Anastasia Mosquito Control District of St. Johns County

2018 Annual Program Report

- Screened Enclosures
- Chicken Coops for Chicken Surveillance Program
- Research Property Construction
- Aerial View 1-17-19
- Left: Gravid Traps
- Right: AGO Traps
- Bell 206B3 Helicopter for AMCD Aerial Capability
  - July 12, 2018

(904) 471-3107 * 120 EOC Drive, St. Augustine, FL 32092 * www.amcdsjc.org
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PREFACE

A MESSAGE FROM THE CHAIRPERSON

We have had a very successful year in mosquito control in 2018. The District purchased a surplus helicopter from the Lee County Mosquito Control District and we started to build our hangar to have our aerial program running in 2019. St. Johns County residents have been free of locally-acquired mosquito-borne diseases for the past 15 yrs. The District attracted & received approximately 300 thousand dollars in grants, materials, labor, and other funds to assist the District’s programs. We kept a low millage rate and utilized our best efforts to control the mosquitoes and mosquito-borne diseases. Most of the phase II construction project has been almost completed and the Board approved the concept to build a Disease Vector Museum for promotion of public education and outreach. Mr. Don Girvan was appointed on December 7 to the Board to replace Jacqueline Rock, who resigned on December 2, 2018 and Commissioner Jeanne Moeller was re-elected. Mrs. Trish Becker was elected in November to replace Mrs. Catherine Brandhorst in January 2019. Thank you to our Board members, all of AMCD’s employees, and all of St. Johns County’s citizens for their support.

A MESSAGE FROM THE DIRECTOR

In 2018 there were higher numbers of sentinel chickens (83) that tested positive for arbovirus in St. Johns County, compared with 2016 (1) and 2017(1). Also, we had two EEE horses and 1 pool of mosquitoes positive for WNV. AMCD received and provided 1,550 service requests. St. Johns County is continuing in 15 years without any locally acquired mosquito-borne diseases. AMCD, as a collaborator, received partial grants or equal value for labor or materials worth about $300,000 from SpringStar/NIH, CDC, DACS, and other companies, to support our programs. AMCD collaborated with the USDA, FMCA’s NE Regional Director, and the NE 1443 Regional Project Committee to successfully organize and hold the 15th annual workshop and attracted 180 registrants from outside of AMCD. AMCD provided the training and supported 8 intern students and 7 visiting scientists through different fund resources. Two employees received AMCA and FMCA awards & scholarships. I was elected as the Executive Director for the World Mosquito Control Association and successfully served the FMCA as the past President and served the Florida Entomology Society as President for the 2nd time. Even though I lost the election, I had been nominated to run for the AMCA Vice President election again. Thank you to our Board of Commissioners, all employees, all collaborators and related organizations and agencies for their cooperation and supporting our programs.
ANASTASIA MOSQUITO CONTROL DISTRICT
OF ST. JOHNS COUNTY
BOARD OF COMMISSIONERS

Mr. Gary Howell
Seat 5
2013-2020

Mrs. Gina LeBlanc
Seat 1
2017-2020

Mrs. Catherine Brandhorst
Seat 4
2011-2018

Mrs. Jeanne Moeller
Seat 2
2007-2018

Mrs. Jacqueline Rock
Seat 3
2017-2018
Resigned 12-2-18

Mr. Don Girvan
Seat 3
2018-2020
Appointed 12-7-18 through 12-30-20

ANASTASIA MOSQUITO CONTROL DISTRICT
APPOINTED OFFICERS

Mr. Wayne Flowers,
Attorney, since: 11-9-10

Ms. Julieann Klein, CPA
since: 9-11-03

Dr. Rui-De Xue, Director
Hired: 4-14-03
Director since: 2005
PERSONNEL: Our voluntary visiting scientists: Mrs. Hui Liu, from Jiangsu Provincial CDC, from 5-2-18 through 7-30-18, Dr. Ding Zhu and Dr. Chao Shi, from Wuxi CDC, Jiangsu Province, China, from August 1st through October 26, 2018, Mrs. Kathy Shirley from Valley Ridge Academy Science Education from 6-4-18 through 7-10-18, Dr. Emad Khater from Ain Shams University in Cairo, Egypt from 9-4-18 through 11-7-18, and a visiting scientist from the University of Mexico join us as a Post Doctorate who worked with AMCD and UF, Dr. Hussein Sanchez Arroyo (8-1-18 to 7-31-19). There were 8 seasonal interns in 2018: Morgan Smith (1-8-18 to 2-23-18), Lagan Mullin (5-1-18 to 8-17-18), Dillon Streuber (5-14-18 to 7-31-18), Courtney Cunningham (5-8-18 to 10-31-18), Catherine Chase (5-14-18 to 7-17-18), Parker Brown (5-15-18 to 06-26-18), Caroline Blunck (7-12-18 to 12-20-18) and Nicholas Acevedo (8-3-18 to 12-20-18).

From May through October, we had 3 returning seasonal (6 mo.) inspector sprayers: Ray Gaulden (4th yr.), Phillip Vaughn (3rd yr.), and John Blalock (2nd yr.), also, 3 new inspector sprayers: Dazmond Hackney (5-1-18 to 10-31-18), Shannon Bentley (05-21-18 to 10-31-18) and Brenda Surratt-Robertson (5-1-18 to 6-25-18).

Mr. Joseph D’Amato, Biological Technician, resigned on 10-26-18 to advance his career in an environmental position with the Navy, Mr. Steven Solana, MC Technician will retire on 1-04-19 after eighteen and a half (18 1/2) years of service with AMCD and Dr. Daniel Dixon will resign on January 3, 2019 after three years with AMCD to obtain a position with the USDA, and on October 22, 2018 AMCD hired a Pilot, Mr. Peter Paul Leone III.

RECOGNITIONS AND AWARDS:

Christopher Bibbs, AMCD Biologist, received the AMCA 2nd Place Student Paper Competition Award at the AMCA annual meeting in Kansas City, MO., February 26-27, 2018. He was also one of three students in Florida who received the Florida Entomological Society (July 2018) and the FMCA (Nov. 2018) Ph.D. Student Paper Award.

James Wynn, AMCD Mechanic, received the AMCA Boyd- Ariaz Grassroots Award for 2018 at the AMCA Annual Meeting in Kansas City, MO. February 26-27, 2018.

Carlye Tulley received a scholarship for the FMCA Dodd Short Course from the CDC Southeastern Center for Excellence in Vector borne diseases in January 2018.

The following AMCD personnel received awards for their years of service with the District: Mr. Patrick Kendrick, Mosquito Control Technician; Mr. Richard Weaver, Data Manager; and Dr. Rui-De Xue, Director; each for 15 years of service and dedication to the District and the Managements Choice Awards were presented to Richard Weaver and James Wynn with bonuses for all extra work this year and for their significant contributions and dedication to the District.
2018  
SEASONAL (6 MONTH) EMPLOYEES

Raymond Gaudden, Inspector Sprayer  
5/1/18-10/31-18  
(9 yrs.)

Phillip Vaughen, Inspector Sprayer  
5/1/18-10/31-18  
(3 yrs.)

John Blalock, Inspector Sprayer  
5/1/18-10/31-18  
(2 yrs.)

Shannon Bentley, Inspector Sprayer  
5/21/18-10/31-18

Desmond Hackney, Inspector Sprayer  
5/1/18-10/31-18

Brenda Surratt-Robertson, Inspector Sprayer  
5/1/18-6/25-18

Morgan Smith, Lab Tech, Intern  
5/6/18-2/25-18

Courtney Cunningham, Intern  
5/6/18-10/31-18

Catherine Chase, Intern  
5/14/18-7/17-18

Ellen Stroehle, Intern  
5/14/18-7/23-18

Parker Brown, Intern  
5/15/18-6/26-18

Logan Mullivan, Intern  
5/7/18-8/17-18

Caroline Schneck, Intern  
7/12/18-12/20-18

Nicholas Accandia, Intern  
8/6/18-12/20-18

VISITING SCIENTISTS

Dr. Qiang Zhu, Visiting Scientist, Jiangsu Province  
07/01/18-10/26-18

Dr. Qiang Zhu, Visiting Scientist, Jiangsu Province  
07/15/18-10/26-18

Mrs. Hui Liu, Visiting Scientist, Jiangsu Province CEC  
03/01/15-07/30-18

Dr. Imed Chehata, Visiting Scientist, Al Ain, UAE  
08-18 to 11-07-18

Dr. Xiaolin Sosa, Arroyo, Visiting Scientist, State of Mexico  
01-18 to 7-22-18

Dr. Michael Trent, Adjunct Teacher Arkansas, October 2018

Dr. Curtis Mark, Adjunct Teacher Evangelist October 2018

ADJUNCT PROFESSORS
SAFETY COMMITTEE:
Data Manager (Safety Coordinator): Mr. Richard Weaver, (Chair)
Operations Manager: Mrs. Marcia Kay Gaines
Supervisor: Mr. Athan Tom Columbus
MC Technicians: Mr. Ricky Stockley; Mr. John “Freddie” Allen, and Mr. Steven Solana

APPLIED RESEARCH COMMITTEE:
Commissioner: Mrs. Jeanne Moeller (Chair)
Molecular Biologist: Dr. Daniel Dixon
Data Manager: Mr. Richard Weaver
Biological Tech.: Mr. Joseph D’Amato
Biologist: Mr. Christopher Bibbs
Education Specialist: Ms. Molly Clark
MC Technician: Ms. Dena Autry

EDUCATION COMMITTEE:
Commissioner: Mrs. Jacqueline Rock, (Chair)
Biologist: Mr. Christopher Bibbs
Education Specialist: Ms. Molly Clark
Molecular Biologist: Dr. Daniel Dixon
Operations Mgr.: Mrs. Marcia Kay Gaines
Biological Tech.: Mr. Joseph D’Amato
MC Technician: Mr. Patrick Kendrick

PLANNING COMMITTEE:
Commissioner: Mrs. Gina LeBlanc, (Chair)
Director: Dr. Rui De Xue
Biologist: Mr. Christopher Bibbs
Operations Mgr.: Mrs. Marcia Kay Gaines
Data Manager: Mr. Richard Weaver
Supervisor: Mr. Athan Tom Columbus

FINANCIAL/AUDIT COMMITTEE:
Commissioner: Mrs. Catherine Brandhorst, (Chair)
Director: Dr. Rui De Xue
Accountant: Mr. Scott Hanna
Data Manager: Mr. Richard Weaver
Admin. Assist.: Ms. Charolette M. Hall
Operations Mgr.: Mrs. Marcia Kay Gaines

EMERGENCY RESPONSE COMMITTEE:
Operations Mgr.: Mrs. Marcia Kay Gaines (Chair)
Supervisor: Mr. Athan Tom Columbus
Data Manager: Mr. Richard Weaver
Biologist: Mr. Christopher Bibbs
Admin. Assist.: Ms. Charolette M. Hall
Education Specialist: Ms. Molly Clark

OPERATIONAL COMMITTEE:
GROUND/AERIAL
Commissioner: Mr. Gary Howell (Chair)
Director: Dr. Rui De Xue
Supervisor: Mr. Athan Tom Columbus
Oper. Mgr.: Mrs. Marcia Kay Gaines
Data Manager: Mr. Richard Weaver
Molecular Biologist: Dr. Daniel Dixon
MC Technician: Mr. David Strickland

AERIAL COMMITTEE:
Commissioner: Mr. Gary Howell (Chair)
Director: Dr. Rui De Xue
Operations Mgr.: Mrs. Marcia Kay Gaines
Data Manager: Mr. Richard Weaver
Pilot: Mr. Peter Paul Leone (Volusia MCD)
Pilot (Ret’d): Mr. Brad Gunn (Beach MCD)
In 2018 AMCD staff were located in the Base Station Complex at 120 EOC Drive. Harrell Construction Co., Inc. anticipates the completion of the construction of the eight acre south parcel and research property in March of 2019, which will increase the efficiency at AMCD.

AMCD purchased a Bell 206B3 helicopter, after approval of the contract by the Board of Commissioners on July 12, 2018, from used surplus from the Lee County Mosquito Control District, for aerial capability for the citizens of St. Johns County.

The North Station property, located at 10150 Cartwheel Bay Ave., St. Johns, FL 32259 was sold on March 15, 2018 to Blue Star Veterinary Hospital for $650,000.00.

AMCD continues providing many services to the citizens of St. Johns County, including, but not limited to: conducting inspections; mosquito control; working with and conducting public education and assistance for local organizations, schools, homeowners associations, and the community in general – to help with surveillance and control of the populations of mosquitoes; to reduce the chance of human virus association and to protect the environment; conducting larviciding and adulticiding especially during the mosquito season from March through November; conducting applied research to test ideas and products to reduce the mosquito population; and providing employee training to keep up with modern technology to help in the control of mosquitoes and mosquito-borne diseases.

In the November 6, 2018 midterm elections; Mrs. Panagiota K. Trish Becker won seat 4, over incumbent Mrs. Catherine Brandhorst. Mrs. Becker’s term will begin on Tuesday, January 8, 2019. After Mrs. Jacqueline Rock resigned her Seat 3 on December 2, 2018, the Commissioner of Agriculture, Mr. Adam Putnam appointed Mr. Don Girvan to Seat 3, beginning December 7, 2018 and he will serve the remainder of that term through December 31, 2020. Commissioner Jeanne Moeller, Seat 2, was re-elected in November for another 4 year term.
FINANCIAL SUMMARY
Fiscal Year - Oct. 1, 2017 through Sept. 30, 2018

TOTAL DISTRICT REVENUES

Ad Valorem Taxes 81.1%
Ad Valorem Taxes $4,970,641
Prior Year Tax Distrib. $12,319
Interest Income $79,060
Intergovernmental $0
Grants $119,673
Other $949,408

Ad Valorem (real property) Current Year Taxes, the primary source of revenue, $4,970,641, comprised of approximately 81.1% of the total Revenues of $6,131,101. Grant Revenues, from Applied Research, Totaling $119,673, shows continued growth. Miscellaneous Revenues, atypical in nature, comprised of $650,000 for the sale of the District’s Northwest sub-station (part of the consolidation process), and $260,691 in FEMA reimbursements. The District’s millage rate remained the same at 0.2150 for the second consecutive year through FY 17/18.

TOTAL DISTRICT EXPENDITURES

$5,226,973

Personal Services, 40%, $2,112,399
Capital Outlay 45%, $2,350,812
Chemical Usage, 4%, $179,159
Operating Expenses, 11%, $584,603

Expenditures for the year were comparatively less than Revenues. The majority were attributed to Personal Services, 40%, and Capital Outlay, 45%, two thirds of which was used for continuation of Phase II of the District Facility Project to be completed in the following 18/19 Fiscal Year.
**BOARD BUSINESS:** AMCD staff provided many documents to Board members and the attorney for Board and Committee meetings in 2018 and supported 12 Board meetings, including the annual First and Final Public Hearings in September for the fiscal year budget and millage. The Service Request Phone App was made available this year to all smart device users in the public for free from the Google Play Store and Apple Apps Store, through GeoMosquito (MGIS). Commissioner Jacqueline Rock informed the Board in May, 2018 that she was resigning her Seat 3 to run for the City of St. Augustine Mayor. Her resignation became effective December 2, 2018. Agricultural Commissioner, Adam Putnam appointed Mr. Don Girvan to Seat 3, effective December 7, 2018 through the rest of the term, December 30, 2020.

**INVENTORY:** The annual physical inventory, monthly tire inventory, and chemical inventory were done regularly. One vehicle was approved for surplus, along with various equipment and other items April 12, 2018.

**DACS INSPECTION:** The Dept. of Agriculture and Consumer Services conducts a “Mosquito Control Pesticide Use Inspection” every 2 years: AMCD’s Inspection that was done in 2015 and 2017 reflected no deficiencies. It is due again in 2019.

**CONTRACTS:** After approval from the Board, many annual contracts were renewed for 2018 or sent out for bid, RFP, or by utilizing the state contracts to assure the District was obtaining the best services at the best possible prices. Some of these included, but were not limited to, the Auditor Contract in May 2018 (continually from 2003) with Julieann Klein from Lombardo, Spradley & Klein; Application Dynamics for small area aerial spraying and with VDCI for large areas adulticiding for 2018; The Board approved; the purchase of a helicopter in May 2018 and the contract for it in July 2018 and the Cintas Uniform contract was approved at the September 13, 2018 Board meeting; AV Fuel Corp. contract for purchase of Jet-A Fuel was approved Oct. 18, 2018 and a contract was approved with St. Johns County Aug. 30, 2018, to rent their hangar to temporarily house the helicopter; Resolution 2018-01 for the 2018 Elections was approved February 15, 2018, as was Resolutions 2018-02 for the millage rate (0.2200) and 2018-03 for the Budget on September 27, 2018 at the Final Public Hearing.

**INSURANCE:** The Board renewed the dental, life, and health, as well as fleet and Worker’s Compensation insurances at the December 13, 2018 Board meeting, again with little differences from the last couple of years; the annual renewals of the Tank Liability Insurance, Fleet Liability and Workers Compensation Ins. at the Sept. 13, 2018 Board meeting, Aviation Hull and Liability Insurance was approved Oct. 12, 2018.

**POLICIES:** The Board approved the updated version of the Commissioner’s Handbook on April 12, 2018 and staff continued updating the District’s Policy Manual and Employee Handbook in 2018 as policies were changed or added.
AMCD WEBSITE:
The AMCD’s website: www.amcdsjc.org continued to provide helpful, important information, such as: important links, public notices, meeting dates, along with, illness advisories, training and workshop information, mosquito biology, as well as document access, public education and employment opportunities, & much more. AMCD is also active on Facebook and Twitter and hosts an online survey to determine customer satisfaction.

During 2018, AMCD continued utilizing the GeoMosquito database computer software program through the website for customer service requests and fogging and now in 2018, GeoMosquito released the free AMCD Phone App for the St. Johns County citizens to now use their Android or I-Phone and smart devices to enter service requests and/or check fogging and service request information via their smart phones and tablets.

We frequently updated our website in 2018 to enable our St. Johns County residents to be informed and to check to see if their address was scheduled for fogging and to enter service requests.

AMCD answered 1,567 service requests in 2018 from local residents by phone, online through our website, by e-mail, fax, and walk-ins.

AMCD held an Open House on May 24, 2018 which was open to all the citizens of St. Johns County. Many were invited, including the Bee Keepers Association, Master Gardeners, the aerial committee members and pilots, as well as, the citizens of St. Johns County who were interested in what we do and who we are. We also had a Media Information Open House on June 26th during National Mosquito Control Awareness week, to get information out on EEE advisory’s in St. Johns County.

AMCD continued to provide service and to educate residents on adult mosquitoes, larvae, adulticiding and larviciding. Staff also dispensed valuable information pertaining to pesticide safety, identification of mosquitoes & other insects, mosquito prevention and pesticide applications, and personal protection methods, as well as commercial mosquito traps, repellents and insecticides, assisting residents with concerns about no treatment areas, such as, bee-keepers properties or personal conditions that warrant no treatment.

Staff also assisted the public by distributing Gambusia, the mosquito larvae eating fish.

AMCD continues to follow Florida Statutes, Chapter 388, 5E-13, DACS’s, EPA labels and Safety Data Sheets, and the District’s policies and procedures while providing necessary inspections, adulticiding and larviciding.
The Anastasia Mosquito Control District of St. Johns County works in cooperation with a number of related local, state, federal agencies, even international, private and commercial organizations, and members of the medical community. Those listed below briefly describe the work associations with AMCD in 2018 to prevent and control vector-borne diseases in Florida.

International Cooperation and Activities:

Continue collaboration with Dr. Gunter Muller, the Hebrew University of Jerusalem, Israel and University of Bamako, Mali on attractive toxic sugar baits and ecology of vector mosquitoes.

Continue collaboration with the Western LLC, Israel, on attractive toxic sugar baits and bait station.

AMCD hosted international visitors: Dr. Emad Khater from Saudi Arabia for 2 months, Dr. Hui Liu from Jiangsu CDC, Dr. Zhu Ding, and Dr. Shi Chao from Wuxi CDC, China for 3 months, and Mr. Chun-Hua Shen, CEO, and Mr. Alan Zhang, World Sale Manager of LongRay, China, and Mr. Brian Liang, Manager, American LongRay for visiting.

Collaborated with Dr. Tong-yan Zhao to organize the 6th International Forum for Surveillance and Control of Mosquitoes and vector-borne Diseases, Xiamen, China, May 26-30, 2019.

Dr. Xue attended the RB’s Vector Control Group meeting in Geneva in early Feb, 2018.

Dr. Xue attended the Asian Vector Control meeting in Beijing, late March 2018.

Dr. Xue visited Jeddah City, Saudi Arabia for dengue vector control consulting in late April, 2018.

Mr. Chris Bibbs gave the panel lecture about vaporizing insecticide at the Australia Mosquito Control Association in early September, 2018

Dr. Xue visited and gave lectures at Jiangsu Provincial CDC, Zhangjiang International Travel Health Center, Beijing Institute of Microbiology and Epidemiology, China, October, 2018.

Dr. Xue attended and gave presentation at the 7th International Forum for sustainable management of disease vectors, Ningbo, China, October 22-24, 2018 and gave talking about Aedes vector control new technology at the 2nd Congress of the World Life Sciences, Beijing, China, October 27, 2018.

Ms. Molly Clark visited/gave a lecture about AMCD’s education and outreach at Wuxi CDC and Jiangsu CDC in China.

Mr. Chris Bibbs gave the invited presentation and student paper at the ESA annual meeting, Vancouver, Canada, middle of November 2018.

AMCD signed MOUs about exchanging visitors, training, and applied research with Wuxi CDC, Zhejiang International Travel Health Center, and Dallah, Saudi Arabia.
Collaborated with the USDA/CMAVE to continue organizing the annual workshop and evaluation of traps & repellents, and Stern Insect Technology for control of *Aedes aegypti*.

Continued to collaborate with NECE, Jacksonville, FL to evaluate spray influencing factors and ovitraps.

Continued collaborating with the NE 1443 project committee to organize the annual workshop.

AMCD is a sustaining member of the AMCA and AMCA/EPA’s PESP member and provided the annual report. AMCD provided training for 12 people from CDC system in May, 2018. AMCD provided a booth on equipment and gave a presentation about vector control response at the Vector Control Workshop organized by the NACCHO in Orlando, middle of March 2018. Dr. Xue organized bridging the gap between research and operation symposium for the AMCA annual meeting, Kansas City, February 2018.

Dr. Xue continues to serve the SOVE Board. Commissioner Mrs. Moeller and Dr. Xue attended the SOVE 48th Annual meeting in California. Dr. Xue reviewed numerous numbers of manuscripts for the Entomological Society of American’s Journals, AMCA’s JAMCA, SOVE’s JVE, Acta Tropica, PLoS One, and Environmental Health. Mr. Bibbs attended the ESA annual meeting and Tropical Medicine and Hyg annual meeting.

**State Agencies and Services:**

The FMCA: Dr. Xue, as Past President, and Commissioner Jeanne Moeller, as a Board member, served the FMCA in 2018. Five commissioners and 11 employees attended the FMCA Dodd Short Courses, two commissioners and 2 staff members attended the FMCA Tallahassee Legislation meeting. Two Commissioners and Dr. Xue attended the AMCA’s DC legislation meeting in May. Four staff members attended the FMCA Biologist/Entomologist workshop. Mr. Weaver, as an FMCA financial committee member, attended the FMCA financial meeting. Two commissioners and 9 employees attended the FMCA annual meeting and gave 8 presentations.

The Florida Entomology Society (FES): Dr. Xue was the President of the FES for 2nd year and AMCD host the 101st annual meeting, St. Augustine, FL, July 22-25, 2018. Dr. Xue organized a vector control response symposium. One commissioner and seven staff attended the meeting. Dr. Xue gave the Presidential address and Mr. Bibbs and Dr. Xue gave two presentations at the symposium and student competition. Mr. Bibbs continued to serve the FES Board as a student representative.
STATE AGENCIES AND SERVICES: (Cont’d)

The District renewed the contract with the FDACS and arthropod control agreement with the DEP and State Parks. Dr. Xue continued to serve the FCCMC Research Review Committee to review 19 grant applications.

The District collaborated with the State and St. Johns County DOH to respond to suspected imported cases in St. Johns County in 2018 and released news for a mosquito-borne illness advisory. Dr. Xue, as a council member, continued to serve the County’s health leadership.

COMPANIES AND OTHER DISTRICTS:

AMCD continued to cooperate with: Central Life Sciences to evaluate larvicides, MGK to evaluate new formulations of adulticides, spatial repellents & resistance, American LongRay for a novel rotated trap testing, SpringStar for AGO trap large deployment in St. Augustine, MosquitoMate for release of Wolbachia infected male mosquitoes in St. Augustine, several other companies for spatial repellents and trap testing, and Gainesville Mosquito Control for barrier spraying on honey bee impacts.

AGENCIES AND UNIVERSITIES:

AMCD cooperated with University of Florida Dr. Phil Kaufman to conduct vaporizing insecticide study and Ph.D. student training. Dr. Don Hahn for SIT study, Dr. Li-Ming Zhao for insecticide evaluation, Dr. R. Dinglasan for the CDC Southeastern Center for Excellence in Vector-borne Diseases’ project and intern student training, and Phil Koehler for non-target impacts.

University of Miami, Dr. Xue as a Voluntary Professor for the school of Medicine continues to cooperate with Dr. John Beier for ATSB and biology and control of mosquitoes.

University of Kentucky, Dr. Xue and Dr. D. Dixon cooperated with Dr. Steven Dobson about MosquitoMate for control of *Aedes aegypti*

University of New Mexico, Dr. Xue and Dr. Dixon cooperated with Dr. John Xu for *Aedes aegypti* collection for Wabochia isolation.
**Mosquito-borne Diseases:**
AMCD cooperates with the Florida Department of Health (DOH) to monitor imported mosquito-borne diseases. St. Johns County was under a mosquito-borne illness advisory, due to many sentinel chickens testing positive for West Nile Virus (WNV) and Eastern Equine Encephalitis Virus (EEE).
AMCD monitored WNV, EEE, Saint Louis Encephalitis Virus (SLE), Highland James Virus (HJV) and California Group Virus, using 10 sentinel chicken sites around St. Johns County. AMCD personnel bled chickens every Monday, from April 4th to December 17th and sent the blood samples to DOH’s Arbovirus Laboratory in Tampa for testing.
In 2018, a total of 84 sentinel chickens tested positive for arboviruses, 39 for EEE and 44 for WNV, 1 for HJV, and 2 horses for EEE. In addition to sentinel chickens, mosquito pools were also tested this year. Pools were sent to two locations: the DOH’s Arbovirus Laboratory in Tampa for WNV, EEE, and SLE testing and the Bronson Animal Disease Diagnostics Laboratory (BADDL) for Dengue, Chikungunya, and Zika virus testing. 151 mosquito pools were submitted this year (139 to DOH Tampa Lab, 12 to BADDL), and only 1 was positive for WNV. In 2018, there were no locally acquired human cases of mosquito-borne diseases in St. Johns County.

**Mosquito Population:**
The adult mosquito population was monitored by 32 CDC light traps baited with Octenol from April to November, 2018 and a total of 42,061 mosquitoes (27 species) were collected. Twelve (12) BG traps, baited with BG Lure and CO₂, were used for *Aedes albopictus* and *Aedes aegypti* for a total of 13,879 mosquitoes collected from January to December, 2018. A total of 55,940 mosquitoes were trapped by both methods.
Larvae surveys were conducted on a daily basis by dipping flooded areas as needed. A total of 44,388 dips were conducted and 3,851 dips were positive with 29,793 larvae found.

**Environmental Parameters:**
Rainfalls were monitored by 32 rain gauges once a week.


**Larvicides and Larviciding:**
In 2018, the District primarily used Bti to kill mosquito larvae, as well as methoprene products in areas where BTI was not applicable.
Mosquito Control Technicians and Inspector/sprayers treated 1,982 times on a total of 10,785.9 acres for larval control.

**Adulticides and Adulticiding:**
Mosquito Control Technicians and Inspector/Sprayers continued to use Aqualure 20-20 (Permethrin) and Mosquitomist Two for ground ULV spraying and treated 292 times on a total of 223,666.8 acres for adult mosquito control. DUET was used for hand thermal fogging for service requests and other areas 119 times on a total of 6,236.91 acres. Talstar P was used for barrier treatments in parks, special areas and for service requests 409 times for a total of 132.75 acres for adult mosquito control. Most of this was conducted for mosquito populations and control of the Zika vector.

**Larvicides and Adulticides Used in 2018**

<table>
<thead>
<tr>
<th>Laricide</th>
<th>Amount Used</th>
<th>Area Treated</th>
<th>Times Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altosid WSP</td>
<td>13901 ea</td>
<td>43.06 acre</td>
<td>302</td>
</tr>
<tr>
<td>Altosid XR</td>
<td>928 ea</td>
<td>2.14 acre</td>
<td>94</td>
</tr>
<tr>
<td>Altosid XRG</td>
<td>4689 lb</td>
<td>781.53 acre</td>
<td>122</td>
</tr>
<tr>
<td>Aquabac XT</td>
<td>76630 fl oz</td>
<td>9578.75 acre</td>
<td>964</td>
</tr>
<tr>
<td>B.t.i. Briquets</td>
<td>3671 ea</td>
<td>8.42 acre</td>
<td>181</td>
</tr>
<tr>
<td>Cocobear</td>
<td>10532 fl oz</td>
<td>27.41 acre</td>
<td>213</td>
</tr>
<tr>
<td>Natular DT</td>
<td>611 ea</td>
<td>0.09 acre</td>
<td>55</td>
</tr>
<tr>
<td>Natular XRT</td>
<td>73 ea</td>
<td>0.16 acre</td>
<td>4</td>
</tr>
<tr>
<td>Sustain MBG</td>
<td>2583 lb</td>
<td>344.35 acre</td>
<td>47</td>
</tr>
</tbody>
</table>

**Adulticides**

<table>
<thead>
<tr>
<th>Adulticide</th>
<th>Amount Used</th>
<th>Area Treated</th>
<th>Times Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aqualure 20-20 1:5</td>
<td>41134.3 fl oz</td>
<td>159229 acres</td>
<td>226</td>
</tr>
<tr>
<td>Duet 50%</td>
<td>9792 fl oz</td>
<td>6236.91 acres</td>
<td>119</td>
</tr>
<tr>
<td>Mosquitomist Two</td>
<td>42529 fl oz</td>
<td>64437.8 acres</td>
<td>66</td>
</tr>
<tr>
<td>Talstar P</td>
<td>44.74 gal</td>
<td>132.75 acres</td>
<td>409</td>
</tr>
</tbody>
</table>

**Source Reduction & Biological Control:**
A total of 423 used tires were collected and removed through-out the year by AMCD staff and personnel, for source reduction.
AMCD provided the public with the mosquito larvae eating fish (named: (Gambusia), for use in retention ponds and ditches, placing 578 fish.

Also, containers in and around residential yards, were emptied numerous times when AMCD staff and personnel performed their inspections.
AUTOCIDAL GRAVID OVITRAP (AGO) MASS DEPLOYMENT:

The Autocidal Gravid Ovitrap (AGO) is a non-chemical, lethal mosquito oviposition trap for use in residential settings. Last year, these traps were tested in a collaboration with AMCD and Springstar, the manufacturing company providing the traps, to launch over 550 traps across three neighborhoods for a combination of surveillance and control of domestic mosquitoes in St. Johns County. This year, AMCD expanded and repeated this study to assess over 1700 of these traps in downtown Saint Augustine and Saint Augustine South. The operations team, surveillance team, interns, and visiting scientists of AMCD all worked together to deploy, maintain, and keep records on these traps until the end of the season. The public was positive about the effort, and many residents not only supported the project, but firmly believe the traps to be a beneficial addition to their areas. Funding for this was by a sub-award from NIH/ SpringStar, Inc.

OPTIMIZATION OF AUTOCIDAL GRAVID OVITRAPS:

AGO traps were shown to be effective in an urban setting in Puerto Rico, resulting in an 80% reduction of mosquitoes in the area where they were mass deployed. These traps passively target gravid mosquitoes through the use of infusion water and visual color stimuli (i.e. a black bucket). Considering mosquitoes that are actively searching for a blood-meal are the most pestiferous to Saint Johns County residents, AMCD tested methods to attract host-seeking mosquitoes to AGO traps in a cost-effective long-lasting manner.

To test this, AMCD's visiting scientists Hui Liu, Shi Chiao, and Zhu Ding used BG lure, octenol, and carbon dioxide (dry ice) as supplemental attractants for the AGO traps. AMCD determined that BG lure and CO₂ were the most effective lures when used with an AGO trap. AMCD also tested if the incorporation of a suction fan enhanced the effectiveness of AGO traps. The field test still needs to be continued.

One of the issues associated with AGO traps is they capture a lot of non-target organisms (flies, moths, beetles, ants, etc.), and some of these organisms may be beneficial. Consequently, an AMCD intern, Lagan Mullis, sought to test different infusion waters compared to tap water to find one that is less attractive to non-target organisms but still captures mosquitoes. Lagan determined that tap water and orchard grass infusion collected the lowest number of non-targets while still collecting mosquitoes.
EVALUATION OF MOSQUITOMATE’S WOLBACHIA-INFECTED MOSQUITOES FOR AEDES ALBOPICUS CONTROL:

Similar to the AGO trap, there are other tools that take advantage of mosquito behavior. One of those tools is the Incompatible Insect Technique (IIT). IIT utilizes a process wherein male mosquitoes infected with a bacteria called Wolbachia are not compatible to produce offspring after mating with females. Considering mosquitoes mate only once, this represents a new avenue of non-chemical control against adult mosquitoes. This process has been used successfully in Miami, FL and was tested this year in the West King Street area of Saint Augustine. In collaboration with MosquitoMate, interns Catherine Chase and Caroline Blunck tested if Wolbachia-infected Aedes albopictus could reduce the native Ae. albopictus population. 120,000 of MosquitoMate’s ZAP mosquitoes were released every week for the trial period from April until Late September. Populations were monitored weekly with BG traps in treatment and control areas throughout the study. Preliminary results suggested that the releases were successful and resulted in a reduction of the Ae. albopictus population. This was funded by a sub-award from MosquitoMate/CDC

EVALUATION OF IRRADIATED MOSQUITOES FOR STERILE INSECT TECHNIQUE AGAINST AEDES AEGYPTI

Sterile insect technique (SIT) has been used for nearly a century to control noxious fly pests. In the early age of SIT, male flies were irradiated to make them unable to reproduce in the wild, which ruined female reproduction because of the female habit of being monogamous to their male mate. In collaboration with the USDA/CMAVE & UF, this technology was resurfaced for Aedes aegypti management where it has been shown that pesticide resistance prevents effective control. With the help of interns Courtney Cunningham and Parker Brown, locally acquired St. Augustine strain Ae. aegypti were sterilized with radiation, reared to adulthood, and then brought to Ae. aegypti infested areas of St. Johns county for weekly releases in an effort to determine flight ranges of the irradiated males, and resultant population reduction in the local area. After releases starting in April and extended through November, it was found that every area that received irradiated male Ae. aegypti returned a 100% reduction in viable field eggs within 1-2 weeks. Furthermore, fluorescent marked males were found to travel as much as 1,700ft away from their release point. When comparing populations to untreated areas, the SIT releases appear to have reduced the Ae. aegypti in test areas by 80% or more.
NON-TARGET IMPACT VALIDATION WITH OPERATIONAL MOSQUITO ADULTICIDES:

When managing outbreaks of mosquitoes, we must be considerate of non-target organisms that may be caught up in the operation. Overwhelmingly, honey bees are a recurring risk when trying to avoid environmental impact. To better understand how our operationally used adulticides may affect honey bees, visiting scientist Dr. Hussein Sanchez-Arroyo is helping AMCD collaborate with the University of Florida to screen our products against both honey bees and mosquitoes to create a side-by-side comparison of sensitivity. This work has so far determined that honey bees require 3 times as much volume of insecticide to come into contact with them to observe the same signs of toxicity as in a mosquito. Even at the increased exposure volume, honey bees have anywhere from 2-6 times greater tolerance to the insecticides as the mosquitoes, and may even have as high as 83 times the tolerance to some mosquito control adulticides. This ongoing project is now evaluating field applied ultra-low volume sprays and outdoor residual (barrier) sprays to determine the likelihood of negative effects in the field. This was funded by a DACS grant to UF.

NEW TRAPPING TECHNOLOGY: ADVANCEMENTS IN SURVEILLANCE AND USING TRAPS FOR MANAGEMENT:

Trap technology for mosquito management is rapidly developing. This year, visiting scientists Shi Chao & Zhu Ding evaluated a novel 12-jar rotator trap from American Longray. This trap nearly doubles the sampling resolution of the previously used John Hock rotator trap and improves the ability to detect fine intervals of mosquito activity throughout the day.

Light traps in general have many makes and models, some of which are designed for home use. Intern Nick Acevedo tested the Dyna Trap XL insect trap, which uses UV light and a proprietary lure for catching mosquitoes and other pests around the home. When compared to CDC light traps, the Dyna Trap was found to catch more *Ae. aegypti* and to perform comparably to the CDC light trap in the field against a mix of wild mosquitoes.

A third trap, the 00ZZZero, uses a combination of permethrin and pyriproxyfen on the interior of this mostly enclosed cast-molded polymer shell. When visiting scientist Dr. Emad Khater used it and modified it with a sheet of sticky paper in the field, the combined action of killing mosquitoes with permethrin and sticky paper, and then larvicide resulted in mean reduction of *Ae. aegypti* by 99.97 in a semi-field test.
### COLLABORATIVE, ONGOING, AND COMPLETED APPLIED RESEARCH PROJECTS FOR 2018

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Institution/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-lethal effects of metofluthrin on resistant and field strains of <em>Ae. aegypti</em></td>
<td>JennyPro bait station prototypes for ATSB field deployment in Elkton tire pile</td>
</tr>
<tr>
<td>Environmental aging assessment of formulated metofluthrin residual</td>
<td>Non-target impact validation with operational mosquito adulticides</td>
</tr>
<tr>
<td>Field efficacy of metofluthrin formulated for outdoor residual treatments</td>
<td>Trial efficacy of the 00ZZZero adulticidal and larvicidal mosquito trap</td>
</tr>
<tr>
<td>Synergy of formulated metofluthrin in multi-active ingredient outdoor residuals</td>
<td>Mosquito light trap comparisons with the all-purpose Dyna Trap for insect removal</td>
</tr>
<tr>
<td>Metofluthrin resistance ratio against <em>Ae. aegypti</em></td>
<td>Evaluation of a novel 12-jar rotator trap from Longray</td>
</tr>
<tr>
<td>ULV proof-of-concept for FIFRA exempt NatureCide</td>
<td>AGO modification with host-baited lures</td>
</tr>
<tr>
<td>Blood feeding competence of irradiated female <em>Ae. aegypti</em></td>
<td>AGO modification with DC-powered fan motor</td>
</tr>
<tr>
<td><em>Aedes aegypti</em> oviposition preferences in common bromeliads containing variable water levels</td>
<td>AGO modification with alternative infusion cocktails and varied fermentation intervals</td>
</tr>
<tr>
<td>Naval Entomological Center of Excellence vertical drift assessment for truck-ULV</td>
<td>Assessment of AGO non-target collection from peridomestic environments</td>
</tr>
<tr>
<td>Screening for native <em>Wolbachia</em> presence in St. Johns County mosquitoes</td>
<td>Trial of the MosquitoMate ZAP, <em>Wolbachia</em> infected <em>Ae. albopictus</em></td>
</tr>
<tr>
<td>Mark-release-recapture study of irradiated male <em>Ae. aegypti</em> in St. Augustine</td>
<td>Tolfenpyrad efficacy against pyrethroid resistant <em>Ae. aegypti</em></td>
</tr>
<tr>
<td>Population reduction trial with irradiated male <em>Ae. aegypti</em> in St. Augustine</td>
<td>Novel ATSB trials with alternative insecticide classes for mosquito control</td>
</tr>
<tr>
<td>Novel infusion water mixtures for improving <em>Ae. aegypti</em> rgg surveillance</td>
<td>Comparative efficacy of the AGO versus the 00ZZZero trap for controlling <em>Ae. aegypti</em></td>
</tr>
</tbody>
</table>
COMMUNITY EVENTS/PUBLIC OUTREACH:

The AMCD was involved in 27 public outreach programs in 2018. District employees worked to inform citizens about the new service request app. The app has been downloaded 346 times since its release in April 2018. Much community outreach effort focused on the three large scale experiments being conducted by the research team this year. Neighborhood door campaigns were conducted for the AGO, SIT, and MosquitoMate projects. Despite the fact that Zika is no longer a common concern for the citizens of St. Johns County, AMCD continues to work with The St. Johns County Department of Health. The outreach program reached 14,013 people in 2018.

AMCA/CDC CROSS TRAINING EVENT:

In May 2018, AMCD was selected to assist with a CDC cross training event. Twelve representatives from the CDC’s Division of Vector-Borne Diseases, Arboviral Diseases Branch, Entomology and Ecology Team were sent to Florida to train with NECE and AMCD. CDC representatives were paired with mosquito control technicians, interns, research staff, the surveillance team, as well as the data manager and the education specialist. The experiences, in combination with a classroom case study allowed the CDC’s team to learn incident management from Dr. Caroline Efstatithion, FDACS regional mosquito control specialist and IMT first responder, and Christopher Bibbs, CDC/AMCA Master Trainer and St. Johns County Department of Health IMT member.

ST. JOHNS COUNTY SCHOOL PROGRAMS:

In 2018 the AMCD taught at 11 different schools in St. Johns County, reaching 1812 students across K-11th grade. Participating Elementary schools included: Crookshank, MK Rawlings, RB Hunt, Valley Ridge Academy, and Wards Creek Elementary Schools. Participating Middle Schools included Valley Ridge Academy and St. John’s Academy. Participating High Schools included Ponte Vedra High, Creekside and St. Johns Technical. The District was once again asked to judge the St. Johns County STEM Fair and is currently on the advisory board for the Academy of Coastal and Water Management at St. Johns Technical High School and the Academy of Biotechnology and Medical Research at Ponte Vedra High School.
PUBLIC RELATIONS: The Districts continued to increase presence on social media in 2018. The Anastasia Mosquito Control District Facebook page now has over 1100 followers and 1000 page likes. We have continued to publish daily spray maps on Facebook, Twitter, and the District’s website. Residents have reported checking our social media pages to see if we will be out in their neighborhood before embarking on evening activities outdoors. The District’s social media following increased steadily throughout 2018 with substantial increases resulting from mosquito activity June through July.

2018 CUSTOMER SATISFACTION SURVEY RESULTS: AMCD continues to gauge customer satisfaction using both physical and internet surveys. For 2018 there were 56 physical surveys returned and 4 internet surveys returned, for a total of 60 returned surveys, many of which contained praise for the knowledgeability and professionalism of inspectors.

Question
1. The goal of AMCD is to preserve and protect the community from mosquitoes and mosquito-borne diseases by reducing nuisance and disease spreading mosquito populations.
2. AMCD staff is informative and professional.
3. AMCD responds to my service requests within the standard 1-2 business days.
4. I am aware of and actively participate in DRAIN and COVER methods.
Organized and attended by AMCD staff and commissioners:

Jan 9-10: Dr. Xue & R. Weaver attended the FMCA Aerial Short Course, Ft. Myers, FL
Jan 12: Dr. Xue attended UF/Dept. of Entomology & Nematology’s seminar about malaria vaccine
Jan 22-24: Ten employees & 5 Commissioners took different classes at the FMCA’s Dodd Short Courses, Orlando, FL. Commissioner Moeller organized the course for the Commissioner’s session
Feb 5-9: Dr. Xue attended the Rollback Malaria Vector Control working group mtg., Geneva, Switzerland
Feb 15: M. Smith attended the UF/EPI Research Day and presented a poster about activity patterns
Feb 16: K. Gaines, R. Weaver, & Dr. Xue attended the UF/EPI Seminar about CDC’s SECEVD & Career Day
Feb 26-Mar 2: Dr. Dixon, C. Bibbs and Dr. Xue attended the AMCA annual meeting where Dr. Xue organized a symposium on bridging the gap between research and operations, Kansas City, MO
Mar 13: D. Autry, M. Clark, & Dr. Xue attended the Vector Control Workshop organized by the NACCHO and AMCA. Dr. Xue taught at the workshop
Mar 19: Dr. Xue, as President, organized & held the Florida Entomological Society Exec. Director mtg.
Mar 20-22: AMCD organized and held the 15th annual workshop at AMCD, St. Augustine, FL
Mar 26-29: Dr. Xue attended the Asian Vector Control meeting, funded by the I2I/IVCC, Beijing, China
Apr 17: Three employees attended the 4th FMCA Biologist/Entomologist workshop where C. Bibbs taught
Apr 21-27: Dr. Xue visited Jeddah for control of Dengue Fever vector and funded by Dallah
May 14-16: Commissioners’ Moeller & Rock, and Dr. Xue attended the AMCA Legislation meeting, Washington DC
May 17: AMCD hosted CDC’s workshop and training and had 12 staff attend
May 22: Dr. Xue attended the FCCMC research selection committee mtg., USDA/CMAVE, Gainesville, FL
June 14: AMCD hosted and held the AMCD & DOH annual collaboration meeting
June 25: AMCD held a seminar for intern student Parker Brown, on bromeliad plants & mosquito oviposition
June 28: Commissioner Moeller and Dr. Xue attended the FMCA Board meeting, St. Petersburg, FL
Jul 10: AMCD held a seminar for a visiting scientist about ULV spray of Naturicide against mosquitoes
Jul 13: AMCD held a seminar for a Univ. of Miami intern student about Wolbachia-infected mosquitoes
Jul 22: AMCD held the FES Board meeting, St. Augustine, FL
Jul 23-25: Dr. Xue attended the FES annual meeting and gave the Presidential address, St. Augustine, FL
Jul 24: AMCD held symposium “Biology & Control of Human Disease Vectors” at FES mtg., St. Aug., FL
Jul 26: AMCD held a seminar for visiting scientist, Hui Liu about AGO & lures and an intern student about ATSB
Aug 2: AMCD held a seminar for a Post doc. & visiting scientist, Dr. Hussein Sanchez-Arroyo on new traps
Aug 17: AMCD held a seminar for intern student, Lagan Mullin about infection & Ago traps
Sep 3: C. Bibbs gave a plenary presentation at the Australia Mosquito Control Assoc., funded by their association, Australia
Sep 20: Commissioner Moeller and Dr. Xue attended the DACS & FMCA legislation meeting in Apopka, FL
Oct 7-11: Dr. Xue and Commissioner Moeller attended the SOVE annual meeting, Yosemite, CA
Oct 12: Commissioner Moeller and Dr. Xue visited Consolidated Mosquito Control District, Fresno, CA
Oct 18: AMCD held a seminar for 3 visiting scientists and one intern student
Oct 22-24: Dr. Xue attended the 7th International Forum for Sustainable Management of Disease Vectors in Ningbo and organized, moderated, and gave a presentation at the symposium for new technology
Oct 25: Dr. Xue attended & gave a lecture on mosquito-borne disease increase at the Zhejiang International Travel Health Center’s Integrated Management of Disease Vector Workshop, Hangzhou, China
Oct 27-28: Dr. Xue co-organized and moderated the vector control symposium for the 2nd World Life Science Congress, Beijing, China. The conference provided funding
Oct 31: Dr. Xue and Molly Clark attended and taught at the Jiangsu Vector Control and Disinfection Association annual meeting, Nanjing, China
Nov 4: Dr. Xue attended the FMCA Board meeting, St. Petersburg, FL
Nov 5-7: Dr. Xue, along with 7 employees, 2 visiting scientists, and Commissioner LeBlanc attended the FMCA annual meeting
Nov 12-14: C Bibbs attended the ESA annual meeting and gave 2 presentations, Vancouver, Canada


**Bibbs, C. S., M. K. Gaines, D. Dixon, C. Efstatious.** Mosquito control operations and incident management team training workshop for CDC-ONDIEH-NCEZD-NCEH personnel. CDC/AMCA Florida Hub, Anastasia Mosquito Control District, Saint Augustine, FL – May 17th, 2018

**Bibbs, C. S., P. E. Kaufman, J. R. Bloomquist, D. A. Hahn, and R. D. Xue.** Acute toxic effects of spatial repellent pyrethroids and potential utility for mosquito management. 4th Annual Florida Mosquito Control Association DODD Entomologist/Biologist Workshop – April 17th, 2018


*Bolded Names are AMCD Staff and Employees*


**Autry, D.** Large-scale deployment of CDC/AGO traps for control of *Aedes* mosquitoes. 15th Annual Arbovirus Surveillance and Mosquito Control Workshop, March 21, 2018.

**Dixon, D.** Field comparison of CDC’s AGO traps & In2Care traps for control of *Aedes* mosquitoes in St. Augustine, FL. 15th Annual Arbovirus Surveillance and Mosquito Control Workshop, March 22, 2018.


**Xue, R. D.** Collaboration and applied research benefit to Anastasia Mosquito Control Operation. 84th AMCA annual meeting, Kansas City, MO, Feb 26-March 2, 2018.


**Xue, R. D., H. Liu, D. Dixon, and D. Autry.** The CDC autocidal gravid ovitraps combined with attractants increase collection of *Aedes aegypti*. 48th Annual SOVE Conference, Yosemite, California, October 7-11, 2018.

**Xue, R. D.** Influence of three common aquatic plants on survival of *Anopheles quadrimaculatus* and ATSB efficacy against the adult mosquitoes. 13th RB Malaria Vector Control Work Group Meeting, Geneva, Feb 6, 2018.

**Xue, R. D.** Presidential address: why have the vector-borne diseases increased recently? 101th Florida Entomology Society Annual Meeting, St. Augustine, FL, July 24, 2018.

**Xue, R. D.** CDC’s AGO incorporation with attractants for control of gravid and host-seeking *Aedes aegypti*. 90th Annual Meeting of the FMCA, St. Petersburg, FL, Nov 4-7, 2018.

**Xue, R. D.** New technology for vector *Aedes* mosquitoes control at St. Johns County, FL. 2nd World Life Science Conference, Beijing, China, October 27, 2018.

**Xue, R. D.** Seminar: What is next for mosquito-borne diseases?, Beijing Institute of Microbiology, Beijing, China, October 28, 2018.

**Xue, R. D.** AMCD vector control response, Jiangsu Conference of Vector Control and Anti-Infection Association, Jiangsu CDC, Nanjing, China, October 30, 2018.

**Clark, M.** Laboratory evaluation of two new active ingredients for ATSB against mosquitoes. 90th Annual Meeting of the FMCA, St. Petersburg, FL, Nov 4-7, 2018.

**Clark, M.** Seminar: Overview of AMCD’s education and public relation program, Wuxi CDC, China, Oct. 27, 2018

**Clark, M.** AMCD outreach and education program, Jiangsu Conference of Vector Control and Anti-infection Association, Jiangsu CDC, Nanjing, October 30, 2018.

**Dixon, D.** Comparison of different infusions with AGO traps to collect mosquitoes and its impact on non-target organisms. 90th Annual Meeting of the FMCA, St. Petersburg, FL, Nov 4-7, 2018.

**Sanchez-Arroyo, H.** Laboratory bioassay of four adulticides against mosquitoes and its impact on honey bees. 90th Annual Meeting of the FMCA, St. Petersburg, FL, Nov 4-7, 2018.

**Weaver, R.** New application (mobile solution) for AMCD service requests. 90th Annual Meeting of the FMCA, St. Petersburg, FL, 2018.


* Bolded Names are AMCD Staff and Employees
IN APPRECIATION

As always, we would like to thank all residents of St. Johns County for their support, as well as, the AMCD Board of Commissioners, the District’s attorney and CPA, all employees, colleagues, and all contractors, cooperative organizations and agencies for their help in 2018.