



Anastasia Mosquito Control District

St. Johns County



Aedes albopictus

2008 Annual Program Report

Phone: (904) 471-3107

Fax: (904) 471-3189

www.anastasiamcd.org

500 Old Beach Road

St. Augustine, Florida 32080

TABLE OF CONTENTS

Mission & Goals.....	1
Director's Message	2
Message from the Chair of the Board of Commissioners	3
Board of Commissioners and Appointed Officers.....	4
Personnel.....	5
Customer/Professional Service	
1. Service Requests	7
2. Customer Satisfaction.....	8
3. Professional Service.....	9
Surveillance	
1. Arbovirus.....	11
2. Mosquito Population	
3. Environmental Parameters	
Operation Control	
1. Ground Application	
(1) Source Reduction.....	13
(2) Larvicides and Larviciding	14
(3) Adulticides and Adult control	15
(4) Personal/Community Protection/Prevention.....	15
2. Aerial Application	16
Education/Training	
1. Public Education.....	17
2. Publications.....	18
3. Employee Continuing Education	19
Applied Research	21
Administrative & Supply Service	22
Appendix	
Financial Report	23
Operations Summary	24
Committee Members & Contributors.....	25
Acknowledgments.....	25



Mission & Goals

To preserve and protect the people from mosquitoes and mosquito-borne diseases.

To reduce/control mosquitoes through integrated pest management based on environmentally-friendly and cost effective methods.

To minimize negative impacts on people and other living things, based on valid scientific data, peer review and public hearings.

To spend public funds prudently; and

To become recognized as one of the leading mosquito control districts.

(Revised & approved on July 10, 2007)



The Director's Message

Under the Board of Commissioners' direction and leadership, AMCD answered more than 1,600 customer service requests for control of mosquitoes and/or information about mosquito-borne diseases. The residents in St. Johns County have been free of any mosquito-borne diseases for the last 5 years, however, one horse died of EEE in May. AMCD provided a significant amount of professional services for other governmental agencies, as well as many professional associations, communities, clubs, private companies, and international organizations.

AMCD increased its development of school programs and worked with the St. Johns County School Board to develop these programs. We were able to enhance classroom teaching and provide field trips for students. Our purpose is to promote public education and public relations about prevention and control of mosquitoes and mosquito-borne diseases. AMCD successfully organized two science exploration days that attracted many students and parents. AMCD had an open house on May 29 and conducted many public education events. AMCD provided 18 CEU's to our own and other mosquito control district employees as well as employees of other organizations through the 5th workshop and the FMCA symposium. AMCD organized a symposia on "Pesticides and the Environment" for the AMCA national conference in Reno, NV and on "Barrier Treatments" for the FMCA state conference in Panama City, FL.

AMCD promoted environmentally-friendly methods and enhanced research on the use of barrier treatments for mosquito control, all aimed at reducing the amount of pesticide application. AMCD used mosquito magnets, personal and community protection techniques (distribution of repellents and toxic bait stations), and barrier treatments to protect residents in areas of significant mosquito activity. AMCD discontinued the use of Malathion in 2008.

AMCD contracted with Southern Helicopter Leasing, LLC for aerial inspection, surveillance, larviciding, and adulticiding. After tropical storm Fay, 17 inches of rain created many breeding sites. AMCD conducted treatments by aerial application for some areas and also to provide barrier treatment around residential areas for larval control and adulticiding (ANVIL 10+10).

DUET, a new formulation of adulticide funded by Clarke Mosquito Control, was tested in the laboratory and in the field. Barrier treatment, using bifenthrin at Treaty Park, Anastasia State Park, and a residential yard, helped the District to reduce cost and complaints from local residents.

The Board hired an Assistant Director in March to help the Board and the Director run AMCD's administration and operations functions. The staff prepared for and supported 18 Board meetings and workshops, and many committee meetings in 2008. The District mechanic, James Wynn, won the FMCA's James Robinson award and Biological Technician /Ph.D. student, Whitney Qualls, won the FMCA's scholarship. Biotech Mike Smith was certified by the Department of Agriculture and Consumer Services for the State Surveillance Program.

AMCD used new technology and scientific methods to provide excellent customer and professional service. Currently, AMCD is doing well and we are working together under the new Board's direction and leadership in order to reach our mission and goals. I appreciate and thank the Board members, employees, contractors, and cooperative organizations for their support and service.

Rui-De Xue, Ph.D.
Director



Message from the Chair of the Board of Commissioners

2



2008 marked the 5th consecutive year without any kind of mosquito – borne disease reported in St. Johns County. This was accomplished by support from the Board as well as dedicated staff. The Anastasia Mosquito Control District continues to have a strong record of accomplishments as evidenced in the Annual Report. We have, as a team, worked hard to fulfill the Mission Statement of the District.

The Board of Commissioners approved a 6% reduction in the total budget and reduced the millage rate for the 2008/2009 budget year. Our accomplishments, such as increases in our aerial program, were made possible by the tax support of the residents of St. Johns County.

Jeanne Moeller, Chair 2008



Board of Commissioners & Appointed Officers

Mrs. Linda Wampler, Vice-Chairperson
Mrs. Barbara H. Bosanko, Commissioner
Mrs. Emily B. Hummel, Commissioner
Mrs. Jeanne Moeller, Chairperson
Mr. John Sundeman, Secretary/Treasurer



Appointed Officers by the Board

Dr. Rui-De Xue, Director
Ms. Priscilla Greene, Assistant Director
Mr. Wyckoff, District Attorney
Mrs. Julieann Klein, CPA



Full-Time Personnel

Administration	Name	Hire Date
Director	Dr. Rui-De Xue	4/14/03
Assistant Director	Priscilla Greene	3/10/08
Administrative Office Assistant	Charolette McElroy	11/05/07
Accountant	Scott Hanna	7/09/07
Department of Entomology		
Education Specialist	Gina LeBlanc	9/26/05-12/11/08
Biological Technician	Mike Smith	11/05/84
Biological Technician/Ph.D. student	Whitney Qualls	3/20/06
VCMS Coordinator	Richard Weaver	4/14/03
Education Specialist	Adam Holt	11/03/08
Base Station		
Supervisor	Kay Gaines	8/07/00
Inspector/Sprayers	David King	2/1/08
	Tom Downey	3/1/06
	Greg Griggs	4/15/91
	Cathy Hendricks	7/08/02
	Patrick Kendrick	4/07/03
	Loren Smith	3/18/02
	Elaine Scanzani	3/20/02
	David Strickland	3/10/97
Mechanic	James Wynn	3/04/96
North Station		
Supervisor	John Boone	4/17/00
Inspector/Sprayers	Michelle Davenport	3/1/06
	Mike Mills	3/31/03
	Vincent Price	6/01/99
	Ed Schneider	10/23/00
	Paul Whatley	7/08/02
Mechanic	Gene Wells	11/26/79
South Station		
Supervisor	David Taylor	2/28/94
Inspector/Sprayers	Freddie Allen	7/08/02
	Steve Solana	4/24/00
	Ken Daniel	9/26/05



Part-Time/Seasonal Personnel

Part-Time	Name	Dates of Service (2008)
Sprayer	Allen Traugh	09/06-10/11
Science Education Intern	Leslie Cox	06/11– 07/30
Biological Technician Intern	Joseph Roney	06/11– 08/10
Seasonal		
Inspector/Sprayer	Steven Steele	05/05-10/31
Inspector/Sprayer	Perry Simon	05/05-6/30
Inspector/Sprayer	Ricky Stockley	05/05– 10/31
Inspector/Sprayer	Kurt Oswald	05/05-05/06
Inspector/Sprayer	Barbi Watkins	05/05– 10/31
Inspector/Sprayer	Jason Wlodarczyk	05/05-10/31
Lab. Assistant	Joshua Beckett	06/11-11/30
Inspector/Sprayer	Bobby Robinson	05/05-10/31
Inspector/Sprayer	William Fitzgerald	05/05-06/27
Utility Helper	Jameson O'Neil	06/11-11/12



2.Customer Satisfaction



Customer & Professional Service

1. Service Requests

All service requests are entered into the Vector Control Management System (VCMS), which is a database used by the District to keep track of all service requests, chemical use, employee time records, landing rates, light traps and other statistical data. In 2008, 1600 service requests were received and services were provided.

Most service requests are called in, some are walk-ins and some are received by the inspector/sprayer while on their route, and others are received via e-mail or fax. The request is entered into the main computer and is assigned to an inspector/sprayer for that area through their pocket computers.



Service requests are addressed as soon as possible after they are received by the inspector/sprayer. An inspector/sprayer will go to the service request site and check the area for standing water and containers holding water. If containers are breeding mosquito larvae, the inspector/sprayer will empty the container if it is not too large. If they are unable to empty the container they will treat the container contents to kill the larvae and inform the owners of what is causing the mosquito problem and what they can do to help eliminate the problem. If no one is home, they will leave a door hanger to explain what they found and recommend prevention tips.

If the service request is for Adulticiding (fogging), the area will be checked for standing water and a landing rate count will be done. A landing rate count is where the inspector/sprayer will stand for one minute and count how many mosquitoes land on them. Three or more mosquitoes landing in a minute is justification for treatment. We may use a CDC trap baited with dry ice or octenol to collect adult mosquitoes for justification (>25 mosquitoes /trap/night) if necessary.

Adulticiding is done between 3:00 a.m. to 7:00 a.m. or in the evenings from 6:00 p.m. to 10:00 p.m. during mosquito activity. Unless the person requests to speak to the inspector/sprayer, they may not be aware that their request has been addressed.

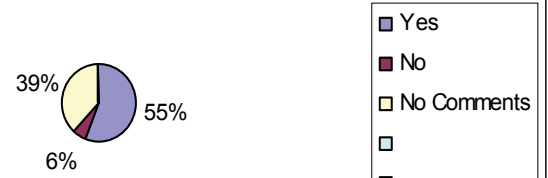
State and Federal regulations require that we have justification before the use of any pesticides. Service requests are part of our justification process for adulticiding as they are indicative of mosquito activity in different areas of the county.

In the fall of 2008, a “Customer Service Satisfaction Survey” was sent out to five hundred St. Johns County residents (250 from our service request database and 250 randomly selected from the phone book). One hundred forty five, or 29% were completed and returned. This return rate was achieved with 40% returned from previous service requests and 18% from the residents selected from the phone book. The survey consisted of ten questions which dealt with the mosquito population, our mosquito control staff, the efforts we make in order to control mosquito-borne diseases, the education and information our employees provide and the timely response to service requests. The overall results follow.

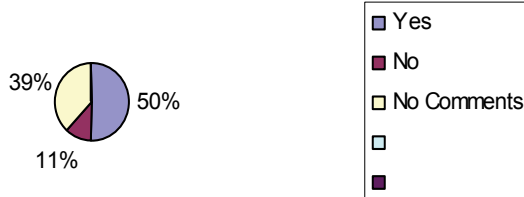
Q1 & 2: I am aware of the service & the mosquitoes are bad and the service are needed.



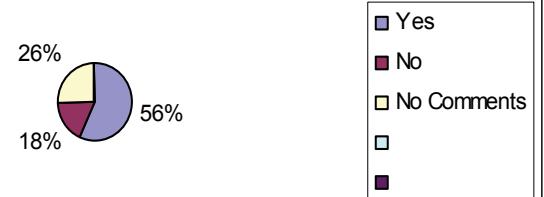
Q3: AMCD personnel are professional & informative.



Q4: AMCD personnel respond to my needs in a timely manner.



Q5: I am aware of the information provided in our website.



Q6: I am satisfied with the information provided on mosquitoes and mosquito prevention.



Q7 & 8: I recognize the importance of controlling mosquito-borne disease and I make an effort to do my part.



Q9: I understand that mosquitoes can be controlled NOT eliminated.



Q10: Overall, I am satisfied with AMCD's effort to control mosquitoes.



3. Professional Service:



Those listed below briefly describes AMCD's work associations in 2008:

American Mosquito Control Association (AMCA): Dr. Xue and Commissioners Moeller and Wampler organized a symposium on "Pesticides and the Environment" for the AMCA Annual Meeting in Reno, NV from March 2-6. Dr. Xue & Mrs. Qualls reviewed six manuscripts for the Journal of the AMCA and published and submitted several manuscripts prior to the meeting. One of the publications published proceeding the AMCA meeting symposium was on "Mosquitoes and Plants". Commissioners Moeller and Wampler, Dr. Xue, and Mrs. Qualls attended the AMCA annual meeting and gave three presentations on mosquito control.

Society of the Vector Ecology (SOVE): Dr. Xue attended the Society of Vector Ecology meeting and presented a poster about DEET repellent and mosquito mating impacts. Mrs. Qualls posted a population dynamic on *Ae. infirmatus* in St. Johns County, Ft. Collins, September 27-October 1.

Florida Mosquito Control Association (FMCA): Eleven employees and Commissioners Moeller and Wampler attended the Dodd Short Courses in Ocala. Dr. Xue gave a presentation on barrier treatment against mosquitoes for the Dodd Short Course. Commissioner Moeller, Dr. Xue, and Ms. Greene attended the Tallahassee Legislation Day to support the FMCA's activities and maintenance of research funding in Tallahassee in March. Mr. Boone served on the FMCA Board as Northeast Regional Representative and Co-instructor at the FMCA's Dodd Short Courses. Dr. Xue edited and published the proceedings of the 2nd- 4th workshops in the Technical Bulletin of the FMCA in 2008. Dr. Xue organized a symposium on "Barrier Treatment against Mosquito Infestations" for the FMCA Annual meeting in Panama City, FL, November 17-19. AMCD provided a total of eighteen CEU's for the FMCA members through the 5th workshop and FMCA meeting symposium. Also, Dr. Xue was elected as the Regional Representative for the FMCA Board in November. AMCD's mechanic James Wynn won the FMCA's James Robinson Award and biotech /Ph.D. student Whitney Qualls won the FMCA Scholarship.

Entomological Society of America (ESA): Dr. Xue reviewed three manuscripts and Mrs. Qualls reviewed one for the Journal of Medical Entomology and submitted a manuscript about blood feeding behavior and DEET repellency with Dr. Barnard from the USDA.

USDA/CMAVE/Mosquito & Fly Unit: AMCD cooperated with the USDA to continue studying geographic information systems, attractants and traps, barrier spraying, new larviciding evaluation, and published several articles on mosquito behavior and control. Dr. Xue reviewed three manuscripts for the USDA/CMAVE and made recommendations for USDA scientist promotions. AMCD cooperated with USDA/CMAVE to hold the 5th workshop to train the mosquito control workers. Commissioner Sundeman and staff visited their laboratory in Gainesville, FL.

Florida Medical Entomology Laboratory (UF/FMEL) and Mid-Florida Research and Education Center (MFREC): AMCD cooperated with FMEL scientists and MFREC scientists to conduct mosquito pesticide evaluation projects and train a Ph.D. student and other employees through a lecture and presentation in the Arbovirus surveillance & mosquito control workshop. The Director, Dr. Glenna Morris from the Emerging Pathogens Institute (EPI), of the University of Florida, gave a lecture at the AMCD's workshop. Dr. Xue attended the EPI's vector-borne disease group meeting in Vero Beach in January.

Florida A & M University and the Public Health Entomology Research & Education Center (FAMU/PHEREC): AMCD cooperated with Dr. Harry Zhong to conduct the impacts of DUET on honey bees and the impacts of barrier treatment on non-targets, evaluation of adulticiding and employee training. AMCD cooperated with Dr. James Cilek on editing proceedings of the workshop. Dr. Xue has been appointed as the FAMU/PHEREC's Research Advisory Committee Member and he reviewed the laboratory programs in November.



University of North Florida (UNF): AMCD cooperated with Dr. Doria Bowers to study the behavior and response in infected mosquitoes and train Ph.D. student, Whitney Qualls and employees.

Auburn University: Dr. Xue was invited to evaluate and recommend a faculty member of the Department of Entomology for promotion to full professor in May.

Kansas State University: Dr. Xue was invited to give two lectures on extension and research accomplishments about Medical and Veterinary Entomology at the Department of Entomology, May 2008.

The Hebrew University, Israel: Dr. Xue cooperated with Dr. Gunter Muller on malaria mosquito control using toxic baits in Israel and Africa. Dr. Xue was invited to visit and consult on malaria control in Angola, Africa in early July and in Israel on a sugar bait study in late July.

Jacksonville Mosquito Control Division: AMCD cooperated with Richard Smith, Jacksonville Mosquito Control for the development of an aerial program and trap evaluation in Jacksonville. Commissioners Moeller and Bosanko visited the Jacksonville facility.

East Flagler Mosquito Control District: Cooperation with Arbovirus surveillance test methods and aerial program development in Palm Coast. Commissioners Bosanko and Wampler and Aerial Committee member, Mr. Radford visited the Flagler Mosquito Control District.

Department of Agriculture and Consumer Services (DACS), Mosquito Control Section: AMCD renewed the operational contract with DACS in reference to reports. AMCD gave operational, pesticide usage, and budget and budget amendment reports to DACS monthly. AMCD attended the DACS mosquito population surveillance program. Mike Smith was certified for the State surveillance program. Dr. Xue and Commissioner Moeller attended the Florida Coordinating Council on Mosquito Control in Manatee County in October. Dr. Xue was appointed as a DACS Research Committee member to conduct the grant review process. AMCD cooperated with DACS on the PPE/pesticide application inspection.

Department of Health (DOH), St. Johns County and Tampa Virus Laboratory: Both of these DOH agencies were instrumental in assisting AMCD in running the sentinel chicken blood testing program. The County Department of Health cooperated with AMCD to share mosquito-borne disease information and issued the press release about prevention and control of mosquito-borne diseases after the EEE horse case in May.

Department of Environmental Protection (DEP), Environmental Education Center, St. Augustine: AMCD cooperated with the center for workshop/employee training, and attempted to create a grant funded biologist position to work on the projects that were of interest to both AMCD and the DEP's Education Center.

Department of Geographic Information System (GIS), St. Johns County: AMCD cooperated with the county GIS Department to work out the mapping system for aerial spraying and breeding habitats.

The Gates Foundation: Dr. Xue was invited to attend and give a presentation on plant feeding and barrier treatment against mosquitoes for the Gate Foundation's Consultation meeting on vector control in Seattle, WA from July 27-31.

Clarke Mosquito Control: AMCD cooperated with Clarke Mosquito Control to study the aerial application efficacy with ANVIL 10 + 10 and Clarke funded AMCD to study a new formulation of adulticide (DUET).



Surveillance

1. Arbovirus

AMCD monitored West Nile Virus (WNV), Eastern Equine Encephalitis Virus (EEE), Saint Louis Encephalitis Virus (SLE), Highland J Virus (HJV), and California Group Viruses by using sentinel chickens and adult mosquito trapping.



Sentinel chickens are bled once a week from March to December at ten locations throughout the county. We have six birds at each location. The blood samples are sent to the Tampa Virus Laboratory for antigen/antibody detection associated with these viruses. Reports are received weekly and positive reports provide us with the information needed to treat areas that have virus activity. In 2008, we had one horse and twenty nine sentinel chickens test positive for EEE. Seven chickens tested positive for HJV and no chickens tested positive for WNV, SLE or California Group Viruses.

AMCD joined the DACS's State surveillance program in 2008. We trap adult mosquitoes at six locations with CDC traps baited with dry ice. These trap collections are also used for arbovirus testing if virus activity has been reported in our sentinel chickens. These mosquitoes are identified to species, pooled into twenty or more of the same species and tested for virus. We have collected a total of 50,541 mosquitoes. *An. crucians*, *Cx. nigripalpus*, *Ae. (Oc.) infirmatus*, *Ae. (Oc.) atlanticus*, and *Psorophora columbiae* are the top five species (fig 1). There were no positive mosquito pools for any arbovirus in 2008.



2. Mosquito Population

AMCD conducts surveillance weekly by monitoring adult populations by performing landing rate counts and trapping adult mosquitoes.

Landing rates are performed three times a week (Monday, Wednesday, and Friday) at 145 sites throughout the county. The inspector/sprayer counts how many mosquitoes land on them within a one-minute period. Each week a CDC light trap baited with octenol is set out in 45 locations to monitor adult mosquito populations. If there are more than 25 mosquitoes per night per trap and we have had high landing rate counts near these locations, a treatment may be made.

Larvae are regularly monitored and inspected to identify breeding sites and optimize control of immatures before they become adults.

3. Environmental Parameters

Rain gauges (56) and tide gauges (2) are located throughout the county to monitor rainfall and tide events. This information helps us predict when a large hatch or emergence of salt marsh or floodwater mosquitoes might occur.



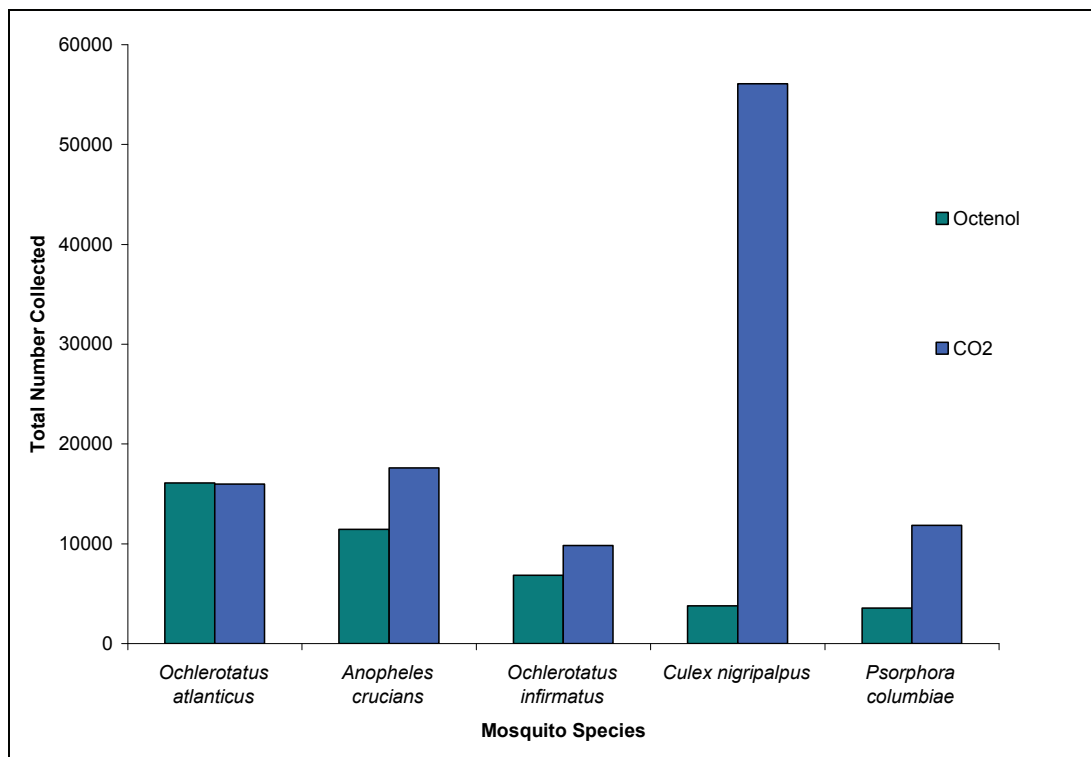


Figure 1. Top five mosquito species collected from March to December, 2008 in St. Johns County in CDC light traps. Collections using octenol are shown in green and collections using dry ice are shown in blue.

Table 1. Total numbers of mosquitoes in St. Johns County, FL, from 2006 to 2008.

	<u>TOTALS</u>		
	<u>2006</u>	<u>2007</u>	<u>2008</u>
CDC Light Traps*	9422	28996	50541
Landing Rate Counts**	2537	13636	8819
State Surveillance***	5422	22786	261067

* 45 CDC light traps baited with octenol were used in 2008.

** 145 LRC sites were taken in 2008.

*** 6 CDC light traps baited with dry ice were added in 2008 for the DACS state report



Operation Control

1. Ground Application (1) Source Reduction



Source reduction is an important aspect and permanent solution for mosquito control. AMCD determines the areas that need source reduction based on service requests, visual inspection, or the surveillance program. One of the major ways AMCD manages source reduction is through customer education. When a service request is made, an inspector/sprayer visits the site, surveys the property for mosquito breeding sites such as tires, bird baths, kiddie pools, buckets, pet bowls, toys, boats, pots and plants (bromeliads and pitcher plants), etc. They inform the customer of what was found and then implement a plan of action. The inspector/sprayer makes the customer aware that emptying the water from these containers once a week will reduce mosquito populations significantly. If a customer is not at home, an assessment is made and a door hanger is left explaining the actions of the inspector/sprayer and suggested actions for the property owner.

Another way AMCD manages source reduction is through their tire removal program. Upon receiving service requests, inspector/sprayers go to the sites and remove old tires free of charge. In 2008, 776 tires were collected.

Also, AMCD assisted many local residents and Home-Owner Associations in Ponte Vedra, Bartram Farms, and along State Road 16, State Road 13 and State Road 13A with ditches and retention ponds to reduce possible mosquitoes and blind mosquito (midge) breeding sites.



(2) Larvicides and Larviciding

Mosquito larvae are generally concentrated in small bodies of water where the larvae are vulnerable to the application of larvicides. St. Johns County is approximately 609 square miles, which is equal to 389,760 acres. More than 120,000 acres are marsh and wet lands which frequently produce mosquitoes following rain. The District treats acres of accessible breeding sites, sometimes repeatedly, during the mosquito season. Those sites include salt marsh, fresh water swamps, ditches, flooded pastures, yards, storm drains, catch basins and artificial containers.

Inspector/sprayers routinely monitor breeding sites, rainfall amounts, temperature and tide gauges. Inspectors treat larvae using an arsenal of different equipment and larvicides. Equipment includes ATVs, trucks, an airboat, backpack blowers and dippers. The District uses environmentally safe and effective larvicides including Altosid, Golden Bear, Agnique, and *Bacillus thuringiensis israelensis* (BTi). Inspectors transfer larvae-eating fish to sites that have a high population of mosquito larvae and no fish population.

Larviciding Summary, 2008

Larvicide	Application Amount	Acres	# of Treatments
Agnique MMF	11.23 gal.	22.47	21
Altosid Briquets	2,716 ea.	6.24	51
Altosid Pellets WSP	15,529 ea.	60.06	262
Aquabac 200 G	360 lb.	60.00	10
Aquabac XT Liquid	813 gal.	12,989.33	1,537
Golden Bear	50.29 gal.	16.76	51
Teknar G	945.00 lb.	164.17	20
Vectorbac G (by air)	200 lb.	33.33	4
Vectobac CG	10.00 lb.	0.66	1
Zoecon Altosid XR-G	11,669 lb. (10,640 lb. by air)	2,129.83	56

(3) Adulticides and Adult Control



Adult mosquito control is accomplished by hand fogging in backyards, truck spraying in neighborhoods and subdivisions, aerial spraying for large areas and in emergency situations, and toxic bait/barrier treatment for small hot spots. Adulticide materials are used to treat areas where adult mosquitoes are found in numbers that justify treatment. The following lists procedures and standards for the adult control program.

In 2008, Aqua-Reslin (permethrin), ANVIL 10 + 10 (sumithrin for aerial application), and resmethrin (hand fogger) were utilized. Materials were applied using variable speed pumps, a Monitor III computer system and high pressure nozzles. Ground applications were made in areas of the county easily accessible by vehicles.

Aqua-Reslin (active ingredient: permethrin) is a concentrated liquid product that is mixed with nine parts water to one part concentrate, and applied by trucks. Aqua-Reslin kills mosquitoes by contact as they are exposed to the fog cloud.

Adulticide Use Summary in 2008

Adulticide	Application Amount	Acres	# of Treatments
ANVIL 10+10 (by air)	147.5 gal.	31,466.20	7
Aqua-Reslin	234.89 gal.	240,682.51	262
Talstar P	0.41 gal.	2.55	5
Total	382.80 Gal.	272,151.26	274

(4) Personal /Community Protection and Prevention

Protection against mosquito bites is promoted through public education. AMCD encourages the public to be proactive by following the “5 D’s of Prevention” and offering other prevention tips.

5 D’s of Prevention

Avoid going outdoors at DUSK & DAWN when mosquitoes are most active. To protect against bites, DRESS so that your skin is covered with clothing. (Long sleeve shirts and pants)
Apply mosquito repellent containing DEET to bare skin and clothing.
Empty containers and DRAIN stagnant water.



Prevention Tips

1. Repair screens and spray repellent on them
2. Rake leaves
3. Remove debris from ditches and rain gutters so that water flows and does not remain stagnant

Prevention Tips (Cont'd)

4. Fill holes in trees with sand or mortar or make a drain hole
5. Keep ponds and pools circulating
6. Flush bromeliads frequently



We strongly encourage the public to take protective measures and reduce mosquito breeding sites. AMCD provides barrier treatments for the residents who live in hot spots/areas. In cooperation with the State Parks, AMCD used mosquito magnets and barrier treatment techniques to protect visitors.

2. Aerial Application

AMCD has a contract service with Clarke Mosquito Control for the aerial spraying in emergency situations. Also, AMCD has a contract service with Southern Helicopter Leasing, LLC, for inspection, larviciding, and adulticiding of hot spots, as necessary. In 2008, St. Johns County did not have an emergency situation, either due to a hurricane or to an epidemic, of mosquito-borne diseases. However, there were more sentinel chickens showing EEE virus than the previous years and a local horse succumbed to EEE in the spring. AMCD cooperated with Southern Helicopter Leasing, LLC to conduct inspections, surveillance and spot larviciding. After tropical storm Fay in August, approximately 17 inches of rain created many breeding sites and the flood water mosquitoes caused a nuisance problem in many areas. AMCD contracted with Southern Helicopter Leasing, LLC to conduct aerial spraying with ANVIL 10+10 upon approval by DACS. Several hot spots were treated for adult mosquitoes in September and October. A total of 1,940 acres (cost: \$29,000 for the helicopter & \$82,000 for larvicides for a total of \$110,600) were treated for larval control and 31,325 acres (cost: \$53,000) were sprayed for adult mosquito control by air.



Education/Training

The Education program expanded considerably in 2008. The school program expanded from five teaching events to nineteen events. AMCD has established a mosquito control education program with St. Johns County Schools and the program continues to grow. In 2008, AMCD held 2 parent/child science workshops that were successful. Additionally, the number of interns doubled this year and a volunteer program was officially established. AMCD created a new brochure for the public, "Mosquitoes and You," which is an informational brochure on the biology and prevention of mosquitoes. AMCD has established an important reputation as an educational resource for the community.

1. Public Education

(1) Teaching & Judging Events:

January 2008. Dodd Short Course (Mr. Boone taught and Dr. Xue gave a barrier spraying presentation).

February 27, 2008. Southwoods Elementary field trip. (Classroom Presentation)

May 1, 2008. RB Hunt Elementary School (4 Classroom Presentations-75 students)

May 9, 2008. RB Hunt Elementary School (4 Classroom Presentations-75 students)

May 15, 2008. RB Hunt Elementary School (3 Classroom Presentations-55 students)

May 16, 2008. RB Hunt Elementary School (3 Classroom Presentations-55 students)

June 5, 2008. Hartley Elementary School (2 Classroom Presentations-35 students)

June 6, 2008. Hartley Elementary School (3 Classroom Presentations- 55 students)

June 9, 2008. Gamble Rogers Middle School (4 Classroom Presentations-120 students)

June 26, 2008. Group home field trip. (Classroom Presentation-7 Students)

August 4, 2008. YMCA field trip (Classroom Presentation-30 students)

August 5, 2008. YMCA field trip (Classroom Presentation-30 students)

August 6, 2008. YMCA field trip (Classroom Presentation-30 students)

August 7, 2008. YMCA field trip (Classroom Presentation-30 students)

September 9, 2008. Science exploration day (Classroom Presentation-36 people)

October 4, 2008. Science exploration day (Classroom Presentation-38 people)

October 6, 2008. Home school field trip (Classroom Presentation-13 students)

October 29, 2008. Cunningham Creek Elementary School (Home School Presentation).

December 11, 2008. Murray Middle School Science Fair (Science Fair judging).



(2) Community Events

April 1, 2008. Glenmoor Retirement Community.

April 12, 2008. Southwoods Elementary Community Day.

April 19, 2008. St. Augustine Earth Day.

April 19-20, 2008. Washington Oaks Earth Day.

May 2-4, 2008. Gamble Rogers Festival.

May 29, 2008. AMCD Open House.

June 13, 2008. Hastings Courthouse.

June 18, 2008. Palm Valley Publix.

June 20, 2008. Hastings Dollar Store.

June 24, 2008. Home Depot.

June 25, 2008. Winn Dixie CR 210.

June 27, 2008. Hastings Courthouse.

June 28, 2008. Turning Point Church Community Day.

June 28, 2008. Emergency Preparedness & Safety Day.

July 1, 2008. Home Depot.

July 8, 2008. St. Johns County tax office.

September 27, 2008. National Estuaries Day (GTMNERR).



(2) Community Events (Cont'd)

October 4, 2008. Bird Island Event.
October 11, 2008. Peace and Unity Weekend.
October 11, 2008. Senior Expo.
October 16, 2008. DOH Health Fair.
October 18, 2008. Cracker Day.
October 25, 2008. Ancient City Kids Day.
November 6, 2008. St. Augustine High School Career Fair.
November 18-23, 2008. St. Johns County Fair.

(3) Public Relations

May-November 2008. Mosquito prevention PSAs. Ch.2.
May-November 2008. Mosquito prevention PSAs. Ch.3.
January-December 2008. Board meetings. Ch.2. January-December 2008. Board meetings. Ch.2.
December 4. AMCD's Legislation Education Day.
December 6, 2008. Christmas Parade

(4). Newspaper Articles

January 9, 2008. St. Augustine Record, "County selects EOC site."
January 11, 2008. St. Augustine Record, "Test Flight."
March 16, 2008. St. Augustine Record, "Business brief."
April 13, 2008. St. Augustine Record, "Mosquito Control identifies priorities for future."
April 11, 2008. St. Augustine Record, "Bid awarded for new emergency operations center."
April 25, 2008. St. Augustine Record, "County to hear ballot issues."
May 6, 2008. St. Augustine Record, "Discussion of referendum items on county commission agenda."
May 9, 2008. St. Augustine Record, "No vote on mosquito district."
May 11, 2008. St. Augustine Record, "Mosquito board scrutiny necessary."
May 14, 2008. St. Augustine Record, "What's wrong with taking straw vote?"
May 21, 2008. St. Augustine Record, "First case of encephalitis confirmed since 2005."
May 22, 2008. St. Augustine Record, "Take precautions against mosquitoes."
June 8, 2008. St. Augustine Record, "AMCD and the Department of Health urge you to protect yourself."
June 20, 2008. St. Augustine Record, "Hats tossed into ring."
July 12, 2008. St. Augustine Record, "AMCD and the Department of Health urge you to protect yourself."
July 12, 2008. St. Augustine Record, "Mosquito District sets millage."
August 3, 2008. St. Augustine Record, "AMCD and the Department of Health urge you to protect yourself."
August 7, 2008. St. Augustine Record, "Either Bequette or Howell will serve well."
August 11, 2008. St. Augustine Record, "District starts fighting mosquitoes."
August 16, 2008. St. Augustine Record, "Mosquito Control District Seat 3."
August 24, 2008. St. Augustine Record, "Report lists 90 Mosquito District violations."
August 27, 2008. St. Augustine Record, "Howell, Bequette to face off for seat."
September 4-6, 2008. St. Augustine Record, "AMCD mosquito information."
September 12, 2008. St. Augustine Record, "District battles over top evaluations."
October 13, 2008. St. Augustine Record, "Mosquito Control: 3 seats are open."
October 26, 2008. St. Augustine Record, "Suggests candidates for election."
October 30, 2008. St. Augustine Record, "Support Radford for Mosquito Control Board."
November 5, 2008. St. Augustine Record, "Bequette wins, seeks fast start."
November 5, 2008. St. Augustine Record, "Browning tops Linser."
November 5, 2008. St. Augustine Record, "Radford defeats incumbent Chiu."

2. Publications

(1) Magazines, newsletters and literature

LeBlanc, G. January 2008. Anastasia Mosquito Control District Brochure.

LeBlanc, G. January 2008. Mosquitoes and You Brochure.

LeBlanc, G. September 14, 2008. Information Digest 13.

Xue, RD, Qualls, WA, Zhong, H, Brock, CL. 2008. Permethrin decomposition after four month storage in the spray truck tanks during mosquito off season, Journal of the American Mosquito Control Association (JAMCA) 24:127-129.

Xue, RD. 2008. Introduction to symposium on mosquitoes and plants, Journal of the American Mosquito Control Association (JAMCA) 24:134-137.

Zhu, JW, Zeng, XP, O'neal, M, Schultz, G, Tucker, B, Coats, J, Bartholomay, L, Xue, RD. 2008. Mosquito larvicidal activity of botanical-based mosquito repellents, JAMCA. 24:161-168.

Xue, R.D. 2008. Toxicity of permethrin-, malathion-, and fipronil-treated plant foliage to *Aedes albopictus* and *Aedes aegypti*, JAMCA 24:169-171.

Xue, RD, Doyle, MA, Kline, DL 2008. Field evaluation of CDC and mosquito magnet® x traps baited with dry ice, CO2, sachet, and octenol against mosquitoes, JAMCA, 24:249-252.

Xue, RD, Ali, A, Kline, DL, Barnard, DR. 2008. Field evaluation of boric acid- and fipronil- based bait stations against adult mosquitoes, JAMCA 24:415-418.

Amoo, AOJ, Xue, RD, Qualls, WA, Quinn, BP, Bernier, UR. 2008. Residual efficacy of field-applied permethrin, d-phenothrin, and resmethrin on plant foliage against adult mosquitoes, JAMCA 24:543-549.

Xue, RD, Qualls, WA. 2008. Arbovirus surveillance in St. Johns County, Florida, Technical Bulletin of the FMCA 8:27-30.

Xue, RD, Ali, A, Barnard, DR. 2008. Host species diversity and post-blood feeding carbohydrate availability enhance survival of females and fecundity in *Aedes albopictus* (Diptera: Culicidae), Experimental Parasitology 119:225-228.

(2) Web Site (www.anastasiamed.org)

AMCD's website is updated on a biweekly basis. In 2008, the website was expanded to include the WNV map of the country, updated District Bid/RFP information, biology and prevention information on local insect nuisance problems, and mosquito control links for counties throughout the state of Florida.

(3) Employee Continuing Education:

(a) Classes:

January 10, 2008. FRS, Cash and Debt Management, Scott Hanna

January 16, 2008. "Arachnids," Whitney Swan.

January 16, 2008. "Snakes," Joseph Burgess.

January 16, 2008. "Larvicide Troubleshooting," James Wynn.

January 16, 2008. "Taxes, Deferred Compensation and IRA's," Scott Hanna.

January 23, 2008. "Mosquitoes and Plants," Rui-De Xue.

January 23, 2008. "Fire Safety," Patrick Kendrick.

January 23, 2008. "Infectious Diseases," Katherine McCombs.

January 23, 2008. "Aquatic Biology," DEP's Biologist.

February 13, 2008. "Barrier Treatment Application," Mike Smith.

February 13, 2008. "IPM," Rui-De Xue.

February 13, 2008. "Marsh Restoration," DEP's Biologist.

February 20, 2008. "Commercial Traps," Rui-De Xue.

February 20, 2008. "Pocket PC," Richard Weaver.

May 5, 2008. "Overview of AMCD's Programs," Rui-De Xue.

May 5, 2008. "Federal and State's Regulation about Pesticides," Priscilla Greene and Richard Weaver.

May 5, 2008. "Mosquito Biology," Whitney Swan.

May 5, 2008. "Mosquito-borne Diseases," Whitney Swan.

May 6, 2008. "Area and Concentration Calculation," Gina LeBlanc.

May 6, 2008. "Adult Mosquito Surveillance," Mike Smith.

(a) Classes: (Cont'd)

May 6, 2008. "Update about Arbovirus Surveillance," Whitney Swan.
May 6, 2008. "AMCD's Applied Research Accomplishments," Rui-De Xue.
May 7, 2008. "Customer Service and Personal Protection," Kay Gaines.
May 7, 2008. "Mosquito Habitats," Mike Smith. 19
May 8, 2008. "How to Prevent and Remove Ticks," Rui-De Xue.
May 8, 2008. "VCMS Training," Richard Weaver.
May 8, 2008. "Sexual Harassment, Workplace Safety, Anti-drug Use, Anti-violence and Anti-alcohol Training," Priscilla Greene.
May 8, 2008. "ULV Equipment Troubleshooting," James Wynn.
June 11, 2008. "Mosquito Quest for Sugar," Joseph.
June 11, 2008. "Ticks," Rui-De Xue.
June 11, 2008. "Education Program Update," Gina LeBlanc.
August 12, 2008. "Customer Satisfaction Survey," Gina LeBlanc.
August 12, 2008. "Duet Project," Whitney Swan.
August 12, 2008. "Malaria in Angola," Rui-De Xue.
October 23, 2008. "Bird Lice," Adam Holt.
October 23, 2008. "Aflac Insurance," David Aboulafia.
October 23, 2008. "Vegetation Treatments Against Mosquitoes," John Boone.
November 13, 2008. Barrier Treatments by Rui-De Xue, Whitney Qualls, Aerial Larviciding by Kay Gaines.

(b) Symposiums, Workshops & Professional Meetings:

March 24-26, 2008. 5th Arbovirus Surveillance and Mosquito Control Workshop (Dr. Xue & Dr. Kline, Organizers).
March 2-5, 2008. AMCA Annual Meeting Symposium (Pesticides and the Environments) (Dr. Xue, Commissioners Moeller and Wampler), Reno, NV.
November 17-19, 2008. FMCA Annual Meeting Symposium (Barrier Treatment Against Mosquito Infestations, Organized by Dr. Xue and Dr. Muller), Panama City, FL.

(c) Presentations at Professional /Community Meetings/Associations/Clubs:

Aerial contract service for mosquito control in St. Johns county, Florida, Fly-In Class, FMCA, Ft. Myers, FL, January 12-14, 2008 (Dr. Xue).
Overview of vegetation barrier treatments against mosquitoes in St. Johns County, The FMCA Dodd Short Course, Ocala, January 26-29, 2008 (Dr. Xue).
Introduction to symposium on pesticides and the environments, AMCA 74th Annual Meeting, Reno, NV, March 2-5, 2008 (Dr. Xue).
Solar impacts of mosquito larvicide-altosid XR-G, AMCA 74th Annual Meeting, Reno, NV, March 2-5, 2008 (Mrs. Qualls).
Permethrin decomposition in spraying truck tank after mosquito seasons, AMCA 74th Annual Meeting, Reno, NV, March 2-5, 2008 (Dr. Xue).
Overview of spraying insecticides on plants against adult mosquitoes, 5th workshop, AMCD, March 24-26, 2008 (Dr. Xue).
Population dynamics of Aedes infirmatus and Aedes atlanticus, 5th workshop, AMCD, March 24-26, 2008 (Mrs. Qualls).
Aerial larviciding in St. Johns County 2008 for all AMCD's employee training, November 13 and the FMCA annual meeting, Panama City, FL, November 17-19, 2008 (Mrs. Gaines, Dr. Xue, Mr. Smith).
Overview of the barrier treatments, Annual Meeting of the FMCA, Panama City, FL, November 17-19, 2008 (Dr. Xue).
Barrier Treatment by mosquito magnets, Annual Meeting of the FMCA, Panama City, FL, November 17-19, 2008 (Dr. Xue and Mrs. Qualls).
Insecticide spraying on vegetation against EEE in northeast St. Johns County, Annual Meeting of the FMCA, Panama City, FL November 17-19, 2008 (Mr. Boone).
Vegetation barrier treatments against mosquitoes in recreational parks and residential areas, Annual Meeting of the FMCA, Panama City, FL, November, 17-19, 2008 (Mrs. Qualls, Dr. Xue, Mr. Smith).
Overview of AMCDs programs-who we are and what we do? AMCD Legislation Education, AMCD, St. Augustine, FL, December 4, 2008 (Dr. Xue).
Mosquito-borne diseases, Legislation Education, AMCD, St. Augustine, FL, December 4, 2008 (Mrs. Qualls).
AMCD's education program, Legislation Education, AMCD, St. Augustine, FL, December 4, 2008 (Mr. Holt and Mrs. LeBlanc).

Applied Research

The purpose of our applied research is to test the efficacy of existing and new innovative methods of mosquito control and to develop new technologies that will allow us to reduce our operational costs.



Barrier Treatment:

In 2008, we continued to investigate barrier treatment applications for use in residential areas, the Ranch Road area, State Parks, and recreational parks. The effectiveness of the treatments lasted for 3 to 5 weeks.

Mosquito plant-feeding behavior & survival:

Intern students checked the survival of mosquitoes based on house plants without flowers. The results showed that the adult mosquitoes can survive feeding on plant juices.

DUET Project & Resistance:

We received outside funding from Clarke Mosquito Control to evaluate a new product, DUET, in the laboratory and the field, against mosquitoes in St. Johns County, Florida. The result showed that the efficacy against adult mosquitoes is better than ANVIL 10+10 and less toxic to honey bees than Naled.

All adulticides used at AMCD were evaluated against local honey bee populations in the field and in the laboratory. Field populations of *Aedes albopictus*, *Ae. infirmatus*, *Ae. atlanticus*, *Ae. taeniorhynchus*, *Culex quinquefasciatus*, *Ps. columbiae*, and *Ps. ferox* were tested for resistance to Diabrom and Aqueslin throughout the 2008 mosquito season. No resistance was found to these insecticides.

Larvicide Test:

We evaluated a common household product as a possible new larvicide in both the laboratory and semi-field troughs against *Cx. quinquefasciatus*, tadpoles, and ostracods. The antibacterial detergent showed promise as a new larvicide.

Administration/Supply

1. **Budget:** Staff prepared the 08/09 budget and millage rate calculation. The final budget and millage rate of 0.1325 was approved by the Board at the final Public Hearing on September 25, 2008. Ms. Klein was appointed as AMCD's part time CPA by the Board. The accountant and the VCMS Coordinator completed all monthly DACS financial, operation, and chemical usage reports on time.
2. **Supply:** Staff prepared for 18 Board Meetings/Workshops, including Board Books, meeting Minutes, documentation, meeting rooms, and equipment/facility. Staff & employees processed 1,600 service requests.
3. **Insurances:** The health insurance carrier for the year was provided by Blue Cross /Blue Shield of Florida. Dental insurance continued to be offered by Metropolitan and life insurance by Principal. Staff cooperated with all requests from our insurance broker for these coverage's.
4. **Inventory.** The annual physical inventory, the monthly tire and monthly chemical inventory were all completed regularly. All surplus Malathion has been sold.
5. **Policy:** The employee Whistleblower Protection Policy and Contract Renewal Policy, were prepared and approved by the Board.
6. **Contract:** AMCD renewed with the town of Hastings for the property lease and with Clarke Mosquito Control for emergency aerial spraying. AMCD entered into a new contract with Southern Helicopter Leasing, LLC for inspection, larviciding and adulticiding.
7. **Auditors:** Annual financial information was given to the District Auditor who compiled and reported to the Board during the March meeting. District environmental compliance and safety has been improved. An inspection by DACS and a 3rd party Environmental Audit was conducted in the spring.
8. **Equipment:** AMCD purchased four new vehicles to replace old ULV trucks. The laboratory bought two surplus tools from the Pasco Mosquito Control District in February.
9. **Maintains:** Employees and the mechanics did calibration of all ULV machines before mosquito season.
10. **Safety:** The Safety Committee cooperated with environmental auditors to inspect and make corrections. Overall knowledge of law and regulations made great progress. The District Safety Award has been transferred from the South Station to the North Station.
11. **Personnel:** Annual employee performance evaluations were done by the end of February 2008. The employees who completed a 5-year anniversary, and Pat Kendrick for outstanding service, were recognized in December. David King was appointed as a full time Inspector/Sprayer I on Feb 1, 2008. Priscilla Greene was hired as the Assistant Director on March 10, 2008. Seven seasonal inspectors worked for AMCD from May through October, and three part-time employees worked for AMCD for 2-3 months. Charolette McElroy's job title was changed to Administrative Office Assistant based on Interim Business Manager, Nick Meiszer's recommendation. Mike Smith's job title was adjusted from Inspector/Sprayer IV to Biological Technician based on the DACS surveillance project and the District's need.

ANASTASIA MOSQUITO CONTROL DISTRICT		
OF ST. JOHNS COUNTY		
CONSOLIDATED FINANCIAL STATEMENTS -- LOCAL FUND - YEAR END 2008		
		2008
REVENUE		3,359,511
EXPENDITURES		2,789,748
EXCESS or (DEFICIT)		569,763
BEGINNING CASH BALANCES		4,706,852
ACCRUAL\CASH ADJUSTMENT		108,327
ENDING CASH BALANCES		5,384,942
RESERVES:		
	CONTINGENCY	70,939
	FUTURE CAPITAL OUTLAY	400,000
	RESERVES TO BE CARRIED FOWARD	366,776
	ENDING CASH BALANCES	4,547,227
TOTAL RESERVES		5,384,942

ANASTASIA MOSQUITO CONTROL DISTRICT		
OF ST. JOHNS COUNTY		
CONSOLIDATED FINANCIAL STATEMENTS -- STATE I FUND-- YEAR END 2008		
		2008
REVENUE		37,525
EXPENDITURES		90,233
EXCESS or (DEFICIT)		(52,708)
BEGINNING CASH BALANCES		78,996
ACCRUAL\CASH ADJUSTMENT		1
ENDING CASH BALANCES		26,289
RESERVES:		
	CONTINGENCY	1,000
	FUTURE CAPITAL OUTLAY	-
	SICK/VACATION LEAVE	-
	ENDING CASH BALANCES	25,289
TOTAL RESERVES		26,289

OPERATIONS SUMMARY	
OPERATIONS	HOURS
Administrative	9611.9
Adulticide	942.6
Air Program	220.2
Assist	1063.4
Bio Control	67.3
Building Maintenance	5430.1
Calib	24.8
Chemical	60.5
Chicken Survey	1656.0
Computer Repair	142.3
Dry Ice	3.7
Equipment Maintenance	372.2
Field Experiment	481.4
Filling Truck	70.6
Gas	77.5
Grounds work	1572.0
Hand Fog	48.3
Identify	193.4
Insectary	987.1
Inspect	11656.7
Inventory	247.7
Lab Experiment	1097.9
Larvicide	2862.2
Light Traps	1730.7
Mechanic/Vehicle/Equipment	1340.7
Meeting	3395.0
Molecular	16.5
Office	2057.2
Other	440.6
Pickle Jar Trap	21.7
Public Relation	589.3
Science Paper & Pre	750.8
Special Project	480.5
Supervisory	4274.4
Tire	128.5
Trails	478.7
Training	2302.3
Travel	1024.7
Vehicle Maint.	809.6
Water	49.4
XCL Fog min pay	4.0
Admin Leave	514.0
Annual Leave	3943.0
Holiday	2503.0
Leave Without Pay (L.W.P.)	810.5
Sick Leave	2436.5
Sick/Personal Leave	176.0
TOTAL LEAVE	10383.0
TOTAL HOURS	69167.3
TOTAL WORK	58784.3

Committee Members & Contributors

Editor: Dr. Rui-De Xue, Director/Entomologist

Members: Ms. Priscilla Greene, Assistant Director

Mr. Richard Weaver, VCMS Coordinator

Mrs. Whitney Swan, Biological Technician

Ms. Charolette McElroy, Administrative Office Assistant

Mrs. Gina LeBlanc, Education Specialist

Acknowledgments

We thank all members of the Board of Commissioners, the District's Attorney, all employees, all contractors, and cooperative organizations and agencies for helping AMCD's programs in 2008. We also thank USDA/ARS/ Center for Medical, Agricultural, and Veterinary Entomology, Mosquito & Fly Unit who gave us their support for workshops, symposiums, lectures, and research, the Department of Agricultural & Consumer Services who provided partial funding, Clarke Mosquito Control for funding the DUET and aerial spraying projects, the State Department of Health, Tampa Laboratory who helped to test arboviruses and local residents who allowed us to use their property to conduct surveillance and experiments.