

# ALAMEDA COUNTY

## MOSQUITO ABATEMENT DISTRICT

### 93<sup>rd</sup> and 94<sup>th</sup> Annual Report 2024–2025



*Dedicated to the Memory of*

**William M. Spinola**

Trustee 1982 – 2015

Passed Away 12/18/24



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*Artificial intelligence tools were used in the development of select content and images included in this report.*

# ACMAD ENTERS THE AGE OF INVASIVE *Aedes* MOSQUITOES



For more than a decade, mosquito control agencies across California have prepared for the eventual spread of invasive *Aedes* mosquitoes—specifically *Aedes aegypti* and *Aedes albopictus*. While many regions experienced introductions earlier, Alameda County benefited from geography, climate, and sustained prevention efforts.

That changed in October 2024, when *Aedes aegypti* was detected near the Alameda County Fairgrounds in Pleasanton during routine mosquito surveillance following a West Nile virus–positive bird.

This detection immediately activated the Alameda County Mosquito Abatement District (ACMAD) Non-native *Aedes* Mosquito Response Plan. Originally developed in 2016, the plan was refined over time as new technologies and proven control strategies became available through collaboration with mosquito control agencies statewide.

A critical challenge in responding to invasive *Aedes* mosquitoes is maintaining vigilance against native mosquito species. Late summer is peak season for *Culex* mosquitoes, which can transmit West Nile virus, while saltmarsh mosquitoes may emerge following high tides if not properly managed. ACMAD's Operations staff carefully balances these priorities to protect public health and quality of life throughout the County (see page 10).

Early detection played a key role in limiting the initial spread of *Aedes aegypti* in 2024. The ACMAD Laboratory's targeted monitoring efforts allowed for a rapid response (see page 12). In 2025, the Lab expanded surveillance using randomized grid trapping, which identified additional *Aedes aegypti* mosquitoes and guided ongoing control efforts. To support this increased workload, ACMAD added a full-time laboratory position, strengthening our capacity to respond effectively.

Because invasive *Aedes* mosquitoes often breed in and around homes, community participation is essential. ACMAD hired a Community Liaison dedicated to the *Aedes* response to support outreach, education, and direct engagement with residents. These efforts, along with coordination with local agencies and partners throughout Alameda County, are described beginning on page 15.

Protecting public health requires reliable vehicles, equipment, and technology. ACMAD's continued investment in these resources allows staff to respond efficiently and effectively across the county (see pages 18 and 20).

Finally, ACMAD is grateful for the leadership and fiscal oversight provided by its 15-member Board of Trustees. Their stewardship ensures that the District remains prepared, accountable, and focused on serving Alameda County residents. Additional information about the Board, staff accomplishments, and financial reports can be found on pages 3, 5, and 21.

While invasive *Aedes* has added a new dimension to ACMAD's mosquito control program, the District is dedicated to continuing its legacy of innovation and proactive efforts to control mosquitoes in Alameda County.

A handwritten signature in black ink, appearing to read 'Ryan Clausnitzer'. The signature is fluid and cursive, with a small blue mark at the end.

Ryan Clausnitzer  
General Manager

# GOVERNING BOARD

The fourteen city councils within Alameda County plus the County Board of Supervisors each appoint one trustee to represent its constituency on the fifteen-member governing board of the Alameda County Mosquito Abatement District for a fixed term of two or four years. The principal acts granting District authority are found in section 2000 of the California Health and Safety Code. The District board members possess a variety of skills and expertise in academia, agriculture, business, education, electrical engineering, entomology, environmental health, geology, insurance, government, human resources, legal, mechanical engineering, parks and recreation, pharmaceuticals, politics, and scientific research.

Trustees serve without compensation; rather, they receive a maximum stipend of \$100 per month for attending business meetings of the Board. The regular Board meetings are held on the second Wednesday of each month at the District office, 23187 Connecticut Street, Hayward at 5:00 p.m. and the meetings are open to the public. Remote meeting attendance is allowed under certain conditions.



## TRUSTEES FOR THE YEARS 2024 & 2025

Trustee	Representing	Years of Service
Cathy Roache	County-at-large	7
Tyler Savage	Alameda	4
Preston Jordan	Albany (2025)	3
Robin López	Albany (2024)	1
Robert Beatty	Berkeley	10
Kashef Qadri	Dublin	3
John Bauters	Emeryville	2
John Zlatnik	Fremont	2
George Syrop	Hayward	3
Maya Manoharan	Livermore	2
Lisa Rasler	Oakland (2025)	1
Eric Hentschke	Newark	10
Hope Salzer	Piedmont	4
Valerie Arkin	Pleasanton (2024)	2
Jeff Nibert	Pleasanton (2025)	1
Victor Aguilar	San Leandro	7
Subru Bhat	Union City	8



Serving  
Alameda County's  
**1.6M**  
residents

**14** Cities  
+ Unincorporated  
Alameda County

**15** Board  
Members

**70**  
**YEARS** of  
District Service combined

# DISTRICT PERSONNEL



Alameda County Mosquito Abatement District staff

Name of Employee	Position	Years of Service
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**SUPPORT STAFF**

Ryan Clausnitzer	General Manager	10.5
Erika Castillo	Regulatory & Public Affairs Director	23.5
Robert Ferdan	Information Technology Director	10.5
Lizbeth Martinez	Community Liaison	1
Judith Pierce	Public Education Officer	5.5
Michelle Robles	Financial & HR Specialist	9.5
Mark Wieland	Mechanical Specialist	11

**OPERATIONS STAFF**

Joseph Huston	Field Operations Supervisor	34.5
Nick Appice	Vector Biologist	11.5
John Busam	Vector Biologist	23.5
Cornelius Campbell	Vector Biologist	22
Erick Gaona	Vector Biologist	6
Sarah Lawton	Vector Biologist	10
Alex Roache	Mosquito Control Technician	3
Ben Rusmisl	Vector Biologist	10
Danny Sharkey	Mosquito Control Technician	3

**LABORATORY STAFF**

Eric Haas-Stapleton	Laboratory Director	10.5
Dereje Alemayehu	Vector Scientist	26.5
Miguel Barretto	Vector Scientist	7.5
Eric Moyung	Associate Vector Scientist	1



Lab staff



Office staff



Operations staff

**Seasonal Employees**

**2024** – Annika Olson, Christian Espinosa, Eric Moyung

**2025** – Annika Olson, Christian Espinosa, Eric Moyung, Jacob Mix

**20**  
FULL-TIME  
EMPLOYEES

# REPRESENTATION ACTIVITIES

The District is one of over 60 agencies that conduct mosquito control and one of over 2,000 special districts, in California. The District participates in the activities of the California Special Districts Association (CSDA), the Mosquito and Vector Control Association of California (MVCAC), and the American Mosquito Control Association (AMCA). Through these organizations, we promote the innovative work of our District, coordinate common activities, and increase the knowledge and abilities of staff and trustees. The following is a list of District employees who have participated in regional, statewide, or national activities either by committee, have spoken or presented, or are an officer chosen by their peers:

## MEMBERSHIPS

### Ryan Clausnitzer, MPA, REHS

At-Large Director, Alameda County Special District Association  
 Chair, California CLASS JPA (2025); Vice-Chair (2024)  
 Director, CSDA  
 Vice-Chair, CSDA Legislative Committee  
 Member, CSDA Fiscal, Audit Committees  
 CSDA Appointee to National Special District Association  
 Executive Committee member, East Bay Economic Development Agency  
 Member, MVCAC Legislative Committee

### Robert Ferdan - CGCIO

Member, Municipal Information Systems Association of California (MISAC)  
 Member, MISAC Artificial Intelligence Task Force  
 Member, Gov AI Coalition  
 Mentor, MISAC Mentorship Program  
 Chair, MISAC AI Use case Committee  
 Member, MISAC Security Committee  
 Member, Multi-State Information Sharing and Analysis Center (MS-ISAC)  
 Member, MVCAC Information Technologies Committee  
 Member, Public Technology Institute (PTI)  
 Board Member at Large, MISAC Northern California Region (2025)

### Erika Castillo

Member, AMCA Endangered Species Regulatory Subcommittee  
 Member, AMCA Federal Lands Regulatory Subcommittee  
 Member, AMCA State and Local Affairs Legislative Subcommittee  
 Member, Hayward Area Shoreline Planning Agency (HASPA) Technical Advisory Committee  
 Chair (2024), MVCAC Regulatory Affairs Committee  
 Board Member, San Francisco Bay Joint Venture  
 Vice Chair (2025), San Francisco Bay Restoration Authority Advisory Committee  
 Member, Wetlands Regional Monitoring Program (WRMP) People and Wetlands Workgroup  
 Vice Chair, WRMP Steering Committee

### Eric Haas-Stapleton, PhD

Editor, Wetlands Ecology and Management  
 Member, MVCAC CalSurv Steering Committee  
 Chair, MVCAC Drone Committee  
 Member, MVCAC Information Technologies Committee  
 Member, MVCAC Laboratory Technologies Committee  
 Member, MVCAC Vector Control Research Committee  
 Member, AMCA Drone Sub-Committee

### Joseph Huston

Member, MVCAC Trash Capture Sub-Committee

### Judith Pierce, MPH

Member, MVCAC Public Education Committee  
 Coordinator, National Mosquito and Vector Control Educators Group  
 Member, Safe Kids Coalition of Alameda County

### Mark Wieland

Member, Alameda County Emergency Managers Association  
 Member, MVCAC Mosquitofish and Biocontrol Sub-Committee



**California Special Districts Association**  
*Districts Stronger Together*



## PUBLICATION

Barretto, M.; Olson, A.; Alemayehu, D.; Clausnitzer, R.; Haas-Stapleton, E.J. Barcoding Quantitative PCR Assay to Distinguish Between *Aedes aegypti* and *Aedes sierrensis*. *Trop. Med. Infect. Dis.* 2025, 10, 230. <https://doi.org/10.3390/tropicalmed10080230>

## MOSQUITO ASSOCIATION PRESENTATIONS

### 2024

Barretto M, Alemayehu D, Clausnitzer R, Haas-Stapleton EJ, 2024. Barcoding quantitative PCR assay to distinguish between *Aedes aegypti* and *Aedes sierrensis*. Presented at the 2024 Annual Meeting of the Mosquito and Vector Control Association of California. Monterey, CA.

Barretto M, Alemayehu D, Clausnitzer R, Haas-Stapleton EJ, 2024. Barcoding quantitative PCR assay to distinguish between *Aedes aegypti* and *Aedes sierrensis*. Presented at the 2024 Annual Meeting of the American Mosquito Control Association. Dallas, TX.

Clausnitzer R, Arreola-Karr C, 2024. The National Special District Coalition. Presented at the 2024 Annual Meeting of the American Mosquito Control Association. Dallas, TX.

Clausnitzer R, Shull R, 2024. The pivotal power of prudence when managing Mosquito and Vector Control money. Presented at the 2024 Annual Meeting of the Mosquito and Vector Control Association of California. Monterey, CA.

Olson A, Barretto M, Clausnitzer R, Haas-Stapleton EJ, 2024. Water quality and environmental DNA: Investigating larval ecology of *Aedes dorsalis* in the San Francisco Bay Area. Presented at the 2024 Annual Meeting of the Mosquito and Vector Control Association of California. Monterey, CA.

### 2025

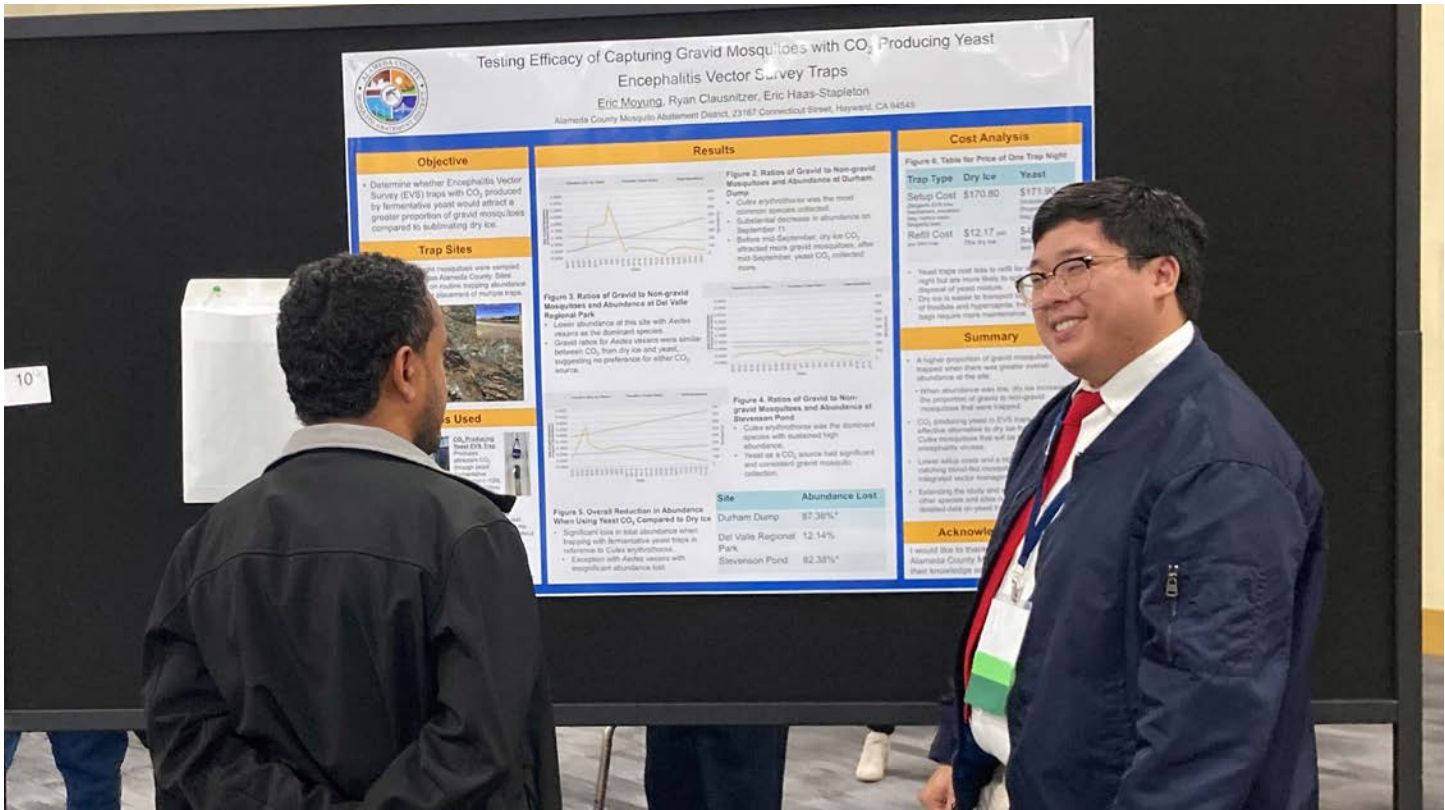
Alemayehu D, Haas-Stapleton EJ, Baysdorfer C, Beyena H, Clausnitzer R, 2025. Mosquito Abatement Through Empowerment (MATE) Tractor Farming: A Collaborative Approach to Solving Public Health Challenges. Presented at the 2025 Annual Meeting of the Mosquito and Vector Control Association of California. Oakland, CA

Barretto M, Clausnitzer R, Haas-Stapleton EJ, 2025. Evaluation of a multiplex qPCR assay for arbovirus detection in mosquitoes and birds: Improving consistency in results. Presented at the 2025 Annual Meeting of the Mosquito and Vector Control Association of California. Oakland, CA.

Clausnitzer R, 2025. California CLASS: A Local Government Investment Pool option for mosquito abatement districts. Presented at the 2025 Annual Meeting of the Mosquito and Vector Control Association of California. Oakland, CA.

Clausnitzer R, 2025. Harnessing the Power of Independence: The Role of Special Districts in Mosquito Control. Presented at the 2025 Annual Meeting of the American Mosquito Control Association. Puerto Rico.





Ferdan R, 2025. Generative AI in Mosquito Control: Opportunities and Challenges Workshop. Presented at the 2025 Annual Workshop of the Vector Control Joint Powers Agency. Santa Cruz, CA.

Ferdan R, Haas-Stapleton EJ, Clausnitzer R, 2025. Generative AI in mosquito control: Opportunities and challenges. Presented at the Plenary Session of the 2025 Annual Meeting of the Mosquito and Vector Control Association of California. Oakland, CA.

Haas-Stapleton EJ, MVCAC Laboratory Technologies and Information Technology Committees, 2025. Bugs, Bytes and Budgets: A deep dive into vector control IT costs. Presented at the 2025 Annual Meeting of the Mosquito and Vector Control Association of California. Oakland, CA.

Haas-Stapleton EJ, Alemayehu D, Clausnitzer R, 2025. Collaborating Globally to Build Local Mosquito Control in Ethiopia. Presented at the 2025 Annual Meeting of the American Mosquito Control Association. Puerto Rico.

Haas-Stapleton EJ, Barretto M, Clausnitzer R, 2025. Evaluation of a multiplex qPCR assay for arbovirus detection in mosquitoes and birds: Improving consistency in results. Presented at the 2025 Annual Meeting of the American Mosquito Control Association. Puerto Rico.

Moyung E, Clausnitzer R, Haas-Stapleton EJ, 2025. Testing efficacy of capturing gravid mosquitoes with CO<sub>2</sub>-producing yeast encephalitis vector survey traps. Presented at the 2025 Annual Meeting of the Mosquito and Vector Control Association of California. Oakland, CA.

Olson A, Barretto M, Lawton S, Gaona E, Clausnitzer R, Haas-Stapleton EJ, 2025. Determinants of immature *Aedes dorsalis* distribution in a dynamic environment. Presented at the 2025 Annual Meeting of the Mosquito and Vector Control Association of California. Oakland, CA.

Pierce J, Curtis-Robles R, 2025. Where Shall We Start? How to Begin Building a Classroom-Based Mosquito and Vector Control Curriculum. Presented at the 2025 Annual Meeting of the Mosquito and Vector Control Association of California. Oakland, CA

Wieland M, Haas-Stapleton EJ, 2025. Electrifying drones: Ford F-150 Lightning powers a greener mosquito control future. Presented at the 2025 Annual Meeting of the Mosquito and Vector Control Association of California. Oakland, CA. Presented at the 2025 Annual Meeting of the American Mosquito Control Association. Puerto Rico.

Wieland M, Clausnitzer R, 2025. Indoor fish rearing: A sustainable shift from traditional outdoor storage. Presented at the 2025 Annual Meeting of the Mosquito and Vector Control Association of California. Oakland, CA.

**PRESENTATIONS TO PARTNERS**City Council Meetings

District update to Newark and Union City  
(Winter 2025)

**Judith Pierce**

District update to Fremont, Pleasanton, Dublin, and  
Livermore (Fall 2025)

**Ryan Clausnitzer**Alameda County Communicable Disease Health  
Providers Call

Tropical Troublemakers: Mosquitoes & the Diseases they  
Carry (September 2024)

**Eric Haas-Stapleton**

Mosquito-borne disease: Targeted history & physical  
symptoms (September 2025)

**Maya Manoharan (ACMAD Trustee)**

Mosquito-borne Tropical Diseases: Local Risks and  
Control Strategies (September 2025)

**Eric Haas-Stapleton**Alameda County Emergency Managers (November 2024)

*Aedes aegypti* focused presentation

**Judith Pierce**Alameda County Health Promotion and Partnerships  
(August 2025)

*Aedes aegypti* focused presentation

**Judith Pierce**Alameda County Safe Kids Coalition (March 2025)

*Aedes aegypti* focused presentation

**Judith Pierce**Alameda County Voluntary Organizations Active in  
Disaster (May 2025)

*Aedes aegypti* focused presentation

**Judith Pierce**Alden Lane Nursery Staff (September 2025)

*Aedes aegypti* focused presentation

**Lizbeth Martinez**Bay East Association of Realtors (June 2025)

*Aedes aegypti* focused presentation

**Judith Pierce, Lizbeth Martinez**California County Information Services Directors  
Association (February 2024)

CISA Cyber Incident Response Resources for Local  
Governments

**Robert Ferdan**California Department of Public Health Continuing  
Education (November 2025)

Aerial Drones for Larvicide Applications

**Eric Haas-Stapleton**Livermore Community Association for Preschool  
Education Headstart (November 2025)

*Aedes aegypti* focused presentation

**Judith Pierce, Lizbeth Martinez**Livermore-Pleasanton Community Emergency Response  
Team - CERT (November 2024, June 2025)

*Aedes aegypti* focused presentation

**Judith Pierce, Lizbeth Martinez, Danny Sharkey**MISAC Annual Conference (September 2024)

How Generative AI Revolutionizes Local Government  
Focusing on Security and Data Privacy

**Robert Ferdan**

The Search for Generative AI Powered Call Management

**Robert Ferdan**Pleasanton North Rotary (July 2025)

*Aedes aegypti* focused presentation

**Dereje Alemayehu, Judith Pierce, Lizbeth Martinez**Tiburcio Vasquez Health Center Promotoras Program  
(September 2024)

*Aedes aegypti* focused presentation

**Judith Pierce, Christian Espinoza**UC Berkeley: Introduction to  
Comparative Virology (2024 and 2025)

Guest Lecture:

West Nile virus vectors and mosquito control

**Eric Haas-Stapleton**UC Master Gardeners of Alameda County  
(September 2025)

*Aedes aegypti* focused presentation and District tour

**Judith Pierce, Lizbeth Martinez****3**

AMCA  
presentations

**12**

MVCAC  
presentations

**26**

Partner  
presentations

# OPERATIONAL DATA

	2021	2022	2023	2024	2025
<b>PHYSICAL CONTROL OPERATIONS</b>					
Maintenance of ditches (linear feet)	4,834	0	0	895	2,253
<b>MOSQUITOFISH OPERATIONS</b>					
Total number of sites stocked with <i>Gambusia</i>	554	464	466	495	499
Total number of fish planted	6,087	5,247	4,211	5,198	5,292
<b>CHEMICAL CONTROL OPERATIONS</b>					
Evergreen 25-5 adulticide (gallons)	0	0	6.65	0	0
<b>SURFACE AGENTS</b>					
BVA2 larvicidal oil (gallons)	510	543	938	426	238
<b>BACTERIAL LARVICIDES</b>					
<b>Bacillus thuringiensis israelensis (Bti)</b>					
Vectobac 12AS liquid concentrate (gallons)	411	1331	953	2,023	2,114
Vectobac GS (pounds)	351	737	680	4,937	3,662
Vectobac G granular (pounds)	7,919	728.2	8,485	10,939	10,617
<b>Bacillus sphaericus (Bs)</b>					
Vectolex FG/CG (pounds)	118	0.5	0	800	2,924
<b>Bacillus thuringiensis israelensis and Bacillus sphaericus</b>					
Vectomax WSP (pounds)	0.92	1.12	0.63	18	88
Vectomax FG (pounds)	1,465	2,280	3,882	2,310	3,025
<b>Spinosad</b>					
Natular XRT (pounds)	548	263	1,520	5,478	4,033
Natular G30 (pounds)	565	317	142	232	277
<b>INSECT GROWTH REGULATORS</b>					
<b>Methoprene</b>					
Altosid Liquid Larvicide 20% (gallons)	7	8.8	7.1	86	242
Altosid Briquets (each)	897	766	547	531	864
Altosid XR Briquets (each)	1,380	1,209	1,356	1,145	500
Altosid Pellets (pounds)	1,011	501	505	488	726
<b>Pyriproxyfen</b>					
SumiLarv .05G (pounds)	697	914	0.11	1,850	2,047
MetaLarv S-PT (pounds)	0	0	17	23	0

# OPERATIONS REPORT

## OPERATIONS PROGRAM OVERVIEW

The ACMAD Operations Program is founded on the principles of Integrated Vector Management (IVM), utilizing physical, biological, and chemical control methods to manage mosquito populations. The primary objective is to control mosquito larvae before they emerge as adults and disperse into the environment. Achieving this objective requires a detailed understanding of the biology and seasonality of the twenty-two native mosquito species present in Alameda County, as well as emerging invasive species such as *Aedes aegypti*, which was detected locally in both 2024 and 2025. Operations staff employ specialized equipment to support surveillance and treatment activities, including amphibious Argo vehicles, unmanned aerial systems (UAS or drones), and an A-1 Super Duty mist blower. These tools allow staff to effectively access and treat a wide range of mosquito breeding habitats.



Many of the environments where mosquitoes breed support diverse plant and animal communities, including threatened and endangered species. Environmental stewardship and the use of materials and methods that minimize impacts on non-target organisms remain central to the District's mission. This commitment is demonstrated through the District's extensive use of bacteria based larvicides, which effectively target mosquito larvae while minimizing impacts on plants, wildlife, and beneficial insects such as pollinators. During 2024 and 2025, Operations staff treated 11,325 acres. Of these, 98% (11,141 acres) were treated using bacterial or growth regulating larvicides (Figure 1). These products provide highly effective mosquito control while supporting the District's commitment to environmentally responsible practices.



## INVASIVE MOSQUITO RESPONSE

During 2024 and 2025, the long-anticipated introduction of the invasive mosquito *Aedes aegypti* was confirmed in Alameda County. This species is of significant public health concern due to its ability to transmit diseases such as dengue, Zika, and chikungunya. *Aedes aegypti* has become established in many California counties and continues to expand its geographic range. The first detection in Alameda County occurred on October 9, 2024, in the City of Pleasanton. Additional detections were confirmed between August and October 2025 in Pleasanton, Livermore, Dublin, and Fremont.

In response to each detection, the majority of District staff conducted comprehensive door-to-door inspections of residential and commercial properties to identify and eliminate mosquito breeding sources. Staff provided residents with education on source reduction and preventive measures to reduce mosquito habitat around homes and businesses. The District also deployed the A-1 Super Duty mist blower to treat more than 700 acres in residential areas. This equipment disperses a fine mist of larvicide over and around structures, allowing treatment of cryptic and inaccessible breeding sites. This method will continue to serve as an important component of the District's invasive mosquito response strategy.



## NATIVE MOSQUITO CONTROL

Requests for service from the public during 2024 and 2025 are summarized by request type (Figure 2) and by city (Figure 3). These service calls provide valuable opportunities for public engagement, education, and targeted mosquito control. Mosquitofish remain an important biological control tool and are routinely stocked in ornamental ponds, livestock watering troughs, and neglected swimming pools. Hundreds of mosquitofish are distributed annually, providing long-term, sustainable control of mosquito larvae.

Routine surveillance and treatment activities include inspection of freshwater and saltwater marshes, creeks, canals, wastewater treatment facilities, storm drains, catch basins, tree holes, and discarded containers such as used tires. The District also conducts annual aerial surveys to identify and address unmaintained swimming pools. These integrated surveillance, treatment, and response efforts form the foundation of the District's mosquito control program.

## SURVEILLANCE, PLANNING, AND PUBLIC HEALTH PROTECTION

Strategic planning of personnel, equipment, and operational priorities remains essential to maintaining effective mosquito control. For many years, the District has proactively prepared for invasive mosquito introductions while maintaining routine control of native mosquito species. Controlling mosquitoes capable of transmitting West Nile virus (WNV) remains a core priority from spring through fall each year.

In both 2024 and 2025, Alameda County was the first county in California to detect WNV activity. Despite the early start of the WNV season, Operations staff successfully balanced invasive mosquito response efforts with ongoing control of native mosquito populations. Continued planning, training, and resource allocation will ensure the District remains prepared to address both endemic and invasive mosquito threats.

Figure 1. Product Applied by Acres.

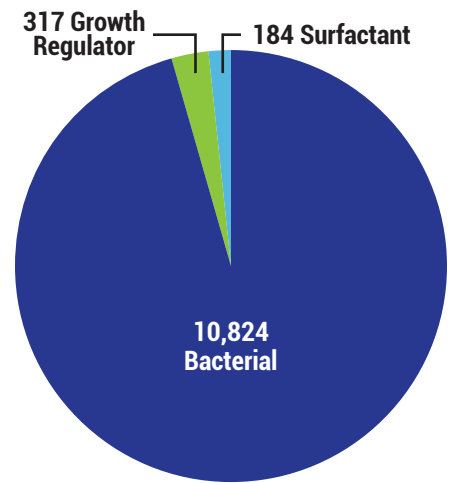


Figure 2. Service Requests by Type.

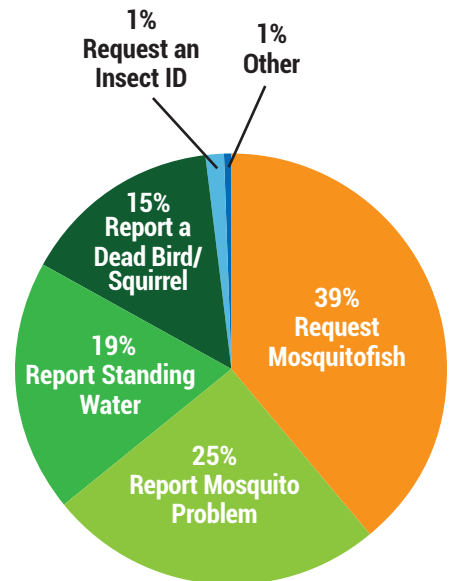
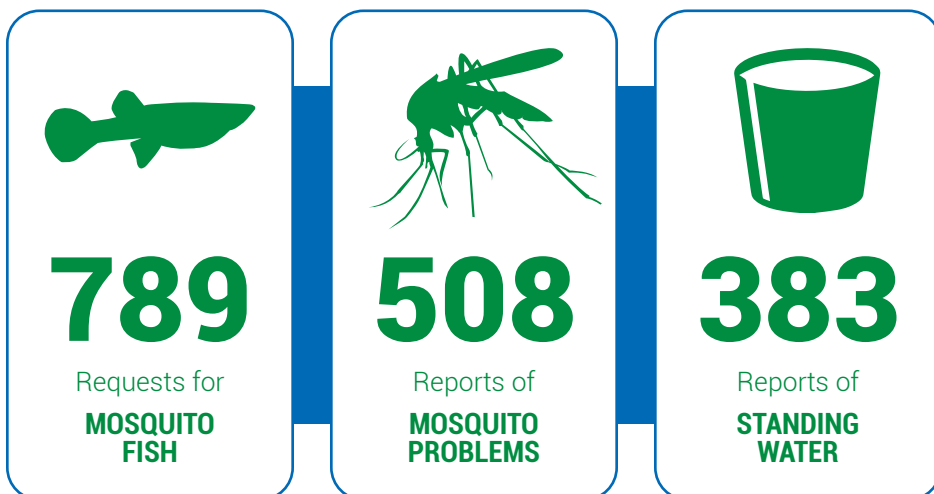
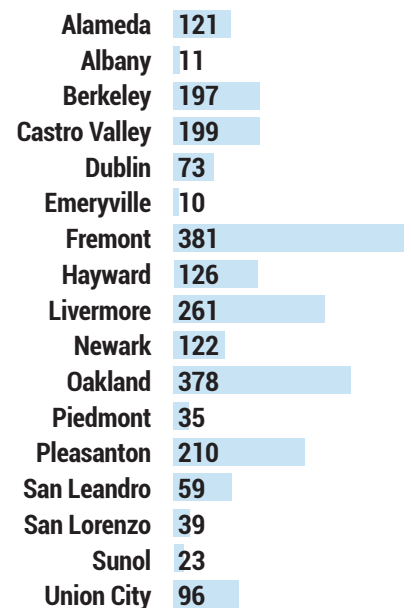


Figure 3. Service Requests by City.



# LABORATORY REPORT

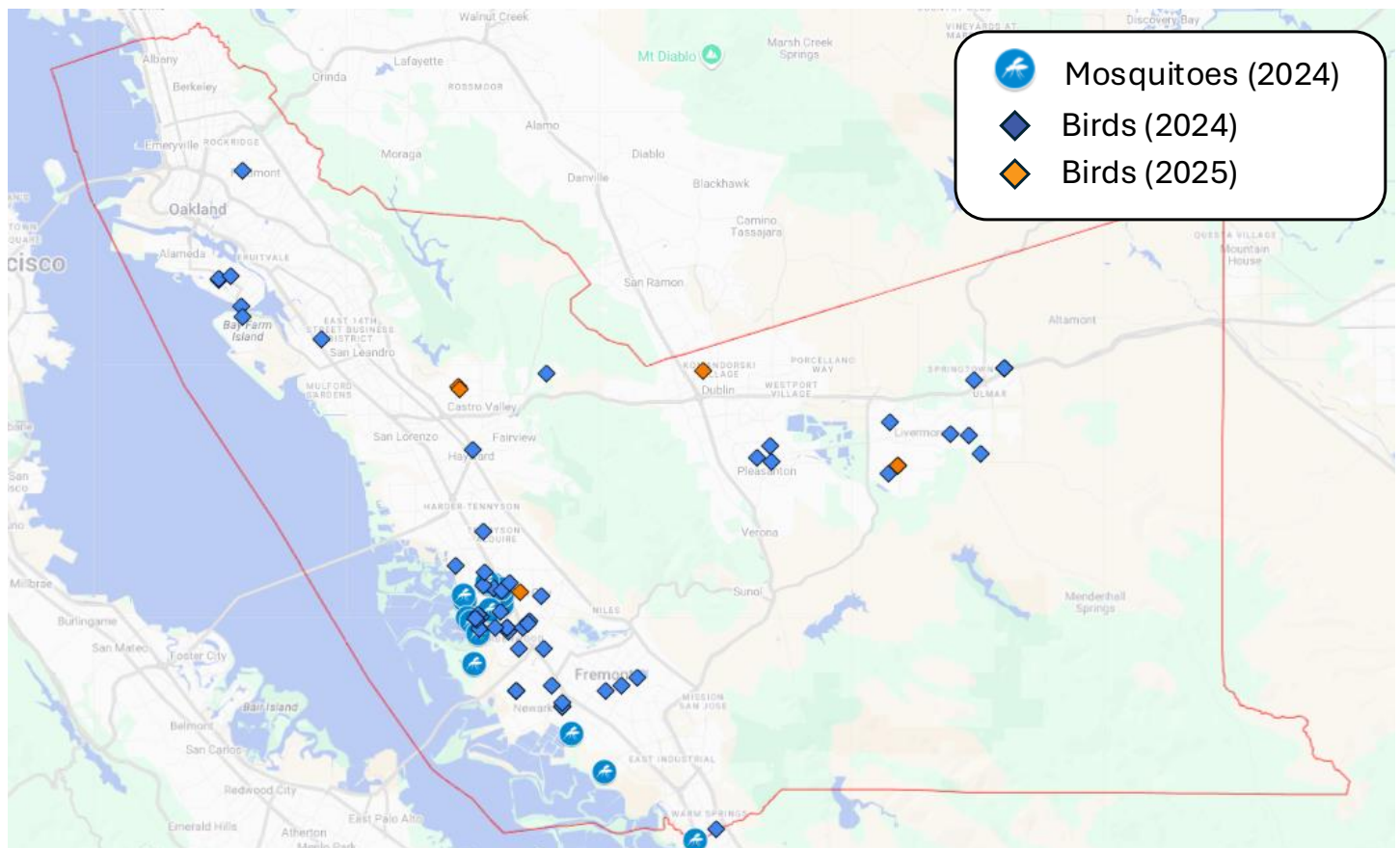
## LABORATORY OVERVIEW

During 2024–2025, ACMAD’s Laboratory maintained countywide surveillance for native mosquito abundance and arboviruses while significantly expanding capacity to detect and respond to invasive *Aedes aegypti*, an important vector of dengue, chikungunya, and Zika. Routine adult mosquito monitoring continued through a network of CO<sub>2</sub>-baited traps, with sites surveyed on rotating schedules to track seasonal abundance and assist field operations. The Lab also supports public health readiness by testing mosquito collections and birds for West Nile virus and by coordinating surveillance actions when mosquito-vectored travel cases are reported by the Alameda County Public Health Department.

## WEST NILE VIRUS SURVEILLANCE AND RISK INDICATORS

West Nile virus (WNV) surveillance remained a core laboratory function during 2024 and 2025. In 2024, Alameda County detected WNV in 53 birds and 19 mosquito pools, with zero human cases. In 2025, WNV indicators were substantially lower, with 6 WNV positive birds, zero positive mosquito pools, and zero human cases (Figure 4). Adult mosquito surveillance also showed that the county’s collections were dominated by species that drive WNV risk (Figure 5). The dominance of WNV-vector species, comprising roughly three quarters of adult collections, underscores the necessity of sustained surveillance. When paired with routine monitoring of all mosquito species, these data provide the foundation for proactive risk communication and the strategic allocation of control resources.

**Figure 4.** Environmental West Nile virus monitoring (2024 – 2025). Map shows the locations of WNV positive birds and mosquitoes from Alameda County. Blue symbols indicate 2024 activity and orange symbols indicate 2025 activity. WNV positive mosquitoes were not detected during 2025. The red outline marks the county boundary.





## ENHANCED DETECTION USING *Aedes Aegypti* eDNA

To improve sensitivity and reduce reliance on adult captures alone, the laboratory developed and deployed an *Aedes aegypti* environmental DNA (eDNA) assay that detects *Aedes aegypti* from water collected in oviposition style traps and container systems, including In2Care traps and household container water samples collected during response investigations. The assay can detect *Aedes aegypti* DNA even when immature mosquitoes are not visually observed in the water, strengthening early detection and helping distinguish ongoing reproduction from transient introductions.

## SUSTAINED NATIVE MOSQUITO MONITORING

In addition to enhanced *Aedes aegypti* surveillance, the Laboratory maintained high volume native mosquito monitoring throughout the biennium, processing 3,047 CO<sub>2</sub> baited traps in 2024 and 2,789 in 2025 and identifying 191,461 adult mosquitoes to species in 2024 and 125,366 in 2025. Species composition was consistent with a typical countywide pattern in which a small number of species accounted for most adult mosquitoes collected, while many other species occur at lower levels. These data provided the operational baseline needed to track seasonal changes, compare neighborhoods and habitats, and prioritize field activities and public communication with clear, transparent metrics.

## STAFFING AND OPERATIONAL RESILIENCE

To strengthen Laboratory capacity and sustain an expanded surveillance workload, in mid-2025 ACMAD hired a new Vector Scientist, Eric Moyung. In late 2025, the District also experienced increased loss and damage of mosquito monitoring equipment, with more than 20 CO<sub>2</sub> baited traps stolen or vandalized, representing nearly \$5,000 in replacement costs for these commercially available traps. This was likely driven by the need to place traps in more visible urban settings to support *Aedes aegypti* monitoring, compared with traditional trap placements in less conspicuous natural areas. In response, Laboratory staff developed an inexpensive trap that replicates the function of the commercial model and can be assembled from off the shelf parts for about \$55 per trap, compared with nearly \$200 for the commercial version. This reduces replacement cost and improves resilience, allowing continued high-density surveillance despite equipment losses.

## 2024

**3,047 Traps placed**

**2,328 Males collected**

**189,133 Females collected**

**191,461**

Adult mosquitoes

**78%** of collected mosquitoes  
can spread WNV

## 2025

**2,789 Traps placed**

**2,559 Males collected**

**122,807 Females collected**

**125,366**

Adult mosquitoes

**76%** of collected mosquitoes  
can spread WNV

## 2024-25

**511 sites trapped**

**98** in Winter

**195** in Summer

**218 *Aedes aegypti* grids**



# OUTREACH AND ENGAGEMENT

As *Aedes aegypti* populations begin to spread in Alameda County, ACMAD's Outreach staff expanded efforts to inform the public about this invasive and medically significant mosquito. These efforts included developing new partnerships, increasing community engagement, and hiring of a newly created Community Liaison position. Because *Aedes aegypti* lays eggs in small, cryptic water sources, effective prevention depends heavily on resident participation. District staff alone cannot identify and eliminate every standing water source on a weekly basis. Therefore, educating residents on how to reduce mosquito breeding habitats is essential to reducing mosquito abundance and protecting public health.

## EVENTS

With increased staff capacity in 2025, the District expanded its participation in community events, increasing from 18 events in 2024 to 29 events in 2025. These events provide opportunities to deliver location-specific information and timely updates on emerging topics, such as male-release mosquito suppression technologies and dengue activity in California. Event selection is guided by mosquito abundance data, attendee demographics, and a commitment to equitable service distribution. For example, following the detection of *Aedes aegypti* in Livermore, Outreach staff prioritized events in Livermore and the Tri-Valley region to ensure residents in affected areas received targeted prevention messaging and information about District services.

## CLASSROOM EDUCATION

The classroom education program continued to expand into additional school districts, including Hayward Unified School District in 2024 and Fremont Unified School District in 2025. The standards-aligned program is designed to be flexible for teachers, offering either a single 45-minute lesson or a two-part lesson that includes a 10-days observation of the mosquito life cycle. During the two-year period, Outreach staff presented to 3,293 children.



Students in Hayward watching mosquitofish eat larvae.

**19** events in 2024

**4,600** conversations with residents

**5** *Aedes aegypti*  
focused presentations  
**350** Attendees

**27** events in 2025

**6,150** conversations with residents

**12** *Aedes aegypti*  
focused presentations  
**601** Attendees

**2024**

**8 Classrooms + 12 School Presentations  
+ 2 School Events =  
1,649 STUDENTS REACHED**

**2025**

**13 Classrooms + 22 School Presentations  
+ 2 School Events =  
1,644 STUDENTS REACHED**



## DIGITAL PRESENCE

During 2024 and 2025, ACMAD expanded its digital outreach through social media, search engine advertising, website display ads, and Smart TV advertising. Performance data from 2024 showed that social media advertising generated higher engagement than Smart TV advertising, leading Outreach staff to prioritize social media, search engine, and display advertising in 2025 (Figure 7).

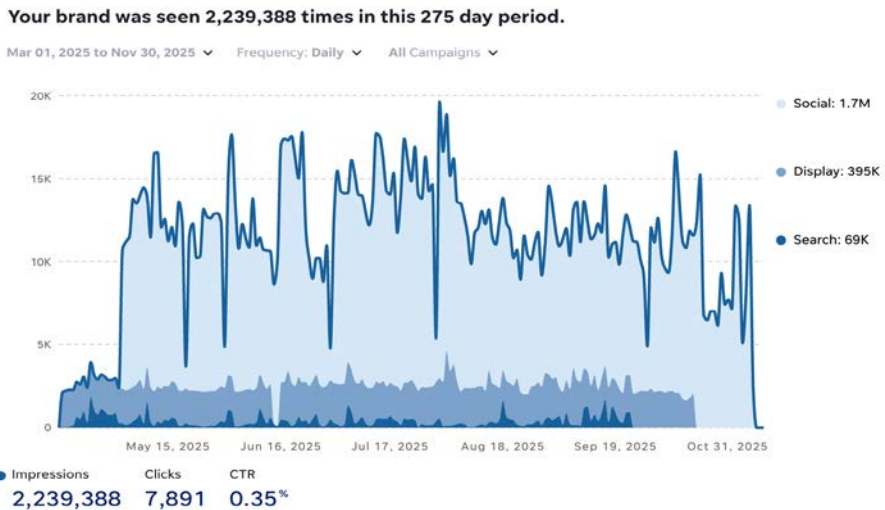
ACMAD video advertisements in 2025 also incorporated on-screen text to accommodate viewers who watch content without sound. More than 95% of advertisement views occurred on mobile devices (Figure 8), allowing residents to easily access the District's website and submit service requests.

Following *Aedes aegypti* detections in Livermore, local news station KRON 4 interviewed District staff regarding the mosquito and inspection procedures residents could expect. The interview has received more than 590 views on the KRON 4 YouTube channel. Over the past two years, the District's website has also undergone multiple updates, including the addition of a dedicated *Aedes aegypti* Frequently Asked Questions (FAQ) page to provide residents with accessible and timely information.



Lab Director Dr. Eric being interviewed by KRON 4 about mosquito traps.

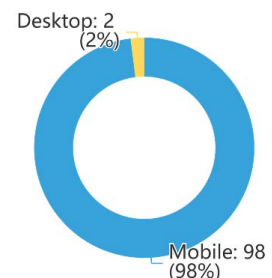
**Figure 7. Graph of total views for social media, display, and search engine advertisements in 2025.** Consistent with 2024 data, social media advertising continued to reach the greatest number of users.



**Figure 8. Images from the 2025 video advertisement alongside mobile vs. desktop user statistics.** Alameda County audiences view District advertisements primarily from mobile devices making mobile compatibility and on-screen text important.



### Which type of device was used to watch the video?



## PARTNER ENGAGEMENT

A key outreach goal from ACMAD's 2024-2026 Strategic Plan was the development of new partnerships to strengthen and amplify the District's mosquito control mission. Outreach staff advanced this goal by hosting Senator Aisha Wahab and Assemblymember Liz Ortega for District tours, formally joining the Hayward Area Shoreline Planning Agency (HASPA), establishing quarterly coordination meetings with Alameda County Public Health Department's Acute Communicable Disease Program, and initiating a partnership with the University of California Master Gardeners. These interactions produced meaningful outcomes, including Senator Wahab sponsoring California's Mosquito Awareness Week Resolution in 2025, ACMAD hosting a field day for Assemblymember Ortega's staff, and the District's Laboratory Director and Trustees presenting to physicians throughout Alameda County in both 2024 and 2025 (see Presentations to Partners section). In addition, the District hosted 25 University of California-trained Master Gardeners for a three-hour facility tour focused on mosquito biology, District operations, and strategies to enhance mosquito prevention outreach.

The spread of *Aedes aegypti* mosquitoes throughout the Bay Area also prompted increased regional collaboration. In spring 2025, mosquito control districts from the Coastal region convened to share lessons learned and discuss control strategies. Presentations addressed recent local detections, response methods, and long-term impacts observed in the Central Valley, where *Aedes aegypti* became established more than a decade ago. Breakout sessions for Laboratory, Operations, Outreach, and Management staff allowed participants to focus on discipline-specific challenges and strategies. Information-sharing opportunities such as this symposium provide valuable insight and support the District's continued planning and preparedness for responding to *Aedes aegypti* in Alameda County.



Assemblymember Ortega's staff retreat.



Community Hero's Event in Newark with Public Education Officer Judith Pierce, Vector Biologist Erick Gaona, Newark Trustee Eric Hentscke, and Vice Mayor of Newark Eve Marie Little.



Senator Aisha Wahab (center) in the ACMAD lab.



ACMAD team with Assemblymember Liz Ortega (center).

# INFORMATION TECHNOLOGY UPDATE

## REAL-TIME FIELD INSPECTION AND MAPPING

Following the detection of *Aedes aegypti* in 2024, ACMAD developed a real-time field mapping program using MapVision, our data management system, to support door-to-door inspection efforts in Pleasanton (Figure 9). The system allowed District staff to record property inspection results live from the field, reducing delays between inspection, data availability, and decision making.

District staff in the office were able to monitor progress as inspections were underway, providing improved situational awareness and coordination across multiple field teams. As new detections were identified, additional properties could be flagged for inspection from the office and immediately pushed to District staff already in the field. This capability allowed inspection routes and priorities to change in response to emerging conditions, replacing static planning with a responsive, data-driven workflow.

**3,353** properties flagged in the database for *Aedes aegypti* response

**874** properties identified for *Aedes aegypti* postcards

**Ally's statistics:**

**2,001** calls answered

**1,543** minutes of call time logged

**386** spam calls filtered



**Figure 9. MapVision *Aedes aegypti* response layer.** An example of the mapping tool for *Aedes aegypti* response areas. Field staff can select from a set of color coded icons to indicate the work done at each property (e.g., doorhanger, inspection, treatment).



## DATA-DRIVEN COMMUNITY FOLLOW-UP THROUGH POSTCARDS

Data collected through property inspections in 2024 was analyzed to identify geographic patterns and areas with higher concentrations of *Aedes aegypti* detections. Inspection results were aggregated and reviewed to determine which neighborhoods posed the highest risk for continued mosquito production. Using these analytics, ACMAD targeted outreach efforts toward residents in the most affected areas. Postcards (Figure 10) were mailed to these households thanking residents for previously granting access and reinforcing the importance of continued mosquito source reduction.

By leveraging inspection data for both operational analysis and targeted outreach, ACMAD ensured that communication efforts were informed by real-world conditions in the field. This approach allowed technology and data analytics to directly support public engagement, reinforcing prevention messaging in areas where it was most needed.

## ALLY: VOICE AI FOR PUBLIC INTERACTION

In response to the surge in phone calls from the public experienced by other California mosquito control districts with *Aedes aegypti*, ACMAD introduced Ally (Figure 11), a voice-based generative artificial intelligence (AI) system. Ally was developed and trained to ensure residents could access timely, accurate information during periods when traditional call-handling models would be strained. Unlike conventional automated phone systems, Ally was designed to engage residents conversationally, providing guidance, answering common questions, and directing interactions without requiring callers to navigate complex menus. Available through both phone and web channels, Ally not only extended ACMAD's availability beyond normal business hours but also increased language capacity with the ability to communicate in English, Spanish, Chinese, and Tagalog by phone and over 60 languages through the chatbot. District staff maintained strict oversight of all communications to ensure consistent messaging aligned with District operations and public health priorities.

Ally represented a shift toward AI as an active operational partner rather than a background support tool. The system absorbed routine inquiries, eliminated spam calls, and created capacity for staff to focus on their other job duties. As conditions evolved, Ally's knowledge and responses could be updated, allowing communication with the public to remain adaptive and responsive. By integrating generative AI directly into public-facing workflows, the District demonstrated how emerging technologies can be applied responsibly to enhance resilience and scalability while maintaining high quality community engagement.

**Figure 10. *Aedes aegypti* postcards.** Pleasanton residents in key 2024 detection areas received postcards in the spring of 2025 reminding them to eliminate standing water on their property and report day-biting mosquitoes.



**Figure 11. ACMAD's generative AI based virtual assistant.** Ally assists the District in handling phone calls and as a chatbot on ACMAD's website.



# FACILITY AND EQUIPMENT

## AQUACULTURE FACILITY

Construction of the District's new Aquaculture Building continued throughout 2024 and is now complete. The facility is equipped with environmental control systems, grow-out tanks for the fry, and dashboard monitoring technology to support efficient fish production operations. The building also provides space for educational activities. Fish production began in May 2025.



## FLEET MODERNIZATION

During 2024 and 2025, the District implemented several fleet improvements to enhance operational efficiency, safety, and sustainability. An all-electric vehicle (EV) truck was added to support the District's unmanned aerial systems (UAS) program. The vehicle is configured with secure storage, improved accessibility, and onboard charging capabilities, allowing it to function as a fully integrated response and treatment vehicle when needed.



Pursuant to Board-approved Resolution No. 1124-1 (Master Equity Agreement), the District also leased three right-hand-drive Jeeps and eight full-size Ford F-150 trucks. These additions improve fuel efficiency and vehicle safety while supporting long-term financial savings. Leasing vehicles is expected to reduce staff time devoted to maintenance and provide greater flexibility as the District transitions toward a fully electric fleet.



## EQUIPMENT UPGRADES

The replacement of weathered and worn trailers provided an opportunity to enhance operational safety and upgrade nurse tank systems. These improvements increase field efficiency and reduce travel time associated with treatment activities.



# FINANCIALS

The District relies on three primary sources of revenue to support its operations and public health mission. First, the District receives a share of ad valorem property taxes collected by the County Tax Assessor. Second, the District is funded through a special tax (Measure K) approved by more than two-thirds of Alameda County voters in 1982, authorizing the District to collect \$1.75 per parcel. Third, the District receives revenue from a benefit assessment approved by over two-thirds of voters in 2008.

For the first time since the benefit assessment was established in 2008, the District increased the assessment from \$2.50 to \$2.90 per parcel, effective Fiscal Year 2025-26. This adjustment was necessary to address the continued and growing threat posed by invasive *Aedes* mosquitoes, ensuring the District can sustain effective surveillance, prevention, and response efforts to protect public health.

To support fiscal stability, emergency preparedness, and long-term planning, the District maintains seven reserve accounts. Four reserves are held with California CLASS (the Repair and Replace Fund, Operational Fund, Enhanced Public Health Emergency Fund, and Enhanced District Contingency Fund). Additional reserves include one account with the Vector Control Joint Powers Agency (VCJPA) (Member Contingency Fund), one with Public Agency Retirement Services (PARS) (Rate Stabilization Fund), and one with the California Asset Management Program (CAMP) (New Asset & Large Project Fund).

Collectively, these reserve accounts strengthen the District's financial resilience, support emergency response efforts, and enable strategic planning for capital improvements and unforeseen events.

The District has maintained the District Transparency Certificate of Excellence since 2016, demonstrating its ongoing commitment to financial transparency, accountability, and responsible stewardship of public funds.

In accordance with Government Code Section 26909, the District undergoes an independent annual audit conducted by an outside firm. The audit ensures that the District's financial statements are free from material misstatement and prepared in accordance with Generally Accepted Accounting Principles (GAAP). Audit procedures include a thorough review of accounting practices, financial disclosures, and overall financial presentation. The District consistently receives an Unmodified Opinion, the highest level of audit assurance. For the fifth consecutive year, the Government Finance Officers Association awarded the District the Certificate of Achievement for Excellence in Financial Reporting.



# GENERAL FUND STATEMENT

## FOR THE FISCAL YEARS ENDED JUNE 30, 2025 AND JUNE 30, 2024

	JUNE 30, 2025		JUNE 30, 2024	
<b>REVENUES :</b>				
Property taxes	\$	3,319,675	\$	3,205,216
Redevelopment distribution		521,320		506,903
Special Assessments		2,009,409		2,002,521
Homeowners Property Tax Relief, State Subvention		15,307		15,648
Investment earnings		464,587		494,404
Investment earnings - PARS		225,383		197,665
Miscellaneous		223,645		183,307
<b>TOTAL REVENUES</b>		<b>6,779,326</b>		<b>6,605,664</b>
<b>EXPENDITURES :</b>				
Salaries and fringe benefits		4,135,379		3,687,283
Materials, supplies and services		1,152,105		1,216,508
Capital outlay		514,541		874,155
<b>TOTAL EXPENDITURES</b>		<b>5,802,025</b>		<b>5,777,946</b>
<b>CHANGE IN NET POSITION</b>		<b>977,301</b>		<b>827,718</b>
<b>NET POSITION - BEGINNING</b>		13,969,958		13,142,240
<b>NET POSITION - ENDING</b>	\$	<b>14,947,259</b>	\$	<b>13,969,958</b>

# COMBINED BALANCE SHEET

## FOR THE FISCAL YEARS ENDED JUNE 30, 2025 AND JUNE 30, 2024

	JUNE 30, 2025		JUNE 30, 2024	
<b>ASSETS</b>				
<u>Current assets</u>				
Cash and investments	\$	12,039,810	\$	11,634,367
Restricted cash and investments		3,165,839		2,603,999
Accounts receivable		1,388		-
TOTAL CURRENT ASSETS		15,207,037		14,238,366
<u>Non-current assets:</u>				
Capital assets, nondepreciable		61,406		87,534
Capital assets, depreciable, net of accumulated depreciation		2,862,938		2,554,219
Net OPEB asset		1,834,317		1,696,641
TOTAL NON CURRENT ASSETS		4,758,661		4,338,394
<b>TOTAL ASSETS</b>		<b>19,965,698</b>		<b>18,576,760</b>
<u>Deferred Outflows of Resources</u>				
Pension related		1,487,647		1,873,501
OPEB related		104,526		193,024
TOTAL DEFERRED OUTFLOWS OF RESOURCES		1,592,173		2,066,525
<b>LIABILITIES</b>				
<u>Current liabilities</u>				
Accounts Payable		259,778		268,408
Compensated Absences		336,310		237,815
TOTAL CURRENT LIABILITIES		596,088		506,223
<u>Non-current liabilities</u>				
Collective net pension liability		4,693,033		4,694,889
TOTAL NON CURRENT LIABILITIES		4,693,033		4,694,889
<b>TOTAL LIABILITIES</b>		<b>5,289,121</b>		<b>5,201,112</b>
<u>Deferred Inflows of Resources</u>				
Pension related		56,801		143,333
OPEB related		446,445		456,612
TOTAL DEFERRED INFLOWS OF RESOURCES		503,246		599,945
<b>NET POSITION</b>				
Net investment in capital assets		2,924,344		2,641,753
Restricted for pension costs		3,165,839		2,603,999
Restricted for OPEB costs		1,834,317		1,696,641
Unrestricted		7,841,004		7,899,835
<b>TOTAL NET POSITION</b>	<b>\$</b>	<b>15,765,504</b>	<b>\$</b>	<b>14,842,228</b>

## LABORATORY DEDICATED TO THE LEGACY OF DR. JAN O. WASHBURN (1952–2024)

The Alameda County Mosquito Abatement District formally dedicated its laboratory in recognition of the contributions of Dr. Jan O. Washburn, who served the District for three decades as a Trustee, Board President, Interim District Manager, and biennial editor.

### PROFESSIONAL CONTRIBUTIONS

Dr. Washburn's academic career included significant research contributions in entomology and ecology. By the age of 40, he had authored three publications in the journal *Science*. Among his most cited work was research conducted at the University of California, Berkeley, on trophic shifts of the ciliate *Lambornella clarki*. This research documented an ecological interaction in which the free-living ciliate transforms into a parasitic form in the presence of its predator, the western treehole mosquito (*Aedes sierrensis*), resulting in larval mortality.

During his 30 years of service to ACMAD, Dr. Washburn supported the integration of scientific research into operational practice. He served two terms as Board President and Interim District Manager. During his tenure, the District adopted technologies including quantitative polymerase chain reaction (qPCR) testing and unmanned aerial systems (UAS) for operational use. He emphasized the use of data-driven decision-making and measurable performance metrics in public service.

### STATEWIDE AND PROFESSIONAL SERVICE

Dr. Washburn also contributed to the broader vector control community in California. From 2009 to 2015, he served as Editor of the *Proceedings and Papers of the Mosquito and Vector Control Association of California (MVCAC)*.

In 2024, a three-hour member symposium titled "The Scientific Legacy of Jan O. Washburn" was held at the Entomological Society of America Annual Meeting in Phoenix, Arizona. The symposium included presentations addressing his research contributions across multiple areas, including scale insects, baculovirus pathogenesis in agricultural pests, mosquito ecology, and public science education. A summary of the symposium presentations was subsequently published in the MVCAC *Proceedings and Papers*.

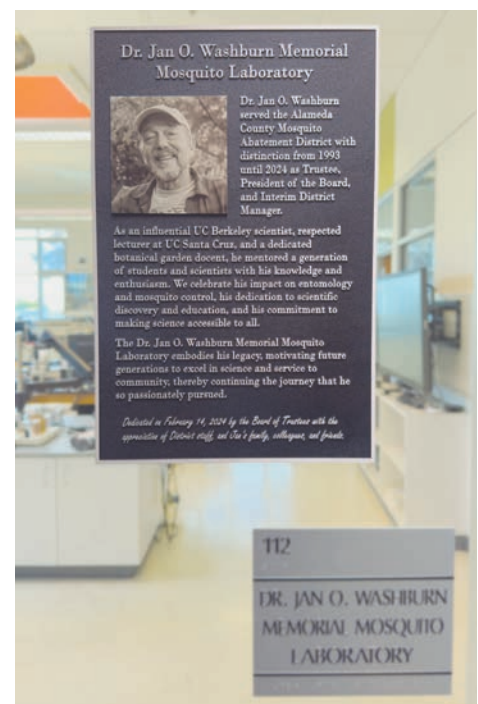
### LABORATORY DEDICATION

On February 14, 2024, the ACMAD Board of Trustees adopted Resolution No. 1122-1 formally renaming the District's laboratory the Dr. Jan O. Washburn Memorial Mosquito Laboratory. The laboratory continues to serve as the District's central facility for mosquito surveillance, pathogen testing, and applied research activities.

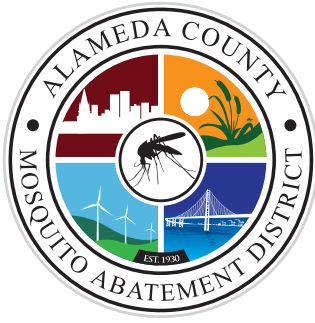
*"Every time we run a molecular assay or develop a new mosquito monitoring method, we do so in the spirit of the scientific rigor and kindness that Jan embodied. He was a leader and mentor who led with humor, an artist who saw beauty in the smallest insect, and a friend who brought a bright and indelible spark to humanity."*

– Dr. Eric Haas-Stapleton, Lab Director

**Memorial plaque at the entrance of the Dr. Jan O. Washburn Memorial Mosquito Laboratory, dedicated by the Board of Trustees of the Alameda County Mosquito Abatement District on February 14, 2024.**







# ALAMEDA COUNTY

## MOSQUITO ABATEMENT DISTRICT

### **Our Mission**

Alameda County Mosquito Abatement District is committed to improving the health and comfort of Alameda County residents by controlling mosquitoes and limiting the transmission of mosquito-borne diseases.

### **Our Vision**

To serve all residents of Alameda County in a transparent and equitable manner by providing knowledge-driven and environmentally-conscious mosquito control. We strive to provide an exemplary model of good government through fiscal transparency and accountability.

**510-783-7744**

 [www.mosquitoes.org](http://www.mosquitoes.org)

 [Alameda County Mosquito Abatement District](https://www.facebook.com/AlamedaCountyMosquitoAbatementDistrict)

 [@AlamedaMosquito](https://twitter.com/AlamedaMosquito)

***[www.mosquitoes.org](http://www.mosquitoes.org)***