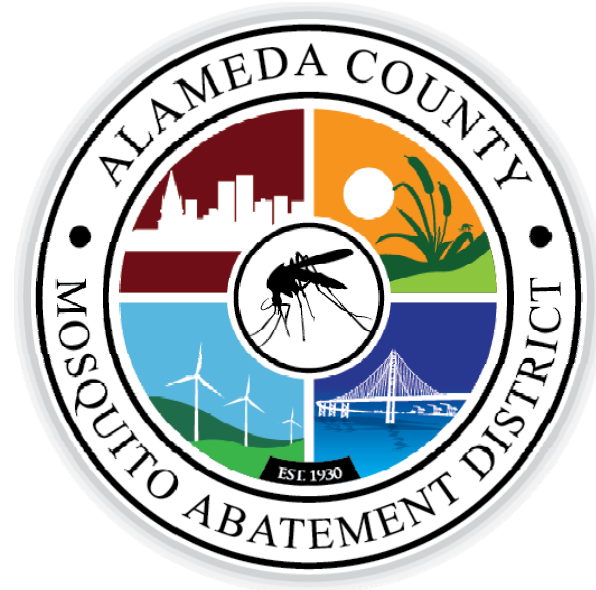


Modern Mosquito Control Challenges and Opportunities

An Independent Special District
Protecting Public Health since 1930



City of Alameda: 2/19/19



Hello Alameda.

- Our District
- Mosquitoes
- Health Threats
- Control
- Innovations
- Partners



Our Board of Trustees

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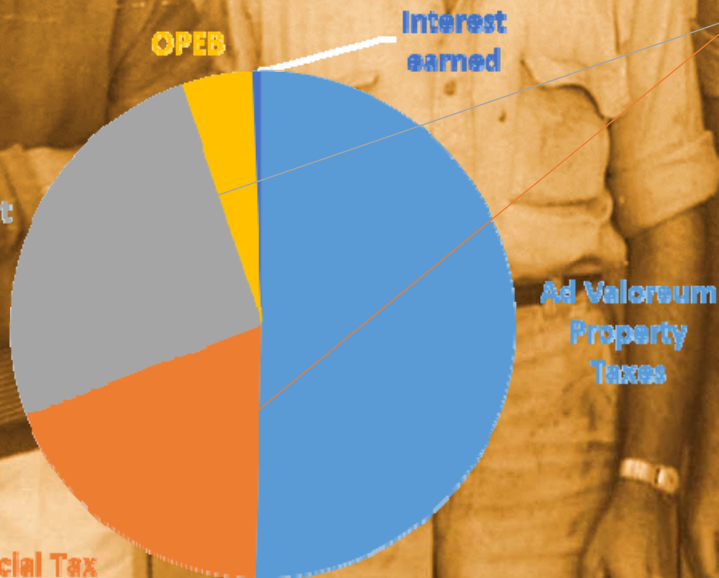
Ed Hernandez, City of San Leandro

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County-at-Large, vacant



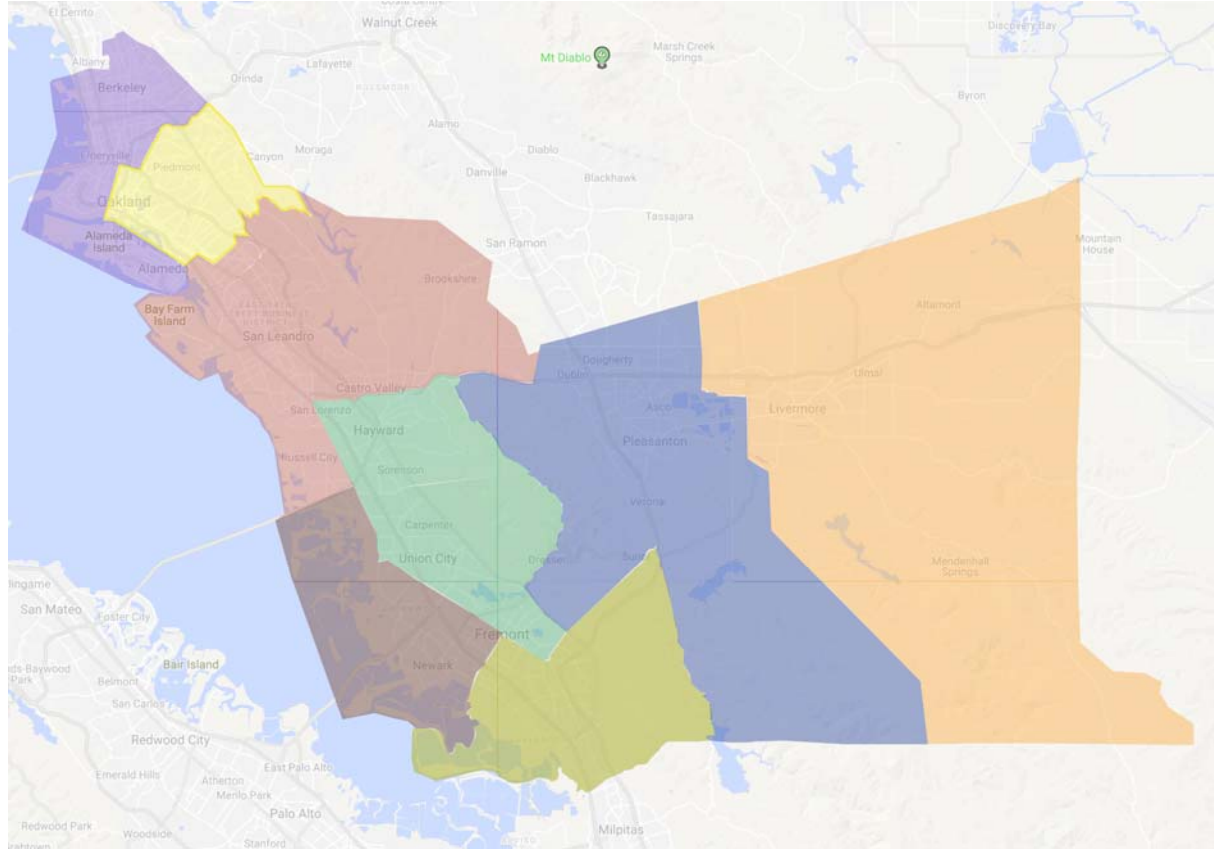
Fixed Charges and/or Special Assessments		
Description	Phone	Amount
CITY SEWER SERVICE	800-676-7516	313.80
MOSQUITO ABATEMENT	800-273-5167	1.74
CSA PARAMEDIC	800-441-8280	32.86
CSA VECTOR CONTROL	800-273-5167	5.92
HEALTHCARE DIST	800-273-5167	298.00
CSA LEAD ABATEMENT	510-567-8280	10.00
* SCHOOL MEASURE B1	844-332-0549	683.20
PERALTA CCD MEAS B	800-792-8021	48.00
SFBRA MEASURE AA	888-508-8157	12.00
HAZ WASTE PROGRAM	800-273-5167	7.40
CSA VECTOR CNTRL B	800-273-5167	4.08
MOSQUITO ASSESS 2	800-273-5167	2.50
AC TRANSIT MEAS VV	800-273-5167	96.00
EBMUD WETWEATHER	866-403-2683	103.74
* EAST BAY TRAIL LLD	888-512-0316	5.44
* EBRP PARK SAFETY/M	888-512-0316	12.00
URBAN RUNOFF	510-670-6615	56.14



(.0009% of property tax assessed value)

Financials

Our Staff: *17 FT & 5 Seasonal Staff*



Mosquito Control

9 FT Staff in 8 Zones
2 Seasonal Staff

Monitoring

3 FT Staff
2 Seasonal Staff

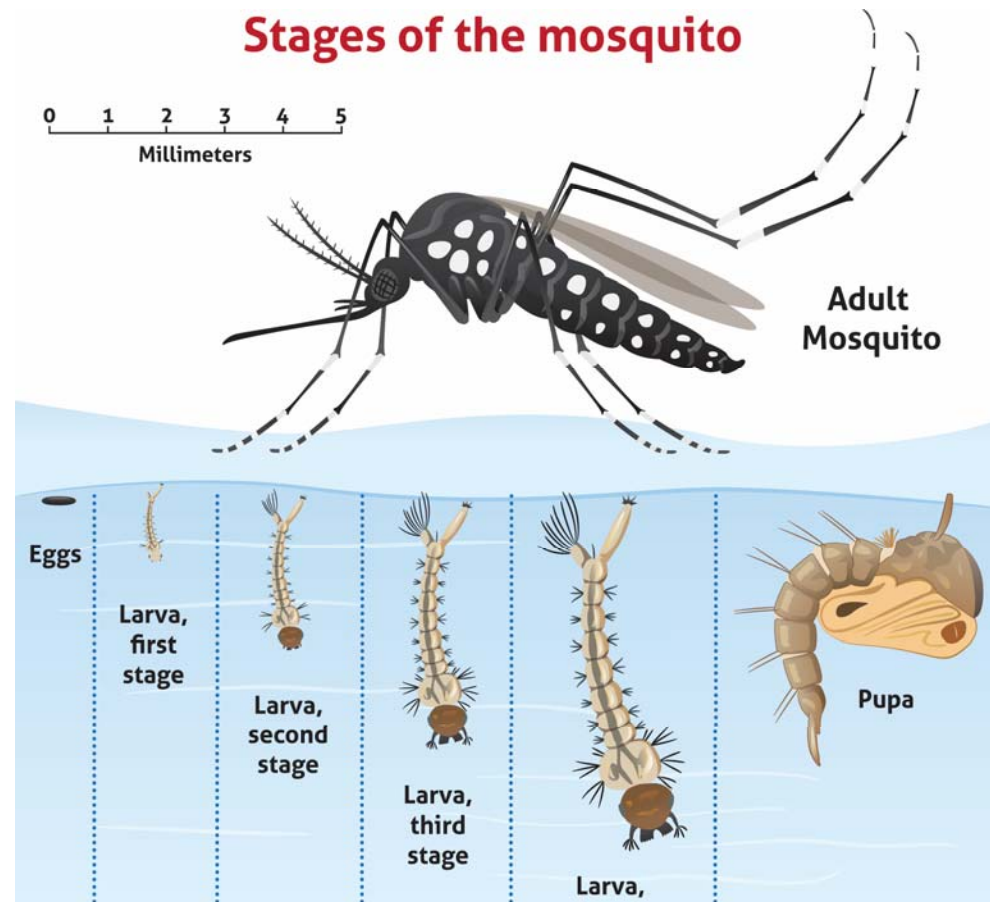
Administrative

5 FT Staff
1 Seasonal Staff



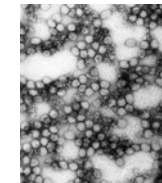
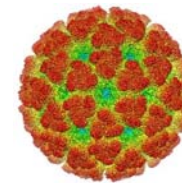
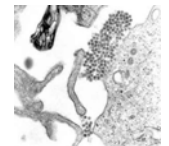
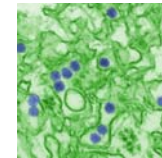
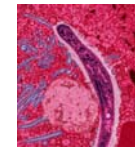
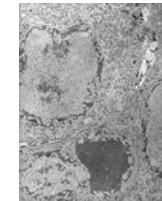
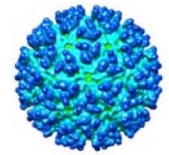
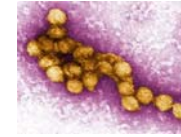
Aquatic Lifecycle

- Urban mosquitoes spend 1 - 2 weeks as larvae or pupae
- Breathe air at the surface of water



Mosquito Pathogens

- West Nile virus
- Western equine encephalitis virus
- Saint Louis encephalitis virus
- Dog heartworm
- Malaria
- Zika virus
- Dengue virus
- Chikungunya virus
- Yellow fever virus



Mosquitoes in Alameda County that transmit West Nile virus



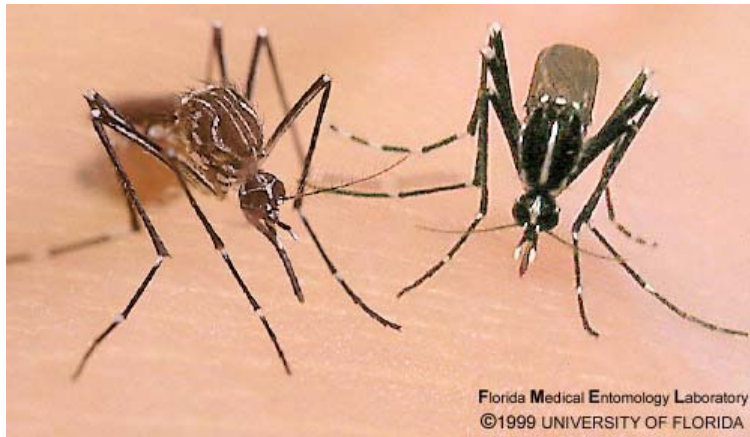
Culex pipiens:
common house mosquito



Culex tarsalis:
western encephalitis mosquito



Mosquitoes that spread Zika, Dengue, Chikungunya, Yellow Fever viruses



Aedes aegypti

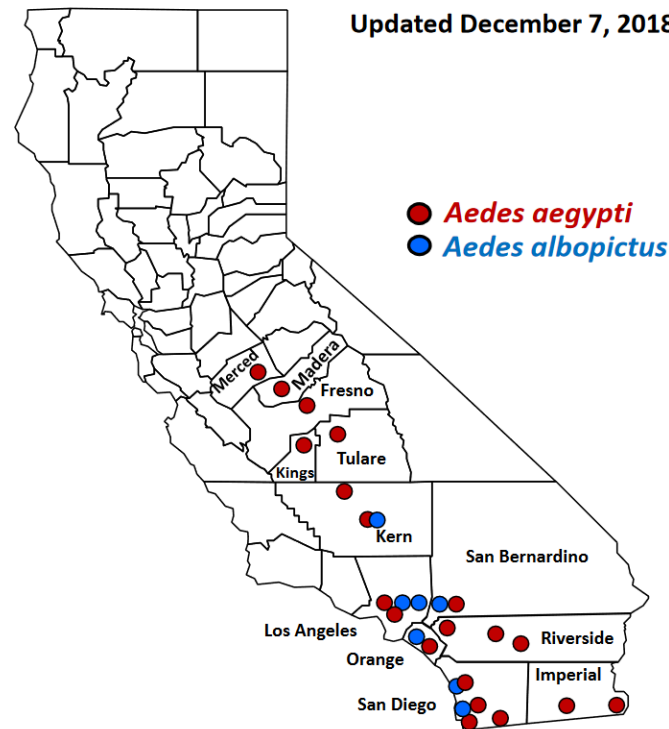
lyre-shaped pattern on thorax

Aedes albopictus

bright lateral line on thorax

Aedes aegypti and *Aedes albopictus* Mosquitoes in California Detection Sites by County/City

Updated December 7, 2018



Counties with

Aedes aegypti only:

Fresno, Imperial, Kings, Madera, Riverside, Merced, Tulare

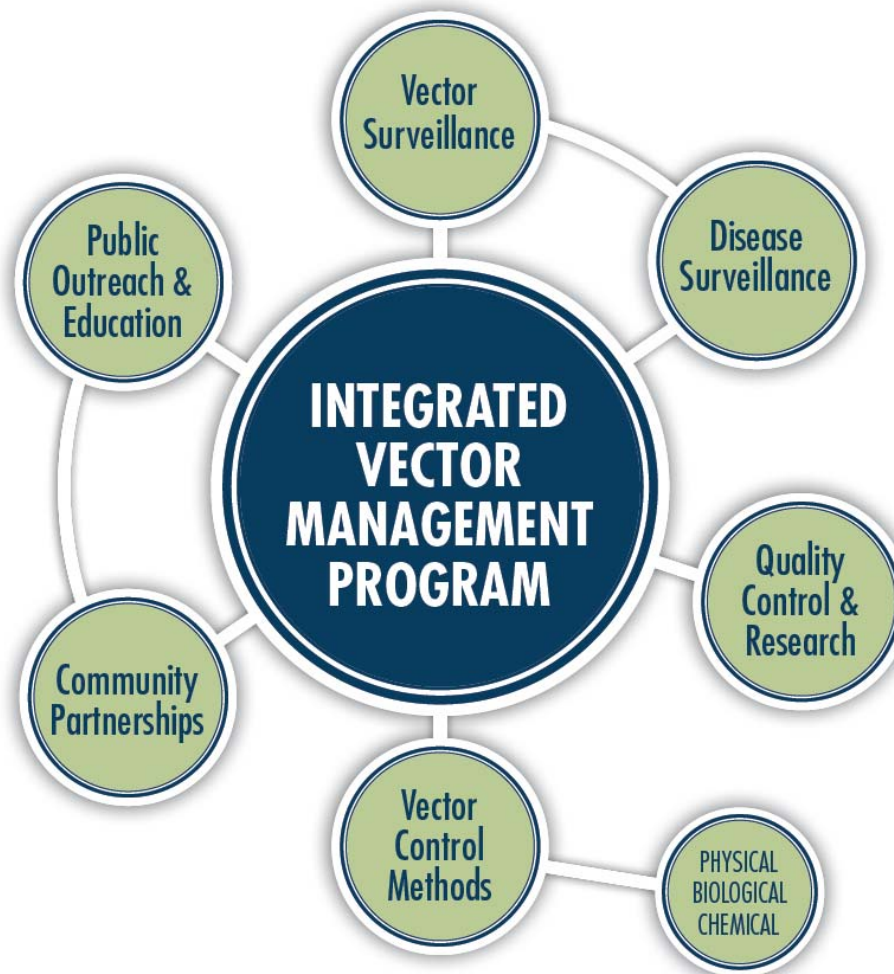
Both *Aedes aegypti* and *Aedes albopictus*:

Kern, Los Angeles, Orange, San Bernardino, San Diego

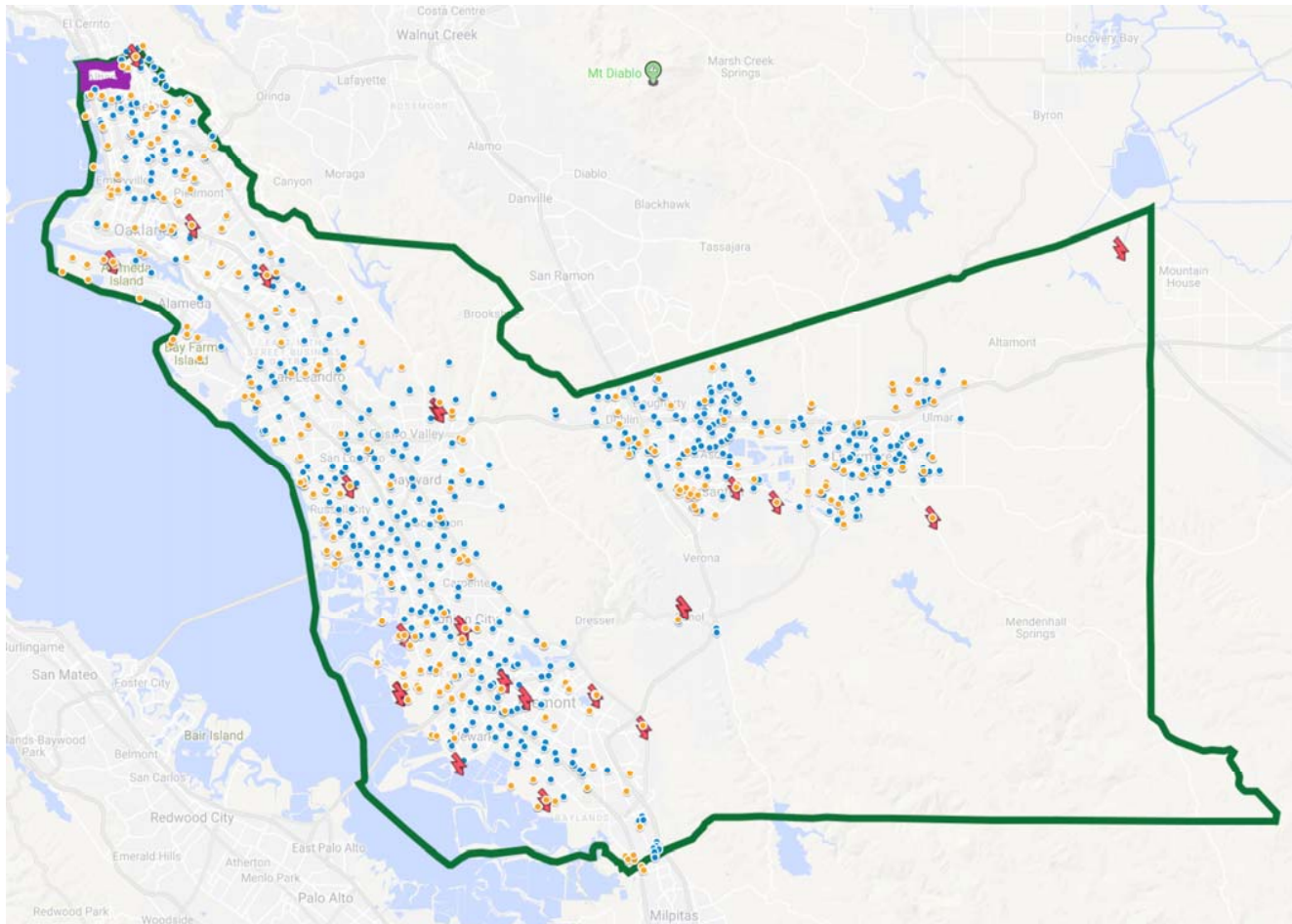
See pages 2 and 3 for *Aedes* detections by city or census-designated place in each county.



Controlling Mosquitoes



Our Service Area and Monitoring Sites



— County boundary

— Outside of service area

⚡ Light traps
(n = 22)

● Native mosquito traps
(n = 180)

● Invasive *Aedes* traps
(n = 710)

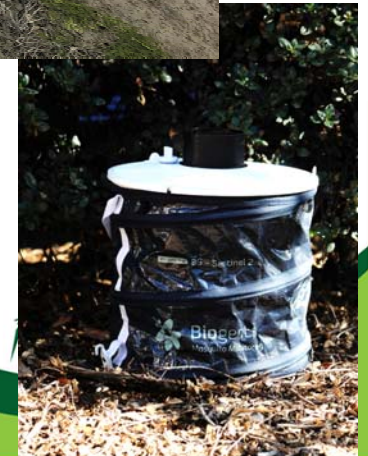
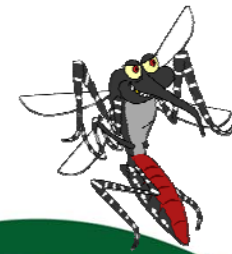


Monitoring Approach

Looking for larvae & eggs



Adult monitoring with traps

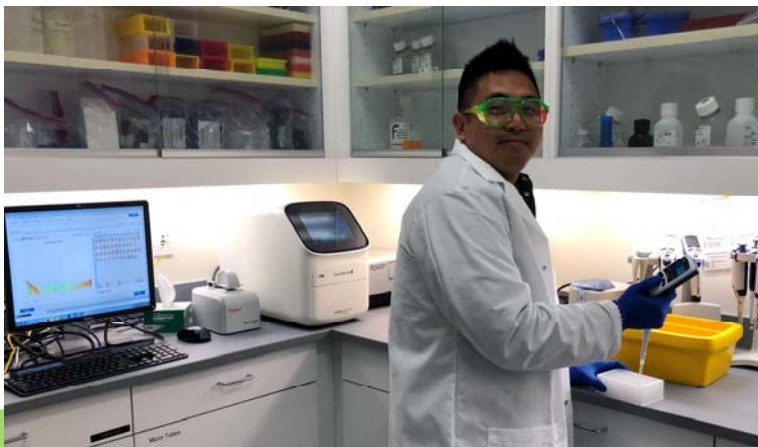


Testing for disease and insecticide resistance

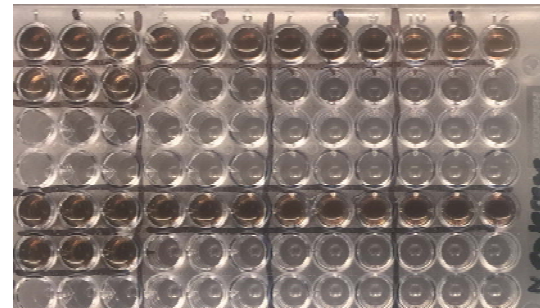
we test more than 90 % of disease-spreading mosquitoes caught in our traps



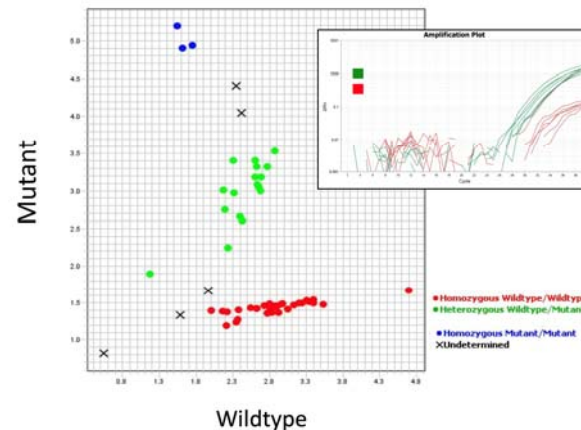
virus test results in 3 hours



sensitivity to insecticides



insecticide detoxification



genetic resistance

Controlling mosquitoes in storm drain systems



Controlling mosquitoes in marshes



Controlling mosquitoes with fish



Controlling mosquitoes through source reduction



Channels for community outreach

Legislative



Interagency



Public



Date

12/23/1953

8/31/2017

Total by City

City	Count
Union City	297
Fremont	247
Berkeley	224
Livermore	108
Castro Valley	90
Alameda	77
Newark	55
Hayward	54
Oakland	54
Alameda County	43
San Lorenzo	40
Emeryville	15

Total by Species

Species	Count
Culex tarsalis	460
Culex pipiens	339
Culiseta incidens	258
Aedes dorsalis	178
Anopheles franciscanus	79

Total by Species Name

SpeciesName: ● Aedes dorsalis ● Anopheles franc... ● Culex pipiens ● Culex tarsalis ● Culiseta incidens



Threats

Opportunities

Financial pressures

Financial planning

Invasive mosquitoes

Emerging technologies

Climate change

Interagency collaboration



1. Financial Planning



\$2.50 benefit
assessment *can* be
raised to \$7.00 for
enhanced services



Pension stabilization-
115 trust with PARS



Reserve funds with
CAMP

2. Innovative Control Methods



Irradiate reproductive cells



Wolbachia-infect



Modify genome using Gene Drives
(CRISPR)



3. Interagency collaboration: trash capture devices/ BMPs



California Stormwater
Quality Association



4. Healthy Wetlands



California Department of
Fish and Wildlife



**South Bay Salt Pond
Restoration Project**



5. Emerging technologies: drone imagery of marshes where mosquitoes can breed



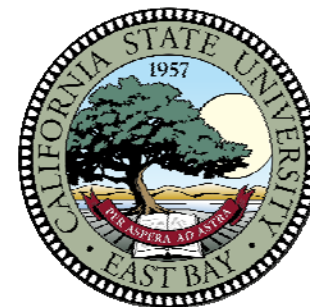
Multispectral camera imagery of landscape



Partnerships



San Francisco Bay Restoration Authority



**SAN MATEO COUNTY
MOSQUITO & VECTOR
CONTROL DISTRICT**
Protecting public health since 1916



**California Special
Districts Association**
Districts Stronger Together



Mosquito Sources in the City of Alameda



- Unmaintained swimming pools, catch basins
- Alameda Point:
 - Runway depressions & two marshes on the west and south
- Chuck Corica Golf Complex (ditches, ponds)
- Street gutters:
Gibbons Drive; Bay Street & Eagle Avenue





Thank you-

- **Ryan Clausnitzer, MPA**
- **General Manager**
- 23187 Connecticut Street
- Hayward, CA 94545
- www.mosquitoes.org
- ryan@mosquitoes.org
- 510-925-1756

