 'n Out ant bait were used. NOMTCB inspectors continued to inspect and treat all NORD parks and playgrounds throughout the City for rodents and red imported fire ants.

In February, NOMTCB inspectors treated the median located at Tchoupitoulas St. at Napoleon Ave. and St. Charles Ave to Lee Circle for red imported fire ants. This is one of the parade routes for Mardi Gras (Carnival). Another parade route inspectors treated was the median ground located at Navarre St. to Orleans Ave. to N. Carrollton Ave. The total amount of bait used was 280 pounds (Esteem and Over n' Out).

In April, NOMTCB inspectors treated Palmer Park for ants. The site is located at the corner of South Carrollton and South Claiborne Ave. A total of 25 lbs of Esteem ant bait was used. The area in City Park used for Voodoo Fest was also treated for red imported fire ants prior to the event.

### **Fight the Blight**

In June and December of 2011 NOMTCB inspectors participated in the Fight the Blight Program. Storm drains were treated (Figure 38) and a survey was performed within a 5-block radius in 5 areas of the city (Districts A, B, C, D, E). We provided information to the public and fact sheets were given to residents regarding rodent management, pest proofing, and information on how NOMTCB services the City. Resident yards were inspected for signs of rodent and mosquito activities.

NOMTCB inspectors treated storm drains for rats around the perimeter of the New Orleans Public School Board office building and a site where an apartment complex building, located at 2646 West Bend Parkway in Algiers was demolished (Figure 39).



Figure 38. Treated storm drains around perimeter where apt. complex



Figure 39. Storm drains treated around perimeter of New Orleans School Board building.

<b>SITE</b>	<b>ADDRESS</b>	<b>ACTIVITY</b>	<b>DATE</b>
Algiers Point #20		German roaches	3/31/2011
Algiers Point #20		Treat german roaches	4/4/2011
Arthur Monday Multi-Center	1111 Newton St.	Ants	4/25/2011
City Hall	1300 Perdido St.	Ants	2/15/2011
City Hall	Water fountain	American roaches	2/16/2011
City Hall		Inspection	2/22/2011
City Hall	Room 2W60	Termites	2/23/2011
City Hall	Trees	Termites	3/3/2011
Criminal Court Bldg.	2700 Tulane Ave.	Mice	3/21/2011
Criminal Court Bldg.		Ants (they treated themselves)	4/27/2011
District Attorney	619 S. White St.	Inspection	7/25/2011
Downtown Library	219 Loyola Ave.	Inspection - found recluse	3/4/2011
Downtown Library		Recluse spider cleanout	3/11/2011
Edna Pillsbury Clinic	2222 Simon Blvd.	Ant and mice inspections	4/18/2011
French Market	1008 St. Peters St.	Mice	1/4/2011
French Market		Rodents	1/14/2011
French Market		Rodent burrows	1/21/2011
French Market		Rodent burrows	1/28/2011
French Market		Inspection	2/15/2011
French Market	Pick bldg / open air	Mice	2/16/2011
French Market		Rodent burrows	2/19/2011
French Market	Mother Nature's Cupboard	Pest proofing	2/22/2011
French Market		Burrows and bait stations	2/26/2011
French Market	Open air	Rats	2/28/2011
French Market	Market Café	Rats	2/28/2011
French Market	Ladies clothing store	Mice	3/31/2011
French Market	Open air / Market Café	Inspection	4/28/2011
French Market	Open air/Market café	German roaches	4/29/2011
French Market	Mother Nature's Cupboard		
French Market	Mother Nature's Cupboard		
Gov. Nicholls Wharf		Bait stations	1/4/2011
Juvenile Civil Court	421 Loyola Ave.	Inspection	3/21/2011
Juvenile Civil Court		Inspection	4/28/2011
Juvenile Civil Court		Bird lice in ceiling tiles	4/29/2011
Keller Library	4300 S. Broad St.	Wasp, red imported fire ants	3/15/2011
Lake Library	Lakeforest / Read Rd.	Pre-treat	1/12/2011
Latter Library	5120 St. Charles Ave.	Proactive inspection/treatment	1/20/2011
New Orleans Transfer Station	2829 Elysian Fields Ave.	Rats	3/8/2011
New Orleans Transfer Station		Re-inspection	3/9/2011
New Orleans Transfer Station		Inspection	3/14/2011
New Orleans Transfer Station		Inspection	3/17/2011
New Orleans Transfer Station		Re-treat bait stations	3/23/2011

Table 2, Part 1. Inspections of city properties.

<b>SITE</b>	<b>ADDRESS</b>	<b>ACTIVITY</b>	<b>DATE</b>
NOFD	Basin St.	German roaches	3/1/2011
NOFD (Engine #07)	1441 Basin St.	Cockroaches	7/18/2011
NOFD (Engine #10)	14069 Morrison Rd.	Mice	2/14/2011
NOFD (Engine #10)		Follow-up mice	2/18/2011
NOFD (Engine #10)		Put in door sweeps	2/24/2011
NOFD (Engine #13)		Rats	2/18/2011
NOFD (Engine #13)	987 Robt. E. Lee Blvd.	Rats	5/6/2011
NOFD (Engine #20)		Roaches	4/4/2011
NOFD (Engine #20)	425 Opelousas St.	German roaches	5/27/2011
NOFD (Engine #39)	1616 Caffin Ave.	Mice	1/6/2011
NOFD (Engine #39)		Mice	1/10/2011
NOFD Headquarters	317 Decatur St.	Ants	1/25/2011
NOPD	1899 Tchoupitoulas St.	Mice	8/11/2011
NOPD (1st District)	501 N. Rampart St.	Spiders	4/20/2011
NOPD (1st District)		Proactive inspection/treatment	4/26/2011
NOPD (2nd District)		Ants, roaches	4/20/2011
NOPD (2nd District)		Proactive inspection/treatment	4/26/2011
NOPD (2nd District)	4317 Magazine St.	Termites	5/23/2011
NOPD (3rd District)	Paris & Mirabeau St.	Cockroaches	5/18/2011
NOPD - (3rd District)	Paris & Mirabeau St	Roaches	4/19/2011
NOPD - (3rd District)		Proactive inspection/treatment	4/26/2011
NOPD (4th District)		Proactive inspection/treatment	4/26/2011
NOPD - Evidence Room	2800 Magnolia St.	Mice	1/5/2011
NOPD - Evidence Room		Call back	1/12/2011
NORD - Digby Park	6500 Virgillian St.	Ants	1/6/2011
Pharmacy Museum	514 Chartres St.	Rats	1/21/2011
Pharmacy Museum		Follow-up rats	1/28/2011
Pontchartrain Center	Congress Dr.	Ants	8/15/2011
Youth Study Center		Mice	1/28/2011
Youth Study Center		Roaches, mice	2/25/2011
Youth Study Center		Rodent presentation	3/10/2011
Youth Study Center		Roaches	3/15/2011
Youth Study Center		Ants	3/16/2011
Youth Study Center		Mice station - pick up	3/17/2011
Youth Study Center		Ants	3/18/2011
Youth Study Center		Ants	4/25/2011
Youth Study Center	1100 Milton St.	Cockroaches, ants, spiders	8/3/2011

Table 2, Part 2. Inspections of city properties.

# TERMITE ENTOMOLOGY

## ED FREYTAG

### Photography

The collection of digital images continued to grow, as all inspectors were required to photograph images of their work in the field with point and shoot cameras. In order to keep the images organized, we are using IMatch 3.6 software from PhotoTools to catalogue thousands of pictures for easy search and retrieval. The images are used for PowerPoint presentations, brochures, documenting research and publications.



Figure 40. *Culiseta inornata* adult female. Scale is 5 mm (0.196 in).

Mieu Nguyen and Cynthia Harrison were able to collect *Culiseta inornata* larvae (the winter mosquito) from a flooded area off Highway 90 by the Rigolets and successfully reared them to adults in the Biolab testing room. Although the adults did not successfully mate and lay eggs, Mieu was able to maintain many females alive in a refrigerator for several months. I completed a series of photographs of the female adult mosquito for the illustrated identification key. *Culex inornata* is not a very picturesque mosquito, as most of the scales are pale brown to sandy colored with some white in between, but the wings and body are large, making it the biggest mosquito that flies in the winter (Figures 40-41). One important identification feature of the *Culiseta* genera is the pre-spiracular hairs.

These hairs are difficult to photograph so they are shown as an inset from the thorax (as shown in Figure 41).



Figure 41. Detail of pre-spiracular hairs of *Culiseta inornata*.

Occasionally, certain insects present very challenging problems to obtain an acceptable image. Sometimes they are hard to photograph because the nature of the surface of the insect, such as mosquitoes with scales and hairs, or just because they are so small (less than 1 millimeter), such as the eggs of mosquitoes (Figure 42) and termites (Figure 43). Because there is little to no information available either on print or on the internet on the actual techniques used to photograph at extremely high magnifications (micro, as opposed to macro photography), the photographer has to rely on trial and error to figure out how to be set up the flash, background, and lens combinations.

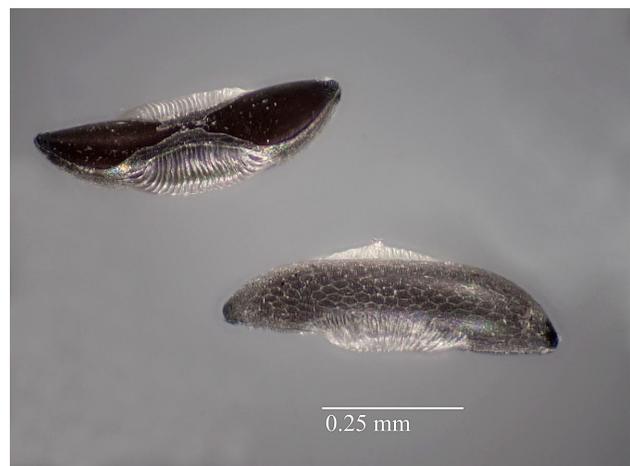


Figure 42. *Anopheles* sp. egg rafts (top and bottom side) with floats designed to keep the eggs on the water sur-



Figure 43. *Reticulitermes* sp. egg

On July 6 the pilot, Ben Smith and I, rented a four-seater helicopter (R-44) from Crescent City Helicopters to do a fly-over and aerial photography of a marsh fire in the Bayou Sauvage area in East New Orleans (Figure 44). The Homeland Security department and the Fire Department wanted to get an exact location of the fire and also on-site observation to determine if the fire was still active. They were concerned whether the smoke was going to affect interstate travel or if it was getting close to buildings. The picture of the marsh fire that we sent to the Fire Department was printed in the Times Picayune the next day.

**Insect Identification.**

All the insect cabinets and trays, as well as microscopes and other equipment were removed from the USDA laboratory and relocated to the laboratory at the new building. Eric Guidry identified approximately 462 insect submissions from various sources, including pest control operators, the public sector, industry, and personnel from our own termite, rodent and mosquito divisions.



Figure 44. Burt Lattimore (pilot) and Ed Freytag (entomologist/photographer) preparing for aerial photography on a R-44 helicopter at Lakefront airport.

We also received many envelopes, bottles, and plastic bags with no insects or insect parts, just wood bits or trash. In other cases, the insects were so thoroughly destroyed that it was practically impossible to determine what type of insect was collected. Samples have been sent mostly from local addresses, but some have come from Slidell, Lake Charles, Harahan, and even from Mississippi.

An abbreviated list of the insects identified include the following:

- Flower beetle larvae
- Bedbugs
- Psocids (bark or book lice)
- Rat mites
- Collembolans (springtails)
- Drugstore beetles
- Rice weevils
- Spider beetles
- Variiegated mud-loving beetles
- Phorid flies
- Webbing clothes moths (web sacs)
- Various ant species
- Various termite species
- Various spider species

### Teaching Collection

The teaching collection has been growing exponentially since Eric took over. A lot of specimens, mostly coleopteran (beetles) and dipteran (flies) have been added this year and were catalogued using File-maker Pro database software.

New specimens added to the collection include the following:

- Halictidae- sweat bees
- Dolichopodidae- long legged flies (metallic green)
- Tachinid flies
- Haliplidae beetles
- Trogossitidae- bark gnawing beetles
- Lycidae- net winged beetles\*
- Trogidae-death feigning beetle\*
- Live Arizona blond tarantulas\*)
- Live Centroides scorpions\*
- Western black widow
- Solpugidia- wind scorpion
- Amitermes termites\*

\*collected while in Arizona

### Collecting Events

A night-collecting trip in the Des Allemands area (with the Audubon insectary crew) yielded many dung beetles, bark gnawing beetles and black and yellow Argiop spiders (garden spiders that weave a zigzag line on the web).

Eric Guidry and I attended the Invertebrates in Education and Conservation Conference (IECC) July 26-31 in Rio Rico, Arizona. This conference was hosted by the Sonoran Arthropod Institute in Tucson, AZ and according to their web site “brings together zoo, aquarium, museum, exhibit design and education professionals, and interested general public, to share their experiences. The conference includes three mornings of paper presentations and three afternoons of specialty workshops and field trips. Conservative collecting is allowed on most trips. Full-day field trips the day before the conference provide opportunities for those who really want to experience “Southern Arizona’s unique diversity”. We attended all the morning papers and went on various collecting field trips, including a night collecting trip in th Madera Canyon of the Coronado National Forest (Figure 45).



Figure 45. Eric Guidry covered in beetles while collecting with a sodium light and a bed sheet in Arizona.

The talks were very informal but extremely informative, especially for those trying to rear insects for exhibition or need to learn about insect collecting and preserving techniques. We enjoyed the forensic entomology lecture and field dissection of a dead pig. Although not intended for the weak (lots of pictures of dead people in all stages of decomposition) it was interesting to learn how the life cycle of certain blow flies can be used to determine the approximate time of death of an animal.

**Honey Bee Calls.** Several calls were received to remove or eliminate honey bees from parks and residences. Bees were treated with a solution of an insecticide (usually Talstar) and foaming agent applied with a foaming machine. Most treatments were made early in the morning before the bee had started to fly from the nest to gather nectar. As a safety precaution, full-body Brazilian-style bees suits were worn at the time of application or when inspecting the sites. The Latter Library called several times concerned that bees inside the trunk of an oak were going to sting visitors, but the hive was too high to pose a threat to the public and it was not possible to treat without the use of a bucket truck. A local pest control company also declined to treat the bees.

Honey bees in trees were treated with a solution of Talstar and foam at West End Park, a park at Cartier and Madrid, and at a St. Roch playground. At least a dozen calls were received where nothing could be done to treat the bees.

About twenty paper wasp nests were treated on the facilities at Joe Brown Park using cans of compressed insecticide such as Wasp-Freeze. They contain pyrethrins and shoot a stream of liquid that provide quick knock-down from a distance of up to fifteen to twenty feet.

### **Nuisance Animal Wildlife**

Although not of an entomological nature, the Termite Division personnel have been involved in receiving and responding to nuisance animal calls. Approximately 60 nuisance calls were received, of which 35-40 were serviced. The number one nuisance animal was the raccoon, closely followed by opossums. Most of the calls were from residents living next to abandoned and blighted properties, requesting that the animals be removed permanently. Live catch metal traps were employed to capture the animals. Occasionally cats were accidentally trapped but were released in the same location.

Notable nuisance animal calls included:

- 1) A call was received from City Hall to remove a small non-venomous snake, which had been trapped in a box.
- 2) A call came in from a movie set company requesting the removal of nutria at Fort Pike during construction of the movie set for GI Joe II. The nutria were damaging water hoses and leaving fecal pellets at the set. Approximately 24 nutria were removed from the area.
- 3) The mounted police in City Park requested trapping of coyotes at the police stables. Two large live traps were set by the stables and baited with turkey wings. The trapping was unsuccessful and the coyotes continue to be spotted by the police on numerous occasions. The traps were moved to a different location and modifications will be made to the trapping technique. Coyotes are known to be difficult to catch in live traps.

# **TERMITE RESEARCH**

## **ED FREYTAG and CARRIE OWENS**

### **New Facility at 2100 Leon C. Simon Drive**

The interior of the new administration/laboratory building was completed in late August, but due to construction issues, we were not able to fully move in until September.

The Termite Division spent a lot of time during the summer moving into our new facility adjacent to the University of New Orleans Lakefront Campus at 2100 Leon C. Simon Drive. Preparations included packing equipment and supplies and fumigating items to be moved, which prevented unwanted introductions of pests into our new facility. A great deal of organizing was required to facilitate ease of moving.

The equipment from the USDA laboratory and from the Biolab was packed in boxes and some of it was brought to the new building. All the materials entering the new building were fumigated to prevent an infestation of silverfish from establishing inside the laboratories. The administration trailer was extremely infested with silverfish so the entire trailer and its contents were fumigated.

### **Historic and Public Properties**

The Termite Division continues to service thousands of in-ground monitoring stations surrounding historic and city owned properties at monthly intervals (Table 3). As stations are serviced, consumption and the presence of live foraging termites are noted. When termite activity within a station is observed, the monitoring wood is replaced with bait containing an insect growth regulator. This bait is shared throughout the termite colony, thus eliminating the colony and preventing further structural damage. Monthly servicing is necessary, even following a bait treatment, due to the high termite pressure in New Orleans. Termites from neighboring colonies readily move into areas previously occupied by colonies eliminated by baiting. Monitoring stations were installed at two sites not previously established. These are the City Park Tennis

Center and the City Park Administration Building. In 2012, commercial (non-research or contract related) Sentricon sites will be converted to "Always Active" status with HD bait for continuous termite protection. These sites will have to be adjusted from monthly to a quarterly or semiannual inspection interval. Barry Lyons has been monitoring the following buildings on a monthly schedule, treated with the Sentricon bait system.

<u>Location</u>	<u>Termite Status</u>
Training Academy (City Park)	Inactive
Algiers Courthouse	Inactive
Algiers Point Library	Inactive
Algiers Fire station	Inactive
Bella Luna	Inactive
Cabildo	Inactive
Carrollton Cemetery	Inactive
Chalmette Battlefield	Inactive
City Hall	Inactive
City Park trees (16)	3 Active
Civil Court Bldg.	Inactive
City Park Admin.	Inactive
City Park Tennis Center	Inactive
Decatur Fire Station	Inactive
Fire station #7	Inactive
French Market	Baited
Gallier Hall	Inactive
Harrison Fire Station	Inactive
HDLC	Inactive
Jackson Square	Inactive
Latter Library	Inactive
Madam Johns	Inactive
Milne	Inactive
Nix Library	Inactive
NO Court	Inactive
Parkway	Inactive
Perseverance Hall	Inactive
Pharmacy Museum	Inactive
River Front Planters	Baited
Lower Pontalba	Inactive
Upper Pontalba	Inactive
Presbytere Museum	Inactive
Railroad	Inactive
Rosedale Police station	Inactive
Vieux Carre Bldg.	Inactive
USDA	Inactive

Table 3. Buildings and trees currently serviced by NOMTCB.

### ***Cabrini Dog Park***

This site consists of approximately 90 Sentricon stations installed around the perimeter of the park and around the trees to treat the Formosan termite infestations. The ground in the park contains lots of bricks and cobblestones, so reinstalling stations is very difficult, and the dust from the bricks runs inside the stations after a rainstorm making the removal and replacement of the bait components difficult.

### **Operational Research**

Our division continues their involvement in multiple operational research projects. The questions that will be answered by these projects will allow us to gain a better understanding of FST biology and treatment efficacies. The knowledge obtained is of great importance, as it will allow us to make sound recommendations regarding future treatments of municipal structures. We will also be able to further educate the general public with new information on urban pests, giving us recognition as leaders in the pest control community.

Barry Yokum (Laboratory Specialist 2) is responsible for finding the necessary properties, structures or trees that fall within the parameters of protocols we will execute. Barry is also responsible for reading and understanding the treatment protocols, treating the structure, inspecting and recording the termite activity, and providing the data to the principal investigator so that a report can be submitted to industry. The majority of these projects consist of industry research contracts that have confidentiality agreements intended to protect information considered to be proprietary or of a sensitive nature for marketing purposes. Sometimes a new material or formulation needs testing, or the application methodology or equipment is new and unique.

Termites were eliminated in 2011 in the following sites under industry supported agreements:

- New Orleans Museum of Art
- Public Works warehouse
- Harrell Center
- Magazine fire supply house

- Poland fire station
- Pontchartrain Park Community Center
- Washington Park shelter
- Pump station #6
- Algiers power station-gauge room
- Levee Board building on Franklin Ave.
- Various city trees

### **Additional Collaborative Research (Industry and University Studies)**

Collaborative studies with the pest control industry were conducted to evaluate the transferability of insecticide products among FST foragers exposed to treated soil in 2-D extended foraging arenas. Bioassays are conducted within extended foraging arenas, comprised of eleven 2-D arenas made of clear Plexiglas and connected together with plastic tubing to determine the relative distances from a treatment zone at which termiticides are transferred between colony members. Each arena requires 1000 individual Formosan termite workers and 100 soldiers. All NOMTCB personnel, including mosquito and rodent personnel, as well as summer interns, were asked to share some of their time counting termites. A total of 140,000 termites were counted for the test. A second EFA study was initiated in August for termiticide products also manufactured by BASF. Approximately 90,000 Formosan termites were counted for this test. Weekly images of each arena are analyzed with SigmaScan Pro 5 software to evaluate the presence of live and dead foragers. Each live worker and soldier is counted by the software by clicking on each termite with the mouse. A red dot is placed on each worker termite to indicate that it has been counted (Figure 46).



Figure 46. Live FST workers (red dots) and soldiers (green dots) being counted with SigmaScan software.

### **Canal Street**

Canal Street is a collaborative research site with Dr. Nan-Yao Su of the University of Florida. A total of 1,289 Sentricon stations are inspected monthly, extending from the Mississippi River to the I-10 overpass which is divided into four sections. This project was initiated in 2008. Approximately 200 stations are active with FST during each monthly inspection. The inspections require at least one assistant to get the job done in a week, but usually several inspectors provide assistance and it gets done in 2-3 days. No active ingredient has been placed in any of the Sentricon ground stations, as this site serves as an untreated control for the French Quarter Operation Fullstop project. Samples are collected in alcohol and brought back to the genetics laboratory operated by Carrie. Attempts were made to delineate colonies using Nile blue dye techniques, but the maintenance personnel in care of the palm trees constantly damaged the collecting buckets which interrupted the collecting and releasing of termites.

### **Armstrong Park**

This site is also under a collaborative agreement with Dr. Nan-Yao Su of the University of Florida. Half of the FST colonies in Armstrong Park were eliminated from switching to the new Sentricon HD (High Density) bait in September of 2010, and the remaining colonies were baited in November of this year. There are still active colonies in the park, but now all the stations contain active ingredient and we are predicting that by the spring of 2012 most of the colonies will be eliminated. During the course of the year many stations were lost or damaged due to construction, and they have been reinstalled.

### **Michigan Technical University**

Glen Larkin of Michigan Tech. University visited New Orleans in late March to conduct damage and infestation readings on the field plots. Test sites were installed to determine termite activity and fungal decay. Timmy Madere installed the stakes and test boxes, as well as maintained the plots free of weeds and poison ivy. During Glen's last visit (October 5, 2011) to conduct readings on the test materials, he decided that the site at the end of Crowder Blvd. by Chef Hwy. had limited termite activity and too much poison ivy, so the site was discarded from

the study. Also discarded was the island in Pontchartrain Park due to the difficulty in accessing the site, which it required bringing a flat boat and dragging it to the island over a golf field. The sites at the Zoo had great activity and it will be expanded, as well as the site on the unimproved land by Virgil Street. The island at City Park will be cleared in 2012 and a large study will be installed.

We were invited to visit the wood protection facilities at the Michigan Tech. University in Houghton, Michigan. Dr. Claudia Riegel, Timmy Madere and Ed Freytag flew to Marquette, MI and then drove to Houghton (approximately 100 miles). Houghton is at the northern most tip of Michigan on the Keweenaw Peninsula of Lake Superior, bordered by what appeared to be unlimited miles of timber.

We met with Dr. Peter Laks and Glen Larkin and visited the research and teaching facilities. More importantly, we signed the paperwork necessary to conduct laboratory and field research under the guidelines of the American Wood Protection Association. Now we are virtual members of Michigan Technical and we will be able to conduct treated wood research under their ISO 17025 certification, which is a standard used for testing and calibration laboratories (aimed at improving their ability to consistently produce valid results). We are still required to conduct a laboratory test and have the certification team evaluate and pass us prior to being able to conduct wood protection research.

### **Decay Detection Inspections**

Several meetings were held with Trapolin-Peer Architects at 800 Magazine St. to determine how and where to inspect the wooden structures for decay using the IML decay detecting drill. This three-story building was previously occupied by a coffee roasting and packaging company (Figure 47) and it will be renovated into apartments. An arrangement was made with Trapolin-Peer Architects to drill all the columns and beams (at approximately every three feet) plus all the floor joists where they enter the walls to detect water damage and/or termite damage.



Figure 47. Third floor of the historic coffee house with wood columns and beams that were tested.

Drilling was initiated the first week of August, but due to nails, concrete, and other obstacles in the columns, several drill bits were broken. During the drilling process the technician started experiencing problems with the motor, so the unit was sent to Atlanta for repair and maintenance. After many setbacks, which included sending the drill back to the manufacturer for cleaning and adjusting, the decay drill testing of beams, posts and joists at the coffee house on 800 Magazine St. was finally completed. All the graphs resulting from the drilling data were generated on the computer, printed and bound in three inch binders for each floor (first through third floor) and delivered to Trapolin-Peer Architects. The fees for drilling have been increased from \$125 per hour to \$150 to cover the costs of the technicians and the printing of the graphs for the final report. They were invoiced \$15,000 for the work performed.

### Statewide Formosan Termite Survey

Two trips were scheduled to northern Louisiana in the hopes of finding Formosan termites in parishes not previously reported. On June 22-24 sticky traps and light traps were inspected and replaced but no FST swarmers were found. The last trip was on July 28-29 to pick up the sticky traps and the remaining operational light traps and again no FST swarmers were collected.

### Operation Full-Stop

The light traps and sticky traps were placed into operation from April to late July. We usually collect

until the first week of August, but since we did not collect any alates in late July over several weeks, the traps were removed the last week of July. The alates found on the sticky traps were counted on-site and the data sent electronically to Pedro Levy of the USDA-ARS' Operation FullStop. Maintenance of the light traps was a continuous process during the duration of the trapping period. Most of the problems with the light traps originated from the charging and timing system. Once a week, the technicians inspected the light traps at night to make sure that the lights were operating properly and to determine if there were new lights nearby that may attract the swarmers away from the light traps. Thousands of FST alates were examined under a dissecting microscope to determine the number of males and females collected per trap.

### Insect Genetics Laboratory

The NOMTCB Insect Genetics Laboratory, formerly located at our Biolab facility in New Orleans East, has moved to our new location, at 2100 Leon C. Simon Drive. The new laboratory houses all equipment and voucher specimens, allowing us to continue termite genotyping and diagnostic testing.

Personnel at the NOMTCB Biolab facility continue to conduct microsatellite genotyping on termite samples submitted by members of the pest control industry. This method continues to be a valuable tool in termite colony delineation. Microsatellite genotyping allows us to determine if termite colonies observed following treatment are the same as those observed prior to treatment, thus assisting the pest control industry in product efficacy testing.

### Continuing Education

Carrie Owens completed all requirements of the University of Florida distance education program, and has earned her Ph.D. in Entomology and Nematology. She submitted her dissertation, entitled "Survival and Behavior of *Coptotermes formosanus* Shiraki (Isoptera: Rhinotermitidae) after flooding in New Orleans, Louisiana," which she defended in October. She maintained a high GPA throughout her career as a graduate student. Her dissertation was turned in to the University of Florida's graduate school in December.

### Survival and Behavior of FST after Flooding in New Orleans, LA

Since Hurricane Katrina made landfall in 2005, inundating approximately 80% of New Orleans, a series of studies have been completed to elucidate if and how FST colonies were able to survive prolonged flooding. Microsatellite genotyping conducted on termite samples collected from inundated areas pre- and post-flooding yielded that FST colonies survived prolonged flooding.

Several studies were conducted to determine the survival mechanisms of colonies. First a bioassay was conducted in which groups of termites were maintained at three different temperatures and submerged within containers. Their mortality was recorded at increasing time intervals, and the lethal times were calculated. At 32°C, 100% mortality was reached at 20 hours. At 21°C, 100% mortality was reached at 30 hours, and at 10°C, 100% mortality was reached at 60 hours. Field colonies established before Hurricane Katrina survived two to three weeks of flooding, much longer than the survival capabilities observed of termites subjected to inundation bioassays. Therefore, for FST colonies to survive prolonged inundation, they must have had access to an oxygen source.

A second bioassay was conducted in which groups of termites were confined to an airtight environment at varying temperatures. Their mortality was recorded at predetermined time intervals, and lethal times were calculated (Figures 47-48). According to our data, 50% of a group of 20 termites (i.e. 10 termites) can survive being confined to approximately 6 cm<sup>3</sup> of air space for 23 days at 10°C, seven days at 21°C, and one day at 32°C. Ten percent of a group of 20 termites (i.e. two termites) can survive in this same space for almost 62 days at 10°C, 27 days at 21°C, and three days at 32°C. During the flooding that followed Hurricane Katrina, termites not succumbed to rising water may have survived by remaining in pockets of air within their hydrophobic carton material. Whether FSTs survived inundation by this mechanism remains unknown, as carton material within tree

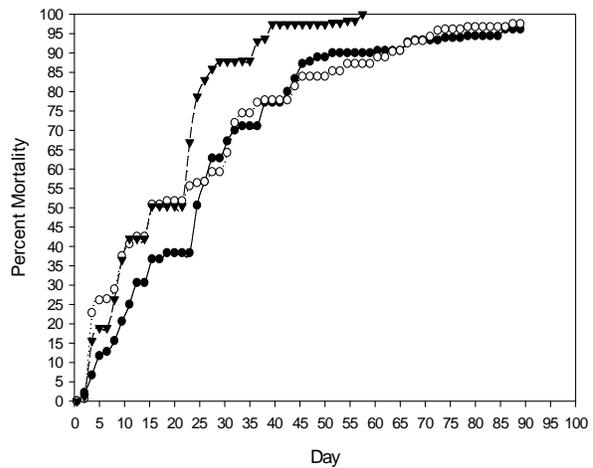


Figure 47. Percent mortality of termites maintained in an airtight environment at 10°C plotted against time. Closed circles represent mortality of groups of 20 termites. Open circles represent mortality of groups of 40 termites. Triangles represent mortality of groups of 60 termites.

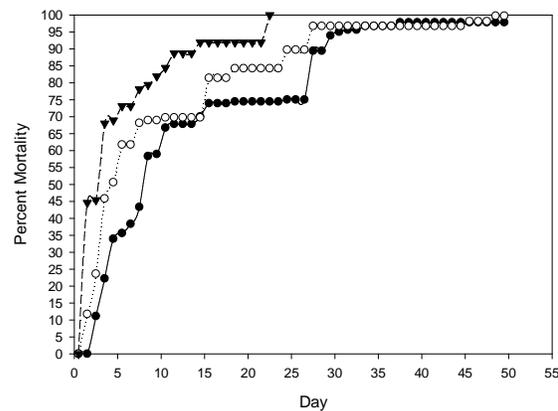


Figure 48. Percent mortality of termites maintained in an airtight environment at 21°C plotted against time. Closed circles represent mortality of groups of 20 termites. Open circles represent mortality of groups of 40 termites. Triangles represent mortality of groups of 60 termites.

voids and structures could not be observed during flooding. However, groups of termites can survive more than three weeks within a hypoxic environment, depending on temperature and the ratio of available space to the number of termites exploiting oxygen.

To determine if FST colonies survive flooding by evacuating or shifting their foraging areas to escape rising flood waters, a field study was conducted

along seasonally inundated areas at the Mississippi River batture. It was concluded that termites do not shift their foraging areas, nor do they move vertically within trees, to escape seasonal inundation. Termite colonies located along the river batture may be adapted to seasonal inundation by remaining within trees, while those located in areas that do not experience seasonal inundation have larger foraging territories.

A bioassay was conducted to determine if FST colonies survive inundation by creating a watertight environment within their nest. Termite foragers were added to artificial trees and foraging arenas, then inundated while behavior was observed. Because water was not observed within three out of four

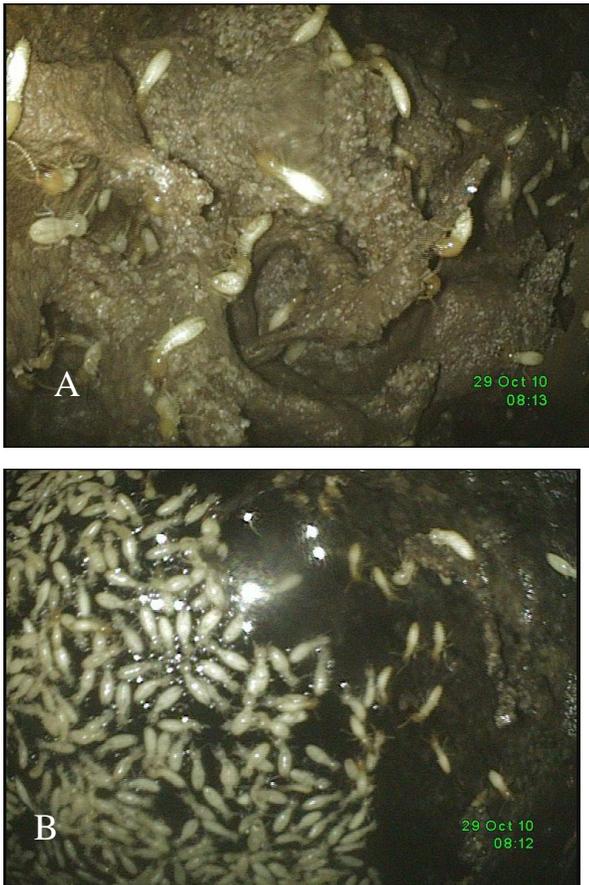


Figure 49A-B. Images taken using a video borescope system to determine if water entered hollowed sections of artificial trees during periods of inundation. (A) Three out of four inundated artificial trees did not exhibit water entering into hollowed tree sections during periods of inundation. (B) One artificial tree filled with water during periods of inundation, and termites were observed floating on the water surface.

artificial trees during periods of inundation (Figures 49A,B), it was determined that FST colonies could have survived prolonged inundation following Hurricane Katrina by creating a sealed environment filled with trapped oxygen within their nest and remaining there until flood waters receded is accepted.

Termites occupying foraging galleries within foraging arenas were observed moving away from water during inundation (Figure 50). Though foraging tunnels within arenas appeared to remain intact during inundation, water readily passed through the galleries. There were no observations made of termites attempting to repair tunnels or prevent water from rising further. These observations would indicate that either the interphase between the Plexiglas and sand was not watertight, or foraging galleries may have at



Figure 50. At least some termites within each arena became restricted within a pocket of air surrounded by water.

least some hydrophobic properties, but would not provide as effective protection under the soil surface during periods of inundation as that provided by carton material within the nest inside trees.

### Database and Sample Archiving

A total of 12,117 termite samples have been archived in the NOMTCB termite collection. These samples have been collected from NOMTCB personnel as well as collaborators from LSU and USDA-ARS. Each sample is properly labeled and termites are stored in 95% ethyl alcohol.

### Outreach and Extension

The town of Fairhope, Alabama requested from our department a demonstration and presentation on the inspection and control of Formosan subterranean termites in trees. Fairhope is a small retirement community of about 13,000 on the eastern shore of Mobile Bay that has kept a small town ambience and devotes a large part of its resources to landscaping. They are extremely fond of their trees but they have been losing them due to Formosan termite infestations. Lodging and travel arrangements for two of us were provided by the town of Fairhope. The regional representative for Dow AgroSciences for Louisiana, Nicky Herbert, was also invited to talk about the Sentricon bait system. Other industry representatives were invited but none were present. I gave a one hour PowerPoint talk on the biology of the Formosan termites, how to inspect for termites in trees, and how to treat trees by injecting a liquid termiticide with a foaming machine. After the presentations we headed to a neighborhood that had several trees infested with FST. Barry Yokum demonstrated how to drill a tree, inspect it using the Videoprobe, and then treat it with a foaming machine with foam only (Figure 51).



Figure 51 Barry Yokum demonstrating how to treat a tree with a foaming machine in Fairhope, Alabama.

One of the problems that we saw with their trees, and that we reminded the folks of Fairhope, is that most of the affected trees are laurel oaks, which are similar in physiology to the water oaks we have in New Orleans. These trees are fast growing but relatively short lived, meaning that by the time they become infested with FST, they are already in decline and are already rotting inside. We will continue to assist the city of Fairhope in their struggle to protect the trees from further FST infestation and damage.

# ***Extension, Technology Transfer and Education***

## ***Earth Fest 2011***

In March, inspectors participated in Earth Fest at Audubon Zoo. Inspectors displayed a table presentation and answered questions about the biology and control of mosquitoes, rodents, termites and other common pests (Figures 52-53).



Figure 52. Cynthia Harrison (Pest Control Specialist 3) explains how mosquitofish help control the mosquito population without using pesticides.



Figure 53. Ashley Freeman teaches visitors about termites.

## ***City Park Spring Garden Show 2011***

In April, inspectors participated in the Spring Garden Show in City Park. Presentations were displayed about mosquitoes, termites, rodents and other pests (Figure 54). Inspectors were on hand to answer questions and educate the public about pests and pest proofing (Figure 55). NOMTCB was awarded 1<sup>st</sup> place in the Educational Excellence division and 2<sup>nd</sup> place in the Government Agencies division.



Figure 54. NOMTCB table presentation at the Spring Garden Show.



Figure 55. Cynthia Harrison shows different ways to control mosquitoes.

## Meetings

Ed Freytag. Meeting on the first Tuesday of every month. Institutional Animal Care and Use Committee (IACUC) of the University of New Orleans. Discuss approval or rejection of study protocols. University of New Orleans Psychology Building, New Orleans, LA.

Ed Freytag. February 24, 2011. Attended a luncheon presentation with the French Quarter Business Association. New Orleans, LA.

Ed Freytag. March 3, 2011. Attended a meeting with the National Pollution and Discharge Elimination System (NPDES) in City Hall, New Orleans, LA. Information was disseminated to comply with the permitting system and to comply with the annual report.

Claudia Riegel, Mike Carroll and Sarah Michaels. August. Attended the grand opening of New Iberia MAD.

Sarah Michaels. October 26, 2011. Geographic Information System (GIS) City User's Group at City Hall. Discussion of City's programs that involve the collection of data that can be used for mapping, viewed web-based services offered by ESRI.

Ed Freytag and Sarah Michaels. Attended meetings to discuss the City's application for a National Pollution and Discharge Elimination System (NPDES) Permit at the New Orleans Sewerage and Water Board Headquarters building.

Sarah Michaels. November 29, 2011. Municipal Stormwater Management Group in City Hall, New Orleans, LA. Discussion to comply with the permitting system and to submit the annual report.

## Presentations

Claudia Riegel. January 26, 2011. Backyard mosquito control. Louisiana Pest Management Association annual meeting. Baton Rouge, LA.

Claudia Riegel. February 11, 2011. Backyard mosquito control. National Pest Management Association.

tion. Tupelo, MS.

March 19-20, 2011. Earth Fest, Audubon Nature Institute. Presented table presentations of mosquitoes, rodents, termites and other unwanted pests. New Orleans, LA.

April 2, 2011. Spring Garden Show. Presented table presentations of mosquitoes, rodents, termites and other unwanted pests. City Park, New Orleans, LA.

Ashley Freeman. March 16-17, 2011. Louisiana Public Health Association (LPHA) Annual Conference. Presented "Rodent Biology and Control." Lake Charles, LA.

Ashley Freeman. March 22, 2011. Greater Baton Rouge Pest Control Association and Louisiana Department of agriculture and Forestry (LDAF) Recertification Class. Presented "Biology and Control of Medically Important Rodent Species" with hands-on laboratory component. Harahan, LA.

Ashley Freeman. March 23, 2011. Department of Microbiology and Immunology: Seminar Series. Presented "Hantaviruses in New Orleans, LA: From Surveillance to Virology."

Ed Freytag. January 25, 2011. Dr. Dawn Wesson's undergraduate medical class from Tulane University. Presented "Bed Bugs, Biology and Control." NOMTCB Biocontrol Laboratory, New Orleans, LA.

Ed Freytag. February 1, 2011. Presentation with Gary Wehlen of E&G Pest Control to Bed and Breakfast owners on St. Charles Ave. Presented "Bedbugs, Biology and Control." New Orleans, LA.

Ed Freytag. March 16-17, 2011. Louisiana Public Health Association (LPHA) Annual Conference Presented "Bedbugs, Cockroaches, Ticks and More" and "Pest Proofing 101." Lake Charles, LA.

Ed Freytag. March 22, 2011. Greater New Orleans Pest Control Association (GNOPCA) Technician Recertification. Presented “Bed Bugs, Biology and Control.” Harahan, LA.

Timmy Madere. March 16-17, 2011. Louisiana Public Health Association (LPHA) Annual Conference. Presented “How to Conduct a Kitchen Inspection.” Lake Charles, LA.

Carrie Owens. March 22, 2011. Greater New Orleans Pest Control Association (GNOPCA) Technician Recertification. Presented “Termite Identification, Biology, and Control.” Harahan, LA.

Ed Freytag. May 23, 2011. Presentation for Entergy training series at Entergy headquarters on Perdido St. downtown New Orleans. Presented “Mosquito Biology, Control and Protection.”

Ed Freytag. August 12, 2011. LDAF Licensee and Technician recertification class sponsored by Jaroy Exterminating at VFW hall in Covington, LA. Presented “Termite Biology and Control.”

Timmy Madere. June 28, 2011. LDAF Licensee and Technician recertification class sponsored by E&G Pest Control at Oldham Chemical headquarters in Metairie. Presented “General Pest Control.”

Timmy Madere. August 12, 2011. LDAF Licensee and Technician recertification class sponsored by Jaroy Exterminating at VFW hall in Covington, LA. Presented “General Pest Control.”

Claudia Riegel. May 16, 2011. Inspection of Formosan subterranean termites in New Orleans. 3rd *Coprotormes formosanus* Symposium, New Orleans, LA.

In May NOMTCB inspectors participated in the third anniversary of the opening of the Audubon Institute’s Insectarium. Our inspectors set up a table of information on mosquitoes, bed bugs and other insects (Figure 56).

October 19-22, inspectors participated in Pest World at the National Pest Management Association (NPMA) Annual Meeting in New Orleans, LA.



Figure 56. Cynthia Harrison (Pest Control Specialist 3) participated in the Insectarium’s Ant-iversary.

Claudia Riegel. October 20. Area-wide termite treatment. New Orleans, PestWorld, New Orleans, LA.

Claudia Riegel. October 21. Sentricon HD, case study in New Orleans, PestWorld, New Orleans, LA.

Claudia Riegel, October 22. Mosquito Control. New Orleans, PestWorld, New Orleans, LA.

Cynthia Harrison. November 29, 2011. Louisiana Mosquito Control Association Annual Meeting. Presented “Evaluation of efficacy of Aquatain AMF Liquid Mosquito Film against *Aedes aegypti* and *Culex quinquefasciatus*.” Covington, LA.

Sarah Michaels. October 11, 2011. Greater New Orleans Pest Control Association (GNOPCA) General Pest Academy. Presented “Mosquito Control.” New Orleans, LA.

Sarah Michaels. October 12, 2011. Greater New Orleans Pest Control Association (GNOPCA) General Pest Academy. Presented “Chagas Disease in Louisiana”. New Orleans, LA.

Sarah Michaels. December 1, 2011. Louisiana Mosquito Control Association Annual Meeting. Presented “Increased surveillance for dengue vectors in New Orleans, LA and implications for disease transmission.” Covington, LA.

Sarah Michaels. December 7, 2011. American Society of Tropical Medicine and Hygiene (ASTMH) Annual Meeting. Presented “Development and Implementation of a Pro-Active Dengue Response Plan in New Orleans, Louisiana.” Philadelphia, PA.

## Recertification

Ed Freytag. January 27, 2011. Attended a termite recertification class in Baton Rouge, LA, to fulfill the termite license requirements by the State of Louisiana Department of Agriculture and Forestry.

Employees holding 8A and 8D mosquito licenses were recertified at the annual Louisiana Mosquito Control Association meeting held in Covington, LA November 30– December 2, 2011.

## Abstracts

*Prevalence of lymphocytic choriomeningitis virus in house mice (Mus musculus) in New Orleans, LA*

<sup>1,2</sup>A Freeman, <sup>3</sup>RW Cross, <sup>3</sup>J Iberg, <sup>1</sup>H Zachary, <sup>1</sup>N Bond, <sup>4</sup>F Bauder, <sup>1</sup>A Bennett, <sup>3</sup>TG Voss, <sup>2</sup>C Riegel, and <sup>1</sup>D Bausch. <sup>1</sup>Tulane School of Public Health & Tropical Medicine, New Orleans, LA, <sup>2</sup>New Orleans Mosquito, Termite and Rodent Control Board, New Orleans, LA, <sup>3</sup>Tulane School of Medicine and Tulane National Primate Research Center, New Orleans, LA, <sup>4</sup>University of New Orleans

Lymphocytic choriomeningitis virus (LCMV) is a member of the *Arenaviridae* virus family. LCMV-infected humans are typically asymptomatic or present with a mild febrile illness; however, more severe cases may result in aseptic meningitis, meningoencephalitis, or congenital abnormalities. Human infection is most often associated with exposure to rodent excreta from the common house mouse (*Mus musculus*). LCMV has the greatest geographic range of any arenavirus, which is thought to be the result of widespread global dissemination of its rodent reservoir on ships. Studies in Europe, the Americas, Australia, and Japan have found LCMV in various wild *M. musculus*. In Baltimore, the prevalence of LCMV infection in *M. musculus* ranged from 3.9% to 13.4%. We are conducting a study to determine the prevalence of LCMV-infected *M. musculus* in New Orleans, Louisiana. The project is a collaborative effort between the New Orleans Mosquito, Termite, and Rodent Control Board and Tulane University to identify the potential risk of rodent borne diseases within the city of New Orleans. To date, 120 *M. musculus* have been live-trapped with Sherman traps at residences and areas of immediate human activity

throughout Orleans Parish. Blood, organs, and feces have been collected and are currently being analyzed for evidence of LCMV by the reverse transcriptase polymerase chain reaction. The results of this study will support the implementation of evidence-based pest management practices in areas shown to have LCMV-positive rodents and represents a unique effort to identify and abate potential rodent-borne public health risks in New Orleans.

*Old World Hantavirus Infection in Rattus Species and Risk Management in Urban Neighborhoods of New Orleans, Louisiana*

<sup>1</sup>A. Freeman, <sup>2</sup>R. Cross, <sup>1</sup>C. Riegel, <sup>3</sup>B. Waffa, <sup>1</sup>A. Balliviero, <sup>3</sup>L. Moses, <sup>3</sup>A. Bennett, <sup>3</sup>N. Bond, <sup>1</sup>A. Golnar, <sup>2</sup>T. Voss, and <sup>3</sup>D. Bausch. <sup>1</sup>City of New Orleans Mosquito, Termite, and Rodent Control Board, <sup>2</sup>Tulane School of Medicine and Tulane National Primate Center, <sup>3</sup>Tulane University School of Public Health and Tropical Medicine

Hantaviruses are lipid enveloped, tri-segmented, RNA viruses belonging to the family *Bunyaviridae*. Hantavirus are divided taxonomically into Old World and New World groups that typically cause hemorrhagic fever with renal syndrome and hantavirus pulmonary syndrome, respectively. Each specific hantavirus has a specific rodent or insectivore reservoir host. In 1983, Tsai *et al* reported the isolation of an Old World hantavirus similar to Seoul virus (coined “Tchoupitoulas virus”) from *Rattus* species rodents caught in New Orleans, Louisiana. Since this study, no hantavirus surveillance has been conducted in this geographic area. We sought to determine if Old World hantaviruses still circulate in rodents in New Orleans and, if so, to develop measures to prevent human infection. Over a three year period, rodents were live-trapped using Sherman and Tomahawk traps. Blood and other tissues were collected and samples tested for the presence of Old World hantaviruses via RT-PCR. Trap sites were identified and selected through citizen service requests and routine municipal rodent management activities. Of the 172 *Rattus rattus* and *Rattus norvegicus* collected, 3.6% tested posi-

tive, indicating continued circulation of Old World hantaviruses in New Orleans. This study has raised awareness of the continued risk of rodent-borne disease in the greater New Orleans area and has spawned proactive management strategies on a city-wide basis, including neighborhood surveys, communication and awareness campaigns, and an aggressive rodenticide baiting program in areas with large rodent populations. Continued surveillance and detection of hantaviruses and other rodent-borne pathogens will help preserve the safety and health of New Orleans' residents.

*Development and Implementation of a Pro-Active Dengue Response Plan in New Orleans, Louisiana*

S.R. Michaels<sup>1</sup>, M.K. Carroll<sup>1</sup>, D.M. Wesson<sup>2</sup>, C. Riegel<sup>1</sup>

<sup>1</sup>New Orleans Mosquito, Termite and Rodent Control Board, New Orleans, LA.

<sup>2</sup>Tulane School of Public Health and Tropical Medicine, New Orleans, LA.

New Orleans, Louisiana has large resident urban populations of both *Ae. aegypti* and *Ae. albopictus*, the two main vectors of dengue virus. Following Hurricane Katrina, studies documented an increase in the relative abundance of *Ae. aegypti* and recent expanded surveillance activities have identified an expansion into areas where previously only *Ae. albopictus* had been found. As *Ae. aegypti* is often a more significant driver of dengue disease in urban areas, information such as this is critical to planning dengue response efforts. Increasing dengue incidence in the Caribbean and an outbreak in Key West, Florida in 2009 prompted the creation of a response plan for New Orleans. As suggested by WHO guidelines, the intention of the plan was to establish an integrated approach to disease control and to incorporate operational research as a framework for evidence-based decision-making, and to direct a targeted response. Expanded surveillance activities have included neighborhood assessments, cemetery surveys, and

placed ovitraps. GIS applications were integrated to determine environmental risk factors and to target control activities based on vector abundance and

changed human population patterns. Bottle-bioassays for pesticide susceptibility were conducted to determine the most appropriate chemical intervention. We believe this plan will strengthen response capacity and provide for targeted public education and control measures in advance of a potential dengue outbreak in New Orleans. Additionally, these efforts will assist us in responding effectively to other arboviral disease events.

### Awards

Ed Freytag received 3rd place in the photography category in the 6<sup>th</sup> Annual City of New Orleans Employee Art Exhibition and Competition for the picture of the fishing camp (Figure 57).

Ed also won 2nd place in the photography category in the 2011 Invertebrates in Education and Conservation Conference in Rio Rico, Arizona for the picture of the Polyphemus moth caterpillar. He also donated two pictures to the SASI (Sonoran Arthropod Studies Institute) to raise money for their association.



Figure 57. Ed Freytag received 3rd place in the photography category in the 6<sup>th</sup> Annual City of New Orleans Employee Art Exhibition and Competition for the picture of the fishing camp in New Orleans.

# Appendix A



**City of New Orleans Mosquito, Termite, and Rodent Control Facility**  
 Exterior Rendering  
 03-10-2010

Figure 57. Schematic rendering of the entrance of the new NOMTCB administration building.



Figure 60. By April 16, the masons were working on the second floor of the building.



Figure 58. Large off white bricks were used on the exterior to surround the first floor, 2/8/2011.



Figure 61. On July 6th, the laboratory cabinets were being installed.



Figure 59. The interior framing on March 23, 2011.



Figure 62. Past and present Directors, Dr. Mike Carroll (left), Dr. Claudia Riegel, and Mr. Ed Bordes) stand in front of the nearly completed Mosquito, Termite, and Rodent Control Board building.