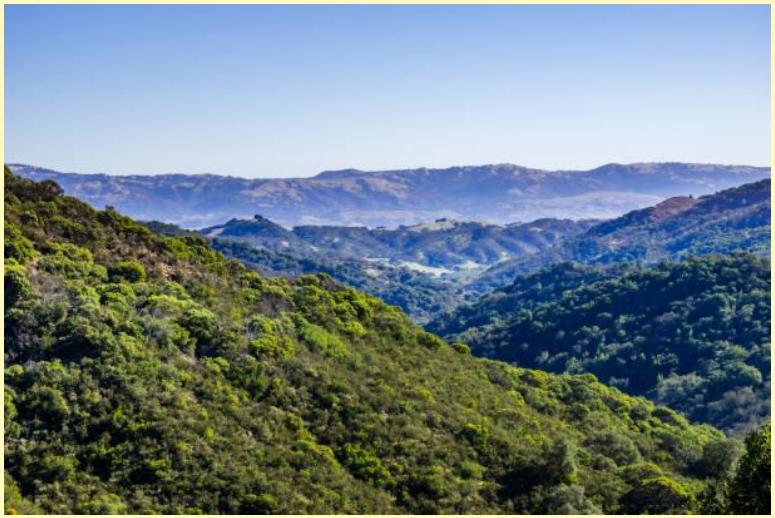
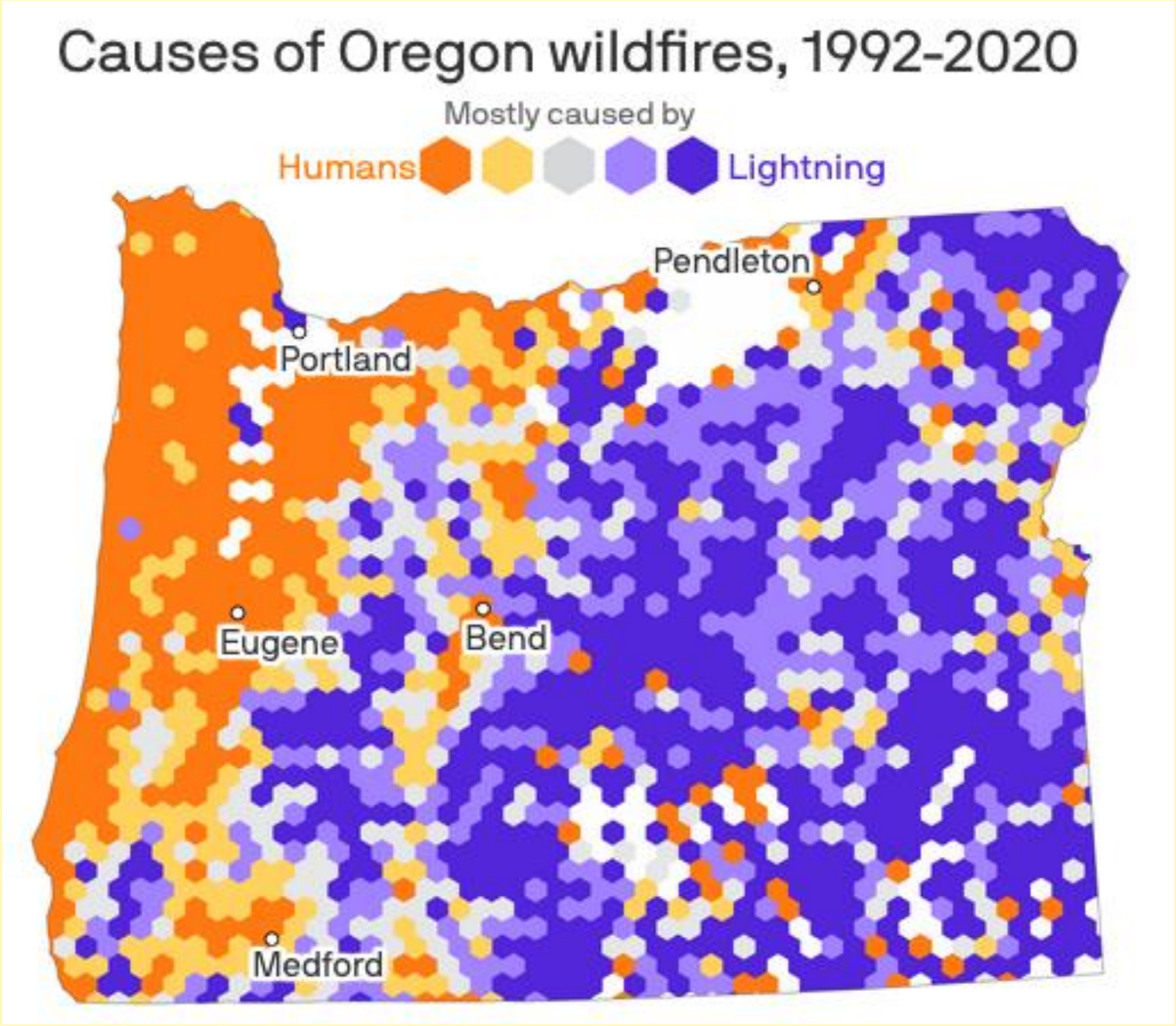
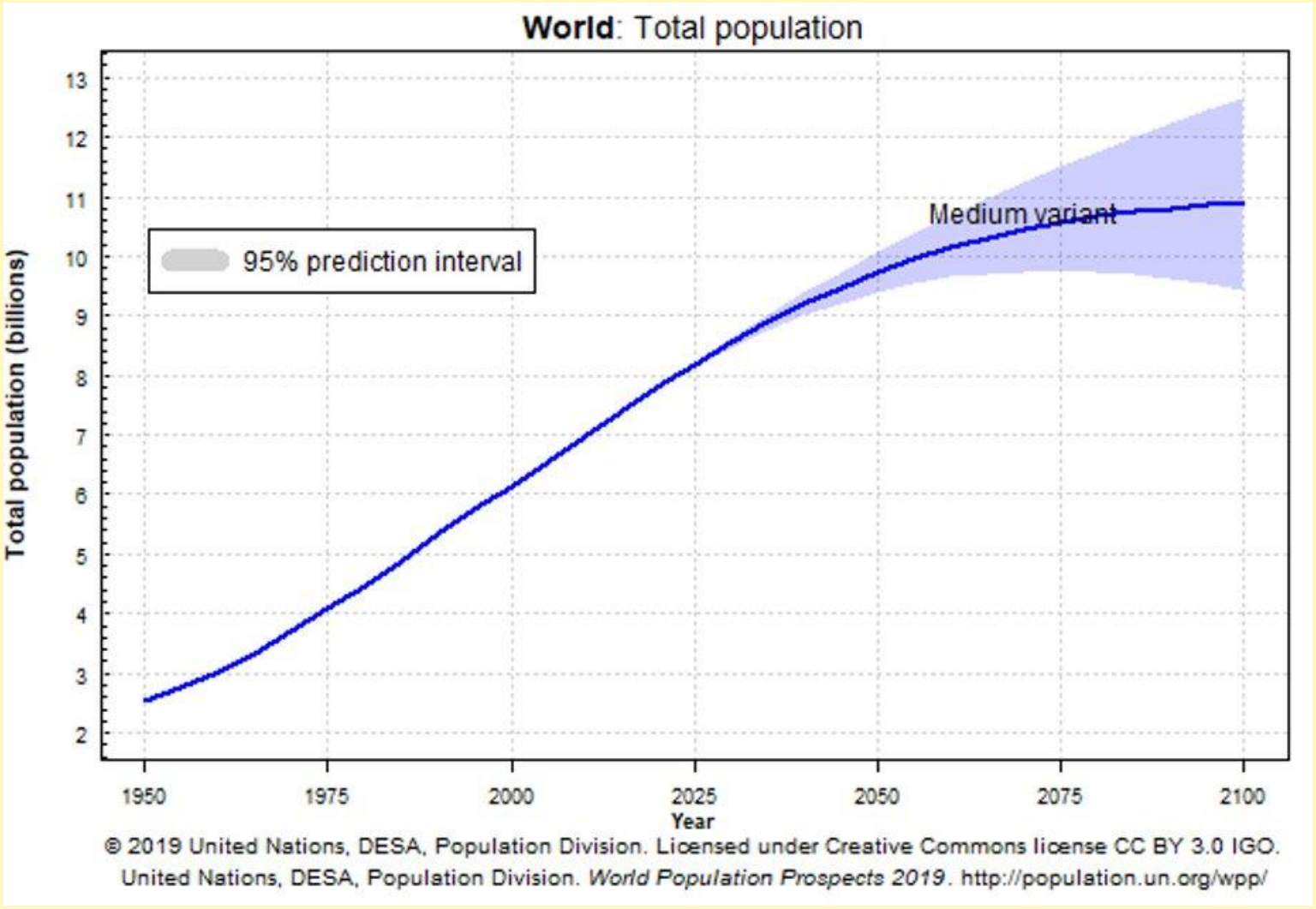
# Enabling conditions

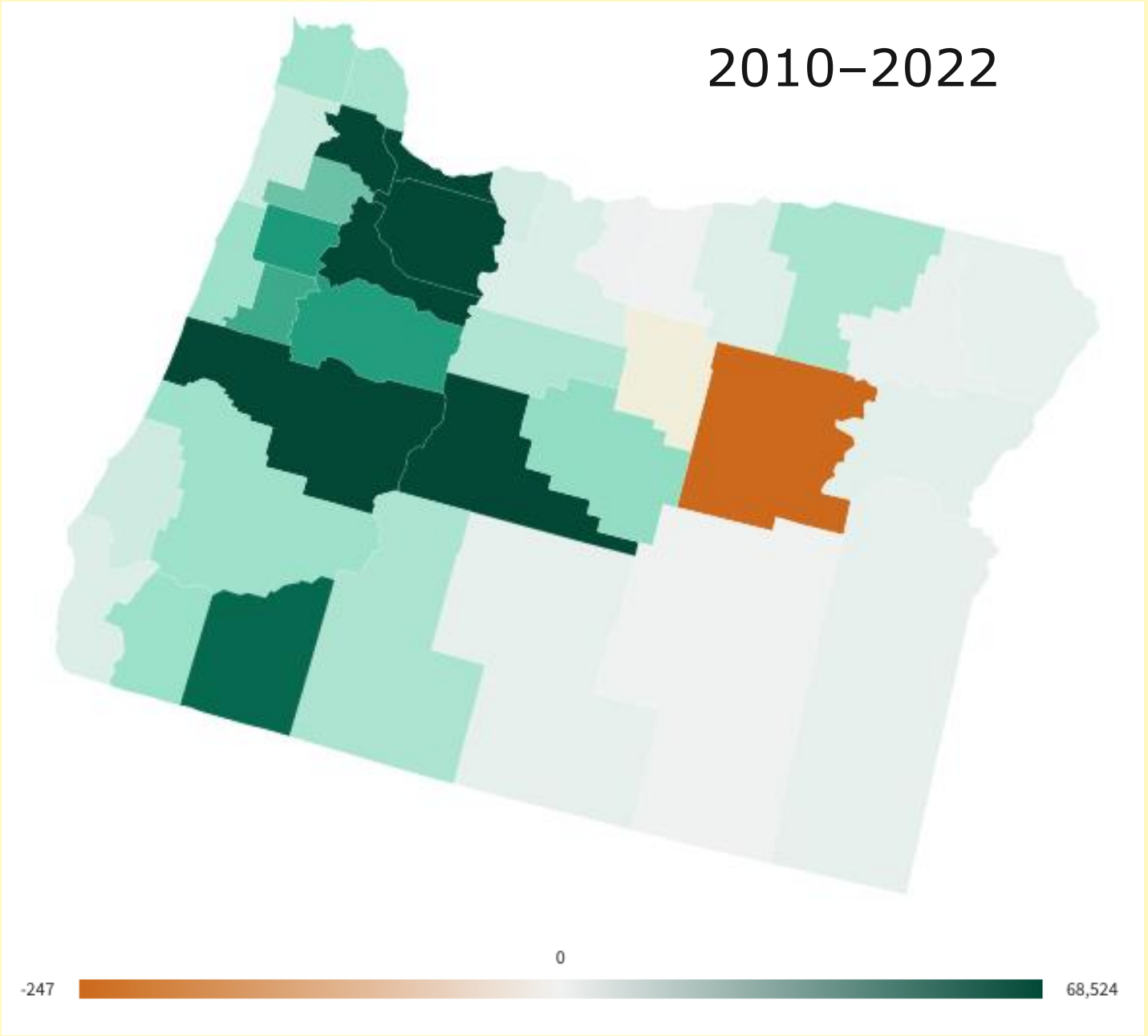





Erin Davis / Axios Visuals

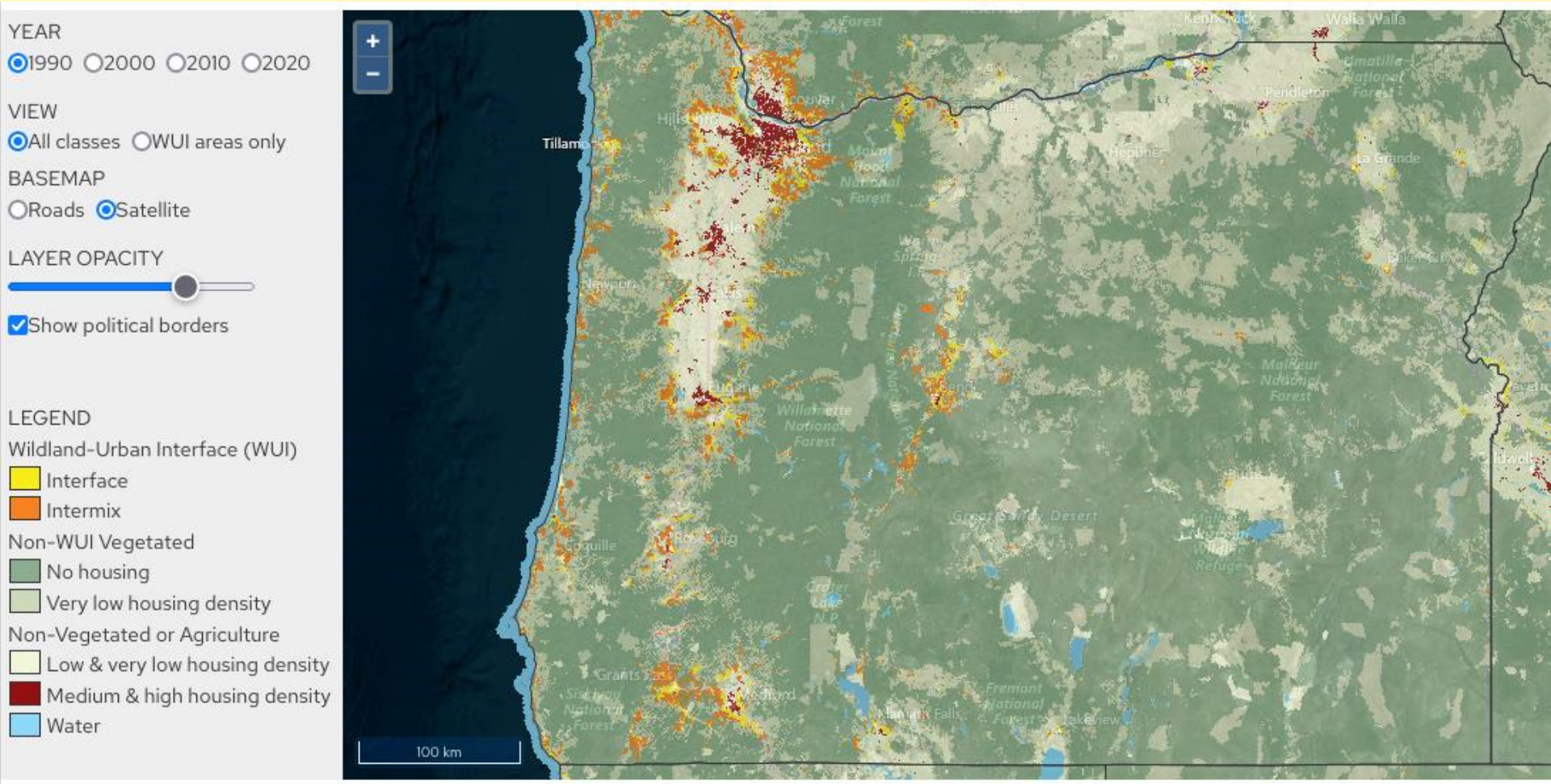
# I = PAT


World: Total population
Total population (billions)
13
12
11
10
9
8
7
6
5
4
3
2
95% prediction interval
Medium variant
1950
1975
2000
2025
2050
2075
2100
Year
© 2019 United Nations, DESA, Population Division. Licensed under Creative Commons license CC BY 3.0 IGO.
United Nations, DESA, Population Division. World Population Prospects 2019. http://population.un.org/wpp/

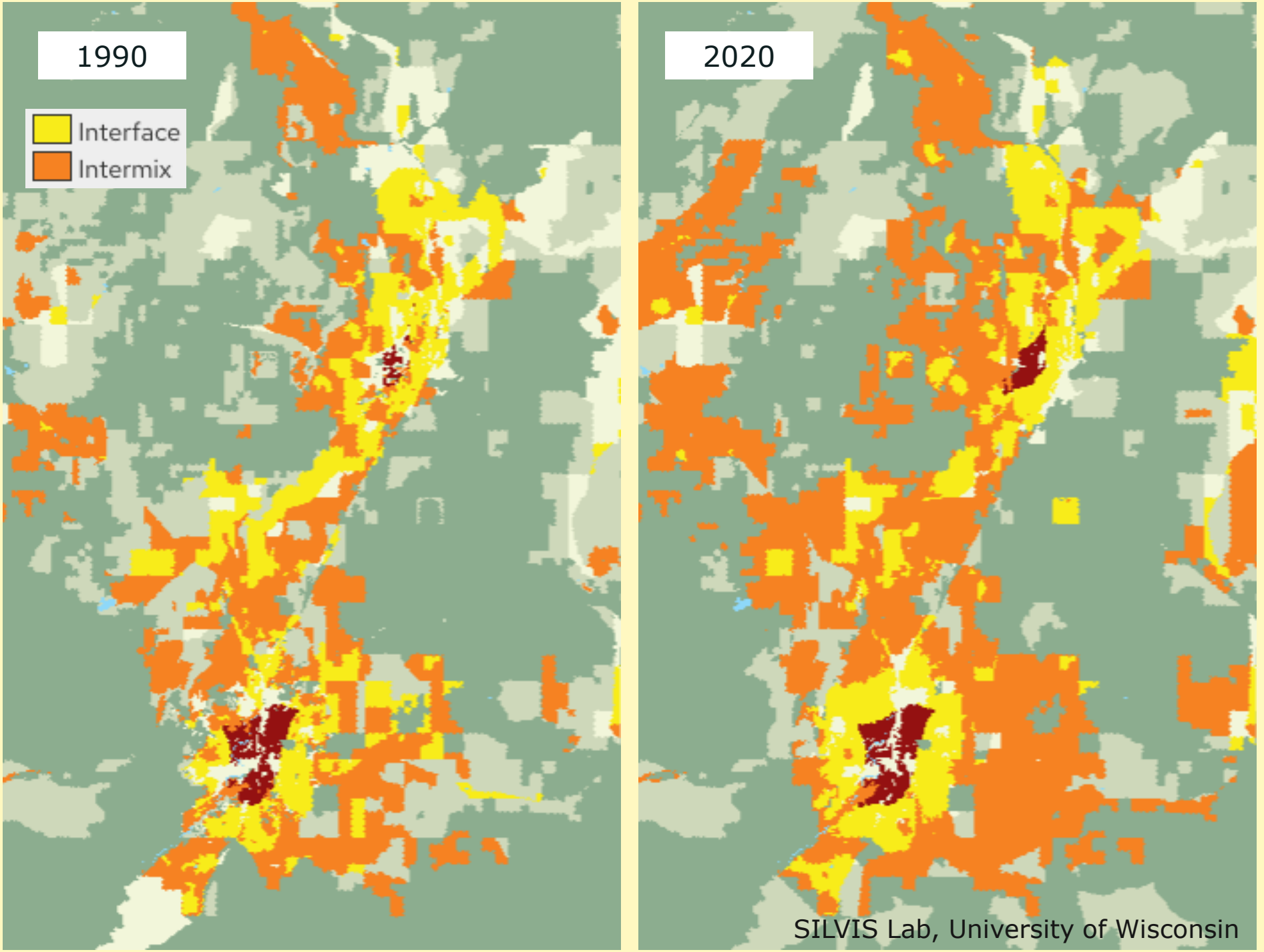


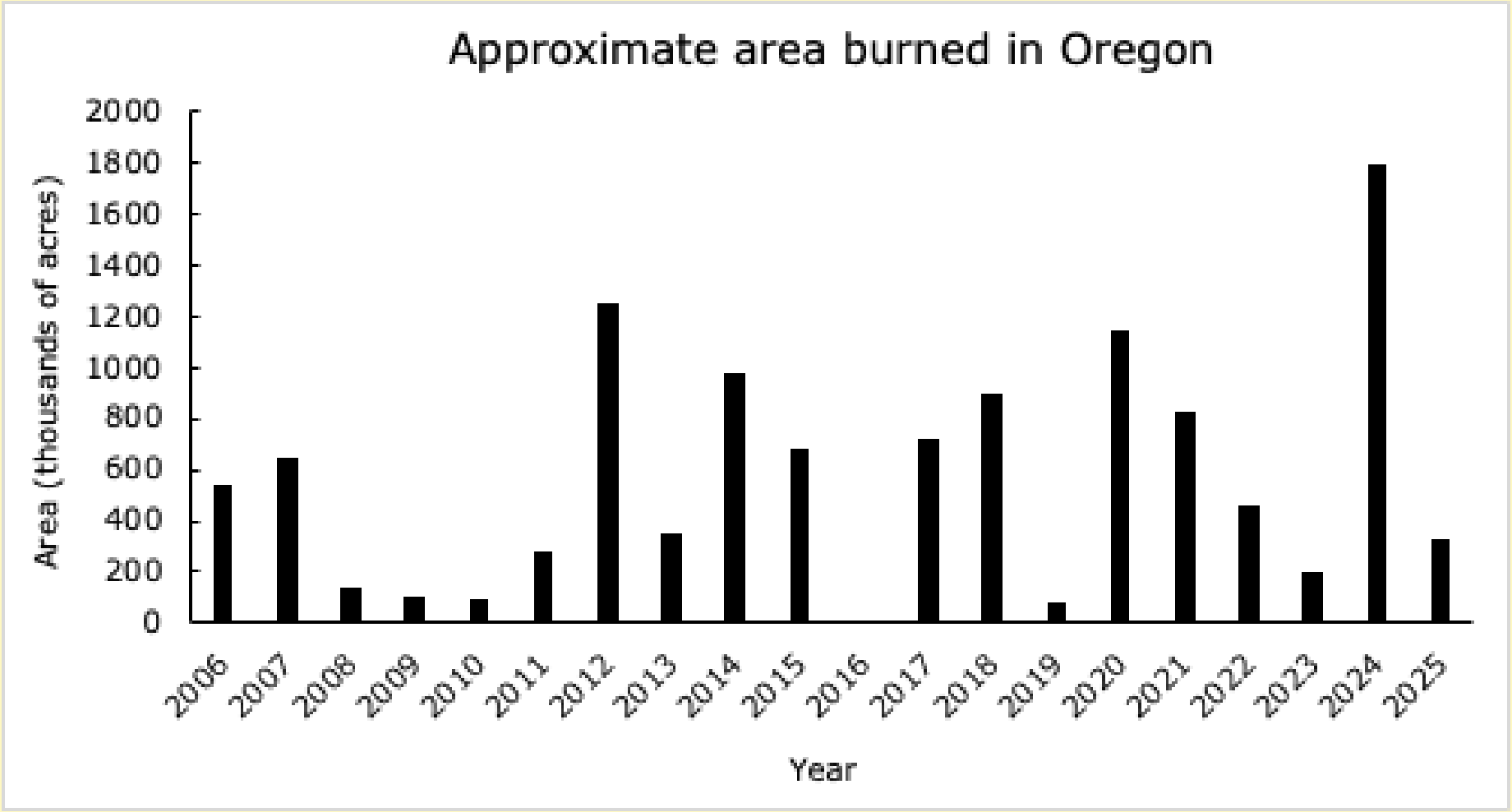

https://usafacts.org

Intermix: housing and vegetation are mixed
Interface: housing abuts continuous wildland vegetation

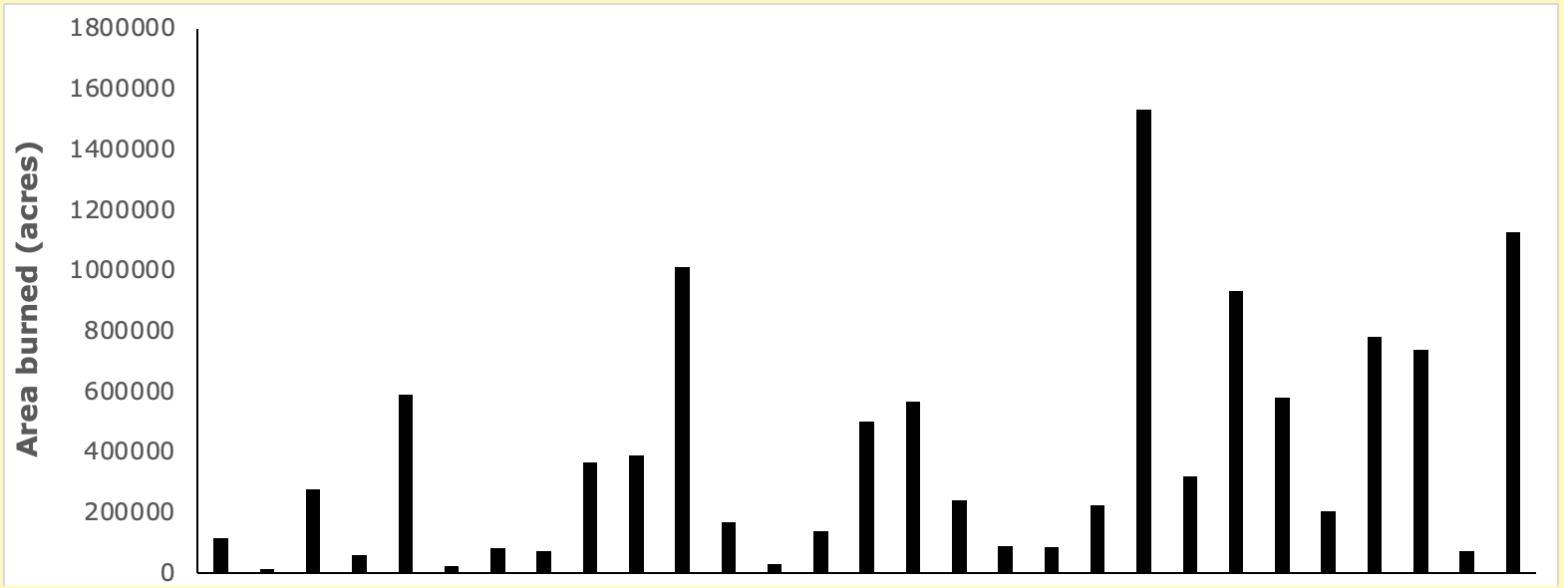


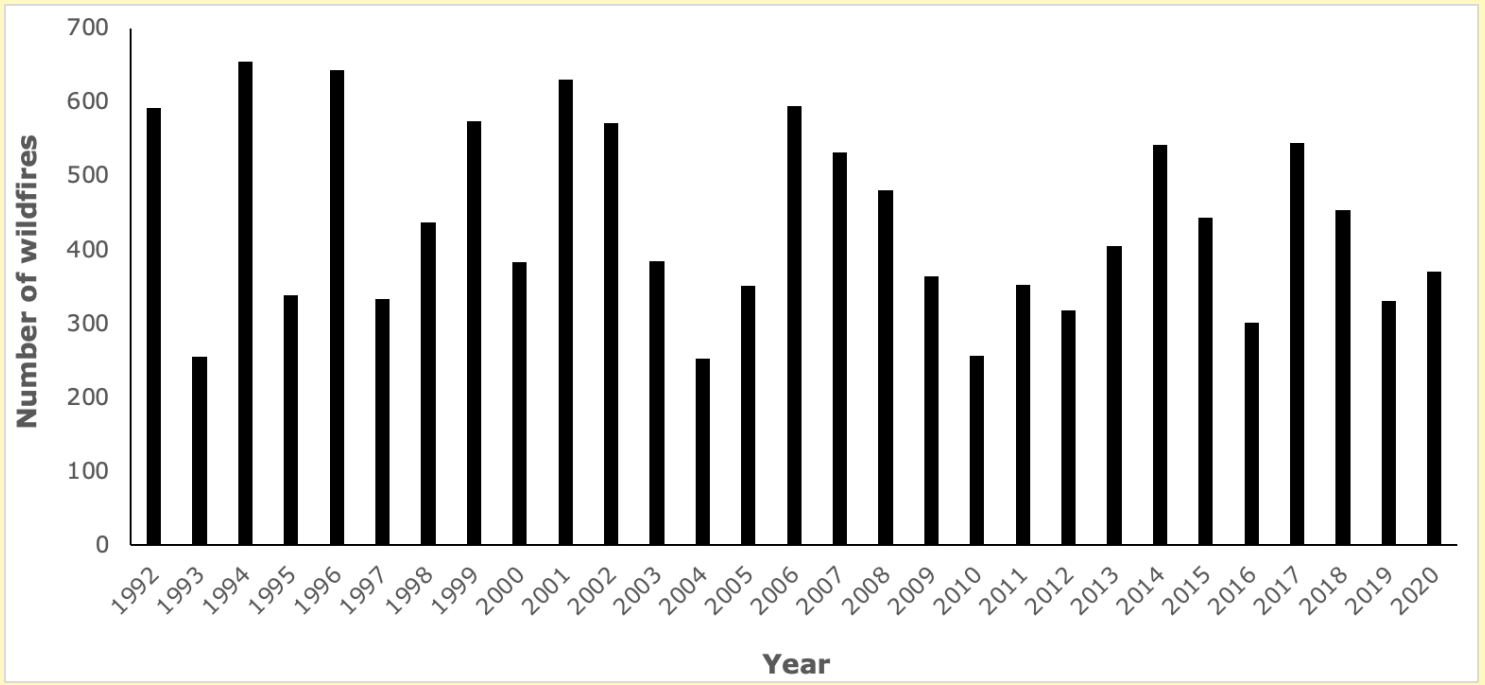

https://silvis.forest.wisc.edu/data/wui-change/


1990
Interface
Intermix
2020
SILVIS Lab, University of Wisconsin




Data from National Interagency Coordination Center



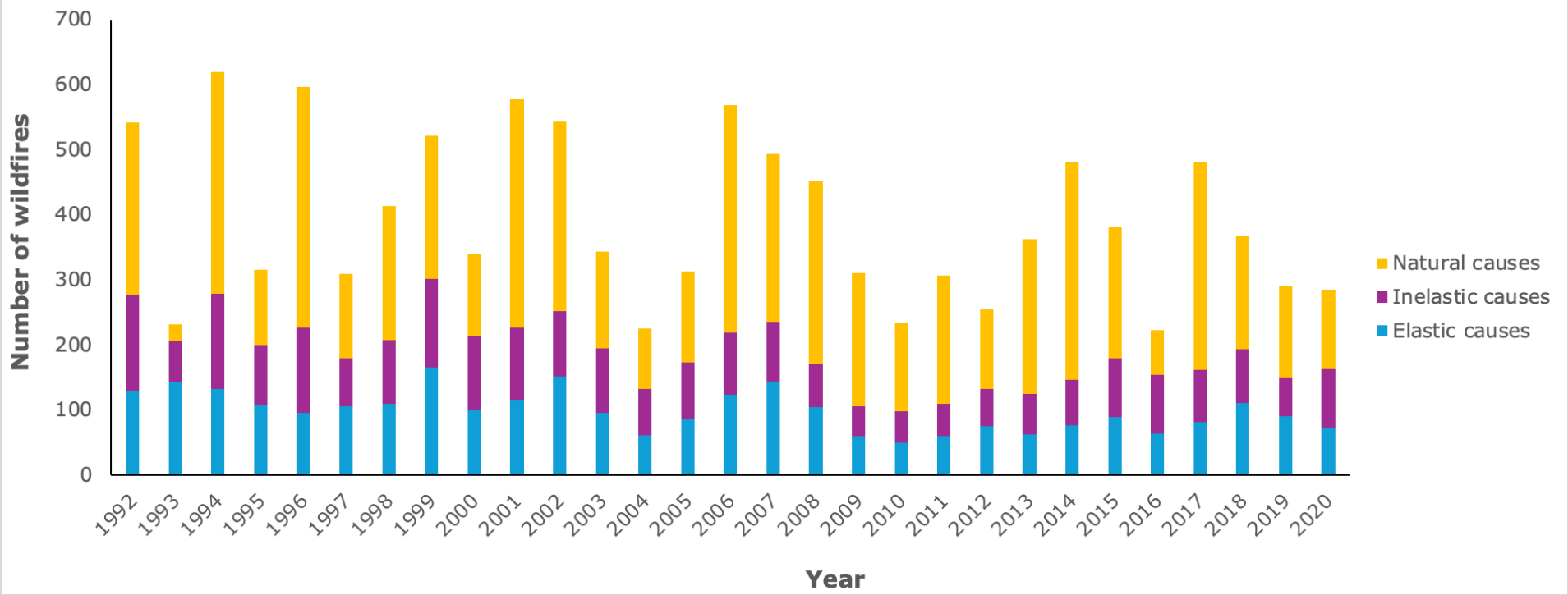




Data from U.S. Forest Service

# Causes of wildfires: Fire Program Analysis Fire-Occurrence Database (Short 2022)

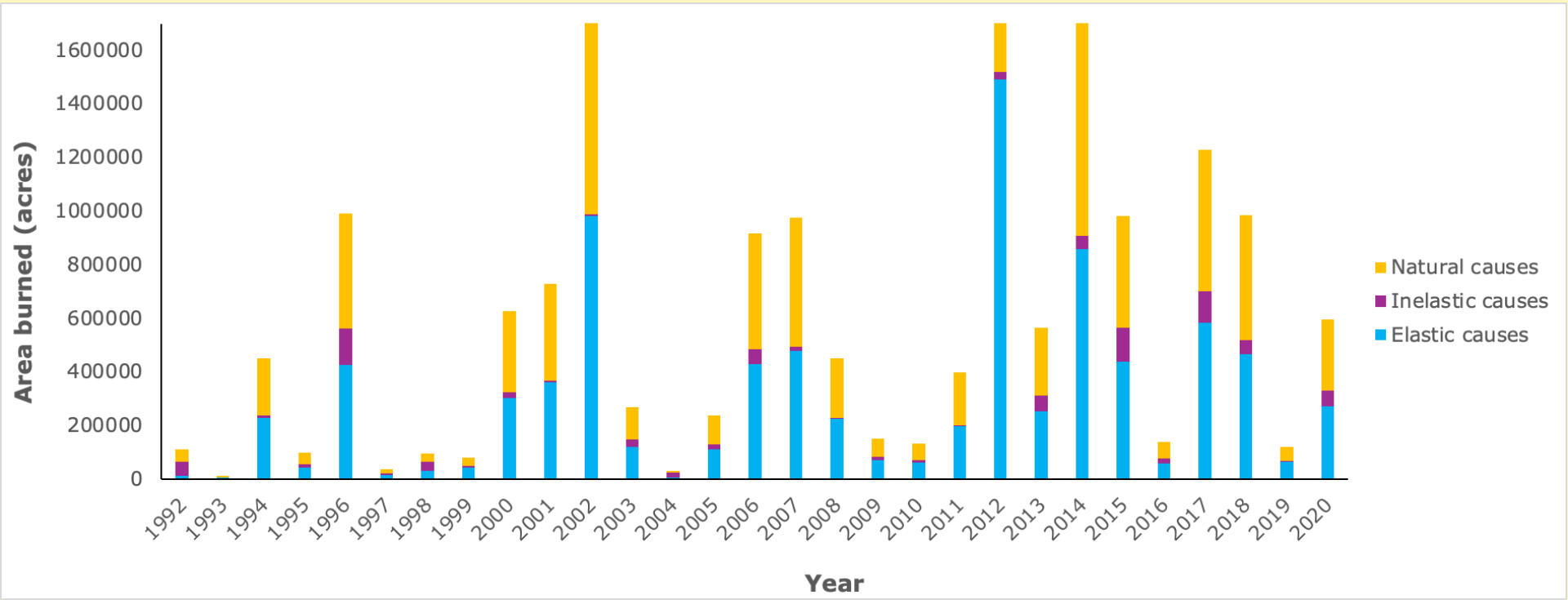
- Inelastic: arson, equipment and vehicle use, misuse of fire by a minor, power systems, railroads, smoking
- Elastic: debris and open burning, firearms and explosives, fireworks, recreation and ceremony

# Number of wildfires in Oregon




Data from U.S. Forest Service

# Area burned in Oregon

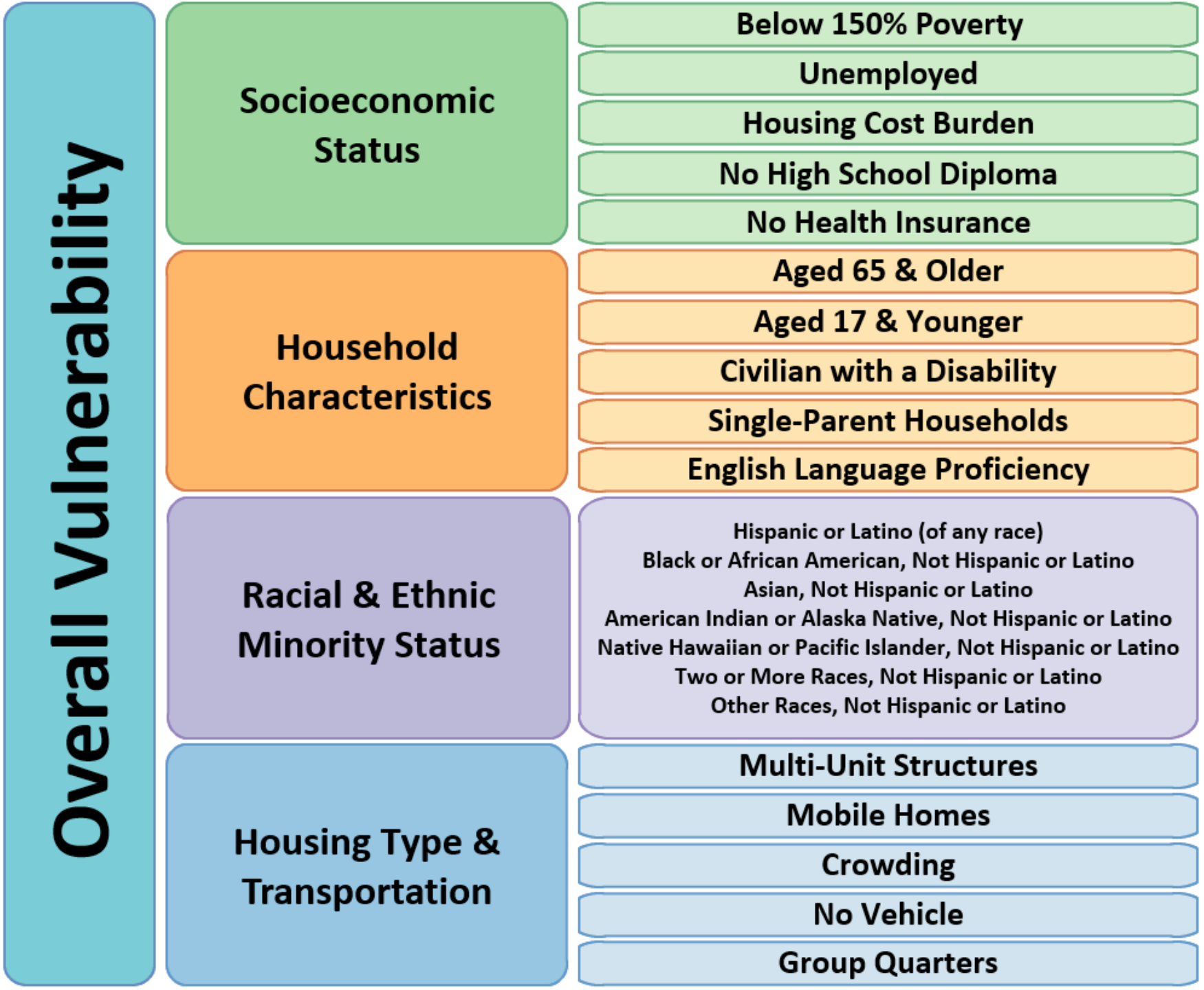



Data from U.S. Forest Service

# Wildfires in the 11 western states, 2000–2021

Josh Edelson / AFP via Getty Images

- People within wildfire perimeters: +185%
- Home and structure losses: +246%
- Demographic, social, economic factors affect exposure, preparedness, recovery


Overall Vulnerability
Socioeconomic Status
Below 150% Poverty
Unemployed
Housing Cost Burden
No High School Diploma
No Health Insurance
Household Characteristics
Aged 65 & Older
Aged 17 & Younger
Civilian with a Disability
Single-Parent Households
English Language Proficiency
Racial & Ethnic Minority Status
Hispanic or Latino (of any race)
Black or African American, Not Hispanic or Latino
Asian, Not Hispanic or Latino
American Indian or Alaska Native, Not Hispanic or Latino
Native Hawaiian or Pacific Islander, Not Hispanic or Latino
Two or More Races, Not Hispanic or Latino
Other Races, Not Hispanic or Latino
Housing Type & Transportation
Multi-Unit Structures
Mobile Homes
Crowding
No Vehicle
Group Quarters

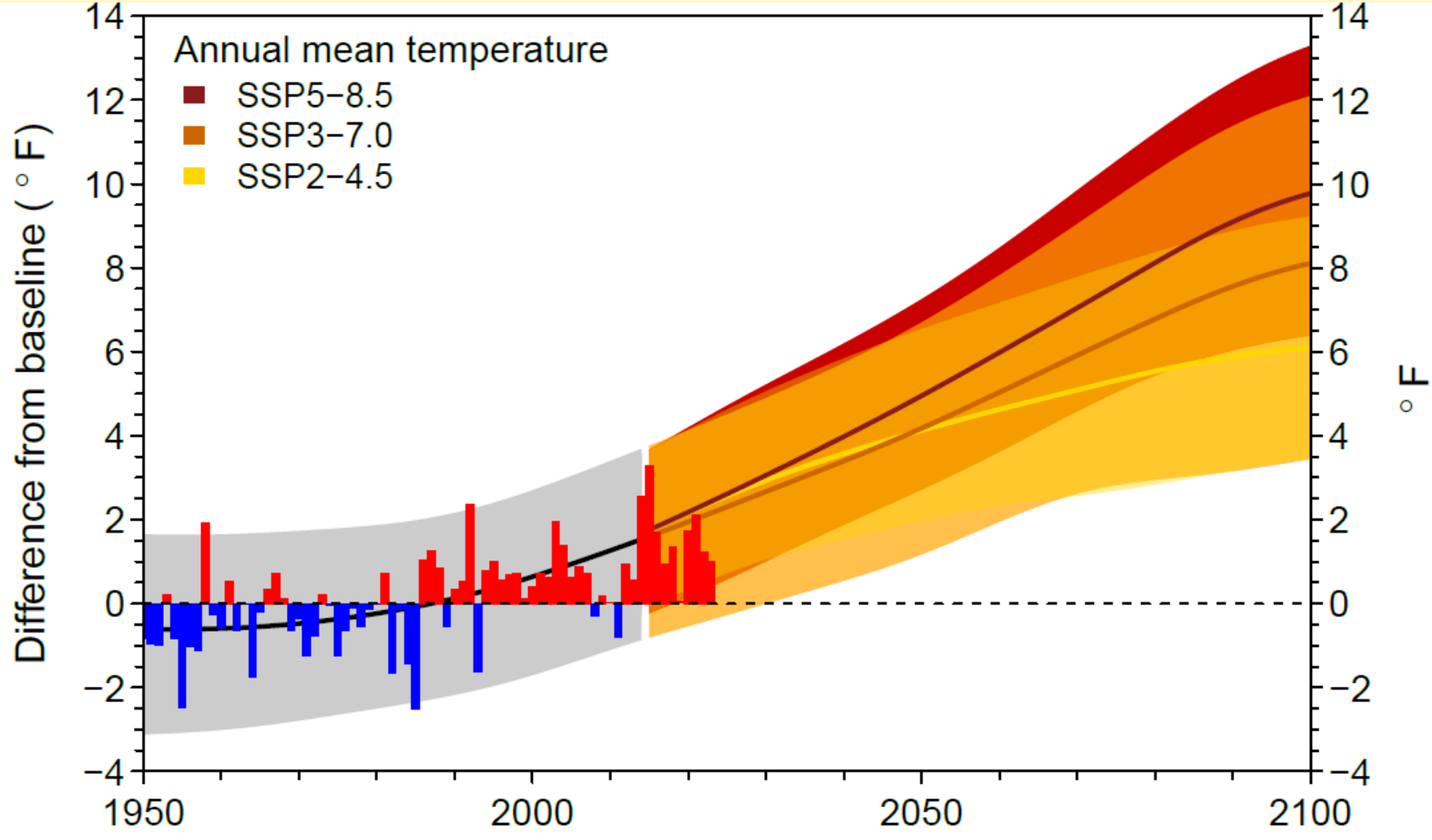
# Exposure of the socially vulnerable increased

Increase in SVI

Increase in area burned in areas with high vulnerability; consistent SVI in burned areas

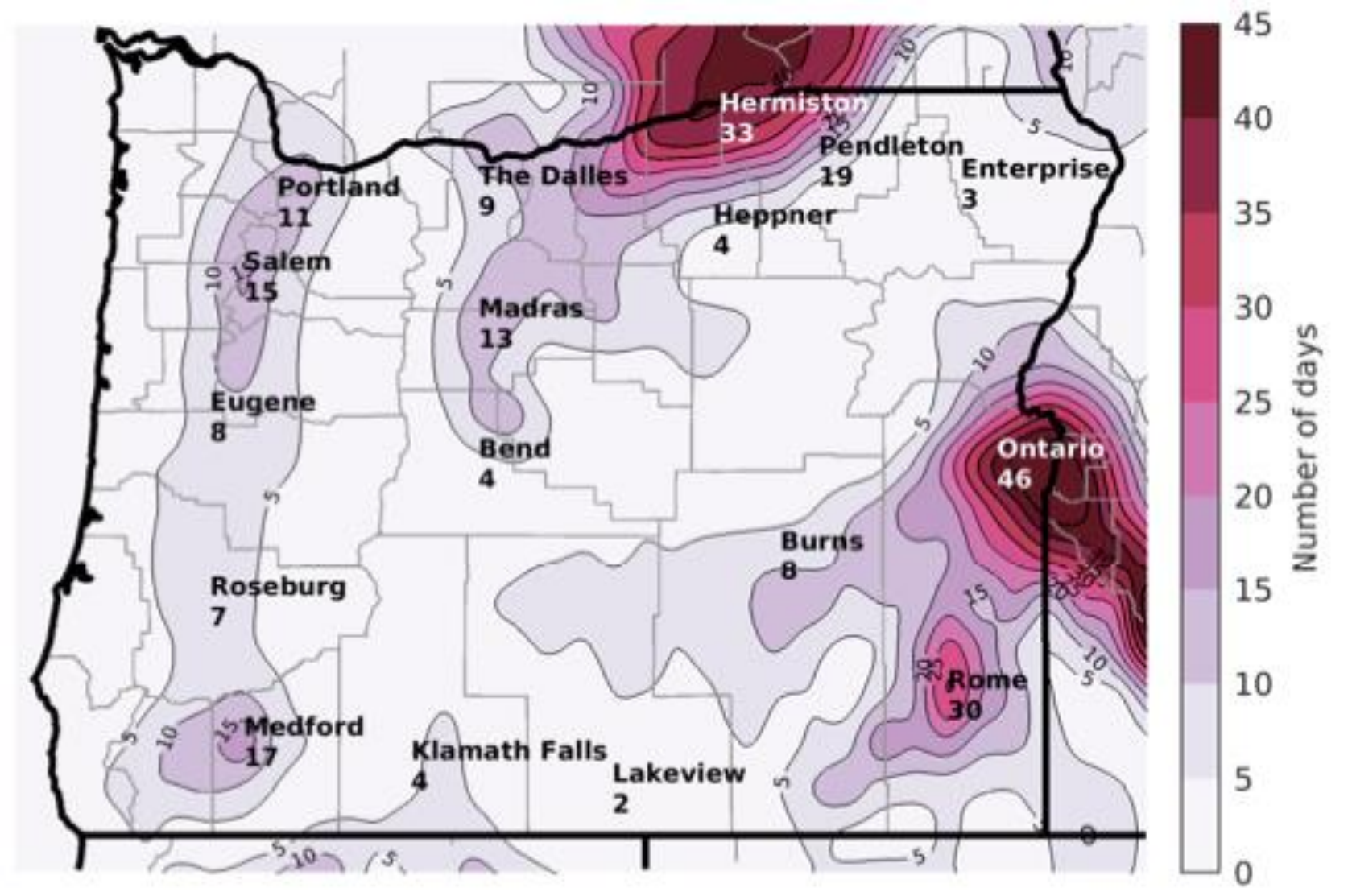
# Extreme heat

# Oregon temperature trends

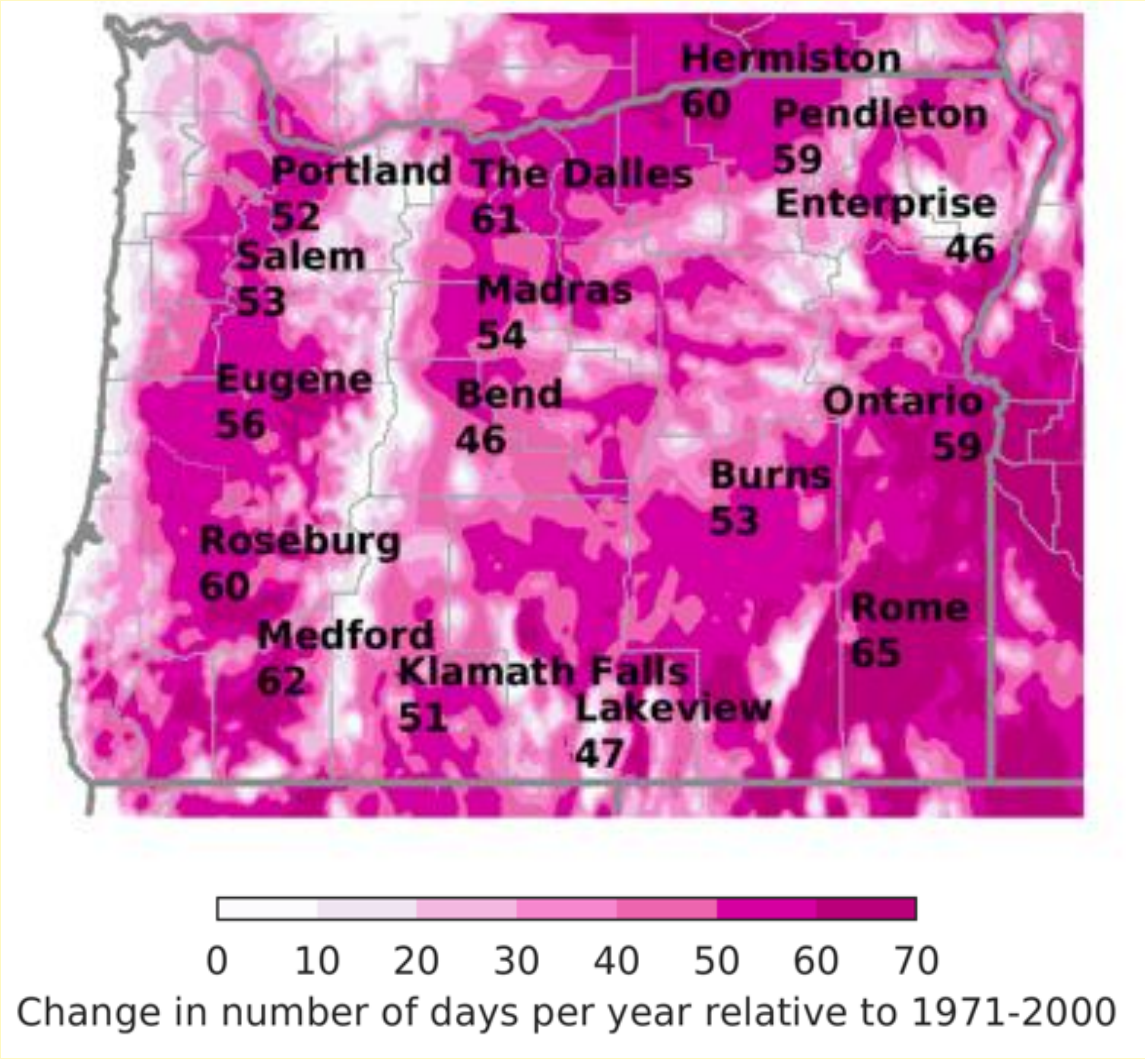



Baseline: 1950–2014

# Average annual number of days with heat index 90°F or above, 1990–2020



# Projected extreme heat index, 2070–2099



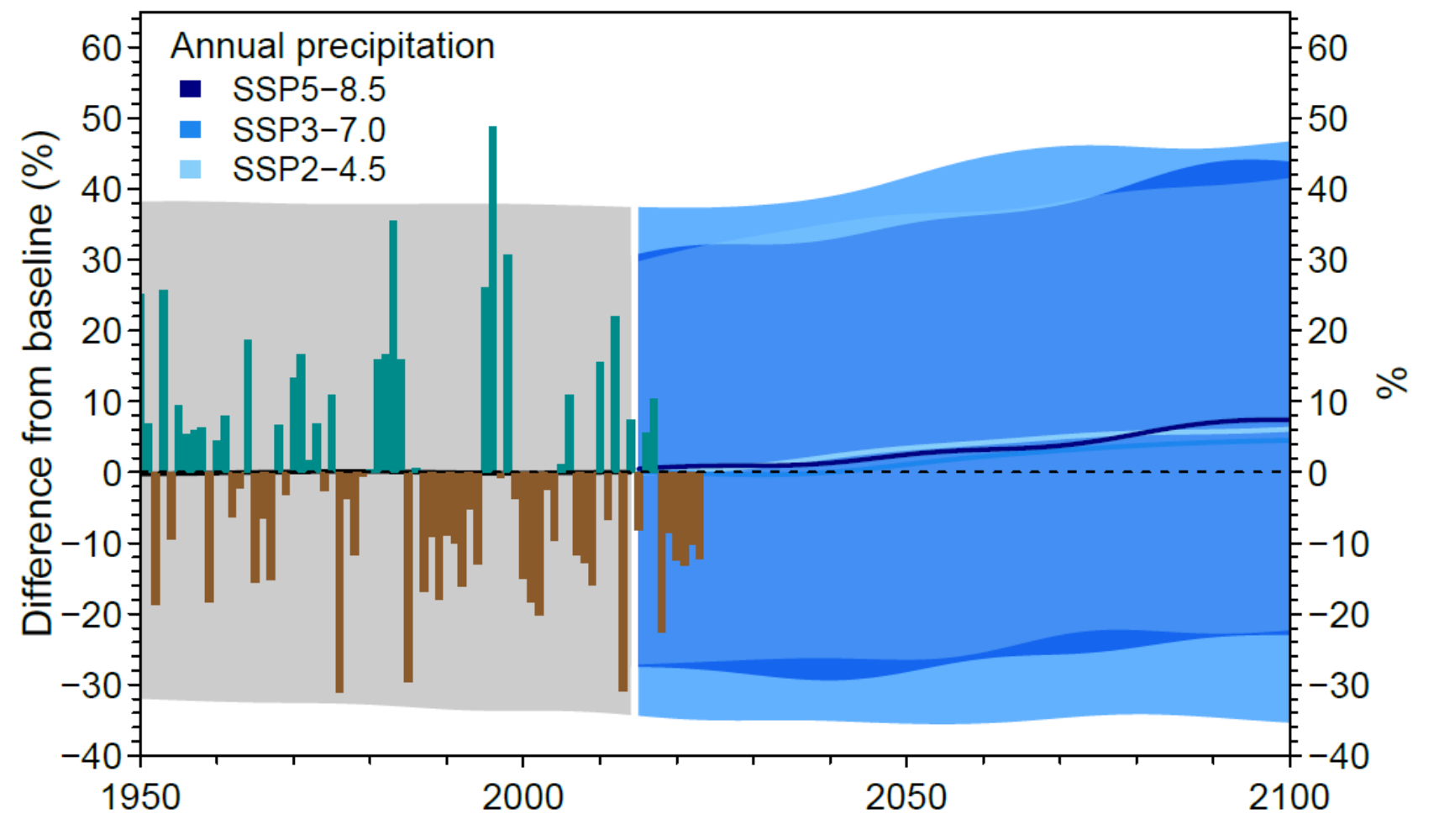

Sixth Oregon Climate Assessment. RCP 8.5. Extreme heat index: ≥90˚F.

# Aridity

# Drought: insufficient water to meet needs

- Different definitions: physical metrics versus effects
- Different time periods
- Regardless of metric: more frequent, longer, more severe drought

# Oregon precipitation trends



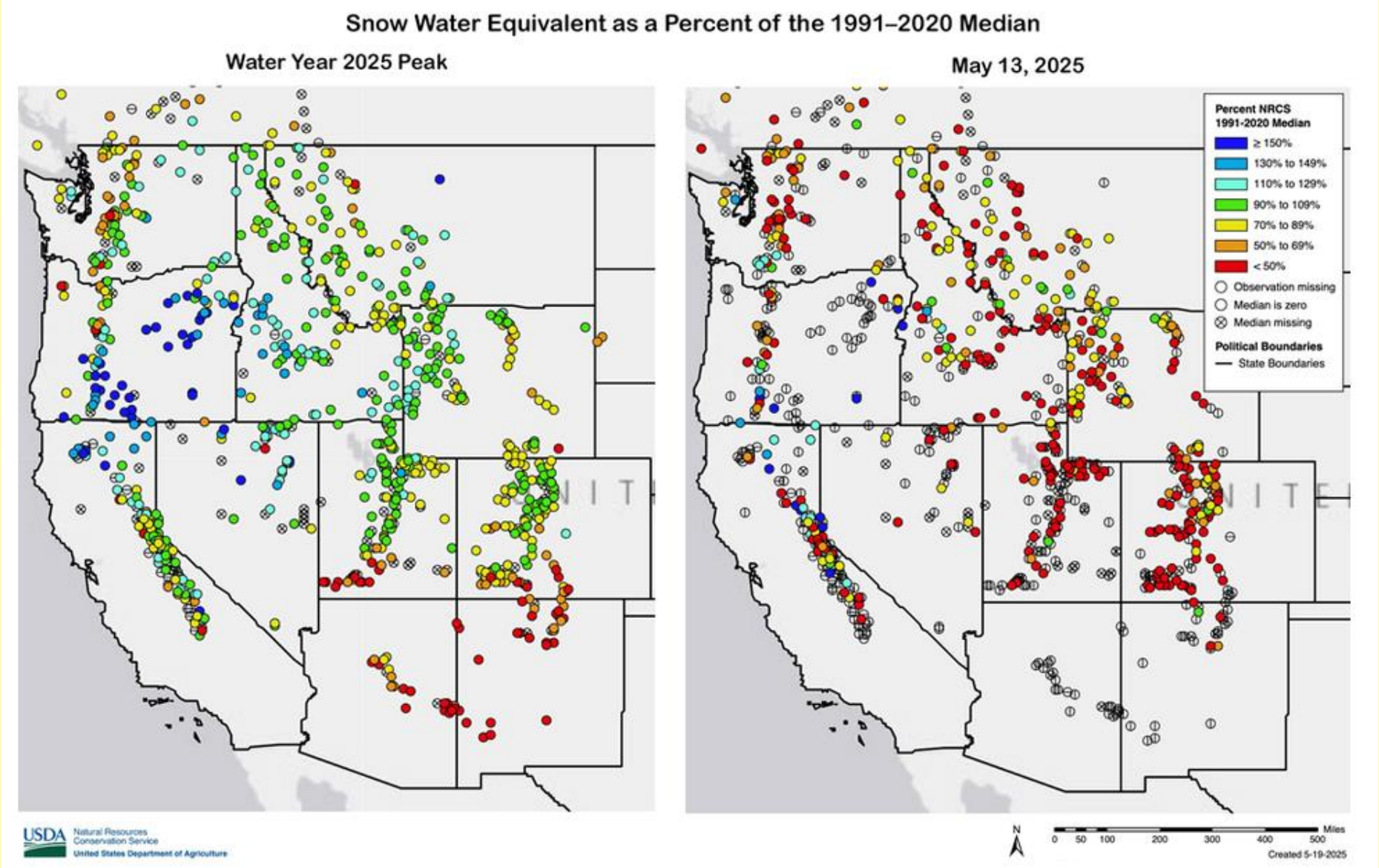

Baseline: 1950–2014

# Less precipitation falling as snow

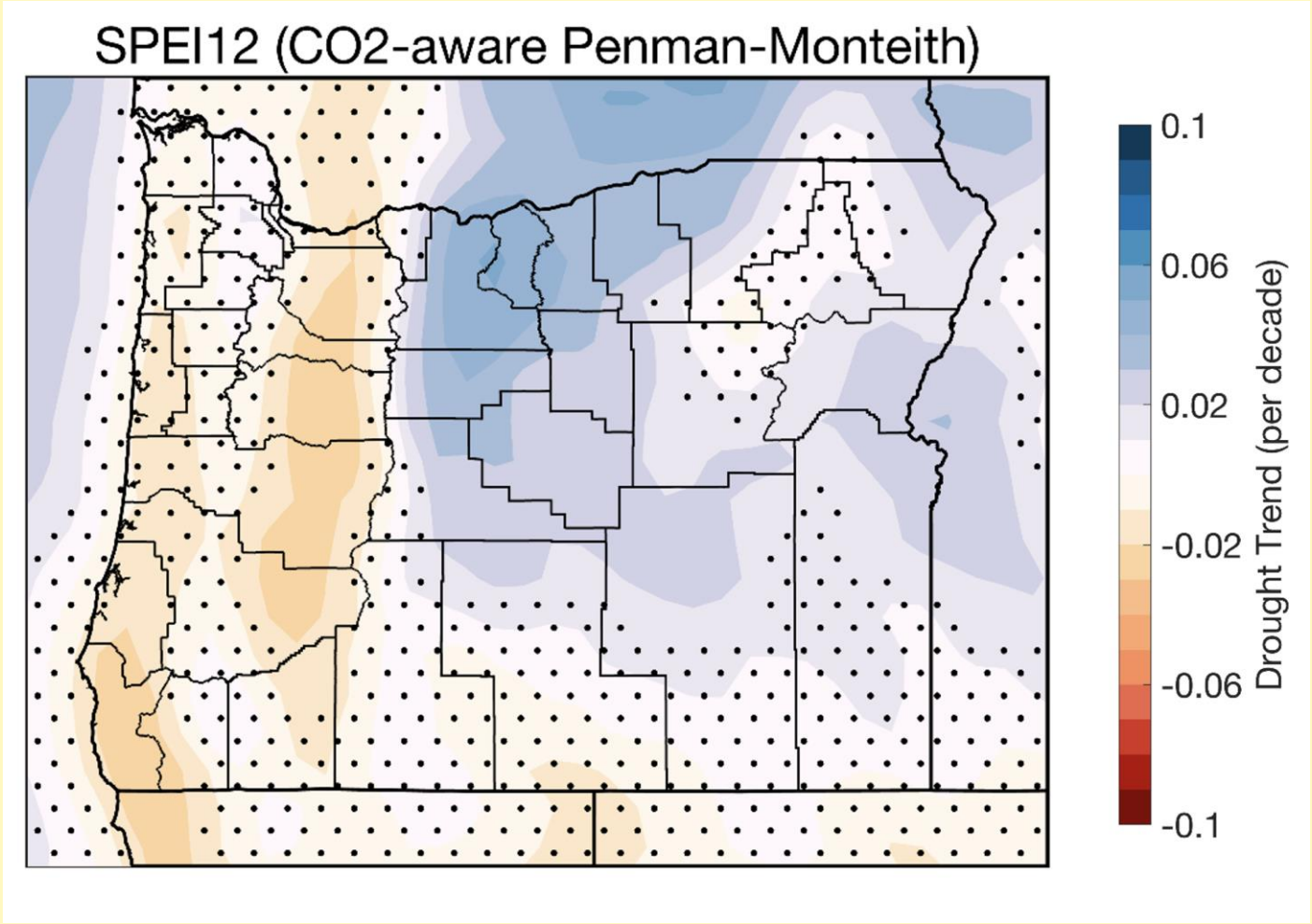
# Snow drought

- Abnormally low snowpack on a given date
- Dry: little precipitation
- Warm: high temperature

# Decoupling of winter and spring conditions



# Drought trend, 1950–2099




Stippling: not statistically significant

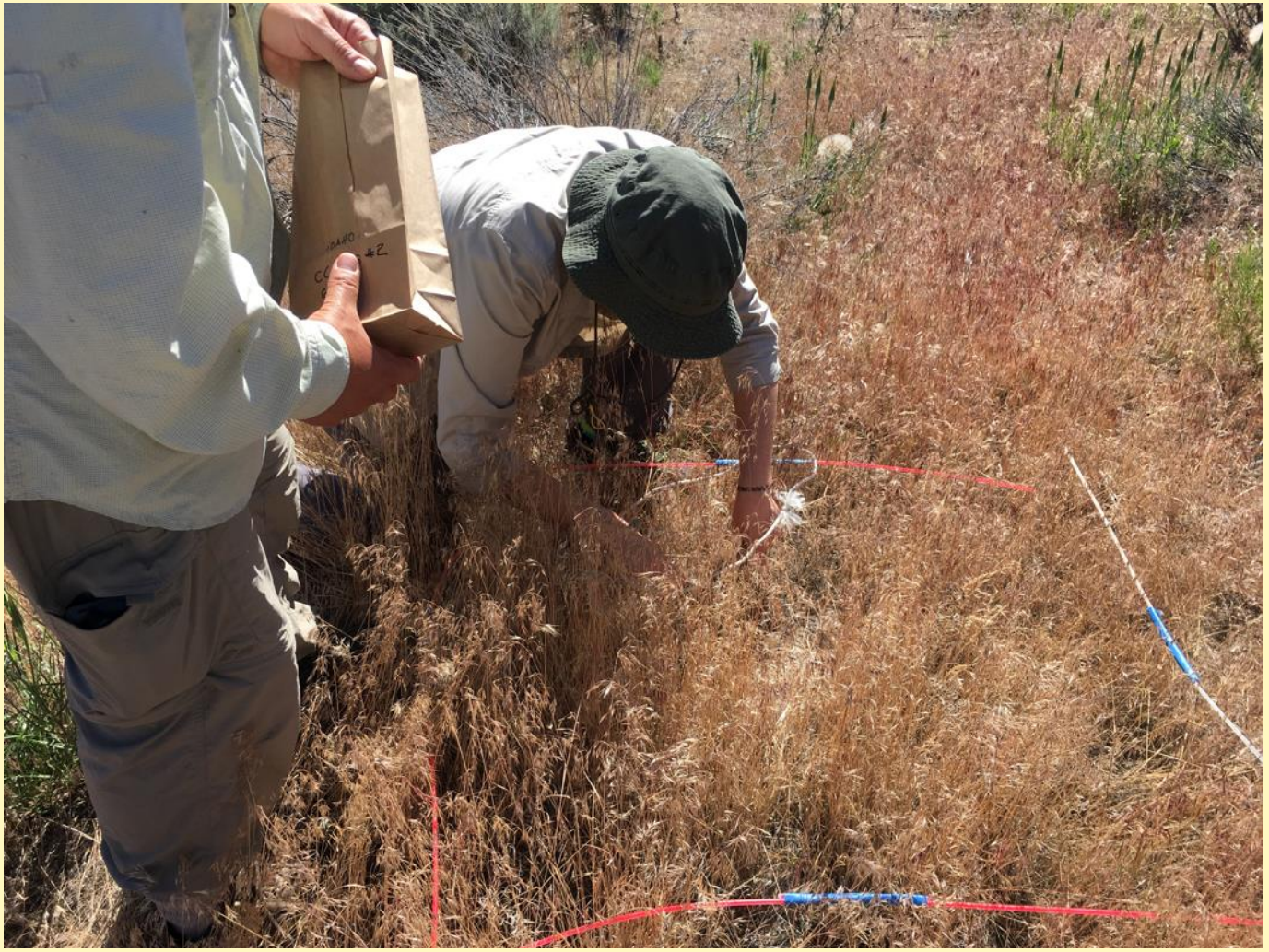
# Compounded effects of heat and aridity

Pierre Markuse

- Dry air makes vegetation drier and easier to ignite
- More overnight and high-elevation fire activity
- Changes in wind speeds are minimal, and more likely in winter

Colorado Newsline

# Ecosystem change



NEWS IN PHOTOS

# Chameleon Wishes Environment Would Occasionally Adapt To Him

Yesterday 8:00am •

The Onion, 30 September 2019

# Vegetation removal

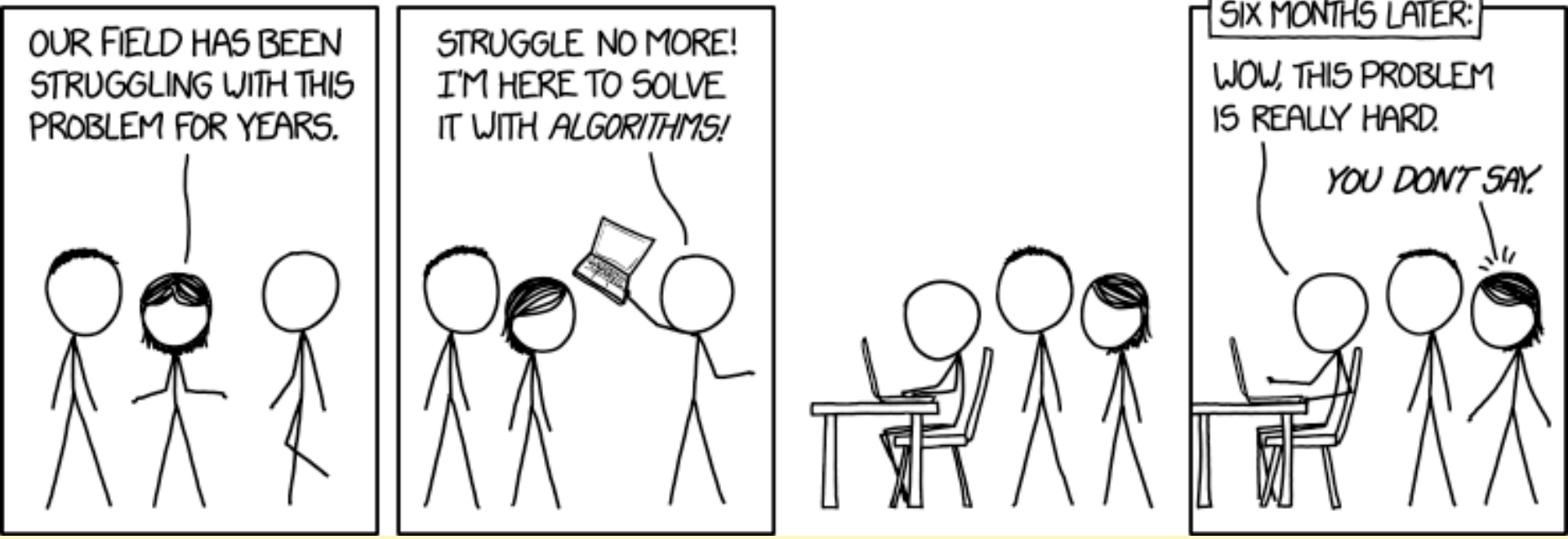
- Not effective for wind-driven wildfires
- Can be effective in some ecosystems . . . with considerable, regular maintenance
- Prescribed fire has some promise, although there are obstacles

# Wildfire preparedness

# Stresses on health care systems

- Surges due to heat or smoke reduce capacity to provide other care
- Needs lag behind smoke
- An 11-day stretch of unhealthy air quality is likely to create substantial strain on Oregon's hospitals

Associated Press / Gerald Herbert




https://xkcd.com/1831/