

ANASTASIA MOSQUITO CONTROL DISTRICT

OF ST. JOHNS COUNTY

ANNUAL PROGRAM REPORT FOR 2022

As an essential business AMCD
continued all operations through the
Covid-19 pandemic.



120 EOC Drive,
St. Augustine,
FL 32092

(904) 471-3107
www.amcdsjc.org



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Message from Chairperson of the Board of Commissioners

As Chair for 2022 and my retirement from AMCD effective 12/31, I am going to take this opportunity to highlight some of our successes over the last years. Please know that none of this could have been achieved without my fellow board members both past and present. Our professional staff have also been supportive of the changes and without their hard work and dedication none of this would have become a reality.

*Each year we answer approximately 5,000 service call and have had only 1 local- acquired human mosquito-borne disease in 19 years!

*We have received more than \$2 millions in funds from Federal, State, local and industry partners.

*Our annual workshop attract more than 220 participants both statewide, nationally and internationally.

*We have been recognized as one of the training centers by the American Mosquito Control Association, CDC/ Southeastern Centers of Excellence. National Association of City and County Health Officials and the Entomological Society of America.

*Our staff has authored or coauthored more than 200 publications or book chapters. We are the number one cited district for operational vector control.

*Our employees have received 18 State and National Awards.

*Lastly we have built a state of the art scientific agency on our 18 acres.

*Our last build outs are our Educational Center that the SJC School Board stated that this is a huge benefit to the schools and to our community.

*The SIT LAB is our last project and will help change the way mosquito control agencies do business in the future.

I am proud of our district and its past successes. I know future boards will continue to support our staff and keep our residents informed and safe from mosquito-borne diseases. It was my pleasure to represent the residents of SJC for the last 16 years.



Mrs. Jeanne Moeller

Message from The Director

In 2022 AMCD had the longest and toughest season with response efforts to control mosquitoes and mosquito-borne diseases due to hurricane Ian and Nicole. The 1st locally-acquired human case of WNV happened since 2003. This year, there were two imported dengue fever cases, two imported malaria cases, a positive WNV horse, a positive EEE horse, several sentinel chickens positive for WNV and a positive mosquito pool in St. Johns County. It was an unusual outbreak of salt marsh mosquito populations and it happened on Anastasia Island and St. Augustine South areas after the Thanksgiving holiday. AMCD's aerial capability was fully operational for surveillance and control of the mosquito outbreak and also assisted the county's agencies to respond and inspect St. Johns County for damage assessments after the hurricanes. AMCD successfully held the 17th Arbovirus Surveillance and Mosquito Control Workshop with more than 200 participants nationwide after being postponed for two years due to the pandemic of COVID-19. In the middle of January, for the first time AMCD hosted the Florida Mosquito Control Association's fly-in class and attracted more than 160 people to participate. AMCD organized and held the Sterile Insect Technique (SIT) expert/consult meeting to update progress and explore further cooperation on December 8th. AMCD received more than \$400k in grant funding from federal, state, and private companies in 2022. The DoD/AFPMB's grant 2nd year and the CDC collaboration grant with UF was completed by the end of 2022. A larvicide project has been conducted under the Good Laboratory Practice (GLP). AMCD received the Entomological Society of America's award to train/host intern students and partnership award from St. Johns County School Board for training intern students from Ponte Vedra High School for the past 2 years. Commissioner Mrs. J. Moeller received the leadership award from the AT&T Governmental Technology for special districts. I received the medal of honor (the highest award) from the American Mosquito Control Association (AMCA) and was elected as the President-Elect for the AMCA. Mr. R. Weaver was elected as the President-Elect for the FMCA. The Disease Vector Education Center was dedicated on December 8, 2022 and AMCD is planning a grand opening in the summer of 2023. The Sterile Insect Technique (SIT) mass rearing facility has been constructed and plans to open in the summer of 2023. I greatly appreciate and thank the strong support from our Board of Commissioners, dedicated employees, excellent collaborators, experts worldwide and funding agencies to our District to continue providing the excellent services to the citizens of St. Johns County.



Dr. Rui-De Xue

Board of Commissioners



**Mrs. Catherine
Brandhort**
Seat 1
2021-2024

Mrs. Jeanne Moeller
Seat 2
2007-2022



Mrs. Gina LeBlanc
Seat 3
2017-2024

**Mrs. Panagiota K.
"Trish" Becker**
Seat 4
2019-2022



Mrs. Gale Gardner
Seat 5
2021-2024

Appointed Offices



Mr. Wayne Flowers
Attorney Since: 11-9-10



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



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

Full Time Employees

Johns Freddie Allen



Mechanic
7-08-2002 to Present

Steven Kyle Arber



Mosquito Control Technician
5-01-2017 to Present

Dr. Vindhya Aryaprema



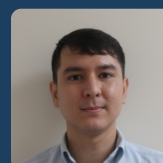
FT Grant Funded Term Limited Biologist
8-05-2019 to 7-15-2023

Taylor Ballantyne



Education Specialist
10-4-2021 to Present

Kai Blore



Biological Lab Technician
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



Field Biologist
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

Jerry Iser



Mosquito Control Technician
2-02-2015 to Present

Heather Keating



Administration Assistant
10-03-2022 to Present

Connor Kuppe



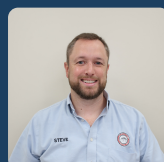
Biological Technician
8-1-2022 to Present

Aye McKinney



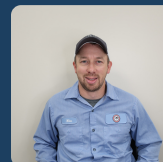
Accountant
1-04-2021 to Present

Dr. Steven Peper



Molecular Entomologist/Biologist
3-23-2020 to Present

Michael Phillips



Pilot
2-24-2020 to Present

Dr. Whitney Qualls



Entomologist/Scientific Manager
10-28-2019 to Present

Dana Smith



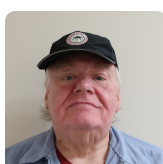
Chief Pilot/Aviation Manager
4-27-2020 to Present

Steven Smoleroff



Biological Technician
10-02-2017 to Present

Rick Stockley



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

Olivia Sykes



FT Grant Funded Term Limited Biological Technician
4-06-2020 to 7-15-2023

Holly Usina



Mosquito Control Technician
1-3-2022 to Present

Richard Weaver



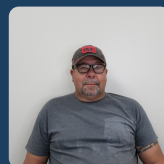
Business Manager
4-14-2003 to Present

Jeremy Wohlforth



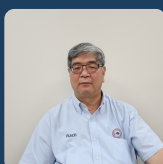
Mosquito Control Technician
2-06-2017 to Present

James Wynn



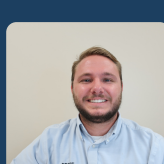
Mechanic
3-04-1996 to Present

Dr. Rui-De Xue



Director
4-14-2003 to Present

Edward Zeszutko



Biological Technician
8-1-2022 to Present

2022 Resigned & Retired

Madeline Steck



FT Grant Funded Term Limited Biological Technician
10-01-2020 to 9-30-2022

Heather Ward



Biological Technician
4-27-2020 to 6-27-2022

Lea Bangonan



FT Grant Funded Biological Technician
6-03-2019 to 12-31-2022

David Strickland



Mosquito Control Technician
3-10-1997 to 6-13-2022

Marcia Kay Giances



Operations Manager
8-7-2000 to 9-31-2022

Full Time Seasonal (6 month) Employees



Jennifer Dentmon
Mosquito Control Technician
5-2-22 to 10-28-22



Kyle Graham
Mosquito Control Technician
5-2-22 to 10-28-22



Logan Hicks
Mosquito Control Technician
5-2-22 to 10-28-22



James Stokley
Mosquito Control Technician
5-2-22 to 10-28-22



Philip Vaughn
Mosquito Control Technician
5-2-22 to 10-28-22



Charles Woody
Mosquito Control Technician
5-2-22 to 10-28-22

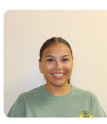
Interns and Volunteers



Arthi Ram
AMCD High School Volunteer
Ponte Vedra High School
6 week



Laryssa Fanney
AMCD Lab Intern
5-10-2021 to Present



Kassidy Caride
AMCD Lab Intern
5-16-2022 to 8-11-2022



Jace Lim
AMCD High School Volunteer
Ponte Vedra High School
6 week



Heather Keating
AMCD Administration Intern
4-4-2022 to 9-31-2022



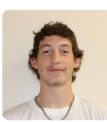
Shaelynn Profulias
AMCD Lab Intern
2-1-2022 to 3-14-2022



Iulia Bernaui
AMCD High School Volunteer
Ponte Vedra High School
6 week



AMCD Lab Intern
5-10-2022 to 10-28-2022



Maddox Kufenburg
AMCD Lab Intern
6-13-2022 to 7-31-2022



Keats Reddick
AMCD High School Volunteer
Ponte Vedra High School
6 week



Edward Zeszutko
AMCD Lab Intern
6-13-2022 to 7-31-2022



Jonathan Shugart
AMCD Lab Intern
6-13-2022 to 7-31-2022

Adjunct Professors



Dr. Stephen Dobson
Adjunct Senior Entomologist
March 2020



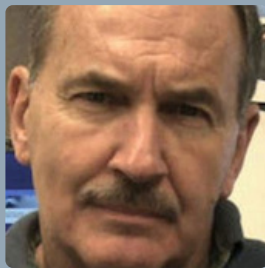
Dr. Michael Turell
Adjunct Senior Arbovirologist
October 2018



Dr. Gunter Muller
Adjunct Senior Vector Entomologist
October 2018



Dr. Ulrich Bernier
Adjunct Senior Chemist
2022



Dr. Donald R. Barnard
Senior Vector Biologist
2022

Administration Personnel and Recognitions

Personnel

Starting on October 3, 2022 Mr. Kai Blore was promoted as Laboratory Manager, Mr. James Wynn was promoted as Senior Mechanic, Dr. Muhammad Farooq as MC Engineer, Mr. Rick Stockley as IT Specialist, and Mrs. Heather Keating as Administrative Assistant. Mr. Edward Zeszutko was promoted as Biological Technician from Lab Intern in August. Mr. Kyle Graham was promoted as Full Time MC Technician (starting 2/6/2023) from Seasonal MC Technician. Mr. Connor Kuppe was hired as Biological Technician 7/11/2022. As of June 13, 2022, MC Technician, Mr. David Strickland retired and as of September 30, 2022, Operations Manager, Mrs. Marcia Kay Gaines retired. As of 6/27/2022, Biological Technician Ms. Heather Ward Resigned. The grant funded, limited time, full time positions this year: Dr. Vindhya Aryaprema, Biologist (7-15-2023), Ms. Olivia Sypes, Biological Technician (7-15-2023), Ms. Madeline Steck, Biological Technician (9-30-2022), and Lea Bangonan, Biological Technician (12- 31, 2022).

AMCD six-week student intern program: Jace Lim, Keats Reddick, Arthi Ram, and Ilulia Berianu from Ponte Vedra High school. AMCD Paid High School Interns from June – August 2022, Jonathan Shugart and Maddox Kaufenburg. AMCD College Interns: Kassidy Caride (Florida State University, funded by CDC Southeastern Center for Excellence in Vector-borne Disease) and Shealyn Prouflias (Rutgers University).

The seasonal staff that worked for AMCD were: Mr. Mahendra Siriwardhane, Mr. James Stokley, Mr. Kyle Graham, Mr. Logan Hicks, Mr. Philip Vaughn, Mr. Charles Woody, Mr. Edward Zeszutko, Mrs. Jennifer Dentmon, Ms. Laryssa Fanney and Mrs. Heather Keating. Visiting Scientists, Dr. Gunter Muller and Dr. Edita Revay.

Recognitions and Awards

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

- Mr. Freddie Allen, 20 years
- Ms. Cathy Hendricks, 20 years
- Mr. Scott Hanna, 15 years
- Mr. Steven Smoleroff, 5 years
- Mr. Kyle Arber, 5 years

The Management Choice Award this year went to Mr. Scott Hanna, Mr. Jeremy Wohlforth, and Mr. Ralph Bruner for their significant contributions and dedication to the District throughout the year. Mr. Richard Weaver was given the Outstanding Employee award for his significant dedication to the District. AMCD received the award for business partnership from SJC School Board for PV High School intern training. Chairperson Moeller received the leadership award for promoting the collaboration with university/institute to conduct applied research from AT&T governmental technology for special districts. Dr. Rui-De Xue received the medal of honor award from the American Mosquito Control Association. Mr. Richard Weaver continues as the elected FMCA Vice President and Dr. Rui-De Xue as the elected AMCA Vice President.



Committee Members 2022

SAFETY COMMITTEE

Business Mgr. (Safety Coordinator)	Richard Weaver (Chair)
Operations Mgr.	Mrs. Marcia Kay Gaines
Supervisor	Mrs. Dena Oliva
A&P Aircraft Mechanic	Mr. Ralph Bruner
Biological Technician	Mr. Steven Smoleroff
MC, Technician Surveillance	Mr. Morgan Duett
IT Technician	Mr. Rick Stockley
Mechanic	Mr. Freddie Allen

APPLIED RESEARCH COMMITTEE

Commissioner	Mrs. Jeanne Moeller (Chair)
Entomologist/Scientific Mgr.	Dr. Whitney Qualls
Feild Biologist	Dr. Muhammad Farooq
Molecular Entomologist	Dr. Steve Peper
Biologist	Dr. Vindhya Aryaprema
Biological Technician	Mr. Kai Blore
Biological Technician	Ms. Heather Ward

EDUCATION COMMITTEE

Commissioner	Mrs. Trish Becker (Chair)
Education Specialist	Ms. Taylor Ballantyne
Entomologist/Scientific Mgr.	Dr. Whitney Qualls
Supervisor	Mrs. Dena Oliva
Biological Technician	Ms. Heather Ward
Biological Technician	Mr. Kai Blore

PLANNING COMMITTEE

Commissioner	Mrs. Gina LeBlanc (Chair)
Director	Dr. Rui-De Xue
Operations Mgr.	Mrs. Kay Gaines
Business Mgr.	Mr. Richard Weaver
Supervisor	Mrs. Dena Oliva
Biological Technician	Mr. Kai Blore
Entomologist/Scientific Mgr.	Dr. Whitney Qualls

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
Operations Mgr.	Mrs. Marcia Kay Gaines
Accountant	Mrs. Aye McKinney

EMERGENCY RESPONSE COMMITTEE

Operations Mgr.	Mrs. Marcia Kay Gaines (Chair)
Entomologist/Scientific Mgr.	Dr. Whitney Qualls
Feild Biologist	Mrs. Dena Oliva
Business Manager	Mr. Richard Weaver
Accountant	Mrs. Aye McKinney
Education Specialist	Ms. Taylor Ballantyne

OPERATIONAL COMMITTEE GROUND/AERIAL

Commissioner	Mrs. Catherine Brandhorst (Chair)
Director	Dr. Rui-De Xue
Aviation Mgr.	Mr. Dana Smith
Feild Biologist	Dr. Muhammad farooq
Operations Mgr.	Mrs. Marcia Kay Gaines
Business Mgr.	Mr. Richard Weaver
Supervisor	Mrs. Dena Oliva
Entomologist/Scientific Mgr.	Dr. Whitney Qualls



Program Overview

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.



- FMCA Fly In Class (January 2022)
- FMCA DODD Short Courses (February 2022)
- AMCA Annual Meeting (Feb. 28 - Mar. 4, 2022)
- FMCA Tallahassee Legislative Days (March 2022)
- AMCA DC Legislation Meeting (May 17-18, 2022)
- FMCA Annual Meeting, Palm Coast FL. (Nov. 14-16, 2022)

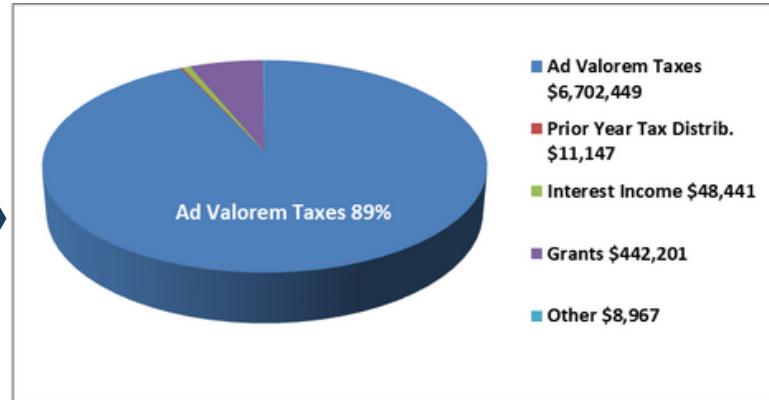
On December 8, 2022 AMCD hosted the dedication of the Education Center. The Education Center Building is projected to be completed Spring 2023.

As we have done since 1949, AMCD has continued to provide many services to the citizens of St. Johns County. These services included but were not limited to: mosquito inspections, population and arbovirus surveillance, public outreach and education, the assistances of local organizations, larviciding, adulticiding, applied research and evaluations of new control tools and techniques, and employee training.

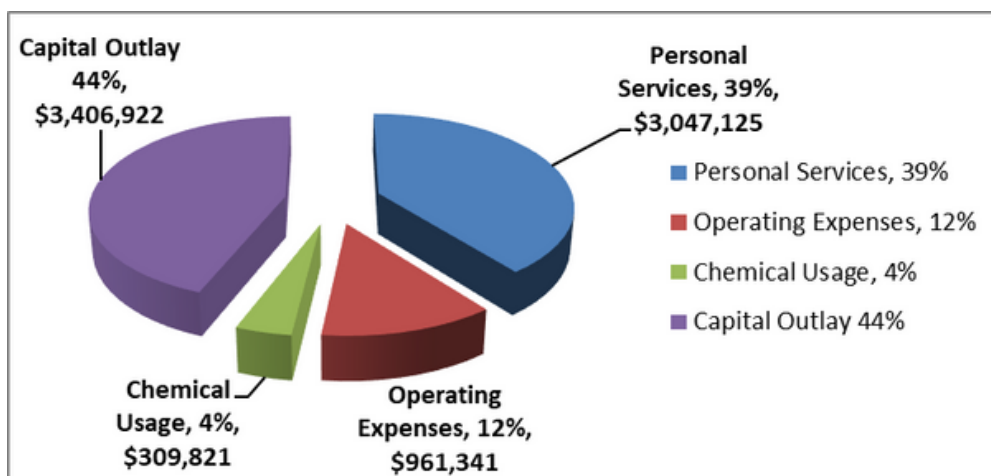


- Ad Valorem (real property) Current Year Taxes, the primary source of revenue, \$6,702,449 comprised of, approximately, 89% of the total Revenues, \$7,213,205.
- Grant Revenues, from Applied Research, totaling \$442,201.
- Interest Income- Return on Investment, SBA Fund, non-current Operating Funds, yielded \$48,441.
- Other Revenues, were predominantly comprised of \$1,553 Surplus Sales, \$6,427 Workshop and \$986 for Dorm Rents.
- The District's millage rate for the General Operating Budget was 0.2000 for the year.

FY 21/22 District Revenues Oct. 1, 2021 through Sept.30, 2022 Total \$7,213,205. Millage Rate: 0.2000



FY 21/22 District Expenditures Total \$7,725,210



The majority were attributed to Personal Services (39%) with Capital Outlay, Operating Expenses, and Chemical Usage comprising 44%, 12%, and 4%, respectively.

Administration and Supply

Board Business:

The AMCD staff provided many documents to Board members, the Board's attorney and for Committee meetings in 2022. The District hosted 13 Board meetings, including the annual First and Final Public Hearings, in September for the 2022/2023 fiscal year budget and millage rate.

Administration & Finance:

The Board approved a Lab Manager, Senior Mechanic and revised Operations Manager to Assistant Director. On July 14, 2022 the Board discussed and approved DACS Work Plan Budget for FY 22/23.

Policies:

On May 5, 2022 the Board approved the Pay Plan Policy revision and increased the amount of manpower. On June 16, 2022 the Board approved Jackie Small to audit AMCD Employee Handbook, District Policy and Procedures and Commissioner Handbook. Due to hurricane Ian this has been delayed. On June 16, 2022 the Board approved the revision of Policy for Commissioners Participation in Meetings via Communication Media Technology. On August 11, 2022 the Board approved the District Director the authority to sign Material Transfer Agreement, Non-disclosure Agreement, Arthropod Control Plan, and Intelligent Property Agreement.

Inventory:

The monthly tire inventory and chemical inventory were completed as required. The annual physical inventory was approved at the September 15, 2022 Board meeting. AMCD had no surplus items in the year 2022.

Contracts:

The Board awarded/signed the final contract with Harrell Construction for building the SIT mass rearing facility in June 2022. On February 10, 2022 the Board approved the collaboration with three organizations (CDC, NACCHO, Fujian Agriculture and Forest University). On March 10, 2022 the Board approved the agreement between MosquitoMate and AMCD for software usage. On April 14, 2022 the MOU between AMCD and i2L company about sharing GLP data was approved. On May 5, 2022 the NDA with Scenico about SIT equipment was approved. On June 16, 2022 the Board approved the collaboration with University of Wisconsin to submit NIH Education Grant. On July 14, 2022 the Board approved the renewal of Arthropod Management Plan for Anastasia State Park. On August 11, 2022 the Board approved the lawyer's contract with a \$250 increase due to inflation. On June 16, 2022 the Board approved the renewal of the auditor contract FY 22 /23. The Board renewed the Cintas Uniform Contract on October 13, 2022

RFPs & BIDs:

January 13, 2022 the Board approved the purchase of the Irradiator Machine for SIT building. June 16, 2022 the Board approved the Bid for Aircraft Engine Compressor Overhaul.

Insurances:

The Board approved the helicopter insurance renewal on July 14, 2022. Renewal of the Fleet/Liability and Workers Compensation Ins. with Thompson Baker Ins. Co., and the Health, Dental, and Life Insurance for the calendar year 2023.

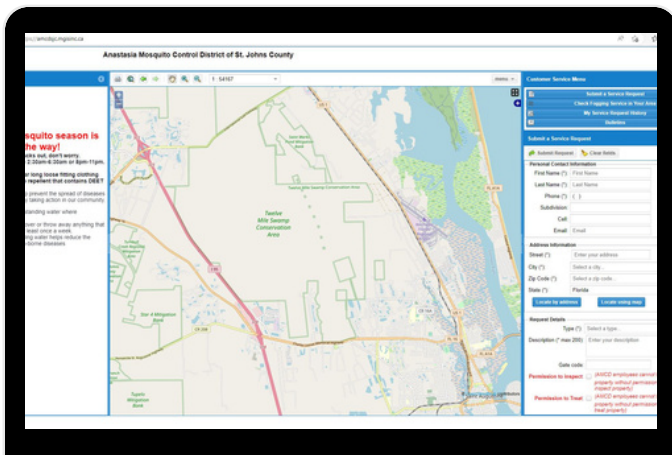


Customer Service

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 opportunities, 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 requested. This page on the website will also allow customers to access and review the status of a service request and see if there is any adulticide (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 also 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.

Scan QR code to
access AMCD's
website



AMCD responded to 4,364 service requests in 2022. The average response time for a service request was 1.4 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 continued conducting detailed tours of the AMCD facility and research 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 to educate St. Johns County residents on many things such as adult and larval mosquitoes, adulticiding, and larviciding. The AMCD staff also dispensed valuable information pertaining to the identification of mosquitoes, pesticide safety, other insects, mosquito prevention and pesticide applications, personal protection methods, as well as commercial mosquito traps, repellents, insecticides, and assisting residents with concerns about no spray treatment areas, including bee-keepers' properties or personal/health conditions that require no treatments be made.

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 disease, and nuisance mosquitoes.

Cooperative Organizations/Professional Services

AMCD works in cooperation with a number of related local-, state-, federal- agencies, international-, private-, commercial organizations, and members of the medical community. Those listed below briefly describe the work associations with AMCD in 2022 to prevent and control vector-borne diseases in Florida.

International Cooperation and Activities:

The collaboration with Dr. G. Muller, the University of Science, Techniques, and Technology of Bamako, Mali working on Attractive Toxic Sugar Baits (ATSB) and natural repellents against vector mosquitoes was continued.

The collaboration with Dr. TY. Zhao, Beijing Institute of Microbiology and Epidemiology to continue working on integrated mosquito management for malaria vector mosquito control.

AMCD hosted 12 visitors from Pan African Mosquito Control Association and VectorBite from UK to discuss possible collaboration and training in late Feb.

AMCD hosted 3 officers visiting from the IVCC about AMCD facility and possible collaboration for larvicide evaluation in late Feb.

Dr. RD. Xue continues to serve the World Mosquito Control Association as their Executive Director until March 2022 and Asian SOVEMC until present.

Dr. RD. Xue continues to collaborate with three Scientists from the Collaboration in Sciences and Technology (COST), Europe Commission for research and development of nanotechnology and treated textiles and spatial repellents against mosquitoes, and AMCD's database analysis.

Dr. RD. Xue organized a symposium for the International Congress of Entomology, Finland, later July and gave a presentation about the challenge and management of container-inhabiting mosquitoes.

Dr. W. Qualls, Dr. S. Peper, Dr. RD. Xue, and Commissioner Mrs. J. Moeller attended the 8th International Congress of SOVE, Hawaii, late September. All Scientists gave their presentations at the meeting.

Dr. RD. Xue was invited and funded by the PMR company to visit the Torch Island, Bahama for salt marsh mosquito control in middle of September.

Dr. RD. Xue attended the 2nd Latin SOVE meeting and gave a presentation about overview of AMCD program, La Plata, Argentina, late October. Visited National University of La Plata's Center for Parasitology and Vector Control and gave a seminar about applied research at the National Institute of Technology's Center for Insecticides and Pest Control during the meeting.



Cooperative Organizations/Professional Services (Cont'd)

State Agencies and Services:

Florida Department of Environmental Protection:

AMCD continued the collaboration with state parks, University of Florida, and environmental education centers for salt marsh management in Fish Island. Arthropod control agreement for Conch Island.

Florida Department of Agriculture and Consumer Service: AMCD continued to renew the non-funded MOU and collaborated for annual inspection. AMCD hosted the FCCMC meeting in middle January. Dr. W. Qualls continues to serve as the DACS/FCCMC's research review subcommittee member.

Florida Department of Health: AMCD continues to collaborate with DOH to surveillance of arbovirus and mosquito-borne diseases and conduct news release.

Florida Mosquito Control Association: AMCD is a governmental member of the FMCA. AMCD hosted the FMCA Fly In class in middle of January. Mr. R. Weaver continues to serve as the FMCA financial member and was elected as the President-Elect.

Dr. RD. Xue serves as the FMCA's Publication Committee Chair, Editor of the JFMCA., Chair of the FMCA Exchange program committee, and on the By-law's committee.

Dr. W. Qualls serves as the FMCA Scholarship Committee Chair and as the Dodd short course committee member, and legislation committee member.

Commissioner Mrs. T. Becker serves as the FMCA Commissioner section Vice Chair.

Dr. S. Peper serves as the Wing Beats Advertising Director and serves on the FCCMC Imperiled Species committee.

Florida Entomology Society: Dr. RD. Xue continues to serve the nomination committee for the FES. Dr. W. Qualls, Dr. Xue, and Mr. K. Blore attended the FES annual meeting and Dr. Xue and Mr. Blore gave presentations in middle of June.



National and Federal Agencies & Associations:

USDA/ARS: The collaboration with several scientists at USDA/CMAVE has organized the 17th annual workshop and SIT for control of *Aedes aegypti* and other studies was continued. The collaboration with Dr. Jerry Zhu for natural repellent evaluation was continued. DoD/NECE: The collaboration with the DoD's NECE, Jacksonville, FL to evaluate ULV spray systems and new formulations of insecticides were continued and started tick population surveillance. DoD/AFPMB: for control action threshold grant has been done for the 2nd year. **CDC:** Collaboration grant with UF about developing a smart cage was completed in December 2022. A small collaboration grant about aerial spraying efficacy of naled has been conducted twice and continued in 2022. **CDC/SECEVD:** AMCD continued their collaboration with the CDC Southeastern Center for Excellence in Vector-borne Disease (SECEVD) for training intern students. **American Mosquito Control Association (AMCA):** AMCD is a sustaining member of the AMCA and an AMCA/EPA PESP legislation committee member. Dr. RD Xue was elected as the AMCA's President-Elect. Dr. W. Qualls serves as Chair for Publication Committee. Dr. S. Peper serves as AMCA's member training committee member. AMCD staff were volunteers to assist the AMCA annual meeting in Jacksonville, FL in last week of Feb. AMCD staff organized 2 symposia for AMCA annual meeting. Commissioner T. Becker and Mr. R. Weaver attended AMCA D.C. legislation meeting in middle of May. Drs. Peper, Qualls, Xue, and M. Farooq reviewed more than 20 manuscripts for the JAMCA and other Journals. Society of Vector Ecology (SOVE): Dr. RD. Xue continues to serve the SOVE Board as the Regional Director. Dr. Xue, Dr. Qualls, Dr. Peper, and Mrs. Moeller attended the 8th International Congress of SOVE. Several Scientists reviewed several manuscripts for Journal of Vector Ecology.

Entomological Society of America (ESA): AMCD's Scientists reviewed numerous numbers of manuscripts for the ESA's Journals and other Journals, such as, Acta Tropic, PLoS one, Parasite & Vectors, Insects, and others at their editors' requests. Dr. Xue as the ESA vector working group member and attended their quarterly zoom meetings and Dr. W. Qualls gave presentations about AMCD intern training program. AMCD has been awarded by the ESA for intern training site. **National Association of City and County Health Office (NACCHO):** Dr. RD. Xue as the Vector Control working committee member of the NACCHO attended and gave update report at their quarter virtual meeting. Dr. W. Qualls and Mr. R. Weaver gave presentation about AMCD education center and applied research.

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 demonstrated and provided the blueprint of our complex to several districts and programs nationwide. AMCD collaborated with Lee CMCD to apply for CDC grant and to train pilots and helicopter mechanics. AMCD collaborated with Central Life Sciences on larvicide, and adulticide product evaluations. AMCD collaborated with DNW Global LLC on new larvicide evaluations. AMCD collaborated with MosquitoMate on a SIT/*Wolbachia* project. AMCD collaborated with New Mountains about new trap evaluations and Chironomid midge. AMCD collaborated with One-derings LLC for repellent doses and new formulation. AMCD continued to collaborate with Lamplight Farms Incorporated to evaluate and develop spatial repellent device. AMCD continued to collaborate with MGK and Sumitomo to evaluate/develop insect repellent and insecticides. AMCD signed material transfer agreement with Syngenta Crop Protection LLC to evaluate/develop new formulation of insecticides.

Agencies and Universities:

University of Florida: AMCD cooperated with the University of Florida Department of Entomology and Nematology with Dr. D Hahn on the SIT project. AMCD collaborated with **UF, Department of Electrical Engineering** with Dr. W. Eisenstadt on the CDC grant for developing a smart cage. AMCD collaborated with UF, Dr. R. Dinglasan at EPI for intern training. AMCD collaborated with **UF, Department of Entomology and Nematology** with Dr. Koehler, and Dr. Baldwin for a non-target study and nanoparticles of adulticides (DACS grant) and to train Ph.D. student Mr. Blore. Dr. Xue continues serving the UF/Department of Entomology's Courtesy Faculty member to train students. **University of Miami:** Dr. Xue serves as a voluntary professor for the University of Miami School of Medicine and continues to collaborate with Dr. John Beier for ATSB and biology and control of mosquitoes. **University of North Florida:** AMCD renewed the contract with the University of North Florida's College of Public Health for training intern students. Dr. W. Qualls taught a class at UNF Department of Biology. AMCD provided many mosquito samples for several universities nationwide.

Local Agencies and Service:

County DOH: Conduct mosquito-borne disease surveillance, open house, and public education. **School Board:** Teach class for mosquito control. Train intern students (4 per year) for P.V. High School. Received a partnership award from St. Johns County School Board in October. **County EOC:** Attended the county emergency response and hosted their staff and team members at AMCD facility during hurricane responses. Used AMCD's helicopter to check damage assessments. **County Fire Rescue:** AMCD supported and collaborated with Department of Fire Rescue to use our helicopters to check damages of road and other property, and damage assessments during and after two hurricane responses. **County Agriculture:** Collaborate to provide public education and jointing open house. **Park & Recreation:** AMCD hosted summer camps students with a tour. **Kiwanis:** Dr. RD. Xue has been Kiwanis member since 2006 and update and collect response about mosquito problem from community and provided many voluntary service and donations for kids annually. **Rotary & Round Table:** AMCD staff and Commissioners gave presentations and conduct public education about AMCD's program and mosquito-borne diseases. **Ponte Vedra High School:** AMCD renewed the contract with Ponte Vedra High School for training intern students. **St. Johns County School Board:** AMCD renewed the agreement with the St. Johns County School Board for student tours and school visits. **Others:** AMCD staff and Board of Commissioners also attended many other local community meetings, club meetings, and different events, to conduct public education for prevention and control of mosquitoes and mosquito-borne diseases.



Surveillance

Mosquito-borne Diseases:

AMCD continuously cooperates with the Florida Department of Health to monitor imported mosquito-borne diseases through local health providers.

Through the Florida Department of Health Laboratory and in-house capabilities, AMCD monitored West Nile Virus (WNV), Eastern Equine Encephalitis Virus (EEEV), Saint Louis Encephalitis Virus (SLEV), Highland James Virus (HJV), and California Group Virus, using nine sentinel chicken sites around St. Johns County. AMCD personnel bled chickens once a week for testing from April through November.

In 2022, a total of 16 sentinel chickens tested positive for arboviruses, 9 for WNV, 1 for SLEV, and 6 for WNV/SLEV. In 2022, there were cases of travel related Dengue and malaria in St. Johns County. In 2022, there was one positive WNV human case and one EEE horse death.

In 2022, AMCD responded to 4,364 service requests in St. Johns County.

Mosquito Population:

The adult mosquito population was monitored by 41 CDC light traps baited with Octenol from April to November, 2022 and a total of 14,156 mosquitoes, 28 species were collected. Twelve BG Sentinel traps (Fig. 1) baited with BG Lure and CO₂ were used for *Aedes albopictus* and *Aedes aegypti* surveillance for a total of 7,506 collected from January to December, 2022. A total of 49,022 mosquitoes, 32 species were collected from BG trapping. A total of 63,178 mosquitoes were trapped by both methods.

Larval surveys were conducted on a daily basis by dipping flooded areas as needed. A total of 20,042 dips were conducted and 1,933 dips were positive with 19,827 larvae found.

Environmental Parameters:

The total average monthly rain fall for St. Johns County in 2022 was 4.24 inches with a total of 51.62 inches for the year per the St. Johns River and Water Management Districts Hydrologic Charts.



Surveillance (Cont'd)

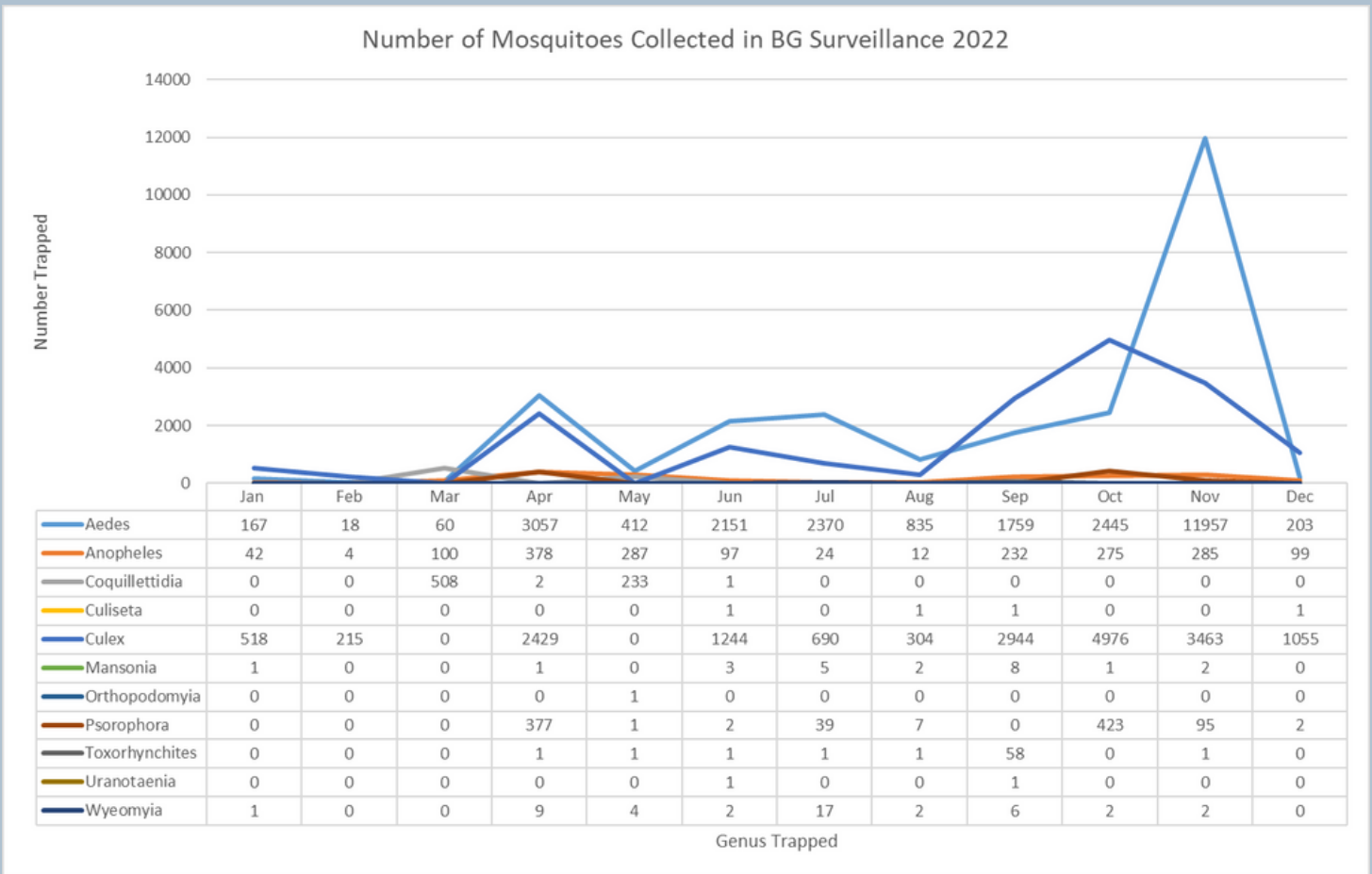


Figure 1. **Total mosquitoes collected throughout 2022 by month and genus in BG-Sentinel Traps**



Surveillance (Cont'd)

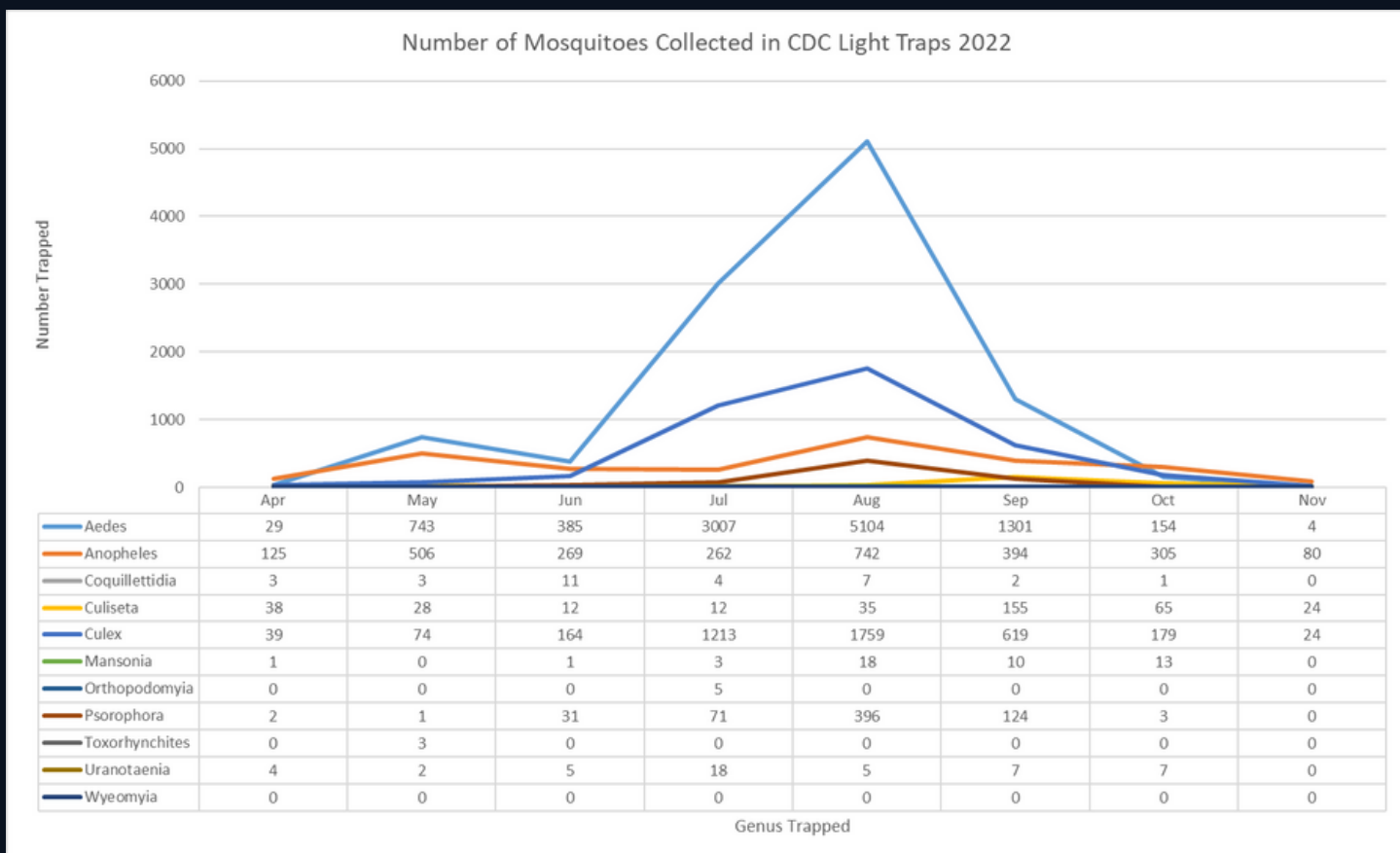


Figure. 2 Total mosquitoes collected throughout 2022 by month and genus in CDC Light Traps



Surveillance (Cont'd)

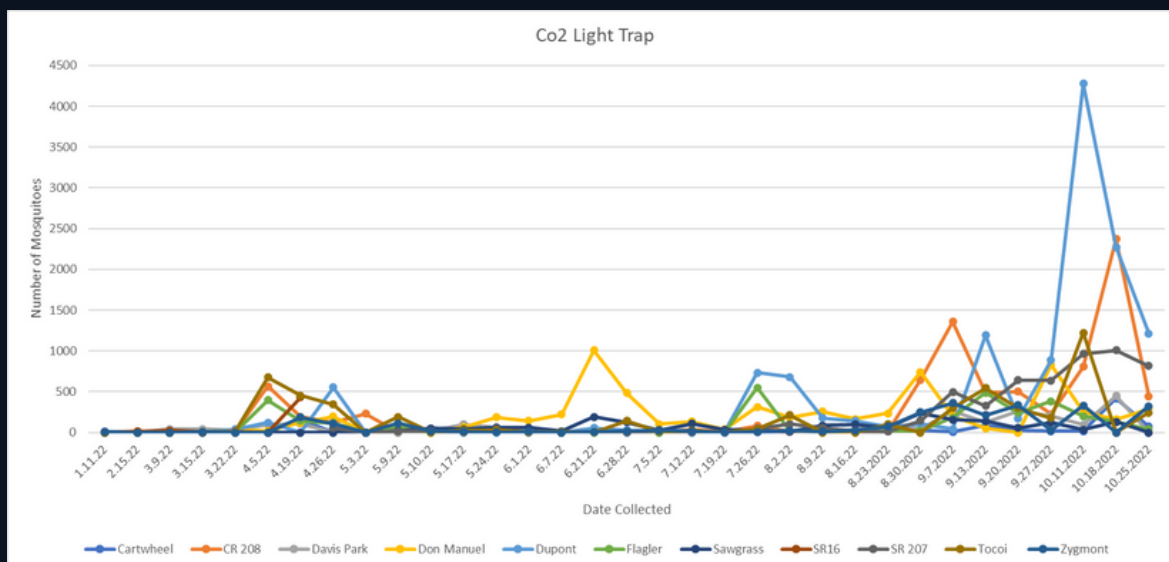


Figure. 3 Total number of mosquitoes collected in 2022 Arbovirus Surveillance Co2 Traps

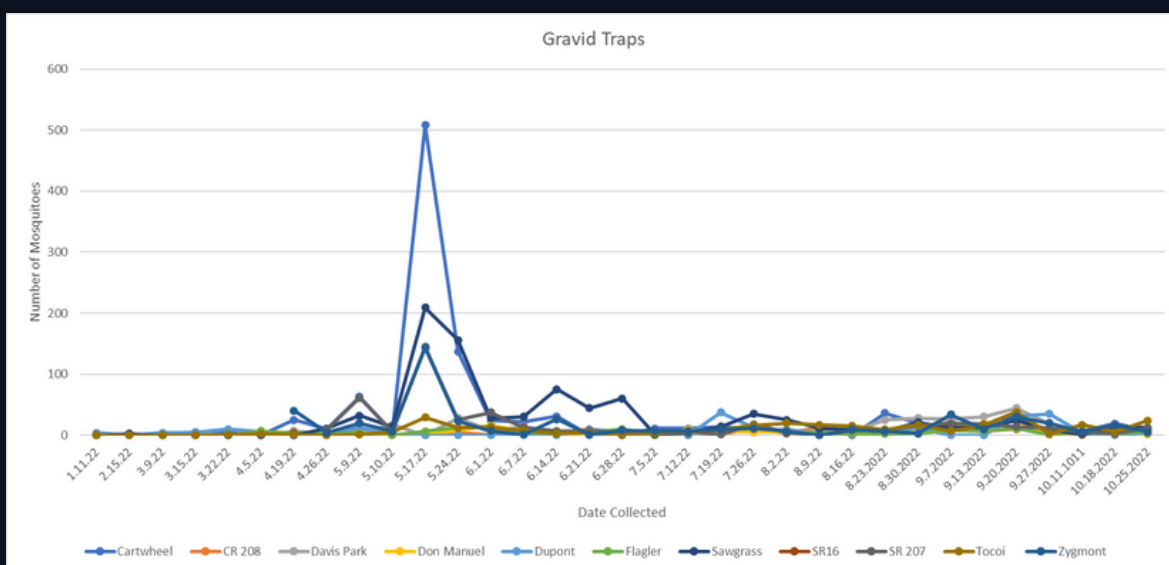


Figure. Total number of mosquitoes collected in 2022 Arbovirus Surveillance Gravid Traps



Operational Control

Larvicides and Larviciding:

In 2022, 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 1,081 times for a total of 4,117.25 acres. The aerial program made 81 applications for a total of 1,596 acres treated.

Adulticides and Adulticiding:

Mosquito Control Technicians continued to use Aqualure 20-20 (Permethrin) and Mosquitomist Two (Chlorpyrifos phosphorothioate) for ground ULV spraying and treated 153 times on a total of 118,254.29 acres for adult mosquito control. DUET was used in the hand thermal foggers to handle service requests and other areas 94 times for a total of 24,305.71 acres. Talstar P was used as an adult mosquito control barrier treatment in parks, special areas, and for service requests a total of 204 times equaling 136.85 acres. The Aviation team had 26 missions, and treated a total of 139,004.61 acres, by air with Dibrom.

Larvicides and Adulticides Used in 2022

Larvicides	Amount Used		Area Treated		Times applied
Altosid WSP	17,038	ea	52.8	acre	255
Altosid XR	627	ea	1.42	acre	39
Altosid XRG	1040	lb	173.33	acre	25
Altosid XRG (air)	14,360	lb	1,436	acre	77
BTI Briquets	3500	ea	8.04	acre	119
Cocobear	3,088	fl oz	8.04	acre	78
Natular DT	66	ea	0.01	acre	5
Sustain MBG	5,150	lb	686.67	acre	117
Sustain MBG (air)	1600	lb	160	acre	4
VectoBac 12AS	7,216	fl oz	451	acre	95
Adulticides	Amount used		Area Treated		Times applied
Aqualure 20-20	14,040.83	fl oz	54,351.42	acre	76
Dibrom (air)	97,280	fl oz	139,004.61	acre	26
Duet 50%	38,160	fl oz	24,305.71	acre	94
Mosquitomist Two	42,880	fl oz	63,902.87	acre	77
Talstar P	46.14	gal	136.85	acre	204

Source Reduction & Biological Control:

A total of 94 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 17 times for a total of 184 fish provided.



Applied Research

Arbovirus Detection Techniques & Influencing Factors:

AMCD continuously cooperates with the Florida Department of Health (FDOH) to monitor imported mosquito-borne diseases through local health providers.

Through the FDOH Laboratory and in-house capabilities, AMCD monitored West Nile Virus (WNV), Eastern Equine Encephalitis Virus (EEEV), Saint Louis Encephalitis Virus (SLEV), Highland J Virus (HJV), and California Group Virus, using 9 sentinel chicken sites around St. Johns County. AMCD personnel bled chickens once a week for testing from April through November.

In 2022, 25 sentinel chickens tested positive for WNV antibodies via our in-house surveillance efforts. All 9 sentinel site had at least 1 positive bird during the season. The state reported 30 presumptive positive sentinel chickens, of which 21 were later confirmed positive for WNV and 3 were confirmed positive for SLEV. No sentinel chickens tested positive for EEEV through state laboratory testing in 2022.

One mosquito pool tested positive in 2022 for WNV.

Good Laboratory Practices (GLP) /DNW Study:

In 2022 we completed the second part of our GLP sponsored project, which included a semi-field evaluation of a novel larvicide. This larvicide was evaluated against 3 larval mosquito species at varying concentration. Results were reported to the sponsor who then had the opportunity to submit our findings to the US Environmental Protection Agency for product registration.



Study funded by the Deployed War Fighter Protection program (DWFP) of the Department of Defense (DoD)

Funded by the DWFP/DoD, AMCD is investigating “Establishing evidence-based action thresholds for *Aedes*, *Culex*, and *Anopheles* mosquito abundance in different operational environments”. Following the work completed in 2022, AMCD continued in-person/over the phone/zoom interviews with the personnel from selected U.S. mosquito control programs to identify in-depth information on establishing action thresholds. We improved our statistical models on action thresholds for different mosquito groups using AMCD historical mosquito abundance data and associated meteorological data and validated those models with real time surveillance data .

Water quality parameters influencing *Aedes* container species distribution in Saint Johns County, FL

Upon the field observations of the distribution of *Aedes aegypti* in St. Johns County (SJC), Florida is restricted to the coastal areas of the county, we started a study to investigate the water quality parameters influencing the distribution of container breeding *Aedes* in SJC.

The field study conducted along three transects from the coast to the St. Johns River identified a positive correlation of the breeding water salinity level with *Ae. aegypti* numbers and a negative correlation with *Ae. albopictus* numbers. The subsequent laboratory study confirmed only the correlation with *Ae. albopictus*, but warranted further studies to characterize other influential environmental and/or sociological factors of *Ae. aegypti* distribution.

Applied Research (Cont'd)

AMCD Insectary 2022

At AMCD, we rear several mosquito species for experimental use in our research and education projects. These include insecticide susceptible lab colonies for the following species: *Aedes aegypti*, *Aedes albopictus*, *Anopheles quadrimaculatus* and *Culex quinquefasciatus*. This year, we are also in the process of attempting to start up a new colony of *Toxorhynchites r. rutilus* for use in our educational program. These mosquitoes are considered a beneficial species because they are non-biting and are predaceous against other mosquitoes in their larval state. All mosquitoes are reared on-site at AMCD's facility in our temperature and humidity-controlled insectaries. In addition to our lab colonies, AMCD insectaries are frequently used to rear field-collected mosquitoes from around St. Johns County. Both field-collected and lab colony mosquitoes are necessary when testing insecticides as comparing mortality between the two can determine if there is insecticide resistance within the local mosquito population.

Evaluation of Smart Bio-Assay for Efficacy of Mosquito Control Adulticides

A smart cage has been developed with CDC grant in collaboration with Dr. W. Eisenstadt, University of Florida (UF), Department of Electrical Engineering to measure spray at the evaluation site. During the second year of this grant, the cages were evaluated at AMCD in different phases. In the first phase, communication between cages while deployed in the test field and the laboratory was tested. In the second phase, each cage was sprayed with a backpack sprayer to ascertain that the smart cage sensor is receiving the droplets, the sensor is measuring the droplets and data is recorded inside the laboratory. The cages in the third phase were exposed to spray released by a truck mounted ULV sprayer in the same way as normal application is done. During this part, droplets near the smart cage were also collected on Teflon® coated slides and droplets characterized with DropVision system. The trend in dispersion of droplets throughout the field detected by the smart cage and slides was similar. Lastly, smart cage was exposed to a mixture of mineral oil and fluorescent dye sprayed through a truck mounted ULV sprayer. The spinners were also deployed to collect droplets for size characteristics using DropVision and for spray quantification with fluorimeter. The data for the last phase of evaluation is being processed by UF.



Evaluation of Contact and Spatial Repellents:

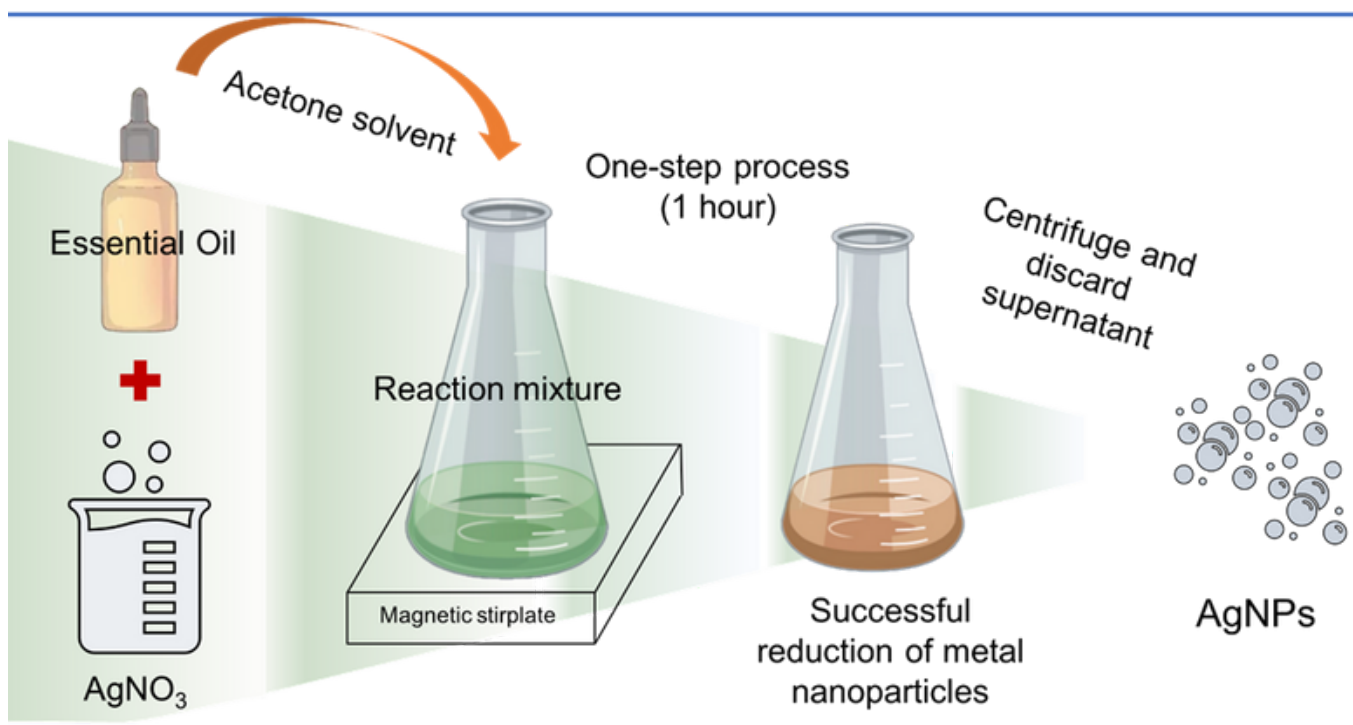
Five natural oils, Clove oil, Eucalyptus oil, Geraniol, Immortelle oil and Lemongrass oil were evaluated using the True Choice Olfactometer. BG Lure was used as an attractant. Overall, the Clove oil, Eucalyptus oil, Geraniol, Immortelle oil and Lemongrass oil had 65, 54, 63, 41, and 65% repellency, compared to 42% by BG lure. Individually, 62.5 µL of Lemongrass oil, 125 µL of Eucalyptus oil, 250 µL of Clove oil and Geraniol, and 500 µL of Immortelle oil had highest repellency.

Twelve new formulations containing medium-chain fatty acids, six each having decanoic acid (C10) and lauric acid (C12) derived from palm oil and coconut oil, provided by Onedrings Lavender Farm (OLF), Clarksville OH were evaluated in olfactometer for spatial repellency against *Aedes aegypti* mosquitoes. Among all decanoic acid formulations tested, the concentration of 2.25 %(wt) indicated the best level of spatial repellency. None of the lauric acid concentrations showed any level of spatial repellency.

Applied Research (Cont'd)

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

Insecticides remain an integral component of mosquito control operations but sustained usage of a limited number of active ingredients (AI) has led to the widespread development of resistance. New types of insecticides will be necessary in maintaining control efficacy, but developing and registering these can be prohibitively time consuming and expensive. This research conducted by AMCD aims to evaluate a novel metal nanoparticle as a potential insecticide which could positively impact Florida mosquito control operations by identifying new technologies for formulating insecticides. As part of this research, metal nanoparticles were synthesized from silver nitrate (AgNO_3) using essential oils from different plants. Essential oils were selected as the reducing agent because they contain many bioactive compounds and metabolites which have insecticidal properties of their own. The resultant nanoparticles were characterized by spectrophotometer analysis and then tested against mosquitoes via topical applications to see if they are toxic to mosquitoes. The goal of this ongoing research is to quantify the intrinsic toxicity of these metal nanoparticles against different mosquito species.



Applied Research (Cont'd)

Collaborative, Ongoing, and Completed

Applied Research Projects for 2022 (Cont'd):

Evaluation of the novel Sirenix Trap (New Mountain LLC/Herb Nyberg Sponsor)

Efficacy evaluation of GroPro Skeeter Larvicide (GroPro Sponsor)

Peak aerial adulticide application deposition (CDC sponsor)

Evaluation of larvicides (Central Life Science Sponsor)

Environmental factors influencing urban container breeding in St. Johns County (CDC/SECEVD's Internal project)

Insecticide resistance evaluation of urban container breeders in St. Johns County (Internal project)

Mosquito rearing quality assurance (MosquitoMate)

New formulation of insect repellent (One-derings LLC)

Novel insect repellent delivery system (Amy Hickcox sponsor)

New repellent evaluation (MGK/Sumitomo)

Semi-field evaluation of REXCU-S as a larvicide against three species of mosquitoes (DNW Global Sponsor)

Evaluation of aerial capabilities throughout the state of Florida (Internal project)

Evaluation of clot time on WNV-positive serum samples (Internal project)

Effectiveness of a commercial ELISA kit for detecting WNV antibodies in chicken serum samples (Internal project)

Field evaluation of Sirenix and CDC-AGO traps against container-inhabiting mosquitoes in St. Augustine (AMCD operation project)



Education Program

AMCD Education and training

Fifteen AMCD employees attended the FMCA Fly-In at AMCD in January 2022. 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-one AMCD employees and four Commissioners attended the in-person DODD Short Courses in February 2022. Nine employees, three commissioners, and seven volunteers attended the AMCA annual meeting in February 2022. All AMCD employees and three Commissioners attended AMCD's 17th Annual Workshop, March 29-31, 2022. In April 2022, Mr. Dana Smith, Mr. Ralph Bruner, Dr. M. Farooq, Mr. Mike Phillips, and Dr. Rui-De Xue attended the Lee County Mosquito Control Aerial Workshop. Two AMCD employees virtually attended the FCCMC meetings in May & September 2022. Dr. Xue attended the International Congress of Entomology in Finland July 2022. Dr. Qualls, Dr. Peper, Dr. Xue, and Commissioner Mrs. Moller attended the 8th International Congress of SOVE in Honolulu, HI September 2022.

Mr. Ralph Bruner, Mr. Jeremy Wohlforth, Kyle Arber, and Dazmond Hackney attended the Hazardous Materials Operations/OSHA Level II training in September 2022 and received a certificate of completion. Dr. Xue attended the 2nd Latin SOVE in Argentina November 2022. Seventeen AMCD employees attended the annual FMCA meeting in Palm Coast November 14-17, 2022.

Community Events/Public Outreach

AMCD was involved with: Cracker Day, National Night Out (Fig. 1), Ancient City Kids Day, High School Career Days, and St. Augustine Christmas Parade. AMCD was involved in the Meeting with the Academy of Coastal and Water Science Advisory Board. Dr. Qualls & Ms. Taylor Ballantyne gave a presentation about AMCD at a St. Johns Beekeeper meeting. Ms. Taylor Ballantyne was interviewed by local radio stations. The local newspaper and other papers /publications published about the AMCD education center & Dr. Xue's award from AMCA in March. AMCD held a dedication ceremony for the education center and gave tours of the new facility. Multiple tours were held at AMCD with different St. Johns schools and community clubs. AMCD was active on social media platforms: Instagram, Twitter, and Facebook.



Figure 1. National Night Out



Figure 4.

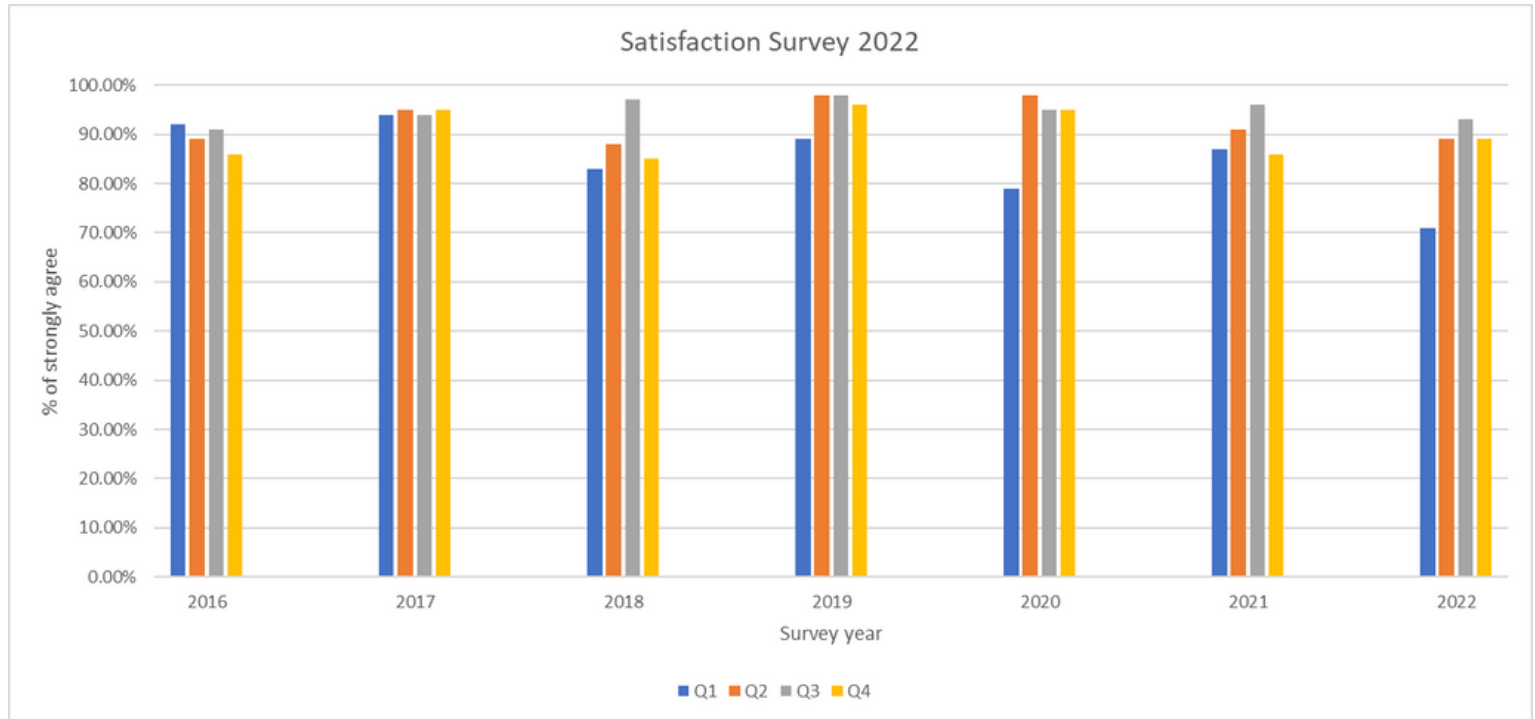


Figure 2.



Figure 3.

St. Johns County School Program In 2022, 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. (Figures 2-4). Mr. Dana Smith Served for St. Augustine High School Aerial Academy, Dr. Xue, Dr. Qualls, and Dr. Peper serve the P.V. High School academy Board and trained intern students for them. AMCD received the business partnership award. Dr. Peper & AMCD received 2 grant awards to train High school students from ESA.



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

Professional Meetings, Symposiums, & Workshops

Organized and Attended by AMCD Staff and Commissioners

January 10-13. AMCD 1st time hosted the FMCA fly in class and military aerial training workshop. Nine staff from AMCD attended the meeting. Dr. Qualls gave a presentation.

January 11. AMCD hosted the FCCMC meeting and 4 staff attended the meeting. Dr. Qualls and Dr. Xue attended the virtual meeting with Mali group for malaria project.

January 18-19. Mrs. Moeller, Mrs. Becker, Mr. Weaver attended the FMCA legislation meeting by virtually.

January 19. Dr. Qualls, Dr. Xue, and Mr. Blore attended MosquitoMate virtual meeting.

January 25-27. Dr. Qualls and Dr. Xue attended CDC Vector Week meeting by virtual.

January 31-February 3. Four Board members and 17 employees attended Dodd short courses and 2 staff gave teaching.

Feb 2. Dr. Xue attended the NACCHO vector control committee meeting by virtual.

Feb 7-9. Dr. Xue attended the California Mosquito and Vector control annual meeting and gave a presentation.

Feb 10. Dr. Xue attended the ESA Vector network virtual meeting. Three staff attended the UF/EPI research day and gave poster presentations.

Feb 15. Dr. Xue attended USDA/ARS stockholder zoom meeting.

Feb 28-Mar 4. AMCD staff assisted AMCA annual meeting in Jacksonville. Dr. Xue and Dr. Qualls organized different symposium. AMCD 7 staff gave different presentations.

Mar 7. Dr. Xue and Dr. Muller attended UF/Natural history museum meeting.

Mar 18. Dr. Xue attended UF seminar by virtual.

Mar 21. Dr. Xue attended the ESA vector network zooming meeting.

Mar 24. Dr. Xue attended international Bioscience virtual meeting.

Mar 29-31. AMCD organized the 17th workshop and 5 staff gave presentations.

Apr 6. Dr. Xue attended ESA zoom meeting about ESA fellow.

Apr 15. Dr. Xue attended ESA zoom meeting about legislation.

Apr 19-21. Dr. Farooq, Mr. Smith, Mr. Philips, Dr. Xue and other 2 staff attended Lee CMCD aerial workshop. Dr. Xue and Dr. Farooq gave presentations.

May 3. Mr. R. Weaver, Mrs. K. Gaines, and Dr. Qualls attended the FCCMC zoom meeting.

May 5. Dr. Xue attended the NACCHO vector control zoom meeting.

June 20-23. Dr. Xue, Dr. Qualls, and Mr. Blore attended the FES annual meeting and Dr. Xue moderated a symposium and gave a presentation. Mr. Blore gave a poster presentation.

Jul 7. Dr. Xue attended the ESA zoom meeting about vector control.

Jul 18-22. Dr. Xue organized a symposium for the International Congress of Entomology and gave a presentation.

Aug 4. Dr. Xue and Dr. Qualls attended the ESA career development zoom meeting.

Sep 13. Mr. R. Weaver, Mrs. K. Gaines, Dr. Qualls, and Dr. Xue attended the FCCMC zoom meeting.

Sep 14. Dr. Xue attended the NACCHO zoom meeting.

Sep 19-23. Mrs. Moeller, Dr. S. Peper, Dr. Qualls, and Dr. Xue attended the 8th International Congress of SOVE and gave several presentations.

October 31-November 3. Dr. Xue attended the 2nd Latin SOVE meeting and gave presentations.

November 14-16. AMCD 3 Commissioners and 17 employees attended the FMCA annual meeting and 7 staff gave presentations.

December 8. AMCD organized the SIT working group meeting.

Dec. 13. Dr. Xue and Dr. Qualls attended the ESA vector control zoom meeting. Dr. Qualls gave a presentation.

Dec. 14. Dr. Xue and Dr. Qualls attended the NACCHO vector control zooming meeting.

Presentations at Professional Meetings in 2022

January 10-12. Florida Mosquito Control Assassination's (FMCA) Fly In, AMCD, St. Augustine, FL.
Whitney Qualls. Efficacy of barrier spraying by aerial application.

February 7-9. Annual Meeting of Mosquito & Vector Control Association of California. Sacramento, CA.

Rui-De Xue. Innovation and technology application at Anastasia Mosquito Control District,

March 1-3. American Mosquito Control Association (AMCA) 88th annual meeting, Jacksonville, FL.

Rui-De Xue. Overview of AMCD program at AMCD symposium,

Whitney Qualls. Education and applied research collaboration 2020-2021 at AMCD symposium.

Muhammad Farooq. Development of smart bio-assay cage and evaluation of natural oils as spatial repellents at AMCD symposium.

Vindyha Aryaprema. Establishing the use of action thresholds by mosquito control programs and characterization of surveillance parameters at AMCD symposium.

Steve Peper. Arboviral surveillance through mosquito pools and sentinel chickens at AMCD symposium.

Michael Turell. Factors affecting the vector competence of mosquitoes for arbovirus at AMCD symposium.

Kai Blore. Evaluation of a nanoencapsulated formulation of the essential oil insecticide at AMCD symposium.

Whitney Qualls. *Culex* best management practices for adulticiding and insecticide resistance.

Trish Becker. Microplastic impacts on mosquito larvae at student competition session.

Madeline Steck. Development of mosquito control action thresholds using historical mosquito surveillance and climate data (poster presentation).

March 29-31. 17th Arbovirus Surveillance and Mosquito Control Workshop, AMCD, St. Augustine, FL.

Rui-De Xue. Prospect and challenge of attractive toxic/target sugar baits (ATSB) and bait stations against vector mosquitoes.

Steve Peper. AMCD's sentinel chickens for arbovirus surveillance.

Michael Turell. The Rift Valley fever virus, risks and dangers to Americas. .

Dana Smith. Overview of AMCD aerial program.

M. Farooq. Evaluation of spatial repellents against *Aedes aegypti*.

Kai Blore. Evaluation of nanoparticle formulation of mosquito adulticides.

Whitney Qualls. AMCD's collaboration project update.

Vindhya Aryaprema. Survey report about decision-making action thresholds.

Heather Ward. Arbovirus surveillance using mosquito pools.

M. Farooq. New technological demonstration, smart cage & droplet analysis.

Presentations at Profession Meeting in 2022 (Cont'd.)

April 19-21. Lee County Mosquito Control District's 2nd annual aerial workshop. LCMCD, FL.
 Rui-De Xue. AMCD's past efforts for establishing aerial program.
 M. Farooq. Droplet size analysis. LCMCD 2nd annual aerial workshop.

June 20-22. Florida Entomological Society annual meeting, Gainesville, FL.
 Rui-De Xue. Non-target impact of AGO traps for control of container-inhabiting mosquitoes
 Kai Blore. Nanoparticles for mosquito adulticide formulation (poster presentation). Florida Entomological Society, Gainesville, FL.

July 18-22. International Congress of Entomology. Finland.
 Rui-De Xue, Symposium organizer & presentation. Exploring and challenge for management of container inhabiting *Aedes* mosquitoes.

September 19-22. 8th International Congress of SOVE, Honolulu, Hawaii.
 Rui-De Xue. Challenge for ATSB against vector mosquitoes.
 Whitney Qualls. Nanoparticles for mosquitocides.
 Whitney Qualls. Action thresholds for mosquito control.
 Steve Peper. A quick and accurate in-house sentinel chicken test for West Nile virus (poster).

October 29-November 3. Rui-De Xue. AMCD program and applied research capability, 2nd Latin American SOVE. La Plata. Argentina.

November 2. Rui-De Xue. Seminar about research capability and collaboration at AMCD. National Center for Pest and Insecticide Evaluation. Buenos Aires. Argentina.

FMCA 2022 Meeting, Palm Coast, Florida.

V. Aryaprema. Establishing evidence-based action thresholds for *Aedes*, *Culex*, and *Anopheles* mosquito abundance in different operational environments.

W. Qualls. From Start to Finish: Creating a Good Laboratory Practice Program at Anastasia Mosquito Control District.

S. Peper. To fly or not to fly: an in-depth look at Florida mosquito control aerial capabilities.

M. Farooq. Evaluation systems for spatial repellents against ticks.

D. Autry. Field evaluation of AGO & Sirenix traps against container mosquitoes in St. Augustine, Northeastern Florida.

S. Smoleroff. AMCD surveillance trapping program.

K. Blore. Evaluation of silver nanoparticle as a control agent against adult mosquito vectors.

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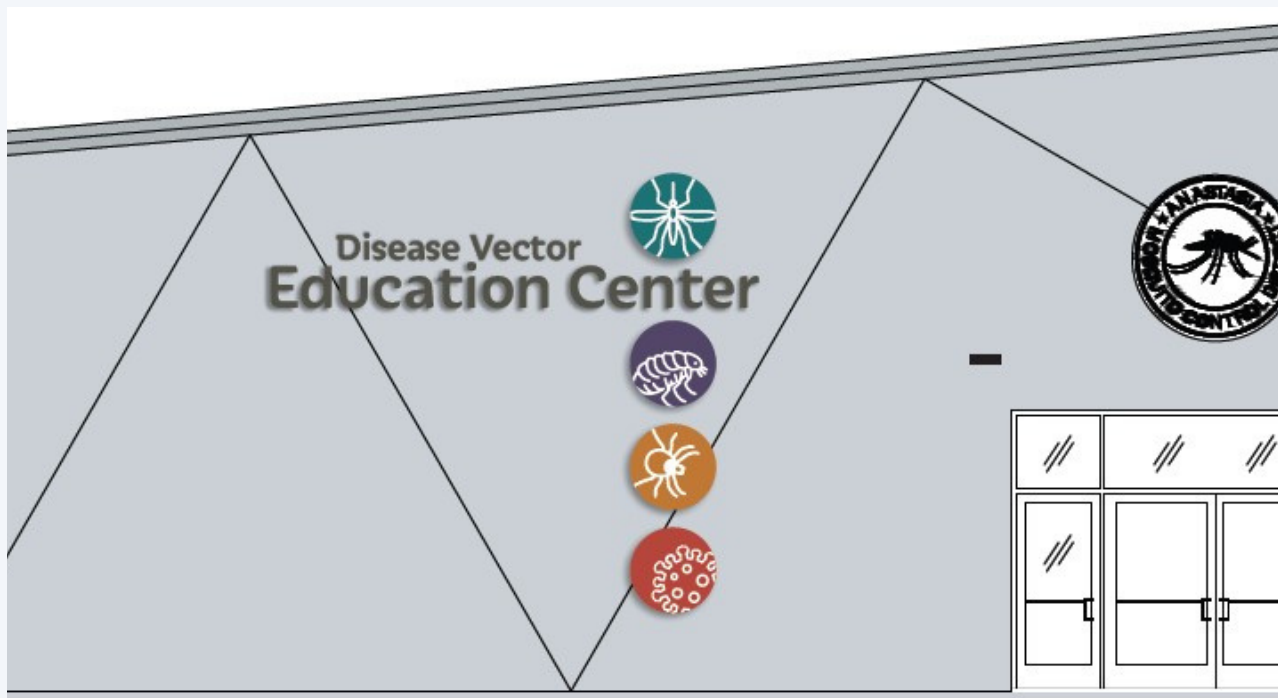
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