MOSQUITO and VECTOR MANAGEMENT DISTRICT of SANTA BARBARA COUNTY

DISEASE SURVEILLANCE REPORT

December 2021

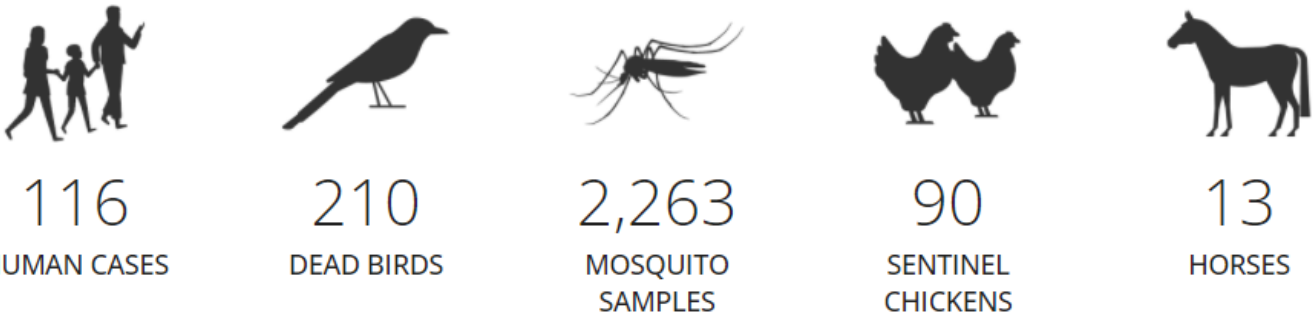
Vector-borne Disease Surveillance

Mosquito trapping will resume in March. Mosquitoes are unlikely to be active when overnight temperatures are lower than 50°F.

December 15, 2021, Vector Biologist Technician K. Schultz attempted to collect ticks using a drag cloth for one hour at Lake Los Carneros. No ticks were found. Another attempt was made on December 22 with the same result.

California Arbovirus Detection

California 2021 Totals:



There was no change in the number of West Nile virus positive horses in California in December. Eight sentinel chickens and one dead bird tested positive. Only three mosquito pools tested positive, to bring the total to 2263. Last month, the number of human cases of WNV in California increased from 108 to 116. There were 11 human fatalities from WNV in California in 2021.

Two mosquito pools tested positive for St. Louis encephalitis virus last month, bringing the California 2021 total to 46 mosquito pools in eight counties. Three human cases of St. Louis encephalitis (SLE) have been reported in California this year (Fresno, Marin, and Stanislaus Counties). In 2020, five cases were detected.

Arbovirus Activity in Santa Barbara County

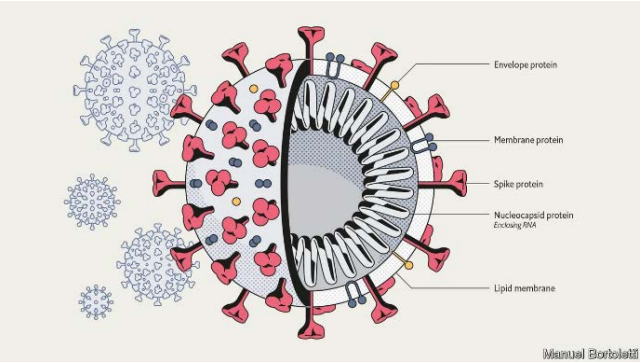
One Santa Barbara resident tested positive for West Nile virus in 2021 (November), but, according to the California Dept. of Public Health, the individual was most likely infected during a trip to the Sacramento area.

Last month, one dead crow in Santa Barbara County was reported to the state hotline, but it went missing before it could be picked-up. In 2021, 36 dead birds were reported, and 10 were tested for WNV; all tested negative. In 2021, the District submitted 43 mosquito pools from San Luis Obispo County (10 sites) and 109 pools from Santa Barbara County (21 sites); all yielded negative results for WNV, SLE and Western Equine Encephalitis.

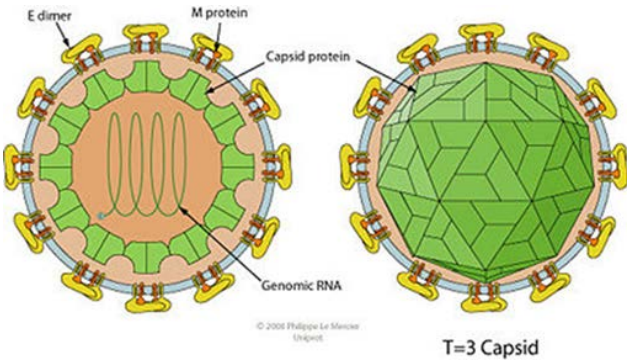
The District currently maintains four sentinel chicken flocks in Santa Barbara County located at the Goleta Sanitary District, Mission Hills Community Services District, the Solvang City Wastewater Treatment Plant, and the U.S. Forest Service Fire Station in Carpinteria. Chickens are tested for WNV, SLE, and WEE once a month November through March. Blood samples were collected the week of December 6; all samples tested negative. The program will be discontinued in March.

Zika Virus and Invasive *Aedes* Mosquito Update
No *Aedes aegypti* or other invasive *Aedes* species were detected in Santa Barbara County last month.

Aedes aegypti mosquitoes are present in 22 California counties. One person tested positive for Zika virus in California in 2021; the infection was travel-associated (acquired outside of California). There were 10 cases of dengue fever and three cases of chikungunya reported from California, all were travel-associated.



SARS-CoV-2, Family Coronaviridae

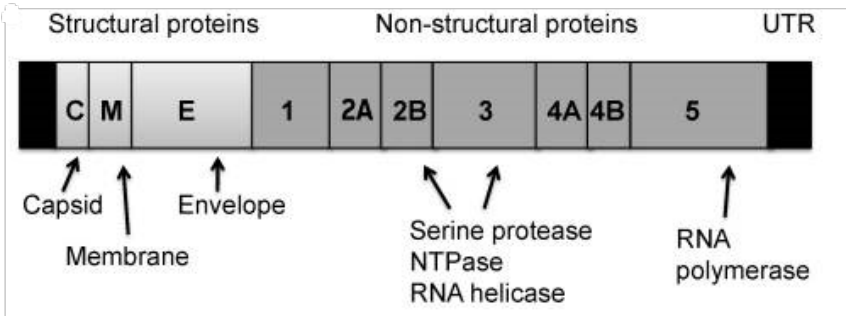


West Nile Virus, Family Flaviviridae

West Nile Virus
Family Flaviviridae

Basically, a virus is made up of genetic material surrounded by a protein capsid. The genome can be DNA or RNA and can be single-stranded or double-stranded. The genome can also be divided into segments, like influenza virus, which has eight segments of single-stranded RNA. One or more of the genes in the genome codes for proteins that make-up the protective capsid. Most viruses are surrounded by a lipid envelope, acquired from the previous host's cell membrane as the virus exited. Embedded in the lipid envelope of a virus are proteins, also translated from the virus genetic material; these membrane proteins are needed to interact with and infect host cells. The "crown" of coronaviruses, like SARS-CoV-2, is made by one of its three membrane proteins (a.k.a. the "spike" protein).

West Nile virus has single-stranded RNA enclosed in an icosahedral-shaped capsid made up of 180 copies of the same protein. It has a lipid envelope; two types of membrane proteins are imbedded and lay flat on the envelope surface. West Nile virus is a member of the family Flaviviridae. Other flaviviruses include yellow fever virus, dengue virus, Zika virus, Saint Louis encephalitis virus, and hepatitis C virus. Many of these are vectored by mosquitoes as a result of thousands of years of coevolution. Once WNV particles are ingested by a mosquito in a blood meal, the viruses must pass through the gut wall, make their way to the salivary glands, and pass through the salivary gland walls, in order to be secreted when the mosquito takes its next blood meal. **Researchers have confirmed that SARS-CoV-2 CANNOT be transmitted by mosquitoes.**



The single-stranded RNA of WNV encodes 10 genes and is 11,000 bases long (UTR=untranslated region)