

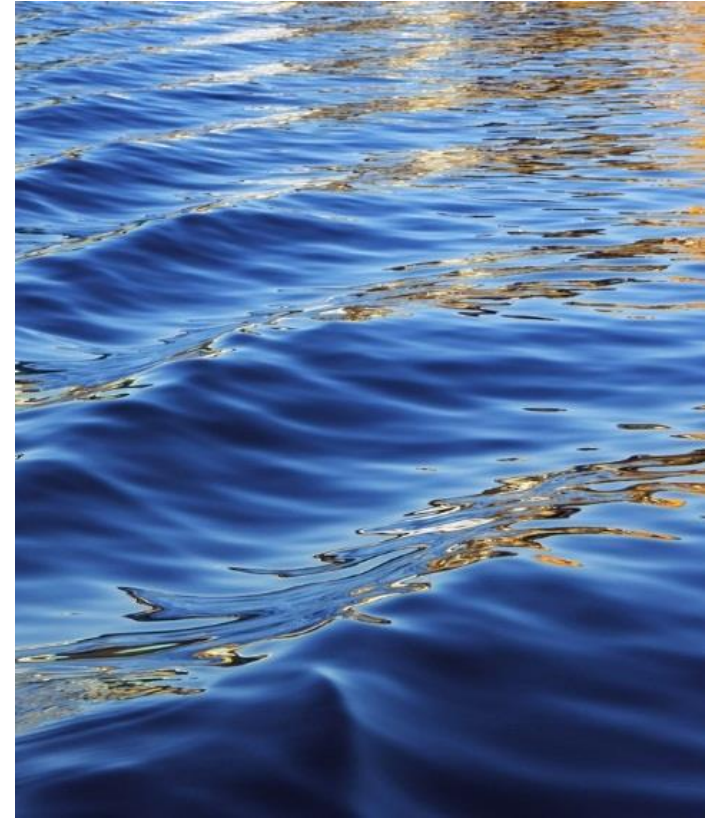


TRIBAL CLIMATE
HEALTH PROJECT



Vulnerability Assessments: Part 2

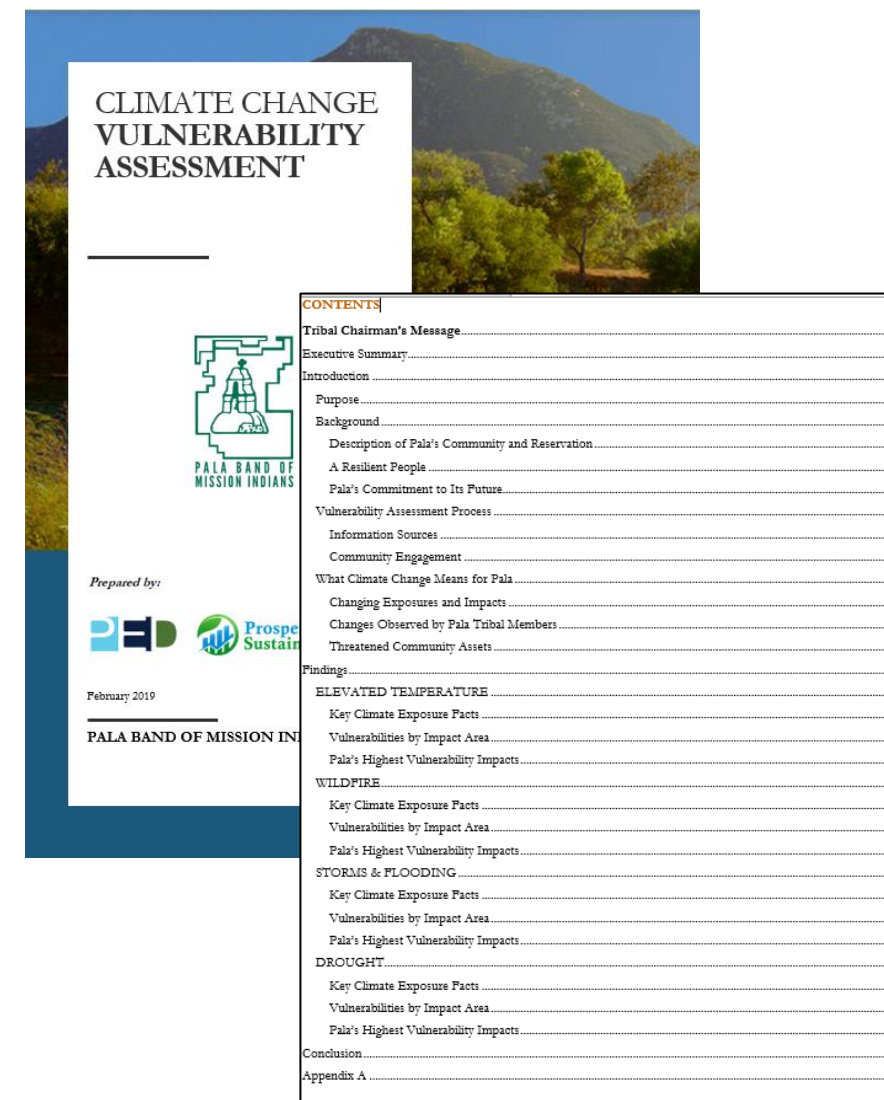
Tribal Climate and Health Adaptation Webinar #7



Since Last Webinar

Suggested Reading

- [Pala Band of Mission Indians Climate Change Vulnerability Assessment](#)
- [Blackfeet Climate Change Adaptation Plan](#)
- [Climate Change in Kiana, Alaska: Strategies for Community Health](#)



Chat Discussion:

What did you read about that surprised you? What did you like about the structure? What types of information sources were referenced?

Assessing Health Vulnerabilities

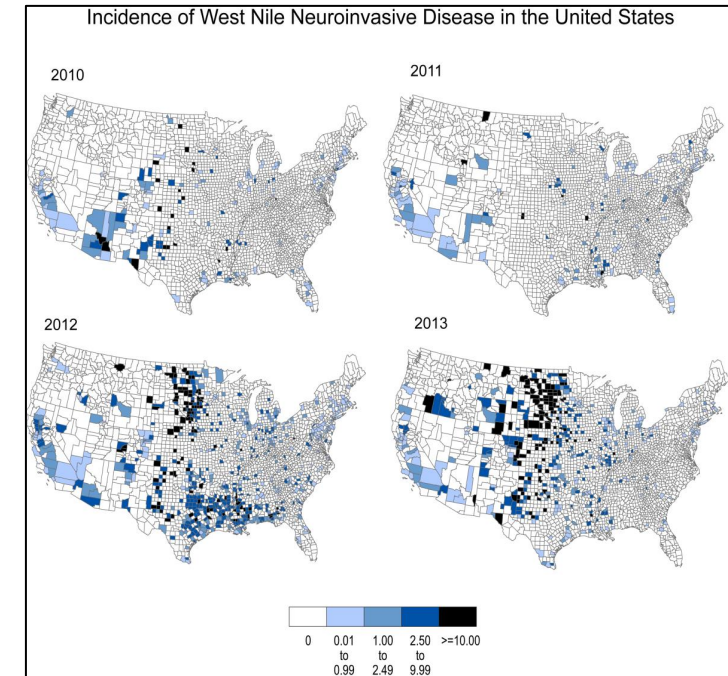
Steps

1. Determine Objectives and Scope
2. Engage the Community
3. Identify Key Indicators
4. Gather and Analyze Information
5. Prioritize Vulnerabilities
6. Synthesize and Present Results

Step 3. Identify Key Indicators

- Exposure and secondary exposure indicators
- Impact indicators – including health
- Population sensitivity and adaptive capacity (moderating factors)

TCHP's Exposures, Impacts, and Strategies Inventory (EISI) tool can help



Chat Discussion:

What climate indicators are you tracking?

Adaptation Planning Tool – [Exposures, Impacts, and Strategies Inventory \(EISI\) tool](#) (Updated October 2, 2019 BETA VERSION). This is a draft of a customizable companion tool that can support communities that are conducting adaptation planning. Information and data sources are compiled and organized to present information needed at several decision-making steps to help your community prepare to take the most effective actions. We are continuing to build functionality and improve information. The latest update includes more indicators and data sources (national and California specific). Please send questions or comments to ahacker@prospersustainably.com.

Survey Template – [Climate Vulnerability Experiences and Priorities Survey](#) for gathering initial community input. If you have a Google account, you can use [this link](#) to create and save a copy of this template to customize for your tribe.

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Fact Sheets – Pala Band of Mission Indian produced the following fact sheets to help their community understand high-risk climate exposures and how to recognize and prepare for climate threats:

- [Extreme Heat \(Elevated Temperatures\)](#)
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- [Flooding and Storms](#)
- [Drought](#)

Other Relevant Training Materials not Produced by the Tribal Climate Health Project

Tribal Resolution Template – [ITEP's Tribal Climate Change Resolution Template](#)

FileHomeInsertPage LayoutFormulasDataReviewViewHelpPower Pivot

CutCopyFormat PainterClipboard

Calibri11Font

Align CenterMerge & CenterAlignment

GeneralNumber

Conditional FormattingFormat as TableCell StylesStyles

InsertDeleteFormatCells

AutoSumFillClearEditing

Sort & FilterFind & SelectIdeas

B67

Water: shortage/supply and distribution disruption

1. EVALUATE SEVERITY AND LIKELIHOOD OF EXPOSURES TO COMMUNITIES (NATIONAL AND CA)																									
Exposure	Secondary Exposure (if applicable)	Regions at Greatest Risk					Exposure Indicators	National Data Sources		CA Data Sources		Data Findings					Exposure Risk Level								
							Annual mean concentration of PM2.5 (ave of quarterly means μ /m3), with percentile (vs other census tracts)				HPI														
Drought	Worsened air quality: dust particulate matter	x				x	PM2.5 -% Days above regulatory standard (County)	CDC - NEPHT	CDC - NEPHT	CDC - NEPHT	CDC - NEPHT													Chart; map; table	Basel
Drought	Vectors: mosquitos	x				x	West Nile Virus-carrying mosquito surveillance - Non-human WNV activitiy (State)		CDC - WNV		CDC - WNV												Map		Basel
Drought	Vectors: forest pests	x				x	Forest vector surveillance - Bark beetles	USFS/US DA	USFS/US DA	USFS/US DA	USFS/US DA												Map		Basel
							Water pathogens - Nitrates in Community Water Systems (County)	CDC - NEPHT	CDC - NEPHT	CDC - NEPHT	CDC - NEPHT												Chart; map; table		Histo
							Water exposure outbreaks (State)	CDC NORS	CDC NORS	CDC NORS	CDC NORS												Map; Table; Chart		Histo
							Incidents of water contaminated by waste/chemicals during storm																		
							Drinking water contaminants (CA percentile) (Census tract)				CalEnviro												Map; Table		Basel
							Impaired water bodies (CA percentile) (Census tract)				CalEnviro												Map; Table		Basel
							Observed water quality																		
Drought	Water: contamination	x				x	Drinking water violations (County)		RWJF		RWJF												Table; map		Basel
Drought	Water: shortage/supply and distribution disruption	x				x	Well production (meter reads) or other water level observations																		

Assessing Health Vulnerabilities

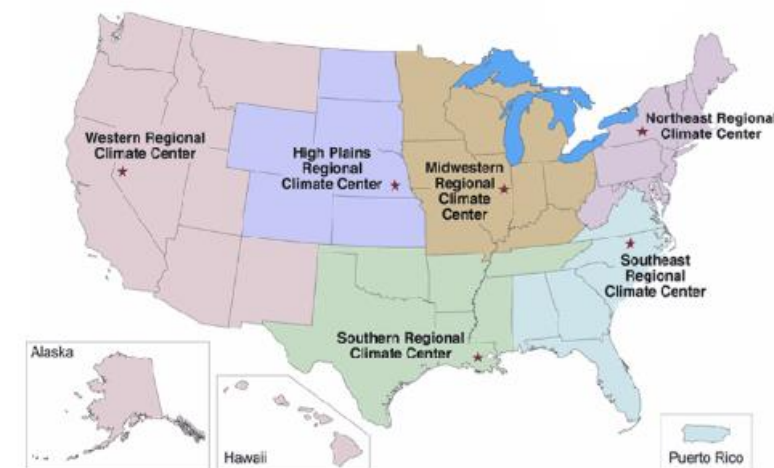
Steps

1. Determine Objectives and Scope
2. Engage the Community
3. Identify Key Indicators
4. Gather and Analyze Information
5. Prioritize Vulnerabilities

Step 4. Gather and Analyze Information

- Find the best data to tell the story
- Look for historical, baseline and projected information on each indicator (identified in step 3) that is ***as location-specific as possible***.
 - Precalculated and visualized are easier to use
- Information sources vary widely:
 - Technical assistance – e.g. Regional Climate Centers, Universities, Tribal Epidemiology Centers, State or local health departments
 - Local, State and National reports
 - Local observations and traditional knowledges
 - National/regional databases

TCHP's Exposures, Impacts, and Strategies Inventory (EISI) tool can help – provides national and California-specific data sources



Chat Discussion:

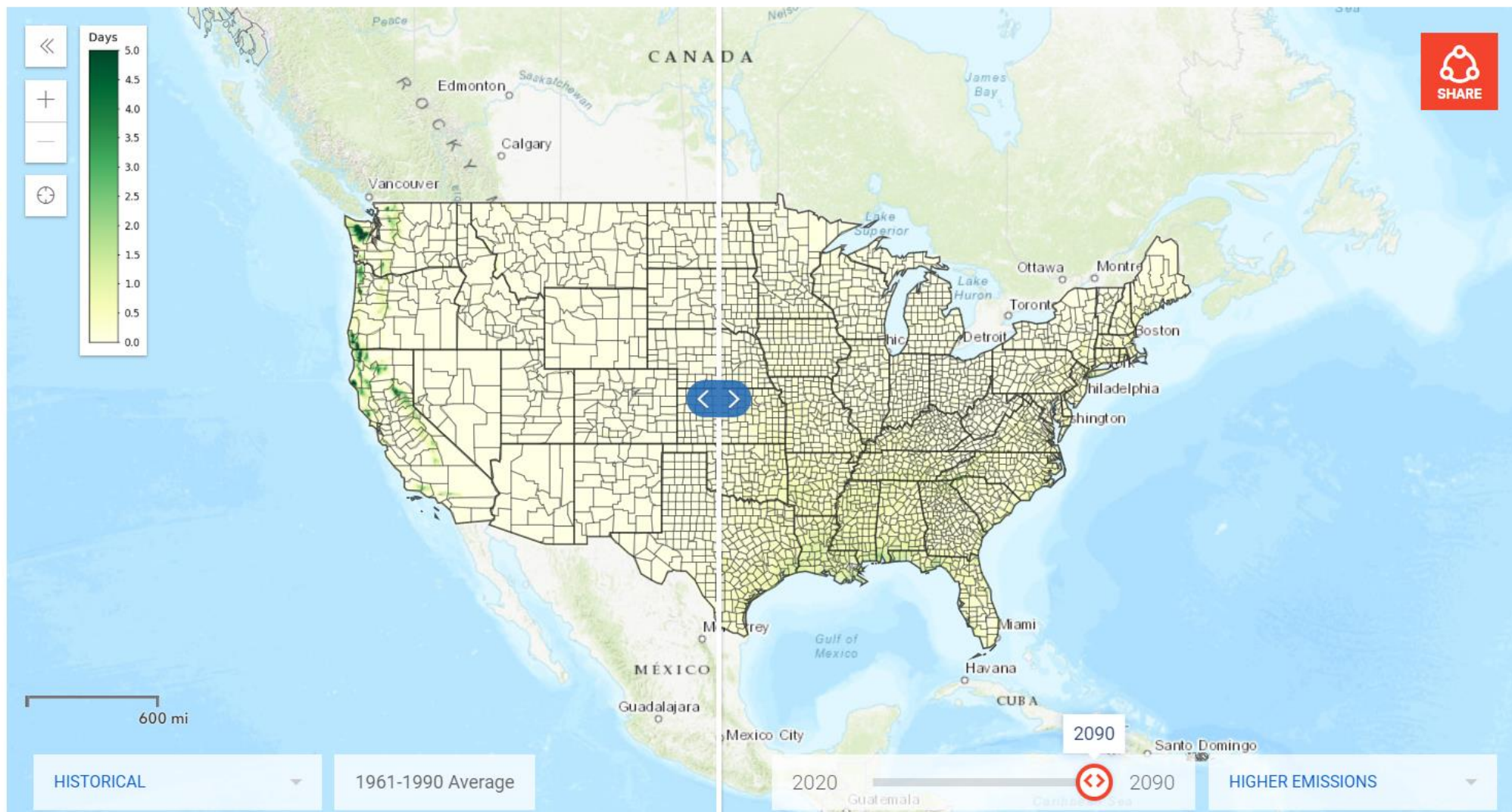
What information sources have you used for your tribe?

Water: shortage/supply and distribution disruption																										
1. EVALUATE SEVERITY AND LIKELIHOOD OF EXPOSURES TO COMMUNITIES (NATIONAL AND CA)																										
Exposure		Secondary Exposure (if applicable)		Regions at Greatest Risk			Exposure Indicators			National Data Sources		CA Data Sources		Data Findings				Exposure Risk Level								
Drought		Worsened air quality: dust particulate matter		x			Annual mean concentration of PM2.5 (ave of quarterly means μ/m3), with percentile (vs other census tracts)			CDC - NEPHT		CDC - NEPHT		HPI				Chart; map; table		Basel						
Drought		Vectors: mosquitos		x			PM2.5 -% Days above regulatory standard (County)			CDC - NEPHT		CDC - NEPHT		CDC - NEPHT				Chart; map; table		Histo						
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Drought		Water: contamination		x			Forest vector surveillance - Bark beetles			CDC - NEPHT		CDC - NEPHT		CDC - NEPHT				Map		Basel						
Drought		Water: shortage/supply and distribution disruption		x			Water pathogens - Nitrates in Community Water Systems (County)			CDC - NEPHT		CDC - NEPHT		CDC - NEPHT				Chart; map; table		Histo						
Drought							Water exposure outbreaks (State)			CDC - NORS		CDC - NORS		CDC - NORS				Map; Table; Chart		Histo						
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Drought							Well production (meter reads) or other water level observations																			

Zoom to location

Days w/ > 3 in

About Days w/ > 3 in





SELECT DATA



CLIMATE CHANGE | HISTORICAL EXTREME HEAT DAYS AND EVENTS | NUMBER OF EXTREME HEAT DAYS | ALL COUNTIES



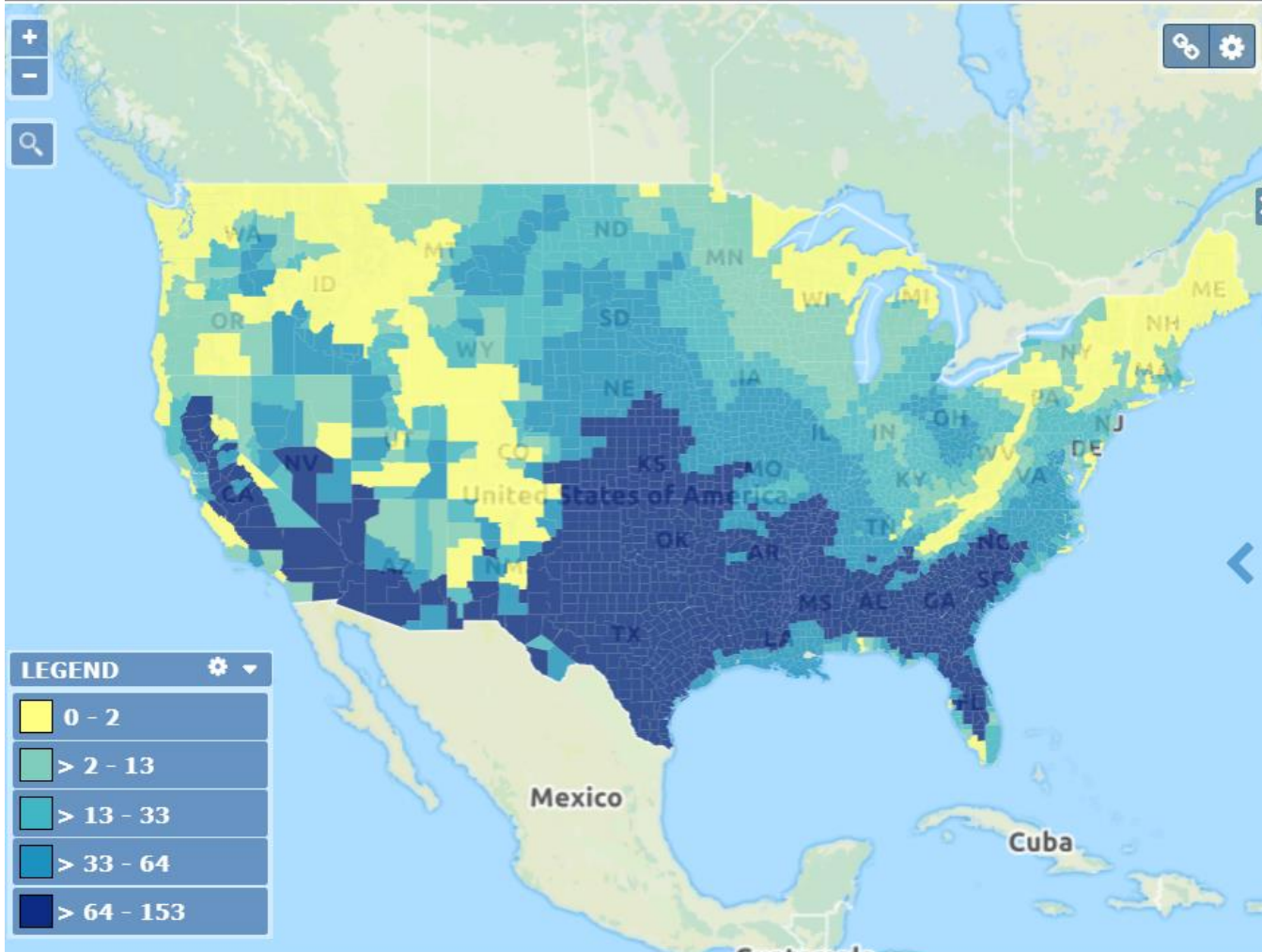
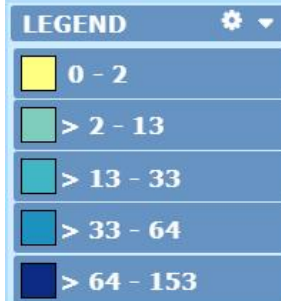
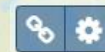
2016



Absolute Threshold: 90 degrees F, †



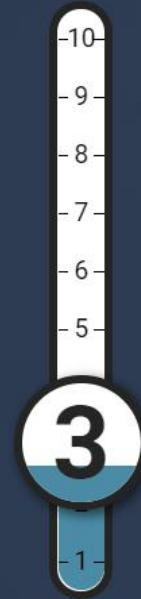
ABOUT DATA



Surging Seas RISK ZONE MAP

English (US)

Water level



Show current coast

See projections

Legend

Social vulnerability

Population

Ethnicity

Income

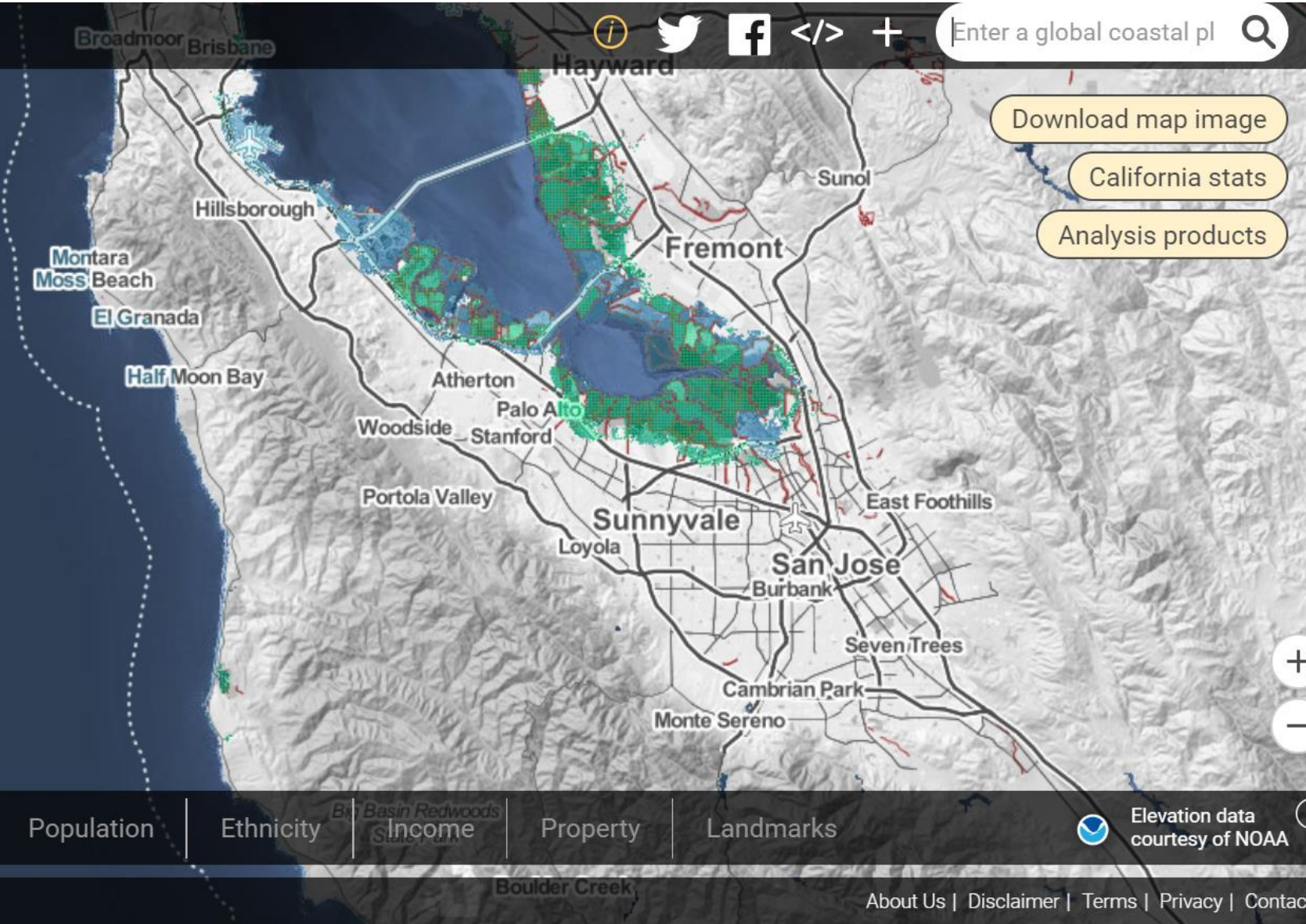
Property

Landmarks

Elevation data courtesy of NOAA

Sea level tools and analysis by CLIMATE CENTRAL

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There are 433 days left in your free trial. Keep making progress on your city's adaptation plan and upgrade your plan.

Upgrade

Climate data for Santa Barbara County, CA

You can use this page to look at temperature and precipitation data from two popular climate datasets: NASA NEX-GDDP or LOCA. See [datasets](#) for more information.

For brevity, “temperature” refers to surface air temperature and “historic” refers to 1950-2006. The indicators below come from the [Climate Change API](#).

Top hazards

All calculations shown on the Hazards use the average of the projections for the years 2025-2035. Select individual indicators to see more projections.



Air-borne disease



Avalanche



Changed seasonal patterns



Coastal flooding
0.6ft higher ocean levels



Cyclone (Hurricane / Typhoon)



Drought
-0.17 fewer dry spells each year

✉ Ask an expert

Lyme Disease

CDC > Lyme Disease Home > Data and surveillance > Recent surveillance data



🏠 Lyme Disease Home

Preventing tick bites +

Tick removal and testing

Transmission

Signs and symptoms +

Diagnosis and testing +

Treatment

Data and surveillance -

How many people get Lyme disease?

Recent surveillance data -

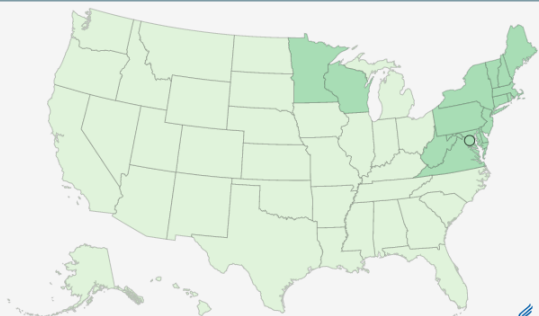
Lyme disease maps: Most recent year

Lyme disease charts and figures: Most recent year

Lyme disease data tables: Most

Lyme Disease Maps: Most Recent Year

Map of Lyme disease incidence* categories — United States 2017



Legend

Incidence Category



Low incidence



High incidence

Data Table

Location	Incidence category	2017 Confirmed	2017 Probable	2017 Incidence	Incidence 3-year av...
Alabama	Low incidence	25	16	0.5	0.4
Alaska	Low incidence	8	2	1.1	0.7
Arizona	Low incidence	18	10	0.3	0.2
Arkansas	Low incidence	2	4	0.1	0



Explore Health Rankings

Take Action to Improve Health

Learn From Others

What Is Health?

Reports



Home



California

2019

Select another state

Tweet

Like 0



Overview

Rankings

Measures

Downloads

Compare Counties

Select a county



Print Help

Español

Back To Map

HEALTH OUTCOMES
OVERALL RANK



Rank



County

- 1 Marin (MR)
- 2 San Mateo (SE)
- 3 Santa Clara (ST)
- 4 Placer (PL)
- 5 Orange (OR)
- 6 San Francisco (SF)
- 7 Napa (NA)
- 8 Sonoma (SM)
- 9 Ventura (VE)
- 10 San Diego (SD)
- 11 Contra Costa (CN)
- 12 Alameda (AL)
- 13 Santa Cruz (SC)
- 14 Nevada (NE)

San Diego (SD)

☐ Show areas to explore ☐ Show areas of strength

County Demographics +

Health Outcomes

10

Length of Life

9

Premature death

4,600



4,500-4,700

5,400

5,300

Quality of Life

14

Poor or fair health

13%

13-13%

12%

18%

Poor physical health days

3.2

3.1-3.3

3.0

3.5

Poor mental health days

3.7

3.6-3.8

3.1

3.5

Low birthweight

6%

6-7%

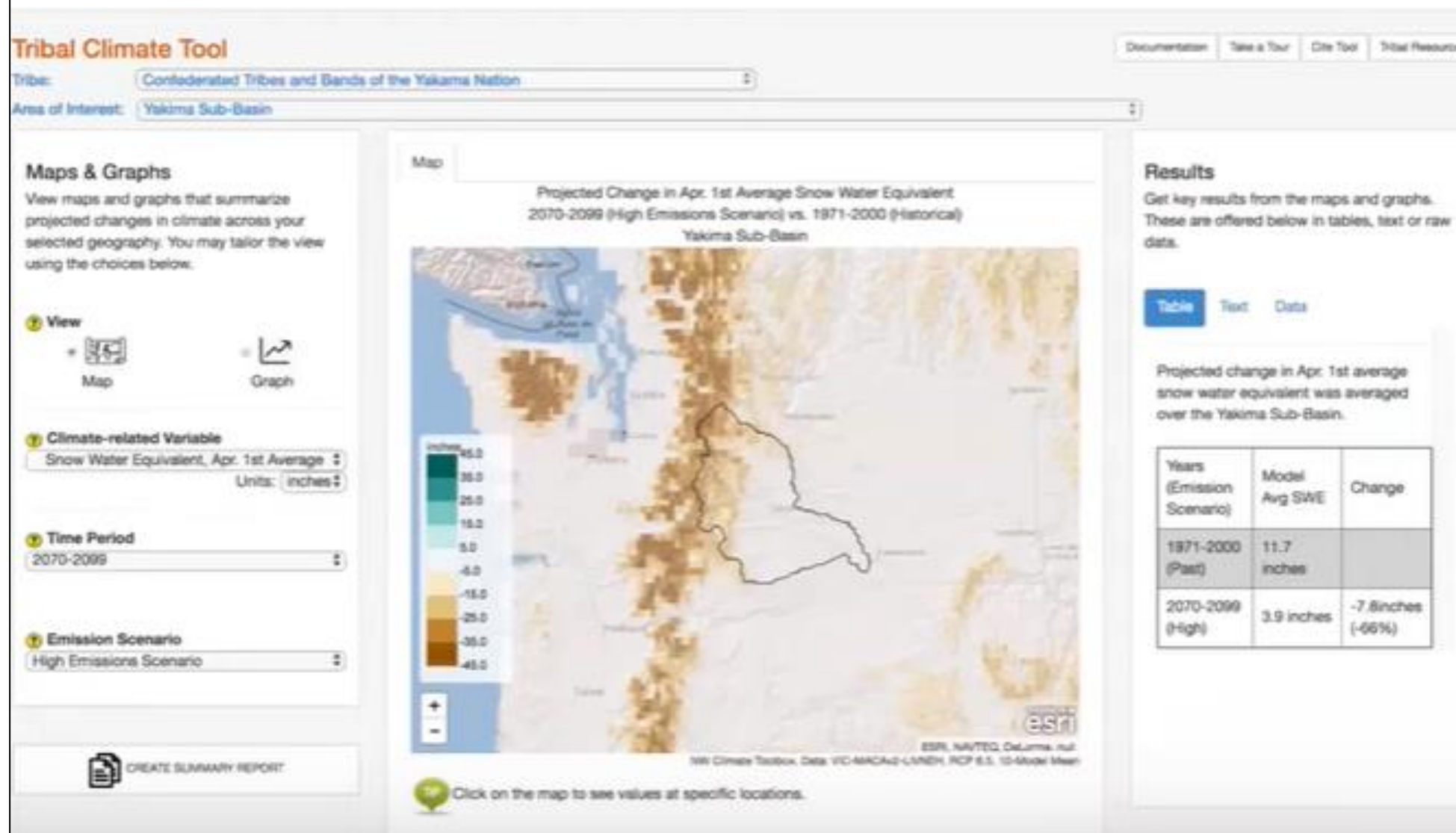
6%

7%

Additional Health Outcomes (not included in overall ranking) +

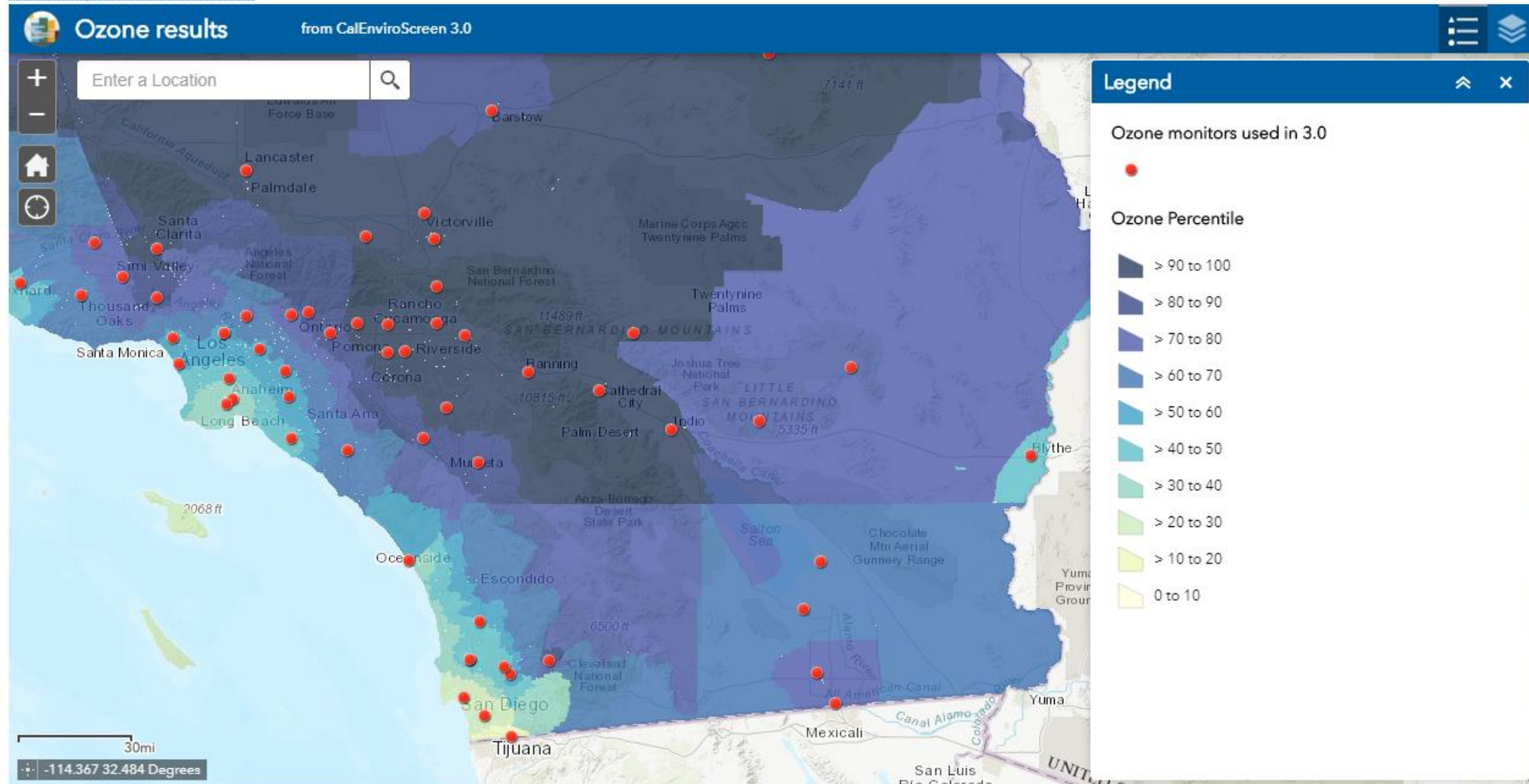
Tribal Climate Tool:

Climate summaries tailored to tribes



CalEnviroScreen 3.0 Ozone Map

[Click to open in a new window](#)



[Save Chart](#) [Download Data](#)

Maximum Temperature

Grid Cell (38.59375, -121.46875)

Emissions peak around 2040, then decline (RCP 4.5)

Range of annual average values from all 32
LOCA downscaled climate models

Modeled Variability Envelope

Observed Data (1950–2005)

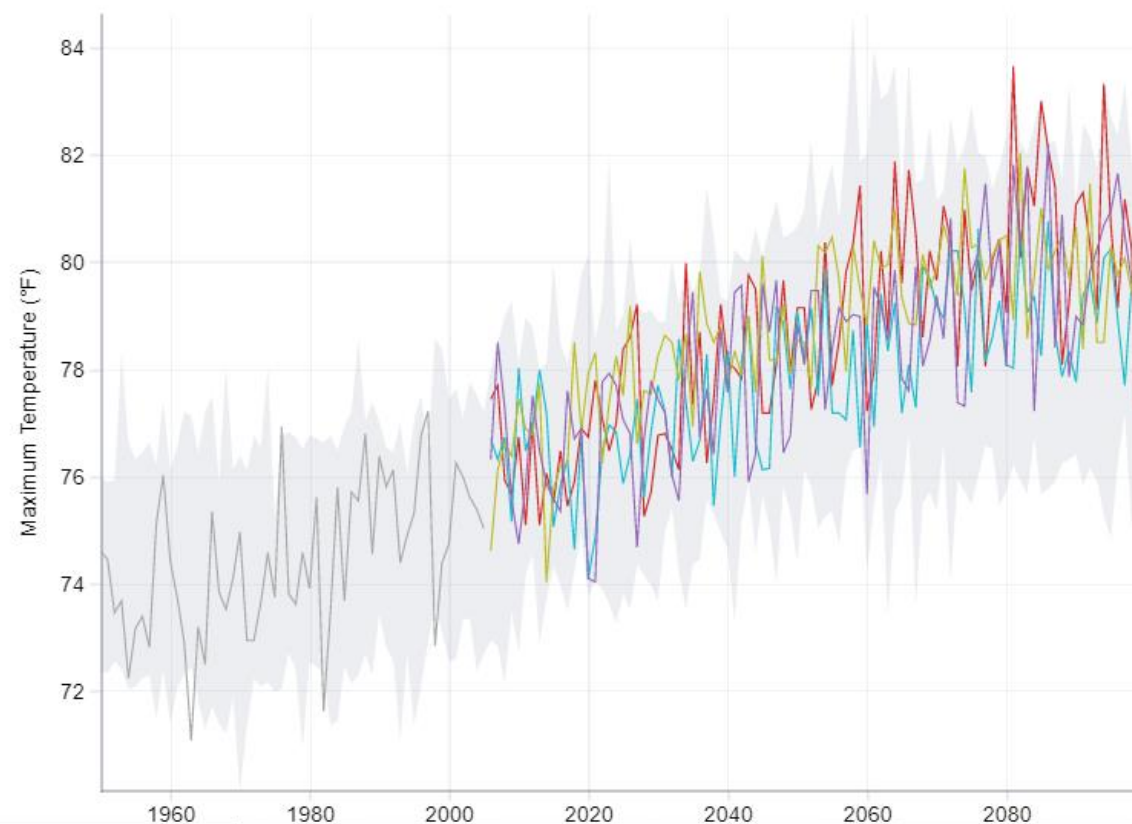
Modeled Data (2006–2099)

HadGEM2-ES

CNRM-CM5

CanESM2

MIROC5



SCENARIOS

RCP 4.5

Emissions peak
around 2040, then
decline

RCP 8.5

Emissions continue to
rise strongly through
2050 and plateau
around 2100

QUICK STATS

Historical Annual Mean for 1961–1990

74.2°F Observed

Modeled Projected Annual Mean for
2070–2099

79.8°F

[Change Location](#)

Assessing Health Vulnerabilities

Steps

1. Determine Objectives and Scope
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- 5. Prioritize Vulnerabilities**
6. Synthesize and Present Results

Step 5. Prioritize Vulnerabilities

- Determine who will rank (high, medium, low)
- Establish criteria to evaluate
- Use all indicator data to make ranking decisions
- Factor in whether the impact will affect community assets ranked as highly important to protect

TCHP's Exposures, Impacts, and Strategies Inventory (EISI) tool can help

RISK	LIKELIHOOD		
CONSEQUENCES	HIGH	MEDIUM	LOW
HIGH	HIGH	MEDIUM-HIGH	MEDIUM
MEDIUM	MEDIUM-HIGH	MEDIUM	MEDIUM-LOW
LOW	MEDIUM	MEDIUM-LOW	LOW

Figure 5 Risk Assessment Matrix. The Institute for Tribal Environmental Professionals risk matrix is a product of likelihood and consequences.*

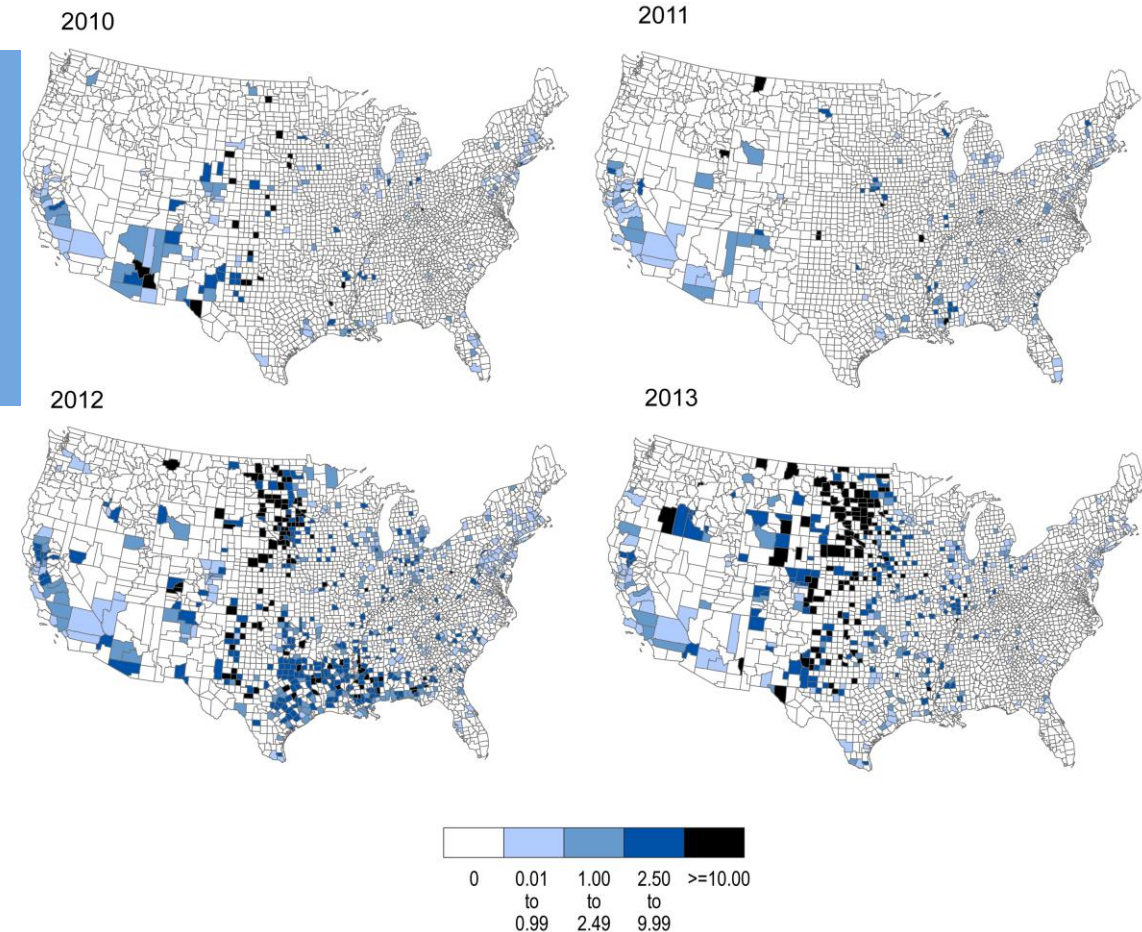
VULNERABILITY =
EXPOSURE RISK +
IMPACT RISK (TO VALUED ASSETS) +
POPULATION SENSITIVITY -
ADAPTIVE CAPACITY

Your Exposures and Health Impacts - Exercise

Individual Exercise:

1. Collect exposure data for your area and evaluate exposure risk
2. Collect health impact data for your area and evaluate vulnerability

Incidence of West Nile Neuroinvasive Disease in the United States



Assessing Health Vulnerabilities

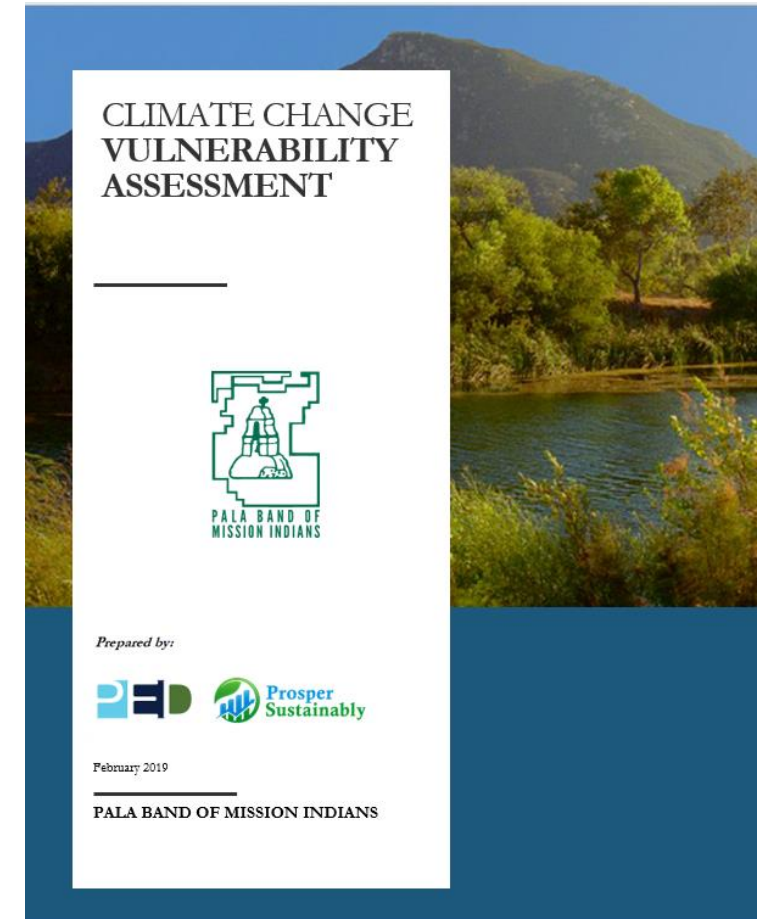
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Step 6. Synthesize and Present Results (*Optional*)

- Incorporate visuals, stories and quotes to make the document compelling to community members and decision makers
- Consider how to use and protect propriety traditional knowledge information
- Present report to decision-makers and seek direction and resources to complete adaptation plan

TCHP's Vulnerability Assessment template can help



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- [Flooding and Storms](#)
- [Drought](#)

Other Relevant Training Materials not Produced by the Tribal Climate Health Project

Tribal Resolution Template – [ITEP's Tribal Climate Change Resolution Template](#)

A scenic landscape featuring a range of mountains in the background under a bright blue sky filled with fluffy white clouds. The foreground shows a dark, silhouetted hillside on the right. A semi-transparent blue box with a thin yellow border is centered horizontally, containing white text.

Individual Reflection: Please take a few minutes to complete Section 3 of “Your Work, Your Community” Form

Wrapping Up

Thank you for being part of our training community!

Suggested reading (complete before next webinar)

- [Oregon Climate and Health Resilience Plan](#)

Next webinar:

November 19, 2019 (9AM PST / Noon EST)

Adaptation Plans Part 1 (Module 4)

***Featuring Guest Speaker on Energy Resilience**

Questions?

Assessing Your Vulnerabilities – Key Resources

Guidance

- Oregon Climate Change Research Institute - [Tribal Climate Adaptation Guidebook](#) (Steps 1, 2 and 3)
- International Tribal Environmental Professionals - [Adaptation Planning Toolkit](#)
- [US Climate Resiliency Toolkit](#)
 - [Tribal National Topic](#)
- CDC: [Assessing Health Vulnerability to Climate Change: A Guide for Health Departments](#)
- [CDC Community Health Needs Assessment](#)
- U.S. Center for Disease Control and Prevention: [Building Resilience Against Climate Effects \(BRACE\)](#)
- [IPCC – Chapter 11: Human Health: Impacts, Adaptation, and Co-benefits](#)
- [ITEP Webinar \(2018\)](#)

Tools and Templates

- TCHP - [Exposures, Impacts, Strategies Inventory \(EISI\) tool – Beta Version](#)
- TCHP - [Pala Vulnerability Assessment Sample](#)

- TCHP - [Climate Vulnerability Experiences and Priorities Survey Template](#)
- TCHP – [Blog: “Data Sources to Assess Tribal Climate and Health Data”](#)
- TCHP – [Resources Clearinghouse](#)
- CDPH – [Template for Assessment of Local Climate Mitigation, Adaptation, and Resilience](#)
- International Tribal Environmental Professionals – [Resolution Template](#)

Examples

- NIHB - [Tribal Climate Champions: Spotlight on Gila River Indian Community](#)
- US Dept of Energy - [Makah Tribal Engagement](#)
- UW Climate Impacts Group - Makah Interview
- [Swinomish Indigenous Health Indicators video](#)
- [Shoshone-Bannock Tribe video](#)
- [Collville Tribes Climate Change Page](#)
- Oregon State Health Authority – [Climate and health video](#)

Tribal Vulnerability Assessments

- [Pala Vulnerability Assessment](#)
- [Community Observations on Climate Change: Nashagak River Trip Report](#)
- [Climate Change Vulnerability of Native Americans in the Southwest](#)
- [Puyallup Climate Change Impact Assessment](#)
- Upper Snake River Watershed: [Climate Change Vulnerability Assessment](#)
- [Swinomish Climate Change Initiative Impact Assessment Technical Report](#)
- Jamestown S’Klallam Tribe: [Climate Vulnerability Assessment and Adaptation Plan](#)
- [Karuk Tribe Climate Vulnerability Assessment](#)