NEW ORLEANS MOSQUITO & TERMITE CONTROL BOARD

2006 ANNUAL REPORT

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DIRECTOR'S REPORT

The following 2006 Annual Report includes the months of November & December, 2006. The years 2005 and 2006 will be remembered as two of the most challenging years in the history of organized mosquito in New Orleans. As I write this, our administrative staff and some scientific and management staff are housed in a temporary FEMA trailer next to the Levee Board administration building on Franklin Avenue at the Lake.

Our Lakefront Airport facilities remain severely damaged or destroyed. The administration building is scheduled for demolition. The Rodent Control Building has been demolished and the property has reverted back to the Port Authority. We are continuing negotiations with FEMA on rebuilding our facilities. The culmination of these efforts will likely take two or more years.

The dedication of our staff has been extraordinary, especially in light of the fact that our workload and defined responsibilities have increased significantly. We are all looking forward to the more normal pace of activities we enjoyed before the hurricane and flood.

I also state without reservation the we have had unwavering support from the Mayor's Office, the Chief Administrative Office and the entire City Council. Thank you so much.

Two thousand seven saw the retirement of the largest number of employees in our program's history. Alphabetically they are Wayne Arceneaux, Mosquito Control Inspector IV (40 years); Edgar Bordes, Director (40 years); Doug Guthrie, Mosquito Control Inspector IV (41 years); Brooks Hartman, Source reduction Supervisor (40 years); and Joe Yurt, Director of Rodent Control (36 years).

By year's end we were short-staffed in all of our programs. Our "veteran" full-time Mosquito Control Inspector, namely Mr. Princeton King, marked his six-month anniversary in December. Starting salaries and a greatly reduced pool of potential employees have made hiring and retention one of our prime goals.

It is impossible to summarize, with all due credit, the 2006 accomplishments of our staff, so please accept this as a prologue to reports that follow:

The biggest mosquito biocontrol program in the history of our country started this year. Thousands of unkempt swimming pools, backyard ponds and saunas were located, inspected, databased and treated with a bacterial biocontrol agent and stacked with mosquitofish. This effort was featured on TV's Discovery

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Channel program, “Dirty Jobs”, in the fall. Fish survival and larval control continue to be outstanding. We are working with the public, the State, and FEMA on long term resolution of this serious mosquito breeding potential.

Our first human case of West Nile virus was confirmed in late July. As such a statement is, it appeared to be a “normal” year. It also looks as if WNV will continue to be a yearly occurrence, especially as we are still trying to determine finer points of the disease cycle.

Southeast Louisiana, including New Orleans, experienced one of the largest broods of saltmarsh mosquitoes (*Aedes sollicitans*) in the past 25 years. Our physical landscape as well as our mosquito species mix has changed dramatically. We have not yet been able to access the irreparable damage to many years of urban and marsh source reduction projects. Aerial spraying continues at above average historical levels. As of this writing, the Britten-Norman Islander twin-engine spray plane is out of service for major engine modifications.

We are continuing to rebuild our termite control program. Most of the electronic detection equipment was lost to the storm. Much of this has been replaced, and cooperative operational research activities have resumed.

Many lay persons assume that the vast subterranean population would be severely affected by the weeks of saltwater in the city; that didn’t happen. Previous field projects have resumed and new projects have been added. Also, the French Quarter Operation Full Stop was mostly unaffected by the storm.

The accomplishments of our internationally recognized Termite Division are far too numerous to even touch on here. These details and products are well elaborated on in the body of this report.

MOSQUITO FIELD OPERATIONS
STEVE SACKETT

Two thousand and six was a year of post-Katrina recovery efforts that were a testimony to the dedication of our staff. With the help of volunteers from the faith-based organization, Operation Blessing, we were able to locate and treat almost all of the abandoned swimming pools in the city (see Bio Control section). Follow-up inspections of the pools indicate that mosquito production was eliminated from pools stocked with minnows, and that fish survival and reproduction were outstanding. In addition to dealing with mosquito breeding in abandoned pools, inspectors and volunteers took on the task of treating or removing thousands of water-filled containers that were found at abandoned houses.

Our staff have also been very diligent in repairing our damaged buildings and the equipment needed to keep our organization running. Our recovery continues.

The first human case of West Nile virus in New Orleans for 2006 was confirmed on July 28 from Comet Street in Algiers. With five years of data, it appeared to be a "normal" year. Specific information parish by parish is available on the State of Louisiana Health Department's website (www.dhh.louisiana.gov). Cases were limited to Algiers and the crescent area of the city. Multiple ground and aerial treatments were conducted city-wide to reduce mosquito populations and the probability of disease transmission.

New Orleans and the surrounding area experienced one of the largest broods of saltmarsh mosquitoes, *Aedes sollicitans*, in recent history. These aggressive daytime biters spread throughout the city, causing telephone complaints to significantly increase. It appears that hurricane Katrina contributed to the elevated populations of saltmarsh mosquitoes by removing marsh grasses and exposing soil where mosquito egg deposition takes place. Large quantities of silt were also deposited on land masses by the storm, providing additional oviposition sites. Adulticiding operations were conducted when environmental conditions allowed.

Over 200,000 packets of mosquito repellent were donated to us by Cutter Repellents to be distributed to our citizens to aid in reducing mosquito bites. Civic associations, city departments, and private citizens were all eligible to receive the donated repellent.

ENCEPHALITIS SURVEILLANCE
Steve Sackett

Sentinel chickens were not utilized as a surveillance tool to monitor mosquito-borne diseases this year for a number or reasons. Data now suggest that chickens are not a good early warning system for WNV and other forms of encephalititis, as humans and chickens typically show first positives during the same time of year. There were also concerns about the use of chickens with the threat of Asian bird flu approaching our country. Our surveillance efforts were therefore directed towards collecting mosquitoes in specialized "gravid" traps at sites throughout the city and sending the specimens to the state laboratory for testing. Mosquitoes were grouped or "pooled" by species, and a positive pool indicated that at least one mosquito of that group had fed on an infected host (typically birds). Once the state lab tested the mosquitoes and sent results, a calculation of the minimum infection rate (MIR) was done to estimate the number of virus-positive mosquitoes per thousand tested. Information from other districts indicated that transmission of WNV to humans typically began to show up when MIR's were above 6.

Table 1 illustrates the MIR's for New Orleans, and it is interesting to note that our MIR went from 0 to 7.8 within one week (first positive pool was collected 7-07-06). Our first human WNV case was confirmed on 7-28-06, so it is very feasible that the infected bite occurred not long after the positive mosquitoes were collected.

Table II illustrates the positive pools for 2006, with information on dates, virus types, and mosquito species.

TABLE I

2006 NEW ORLEANS MOSQUITO POOLS
Minimum Infection Rate (MIR)

Date of Collection	# Positive Pools	# Mosquitoes Tested	**MIR**
(All mosquitoes collected from 3-3-06 to 6-30-06 were negative)			
7-07-06	2	256	7.8
7-13-06	4	336	11.9
7-20-06	4	333	12.0
7-28-06	1	113	8.8
8-04-06	1	102	9.8
8-11-06	5	176	28.4
8-18-06	2	90	22.2
8-25-06	4	315	12.7
9-01-06	1	86	11.6
9-08-06	2	284	7.0
9-14-06	0	141	0.0
9-22-06	1	269	3.7
9-29-06	0	80	0.0
10-06-06	0	155	0.0
10-13-06	0	79	0.0
10-20-06	0	32	0.0
10-27-06	0	50	0.0

END MOSQUITO POOL SAMPLING FOR 2006

TABLE ll

POSITIVE MOSQUITO POOLS 2006

COLL. DATE	POOL #	TYPE	SPECIES
7-7-06	41	SLE	Cx. q.
	43	WNV	Cx. q.
7-13-06	44	SLE	Cx. q.
	49	WNV	Cx. q.
	53	SLE	Cx. q.
	54	WNV	Cx. q.
7-20-06	55	WNV	Cx. q.
	58	WNV	Cx. q.
	59	WNV,SLE	Cx. q.
	60	SLE	Cx. q.
7-28-06	64	SLE	Cx. q.
8-4-06	85	WNV	Cx. q.
8-11-06	86	SLE	Cx. q.
	87	SLE	Cx. q.
	89	SLE	Cx. q.
	91	WNV	Cx. q.
	96	WNV	Cx. q.
8-18-06	102	SLE	Cx. q.
	105	WNV	Cx. q.
8-25-06	116	WNV	Cx. q.
	118	WNV	Cx. q.
	119	WNV	Ae.ae.
	120	WNV	Cx. q.
9-1-06	125	WNV	Cx. q.
9-08-06	137	WNV	Cx. q.
	145	SLE	Cx. q.
9-22-06	171	SLE	Cx. q.
10-27-06	End mosquito pool sampling for 2006		

BIOLOGICAL CONTROL
Greg Thompson

Hurricane Katrina drove out the city's population and rendered much of New Orleans uninhabitable. One of the myriad problems left in the wake of the storm was the large number of swimming pools that if not treated by mosquito control personnel would create a massive mosquito and possible public health problem.

We have to date located and visited over 5,000 pools (5,008 as of 1/1/07). Property owners are currently maintaining less than one half (2,315) of the pools. The floodwater brought along its own mosquito control treatment to many of the city's pools. The water brought in and then left behind fish in at least 752 pools. Mosquito control staff along with the help of volunteers, have released fish into 1,483 pools as of January 1, 2007. These fish should provide the long-term mosquito control needed in these pools until the property owners return to New Orleans.

An important, even ominous, statistic is that approximately half of the pools in New Orleans are still not being maintained, or have not been removed by their owners more than 16 months after the flood.

We made use of a decade of real estate sales listings, aerial photographs, neighborhood associations, churches and door-to-door canvassing to locate the above-mentioned pools. However, there are more pools as yet not located and possibly breeding mosquitoes.

The NOMTCB is continuing to visit churches and staff information booths at various public events. We distribute ant bait, rat glue boards, mosquito repellant and educational flyers at these locations. Visitors are asked to fill out a survey form in order to receive these handouts so that critical information about abandoned pools, elevated rodent populations, and more is collected. A section of this survey requests that city residents list the addresses of pools that may need treatment.

It is our hope that the survey sheets and phone-in complaints will lead us to the remaining pools.

VECTOR RODENT CONTROL
JOYCE SMITH

City Properties:
During the months of November through December of 2006, New Orleans Vector/Rodent control program conducted surveys and ongoing treatment to the following city and state buildings: Municipal Auditorium, Treme Center, Cafe Du Monde, Woldenberg Park, Police Headquarters, Moonwalk, City Park, Tulane Hospital, Charity hospital, main bus station, City Hall, Civil/Juvenile Court building, River Walk, main library, University Hospital, and selected fire/police station. City facility inspections and treatment are done on an ongoing basis, with additional follow-up for individuals incoming department complaints. An IPM program for City of New Orleans buildings was initiated in the 4th quarter of 2006. Field inspections and treatment was initiated with a full inspection of the buildings. The goal was to control the pests but also to educate employees at these facilities about conducive conditions such as the removal of trash and clutter.

Complaints/Education
In November through December a total of 1,049 complaints were received by e-mail, 311, and calls that were made directly to the rodent control office. A total of 2,914 complaints were received in 2006. All complaints received were followed with a full inspection of the property owner's yard and a rodenticide treatment if burrows or structural openings were found on the property. The 2 to 3 nearest storm drains at each property filing a complaint were treated with rodenticide bait blocks. In addition, a rodent brochure with useful information was left at each property. Of the 1,049 complaints received in November and December, burrows and structural openings were found at 347 properties. Properties can only be treated if burrows and structural openings are found. NOMTCB uses rodenticides and other pesticides according to the manufacture's label or State of Louisiana laws, whichever is more stringent. Year to date, 671 resident properties have received a rodenticide treatment.

Rodent Control inspectors are continuing to be cross trained in termite, mosquito, and pest control work. The rodent control administrative staff continues to improve their skills on different types of software to take complaints and manage the complaint data and survey information. The inspectors are continuing to participate in neighborhood presentation events around the New Orleans area to provide information about rodent control and rodent prevention.

Operational Research and Treatment
NOMTCB does not treat pests in structures on private property, only the yard. In November through December, 764 burrows and structural openings were treated on City of New Orleans property which includes, city owned properties, parks, green space, and sidewalks. In 2006, a total of 2,417 burrows or structural openings were treated. A total of 757 rodenticide bait packs were used in November through December and a total of 2,472 packs used in 2006.

The rodent population has been increasing since hurricanes Katrina and Rita. Work has been conducted to identify the location of the populations of Norway rats and Roof rats. Houses that have not been gutted, abandoned houses, yards and lots that have not been maintained, trash piles, and storm drains are all contributing to the elevated population of rats. In November through December 2006, 1,544 storm drains were treated with a total of 9,717 rodenticide bait blocks. There were 3,717 storm drains treated in 2006 year and 17,103 bait blocks were used in 2006. Rodent control and mosquito control inspectors treated all storm drains in the city business district, warehouse district and the French Quarter in order to keep the rodent population low in areas of economic development and tourism.

Evaluation of the palatability of several commercially available rodenticide bait blocks was initiated in the 4th quarter of 2006 in cooperation with Dr. George Rotramel. The bait blocks were evaluated in storm drains in area with extreme rodent pressure. The areas were uptown (the boundaries were LaSalle, Louisiana Ave, Loyola, and Washington Ave) and the second area was downtown (the boundaries were North Johnson, St. Roch, North Claiborne, and Elysian Fields). We treated 100 storm drains in each area and evaluated the bait at 7, 14, 30, and 60 days. Important information about palatability was collected in addition to reducing the rodent population to low levels. The rodent control group was approached by many residents when servicing the area with praise for the visible difference in the decline of rodents.

Night time surveillance was conducted on certain city buildings with rodent problems in the summer of 2006. The rodent problems were identified and treated.

In the night surveillance, we trapped rats for special projects for media events and photographs for brochure and other educational materials. Rodent Control appeared on the show, "Dirty Job" in the month of October.

We also had interviews with Time Picayune and Fox Channel 8 to educate the public and city workers on how to prevent and control mice and the rodent problem in the city and buildings.

AVIATION
Joseph Riedl

Aerial treatments continued throughout the year following Katrina. Orleans Parish was sprayed repeatedly to combat the infestation of the West Nile virus, saltmarsh and tidewater mosquitoes. Good results were attained. The airplane held up well and what ground support equipment we managed to save or acquire did the job.

At our damaged but operable hangar, work progressed. A few repairs were made on the facility. Some tools and equipment has been recovered. And the Islander was maintained. The office has been made functional. There is much more to be done to get back to where we were before the storm damage.

Due to cracks found on the crankshafts of a number of engines like the ones on our airplane, the Lycoming Factory requested that the shafts be replaced. This was initiated under what they call a mandatory service bulletin. These shafts were constructed by a process called hammer forging. They were going to supply the crankshafts and installation kits but nothing else. After much discussion, Lycoming decided, because of Katrina and our losses, to cover all expenses. The engines are presently at the factory for repair.

Federal regulations were complied with. Required paperwork is up to date. Future planning is underway for the next spraying season.

SOURCE REDUCTION
Brooks Hartman

Source reduction personnel have been assigned to the spraying water hyacinth in City Park within the north golf course lagoon system during 2006.

The dense growth of water hyacinth is responsible for much of the mosquito breeding within the park area. There is much concern because of nearby residential areas. The dense vegetation has for the most part been confined to one pond area but has recently escaped into other adjacent lagoons. Source Reduction will continue with water hyacinth control in City Park throughout 2007 and beyond.

Ditching maintenance with the backhoes is on hold temporarily for much needed repairs on both backhoes. We will be transporting both machines to Norwel Equipment Company for the repairs in the near future.

Several of our existing ditch systems in New Orleans East, such as the Nature and Science Center property, are still covered over by downed trees in the ditches caused by Hurricane Katrina along with dense vegetation growth which is, in some cases, hampering drainage. Much hand work has been accomplished in this and other drainage sites in New Orleans East. Work will continue in all Source Reduction areas during 2007.

Source Reduction personnel will continue with an ongoing commitment to reduce mosquito populations throughout Orleans Parish during 2007.

Personnel were also assigned to the Plant Maintenance Supervisor with in-house projects of repair and cleanup duties of the NOMTCB facilities.

TERMITE ENTOMOLOGY
ED FREYTAG

This year we were able to conduct only a small fraction of the volume of termite research as in previous years due to the difficulties experienced in recuperating from Hurricane Katrina. Most of our expensive termite detection equipment was damaged beyond repair after soaking in salt water from Lake Pontchartrain, and it has been a slow and tedious process trying to purchase replacement units. Most of the desktop computers did not survive the storm surge that destroyed the main office and two mosquito control buildings on the Lakefront airport. We were not able to recover the data from the hard drives because we could not get to the offices for two weeks, and the backup CDs and hard drives were also destroyed in the flood. Paper files were soaked and even though we salvaged everything that we could, every piece of paper was covered with mold or was stuck fast to each other.

In the months following Katrina we had to regroup both emotionally and physically without an office and very little equipment. Fortunately for our agency, I was able to dedicate most of my time to acquiring computers, printers and other peripherals such as digital cameras so that we could get our departments functioning. FEMA put extreme demands on all of us to provide lists of all the equipment and assets lost during the hurricane, and without computers and internet access we would have been severely limited in our efforts. All the damaged buildings and equipment was documented and catalogued using digital cameras.

As soon as we could get in the field, we started monitoring for termite activity in the field. Contrary to popular belief, most of the research sites that were under several feet of water for up to three weeks still had active Formosan and native subterranean termites when we inspected them shortly after the water was pumped out. Many of the buildings in which we were conducting termite control research were gutted out because they suffered severed flood damage. The flooding made these chemical trials invalid because the cause of termite control could not be determined to be a direct effect of the chemical or of the flooding.

It is important to note that most of the wildlife, vertebrate and invertebrate, was displaced from New Orleans by the high winds and flooding caused by hurricane Katrina. Flies, bottle flies (metallic green and blue flies) and phorid flies (coffin flies), were the first insects to repopulate our area because rotting food was easily accessible from huge piles of garbage and from thousands of refrigerators abandoned without electricity. An increase in the mouse and rat populations also became immediately evident in the months following the hurricane due to lack of sanitation and plenty of harborage and food provided by thousands of abandoned buildings. A new invasive species, the brown widow spider, was also discovered in great numbers in New Orleans and surrounding areas.

Two brochures were published by our agency to inform the public how to deal safely with these pests: Our first publication was Doc. NOMTCB 1-2006 "Rodent Control & Prevention After Hurricane Katrina, Guidelines for Property Owners and Tenants", authored by Claudia Riegel and Ed Freytag, and Doc. NOMTCB 2-2006 "The Brown Widow Spider: An Invasive Species of Medical Importance, authored by Kenneth Brown, Jayme Necaise, and Ed Freytag.

My contribution to the projects was to provide high quality original photography of rats, mice, and spiders, which turned out to be a much more difficult task than I had originally anticipated. The rats (roof and Norway) and mice had to be live-trapped in the field, and were absolutely unfriendly and uncooperative when brought to our facility at the Lakefront Airport. Live shots of rats were taken after anesthetizing the critters with chloroform inside a specially designed cage. The spider specimens were collected in the field and brought to our insect rearing facility in East New Orleans. The Audubon Zoo personnel were kind enough to assist me in manipulating the spiders into position for the shots. One of my black widow photos was submitted to the Pest Control Technology magazine photo contest where is took first place. It was also submitted to the 3rd Annual Municipal Employee Art Exhibit, The City of New Orleans Mayor's Art and Entertainment, besting many entries to earn a 2nd place vote in the intermediate level in photography.

OPERATIONAL RESEARCH, HURRICANE ACTIVITIES, EXTENSION, AND EDUCATION & TRAINING

CLAUDIA RIEGEL

The work presented below is a summary of the following NOMTCB employees: Kenneth S. Brown, Barry Lyons, Aaron Mullins, Carrie B. Owens, Perry Ponseti, Claudia Riegel, and Barry Yokum. I would like to begin my initial report by expressing my appreciation to the City of New Orleans Mosquito and Termite Control Board (NOMTCB). This organization is recognized nationally and internationally for their expertise in Formosan subterranean termite (FST) research, management, and extension. The ability of a municipal department to function at such a high level is a credit to the staff, board, and city.

The termite division has multiple ongoing research projects as well as several planned for the coming spring. We continue to be involved in product testing under research agreements with Dow AgroSciences, Bayer Environmental Sciences, Whitmire Microgen, Syngenta Crop Sciences, and others. We are also involved in collaborative efforts with scientists from various agencies including the USDA, the University of Mississippi's National Center for Physical Acoustics, Commonwealth Scientific and Industrial Research Organization (CSIRO), Oklahoma State University, and Louisiana State University. Our specific areas of research range from testing novel and commercially available termite detection tools, to the development of a novel alate light trap for collecting large numbers of winged reproductives in the French Quarter for subsequent genetic studies, to determining the extent of the current range of the Formosan subterranean termite (FST) and the brown widow spider (*Latrodectus geometricus*) within Louisiana. We also continue to provide information to the public through extension efforts that include invited talks, development and distribution of fact sheets, and media interviews.

City Properties

New Orleans Mosquito and Termite Control Board located City of New Orleans properties in 2006 in which to conduct operational research. Fire station 7, Stallings playground, Berhman pool house, equestrian horse barn in City Park, and Parks and Parkways administration building have been treated with 0.5% noviflumuron. In January, we began the process of assessing a number of field sites to evaluate termite pressure and identify sites that may be used for future research. Field sites evaluated include Spanish Fort Blvd., Joe Brown Park, Audubon Zoo, sculpture gardens in City Park, a parking lot with infested trees on Decatur in the French, Lighthouse for the Blind, and Holt cemetery. Termites from these sites have been and will continue to be collected in order to establish laboratory colonies for upcoming bioassays.

A collection of a single intact carton nest from the Joe Brown Park site yielded several findings of interest including multiple physogastric nymphoid neotenics ("queens") and a number of intact and partially cannibalized nymphs. Samples from this collection have drawn interest from USDA-ARS and Commonwealth Scientific and Industrial Research Organization (CSIRO) scientists. Results of ongoing investigations may yield clues as to how FST populations respond to environmental stresses.

An Integrated Pest Management (IPM) program was initiated in November of 2006. Spraying or applying pesticides alone will rarely remedy pest problems. The goal is to implement an integrated pest management (IPM) program at City of New Orleans buildings. An IPM program implements a thorough inspection, identification of the pests, detailed recommendations to the property owner/manager, treatment, and continued evaluations of the site. IPM incorporates sanitation, exclusion, mechanical control, and chemical control to manage pests. The goal of the program is to reduce the amount of used pesticides, apply targeted treatments only when needed, save money for the City of New Orleans in man hours, equipment usage, and pesticide costs, and maintain a pleasant workplace for City employees.

Operation Full Stop

Louis Armstrong Park: Termite monitoring in Armstrong Park continued through 2006. Three "new" FST colonies have been detected in 2006. This brings the total number of FST colonies within the park to nine since the elimination of all FST colonies in 2002-2003. Mark-recapture studies is planned in 2007 to confirm that these are separate colonies. All of these colonies have first been detected in one or two stations, and have gradually been expanding their territories. With one exception, Dr. Nan-Yao Su (University of Florida) and I believe these to be small, incipient colonies that are expanding their territories in the absence of the larger, dominant colonies that were eliminated in 2002-2003.

Alate dispersal flight activity in Armstrong Park was conducted in the second quarter of 2006 using 68 glue traps and a single New Jersey style light trap. In 2005, 1,837 FST alates were recovered, and in 2006, 725 FST alates were recovered. Monitoring and characterization of re-invading FST alates and colonies will continue in 2007.

Jackson Square: Monitoring of termite activity in Jackson Square continued through 2006. These colonies have been cryptic in nature; not staying in the same stations from month to month. The pattern of termite activity suggests there were 2 to 3 FST colonies and several colonies of native *Reticulitermes* species in Jackson Square in spring 2006. Mark-recapture was difficult and was not effective at delineating the colonies' foraging territory due to the sporadic activity in the bait stations. In order to eliminate all of the colonies present in Jackson Square prior to the 2007 dispersal flight season, work began on identifying active stations, and collecting final DNA samples for future analysis. In the fall of 2006, only one detectable colony remained. Properties around Jackson Square were under contract and it was possible that the termites came in contact with 0.5% noviflumuron around the upper Pontalba building where recent baiting was confirmed. Treatment of the final FST colony and *Reticulitermes sp.* colonies began in the fourth quarter of 2006.

Our termite group initiated several laboratory and field oriented research projects both in-house and in collaboration with scientists from the USDA-ARS, Oklahoma State University, the University of Mississippi, and CSIRO. Such projects include evaluations of emerging termite detection technologies, testing of termite resistant products, assessment of a novel method for dyeing termites for triple mark-release-recapture studies, and chemical analyses of FST carton nest material.

French Market and Riverfront Railroad: In 2003, NOMTCB installed approximately 300 Sentricon® Stations around the buildings in the French Market. Termite activity was monitored and mark recapture was conducted to delineate FST colonies. In October 2006, the concrete ground surfaces at the downriver end of the flea market was removed for renovations. The termites in bait stations in the upriver portion of the Flea Market were treated with 0.5% noviflumuron in October 2006. Thirty-six of the 40 stations were active with FST. FST activity significantly decreased after treatment. Treatment will continue until feeding stops. The French Market Corporation plans on remodeling this portion of the French Market in January 2007.

In 2006, there was a decrease in the total number of FST alates recovered from 42 glue traps in the Riverfront and French Market areas of the French Quarter. In 2005, 10,074 FST alates were recovered, and in 2006, 6,586 FST alates were recovered.

Stump survey: The threat FST poses to standing live trees in the New Orleans area is well documented. However, quantifying that threat and the damage FST causes to urban trees is difficult and published estimates vary considerably. Remaining stumps from trees damage by hurricane Katrina that were subsequently removed, provided a unique opportunity to quantify the number of damaged trees, species of trees attacked, amount of damage per tree, and subsequently the threat FST poses to the city's trees. An exhaustive survey of stumps along the lakeshore and within City Park was initiated in March 2005. In total, 20.2% of stumps showed signs of termite damage. Results of this study were presented at the 2006 national Entomological Society of America (ESA) meeting and will be submitted for publication in a peer reviewed journal (Kenny Brown, lead author).

FST State Survey: Documentation of the current distribution of FST within the state of Louisiana and increasing public awareness of the FST problem within the state are vital to limiting human aided transport of this important economic pest. Winged reproductives are often the first sign of FST infestations in areas outside their known range. Production of solar powered alate light traps designed by researchers at Oklahoma State University began in March. These traps made it possible to remotely monitor FST swarms throughout the state. Traps were installed in parishes that have previously had no official reports of FST. This survey resulted in the documentation of populations of FST in five previously unreported parishes (Allen, Iverville, St. John the Baptist, Beauregard, and Pointe Coupee). A manuscript entitled "New parish records of *Coptotermes formosanus* (Isoptera: Rhinotermitidae) in Louisiana" detailing the results this study was submitted to the Florida Entomologist in October.

Our lab is also actively involved in projects with the USDA-ARS Operation Full-Stop program. NOMTCB has been collaborating with ARS scientists to develop a novel solar powered alate light trap which will be utilized in the 2007 swarm season. The goal is to develop a trap that can remotely collect specimens into alcohol

for subsequent genetic studies. The specimens will be used to gain information pinpointing the origination of individuals within swarms in the French Quarter.

Termite Detection Tools: Laboratory and field evaluations of non-destructive microwave based termite detection devices were conducted in 2006. Devices that are being evaluated include microwave-based motion detectors and acoustic detection devices. Field evaluations of these devices have exhibited deficiency in their relative abilities to detect termites through some common construction materials. A preliminary evaluation of a single point laser, designed to detect minor vibrations, for use in detecting termite head-banging and chewing identified marked limitations. However, significant modifications and improvements have been made and subsequent field and laboratory evaluations are planned for this spring. This work is a cooperative investigation with NOMTCB, the USDA-ARS, and the University of Mississippi's National Center for Physical Acoustics.

Non-chemical control of drywood termites has been an area of ongoing research in the United States for decades. One specific area that has seen considerable investigation is the use of heat. Our lab evaluated the Speedheater® infrared paint remover (Speedheater System AB, Sävendalen, Sweden) for use against drywood termites. The unit was designed to raise the surface temperatures of wooden members well above the temperature required to kill drywood termites. A final report of laboratory evaluations was submitted to the manufacturer in November 2006.

Inspections: The NOMTCB has continued to inspect properties in the French Quarter for Operation Full-Stop. The NOMTCB has focused on areas in the French Quarter that still has termite pressure. We have worked directly with pest control operators to give them training on placement of above-ground stations. We have successfully worked with several companies in participating in Operation FullStop to eliminate above-ground infestations that have been problematic for several years. All reports and termite samples have been sent to the USDA-ARS.

Operational Research

New Orleans Mosquito and Termite Control Board has participated in operational research projects with several corporations and researchers. Our projects significantly increased in 2006. The termite division currently has a range of basic and applied research projects at various stages, from planning and protocol preparation to submit for peer review. We continue to be involved in product testing under research agreements with Dow AgroSciences, Bayer, Whitmire Microgen, and others. We have current projects in collaboration with scientists from various agencies including the USDA, the University of Mississippi's National Center for Physical Acoustics, Commonwealth Scientific and Industrial Research Organization (CSIRO), and Oklahoma State University. Our areas of research range from testing of products for detection, prevention, and control of subterranean termites to colony seasonal acoustic patterns to comparisons of relative termite pressures to above ground wooden structures.

There is considerable interest in the relative foraging intensities of established colonies of endemic and cosmopolitan termite populations/species. Such information is valuable for comparisons of studies conducted worldwide on varying termite species, especially those concentrating on novel control compounds/techniques. Six replicates of a field study comparing foraging intensity of FST to other *Coptotermes* species as well as other destructive termite species were installed in New Orleans in May. This is a cooperative project with scientists from Australia (CSIRO), China, NOMTCB, and Oklahoma State University. The final replicate was evaluated on 24 Oct. Samples and a final report were sent to CSIRO laboratories in Canberra, Australia for analysis in January 2007.

Survival of FST after Hurricane Katrina: The effects of flooding on FST colonies are being studied. Microsatellite genotyping is currently being conducted on FST samples collected from areas of New Orleans pre- and post-flooding in order to determine colony survival, colony movement, and colony breeding systems. These areas include the French Market which did not flood (the control), City Park Pan American Stadium, which had approximately five feet of brackish water for at least two weeks, and the islands in the lagoon at the southern edge of City Park, which had approximately three feet of brackish water for eight days.

The samples from the islands in City Park are a new addition to this study. These islands were evaluated for FST activity before Hurricane Katrina and samples were collected at that time. These samples were recovered after the storm. Recently, FST activity was re-evaluated on these islands, and termites were collected from the islands.

More termite samples from the flooded sites, Kirsch Rooney, City Park South Course, Roosevelt Mall, and Stallings Playground will be added to this study if they are recovered from collections made with co-operators prior to the hurricane. One pre- and post-storm sample has been obtained from the Juvenile Detention Center and Parks and Parkways. Two pre- and post-storm samples have been recovered from Tad Gormley Stadium in City Park, which also flooded. It should be noted that the trees at the Juvenile Detention Center and Tad Gormley Stadium were treated with bifenthrin in spring 2005, but termite activity has not ceased at these sites.

For this study, DNA extractions have been performed on approximately 800 individual termites, and thus far, a little over half have been genotyped using four loci. Preliminary data has indicated that there is more than one colony at each of these sites. For some of the loci, alleles are present in one or two samples, and not in the other samples being used.

***Optimizing Laboratory Techniques and Archiving Termite* Samples:** In August of this year, it was noticed that results from genotyped samples were becoming inconsistent. This problem has been resolved by performing DNA extractions on more samples and optimizing the PCR protocol. Approximately one and a half months were spent experimenting with different reagents, DNA template amounts, and reagent concentration.

FST samples recovered after Hurricane Katrina, as well as those collected since the storm, are currently being archived and kept at the NOMTCB Biolab facility. These samples are being prepared in a way that would protect them from another flood or storm surge. Samples are being placed in 95% ethyl alcohol in plastic snap-cap vials. Labels are placed inside the vials, in case the outside label is washed off for any reason. Parafilm® is wrapped around the cap, to prevent the vial from opening. Approximately half of the FST samples being kept at the laboratory have already been archived in this way.

Brown Widow Spider: In October 2006, a single brown widow spider (*Latrodectus geometricus*) was collected from a field site near the University of New Orleans' lakefront campus. The range of this species has until recently been limited in the United States to southern Florida. Since this collection, our group has collected these spiders in multiple locations with the greater New Orleans area and southern Louisiana. We developed a fact sheet on brown widows which is distributed during our outreach activities and have given talks to pest control operators and public health and medical professionals. We are also finalizing a manuscript in cooperation with Jerome Goddard of the Mississippi Department of Health, entitled "Apparent rapid geographic expansion of the habitat of the brown widow spider, *Latrodectus geometricus* (Araneae: Theridiidae)" to be submitted to a peer review

Hurricane Katrina

The NOMTCB is eligible for several types of FEMA reimbursement. We have working with FEMA, the State of Louisiana, and City of New Orleans to complete the project worksheets (PW). We have completed PW for approximately $3,000,000.00. Many project worksheets have been funded and are in the NOMTCB budget. We are maintaining excellent records of our documents for future auditing. We still have PWs at the State level that are being reviewed prior to disbursement. The process is slow and time consuming.

The status of the PW of our building is still uncertain. We are still negotiating with FEMA to complete all our capital PWs. However, the PWs for our administration building and Rodent control building have been completed and are awaiting approval signatures. A 404 state hazard mitigation proposal was submitted for $350,000 to mitigate damages to the hanger building in the event of another disaster. The proposal is in review at the State of Louisiana mitigation group.

Extension, Technology Transfer, and Education

The technicians and staff at NOMTCB and Rodent Control have been cross-trained in all of our field duties. Several of our rodent control inspectors have been trained in mosquito control inspector duties such as yard inspections, driving and loading fog trucks, and termite control duties. Training will continue throughout the year. In addition, the rodent control administrative staff has learned how to used software packages such as FileMaker Pro, Excel, Outlook to take complaints and manage the complaint data and survey information. In addition, termite inspectors have been taught how to load the airplane insecticide for aerial mosquito spraying. Cross-training is the key to an efficient, well-rounded organization. In the field, our goal is to have an inspector visit a property once. The inspector could service all the issues at a particular property. We are severely challenged with hiring people to work with the City of New Orleans. The salaries are not competitive with the market or with the industry. Therefore, it is critical to cross-train our employees so that we can tackle our ever growing work load.

Our group has been actively involved in a number of extension activities including providing the walking tour of area-wide management of FST in New Orleans historic French Quarter for attendees of the 50th annual meeting of the Association of Structural Pest Control Regulatory Officials. We have also provided talks on termite biology and venomous spider identification at recertifications of the Greater New Orleans Pest Control Association, at the 10th annual International Preservation Trades Workshop, and the Baton Rouge Pest Control Association recertification. We have developed fact sheets and brochures for brown widow identification and rodent prevention and control. We also continue to identify submitted insect specimens for local pest management professionals.

Several presentations were made at homeowner association meetings such as the Gentilly association, Venetian Isles, and others. We also participated in a City Park homeowner fair that attracted hundreds of people. We offer information to the public about termites, termite control, mosquitoes, and rodent control. We have received hundreds of calls and emails from the community to obtain information about mosquitoes, termites, other insects, and rodents. The majority of the calls were received have been for mosquito control and rodent control. NOMTCB has been working with homeowner associations and nonprofit groups to deliver information and pest control products and services to the citizens. More than 3,600 bags containing donated ant bait, mosquito repellent wipes, glue boards, and informational technical sheets have been given away in at homeowner events.

NOMTCB has used the media (newspaper, television, and radio) to let residents know how to contact us about service requests. In addition, we have used this medium to educate the metro area about termites, mosquito control, and rodent control. NOMTCB filmed with Discovery Channel's Dirty Jobs which is scheduled to air in December 2006 and January 2007.

The following is a comprehensive list of scientific and extension publications and presentations members of NOMTCB participated in.

Honors and Awards:

K. S. Brown. 2006 recipient of the John Henry Comstock Graduate Student Award presented by the Entomological Society of America. (Director's note: This is the highest student recognition award in entomology in the United States)

K.S. Brown. 2006. Second place in Ph.D. poster competition at the 54th Annual Meeting of the Southwestern Branch of the Entomological Society of America (SWBESA), Austin, TX.

Ed Freytag. First Place Award. Pest Control Technology Magazine Photo Contest. Black Widow Spider.

Ed Freytag. Second Place Award. Third Annual Municipal Employee Art Exhibit, The City of New Orleans. Intermediate level in photography. Black Widow Spider-Suspended Danger.

Smith, M. P., K. S. Brown, G. H. Broussard, A. L. Smith, and B. M. Kard. February 28, 2006. First place in master's ten-minute oral presentation competition at the 54th Annual Meeting of the SWBESA, Austin, TX.

Publications (peer reviewed):

Suiter, R. D., B. M. Scheider, C. Riegel, M. S. Smith, & G. W. Bennett. 2006. Brood reduction in noviflumuron-fed Pharaoh's ant, *Monomorium pharaonis*, and Argentine Ant, *Linepithema humile*, colonies (Hymenoptera: Formicidae). Sociobiology 47:149-164.

Publications (non-peer reviewed):

Brown, K. S., G. H. Broussard, B. M. Kard, M. P. Smith, and A. L. Smith. 2006. Colony characterization of *Reticulitermes flavipes* (Isoptera: Rhinotermitidae) on a native tallgrass prairie. Proc. 2006 National Conference on Urban Entomology.

Brown**,** K. S., J. S. Necaise, and E. D. Freytag. 2006. The brown widow spider: an invasive species of medical importance. The City of New Orleans Mosquito and Termite Control Board extension bulletin Doc. NOMTCB 2-2006.

Brown, K. S., and C. Riegel. 2006. Termites: identification and prevention. The City of New Orleans Mosquito and Termite Control Board extension bulletin Doc. NOMTCB 3-2006.

Broussard, G. H., A. L. Smith, M. P. Smith, K. S. Brown, and B. M. Kard. 2006. Influence of monitoring station diameter and food source volume on the frequency of subterranean termite activity. Proc. of the 54th Annual Meeting of the Southwestern Branch of the Ento. Soc. of Amer. 3: 7.

Smith, M. P., K. S. Brown, G. H. Broussard, A. L. Smith, and B. M. Kard. 2006. Characterization of *Reticulitermes flavipes* colonies on a native tallgrass prairie/cross-timbers habitat. Proc. of the 54th Annual Meeting of the Southwestern Branch of the Ento. Soc. of Amer. 3: 3.

Riegel, C. and E.D. Freytag. 2006. Rodent control & prevention after hurricane Katrina – Guidelines for property owners and tenants. New Orleans Mosquito and Termite Control Board extension bulletin Doc. NOMTCB 1-2006.

Posters at Scientific Meetings:

Broussard, G. H., A. L. Smith, M. P. Smith, K. S. Brown**,** and B. M. Kard. February 28-29, 2006. Influence of monitoring station diameter and food source volume on the frequency of subterranean termite activity. Second place in Ph.D. poster competition at the 54th Annual Meeting of the Southwestern Branch of the Entomological Society of America (SWBESA), Austin, TX.

Broussard, G. H., A. L. Smith, M. P. Smith, B. M. Kard, and K. S. Brown. December 11, 2006. Relationship of detection station size and food volume to initial visitation by termites (Isoptera: Rhinotermitidae). 54th Annual Meeting of the Entomological Society of America, Indianapolis, IN.

Presentations:

Brown, K. S. March 23, 2006. Termite biology. Louisiana Pest Control Association and the Greater New Orleans Pest Control Association technician recertification, Harahan, LA.

Brown, K. S. April 25, 2006. Termite control. Northeastern Louisiana Pest Control Association technician recertification. Monroe, LA.

Brown, K.S. October 19, 2006. Termite biology. Greater New Orleans Pest Control Association technician recertification, Harahan, LA.

Brown, K. S. October 27, 2006**.** The brown widow spider: an invasive species of medical importance. 10th Annual International Preservation Trades Workshop, New Orleans, LA.

Brown, K. S., B. M. Kard**,** M. P. Smith, and A. L. Smith. March, 2006 Colony characterization of *Reticulitermes flavipes* (Isoptera: Rhinotermitidae) on the Nature Conservancy's Tallgrass prairie preserve. 2006 Tallgrass prairie retreat sponsored by Oklahoma Experimental Programs to Stimulate Competitive Research (EPSCoR).

Brown, K. S., B. P. Yokum, C. Riegel, E. D. Freytag, and M. K. Carroll. December 12, 2006. Evidence of subterranean termite (Isoptera: Rhinotermitidae) damage in tree stumps following hurricane Katrina in New Orleans, LA. 54th Annual Meeting of the Entomological Society of America, Indianapolis, IN.

Freytag, E. D. January 25-27, 2006. Termite detection tools. Nebraska Urban Pest Management Conference in Lincoln, Nebraska

Freytag, E. D. June 8, 2006. Effects of Katrina on termites and other pests. Cajun Pest Control Association, Houma, LA.

Freytag, E. D. August 19, 2006. Termites, flies, ants and rodents. Carrollton Homeowners Association, New Orleans, LA.

Freytag, E.D. September 27, 2006. Termites and mosquitoes. Coastal Bend Chapter of the Texas Pest Control Association. Corpus Christi, Texas.

Freytag, E. D. October 10, 2006. Termite biology. Greater New Orleans Pest Control Association, Kenner, LA.

Freytag, E. D. December 10, 2006. Effects of hurricane Katrina on subterranean termites. 54th Annual Entomological Society Meeting. Indianapolis, Indiana.

Mullins, A. J. March 2, 2006. Control of subterranean termites: Acadian Pest Control Association, Lafayette, LA.

Mullins, A. J. March 15, 2006. Louis Armstrong Park and Jackson Square progress report. USDA-ARS FST Technical Committee Meeting. New Orleans, LA.

Mullins, A. J. March 23, 2006. Ants and ant control in Louisiana. Louisiana Pest Control Association and the Greater New Orleans Pest Control Association Technician Recertification. Harahan, LA.

Mullins, A. June 30, 2006. Pest control (ants). House Call recertification meeting. Harahan, LA.

Owens, C.B. March 15, 2006. Research plans. Annual Formosan Subterranean Termite Technical Meeting. New Orleans, Louisiana.

Owens, C.B. March 23, 2006. DNA: From Basics to Applications. Louisiana Pest Control Association and the Greater New Orleans Pest Control Association technician recertification, Harahan, LA.

Riegel, C. January 12, 2006. New technologies in termite management– detection and control. 2006 Purdue Pest Management Conference. West Lafayette, IN.

Riegel, C. January 12, 2006. Termite treatments-issues, liabilities, chemicals and non-chemicals. 2006 Purdue Pest Management Conference. West Lafayette, IN.

Riegel, C. January 14, 2006. Termite detection tools. Georgia Pest Control Association 50th Annual Meeting. Athens, GA.

Riegel, C. February 1, 2007. What we learned from subterranean termites post-hurricane Katrina. Dow AgroSciences East-Coast Authorized Pest Control annual meeting. Orlando, FL.

Riegel, C. February 3, 2007. What we learned from subterranean termites post-hurricane Katrina. Dow AgroSciences West Coast Authorized Pest Control annual meeting. Las Vegas, NV.

Riegel, C. April 2006. Termites after the storm. University of Hawaii 2006 seminar series. Honolulu, HI.

Riegel, C. June 21, 2006. Pest Control– before and after Katrina. Florida Pest Management Association annual meeting. Bonita Springs, FL.

Riegel, C. July 11, 2006. Control of Formosan subterranean termites along the Mississippi riverfront. Railway Tie Association, New Orleans, LA.

Riegel, C. August 28, 2006. How Louisiana and New Orleans dealt with pest control issues from hurricane Katrina– rodent control. ASPCRO 2006 annual meeting. New Orleans, LA.

Riegel, C. September 25, 2006. The use of pesticides after a natural disaster. Annual Responsible Industry for a Sound Environment Meeting. Orlando, FL.

Riegel, C. November 10, 2006. Status of Formosan subterranean termites in New Orleans. 30th Annual Entomology Field Day and Workshop. Florida A&M, Tallahassee, FL.

S. Sackett. November, 10, 2006. The use of larvivorus fishes to control mosquitoes in abandoned swimming pools after hurricane Katrina. 49th Annual meeting. Louisiana Mosquito Control Association 2006 meeting. Hammond, LA.

Smith, M. P., K. S. Brown, G. H. Broussard, A. L. Smith, and B. M. Kard. February 28, 2006. Characterization of *Reticulitermes flavipes* colonies on a native tallgrass prairie/cross-timbers habitat. First place in master's ten-minute oral presentation competition at the 54th Annual Meeting of the SWBESA, Austin, TX.

Yurt, Joe. June 30, 2006. Commercial vertebrate control. House Call recertification meeting. Harahan, LA.

Meetings:

Brown, K. S. August 29, 2006. Area-wide management of the Formosan subterranean termite in New Orleans' historic French Quarter (walking tour). 50th Anniversary of the Association of Structural Pest Control Regulatory Officials (ASPCRO), New Orleans, LA.

Freytag, E. D. March 21-23, 2006. The Wood Protection 2006 Annual Meeting. . New Orleans, LA.

Freytag, E. D. April 2006. Provided sites with active Formosan termites at fire station 7 for The Learning Channel interview of Ed Bordes and Dr. Nan Yao Su.

Freytag, E. D. May 2006. Meeting with Parkway to discuss long-term termite projects in parks.

Freytag. E. D. July. Mosquito needs post-Katrina- requested for reimbursement for extraordinary efforts to control mosquitoes post-Katrina. Baton Rouge, LA.

Freytag, E.D. August 27-30th. Attended the ASCPRO meeting. New Orleans, LA.

Freytag, E. D. July 11, 2006. Attended a meeting with the Railroad Tie Association at the Hotel Monteleone. New Orleans, LA.

Workshops:

NOMTCB. November 11, 2006. Rodent control workshop presented by Dr. George Rotramel (Rotramel Technical Services). New Orleans, LA.

Committees:

Brown, K. S. 2006. Institutional Biosafety Committee at Tulane University.

Media Events:

Numerous media events on the radio, television, and printed media.
Brown, K. S. Brown Widow in New Orleans. WWLTV (channel 4)
Brown, K. S. Brown Widow in New Orleans. WDSU (channel 6)
Brown, K. S. Brown Widow in New Orleans. Fox 8 (channel 8) October 26, 2006.
Discovery Channel's Dirty Jobs

2006 New Orleans Community Outreach:

We offer information to the public about termites, termite control, mosquitoes, and rodent control. We have received hundreds of calls and emails from the community to obtain information about mosquitoes, termites, other insects, and rodents. Several presentations were made at homeowner association meetings in the 9th Ward, Lakeshore, City Park, Lakeview, local churches, and at many other locations.

At these meetings we asked residents to fill out a questionnaire reporting mosquito problems, rodent problems, and the presence of red imported fire ants. These complaints were directed to the appropriate departments to be serviced. We also answered questions posed by the public and distributed brochures with information for identification and control measures that should be done in their own areas to assist in controlling mosquito and rodent problems.

New Orleans Mosquito and Termite Control

April	Welcome Home Fair, New Orleans City Park Botanical Gardens
October	Convention Center Homebuilders Show.
October 15	Mary Queen of Vietnam Church. 14001 Dwyer Blvd.
October 22	Mary Queen of Vietnam Church. 14001 Dwyer Blvd.
November 5	Mt. Carmel Fair. Robert E. Lee Blvd.
November 19	Mary Queen of Vietnam Church. 14001 Dwyer Blvd.
December 3	Resurrection of Our Lord Church. 9701 Hammond St.
December 10	St. Maria Gorretti Church. 7300 Crowder Blvd.
December 16	Resurrection of Our Lord Church. 9701 Hammond St.
December 16	St. Maria Gorretti Church. 7300 Crowder Blvd.