



MOSQUITO and VECTOR MANAGEMENT DISTRICT of SANTA BARBARA COUNTY

DISEASE SURVEILLANCE REPORT

September 2022

Vector-borne Disease Surveillance

North Santa Barbara County got lots of attention last month. Many mosquito sources are dry. Trapping will continue through October, as West Nile virus (WNV) numbers continue to increase in California.

Location	Date	Number of Mosquitoes	Type of Trap	# of Traps	Mosquitoes per Trap Night	Pools Submitted	WSW Test Result
Crescent Ave, 93105	8/30-9/2	31	Gravid	2	5.2	2	-
El Capitan Campground, Gaviota Coast	9/1-9/2	2	EVS	3	0.7		
Gaviota Campground, Gaviota Coast	9/1-9/2	4	EVS	4	1		
Leroy Park, Guadalupe	9/1-9/2	4	EVS	5	0.4	2	-
Paradise Road	9/13-9/14	47	EVS	10	4.7	1	-
Paradise Road	9/13-9/16	9	Gravid	2	1.5	1	-
MVMD, Summerland	9/1-9/16	6	BGS2	1	0.4		
Atascadero Creek, Goleta Valley	9/15-9/16	13	EVS	9	1.4		
Solvang Sanitary District	9/22-9/23	49	EVS	5	9.8	1	-
Santa Ynez County Park	9/22-9/23	8	EVS	4	2	2	-
Solvang Sanitary District	9/23-9/26	26*	BGS2	1	8.7		
Solvang Sanitary District	9/23-9/26	1	Gravid	1	4.7	1	-
Santa Ynez County Park	9/23-9/26	20	Gravid	1	6.7	2	-
UCSB/SBAir Bluffs	9/27-9/28	98	EVS	7	14	2	-
Atascadero Creek	9/27-9/30	4	Gravid	2	0.7	1	-
Islay Park, San Luis Obispo, SLO County	9/28-9/29	24	EVS	3	8	2	-
Islay Park, San Luis Obispo, SLO	9/28-9/29	4	Gravid	1	4	2	-
Laguna Lake Park, San Luis Obispo, SLO	9/28-9/29	55	EVS	3	13.75	1	-
Producer's Ditch, San Luis Obispo, SLO	9/28-9/29	1	Gravid	1	1	1	-
Producer's Ditch, San Luis Obispo, SLO	9/28-9/29	31	EVS	3	10.3	2	-
Wastewater Treatment, San Luis Obispo, SLO	9/28-9/29	9	EVS	3	4.5	2	-

BGS2=Biogents Sentinel 2

BGP=Biogents Pro

EVS=enkephalitis surveillance trap (CO₂)

WSW=West Nile virus, St. Louis

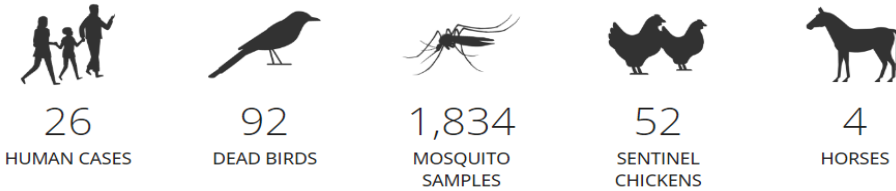
Enkephalitis virus, and Western Equine Enkephalitis virus

*Placed under outdoor light near a gravid trap; BG human-scent lure only--unusually high #; 4 species; 1 bat dropping

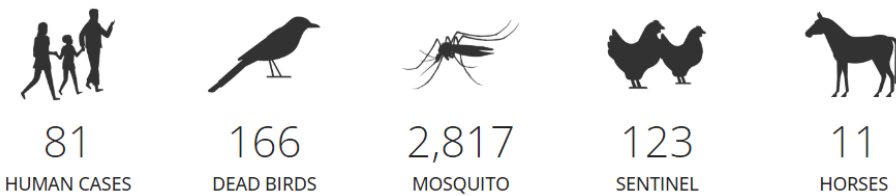
California Arbovirus Detection

In September, 983 WNV positive mosquito pools were reported throughout California for a 2022 total of 2,817 positive pools. One hundred and sixty-six dead birds have tested positive for WNV; at this time last year, there were 198. Out of the total of 90 human WNV cases, seven were fatal, and nine were asymptomatic blood donors. One hundred and thirty-one mosquito pools from nine counties tested positive for Saint Louis encephalitis virus in 2022; there have been six human cases. No detections of Western equine encephalitis virus have been reported in California this year.

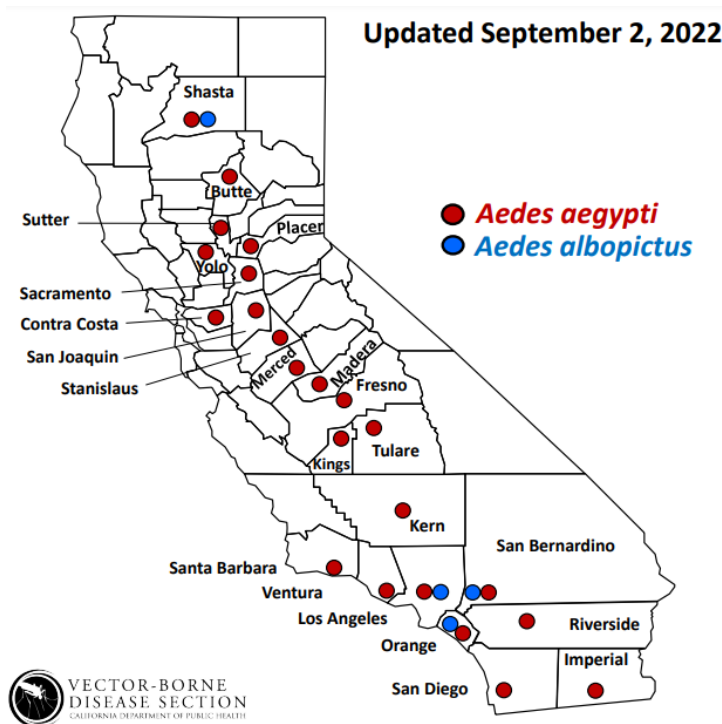
2022 West Nile Virus Activity in California through August



2022 West Nile Virus Activity in California through September



In September, two dead birds were reported in Santa Barbara County, but neither was in acceptable condition for testing. Thirty-four mosquito pools from Santa Barbara County (23) and San Luis Obispo County (11) tested negative for encephalitis viruses.



Invasive *Aedes* Mosquito and Zika Virus Update

No *Aedes aegypti* mosquitoes or other invasive *Aedes* species have been detected in Santa Barbara County, thus far in 2022.

Aedes aegypti mosquitoes are present in 22 California counties. *Aedes albopictus* is present in four. *Aedes notoscriptus* occurs in L.A., Orange and San Diego Counties. To date, 323 mosquito pools have tested negative for Zika, dengue, or chikungunya in California in 2022.

(Joshua Molina / Noozhawk photo)



Andree Clark Bird Refuge from the Santa Barbara Zoo

(Pete Wolf photo)



Lake Los Carneros

The Effects of Drought on Mosquitoes

During a drought, one might think that less water means less larval mosquito habitat, therefore, fewer mosquitoes. It turns out that it's not that simple.

It is true that drought reduces mosquito production in some cases. For example, in the Andree Clark Bird Refuge and at Lake Los Carneros the waterline has receded away from the edge vegetation so mosquito larvae can't hide from predators that eat them. Also, anecdotally, rain seems to get "soaked-up" by the thirsty ground at the beginning of the rainy season during a drought and vernal pools don't hold water until the first couple inches of rain have accumulated. In addition, a UCLA study showed that if, during a drought, citizens actually adhere to water use restrictions, mosquito abundance is lower.

That leads to an important point: many mosquito sources do not depend on rain to be productive. "Urban drool" is a funny name for the water that runs off from residents washing cars, spraying down patios, playing in the sprinklers, watering lawns, etc. This water often becomes stagnant in drains, street gutters, creeks, or drainage ditches. Saucers beneath potted plants can accommodate invasive *Aedes* mosquitoes (whose eggs are very resistant to drying out) when plants are watered. Another rain-independent mosquito source is a tidal salt marsh; eggs hatch when high tides flood areas of a coastal marsh under certain conditions.

There are situations in which mosquito production actually increases during a drought. The Devereux Lagoon at UCSB fills with rain and produces mosquitoes until there is enough water to break through the lagoon berm and drain. Predator populations can also be affected by drought. Dragonflies are mosquito predators with an aquatic juvenile stage that takes a long time to develop; a body of water could dry-up before they mature to winged-adults. Mosquito fish placed in, for example, an abandoned swimming pool to control larvae will die if the water dries-up; when it rains again, the pool will refill but no fish will be available to eat mosquito larvae.

A study in New Jersey found that the incidence of West Nile Virus increased when there is less rainfall. One possible explanation is that the *Culex* vector species, that often breed in containers, can get flushed-out when rainfall is plentiful. Also, the nutrient content of water with lots of decaying organic matter can increase if it's not diluted enough by rain; this type of water is especially attractive to female *Culex* ready to lay eggs. Another possibility is that animals visiting the same sparse watering holes increase the likelihood of mosquitoes picking up the virus from infected individuals.

Residents that collect rain water need to be aware of the mosquito-breeding potential and use a tight lid or screen on rain barrels and containers, use the water within two weeks, or stock the water with mosquito fish.

Bhattachan, Abinash, Nicholas K. Skaff, Amanda M. Irish, Solomon Vimal, Justin V. Remais, and Dennis P. Lettenmaier. 2021. Outdoor Residential Water Use Restrictions during Recent Drought Suppressed Disease Vector Abundance in Southern California. *Environmental Science & Technology*. 55 (1), 478-487
DOI: 10.1021/acs.est.0c05857

Johnson, B. J. and M.V.K. Sukhdeo. 2013. Drought-Induced Amplification of Local and Regional West Nile Virus Infection Rates in New Jersey. *Journal of Medical Entomology*, 50(1): 195-204, <https://doi.org/10.1603/ME12035>