

ANASTASIA MOSQUITO CONTROL DISTRICT



Of St. Johns County

2023 Annual Program Report

120 EOC Drive,
St. Augustine,
FL 32092

(904) 471-3107
www.amcdsjc.org



ANASTASIA MOSQUITO CONTROL DISTRICT
OF ST. JOHNS COUNTY

COMMEMORATES THE COMPLETION OF THE
STERILE INSECT TECHNIQUE FACILITY
2023

BOARD OF COMMISSIONERS
TRISH BECKER
CATHERINE BRANDHORST
GAYLE GARDNER
MARTHA GLEASON
GINA LEBLANC

FORMER BOC MEMBER & CHAIR OF THE PROJECT
JEANNE MOELLER
DISTRICT DIRECTOR: DR. BUI-DE XUE

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CONGRESSMAN AND HIS STAFF'S TOUR OF AMCD FACILITY
AUGUST 24, 2023 (THURSDAY) AT 1:30PM

1. Welcome, introduction, and overview of AMCD programs by Director Dr. Xue
2. Tour of the Disease Vector Education Center by Commissioner Vice Chairperson Mrs. Becker & Business Manager Mr. Weaver
3. Tour of the SIT building by Scientific Manager Dr. Qualls, Commissioner Mrs. Becker, and Mr. Weaver

DOCUMENTS:

1. Why support for vector management is essential to protecting Americans! This statement paper provided by the Entomological Society of American (ESA).
2. AMCD 2022 Annual Program Report.
3. 2023's 18th Annual Workshop agenda.
4. Articles:
 - a. Establishment, Expansion, and Centralization of the AMCD, 1948-2023, published in Wing Beats, 2023.
 - b. Development of a successful education program and Disease Vector Education Center at the AMCD, St. Augustine, FL, published in Fly Times, 2023.
 - c. Creation and development of an aerial spray program at AMCD, St. Augustine, FL, published in Wing Beats, 2022.
 - d. Innovation and technology application in the AMCD, St. Augustine, FL, published in Proceedings and Papers of the Mosquito and Vector Control Association of California, 2022.



Marco Rubio's Office Director Ms. Ashley Cook, visits Education Center



Congressman Rutherford visits Education Center

2 MESSAGE FROM CHAIRPERSON OF THE
BOARD OF COMMISSIONERS

In 2023, our District continued to provide excellent services to citizens of St. Johns County and related professional organizations. Commissioner Mrs. Martha Gleason was sworn into office in January 2023. Commissioner Mrs. Becker served as Secretary for the Florida Mosquito Control Association (FMCA) Commissioner Section. Commissioners Gardner & Gleason attended the Florida Mosquito Control Association's Tallahassee legislation event and annual meeting. Commissioner Becker attended and gave a presentation at the American Mosquito Control Association's (AMCA) annual meeting, and four Board members attended the AMCA's Washington DC legislation meeting. The District hosted Congressman John Rutherford (District Five) and two of his staff members to visit and tour the AMCD Disease Vector Education Center and SIT building on August 24, 2023. The District hosted Senator Marco Rubio's Office Director Ms. Ashely Cook and provided a tour of the AMCD facility on August 22, 2023. The District received a positive report and a couple of recommendations from the Balmoral Group Audit regarding special district's accountability, which was contracted through the state government and legislators. The Board of Commissioners reduced the millage rate from 0.19 to 0.18 based on the District's needs and staff recommendations. Thanks to all the dedicated employees for their hard work.



Ms. Gayle Gardner

There was one EEE human case, four travel-related dengue cases, two EEE horses, and 71 positive sentinel chickens for WNV & EEE, and five outbreaks of mosquito populations in St. Johns County in 2023. St. Johns county was under mosquito-borne illness advisory from June to December. AMCD provided/answered more than 3,500 service requests. The District successfully held the 18th annual workshop and attracted about 300 participants including 18 international scientists and students from nine other countries. Due to many attendees and presentations, we had to utilize two places (the hangar and Board room) to conduct all presentations including student and repellent symposia. In late September, AMCD received a very positive final report by the Balmoral Group audit about the special district accountability contracted by the State Government. AMCD held the first meeting of adjunct and consulting meeting about AMCD's future program direction before the 18th workshop. AMCD's unfinished Disease Vector Education Center (DVEC) had a successful open house during the national mosquito control awareness week in June and hosted more than 1,000 visitors from schools, other groups and individual by appointments and brought more business to St. Johns County. The inside displays of the DVEC (about 80% done) and SIT's project (90% done) have been postponed to grand opening in March-April 2024 due to problems with supply, shipment, and contractors. AMCD received more than \$440,000 grant funds from DoD, ESA, CDC, USDA, Florida State, and several industries that created one full-time position and 18 part-time positions. AMCD completed the DoD three-year grant at the end of July 2023. AMCD provided 22 intern students training at different times and received different funds to support the intern program from different resources. Also, AMCD hosted four visiting scientists from India, Italy, Australia, and Mali. Mr. Richard Weaver started his FMCA Presidential position from the middle of November 2023 and I have served as the American Mosquito Control Association's President-Elect since early March 2023. I greatly appreciate and thank the support from Board of Commissioners, dedicated employees, collaborators, industries, experts/consulters, citizens, and funding agencies to AMCD to continue providing the excellent services to St. Johns County.



Dr. Rui-De Xue

BOARD OF COMMISSIONERS



*Mrs. Catherine
Brandhort
Seat 1
2021-2024*

*Mrs. Martha Gleason
Seat 2
2023-2026*



*Mrs. Gina LeBlanc
Seat 3
2017-2024*



*Mrs. Panagiota K.
"Trish" Becker
Seat 4
2019-2026*



*Mrs. Gale Gardner
Seat 5
2021-2024*



APPOINTED OFFICES



*Mr. Wayne Flowers
Attorney Since: 11-9-10 to
12-31-2023*



*Ms. Julieann Klein
CPA Since: 9-11-03*



*Dr. Rui-De Xue
Hired: 4-14-03
Director Since: 2005*

FULL TIME EMPLOYEES

5

Johns Freddie Allen



Mechanic
7-08-2002 to Present

Steven Kyle Arber



Mosquito Control Technician
5-01-2017 to Present

Dr. Vindhya Aryaprema



FT Contracted Biologist
8-05-2019 to 7-30-2028

Kai Blore



Lab Manager
4-02-2019 to Present

Ralph Bruner



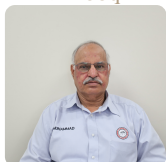
A&P Aircraft Mechanic
9-03-2019 to Present

Morgan Duett



Mosquito Control Technician, Surveillance
2-06-2017 to Present

Dr. Muhammad Farooq



MC Engineer
9-16-2019 to Present

Dazmond Hackney



Mosquito Control Technician
2-02-2021 to Present

Scott Hanna



Accountant/Chief Financial Officer
7-03-2007 to Present

Cathy Hendricks



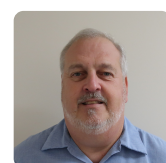
Mosquito Control Technician
7-08-2002 to Present

Tomomi Hirokawa



Education Specialist
10/02/2023-Present

Jerry Iser



Mosquito Control Technician
2-02-2015 to Present

Heather Keating



Administration Assistant
10-03-2022 to Present

Connor Kuppe



Biological Technician
8-1-2022 to Present

Aye McKinney



Accountant
1-04-2021 to Present

Dena Oliva



Operations Supervisor
8/24/2015-Present

Dr. Steven Peper



Molecular Entomologist/Biologist
3-23-2020 to Present

Dr. Whitney Qualls



Assistant Director
10-28-2019 to Present

Dana Smith



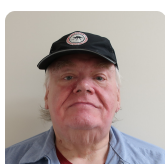
Chief Pilot/
Aviation Manager
4-27-2020 to Present

Steven Smoleroff



Field Biologist
10-02-2017 to Present

Rick Stockley



Information Technology (IT)
2-04-2013 to Present

Olivia Sypes



Biological Technician
4-06-2020 to present

Holly Usina



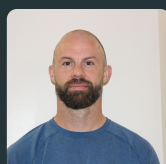
Mosquito Control Technician
1-3-2022 to Present

Richard Weaver



Business Manager
4-14-2003 to Present

Brandon Weir



A&P Mechanic
6-26-2023 to Present

Jeremy Wohlforth



Mosquito Control Technician
2-06-2017 to Present

James Wynn



Senior Mechanic
3-04-1996 to Present

Dr. Rui-De Xue



Director
4-14-2003 to Present

Edward Zeszutko



Biological Technician
8-1-2022 to Present

2023 RESIGNED

Taylor Ballantyne




Education Specialist
10-4-2021 - 6-1-2023

FULL TIME SEASONAL (6 MONTHS), INTERNS & VOLUNTEERS

6


Nicole Blackwelder

 Inspector
 Sprayer
 5/1/2023 - 10/27/2023

Bill Cotter

 Inspector
 Sprayer
 5/1/2023 - 10/27/2023

Ken Daniel

 Inspector
 Sprayer
 5/1/2023 - 10/27/2023

Damyon Hackney

 Inspector
 Sprayer
 5/1/2023 - 6/27/2023

Willis Owings

 Inspector
 Sprayer
 5/1/2023 - 7/10/2023

Philip Vaughn

 Inspector
 Sprayer
 5/1/2023 - 10/27/2023

James Stokley

 Inspector
 Sprayer
 6/12/2023 - 11/30/2023

Kaitlyn Gualillo

 Lab
 Intern
 5/1/2023 - 10/27/2023

Decyo McDuffie


 Lab
 Intern
 1/9/2023 - 5/1/2023

Davina Waters

 Lab
 Intern
 5/1/2023 - 8/28/2023

Lauren Owen

 Lab
 Volunteer
 5/30/2023 - 7/27/2023

Braeden Wyman

 IT
 Intern
 5/30/2023 - 7/27/2023

Tomomi Hirokawa

 Lab
 Intern
 1/11/2023 - 5/1/2023

Hannah Hayakawa

 Lab
 Intern
 5/30/2023 - 7/27/2023

Samay Patel

 Lab
 Intern
 5/30/2023 - 7/27/2023

Khaled Bouaziz


 IT
 Intern
 5/30/2023 - 7/27/2023


Lauren Van Rhee


 Lab
 Intern
 5/1/2023 - 10/27/2023

Yara Steele

 Lab
 Intern
 6/12/2023-8/7/2023

Colin Shipp-Clark

 Lab
 Intern
 5/30/2023 - 7/27/2023

Valentina Albo

 Lab
 Intern
 5/30/2023 - 7/27/2023

Garrett Miller

 Lab
 Intern
 5/8/2023-8/2/2023

Avery Glenn

 Lab
 Intern
 5/18/2023 - 10/27/2023

Katie Peters

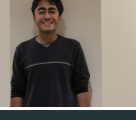
 Lab
 Intern
 8/18/2023-2/23/2023

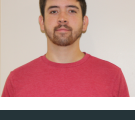
Leyhma Leban

 Lab
 Intern
 6/12/2023-8/7/2023

Julio Silva

 Lab
 Intern
 1/23/2023 - 6/30/2023

Adarsh Annadata

 Aviation
 Intern
 11/6/2023- Present

Kody Fisher

 Lab
 Intern
 9/5/2023-12/15/2023

Xharia Lipkins

 Lab
 Intern
 6/12/2023-8/7/2023

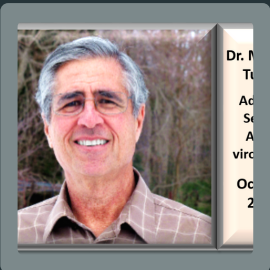
Lyllian Huber

 Aviation
 Intern
 11/6/2023- Present

ADJUNCT PROFESSORS



*Dr. Stephen
 Dobson
 Adjunct Senior
 Entomologist
 March 2020*



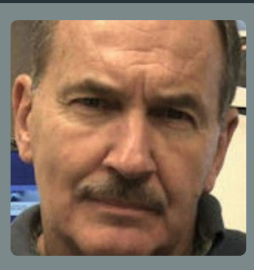
*Dr. Michael
 Turell
 Adjunct Senior
 Arbovirologist
 October 2018*



*Dr. Gunter Muller
 Adjunct Senior
 Vector
 Entomologist
 October 2018*



*Dr. Ulrich
 Bernier
 Adjunct Senior
 Chemist
 2022*



*Dr. Donald R.
 Barnard
 Senior Vector
 Biologist
 2022 to 2023*

ADMINISTRATION PERSONNEL AND RECOGNITIONS

Personnel

Taylor Ballantyne resigned May 2023. Starting October 2023, Tomomi Hirokawa was hired as the Education Specialist and Dr. Whitney Qualls was promoted to Assistant Director.

AMCD six-week student volunteer intern program had three students from Ponte Vedra High School: Lauren Owen, Braeden Wyman, and Khaled Bouaziz. The AMCD paid high school interns from May - July 2023 were Collin Shipp-Clark, Hannah Hayakawa, Samay Patel and Valentina Fraga. AMCD College Interns for 2023 were Avery Glenn, Davina Waters, Garrett Miller, Julio Silva, Kaitlyn Gaulilo, Katie Peters, Kody Fisher, Lauren Van Rhee, Tomomi Hirokawa, Decyo McDuffie, Yara Steele, Xharia Lipkins, and Leyhma Leban.

The seasonal staff that worked for AMCD were Amanada Smith, Bill Cotter, Daymon Hackney, James Stokley, Ken Daniels, Nicole Blackwelder, Philip Vaughn, and Willis Ownings.

Visiting Scientists were Dr Reddya Naik (India), Dr. Pat Dale (Australia), Mr. Anounou Sissoko (Mali), and Dr. Ashgard Talbalaghi (Italy).

Recognitions and Awards

The following AMCD personnel received an award for their years of service with the District:

- Mr. Rick Stockley, 15 years
- Mr. Richard Weaver, 20 years
- Dr. Rui-De Xue, 20 years

The Management Choice Award this year went to Mrs. Aye McKinney, Mr. Morgan Duett, Ms. Cathy Hendricks and Mr. Steven Smoleroff for their significant contributions and dedication to the District throughout the year. Mr. James wynn was given the Outstanding Employee award for his significant dedication to the District.

Mr. Kai Blore, Lab Manager/UF Ph.D. student received honor award for student paper competition at AMCA annual meeting, Reno, Feb 2023.



COMMITTEE MEMBERS 2023

Safety Committee

Business Mgr. (Safety Coordinator)	Richard Weaver (Chair)
Assistant Director	Dr. Whitney Qualls
Supervisor	Mrs. Dena Oliva
A&P Aircraft Mechanic	Mr. Ralph Bruner
Field Biologist	Mr. Steven Smoleroff
Lab Manager	Mr. Kai Blore
Mechanic	Mr. Freddie Allen

Financial/audit committee

Commissioner	Mrs. Gayle Gardner (Chair)
Director	Dr. Rui-De Xue
C.F.O./Accountant	Mr. Scott Hanna
Business Mgr.	Mr. Richard Weaver
Administrative Assistant	Mrs. Heather Keating
Accountant	Mrs. Aye McKinney
Cheif Pilot/Aviation Manager	Mr. Dana Smith

Applied research Committee

Commissioner	Mrs. Martha Gleason (Chair)
Assistant Director	Dr. Whitney Qualls
Mosquito Control Engineer	Dr. Muhummad Farooq
Molecular Entomologist	Dr. Steve Peper
Lab Manager	Mr. Kai Blore
Biological Technician	Mr. Edward Zeszutko

Emergency response Committee

Assistant Director	Dr. Whitney Qualls (Chair)
IT Specialist	Mr. Rick Stockley
Supervisor	Mrs. Dena Oliva
Business Manager	Mr. Richard Weaver
Aviation Manager/Chief Pilot	Mr. Dana Smith
Education Specialist	Mrs. Tomomi Hirokawa

Education Committee

Commissioner	Mrs. Trish Becker (Chair)
Education Specialist	Mrs. Tomomi Hirokawa
Assistant Director	Dr. Whitney Qualls
Supervisor	Mrs. Dena Oliva
Biological Technician	Mr. Edward Zeszutko
Lab Manager	Mr. Kai Blore

Operational committee ground/aerial

Commissioner	Mrs. Catherine Brandhorst (Chair)
Director	Dr. Rui-De Xue
Aviation Manager/Chief Pilot	Mr. Dana Smith
Senior Mechanic	Mr. James Wynn
Business Mgr.	Mr. Richard Weaver
Supervisor	Mrs. Dena Oliva
Assistant Director	Dr. Whitney Qualls
Biological Technician	Mr. Morgan Duett

Planning Committee

Commissioner	Mrs. Gina LeBlanc (Chair)
Director	Dr. Rui-De Xue
Aviation Manager/Chief Pilot	Mr. Dana Smith
Molecular Entomologist	Dr. Steven Peper
Supervisor	Mrs. Dena Oliva
Assistant Director	Dr. Whitney Qualls

Animal Care Committee

Molecular Entomologist	Dr. Steven Peper (Chair)
Lab Manager	Mr. Kai Blore
Biological Technician	Mr. Steven Smoleroff
Biological Technician	Mr. Conner Kuppe
Assistant Director	Dr. Whitney Qualls

Institute of Review Board Committee

Commissioner	Mr. Richard Weaver (Chair)
Assistant Director	Dr. Whitney Qualls
Mosquito Control Engineer	Dr. Muhummad Farooq
Director of County DOH	Mr. Shane Lockwood
Adjunct Professor	Dr. Uli Bernier



AMCD Mission, Values, Vision, and Programs

- Our Mission:* To protect all people from the nuisance of mosquitoes and mosquito-borne diseases in St. Johns County, Florida.
- Our Values:* Service Driven, Scientific Based, Professional, Justified, Environmentally-friendly, Collaborative, Compassionate, Accountable, and Sustainable Excellence.
- Our Vision:* AMCD of St. Johns County will be among the healthiest in the Nation -- a well-served community, enjoyed by all and supported by all partners.
- Our Programs:* Customer Service, Operations (including Surveillance and Control by Ground and Aerial Application), Education, and Applied Research.



Since 1949, AMCD has continued to provide many services to the citizens of St. Johns County. These services include but are not limited to: mosquito inspections, population and arbovirus surveillance, public outreach and education, assistance to local organizations, larviciding, adulticiding, applied research through evaluations of new control tools and techniques, and employee training.

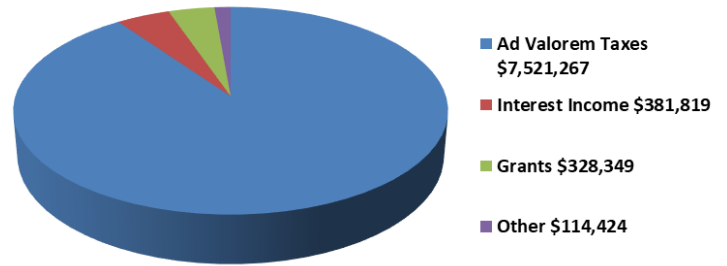
- Service request by using the website and App through computer, mobile phone, I-Pad, phone call, e-mail, fax, text message, and walking in.
- Pick up used tires for source reduction.
- Mosquito problem inspection.
- Provide mosquito fish for biocontrol.
- Provide facility tour by appointment.



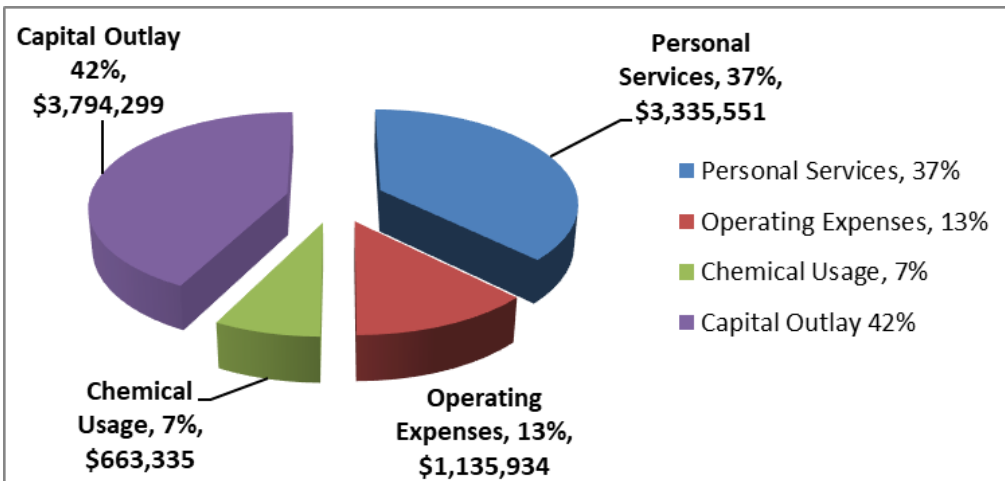
BUDGET

- Ad Valorem (real property) Current Year Taxes, the primary source of revenue, \$7,521,267 comprised of, approximately, 90% of the total Revenues, \$8,345,859. Grant Revenues, from Applied Research, totaling \$442,201.
- Interest Income - Return on Investment, SBA Fund, non-current Operating Funds, yielded \$381,819.
- Grant Revenues, from Applied Research, totaling \$328,349.
- Other Revenues, were predominantly comprised of \$1,059 surplus sales, \$12,039 Workshop, \$6,513 Dorm rent and \$94,813 Misc.
- The District's millage rate for the General Operating Budget was 0.1900 for 2023.

FY 22/23 District Revenues Oct. 1, 2022 through Sept.30, 2023
 Total \$8,345,859. Millage Rate:
 0.1900



FY 22/23 District Expenditures
 Total \$8,929,119



The majority were attributed to capital outlay (42%) with Personal Services, Operating Expenses, and Chemical Usage comprising 37%, 13% and 7% respectively.

ADMINISTRATION AND SUPPLY

Board Business:

The AMCD staff provided many documents to Board members and the district attorney for committee and board meetings in 2023. The District hosted 13 Board meetings, including the annual first and final public hearings, in September for the 2023/2024 fiscal year budget and millage rate.

Administration & Finance:

The Board approved the Assistant Director Job Description on March 9th, 2023. On July 13, 2023 the Board discussed and approved the DACS Work Plan Budget for FY 23/24.

Policies:

On March 9th, 2023 the Board reviewed the policy regarding the election of officers. On February 9th, 2023 the updated employee handbook was approved. On May 11th, 2023 the Board of Commissioners and related staff started drafting a investment policy for AMCD.

Inventory:

The monthly tire inventory and chemical inventory were completed as required. The annual physical inventory was approved at the October 12th, 2023 Board meeting. The annual surplus items were approved at the August 17th, 2023 Board meeting.

Insurance:

The Board approved the helicopter insurance renewal on July 13, 2023. Renewal of the Fleet/Liability and Workers Compensation Ins. and the Health, Dental, and Life Insurance for the calendar year 2023 was approved with Thompson Baker Insurance Company.

Contracts:

January 19th, 2023 the Board approved the renewal contract for Aerial Mosquito Control Services and signed the MOU for the 2023 summer internship program. April 13th, 2023 the Board signed the comcast proposal. August 17th, 2023 the Board renewed the auditor contract with Julieann Klein and approved Gallagher as the Agent of record for helicopter insurance and the Board approved the Agent of Record for health, life and dental to Herbie Wiles. September 14th, 2023 the Cintas uniform contract was renewed and the fleet/liability and workers compensation insurance was approved. October 12th, 2023 the board approved the Mobi soft contract renewal and an agreement regarding the Saint Johns County utilities easement. December 14th, 2023 the board interviewed and selected a new district attorney to start on January 1st, 2024. August 11, 2023 the Board approved the contract between AMCD and Whirly Girl.

RFPs & BIDs:

April 13th, 2023 the Board approved the bid for an articulating boom. May 11th, 2023 the Board approved the RFP for aviation insurance. June 15th, 2023 the Board approved the RFP for auditor and agent of record for property, fleet, and workers compensation. August 17th, 2023 the Board approved RFP for agent of record for health, life and dental insurance and the RFP for a new district attorney. August 17th, 2023 the Board approved the RFP for vehicle purchase.



Figure: AMCD hosted the Bartram Trail Library group

AMCD Website:

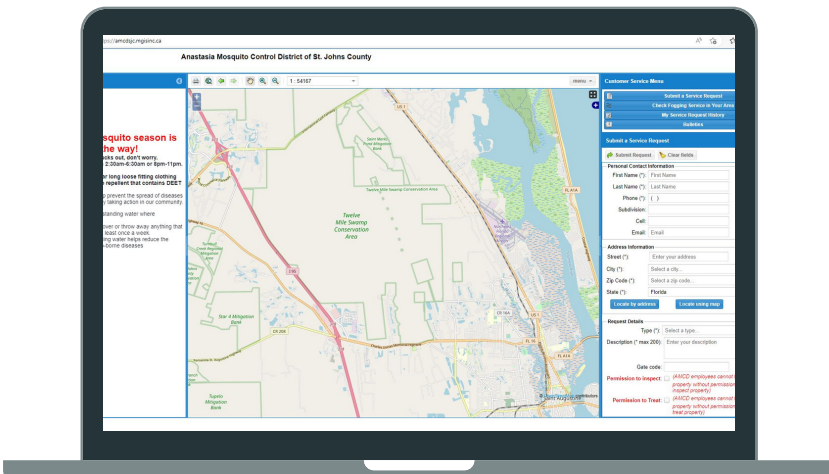
AMCD's website: www.amcdsjc.org is an important tool for providing information to the public, other mosquito control districts, and staff. The site contains important information including public notices, meeting dates, mosquito-borne disease advisories, training, education, and employment opportunities. One of the most important links on the AMCD website is the service request button. At this link, St. Johns County citizens can enter requests for service. This service request is linked to the District's database, Geomosquito, and immediately notifies the AMCD technicians in the field that a request for service has been made. This page on the website also allows customers to access and review the status of a service request and see if there is an adulticide mission (fogging) scheduled in their area. AMCD also keeps the public engaged using social media and has a presence on Facebook, Twitter, and Instagram. AMCD has developed a free app (EMS) to enter service requests, to check for adulticiding, and the ability to get important notifications from the District. This free app is available for iPhone and Android phone users.

AMCD responded to 3,479 service requests in 2023. The average response time for a service request was 1.07 days. Service requests were received by the District office via phone, email, website, and phone app with more than 75% of service requests coming in through the phone app and web interface.

AMCD staff conducted detailed tours of the AMCD facility and buildings to members of the public, local and state officials, members of the education system, and other government agencies especially other mosquito control districts.

AMCD continued to provide service and education to St. Johns County residents on adult and larval mosquitoes, adulticiding, and larviciding. AMCD staff also dispensed valuable information pertaining to the identification of mosquitoes, pesticide safety, other insects, mosquito prevention and pesticide applications, personal protection methods, commercial mosquito traps, repellents, insecticides, and assisted residents with concerns about no spray treatment areas, including bee-keepers' properties or personal/health conditions that require no treatments to be made.

*Scan QR code to
access AMCD's
website*



AMCD strictly adheres to the Florida Statutes, Chapter 388, and 5E-13 of the Florida Administrative Code. The District also follows all Florida Department of Agriculture and Consumer Services and Environmental Protection Agency rules. Labels and Safety Data Sheet instructions are closely followed, as well as, the District's own policies and procedures. AMCD is committed to public safety while providing the important public service of larviciding and adulticiding in order to reduce the spread of vector-borne diseases and nuisance mosquitoes.

AMCD works in cooperation with a number of related local, state, and federal agencies, as well as international, private, and commercial organizations, and members of the medical community. Those listed below briefly describe the work associations with AMCD in 2023 to prevent and control vector-borne diseases in Florida.

International Cooperation and Activities:

- Continued the collaboration with Dr. Gunter C. Muller, from the University of Science, Techniques, and Technology of Bamako, Mali on Attractive Toxic Sugar Baits (ATSB) against vector mosquitoes.
- Continued the collaboration with Dr. Tong-Yan Zhao, Dr. Chun-Xiao Li, Beijing Institute of Microbiology and Epidemiology to organize/hold the 8th International Forum for Surveillance and Control of Mosquitoes and Vector-borne Diseases, Beijing, October 26-28, 2023 Dr. Rui-De Xue gave the conference presidential address about AI technology for surveillance and control of mosquitoes and vector-borne diseases.
- Dr. Xue collaborated with Professor E. L. Hsu and Professor H.H.Pai from Taiwan Environmental Pest Control to organize a workshop, Taichung, Taiwan. October 19-20, 2023. Dr. Xue gave a presentation about ATSB. Also, Dr. Xue visited Kaohsiung Medical University's mosquito research laboratory about Wolbachia for dengue control and the city DOH vector control facility.
- Dr. Xue served as a program committee member of the Asia Pacific Conference on Mosquito and Vector Control, organized and moderated a symposium about technology and beyond. Dr. Xue also gave a presentation about essential oils and ATSB in other symposium, ChiangMai, Thailand, November 27-31, 2023. After the conference, Dr. Xue visited the Department of Parasitology, Medical School, ChiangMai University on Nov. 31.
- Dr. M. Farooq in collaboration with the Salt Lake City MCA visited and consulted on a malaria control project in Mali in June for 2 weeks.
- Dr. Xue served on the review committee to evaluate 9 applications for the WHO/TDR scholarship to join the data training in Bangkok in October.
- Dr. Xue gave a presentation about container-inhabiting mosquitoes at the 10th International Congress of Dipterology's biting fly symposium, Reno, July 10-13, 2023.
- AMCD hosted a visitor from Mali for malaria control collaboration project.
- AMCD hosted a professor from Australia to collaborate on salt marsh mosquito ecology.
- AMCD hosted a visiting scientist from India to collaborate on nanoparticle insecticides for use in ATSB.
- AMCD hosted a visiting scientist from Italy to evaluate a misting system.
- Dr. Xue has continued as the Expert Committee member for the International Standard Organization (ISO).



Figure. Intern working in the field putting out BG sentinel traps.

State Agencies and Services:

- DEP: AMCD collaborated with state parks and joined the environmental education center consulting meetings for salt marsh management.
- Dr. Xue has been appointed by Agricultural Commissioner as the FCCMC member for 4-year services. (since October 3, 2023)
- Dr. Qualls continues to serve the DACS/FCCMC's research review subcommittee member.
- Mr. Weaver continues to serve the FMCA financial member and President, Dr. Xue for the FMCA's Publication Committee Chair and Editor of the JFMCA, Chair of the FMCA Exchange program committee and research advisory committee.
- Dr. Qualls as the FMCA Dodd short course committee and legislation committee member,
- Dr. Peper as the advertising director for Wing Beats.
- Mrs. Becker as the Vice Chair of the FMCA Commissioner section.
- Dr. Xue as the Past President of the Florida Entomology Society assisted the nomination and attended the annual meeting.



National and Federal Agencies & Associations:

- Continued collaboration with USDA/CMAVE to organize the annual workshop and SIT for control of *Aedes aegypti* and other studies.
- Continued collaboration with Dr. Jerry Zhu at USDA/ARS for natural repellent evaluation.
- Continued collaboration with the DoD's NECE, Jacksonville, FL to evaluate ULV spray systems and new formulations of insecticides.
- Collaborated with the DoD's AFPMB for control action threshold grant (finished by the end of July 2023).
- Collaborated with CDC Southeast Center for Excellence to train 3 intern students.
- Collaborated with CDC/ESA to train 3 college intern students (FAMU) during summer.
- AMCD is a sustaining member of the AMCA and an AMCA/EPA PESP member.
- Dr. Qualls continued as committee chair to serve the publication committee of the AMCA.
- Dr. Xue as President-Elect of AMCA.
- Dr. Xue as the NACCHO vector-borne disease working group member
- Dr. Xue continues as the ESA vector control net working to support legislation items about vector control.
- Dr. Xue served on the SOVE Board as the Regional Director until December.
- Dr. Xue, Dr. Qualls, Dr. M. Farooq, and Dr. Steven Peper reviewed numerous manuscripts for the ESA's Journals, AMCA JAMCA, SOVE's JVE, Acta Tropica, J-Peer, PLoS one, Parasite & Vectors, Pathogens, Insects, Scientific Report, PLoS One, and several other journals at their editors' request.

COOPERATIVE ORGANIZATIONS/PROFESSIONAL SERVICES (CONT'D)

Companies And Other Districts:

- AMCD collaborated with several local mosquito control programs in the northeast region to share mosquito and mosquito-borne disease information.
- AMCD continued to provide the blue print of our complex to several other districts and programs.
- AMCD collaborated with Lee CMCD to train pilots and SIT project.
- Clarke: New larvicide evaluation.
- MosquitoMate: Wolbachia-infected mosquitoes, and SIT rearing facility and standard procedures for mass rearing.
- Sumitomo/MGK: new insect repellent evaluation.
- Italy company for evaluation of misting system.
- LampLight Farm, Inc.: spatial repellent device evaluation.
- Syngenta; New formulation of insecticides.
- FMC: New formulation larvicide evaluation.
- Thermacell: spatial repellent evaluations.
- VectorTech: grant application, species ID and AI technology

Local Agencies and Service:

- County EOC for hurricane response
- County Fire rescue for hurricane and fire disaster response
- County Department of Parks for public education both at the EDU center and at public events
- St. Johns School Board for high school interns and school science project training and judging
- P.V. High School Career Academy intern student training & St. Augustine High School St. Johns Academy for student science project evaluation
- Utility Department for Easement at AMCD south part of property.
- DOH for disease surveillance and public education/news release.
- Agricultural center for pest control license examination and public education
- Local inter-agency/resource & service organization networking group. St. Johns County Chamber of Commerce for public education, Kiwanis Club for kids, St. Johns Chamber Rotary Club
- Attended other local community's activity, such as Christmas Parade, Cracker Day, Ancient city Kids, Earth Day

Agencies and Universities:

AMCD cooperated with the University of Florida:

- Dr. Dan Hahn for the SIT project,
- Dr. Wiliam Eisenstadt for DWFP DOD grant application,
- Dr. R. Dinglasan for intern training,
- Dr. P. Koehler and Dr. R. Baldwin for non-target study and nanoparticles of aduicticides and to train Ph.D. student K. Blore.
- Dr. Jack Cameron for a FDACS's honey bee grant
- Dr. Burkett-Cadena from UF FEML for sugar feeding and traps grant.

AMCD with 4 other organizations: applied for CDC collaboration partnership for training and evaluation of mosquito control techniques and the CDC approved the application, but funds were not available.

AMCD cooperated with 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, and special issue for AI technology for Acta Tropica.

AMCD cooperated with University of North Florida: AMCD has a MOU with the University of North Florida's College of Public Health for training intern students. Dr. Qualls gave seminar and joined UNF's Department of Biology graduate student committee.



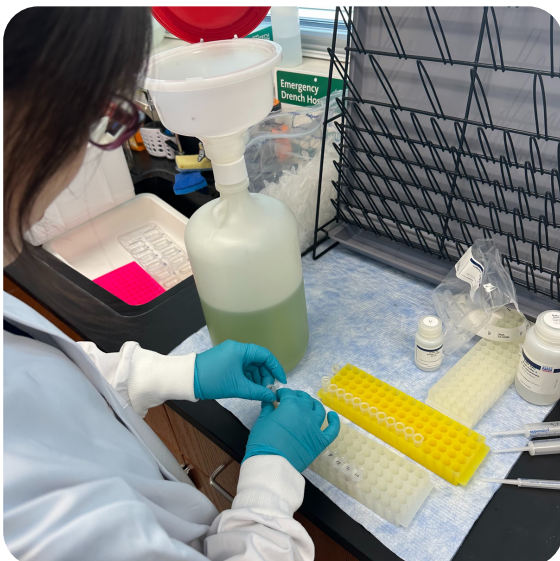
Mosquito-borne Diseases:

AMCD continuously cooperates with the Florida Department of Health (FDOH) to monitor local and imported mosquito-borne diseases through local health providers. In 2023, one locally acquired case of eastern equine encephalitis virus (EEEV) and four imported cases of dengue were found in St. Johns County.

Through the FDOH Laboratory and in-house capabilities, AMCD monitored West Nile virus (WNV), eastern equine encephalitis (EEEV), Saint Louis encephalitis virus (SLEV), Highland James virus (HJV), and California group virus, using nine sentinel chicken sites around SJC. AMCD personnel bleed chickens once a week for testing from April through November.

In 2023, a total of 74 sentinel chickens tested positive for arboviruses, 68 for WNV, 1 for SLEV, and 5 for EEEV. One of those chickens tested positive for both WNV and EEEV on the same day and one of the chickens tested positive for WNV by in-house testing and positive for SLEV by the state laboratory. Two horses were also reported by the FDOH as positive for EEEV.

Three mosquito pools tested positive for WNV in 2023. One of the positive pools consisted of mixed species and was collected from a CDC light trap baited with CO₂ on July 25th. The other two positive pools were *Culex nigripalpus*, the main vector for WNV in SJC and were collected from gravid traps on September 6th and 20th, 2023.



● Mosquito Population:

● Adult mosquito populations were monitored by
● 41 CDC light traps baited with octenol from April
● to November, 2023 and a total of 10,590
● mosquitoes representing 29 species were
● collected. Twelve BG Sentinel traps baited with
● BG Lure and CO₂ were used for *Aedes albopictus*
● and *Aedes aegypti* surveillance. A total of 20,434
● mosquitoes, representing 33 species were
● collected from BG trapping. A total of 31,024
● mosquitoes were trapped by both methods.

● Larval surveys were conducted on a daily basis by
● dipping flooded areas as needed. A total of 23,566
● dips were conducted and 2,180 dips were positive
● with 36,048 larvae found.

● Environmental Parameters:

● The total average monthly rain fall for St. Johns
● County in 2023 was 4.25 inches with a total of
● 51.05 inches for the year per the St. Johns River
● and Water Management Districts Hydrologic
● Charts.



SURVEILLANCE(Cont'd)

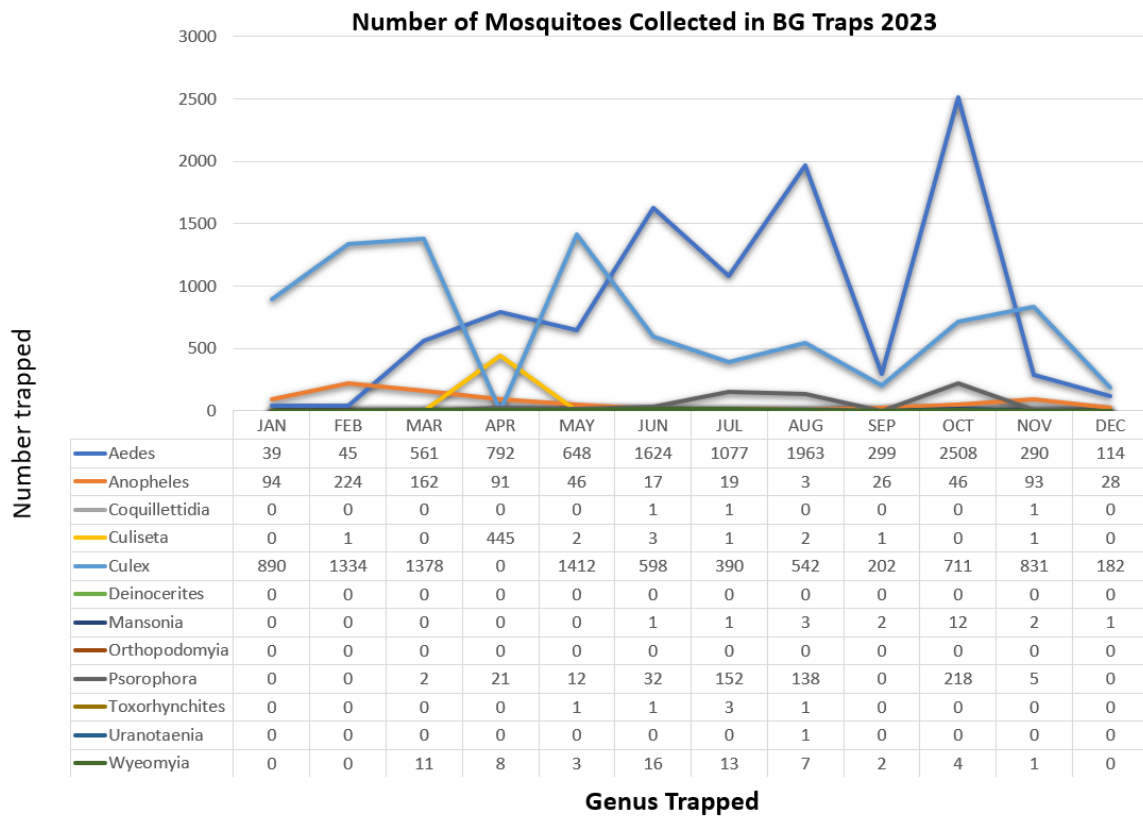


Figure . Total mosquitoes collected throughout 2023 by month and genus in BG-Sentinel Traps



Figure. Intern students working in the taxonomy laboratory identifying egg papers, mosquito specimens, and counting larvae for a bioassay.

SURVEILLANCE (Cont'd)

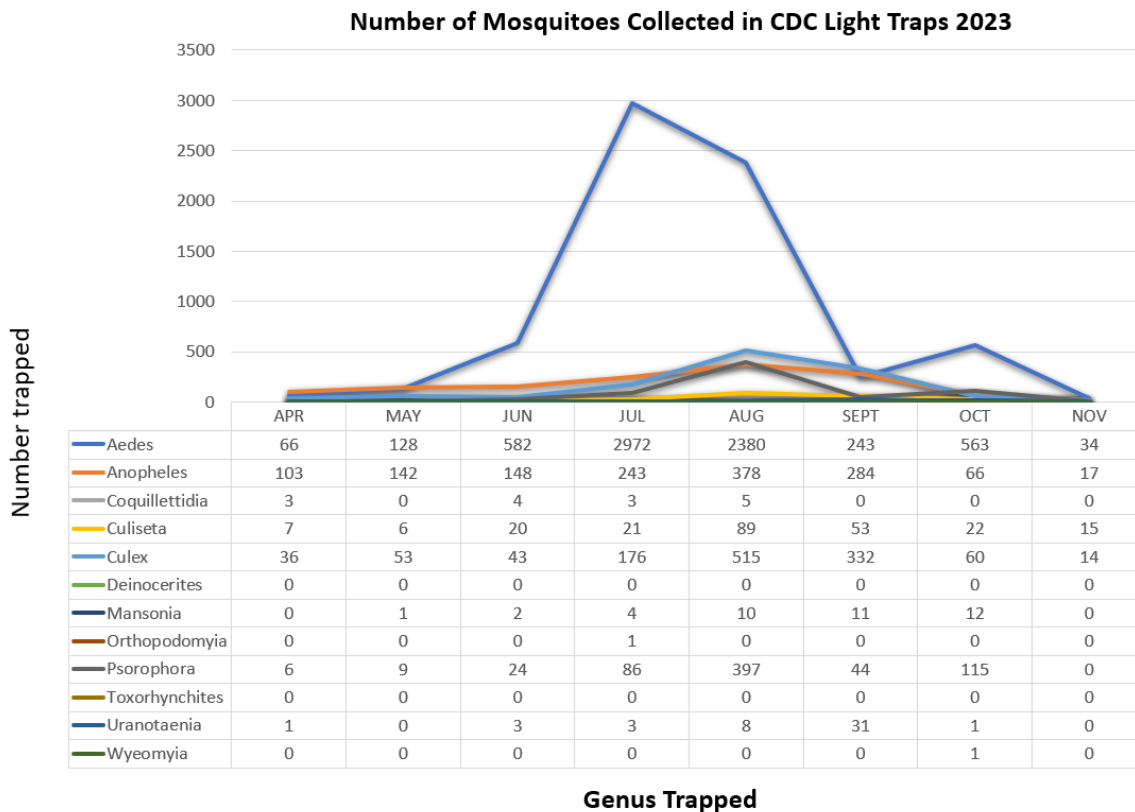


Figure. Total mosquitoes collected throughout 2023 by month and genus in CDC Light Traps



Figure. Intern students working in the taxonomy laboratory identifying egg papers and mosquito specimens.

SURVEILLANCE (CONT'D)

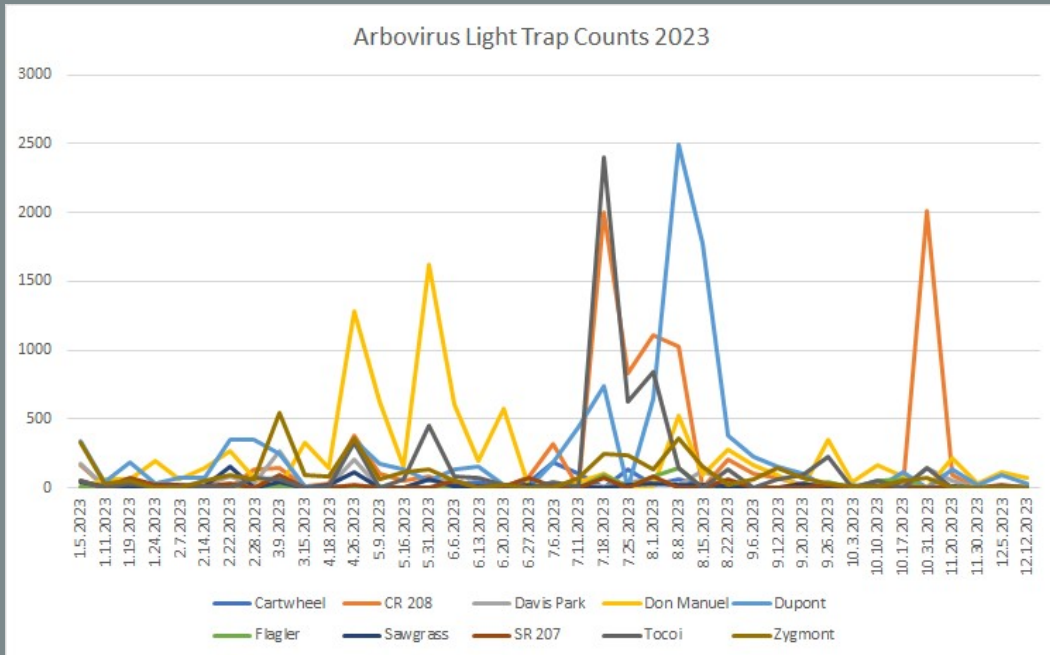


Figure. Total number of mosquitoes collected in 2023 Arbovirus Surveillance Co2 Traps

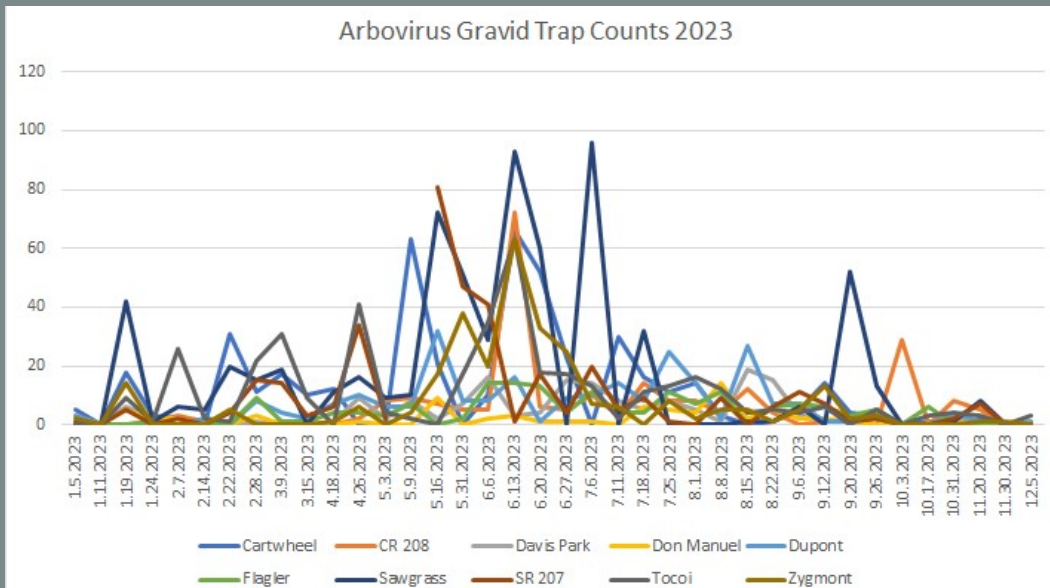


Figure . Total number of mosquitoes collected in 2023 Arbovirus Surveillance Gravid Traps



Larvicides and Larviciding:

In 2023, the District primarily used *Bacillus thuringiensis israelensis* to kill mosquito larvae, as well as methoprene products in areas where BTI was not applicable. Mosquito Control Technicians treated 1,373 times for a total of 5,759.03 acres. The aerial program made 57 applications for a total of 4,244 acres treated.

Adulticides and Adulticiding:

Mosquito Control Technicians continued to use Aqualure 20-20 (Permethrin) and Mosquitomist Two for ground ULV spraying and treated 164 times for a total of 109,846.76 acres for adult mosquito control. DUET was used in the hand thermal foggers to handle service requests and other areas 77 times for a total of 24,061.12 acres. Talstar P was used as an adult mosquito control barrier treatment in parks, special areas, and for service requests a total of 112 times equaling 82.67 acres. The Aviation team had 16 missions, and treated a total of 89,612.36 acres, by air with naled.

Larvicides and Adulticides Used in 2023

<i>Larvicides</i>	Amount Used		Area Treated		Times applied
Vectobac G	40	Ib	6.5	acre	1
Altosid WSP	40,289	ea	124.86	acre	425
Altosid XR	406	ea	.93	acre	32
Altosid XRG	8285	Ib	1380.83	acre	108
Altosid XRG (air)	30080	Ib	3008	acre	39
BTI Briquets	1638	ea	3.76	acre	32
Cocobear	2950	fl oz	7.68	acre	90
Natular DT	355	ea	.05	acre	20
Sustain MBG	3870	Ib	510.65	acre	87
Sustain MBG (air)	5000	Ib	500	acre	8
Liquid BTI	59,626	fl oz	3,724.12	acre	578
VectoBac G Air	7360	Ib	736	acre	10
<i>Adulticides</i>	Amount used		Area Treated		Times applied
Aqualure 20-20	11,154.17	fl oz	43,177.18	acre	77
Naled (air)	53,760	fl oz	89,612.36	acre	16
Duet 50%	37,776	fl oz	24,064.12	acre	77
Mosquitomist Two	44,002	fl oz	66,669.58	acre	87
Talstar P	27.86	gal	82.67	acre	112

Source Reduction & Biological Control:

A total of 158 used tires were collected and removed throughout the year by AMCD staff and personnel as a means of source reduction.

Empty containers in-and-around residential yards were emptied numerous times when AMCD staff and personnel performed their inspections.

AMCD provided the public with the mosquito larval eating fish (*Gambusia*) for use in retention ponds and ditches 11 times for a total of 144 fish provided.



The purpose of AMCD's applied research is to figure out more efficient ways and solution to conduct operation surveillance, control, and improvement of service requests. In 2023, AMCD staff submitted 9 proposals and received 3 grant funds (CDC, USDA and DACS) with collaborators, DOH, UF/FMEL, VectTech). Total of \$450K received from federal, states, and private companies. AMCD completed the DoD 3-year grant, one DACS collaborative grant, and five industry grants. AMCD staff authored and coauthored more than 20 publications and 3 book chapters. To better understand how sentinel chickens are used at different mosquito control programs throughout the state, AMCD developed and distributed a survey to those programs that use sentinel chickens. Ideally, results of this survey will help programs learn ways to improve their current sentinel operations, boost the efficiency of their program, save on operational costs, and help to ensure programs are good stewards of the animals they use for surveillance. Twenty-seven programs responded that use sentinel chickens. Some survey results include: Districts averaged one flock of chickens every 89 square miles and 8.6 flocks per district. Programs average 5.7 chickens per flock and typically maintain 23 extra birds in reserve to replace positive birds from the field. Barred Rock and Rhode Island Red are the most popular species used as sentinel chickens.

Evaluation of Three Battery Powered Backpack Sprayers for Barrier Applications

Barrier applications block movement of mosquitoes from a breeding site to the human activity area. Backpack sprayers producing mist spray are the preferred choice for small scale barrier applications. There are a variety of battery powered backpack sprayers which recently are on the market with modifications to reduce operator fatigue. Due to the inability for a backpack to be selected solely on its specifications, a study was conducted to compare three battery powered sprayers for barrier applications for mosquito control. These sprayers were the Field King 190515, Birchmeier AS1200 AC2, and Ryobi Electrostatic sprayers (Figures below). The AS1200 is an attachment to Birchmeier REC15 backpack that has five airspeed levels with the midlevel selected for this evaluation. Talstar® P insecticide (A.I. Bifenthrin 7.9%) was applied to vegetation at maximum label rate by mixing 1 fl oz to 1 gal of water to cover 1,000 sqft. As Ryobi has the electrostatic feature, 1 fl oz was mixed with 0.5 gal of water to cover 1000 sqft. Twelve vegetation plots, 200 ft long, separated by at least 200 ft from each other, were selected at three sites in St. Johns County. Three randomly selected plots were assigned to each sprayer and three to control. The effectiveness of the applications was evaluated by leaf bioassays and by monitoring mosquito populations on two sides of the treated vegetation. Leaf bioassays were conducted in the laboratory for locations at 0, 5, 10, and 15 ft into the canopy for each plot. For the leaf bioassay, 10 female *Ae. aegypti* were aspirated into the bioassay dishes and exposed to either treated or non-treated leaves for 24 hours when mortality was recorded. Mosquitoes were collected weekly for 24 h with CDC light traps baited with dry ice and lure, one trap in the front and one on the backside of the treatment area on the vegetation edge. Pre-treatment trapping was conducted 2 weeks before the barrier applications were made and continued four weeks post-spray. All mosquitos were identified to species. Based on the leaf bioassays, the Field King, Birchmeier and Ryobi, had control for 2, 3 and 1 weeks after application, respectively. The three sprayers on average reduced mosquito populations by 71.0%, 55.5%, and 31.3 %, respectively.



Field King 190515



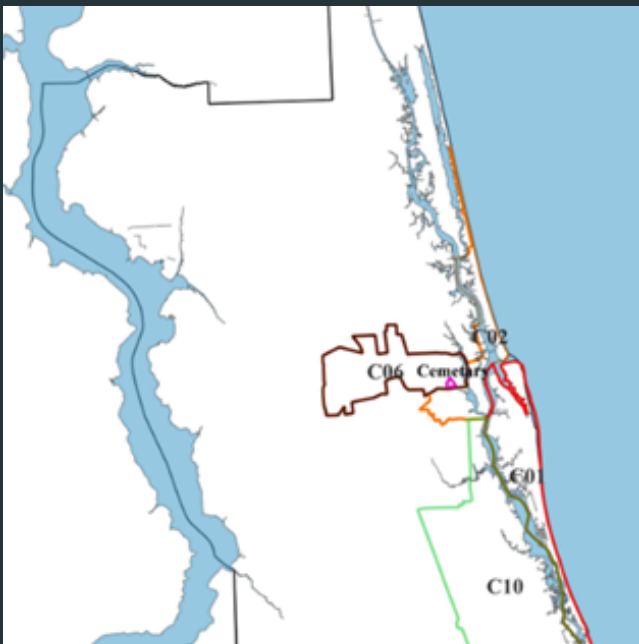
Ryobi Electrostatic



Birchmeier
AS1200 AC2

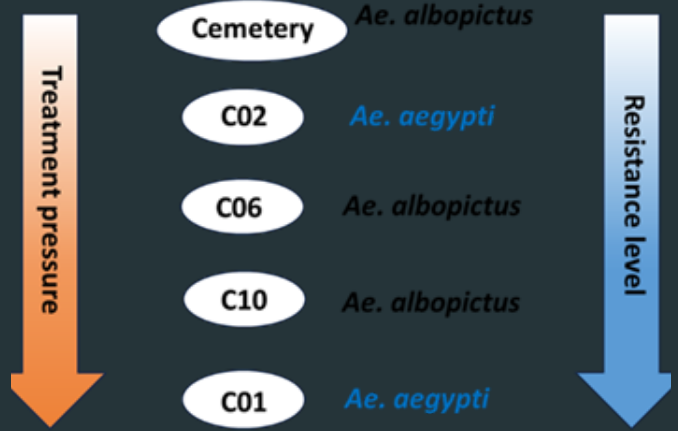
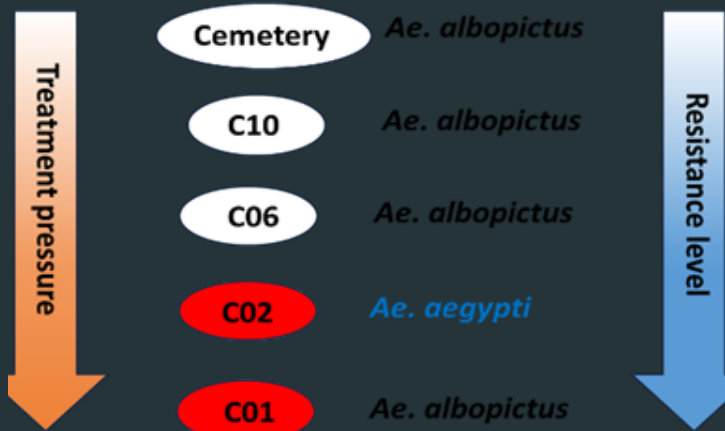
Insecticide resistance of *Aedes aegypti* and *Aedes albopictus* in different operational zones in the St. Johns County

Insecticide resistance levels of *Aedes aegypti* and *Ae. albopictus* mosquitoes of St. Johns County was evaluated for Aqualuer® 20-20 and Duet®. *Aedes* populations from five different operational zones of the county which have different treatment pressures were tested separately. The study demonstrated variations in resistance levels in populations in different operational zones following the gradient of the treatment pressure. However, the resistance levels detected from tested populations of *Ae. aegypti* were always higher than that of *Ae. albopictus* for both products. The results provide a preliminary map for planning routine resistance monitoring and management of the two *Aedes* species in the county.



Aqualuer

Duet



Evaluation of a nanoparticle encapsulated permethrin formulation against three species of adult mosquitoes: *Aedes aegypti*, *Culex quinquefasciatus* and *Anopheles quadrimaculatus* (Ph.D. student project).

Insecticides remain an integral component of mosquito control operations but sustained use of a limited number of active ingredients (AI) has led to widespread development of resistance. New insecticides, AIs, and formulations are therefore necessary to maintain future efficacy of mosquito control. As part of the effort to research and develop novel insecticides, toxicity screening of silver nanoparticles (AgNPs) was conducted at AMCD to assess their viability as potential adulticides against different genera of mosquitoes. Nanoparticles were synthesized from silver nitrate (AgNO_3) using essential oils as both a reducing and capping agent. The formed particles were characterized using several types of analysis including UV-Vis spectrophotometer analysis, transmission electron microscope and Zetasizer NSP to determine size and morphology. Additionally, the AgNPs were evaluated in conjunction with permethrin to evaluate potential synergism. Analysis of samples synthesized using geraniol, lemongrass, and eucalyptus oils using nanoparticle tracking analysis yielded median particle size between 47.4 - 82.6 nm confirming nanoparticle formation and size. Dynamic light scattering analysis measured a similar distribution of size with particle concentrations ranging between 5.9×10^9 - 4.8×10^{11} particles per milliliter. Observed nanoparticles were spherical in morphology. Toxicity screening of the nanoparticles did not demonstrate significant standalone mortality in test mosquitoes. Synergist testing is currently ongoing with evidence to suggest potential synergistic interaction.

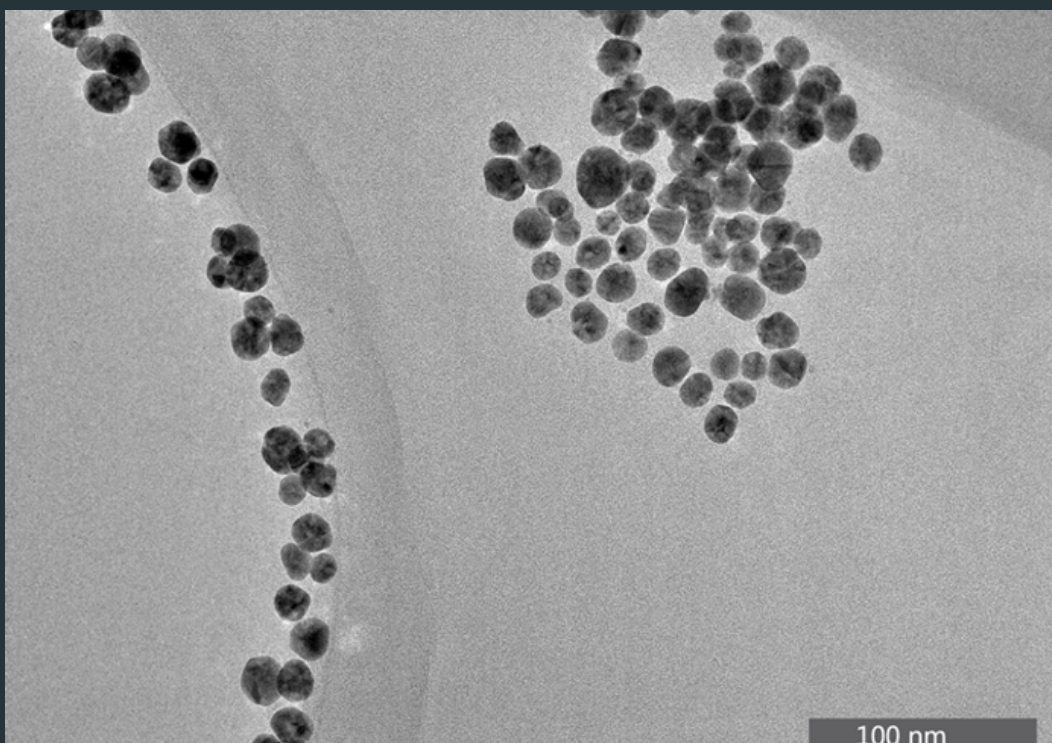
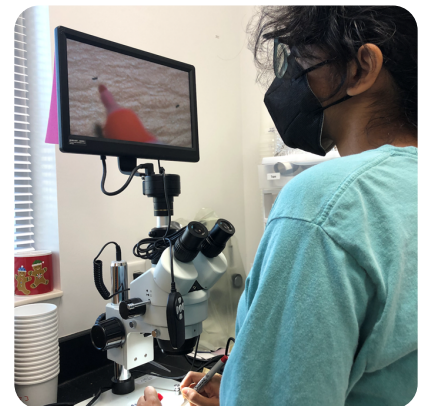


Figure. TEM image of geraniol AgNP sample with 94000x magnification

Collaborative, Ongoing, and Completed Projects:

- Pesticide Free Community Survey: Deciphering the code on how to approach the public about pesticides
- Environmental Factors Influencing Salt Marsh Mosquito Distribution in SJC
- Evaluating Prevalence of Dog Heartworm (*Dirofilaria immitis*) Infected Mosquitoes Species in St. Johns County
- Sentinel Chicken survey
- Evaluation of Three Battery Powered Backpack Sprayers for Barrier Applications
- Evaluation of PlugNRepel in Outdoor Screen Enclosures Lamplight Farms, LLC
- Evaluation of the Spatial Repellent Device, Centrifuge, in Outdoor Screen Enclosures Lamplight Farms, LLC
- Evaluation of Thermacell spatial repellent devices
- Evaluation of Novel Larvicides in Outdoor Larval Ponds and Laboratory Settings for FMC
- Evaluation of a novel chemistry for repelling mosquitoes—MGK
- Evaluation of novel chemistries for adult mosquito control- Syngenta
- Mosquito sugar feeding for vector control and arbovirus detection in Florida
- Non-target impacts of mosquito larvicides and adulticides to Florida honey bees (*Apis mellifera*)
- Evaluation of misting system for adult control
- Comparison of nozzles for misting systems in the wind tunnel
- Evaluation of Birchmeier AS1200 AC2 system for barrier application
- Comparison of the impact of chicken blood, bovine blood and an artificial blood meal on mosquito fecundity
- Evaluation of a spatial repellent device for Woodstream
- Evaluation of a nanoparticle encapsulated permethrin formulation against adult mosquitoes
- Evaluation of nano-formulation of essential oils as ATSB active ingredient against adult mosquitoes



Employee Education and training

Four AMCD employees attended the FMCA Fly-In at Savannah in January. Annual mandatory training was done in-house in February for full-time employees and again in May, and June for those that needed to make up any training and for new hires. Twenty employees and four Commissioners attended FMCA DODD Short Courses in February. Five employees and two commissioners attended the AMCA annual meeting, Reno in late February. All AMCD employees and three Commissioners attended 18th Annual Workshop, March 28-30. In April three aerial crews and three employees attended the Lee County MCD's Aerial Workshop. Five staff attended the FCCMC meeting in January, May & October. Thirteen employees attended the FMCA annual meeting, Ft. Myers, Nov 13-17, 2023. Kai Blore continues his Ph.D. study through University of Florida. Dena Oliva received her MBA in December 2023. Dr. M. Farooq participated in a Malaria Control Project in Mali, Africa, June 12-24.

Community Events/Public Outreach

AMCD was involved with Cracker Day, Touch-A-Truck, National Night Out, Earth day, Ancient City Kids Day (Fig. a,b), High School Career Days, and St. Augustine Christmas Parade (Fig.c). Ms. T. Hirokawa gave presentations at Land Day at South Woods Elementary School (Fig. d). The Science team gave presentations at Island Prep Kids Day and at the Anastasia Island Library. AMCD also hosted the Environmental Education and Outdoor Recreation Summer Camp through the SJC Park Systems. AMCD held a dedication ceremony for SIT Mass Rearing Facility and gave tours of the new facility. Multiple tours were held at the Education Center with different local communities, St. Johns schools, Home-schools, and local church groups. Commissioner Becker gave more than 10 presentations and interviews at different community events. AMCD was active on social media platforms: Instagram, Twitter, and Facebook. Website update weekly.



Figure a



Figure b



Figure d



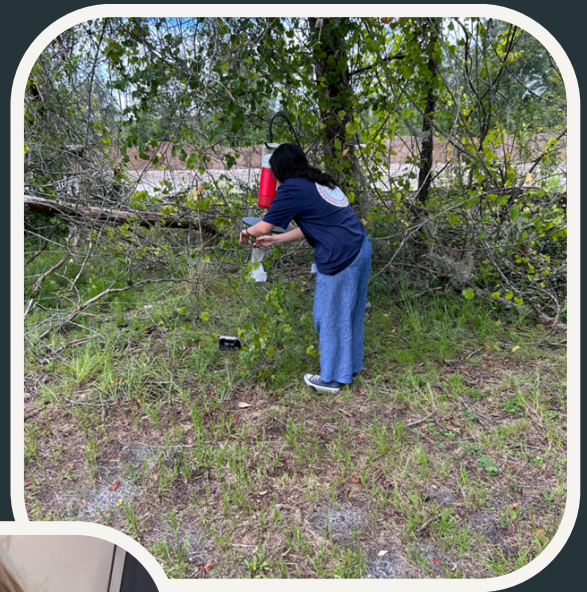
Figure c

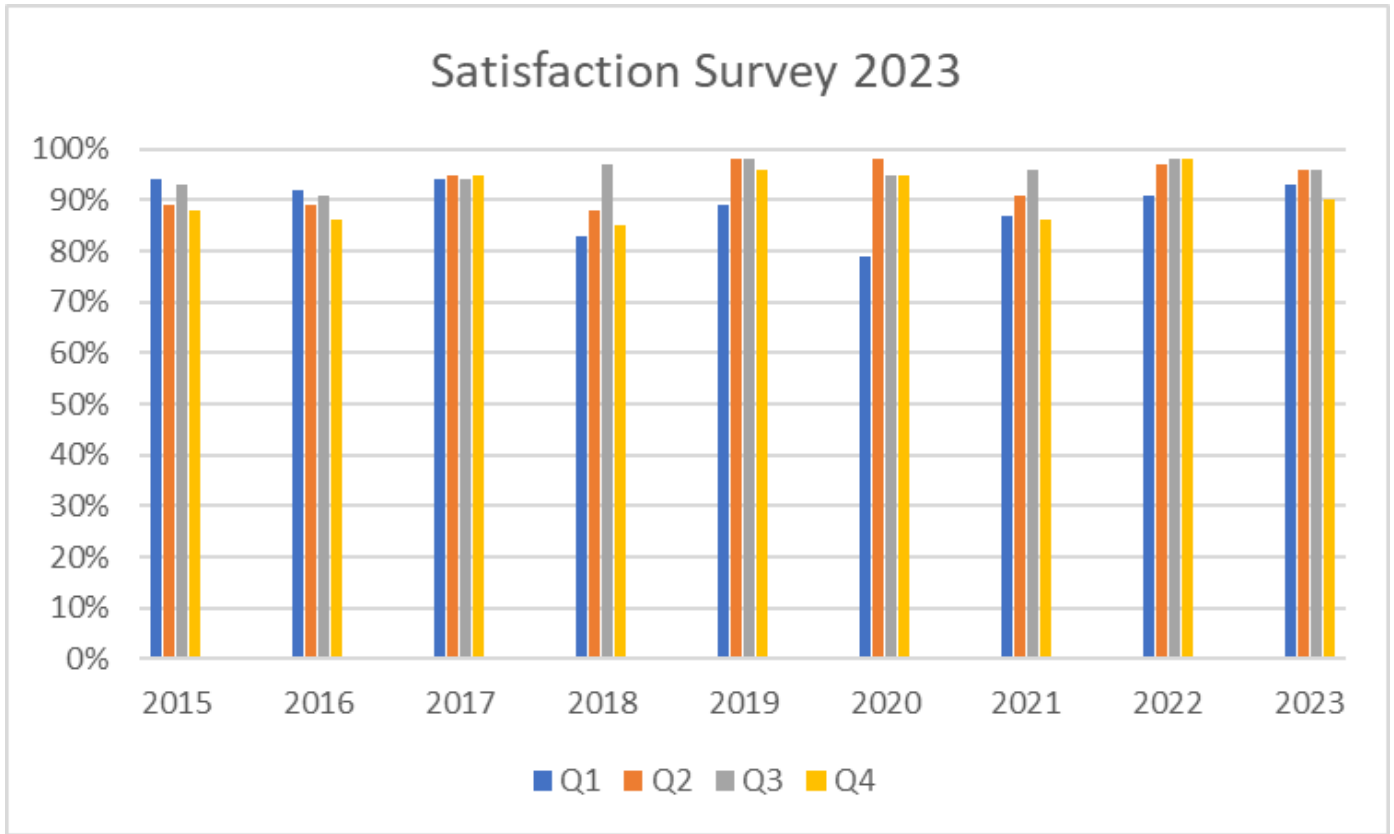
St. Johns County School Program In 2023, AMCD taught a BTI lab at St. Johns Technical High, three first grade classes with St. Johns Virtual School on the mosquito life cycle, a class about insects at Island Prep Elementary School, and ten 1st grade classes at Ponte Vedra/ Palm Valley Elementary School on the mosquito life cycle. Mr. Smith served on the St. Augustine High School Aerial Academy. Dr. Xue, Dr. Qualls, and Dr. Peper served on the P.V. High School Academy Board and trained intern students. Dr. Peper & AMCD received 2 grant awards to train high school students and 3 college interns from Entomological Society of America (ESA).

AMCD Internship Program

Since 2005, Anastasia Mosquito Control District (AMCD) has provided multiple internships to all educational levels. The internship program was created to enhance AMCD's program through education and applied research, encourage interest in mosquito control for both scientific and non-scientific students, mentor interns in the scientific method, laboratory procedures, and public health, as well as bring new technologies and methods to the field of mosquito control. AMCD has partnered with over 18 Universities and Colleges across the US, the Entomological Society of America's Public Health Entomology for All program, Centers for Disease Control and Prevention, the CDC Southeastern Center for Vector-Borne Diseases at the University of Florida Emerging Pathogens Institute, and the Academies of St. Johns County. In 2023, we had 5 graduate students, 8 undergraduate students, and 9 high school students for a total of 22 interns. In total we have trained 103 students: 36 graduate students, 43 undergraduate students, and 23 high school students.

Figure. Interns working in the field and laboratories





Satisfaction survey questions

Q1- I am aware of and actively participate in the DRAIN and COVER method: Drain standing water and cover your skin with clothing and repellent.

- The % of people surveyed who responded "strongly agree" has decreased since 2016

Q2- The AMCD staff were professional.

- The % of people surveyed who responded "strongly agree" was in line with previous years.

Q3- AMCD responds to my service requests within the standard 1-2 business days.

- The % of people surveyed who responded "strongly agree" has increased since 2016

Q4- The AMCD staff were informative.

- The number of people who respond "strongly agree" has increased since 2016

Organized Professional Meetings,

Symposiums, Workshops & Presentations

28

FMCA Fly-In Workshop, Savannah, GA, January 10-13.

Presentations: Xue RD. Creation and development of aerial program at Anastasia Mosquito Control.

Florida Mosquito Control Association Dodd Short Courses, January 23-27 (Virtual) and January 30-February 2 (In-person).

Organized Classes:

- Qualls WA. Tips and Tricks to Equipment calibration and characterization
- Qualls WA. Advanced Mosquito Control
- Qualls WA, Peper ST, Blore K. From Start to Finish: What your program needs to conduct applied public health research
- Peper ST. In-house Molecular Testing

AMCA annual meeting, Reno, NV, Feb 27-Mar 3.

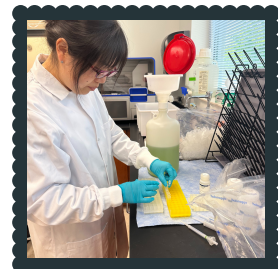
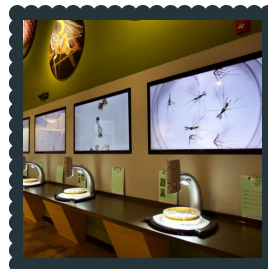
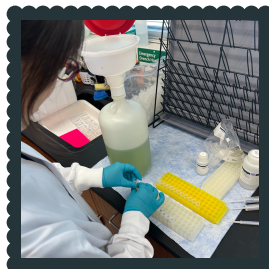
AMCA Elected Officers: RD Xue as AMCA's President-Elect. Worked on AMCA annual meeting program and moderated the panel session, Reno.

Organized Symposiums: National perspective into treatment thresholds for mosquito management, and Applied Research at the District level

Presentations:

- Xue RD, Aerial barrier spray against flooding water mosquitoes
- Xue RD, Muller GC. Insect repellent testing standards
- Xue RD, Muller GC. Sugar feeding behavior and ATSB
- Xue RD, Muller GC. Modified traps and trapping progress
- Farooq M. Evaluation systems for spatial repellents against ticks.
- Qualls WA, Aryaprema V. Review of Action Thresholds from the Literature focusing on current approaches to developing and implementing thresholds
- Qualls WA. Applied Research and Education Program at AMCD Benefits to Operations
- Qualls WA. Building an IIT/SIT program at AMCD
- Peper ST. Results from a research survey: Capabilities and capacities for vector control in Florida and Texas
- Peper ST. Journal formatting: To compromise or not to compromise

Moderators: Qualls WA. and Peper ST. were symposium moderators



Organized Professional Meetings, Symposiums , Workshops & Presentations (cont.)

18th Arbovirus Surveillance and Mosquito Control Workshop, AMCD, St. Augustine, FL, March 28-30, 2023.

RD Xue organized adjunct/consulting/collaborating meeting, AMCD on March 27. Dr. Xue organized 18th annual workshop. WA Qualls, ST Peper, and RD Xue moderated different sessions.

Presentations:

- Xue RD. AMCD intern training and job opportunity
- Peper ST. WNV surveillance in St. Johns County, Florida in 2022
- Turell M. The Rift Valley fever virus, risks and dangers to Americas
- Smith D. Overview of AMCD aerial program
- Farooq M. Evaluation of spatial repellents against ticks
- Blore K. Evaluation of nanoparticle formulation of mosquito adulticides
- Qualls WA. AMCD's collaboration project update
- Aryaprema V. Salinity effects on the distribution of container breeding *Aedes* species
- Farooq M. Evaluation of backpack sprayers to apply adulticides against *Aedes aegypti*

Lee County Mosquito Control District's 3rd Annual Aerial Workshop, April 16-18.

Presentations:

- Qualls WA. Buff spraying against adult mosquitoes in St. Johns County, Florida
- Smith D. Update AMCD aerial program

10th International Congress of Dipterology. Reno, NV, July 16-21.

Presentation: Xue RD. Population dynamics and its management of container-inhabiting mosquitoes (Diptera: Culicidae) in Northeastern Florida.

Society for Vector Ecology, 51st Annual Conference, Charleston, SC, September 18-21.

Presentations:

- Peper ST. From River Otters to Quail to Pigs to Mosquitoes: An Unexpected Journey to Working in County Government.
- Qualls WA. From River to Sea: identifying environmental triggers of Florida's most notorious nuisance and vector mosquitoes.
- Peper ST. Served as a panelist during the SOVE student symposium

Taiwan Environmental Pest Control Association's workshop on mosquito control, Taichong, Taiwan, October 19-20. Meeting Organizer: Xue RD. Workshop organizer

Presentation:

- Xue RD. ATSB for operation control of mosquitoes



ORGANIZED PROFESSIONAL MEETINGS,
SYMPOSIUMS , WORKSHOPS & PRESENTATIONS (CONT.)

30

8th International Forum for Surveillance and Control of Mosquitoes and Vector-borne Diseases, Beijing, China, October 26-20. Meeting Co-organizer: Xue RD.

Presentation:

- Xue RD. Challenge and Exploration of Artificial Intelligent (AI) technology for surveillance and control of mosquitoes and vector-borne diseases.

Florida Mosquito Control Association Annual Meeting, Cape Coral, Florida, Nov. 14-16.

FMCA Elected Officers: Weaver JR as President-Elect organized the FMCA annual meeting.

Presentations:

- Peper ST. A survey of sentinel chicken programs
- Oliva D. ULV Planning and implementation process
- Smoleroff S. Surveillance trapping program
- Aryaprema V. Insecticide resistance profiles of *Aedes aegypti* and *Aedes albopictus* of St. Johns County, FL
- Blore K. Evaluation of silver nanoparticles as a control tool against adult mosquito vectors
- Qualls WA, Farooq M. Evaluation of three battery-powered backpack sprayers for barrier applications
- Qualls WA. High School students and college students and graduate students oh My! How to create an internship program that spans different education levels
- Kuppe C. Implementation of GIS in Mosquito Management Programs
- Zeszutko E. Evaluating prevalence of dog heartworm infected mosquitoes

Asian Pacific Conference on Mosquito and Vector Control, Chiangmai, Thailand, Nov. 27-31.

Symposium Organizer: Xue RD. Invited symposium organizer

Presentation:

- Xue RD. Three natural essential oils as active ingredients of ATSB against *Aedes* mosquitoes

Seminars and Lectures:

- Qualls WA. Action Thresholds: One size does not fit all. Deployed War Fighter Program. March 16th. virtual
- Qualls WA. Applied Research and Education Program at AMCD benefits to operations. University of North Florida Biology Series Seminar, January 20.
- Qualls WA. Overview of AMCD. St. Johns County Rotary Club (August 2), St. Johns County Bee Keepers Association (October 2), Southeast Pest Management Workshop (May 9).
- Qualls WA. After the Storm: Role of AMCD. St. Johns County Emergence Management Operations Morning Chat, October 5.
- Peper ST. From Bears to Beavers and Otters to Mosquitoes: Ecological and Public Health Based Research. Seminar Series: Ponte Vedra High School, February 5.
- Peper ST. Arbovirus and Pathogen Detection Program: Promoting and Protecting Public Health. Jacksonville Area Microbiology Society, September 12.

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The Balmoral Group worked in consultation with a mosquito control expert in the course of this review and found that AMCD delivers a wide variety of mosquito control services effectively and efficiently within the scope of the MCD's charter and applicable laws and regulations. The district is managing its resources in an efficient and effective manner to achieve its goals and objectives. AMCD has engaged in a strategic planning process and has several clearly defined and measurable goals and objectives that adequately address the district's statutory purpose, provide sufficient direction to the district, and are achievable within budget. The district tracks SCOPE Section 189.0695, Florida Statutes, requires the conduct of performance reviews of Independent Mosquito Control Districts. The Balmoral Group was selected by the Office of Program Policy Analysis and Government Accountability to perform the review, which evaluates the district's programs, activities, and functions, including:

- evaluating the district board's primary function and governance;
- assessing service delivery and comparing similar services provided by municipal or county governments located within the district's boundaries;
- describing district purpose, goals, objectives, performance measures, and performance standards and evaluating the extent to which they are achieved;
- analyzing resources, revenues, and costs of programs and activities; and
- providing recommendations for statutory or budgetary changes to improve the special district's program operations, reduce costs, or reduce duplication.

In the Final Report provided to AMCD (September 2023), Balmoral found that AMCD is largely meeting its performance standards and suggested that the district could establish additional performance metrics.

Based on its review, The Balmoral Group presented the following recommendations for the improvement of mosquito control services at AMCD:

- The Legislature could consider amending section 403.709(1), Florida Statutes, to require a portion of the funds currently administered by DEP for solid waste activities to be allocated to waste tire abatement activities by MCDs.
- The district could formalize additional performance measures and standards that would allow the district to monitor and track progress toward all its goals and objectives.
- The Legislature could consider directing the Florida Coordinating Council on Mosquito Control to form a subcommittee consisting of mosquito professionals and researchers from around the state to develop model goals, objectives, and performance measures and standards to assist this state's MCDs with performance monitoring.

ATTENTION: For a full report from the Balmoral Group, please visit amcdsjc.org



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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 2023.

