

Emerging Issue: Environmental Health and Emergency Preparedness

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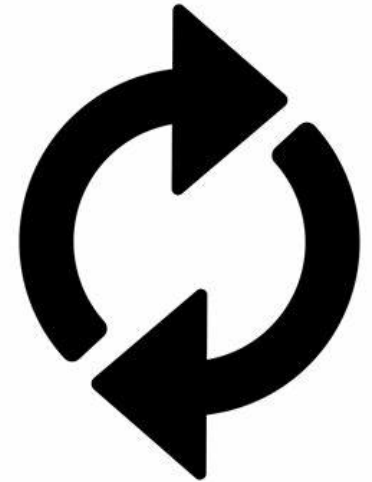
CALIFORNIA AREA INDIAN HEALTH SERVICE

DIVISION OF ENVIRONMENTAL HEALTH SERVICES (DEHS)

MARCH 2025

Trends in Environmental Health

- Extreme Heatwaves
 - Increase in frequency, duration and scale of extreme heat events in recent years
- Wildfire Smoke Events
 - Increase in frequency, duration and severity in recent years
- Shifting Prevalence and Range of Vectorborne Diseases
 - Range of vectors carrying human disease have increased range over time
 - Seasonal patterns for vectors have changed
- Increase in Heavy Precipitation Events
 - Increase in frequency and severity of atmospheric rivers in recent years leading to flooding and disruption to critical public services



Extreme Heat Event Facts

- 2024 was hottest year on record
- 2023 was the second hottest year on record
- Extreme heat ranks among the deadliest of natural hazards and claims many more lives when compared to other disasters.
 - The 2021 Pacific Northwest heat dome claimed over 650 lives in Oregon, Washington and British Columbia
 - The 2022 California heat wave caused a 5% increase in deaths in the state. This translates into 395 more deaths in California than what would normally be expected during that timeframe



Source: ABC new, June 1, 2021
<https://abcnews.go.com/US/heat-wave-pounds-west-100-degrees-forecast-california/story?id=78014957>

NASA Earth Observatory: [2024 Was the Warmest Year on Record](#)

USDA Northwest Climate Hub: [2021 Northwest Heat Dome: Causes, Impacts and Future Outlook | USDA Climate Hubs](#)

Milet M, et. al. (July 2023) [Excess mortality during the September 2022 heat wave in California](#). Sacramento, CA: California Department of Public Health

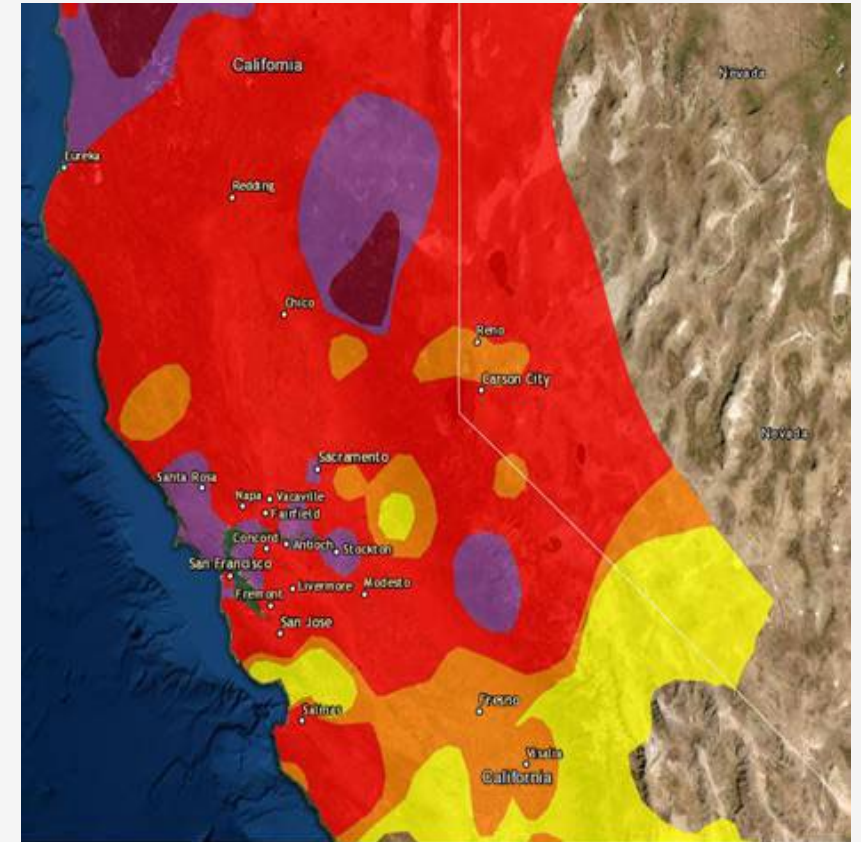
Extreme Heatwaves: Health Impacts

- **Extreme heat events are associated** with an increase in miscarriage/still born, heart attacks, heat stroke and heat exhaustion
- **Extreme Heat that lingers:**
 - The risk to vulnerable populations (elders, children, pregnant women) increases significantly if heat event lasts more than 1 day
- **Prolonged heat events can lead to rolling blackouts:**
 - Putting individuals on powered medical equipment at risk (nebulizer, oxygen concentrator, hemodialysis equipment)
 - Putting vulnerable populations (elders, children, pregnant women) at greater risk due to lack of electricity to operate A/C and fans



Wildfire Smoke Event Facts

- **19 of the 20 largest fires in the history of California occurred within the past 20 years**
 - More frequent large wildfires resulted in more frequent and larger scale wildfire smoke events
- **Wildfire smoke events have co-occurred with prolonged drought in California**
 - Drought has led to higher levels of PM 2.5 in the spring and summer and dust storms
 - Dust storms are associated with increased incidences of Valley Fever
- **Increased exposure to PM 2.5 and PM 10 associated with dust storms and wildfires linked to increase in asthma and other respiratory issues and increased number of heart attacks**



Northern California Air Quality 9/11/2020
Source: US EPA Airnow

A.K. Heaney *et al.* [Coccidioidomycosis seasonality in California: a longitudinal surveillance study of the climate determinants and spatiotemporal variability of seasonal dynamics, 2000–2021](#). *The Lancet Regional Health — Americas*. Vol. 38, October 2024, 100864. doi: 10.1016/j.lana.2024.100864.

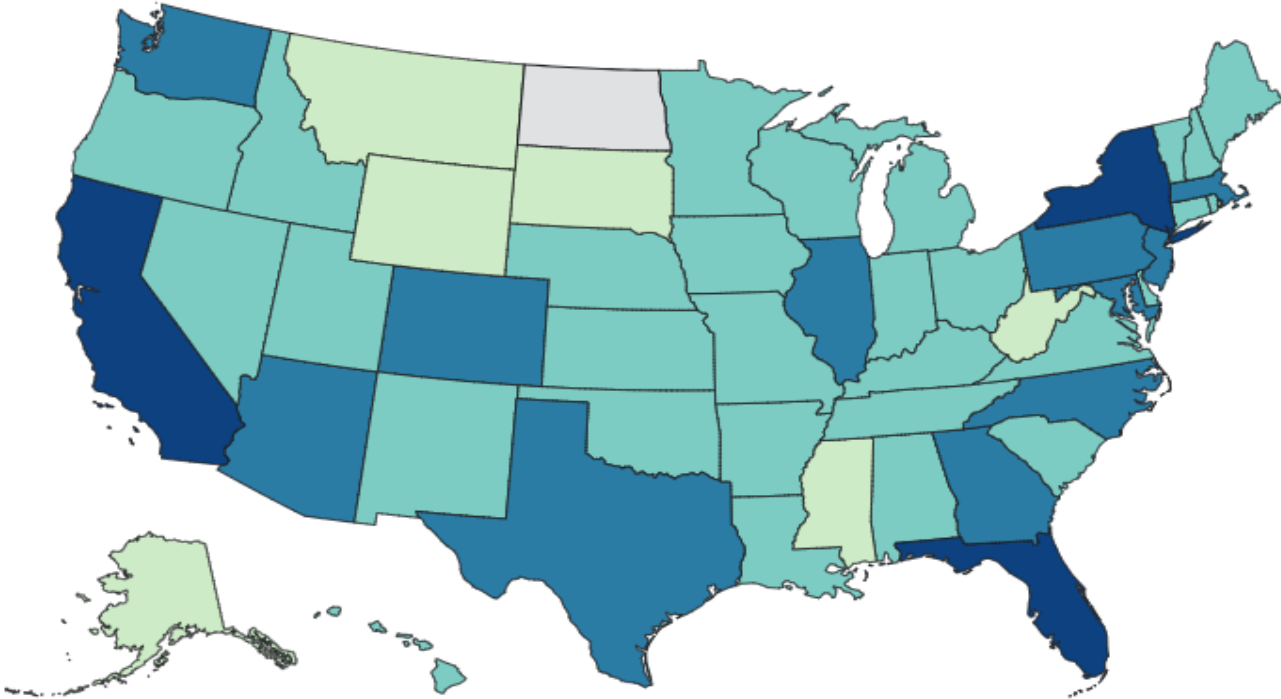
California Air Resources Board: [Inhalable Particulate Matter and Health \(PM2.5 and PM10\)](#)

Pu, Bing *et al.* [Compound Heat Wave, Drought and Dust Events in California](#). 2022 American Meteorological Society, doi: 10.1175/JCLI-D-21-0889.1.

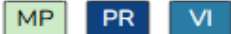
Disease Vector Facts

- Disease vectors have increased range and prevalence in recent years
- **Zika**
 - Aedes species of mosquito has increased in prevalence in California since 2018
- **Dengue Fever**
 - No. of cases in the USA have increased significantly since 2010
 - Most cases in California, Florida and New York
 - Oct. 2023: California's first reported case of locally acquired Dengue Fever

All dengue cases by jurisdiction of residence in US states and territories, 2024



U.S. Territories



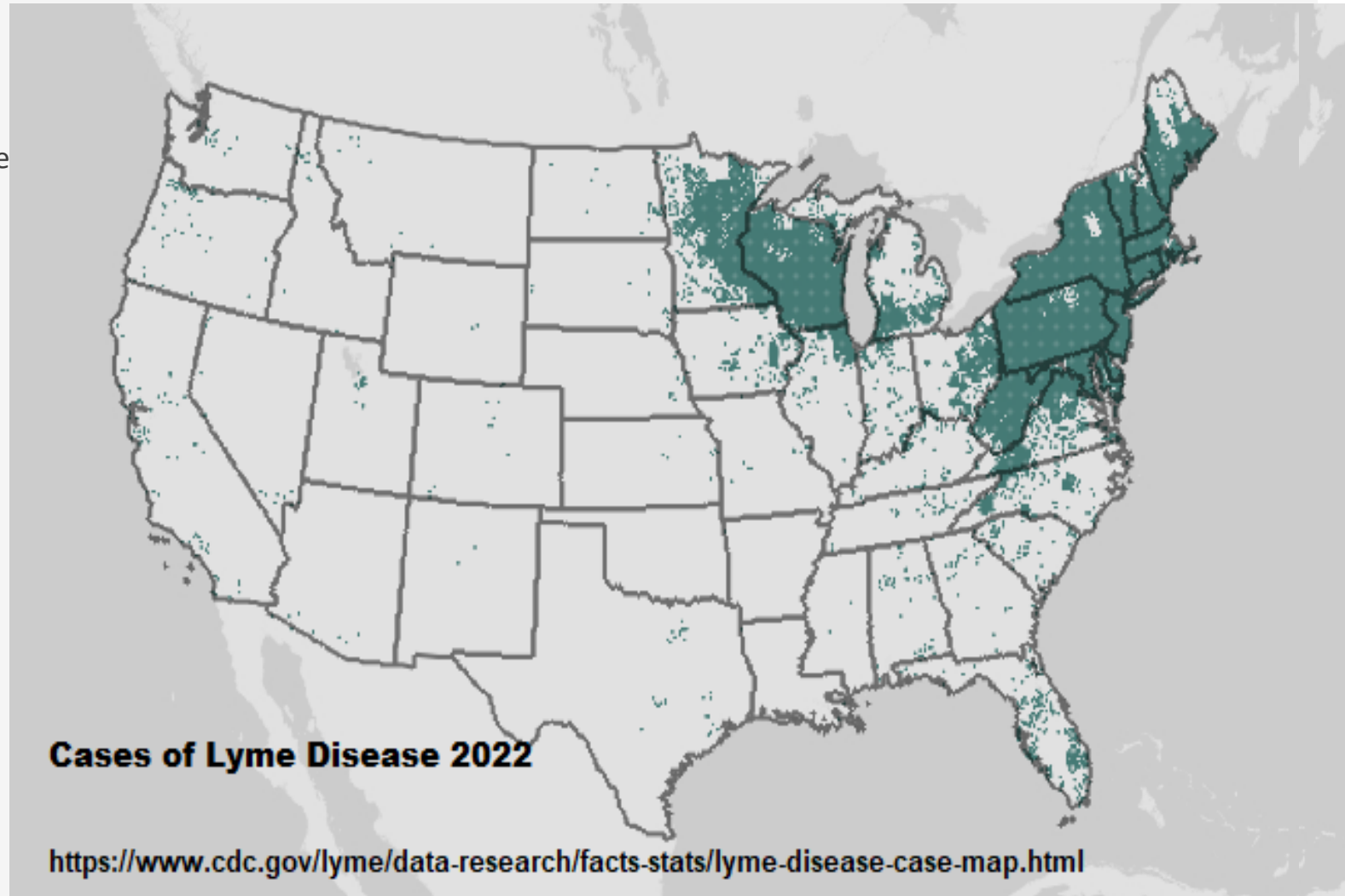
Legend



Sources: cdph.ca.gov/Programs/CID/DCDC/Pages/Zika.aspx
cdc.gov/lyme
cdc.gov/dengue

Disease Vectors

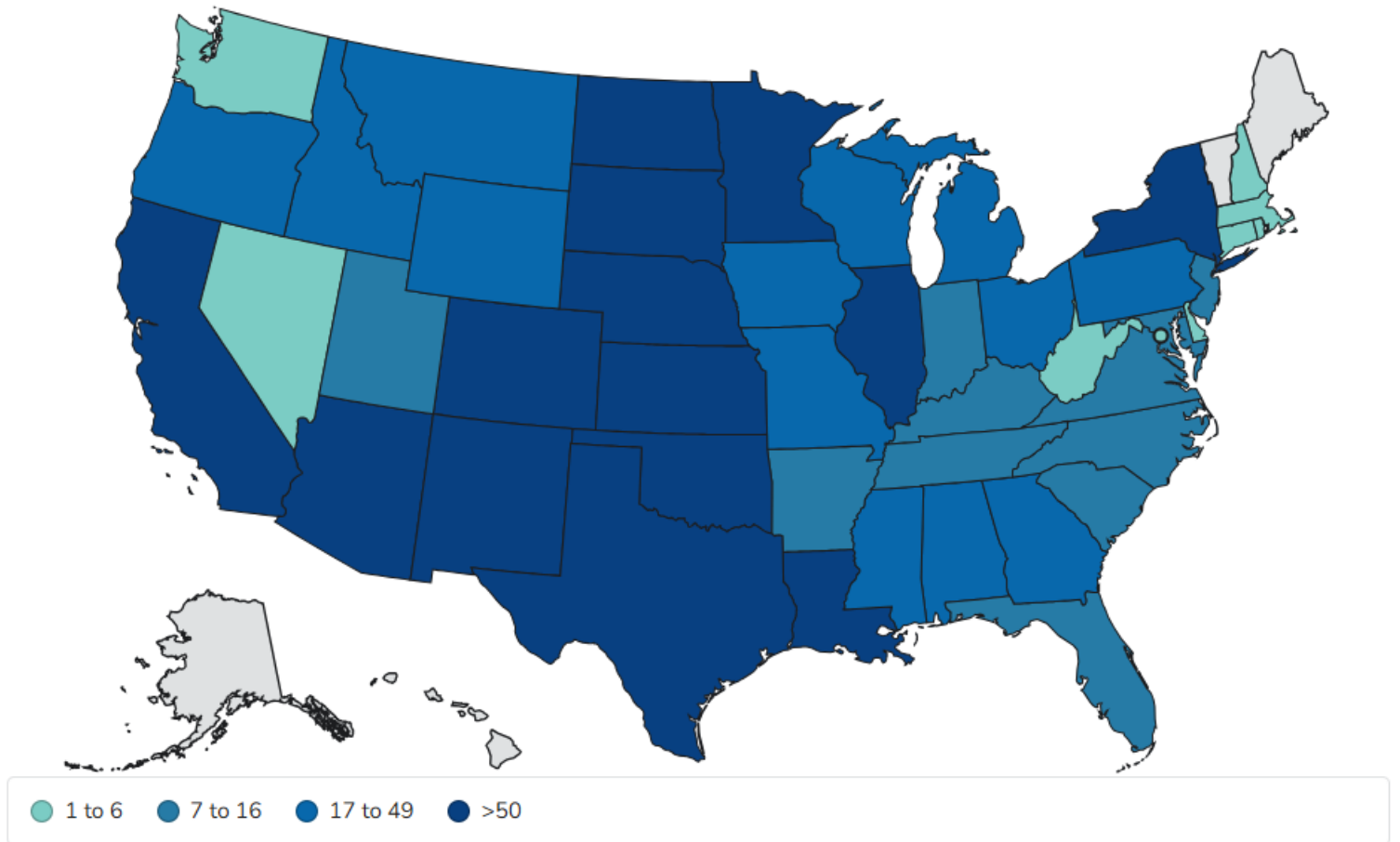
- **Lyme Disease**
 - Range has spread westward since its first discovery in Connecticut in 1980s
 - Fastest growing vectorborne infections in the US



Disease Vectors

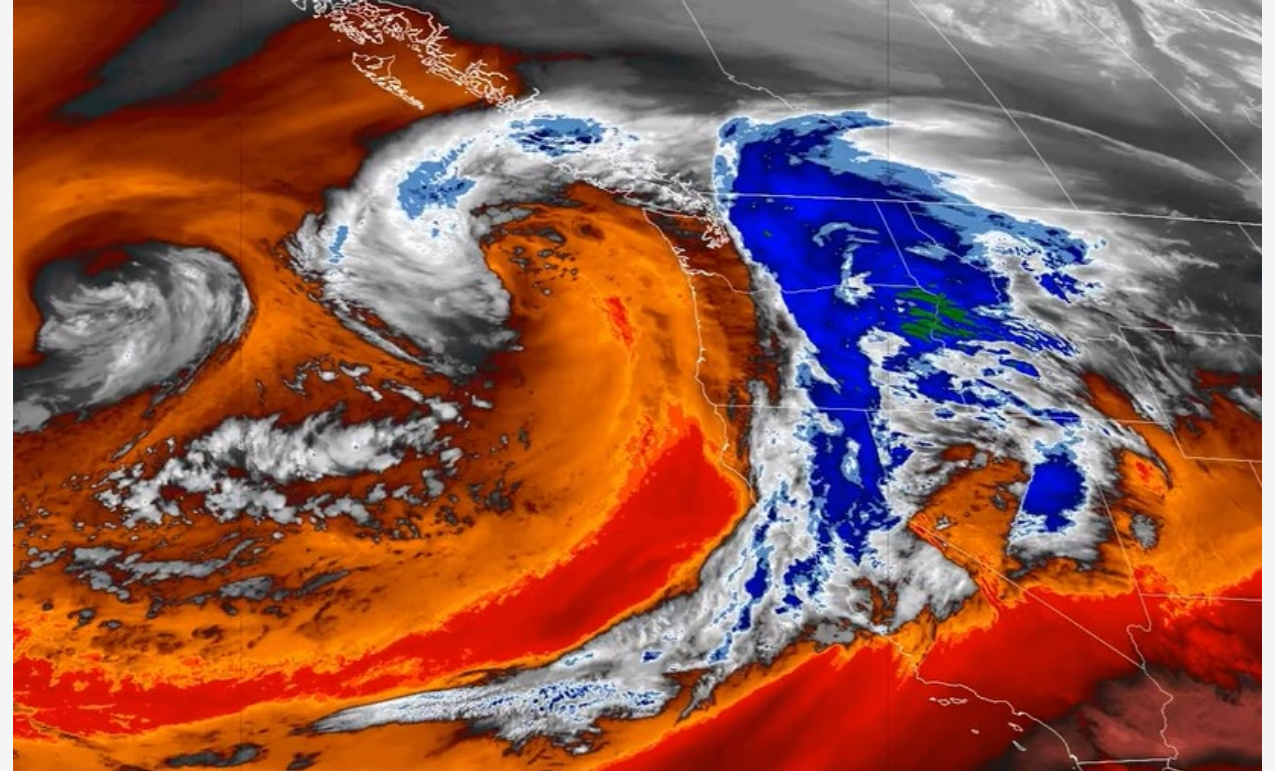
- **West Nile Virus**
 - First detected in 1999
 - Most common mosquito borne disease diagnosed in the US

West Nile virus human disease cases reported by state of residence, 2023, All disease cases



Atmospheric River Facts

- Increase in **frequency and severity of atmospheric rivers** on the West Coast
- **More severe flooding** associated with these large storms
- Extreme precipitation event cause an increased **risk of failure** for storm water and wastewater infrastructure
- Extreme precipitation event cause **disruptions in electric infrastructure**



Bomb Cyclone Storm, Nov. 21, 2024

Image Source: [CNN](#)

Public Health Risks Associated with Heavy Precipitation Events

- **Increased risk of Illness**
 - Potable water
 - Mass sheltering
 - Valley Fever
- **Increased risk of exposure to inhalation hazards**
 - Mold in flooded buildings
 - Carbon monoxide from generators
- **Lack of adequate sanitation**
 - Loss of access to potable and/or running water
 - Accumulation of solid waste
- **Pest infestation associated with:**
 - Standing water (mosquitos)
 - Accumulated solid waste (vermin)
- **Lack of access to medical care and services** due to evacuation and disruptions in power, transportation and other utilities
 - Impacts access to Rx medications, powered home medical equipment, access to critical healthcare services



Morbidity and Mortality Weekly Report (MMWR)

Outbreak of Norovirus Illness Among Wildfire Evacuation Shelter Populations — Butte and Glenn Counties, California, November 2018

Weekly / May 22, 2020 / 69(20);613-617

California Area DEHS Resources & Services

DISASTER PREPAREDNESS

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Tribal Extreme Heat Toolkit

Resource for Tribes:

- Guidance with setting up a cooling shelter
- Guidance to develop a tribal community extreme heat response plan



Toolkit Elements

- **Cooling Center Guideline**

- Attributes of suitable facility
- Recommended supplies and equipment needed for operating cooling center
- Recommended training for cooling center staff

- **Guidance on Preparing a Tribal Extreme Heat Event Response Plan**

- Walk through of a Community Hazard Vulnerability Assessment
- Template of an Extreme Heat Plan
 - Plan defines the conditions which initiate:
 - mobilizing the extreme heat response plan
 - Opening a cooling center

- **Community Preparedness Resources**

- Templates for health and safety outreach, education and communication during an extreme heat event

Tribal Wildfire Smoke Toolkit



Resource for Tribes:

- Tribes guidance with setting up a **cleaner air shelter**
- Tribal facility managers guidance on developing an **HVAC Smoke Readiness Plan** for their facility based on current ASHRAE recommendations
- **Public Health Education Materials and Presentations** to educate about the health risks of wildfire smoke targeting:
 - Community members
 - Healthcare providers

Wildfire Smoke Community Presentations

Purpose: Educate community members and healthcare providers about:

- **Health impacts of wildfire smoke exposure**
- **Preparing for Wildfire Smoke Events**
 - Guidance on masks, air purifiers, clean air rooms
- **Resources for local air quality information**
 - Understanding Air Quality Index
 - Interpreting PurpleAir monitor readings

Air Quality Index		
AQI Category and Color	Index Value	Description of Air Quality
Good Green	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Moderate Yellow	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups Orange	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Unhealthy Red	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy Purple	201 to 300	Health alert: The risk of health effects is increased for everyone.
Hazardous Maroon	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

Table 2. The Air Quality Index includes AQI categories and colors, corresponding index values and cautionary statements for different levels of health concern.

Water Utility Emergency Response Plan Template

4.2 Watershed: Extreme Runoff Event in <NAME> Watershed <INCLUDE ONLY IF APPLICABLE—e.g. surface water source>

Description: Extreme flow events increases turbidity and the risk of damage to <WATER UTILITY NAME> and community physical structures.

Indicators: <IF APPLICABLE: Alarm notification from <WATER UTILITY NAME> <ID CONTROLLER SYSTEM>; phone call from Tribal EPA or resident; extreme weather statement issued by National Weather Service, other forecaster or from local media; direct call from <WATER UTILITY NAME> staff members visually noticing heavy rainfall event <IF APPLICABLE—or notification from the [USGS WaterAlert Service](#) which sends an alert when river gauges have surpassed specified parameters.>

Actions: By <WATER UTILITY NAME> staff upon receipt of notification:

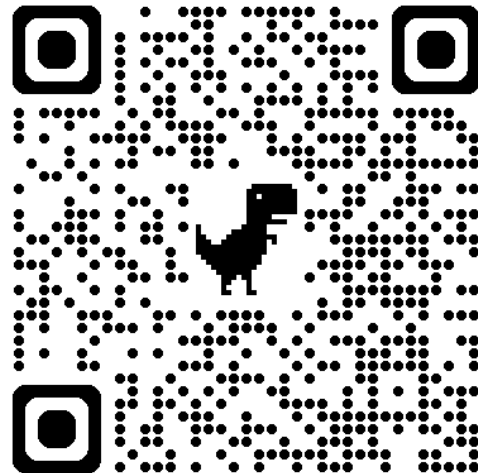
1. Fill storage tanks to full capacity to maximize storage.
2. Plan for additional fuel needs. Coordinate fuel deliveries to emergency generators and fill fuel tanks of <WATER UTILITY NAME> vehicles.
3. Ensure Water Treatment Plant (WTP) has a two week supply of all chemicals on hand.

Plan consists of Emergency Action sheets/checklists for:

- Hazardous Algal Bloom
- Extreme Runoff Event in Watershed
- Contamination of Source Water
- Loss of Flow from Well
- Power Failure at Water Treatment Plant
- Water Main Break
- Water Distribution Pump Failure
- Water Treatment Chemical Spill

CAIHS DEHS Toolkits Available at this link:

<https://www.ihs.gov/california/index.cfm/offices/oehe/dehs/emergency-management>



DEHS support for Confirmed Case of Aedes Mosquito Borne Diseases



DEHS can assist with:

- Assessing the premises of confirmed case for mosquito harborage conditions
- Implement vector surveillance and control measures at home in partnership with federally certified vector control technician
- Initiate localized public education outreach to eliminate harborage conditions in neighborhood

Zika and Dengue Fever Outreach Materials:

- Advise about the risk factors that could lead to the development of a local reservoir of Zika/Dengue infected Aedes mosquitoes.
- Educate public health practitioners to recognize Aedes harborage conditions
- Educate tribal community members about symptoms of Dengue and Zika, the risk of Aedes mosquitos and to report daytime biting mosquitos

Food and Shelter Sanitation

DEHS support during a community emergency:

- Selection of emergency shelter and massing feeding sites
- Assessing food handling and storage at temporary mass feeding operation
- Guidance on managing food donations
- Assessing restaurants impacted by flood, prolonged power outage, earthquake, boil water notice, etc.
 - guidance on closure and reopening requirements
 - guidance on clean up procedures
 - guidance on food disposition and salvaging
- Assessing emergency shelters for infection prevention, basic sanitation and safety



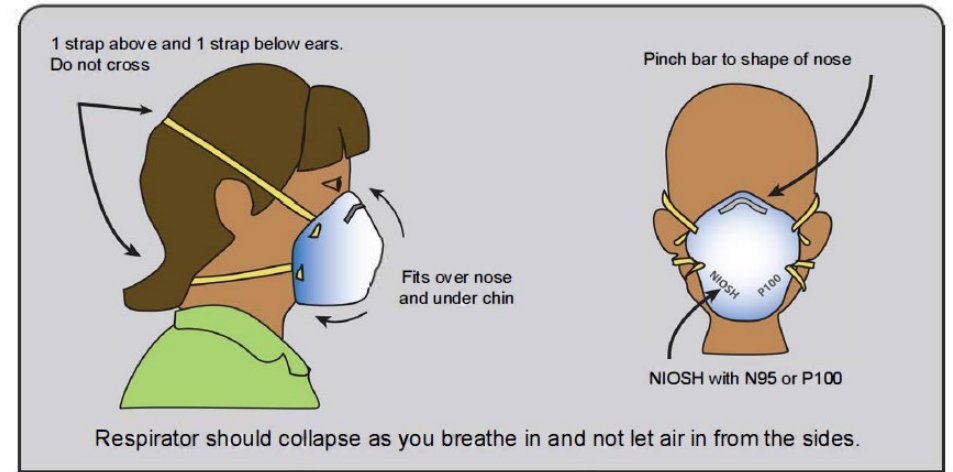
Wildfire Smoke/Dust Storm Events

DEHS support includes:

Maintain small **cache of supplies** for rapid deployment in the event of a Wildfire Smoke/Dust Storm event impacting a tribal community (i.e. N95s)

Liaison to TransAm: resource for excessed medical and emergency equipment

Liaison to National Supply Service Center: source for emergency supplies such as air purifiers and N95 respirators at GSA pricing



Overview: California IHS Emergency Response Resources

California Area IHS Resources

California Area IHS may mobilize its own resources at the direction of Headquarters and/or Area Leadership.

Agency Funds: IHS Areas do not receive an annual appropriation for use in tribal/THP emergency preparedness or operational support

- Generally any funds expended at the Area level are from program appropriated funds

IHS Director's Emergency Fund

- Limited reserve to address emergencies and disaster relief at IHS /Tribal Health Programs
- Funds are not intended for administrative, maintenance, construction or any other purpose beyond emergencies and disaster relief/recovery (*ESF 8 core functional areas are a guide for requests*)
- Proposal submitted by the Area Director to the IHS Director

HQ SFC

- Has a small pool of funds for emergency repairs to Tribal water/wastewater systems

California Area Office Resources

IHS Personnel:

- USPHS Commissioned Officers can be deployed to respond to an emergency
 - Requests processed by IHS HQ and CCHQ
- Area Leadership can authorize for California Area IHS staff to travel to provide technical assistance to a Tribe/THP
- OEHE Emergency Response Services pertain to:
 - Access to potable water
 - Collection and treatment of raw sewage
 - Management of solid waste
 - Mass sheltering
 - Vector Control
 - Food Safety
 - Hazardous Material Management
 - Healthcare equipment and supplies
 - Maintaining access to healthcare facilities

SFC: Emergency Support Resources



During a disaster:

- Emergency water hauling services to keep water systems from going dry
- Assessment of water and wastewater infrastructure damage and identification of needs
- Troubleshooting and technical assistance to get water and wastewater systems functional after a disaster
- Emergency funding to repair or replace individual or community water and wastewater systems affected by the disaster
- Technical assistance to Tribes with obtaining funding from the State or other federal agencies for water and wastewater needs (i.e. supporting documentation such as cost estimates/designs)

SFC Emergency Support Resources



During the recovery:

- Detailed damage assessments
- Procuring resources necessary to stabilize and/or restore water/sewer infrastructure functions and minimize associated health and safety threats
- Engineering and construction cost estimates
- Writing /reviewing scope of work for contracts
- Defining technical specification and/or drafting solicitation packages for projects

DEHS Emergency Support Resources



During a disaster:

Health and Safety Hazard Assessments

- Emergency Shelter Surveys
- Food Sanitation & Water Hauler Inspections
 - Mass feeding operations serving evacuees and responders
 - Donated food/water
- CWS: guidance on issuing/lifting a boil water notice
- Investigation of disease outbreaks

- **Disseminate Public Health and Safety Information**
 - Air quality (indoor/outdoor)
 - Drinking water safety
 - Basic Sanitation
 - Vector Control measures

DEHS Emergency Support Resources



During the recovery:

◦ **Health and Safety Hazard Assessments:**

- Reoccupancy inspections of buildings
 - e.g. mold/moisture and IAQ assessments
- Pre-operational inspections of food establishments
- Guidance on lifting boil water notices

◦ **Recovery/Clean-up health and Safety guidance:**

- Guidance on mold abatement
- Guidance on PPE selection
- Respirator fit testing
- Waste characterization and disposal guidance

◦ **Disseminate Public Health and Safety Information to community regarding:**

- Safe procedures for cleaning up after fire/flood
- Vector control measures

HFE Emergency Support Resources



Before an emergency/disaster, Health Facilities Engineering (HFE) offers:

- Operation & Maintenance planning
- M&I/Financial planning
- Drafting/reviewing scopes of work and technical specifications for projects

During the recovery:

- Facility Condition Assessments (FCA) which can support insurance claims
- Technical assistance with Operation & Maintenance
- Engineering and construction cost estimates for repairs
- Drafting/reviewing scopes of work and technical specifications for projects

Please Note:

OEHE is not permitted to provide bottled water or fuel

BOTTLED WATER, FOOD AND FUEL MAY BE AVAILABLE THROUGH CALOES BY CONTACTING THE CALOES TRIBAL LIAISON



Contact Us for
Assistance!

Escondido District Office

Brian Lewelling District
Environmental Health Officer PH:760-
735-6891 Email:
brian.lewelling@ihs.gov

Cabazon, Indian Health Council (Inaja (Cosmit), La Jolla, Los Coyotes, Mesa Grande, Pala, Pauma (&Yuima), Rincon, San Pasqual, Santa Ysabel), Southern Indian Health Council (Barona, Campo, Cuyapaipa, Jamul, La Posta, Manzanita, Viejas), Sycuan

Redding District Office

VACANT:
Contact Aaron Alexander
Sacramento District Environmental
Health Officer
PH: 916-930-3981 x21338
Email: aaron.alexander@ihs.gov

Feather River (Berry Creek, Enterprise, Mooretown), **Greenville**, **Karuk**, **Modoc** (Alturas, Cedarville Ranch), **Pit River**, **Quartz Valley**, **Redding Rancheria**, **Rolling Hills** (Paskenta), **Susanville**, **Warner Mountain** (Fort Bidwell)

Hoopa Valley, **UIHS-Tsurai** (Blue Lake, Big Lagoon, Cher-ae Heights (*Trinidad*), Elk Valley, Resighini Rancheria, Tolowa Dee-ni' (*Smith River*), Yurok Tribe of Hoopa Valley, Rohnerville (*Bear River*), Wiyot Tribe (*Table Bluff*))

Sacramento District Office

Sacramento District Office

Aaron Alexander

District Environmental Health Officer

PH: 916-930-3981 x21338

Email: aaron.alexander@ihs.gov

Chapa De (Auburn), Northern Valley (Chico (Mechoopda), Cortina, Grindstone, Yocha Dehe Wintun (Rumsey)), Shingle Springs (healthcare facility)

Clovis Field Office:

Alyssa Bernido

Field Environmental Health Officer

PH: 559-322-7488 x27306

Email: alyssa.bernido@ihs.gov

California Valley Miwok (Sheep Ranch), Central Valley (Big Sandy, Cold Springs, North Fork, Picayune, Santa Rosa Community), MACT (Buena Vista Rancheria, Ione Band, Jackson), Mathieson Memorial Health Clinic (Chicken Ranch), Santa Ynez, Table Mountain Rancheria, Shingle Springs (community), Tule River, Tuolumne, Tejon, Wilton Rancheria

Ukiah Field Office:

Troy Barker

Field Environmental Health Officer

PH: 707-462-5314 x25103

Email: william.barker@ihs.gov

Colusa (Cachil Dehe Band); **Consolidated Tribal Health** (Cahto (*Laytonville*), Coyote Valley, Guidiville, Hopland, Pinoleville, Potter Valley, Redwood Valley, Sherwood Valley) **Lake County** (Big Valley, Elem, Middletown, Robinson, Scotts Valley, Upper Lake (*Habematolel*)), **Round Valley** (Covelo), **Sonoma County Health** (Cloverdale, Dry Creek, Kashia Band (*Stewarts Point*), Graton, Lytton, Manchester), **Koi Nation**

Thank You!

CAROLYN GARCIA, MSPH REHS

DIVISION OF ENVIRONMENTAL HEALTH SERVICES

CALIFORNIA AREA INDIAN HEALTH SERVICE

