

West Nile Virus State of Emergency: 2007 Summary Report

On August 2, 2007, Governor Arnold Schwarzenegger declared a State of Emergency due to increasing risk of West Nile virus (WNV) transmission in California. Through the end of July, 56 human cases of WNV had been reported to the California Department of Public Health (CDPH), a number significantly greater than the 16 cases reported at the same time in 2006, and comparable to 2004 (54 cases) and 2005 (56 cases) when ultimately 779 and 880 cases were reported, respectively, and a total of 48 people died. It appeared that California was on a trajectory similar to 2004 and 2005 when morbidity and mortality from WNV were extensive in many regions of the state. The intent of the Emergency Proclamation was to provide additional resources to local agencies to assist with WNV prevention, surveillance, and control, and ultimately minimize the risk of California residents and visitors from becoming infected with WNV.

The August 2, 2007 Emergency Proclamation was followed by three Executive Orders. The sequence of events included:

- August 2, 2007: State of Emergency Proclamation
 - Instructed CDPH to carry-out 11 specific orders, as detailed below, to reduce WNV transmission. Orders 1 and 2 allocated up to \$1.35 million for mosquito control and WNV surveillance.
- August 13, 2007: Governor's Executive Order (S-10-07)
 - Allocated up to \$10 million in additional funding for mosquito control and WNV surveillance.
- August 20, 2007: Governor's Executive Order (S-11-07)
 - Allocated up to \$500,000 to the California Department of Fish and Game for vegetation and water management on state-owned wetland wildlife areas.
- September 10, 2007: Governor's Executive Order (S-12-07)
 - Allowed funds previously allocated through the Emergency Proclamation and Executive Order (S-10-07) to be awarded to local agencies to enhance education of the general public on WNV prevention, expand outreach to the medical community, and intensify human case surveillance.

Partial text from the Emergency Proclamation and Executive Orders is provided below, along with a description of response activities carried out under the leadership of the Vector-Borne Disease Section (VBDS), CDPH. Full text of the Proclamation and Executive Orders can be found at <http://westnile.ca.gov> (under Resources).

Emergency Order 1

IT IS ORDERED that the Department of Public Health shall allocate up to \$1 million as needed, to local vector control agencies to identify potential mosquito habitat and to treat those areas to prevent the spread of West Nile Virus in the three above-listed counties (e.g., Kern, Colusa, and San Joaquin) and other counties identified by the Department of Public Health.

Emergency Order 2

IT IS FURTHER ORDERED that the Department of Public Health shall allocate up to \$350,000 to local vector control agencies for surveillance purposes to provide an early warning of the incidence of West Nile Virus so that proper control measures can be taken by the local vector control agencies to prevent the spread of West Nile Virus in the three above-listed counties and other counties identified by the Department of Public Health.

Governor's Executive Order S-10-07 (August 13, 2007)

IT IS ORDERED that the Department of Public Health shall allocate up to an additional \$10 million, as needed, to local vector control agencies to identify potential mosquito habitat and to treat those areas to prevent the spread of West Nile Virus and/or for surveillance purposes to provide an early warning of the incidence of West Nile Virus so that proper control measures can be taken by the local vector control agencies to prevent the spread of West Nile Virus in counties identified by the Department of Public Health.

Governor's Executive Order S-12-07 (September, 10, 2007)

IT IS ORDERED that the Department of Public Health shall allocate funds previously provided through the Governor's August 2, 2007 Emergency Proclamation and Executive Order S-10-07, as needed, to local agencies involved with West Nile Virus response to (1) enhance and expand public education on West Nile Virus prevention, (2) enhance outreach to the medical community, and/or (3) conduct active surveillance or epidemiological investigations of human West Nile Virus cases in counties identified by the Department of Public Health to be at elevated risk of West Nile Virus transmission.

Orders 1 and 2 and Executive Order S-10-07 appropriated up to \$11.35 million to assist local agencies with WNV prevention, surveillance, and control. Funds totaling \$6,214,219 were allocated over ten funding phases to 67 agencies in 36 counties.

Award process:

Counties identified in the Governor's Emergency Proclamation at highest risk of WNV transmission were notified immediately and by Tuesday, August 7, 2007, letters of intent to allocate base funding (total \$400,000) for mosquito control were provided to Kern, San Joaquin, and Colusa Counties; \$53,000 was also immediately allocated to Glenn County. Also on August 7, emergency funding applications were distributed to all local vector control and public health agencies and a conference call was held to explain the application process. Emergency award funding was based primarily on the risk of WNV transmission and on immediate resource needs of the applicant agency. Other evaluation criteria included the ability of an agency to use additional resources in a timely manner to impact current WNV activity and the population size afforded protection by additional resources. Funds were distributed via local assistance awards following the evaluation and approval of an award application submitted by the local agency.

Per the August 2, 2007, Proclamation and Executive Order S-10-07, funds could only be used for emergency mosquito control or WNV surveillance. Allowable expenditures included: 1) salary for temporary (seasonal) personnel engaged in surveillance or mosquito control activities or for overtime not previously budgeted for existing staff, 2) mosquito control products, 3) mosquito control or surveillance equipment, and 4) contracts for aerial application of mosquito control products or aerial surveillance for neglected swimming pools or other mosquito producing habitat. Subsequent to Executive Order S-12-07 (September 10, 2007), agencies could also apply for funding for WNV public education, medical community outreach, and human case surveillance. Allowable expenditures included: 1) temporary personnel or overtime not previously budgeted, 2) costs associated with public education and outreach (e.g., advertising, printing), and 3) costs associated with human case surveillance (e.g., lab supplies).

Applicants were required to submit a justification for requested funds, including a description of their current WNV risk and how the funds would reduce the risk of virus transmission. Specifically, applicants detailed why their current resources were insufficient; how additional staff would be used; which problem habitats required enhanced control or surveillance; what sources of mosquitoes were currently not controlled; why additional equipment or contractual services were needed; and how WNV public education, outreach to the medical community, and/or human case surveillance would be enhanced. Current WNV risk was estimated using the risk assessment table in the California Mosquito-Borne Virus Surveillance and Response Plan (see <http://westnile.ca.gov>). This assessment table provided a semi-quantitative measure of WNV transmission risk based on eight surveillance factors (environmental conditions, adult mosquito vector abundance, virus infection rate in mosquitoes, sentinel chicken seroconversions, fatal infections in birds, infections in horses, infections in humans, and proximity of detected virus activity to urban or suburban regions).

The initial deadline for receipt of applications subsequent to the Emergency Proclamation was Wednesday, August 8, 2007. Subsequent to Executive Order S-10-07, there was no application deadline; applications were processed as received by the Vector-Borne Disease Section (VBDS) of CDPH to allow maximum responsiveness to changing WNV risks throughout the state. CDPH issued a Letter of Award to recipient agencies indicating the level of funding being granted. Upon signature and return of this letter to CDPH, agencies were eligible to spend against the award. Funds were distributed to agencies via lump sum payments and had to be expended by December 31, 2007. Award recipient agencies were required to submit a final report indicating budgeted expenditures and provide a narrative; award expenditures were subject to audit.

Award funding:

Initial requests for award funding far exceeded the emergency proclamation allocation of \$1.35 million. The Governor rapidly responded via Executive Order S-10-07 which provided additional funding. This funding was a ceiling amount; funds could only be awarded based on the strict criteria mentioned above and had to address the

current emergency. The need for funds to support public education and human case surveillance was addressed subsequent to the immediate needs of mosquito control and WNV surveillance via Executive Order S-12-07.

Of the approximately \$6.2 million allocated to 67 local agencies in 36 counties from August 7 to October 15, 2007 (Table 1), approximately \$4.3 million was directed toward enhancing mosquito control, \$725,000 for WNV surveillance, \$1.2 million for WNV public education, and \$40,000 for human case surveillance (Table 2). The amount allocated to an individual county ranged from \$3,000 to \$813,244.

The bulk of the mosquito control and WNV surveillance funding (Figure 1a) was used for mosquito adulticides (34%) and larvicides (25%), followed by equipment (19%), contract applications of pesticides (10%), labor (7%), and aerial surveillance for neglected swimming pools (5%). Of the \$1.9 million allocated for public education, outreach to the medical community, and human case surveillance (Figure 1b), over half of the funding was used for radio and television advertising (55%). Funds were also used for printed materials (23%), promotional items (10%), displays (9%), and labor (3%).

Based on the final reports received from recipient agencies, the award funding succeeded in providing for the timely acquisition of critical resources that reduced the local risk of WNV transmission. Of the \$6,214,219 allocated, only \$111,480 was unspent as planned and returned to CDPH for deposit in the State General Fund.

The funds allocated in 2007 augmented the \$15 million provided by the state during the previous two fiscal years. The prior funds were dedicated to enhancing and expanding mosquito control in California and were not provided through an emergency declaration. The \$21.2 million provided over three years to local agencies effectively strengthened the mosquito control infrastructure in the state and was instrumental in establishing services to regions of California previously without vector control.

Table 1. West Nile virus emergency funding over ten phases: August 7 to October 15, 2007. Total amount allocated: \$6,214,219.

Funding Phase	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	Phase 9	Phase 10
Date	8-7-07	8-10-07	8-13-07	8-22-07	8-30-07	9-6-07	9-20-07	9-27-07	10-9-07	10-15-07
Amount	\$453,000	\$897,000	\$562,036	\$1,397,771	\$382,452	\$741,526	\$1,009,075	\$269,373	\$411,935	\$90,051
No. of Agencies	4	28	20	22	6	12	13	9	13	11
No. of Counties	4	21	17	15	6	11	13	7	11	9

Table 2: West Nile virus emergency funding by county and allocation category.

COUNTY	TOTAL	MOSQUITO CONTROL	SURVEILLANCE	PUBLIC EDUCATION	HUMAN CASE SURV.
ALAMEDA	\$35,360	\$0	\$35,360	\$0	\$0
AMADOR	\$34,876	\$26,376	\$8,500	\$0	\$0
BUTTE	\$428,608	\$373,620	\$30,538	\$24,450	\$0
CALAVERAS	\$49,161	\$30,664	\$16,637	\$1,860	\$0
COLUSA	\$442,860	\$355,830	\$38,904	\$48,126	\$0
CONTRA COSTA	\$10,000	\$0	\$0	\$700	\$9,300
EL DORADO	\$11,430	\$11,430	\$0	\$0	\$0
FRESNO	\$277,510	\$169,542	\$53,268	\$44,500	\$10,200
GLENN	\$278,103	\$233,184	\$25,618	\$19,300	\$0
IMPERIAL	\$61,162	\$37,933	\$5,030	\$18,199	\$0
INYO	\$20,041	\$15,041	\$5,000	\$0	\$0
KERN	\$813,244	\$381,884	\$62,126	\$369,234	\$0
LAKE	\$64,963	\$57,963	\$7,000	\$0	\$0
LOS ANGELES	\$301,032	\$118,728	\$27,365	\$154,939	\$0
MARIN-SONOMA	\$14,115	\$0	\$14,115	\$0	\$0
MERCED	\$251,097	\$235,852	\$9,695	\$5,550	\$0
MODOC	\$21,050	\$15,208	\$0	\$5,842	\$0
MONO	\$15,000	\$15,000	\$0	\$0	\$0
NAPA	\$44,427	\$32,591	\$11,836	\$0	\$0
NEVADA	\$3,000	\$2,450	\$550	\$0	\$0
PLACER	\$146,804	\$91,990	\$20,470	\$34,344	\$0
RIVERSIDE	\$228,080	\$136,334	\$46,632	\$41,514	\$3,600
SACRAMENTO-YOLO	\$552,010	\$211,760	\$45,250	\$295,000	\$0
SAN BENITO	\$17,085	\$10,200	\$910	\$5,975	\$0
SAN BERNARDINO	\$241,802	\$107,929	\$119,598	\$14,275	\$0
SAN JOAQUIN	\$691,259	\$667,929	\$23,330	\$0	\$0
SAN LUIS OBISPO	\$68,798	\$35,800	\$15,998	\$17,000	\$0
SANTA CLARA	\$69,700	\$47,461	\$19,983	\$0	\$2,256
SANTA CRUZ	\$26,605	\$9,580	\$9,875	\$7,150	\$0
SHASTA	\$331,549	\$245,053	\$31,031	\$55,465	\$0
SOLANO	\$52,429	\$52,429	\$0	\$0	\$0
STANISLAUS	\$93,775	\$71,113	\$11,925	\$4,300	\$6,437
SUTTER-YUBA	\$174,041	\$174,041	\$0	\$0	\$0
TEHAMA	\$183,573	\$166,110	\$17,463	\$0	\$0
TULARE	\$155,747	\$109,559	\$10,646	\$26,620	\$8,922
VENTURA	\$3,923	\$3,638	\$285	\$0	\$0
TOTAL	\$6,214,219	\$4,254,222	\$724,938	\$1,194,343	\$40,715

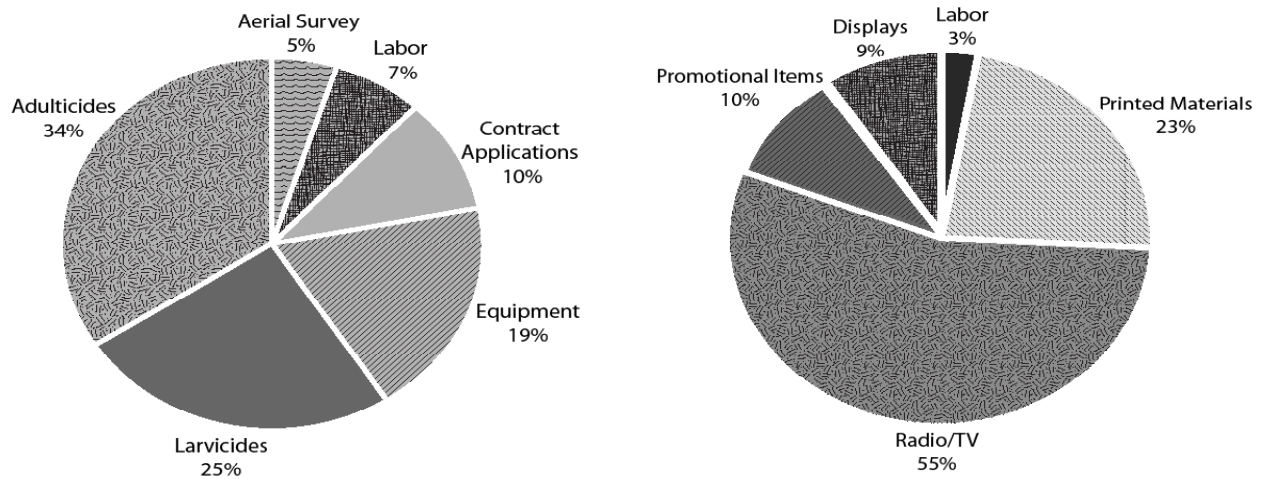


Figure 1: a) Emergency mosquito control and West Nile virus surveillance funding, b) emergency West Nile virus public education, outreach, and human case surveillance funding; percentage of funding by category.

Emergency Order 3

IT IS FURTHER ORDERED that the Department of Public Health shall coordinate with the State and Consumer Services Agency, the Resources Agency and the Department of Food and Agriculture to develop a plan using best management practices for implementation by the appropriate state agencies for the early detection of West Nile Virus on state-owned properties and appropriate mitigation and abatement measures. Funds in the amount up to \$150,000 shall be allocated for the purpose of developing this plan.

The Emergency Proclamation ordered CDPH to develop a best management practices (BMP) plan for mosquito control on state-owned properties. In response, CDPH immediately contacted partnering state agencies and the Mosquito and Vector Control Association of California to form a steering committee and initiate plan development. On September 12, 2007, a contract was executed allowing CDPH to hire staff to develop the BMP plan in concert with partnering agencies and under the leadership of VBDS.

A stakeholder meeting was held on October 18, 2007; 13 agencies were represented. Stakeholders provided input on development of the BMP plan and established a timetable for plan completion, dissemination, and evaluation. A draft plan was subsequently reviewed by members of the steering committee and the document finalized in June, 2008. The printed document “Best Management Practices for Mosquito Control on California State Properties” was distributed to appropriate state and local agencies in July and follow-up contact made with state agencies to help ensure plan implementation. The document can be found at <http://westnile.ca.gov> (under Resources).

Emergency Order 4

IT IS FURTHER ORDERED that the Department of Public Health and the Department of Food and Agriculture shall work with the Mosquito Research Program at the University of California, Davis, to determine what resources are needed to further advance the research on the ecology and the epidemiology of West Nile Virus.

In consultation with the UC Davis Center for Vectorborne Diseases and the University of California Mosquito Research Program, CDPH developed a funding proposal to 1) promote research on the ecology and epidemiology of WNV through a comprehensive, sustainable surveillance system, and 2) promote a broad spectrum of research on WNV and mosquito biology and control at all UC campuses.

The proposal was submitted by VBDS for review and evaluation by key staff at CDPH, Health and Human Services Agency, and the Governor's Office. The proposal was well received but ultimately, due to the state budget deficit projected for fiscal year 2008-09, funds were not available for proposal implementation.

Emergency Order 5

IT IS FURTHER ORDERED that the Department of Public Health shall work with (1) local vector control districts to utilize their existing power pursuant to Health and Safety code section 2053 to inspect and abate vector or public nuisances, with special emphasis on the removal of standing water in untended pools and containers on vacant property; and (2) the Business, Transportation and Housing Agency and local public health departments to notify lenders, realtors, mortgage brokers and others whose responsibilities include managing vacant homes to ensure that pools and other containers that can hold water are drained and maintained empty to prevent the spread of West Nile Virus.

In 2007, the rate of home foreclosures increased dramatically leaving many backyard pools untended. These pools provided excellent habitat for mosquito breeding and increased the risk of WNV transmission in urban areas. In recognition of this problem, the Emergency Proclamation instructed CDPH to address mosquito breeding in neglected pools in collaboration with local vector control agencies and the Business, Transportation and Housing Agency, which includes the Department of Real Estate.

Within a week of the Emergency Proclamation, CDPH developed and distributed a "neglected pool" information flyer to agencies and the general public. CDPH also developed and distributed a Question and Answer sheet for public agencies on mosquito management strategies for untended pools and vacant properties. All documents were posted on the CDPH website.

CDPH contacted the Business, Housing and Transportation Agency who subsequently 1) sent an electronic alert to all Department of Financial Institutions alerting them of the emergency declaration and encouraging those with property management responsibilities to drain and maintain pools and other containers that may breed

mosquitoes, 2) prepared a list of contacts and stakeholder groups who would benefit from the information, and 3) sent a letter to all real estate brokers in affected counties with information about the declaration and actions to take. The Department of Real Estate also posted the general notification on their website.

Emergency Order 6 instructed CDPH to provide technical assistance to local agencies as needed to minimize the risk of WNV transmission. **Emergency Orders 7, 8, and 9** pertained to deployment of state resources, administration of contracts, and exemptions from certain government codes to allow rapid facilitation of the Governor's emergency orders. **Emergency Order 10** required CDPH to consult with county agricultural commissioners prior to certain pesticide applications, but such consultation was not necessary as CDPH did not apply pesticides for mosquito control. **Emergency Order 11** was not relevant to WNV; it required CDPH to provide consultation to local agencies on Valley Fever (coccidioidomycosis).

Governor's Executive Order S-11-07, August 20, 2007

IT IS ORDERED that the Department of Public Health shall allocate up to \$500,000 in additional funds to the Department of Fish and Game. The Department of Fish and Game shall use these funds for vegetation management on the following wetland wildlife areas managed by the Department of Fish and Game and located in counties determined by the Department of Public Health to be at high risk of West Nile Virus transmission: Mendota Wildlife Area (Fresno County); Los Banos and North Grasslands wildlife areas (Merced County); Upper Butte Basin Wildlife Area (Butte and Glenn counties); and Gray Lodge Wildlife Area (Butte and Sutter counties). In addition to these wetland wildlife areas, the Department of Fish and Game shall use these funds for vegetation management on other wetland wildlife areas identified in consultation with the Department of Public Health as being located within counties that are moderate to high risk of West Nile Virus transmission. The Department of Fish and Game shall consult with the Department of Public Health regarding best practices for vegetation management to prevent West Nile Virus, including best water management practices, vegetation control, wetland infrastructure maintenance, wetland enhancement features, and biological controls.

On August 20, 2007, CDPH was ordered to allocate funds to the California Department of Fish and Game (DFG) for vegetation and water management in wetland wildlife areas to reduce mosquito production and WNV transmission risk. CDPH consulted with DFG and local vector control agencies and provided an initial allocation of \$100,000 to DFG on August 22 to conduct immediate vegetation management on the five wetland wildlife areas indicated in the Executive Order. An additional allocation of \$400,000 to DFG was provided on August 30 to conduct vegetation and water management and wetland infrastructure maintenance on eight wetland wildlife areas in eight counties.

Ultimately in 2007, 380 human cases (20 fatal) of WNV were reported in California, far fewer than projected in late July. Resources provided through the Emergency Proclamation and subsequent Executive Orders likely contributed to minimizing illness and death from WNV in 2007. The emergency funding, coupled with state funding provided to enhance mosquito control infrastructure during the prior two fiscal years, has vastly improved California's ability to respond to the statewide WNV invasion. Continued collaboration between state and local public health and vector control agencies, as exemplified during the emergency proclamation response, is essential as we collectively strive to protect California residents and visitors from the ongoing threat of WNV infection.

*Prepared by the Vector-Borne Disease Section, California Department of Public Health,
1616 Capitol Ave., MS 7307, P.O. Box 997377, Sacramento CA 95899-7377*