

Assessing Drought Impacts Using Community Assessment for Public Health Emergency Response (CASPER)

Jason Wilken, PhD, MPH

CDC Career Epidemiology Field Officer Assigned to the California Department of Public Health

DROUGHT DESK *Environmental & Occupational Emergency Preparedness Team*

Preparing for the Health Impacts of Drought • February 4, 2019

Town Out of Water

Drought

A “deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people”

—National Oceanic and Atmospheric Administration

Photo: Justin Sullivan — Getty Images

Photo: Justin Sullivan — Getty Images

Drought

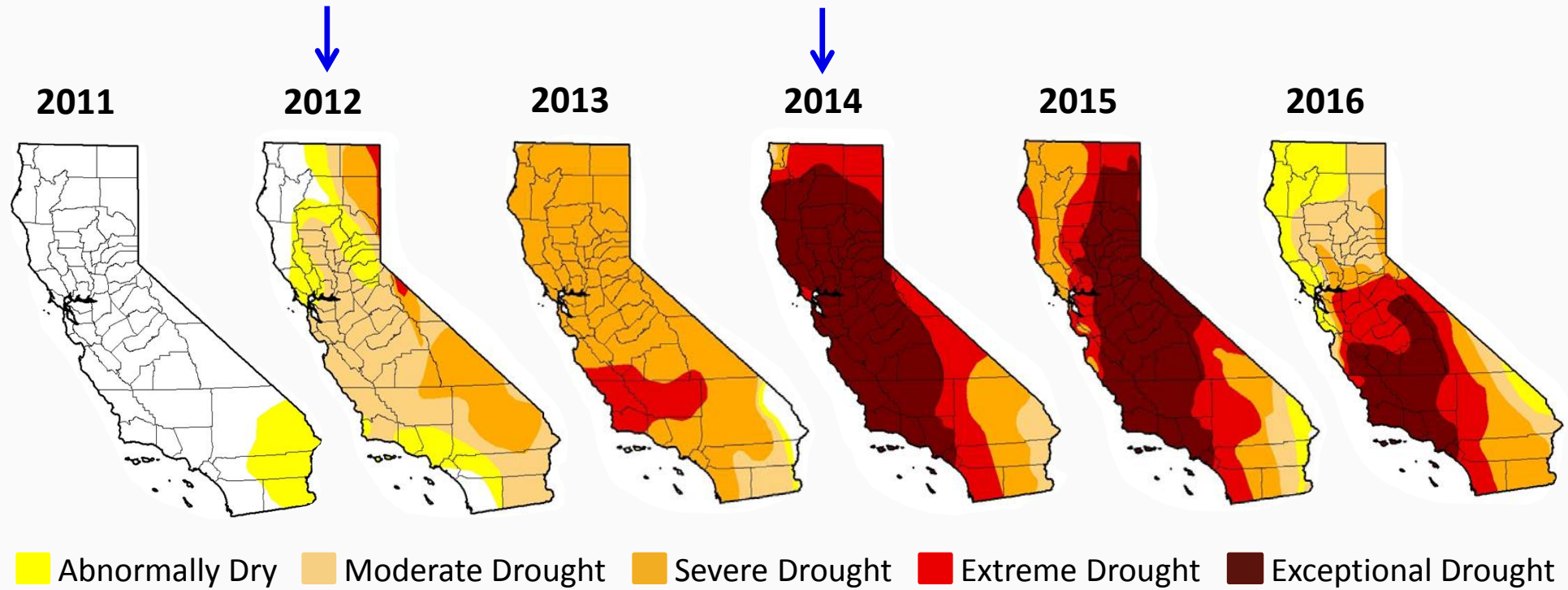
...a complex and prolonged disaster



one of the most costly climate-related events

Photo: Justin Sullivan — Getty Images

Photo: Justin Sullivan — Getty Images



Source: U.S. Drought Monitor

The Mercury News

Brown declares California drought emergency

Potential Health Effects of Drought

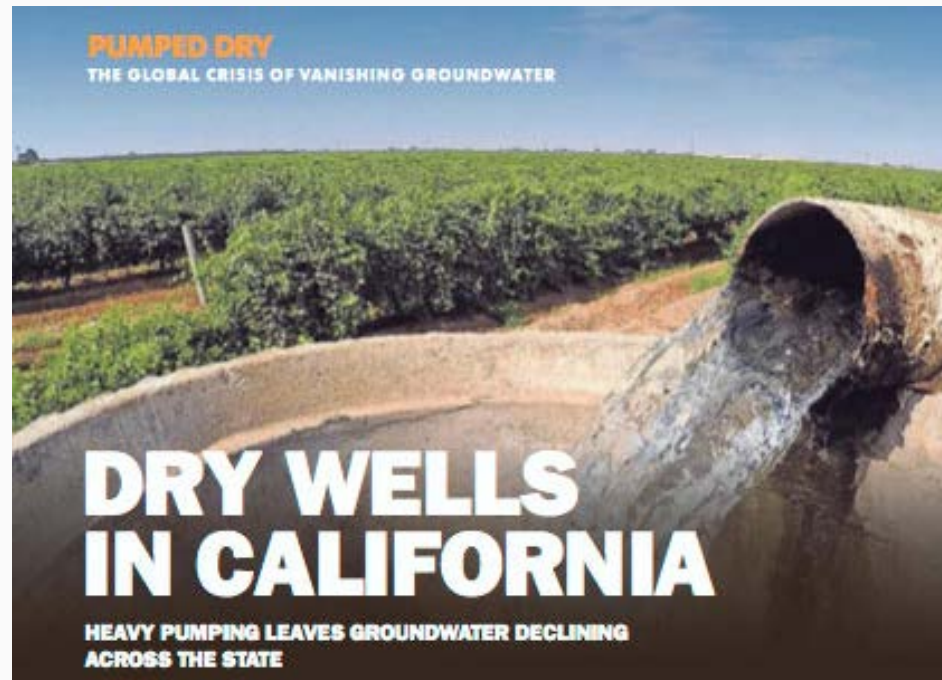
- Decreased quality and quantity of potable water



Photo: California Department of Water Resources

Potential Health Effects of Drought

- Decreased quality and quantity of potable water



2,600 dry wells

13,000 residents

Potential Health Effects of Drought

- Decreased quality and quantity of potable water
- Compromised food and nutrition

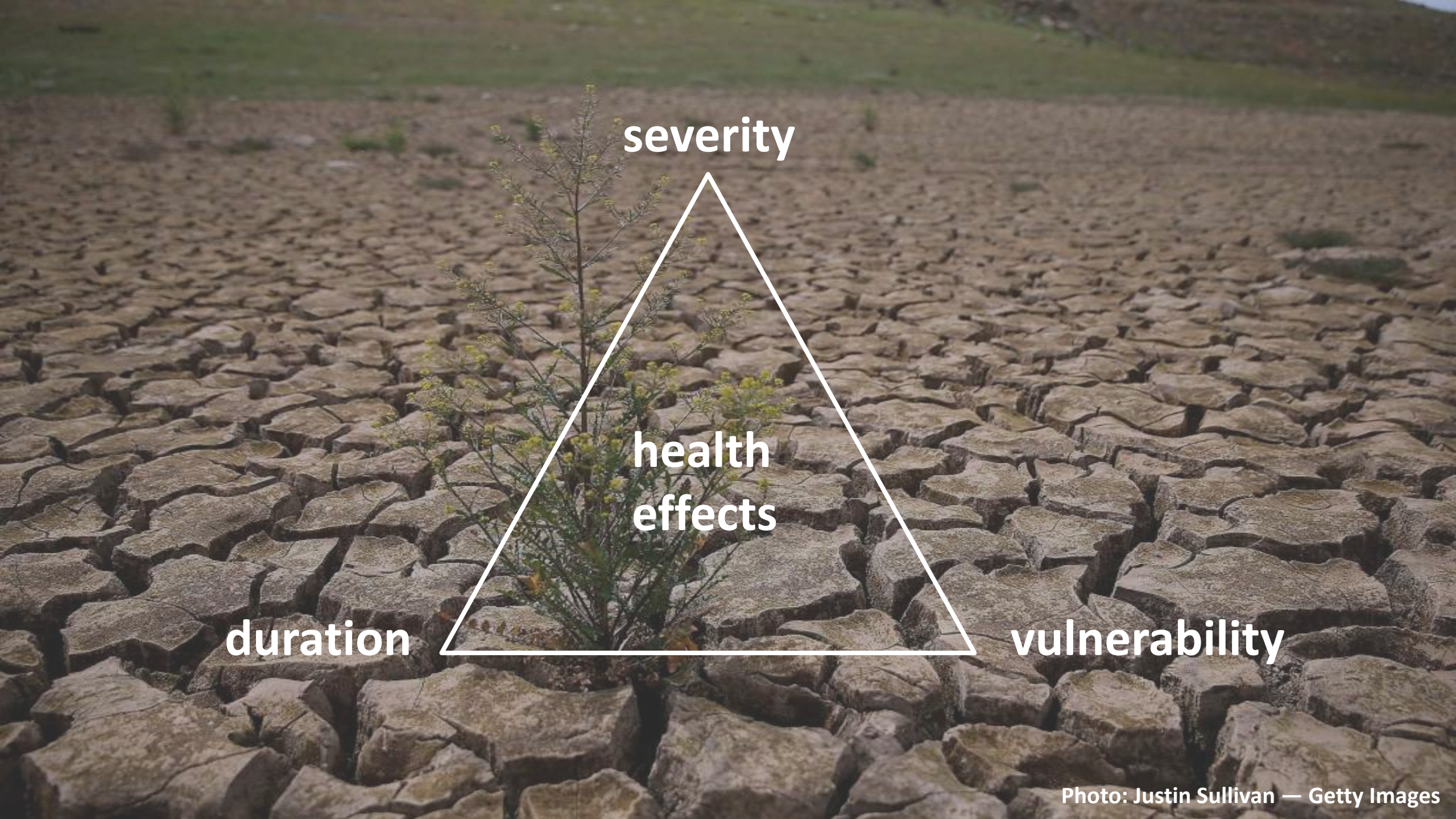


Potential Health Effects of Drought

- Decreased quality and quantity of potable water
- Compromised food and nutrition
- Increased disease incidence

Potential Health Effects of Drought

- Decreased quality and quantity of potable water
- Compromised food and nutrition
- Increased disease incidence
- Adverse behavioral health outcomes



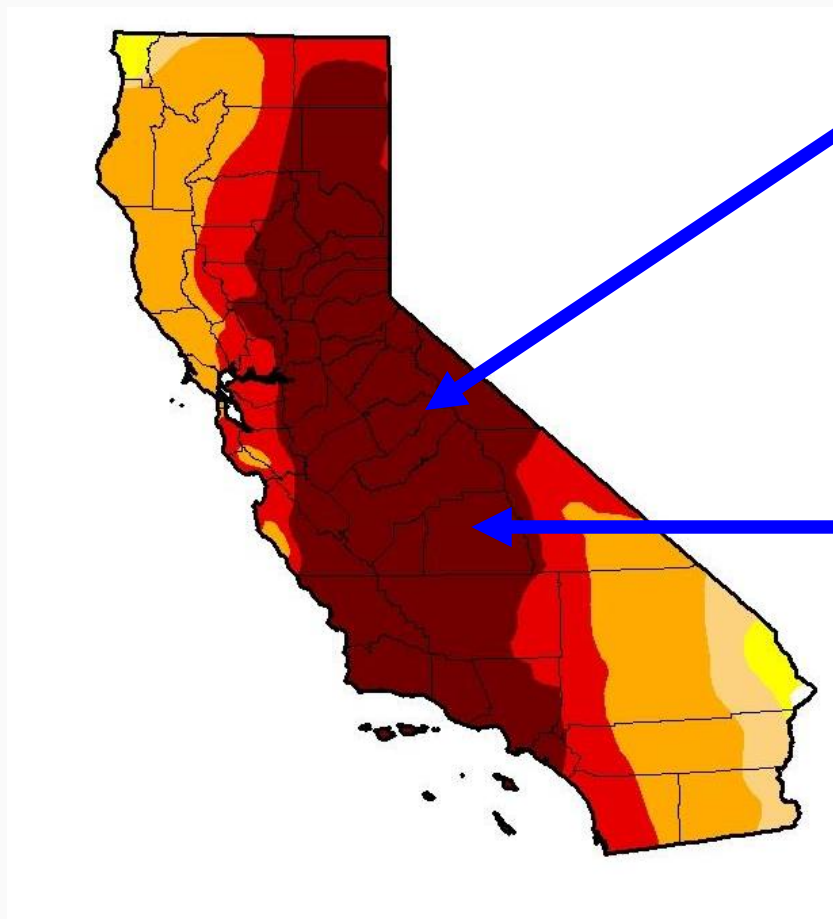
severity

**health
effects**

duration

vulnerability

Assessments of Public Health Impact of Drought, 2015



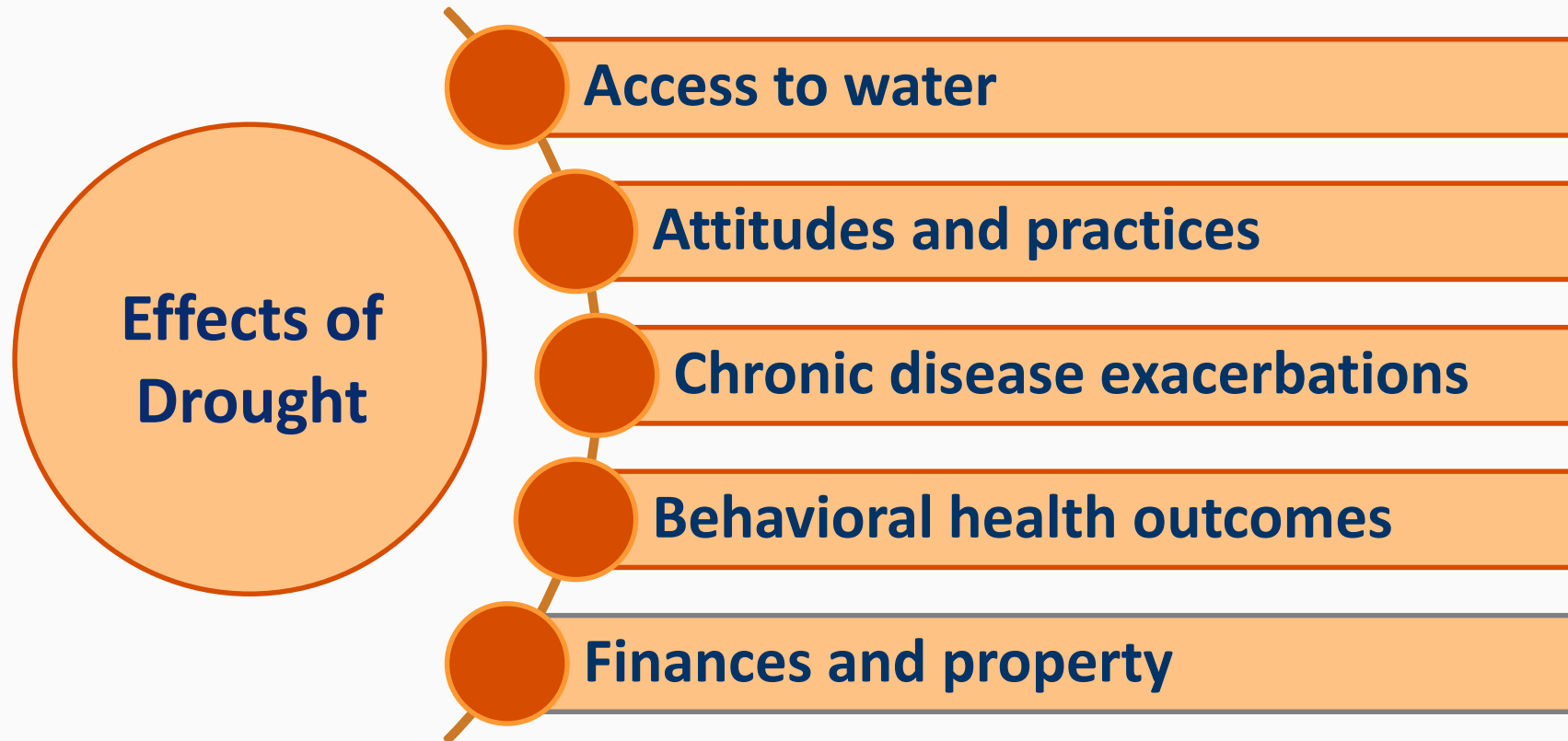
Mariposa County:

- Sierras, forested foothills
- Massive tree-deaths, low reservoirs

Tulare County:

- Central valley, agricultural
- >1,300 dry wells, impacting >6,000 residents

Objectives



Community Assessment for Public Health Emergency Response (CASPER)



- **Rapid needs assessment**



- **Disaster response**



- **Decision making and resource allocation**



- **Specific needs of local health jurisdiction**

Community Assessment for Public Health Emergency Response (CASPER)



- **Two-stage sampling**

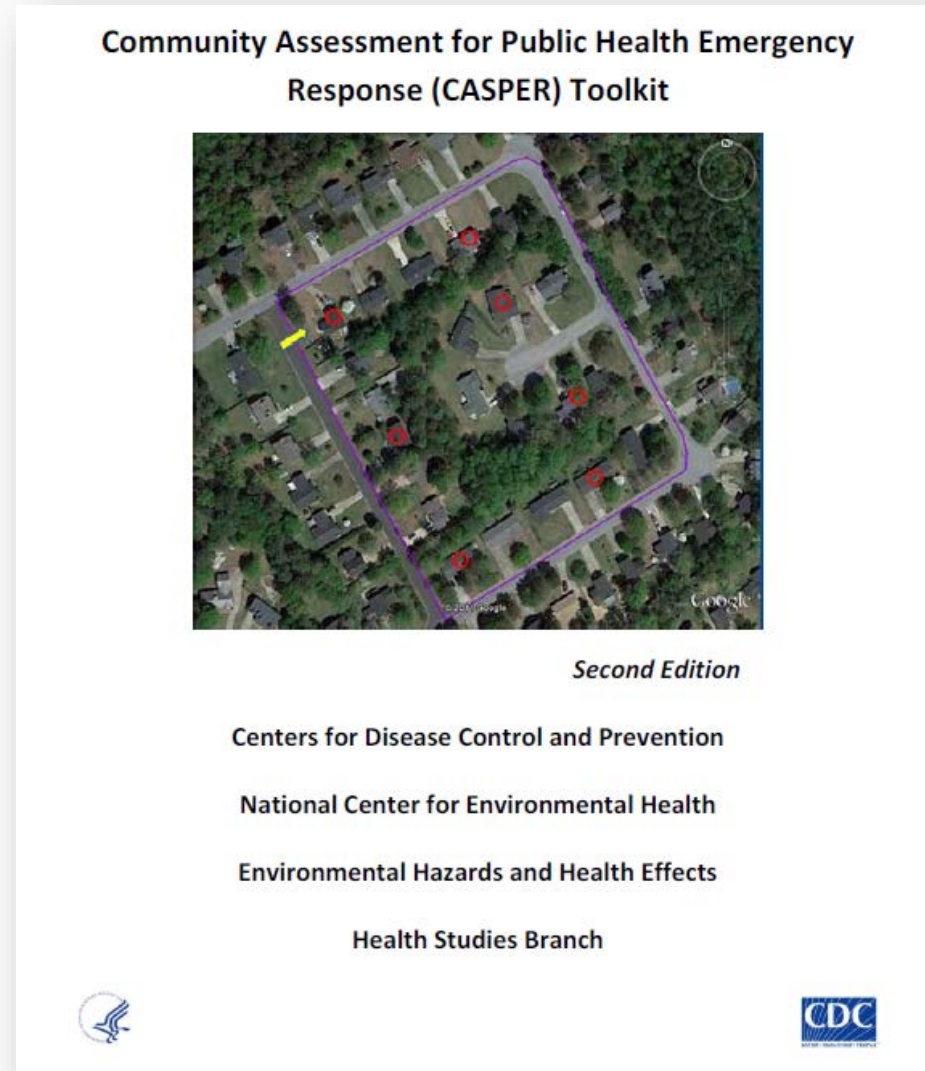


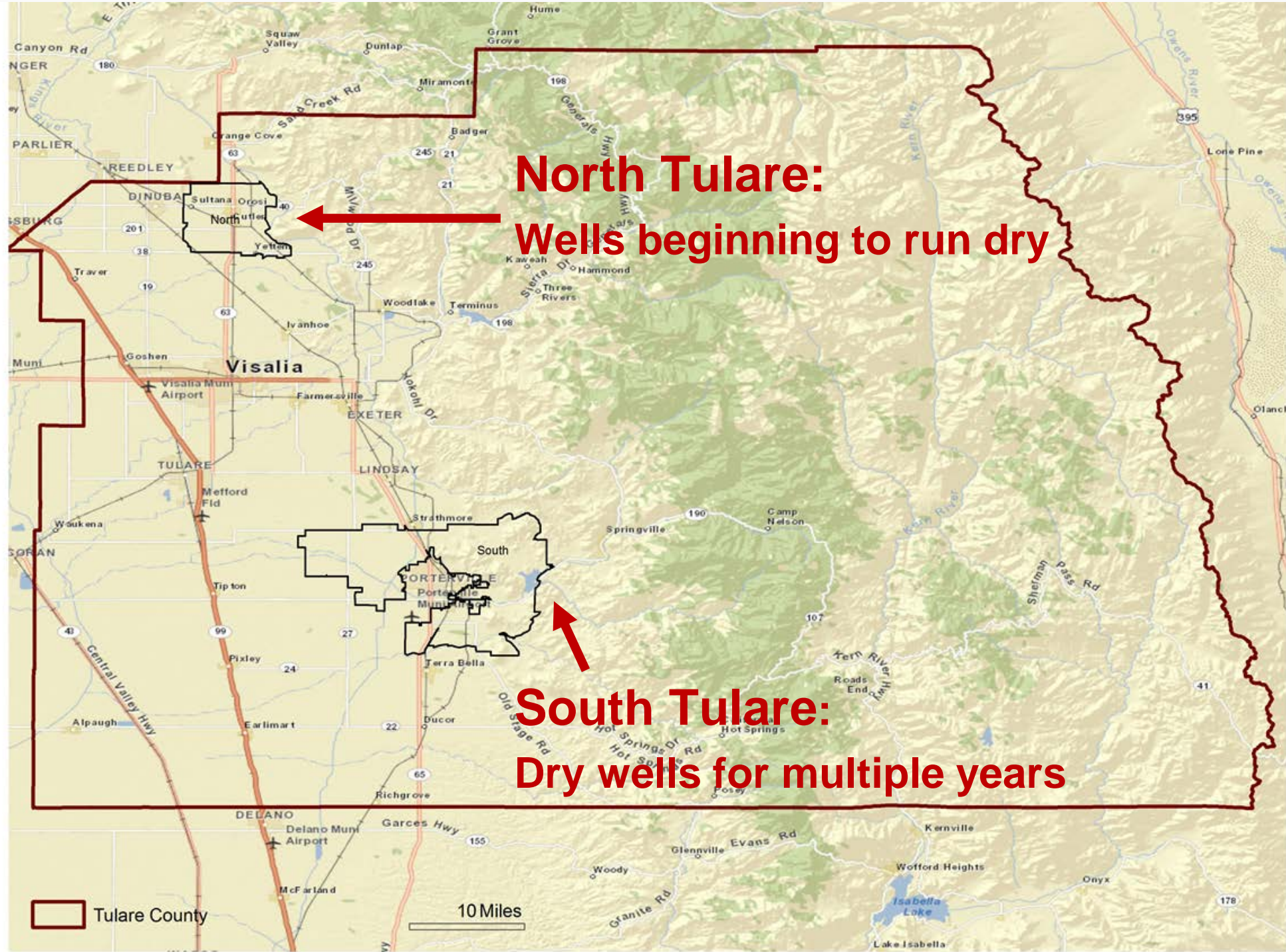
- **210 interviews (30 x 7 design)**



- **Generalized to the area of interest**

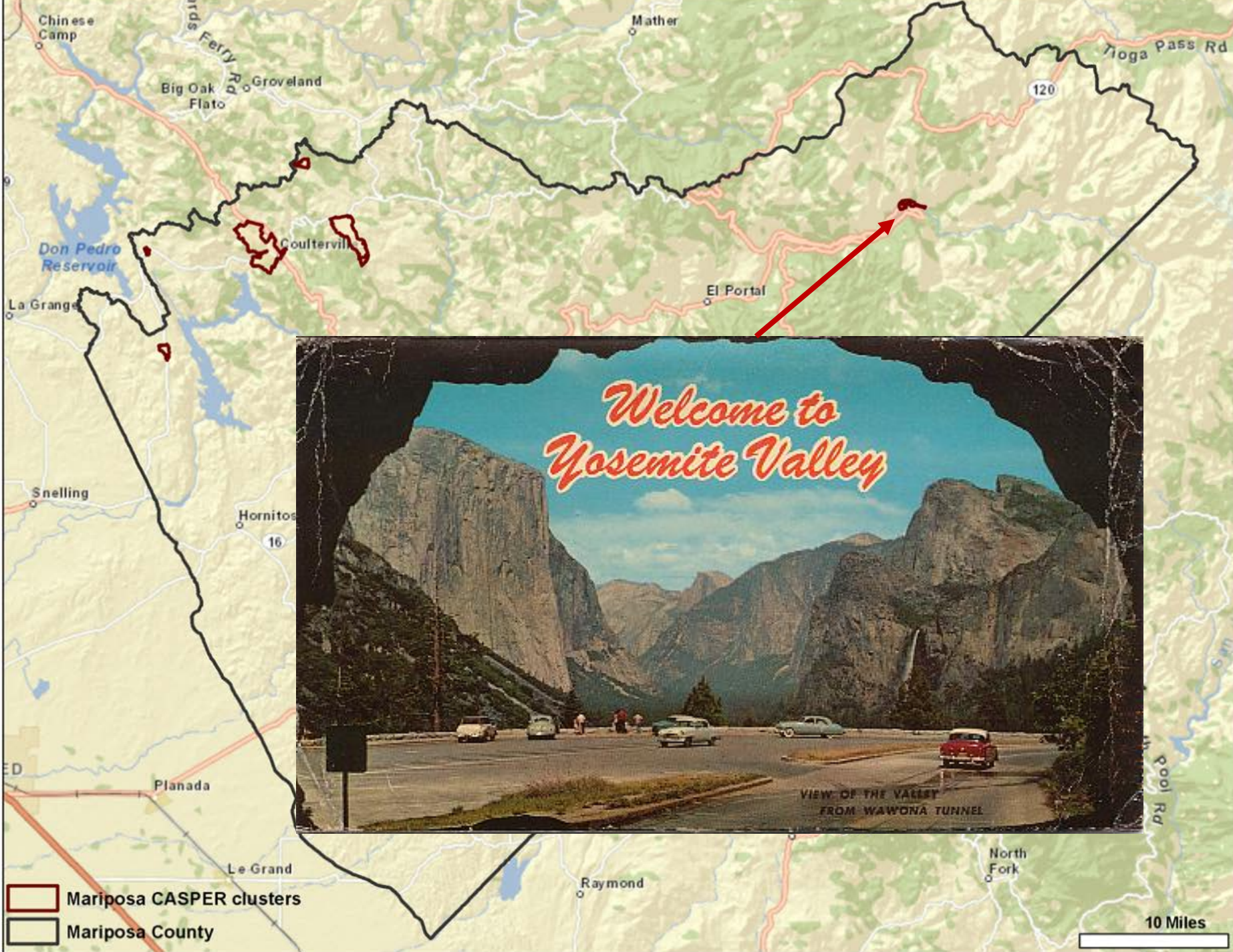
Community Assessment for Public Health Emergency Response (CASPER)





**North Tulare:
Wells beginning to run dry**

**South Tulare:
Dry wells for multiple years**



 Mariposa CASPER clusters
 Mariposa County

10 Miles



SAVE
OUR
WELLS

OUR
WELL
IS
DRY!

<u>Private wells</u>	No running water in home	
North Tulare	North Tulare:	8%
South Tulare	South Tulare:	12%
Mariposa	Mariposa:	3%

Photo: Chris Richard

A woman with long dark hair, wearing a blue floral dress, is seen from behind, washing clothes in a blue plastic tub. The tub is placed on a kitchen counter. In the background, there is a window with floral curtains and a sink area with various kitchen items like a pot and a bowl. A semi-transparent blue box with white text is overlaid on the left side of the image.

Capture and reuse water

North Tulare: 29%

South Tulare: 42%

Mariposa: 37%



Wash hands less frequently/ shorter duration

North Tulare: 58%

South Tulare: 68%

Mariposa: 52%

Property impacts

North Tulare: 39%

South Tulare: 48%

Mariposa: 54%

Financial impacts

North Tulare: 39%

South Tulare: 40%

Mariposa: 25%

Chronic condition has gotten worse since drought started*

North Tulare:	26%
South Tulare:	46%
Mariposa:	36%

* Among households reporting a member with a chronic condition

Acutely stressed

North Tulare: 15%

South Tulare: 26%

Mariposa: 8%

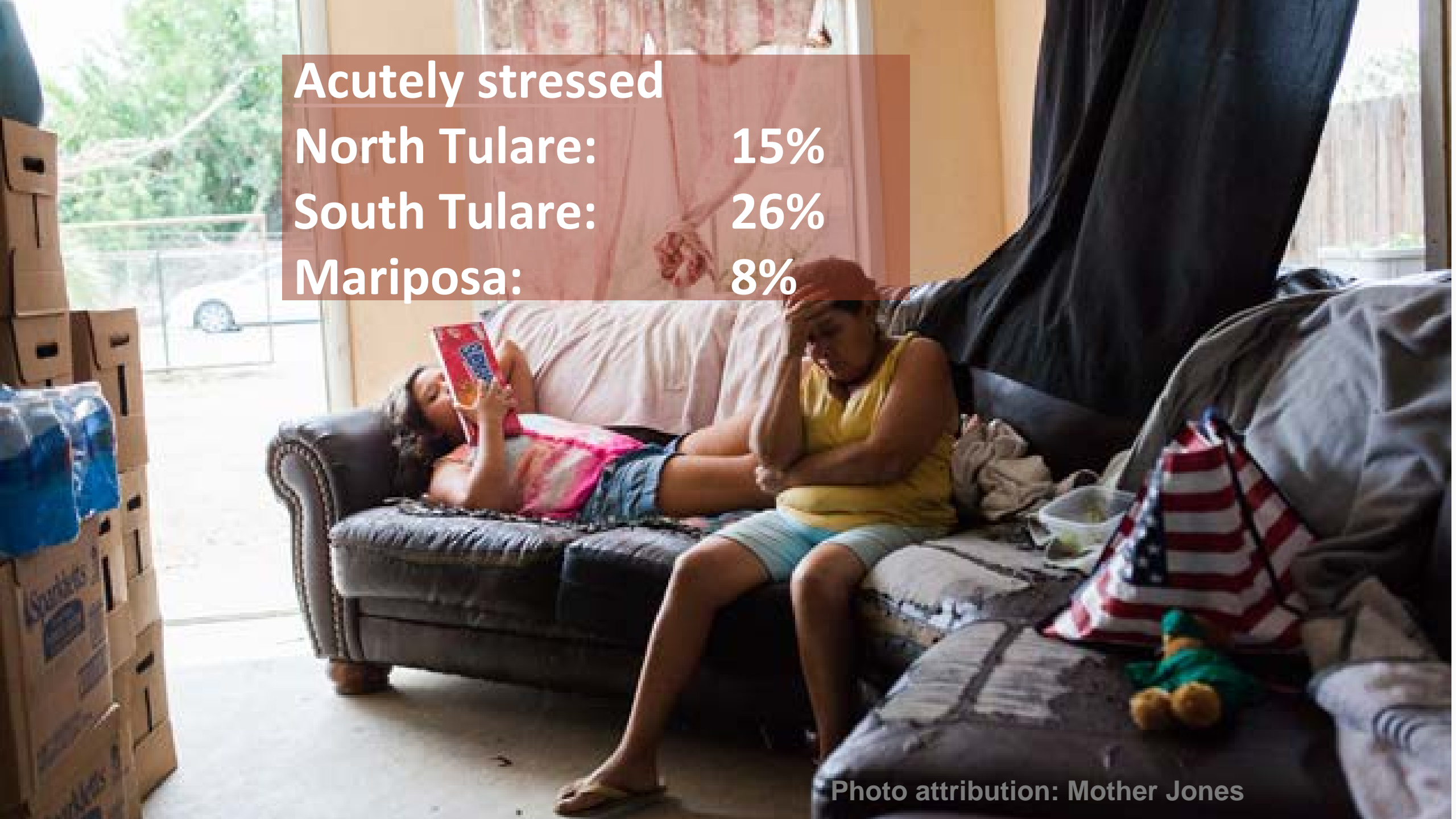


Photo attribution: Mother Jones

Considered moving

North Tulare: 14%

South Tulare: 34%

Mariposa: 17%



A photograph of a cracked, dry earth surface, likely a result of drought. The ground is composed of numerous irregular, polygonal blocks of dry soil, separated by deep, dark cracks. In the center of the frame, a small, thin green plant with yellow flowers is growing out of a crack. The background shows a flat, dry landscape extending to a distant horizon under a clear sky.

Decreased quantity of potable water

Water conservation behaviors

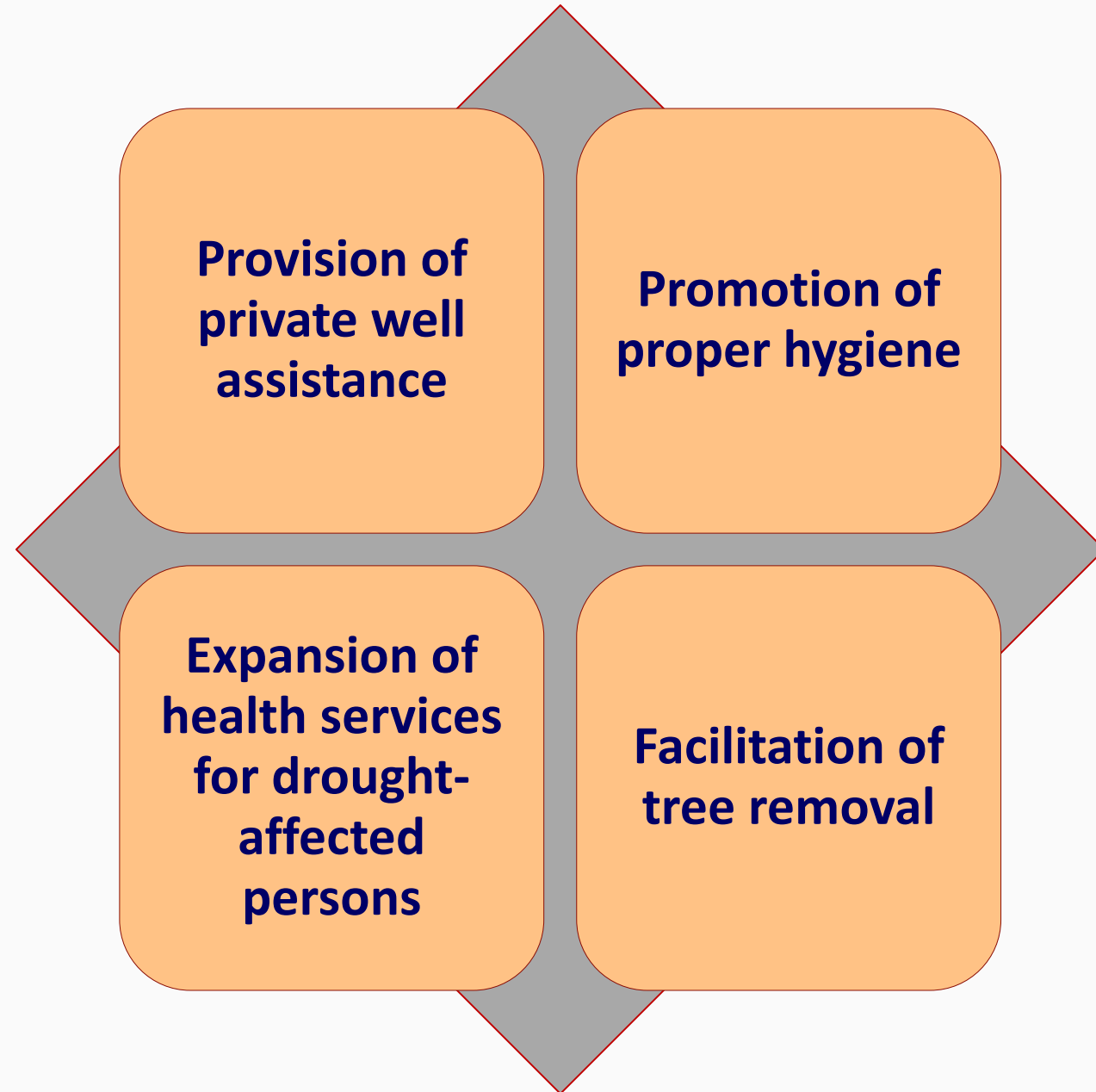
Exacerbations of chronic disease

Acute stress

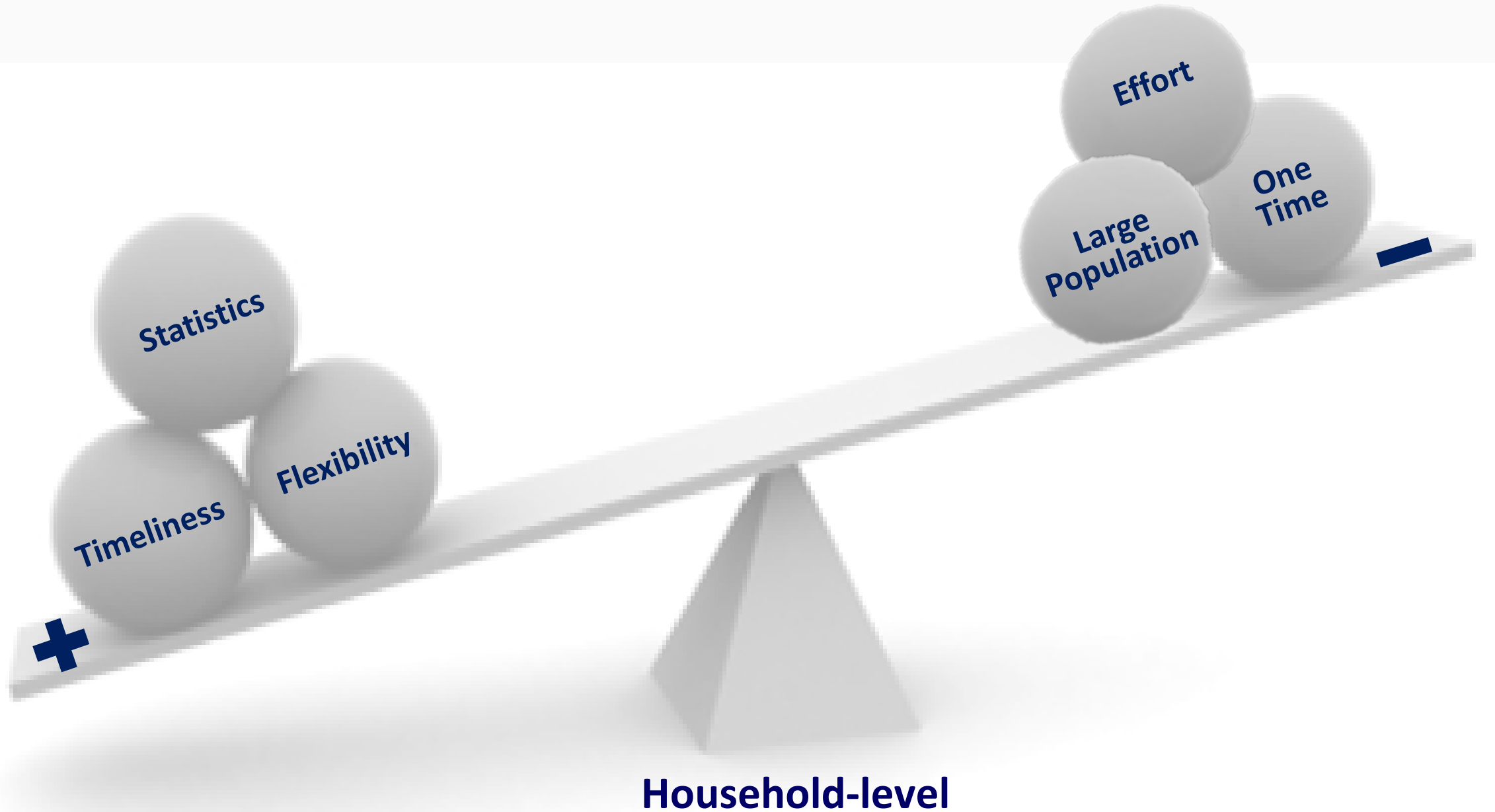
Property and financial effects

Depopulation risk

Recommendations



Is CASPER Right for the Job?



CASPER e-Courses and Videos

- UNC course (25min, CEU available)

https://nciph.sph.unc.edu/tws/HEP_CASPER/certificate.php

- CDC course (60-120 min, CEU available)

http://www.cdc.gov/nceh/hsb/disaster/CASPER_elearning/

- Lake County, **CA, 2012 (9-min)**

<https://www.youtube.com/watch?v=vf12bE-pdu0>

- Fort Bend, **TX, 2015 (5-min)**

<https://www.youtube.com/watch?v=37mWBZ83aQE>

- Ysleta Del Sur Pueblo Indian Nation, by El Paso, **TX, 2015 (7-min)**

https://www.youtube.com/watch?v=pQtpKoAaV_w

- Harris County, **TX, 2015, 2017**

(3-min) <https://www.youtube.com/watch?v=IDgna5xyG4c> *(10-min)* <https://www.youtube.com/watch?v=GwB9jtTbrKU>

(nine 1-min videos on different CASPER aspects)

<https://www.youtube.com/playlist?list=PLOBJgqWGHBJEcdrJhS22AL3cvumFxtVWz>

- **CDC Response to Hurricanes, 2018 (5-min)**

<https://www.youtube.com/watch?v=bTc91V1Xexg>

A white, rectangular sign with a black border and a slightly curved bottom edge is mounted on a metal guardrail. The sign contains the text "NO DIVING FROM BRIDGE" in bold, black, sans-serif capital letters. The background of the image shows a sandy area with sparse vegetation and a sunset sky.