CLIMATE CHANGE AND SOUTHERN CALIFORNIA FORESTS

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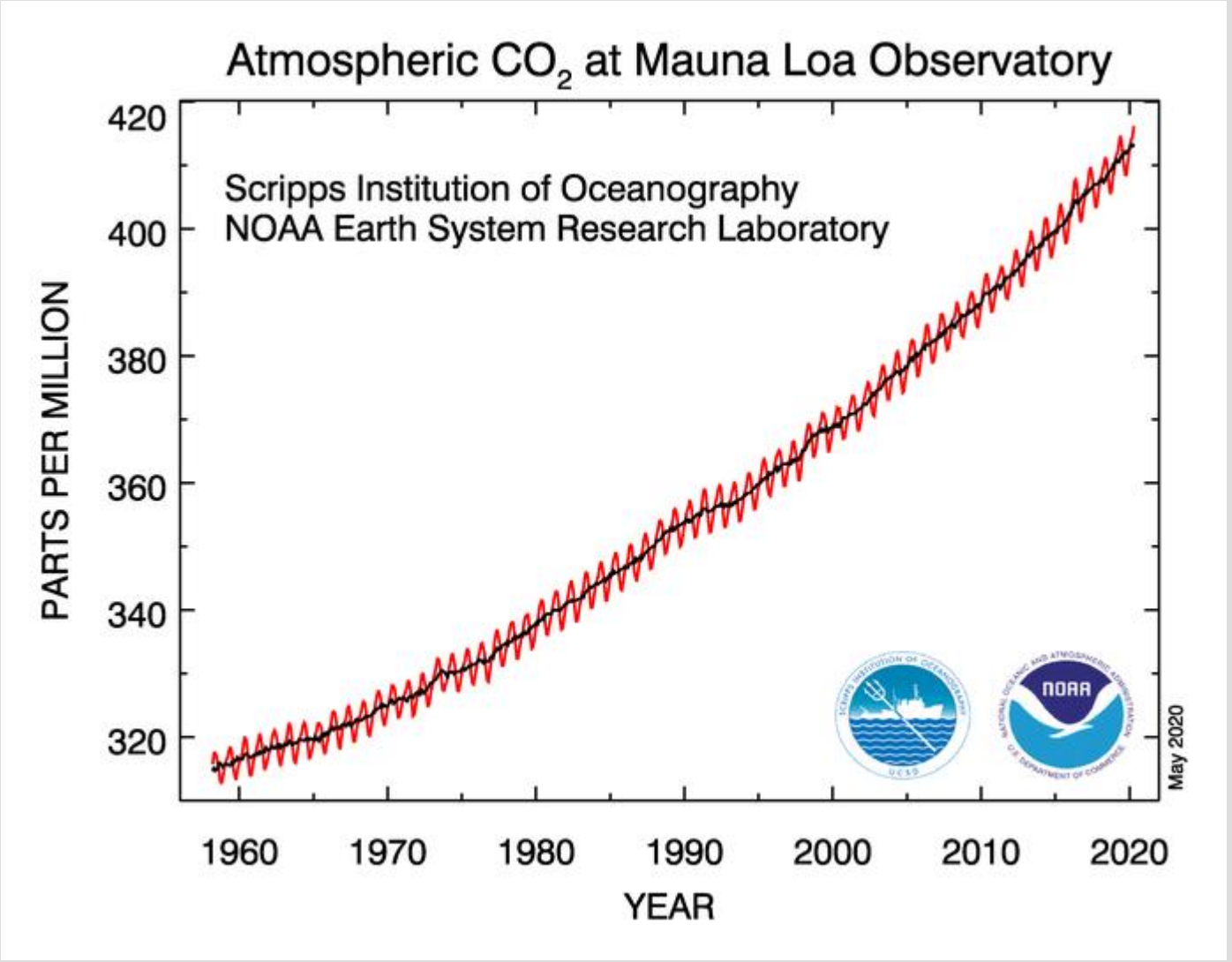
USDA California Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

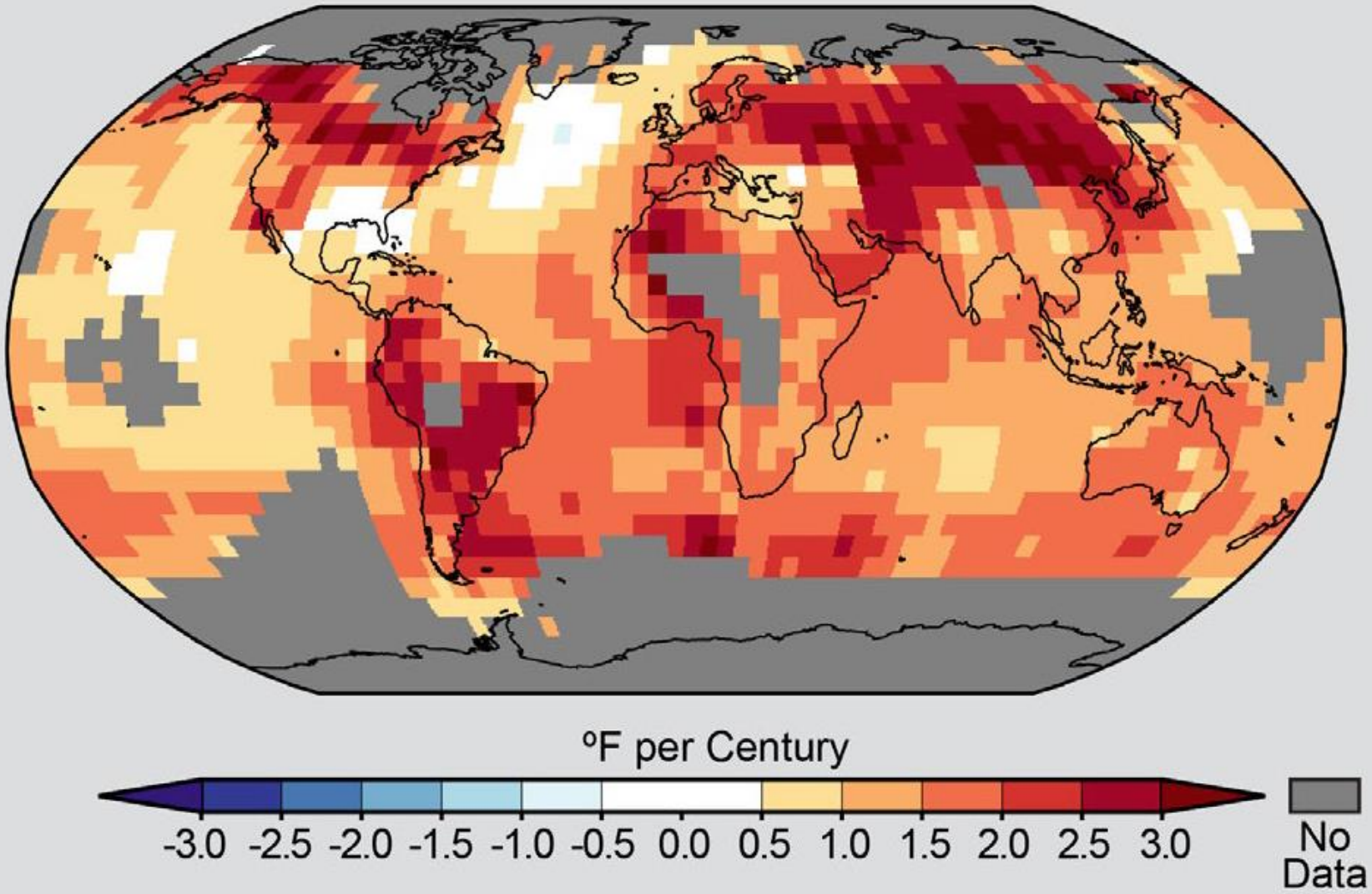
FOR TODAY

1. A look back at our climate
2. The future of climate change
3. Effects of a changing climate to resource and forest management
4. A primer to forest management through a filter of climate adaptation
5. Resouces to support climate-informed decision-making

BENDING THE CURVE

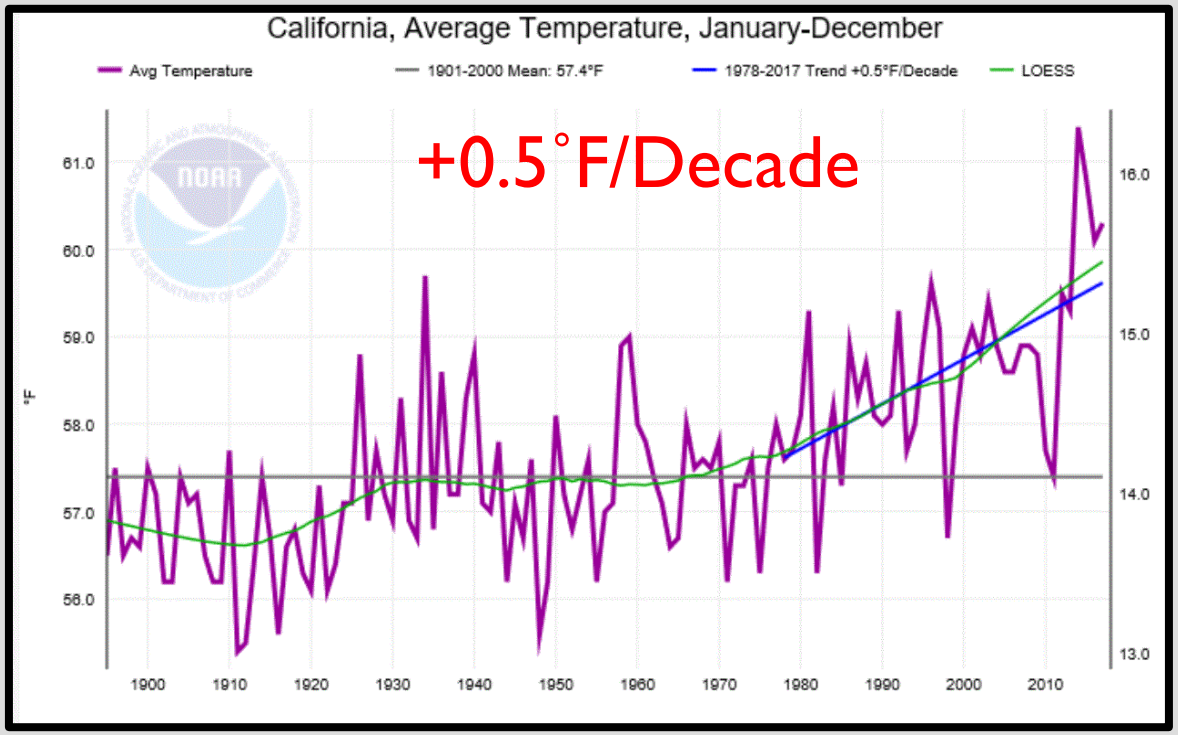


TEMPERATURE TREND FROM 1900 TO 2012



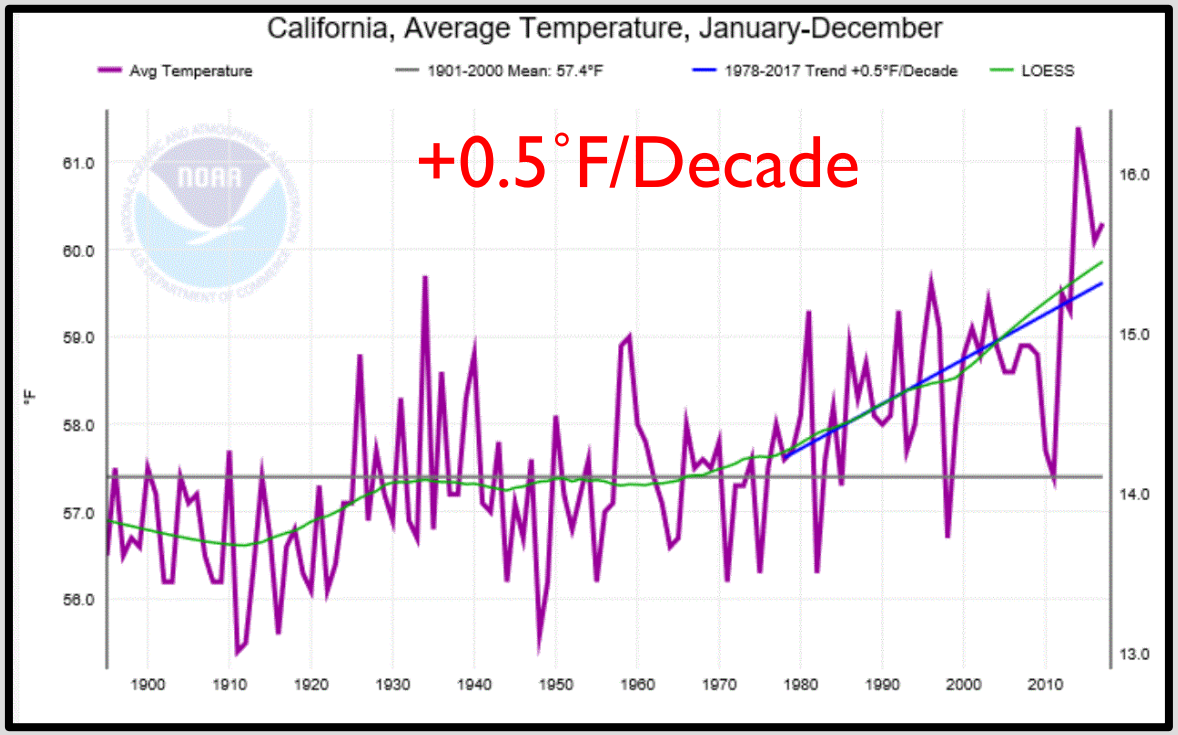
Source Map from FAQ appendix of the 2014 National Climate Assessment. Originally provided by NOAA NCDC.

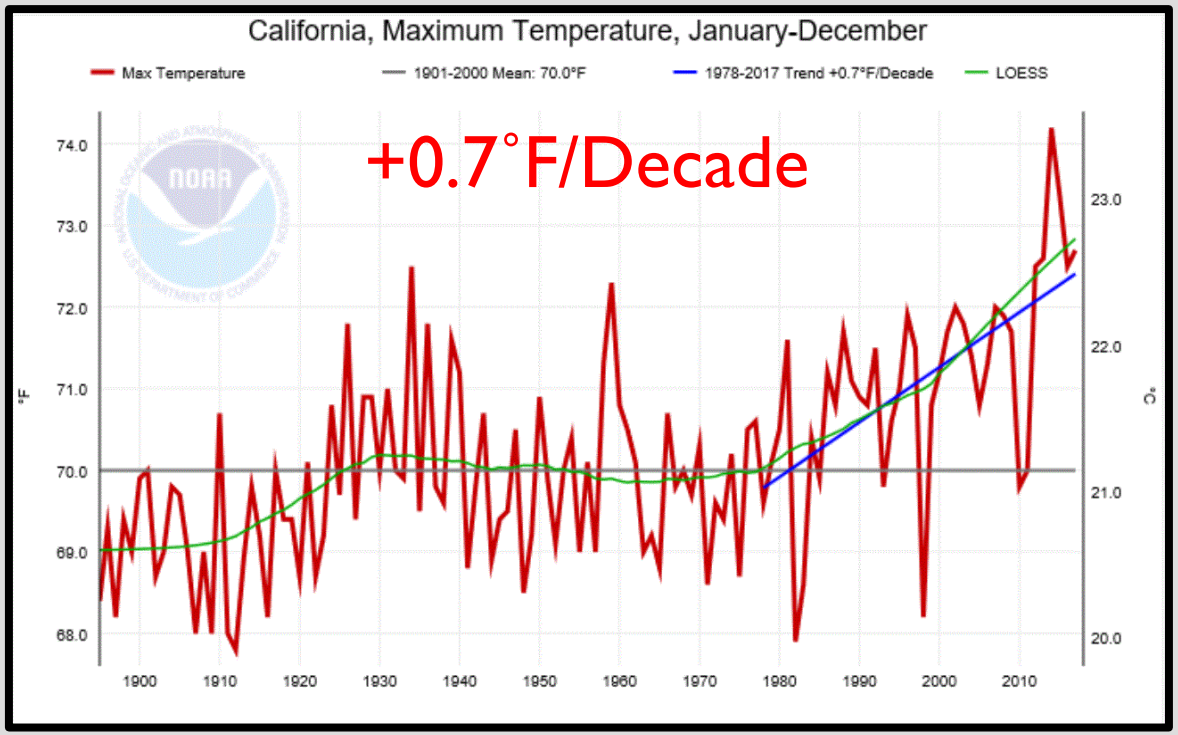
Historic Temperature Trends



Source: NOAA

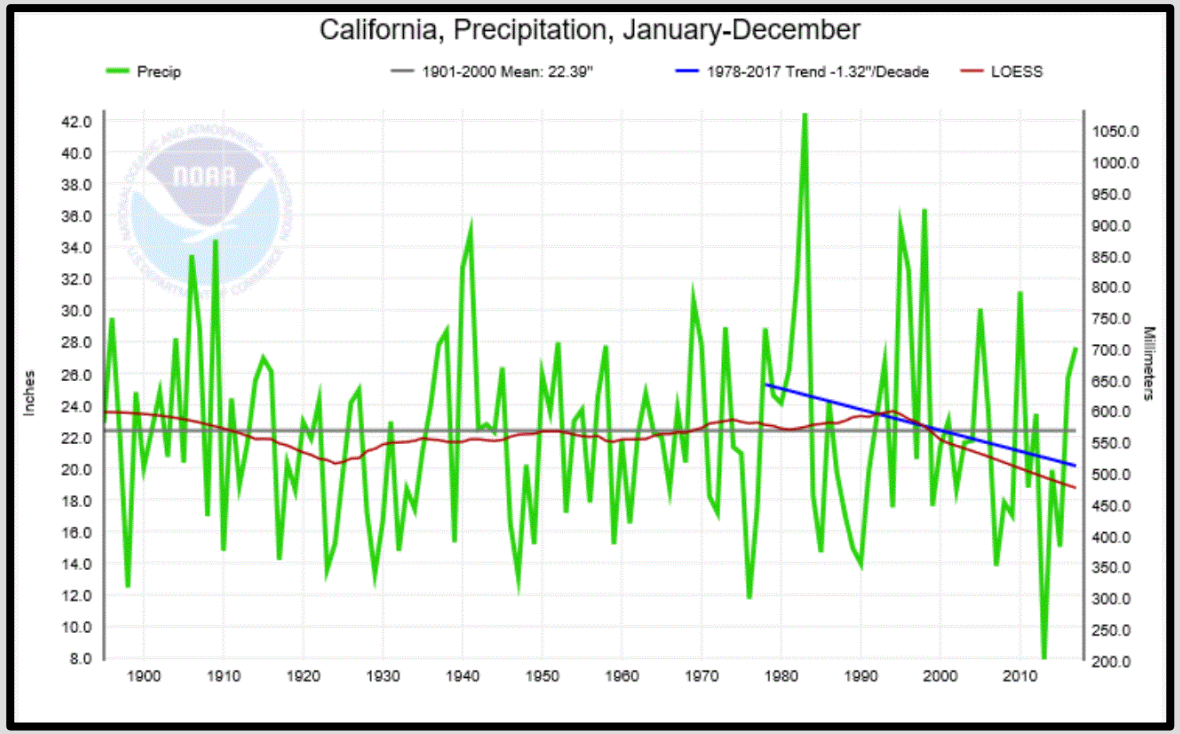
Historic Temperature Trends





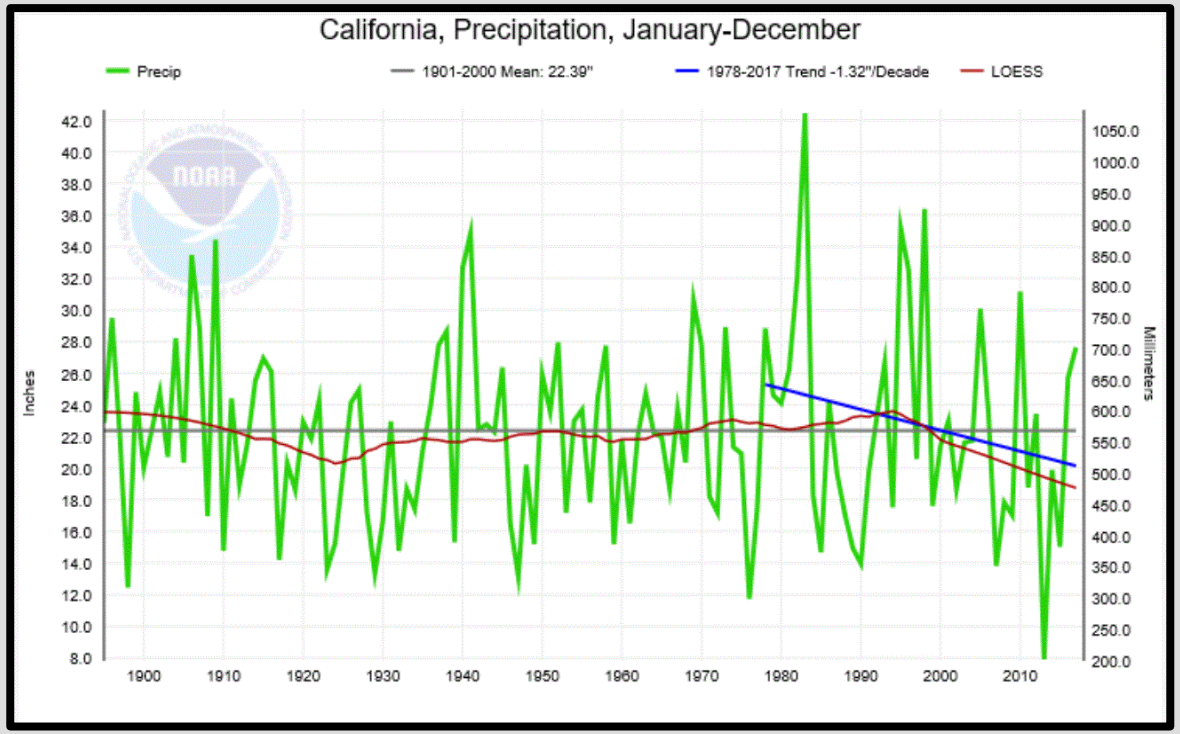
Source: NOAA

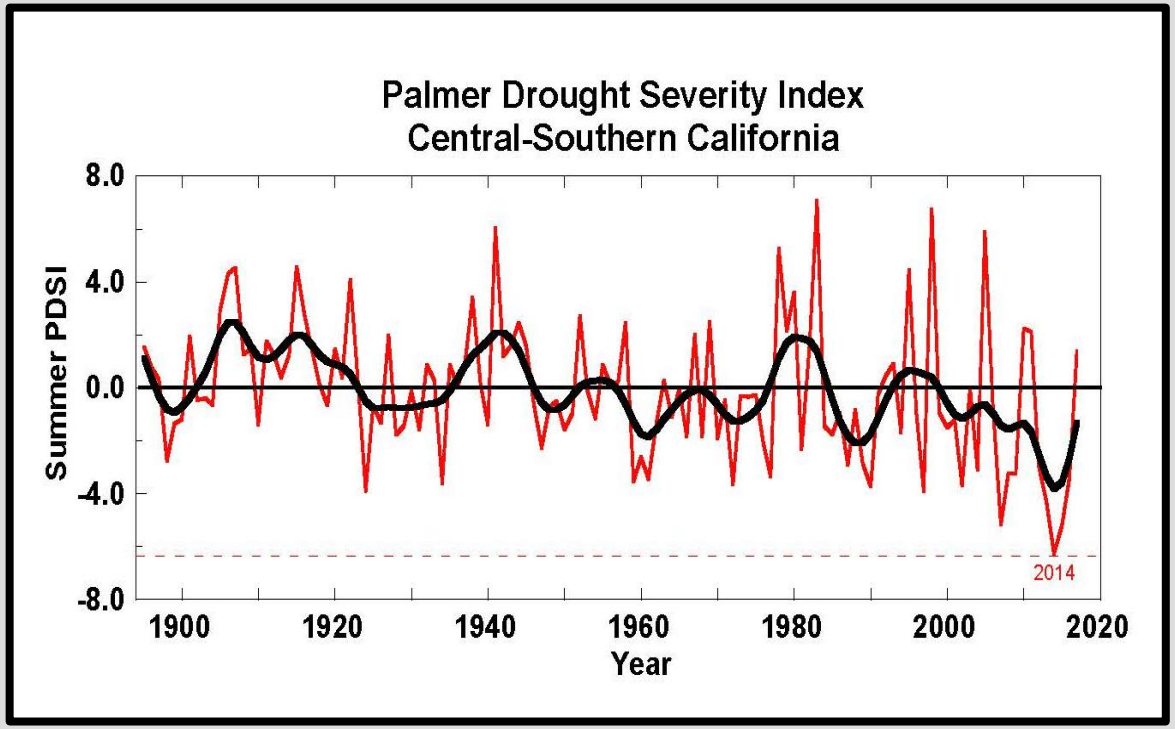
Historic Precipitation Patterns



Source: NOAA

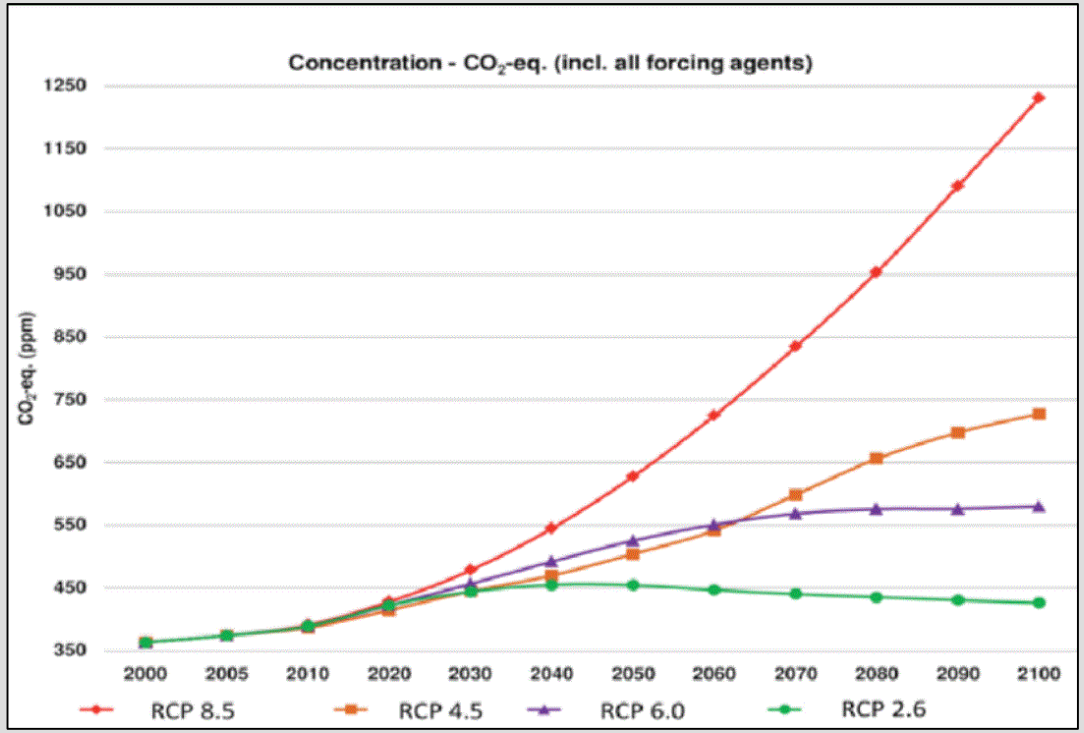
Precipitation & Drought - Historic

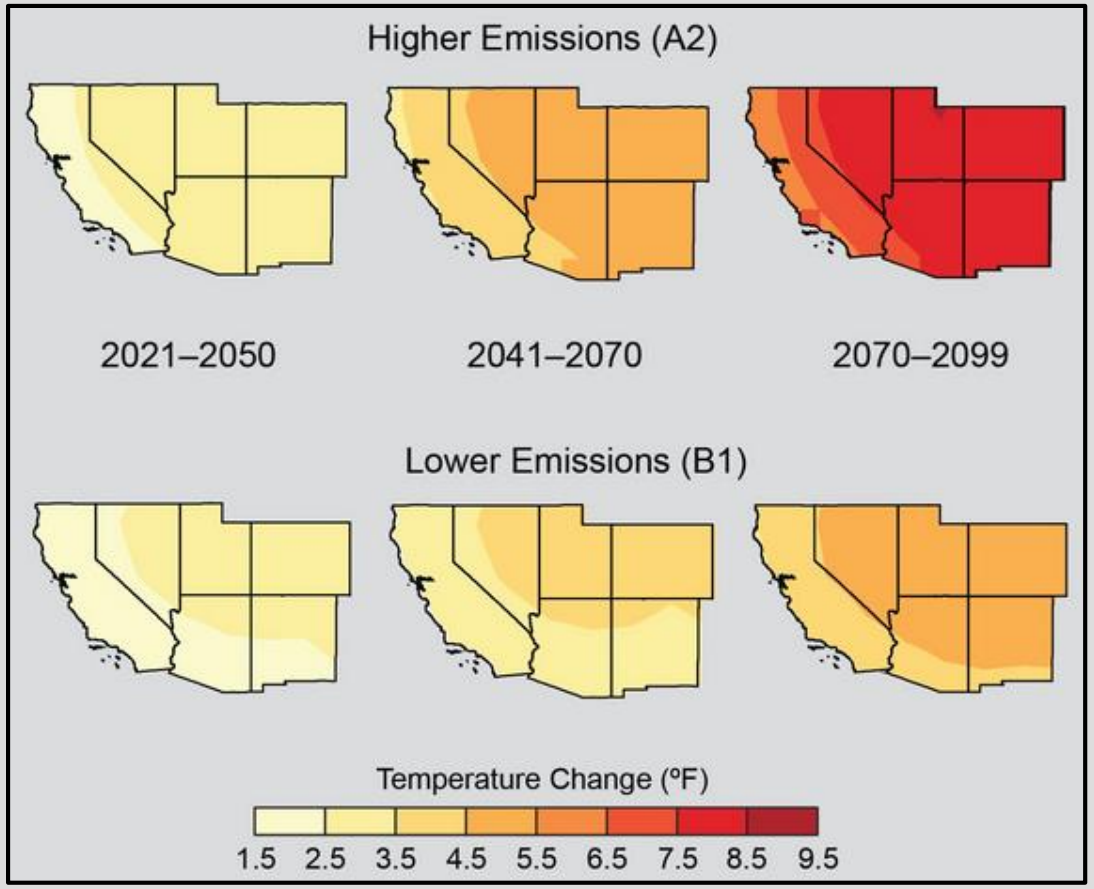




Source: NOAA

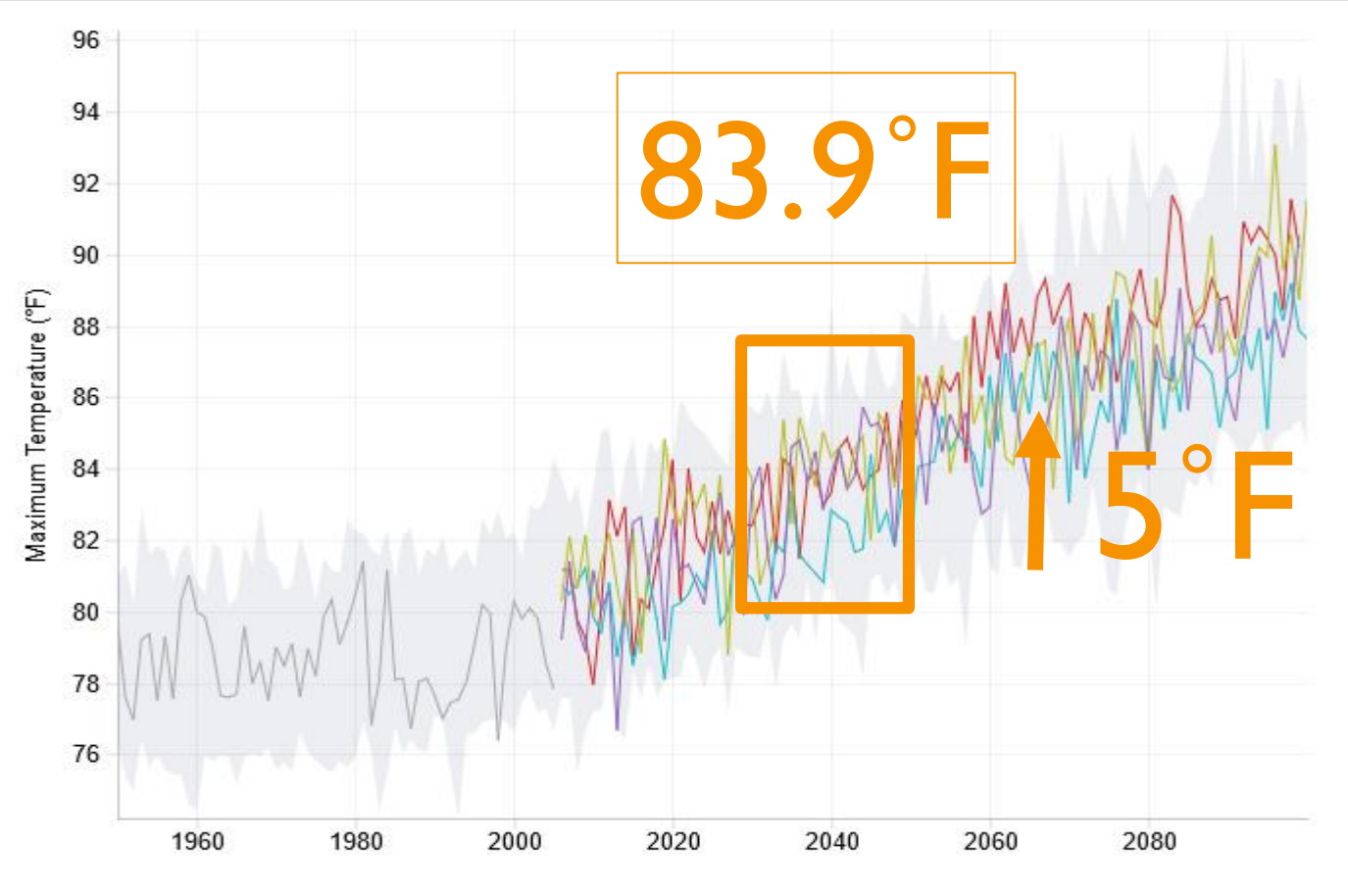
CLIMATE MODELS AND GREENHOUSE GAS EMISSIONS





A WARMING FUTURE (2040-2050)

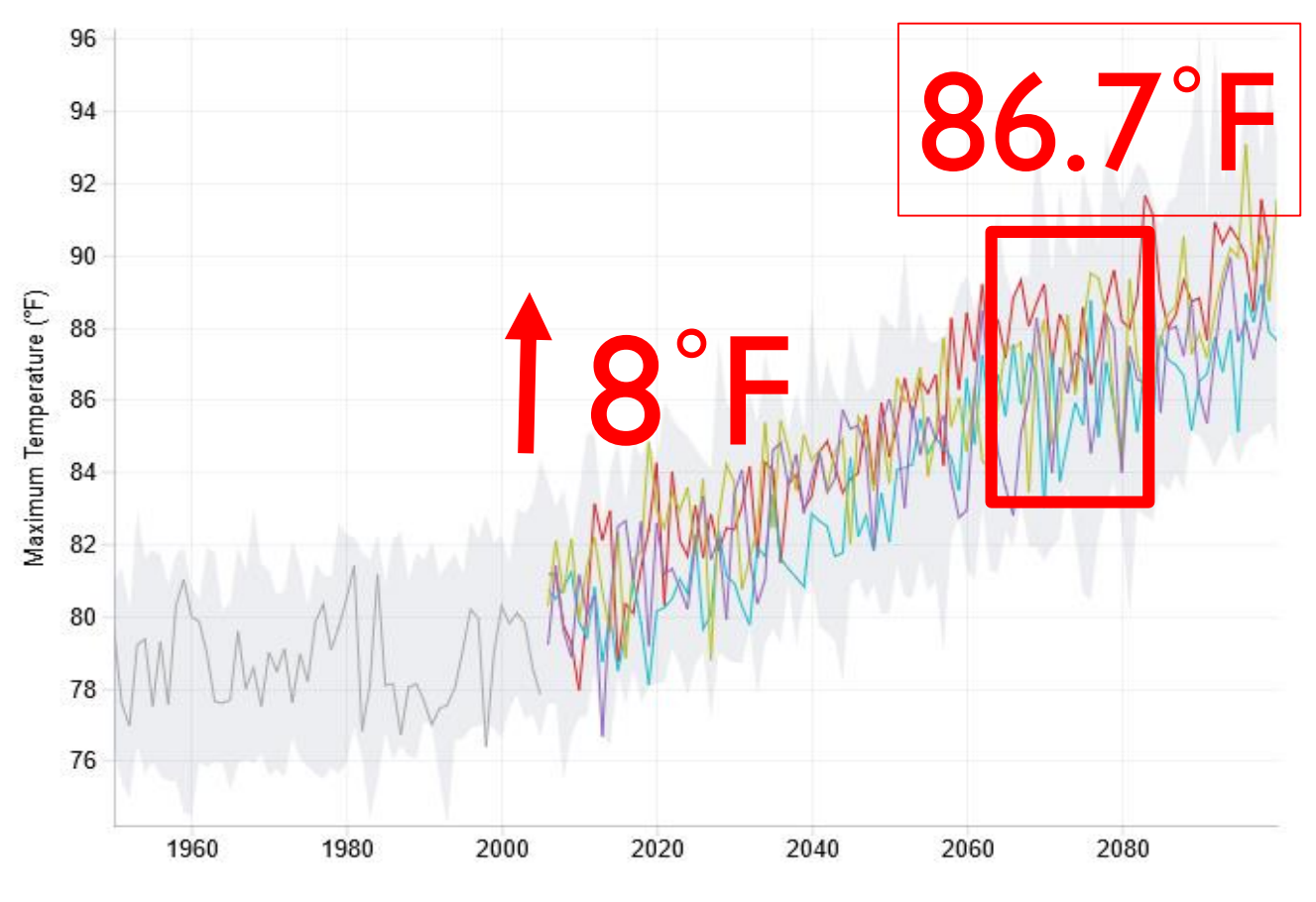
Future Max Temp: Four Climate Models & RCP 8.5 (San Bernardino)



Source: Cal Adapt accessed 2019

A WARMING FUTURE (2070-2080)

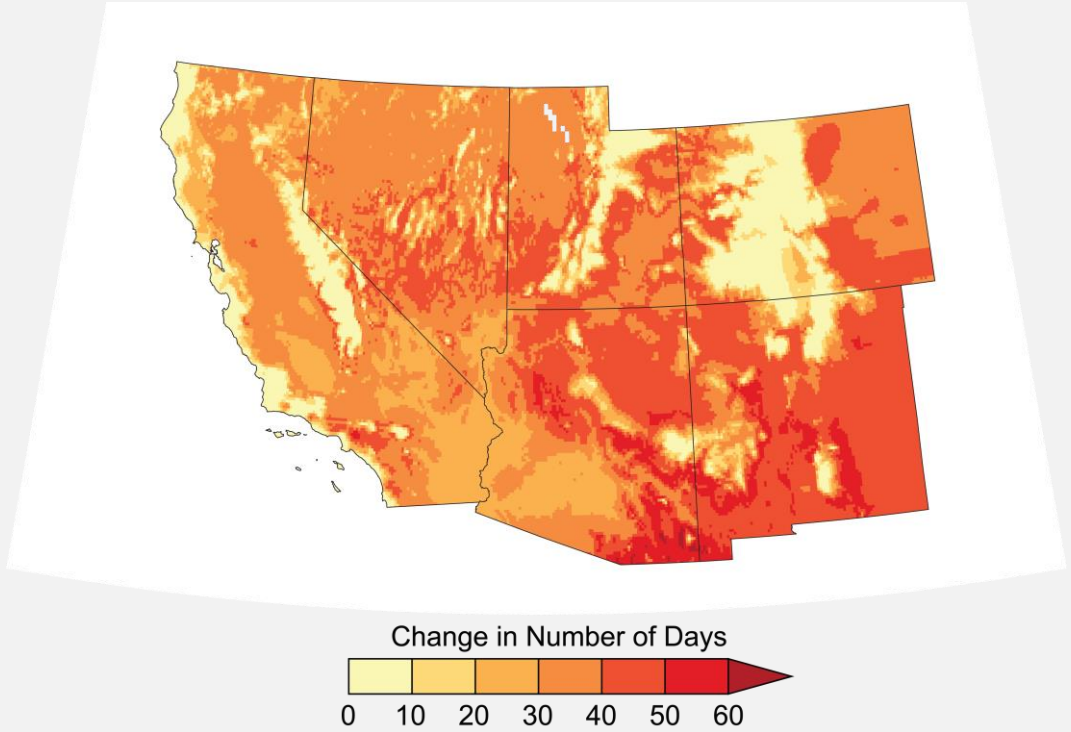
Future Max Temp: Four Climate Models & RCP 8.5 (San Bernardino)



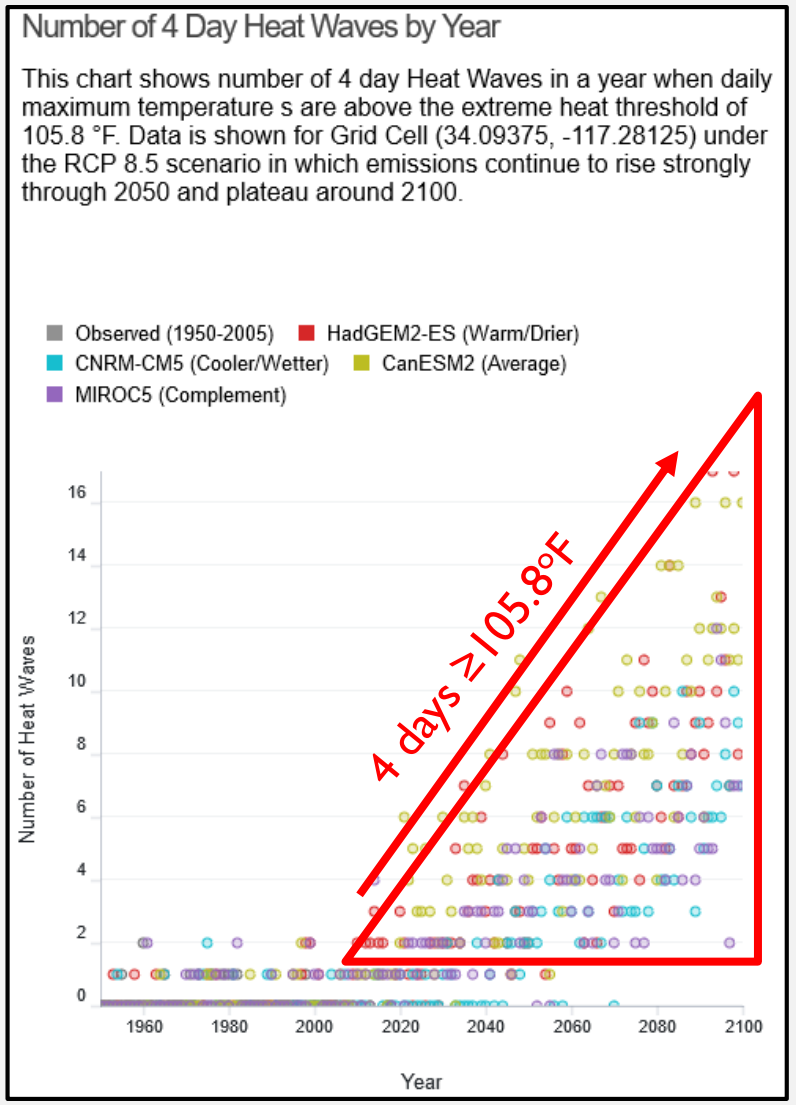
Source: Cal Adapt accessed 2019

EXTREME HEAT EVENTS WILL INCREASE

Projected Increases in Extreme Heat



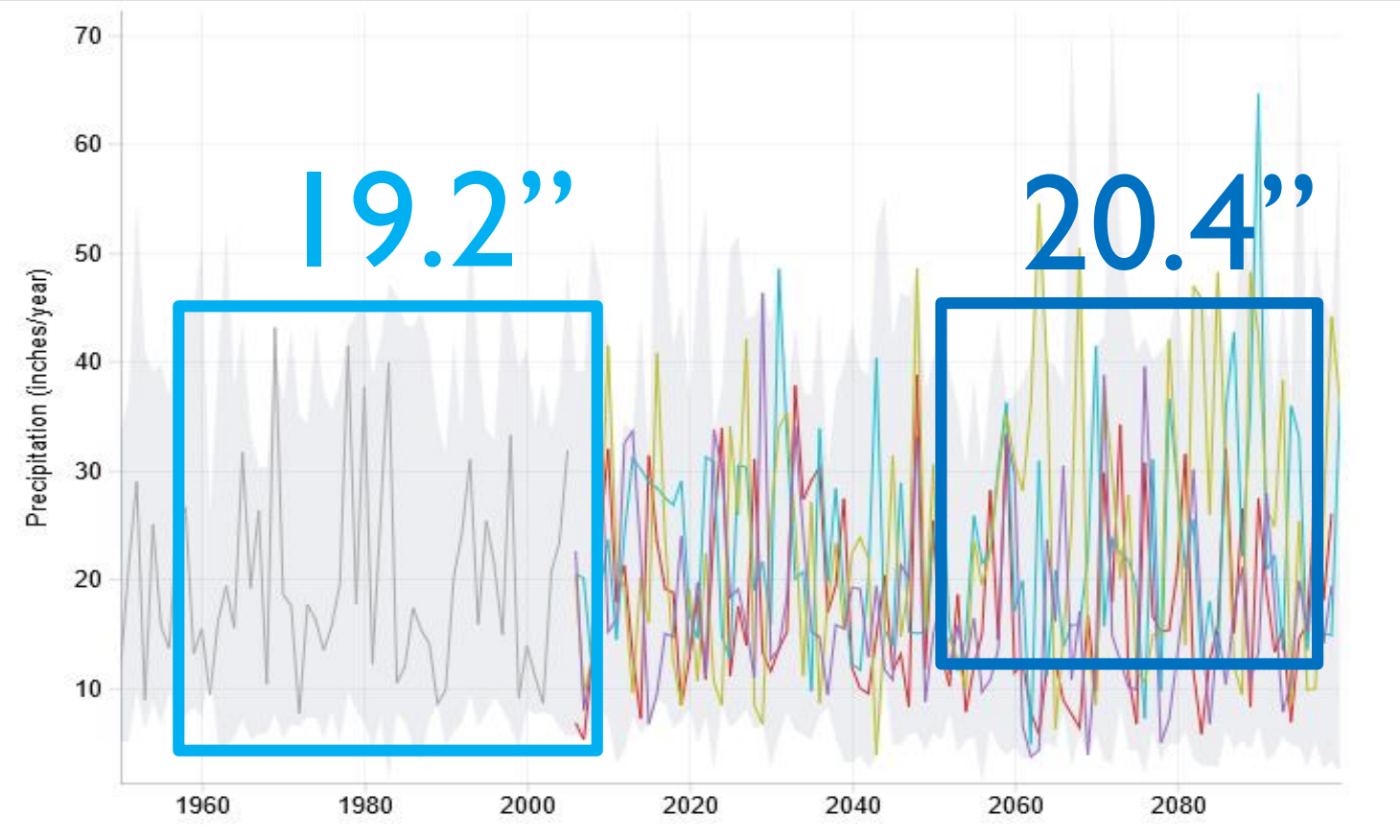
Source: https://nca2018.globalchange.gov/chapter/25/



https://cal-adapt.org/tools/extreme-heat/

SIMILAR PROJECTED PRECIPITATION

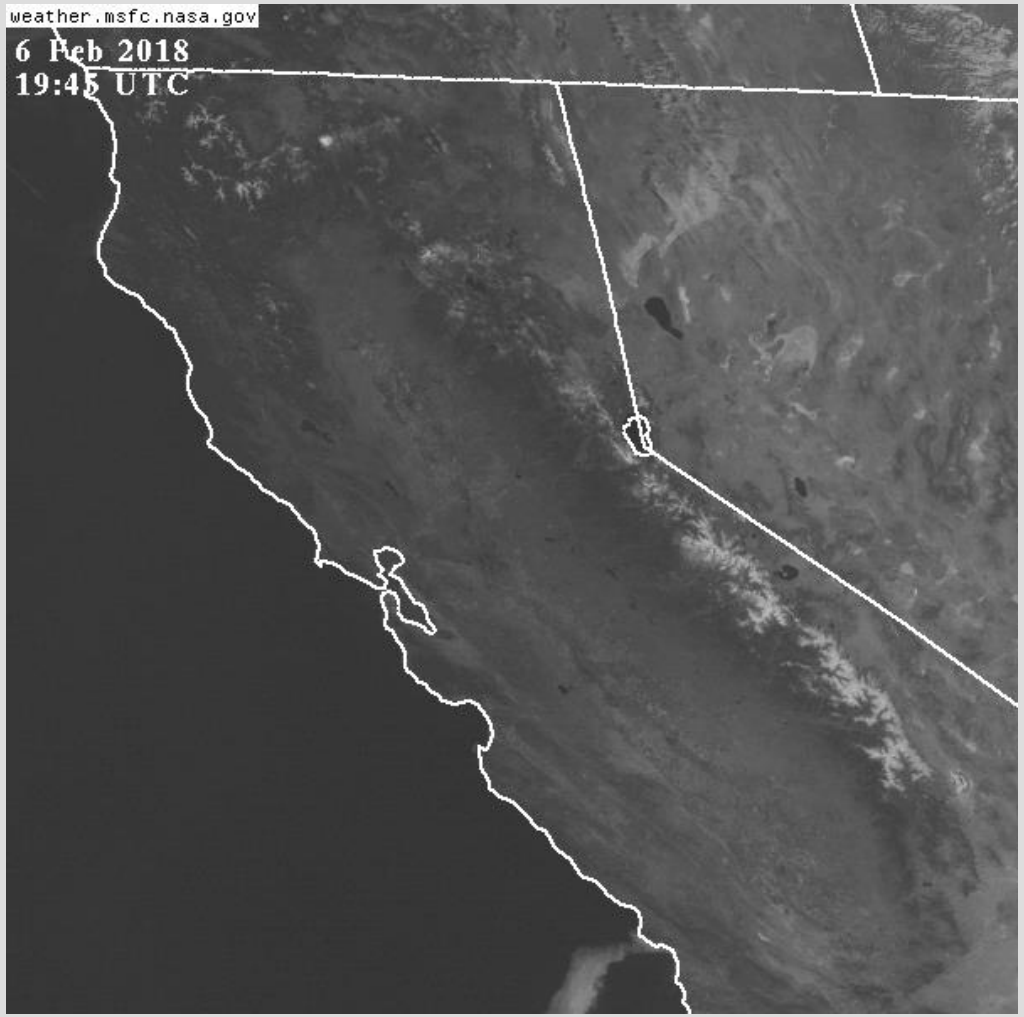
Future Mean Precipitation: Four Climate Models & RCP 8.5 (San Bernardino)

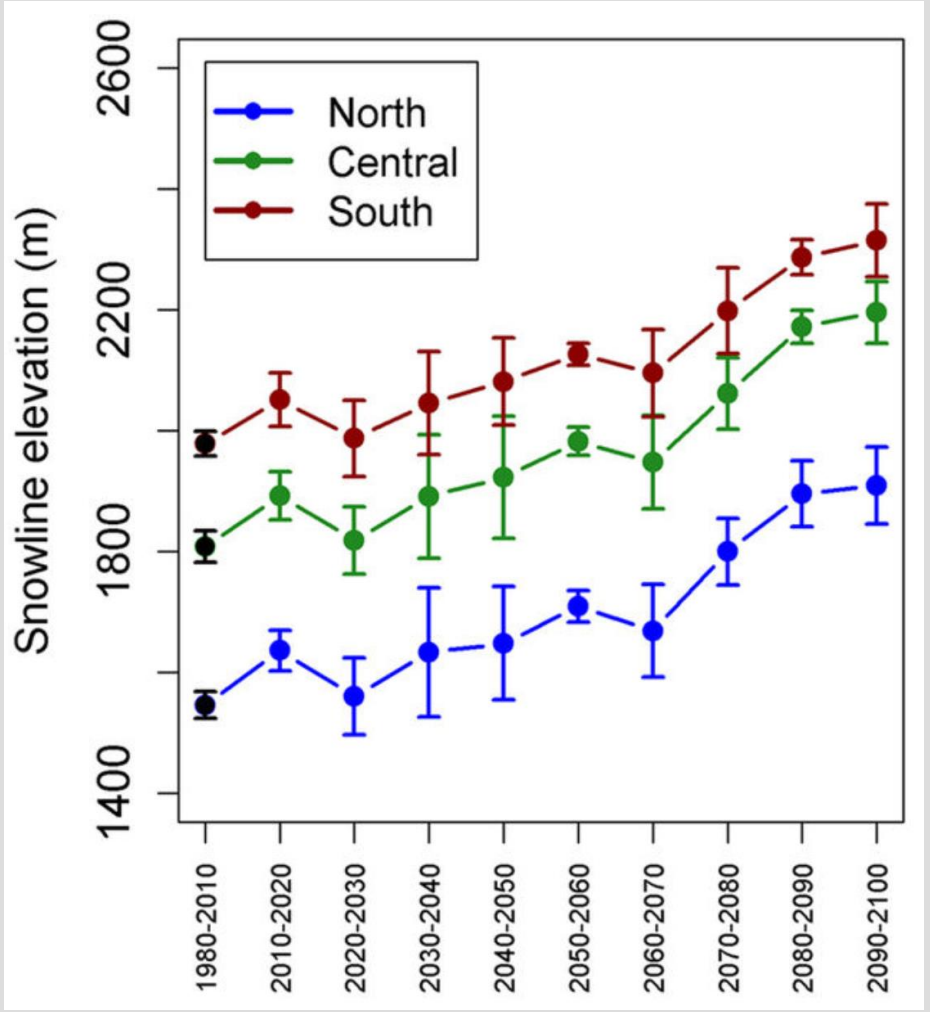


With higher future temperatures increases in climatic water deficits maybe likely…

Source: Cal Adapt accessed 2019

SHIFT FROM SNOW TO RAIN



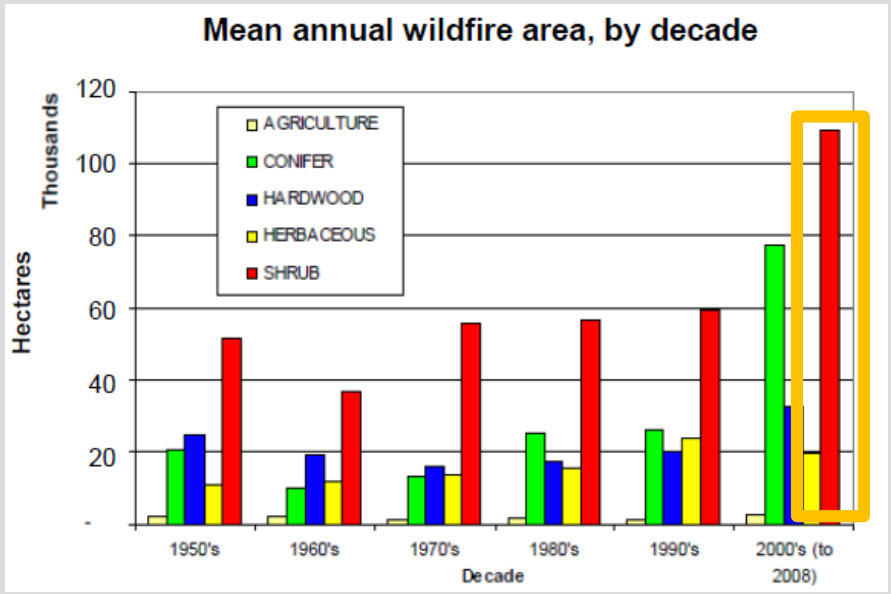


Snow Cover by 20–84%

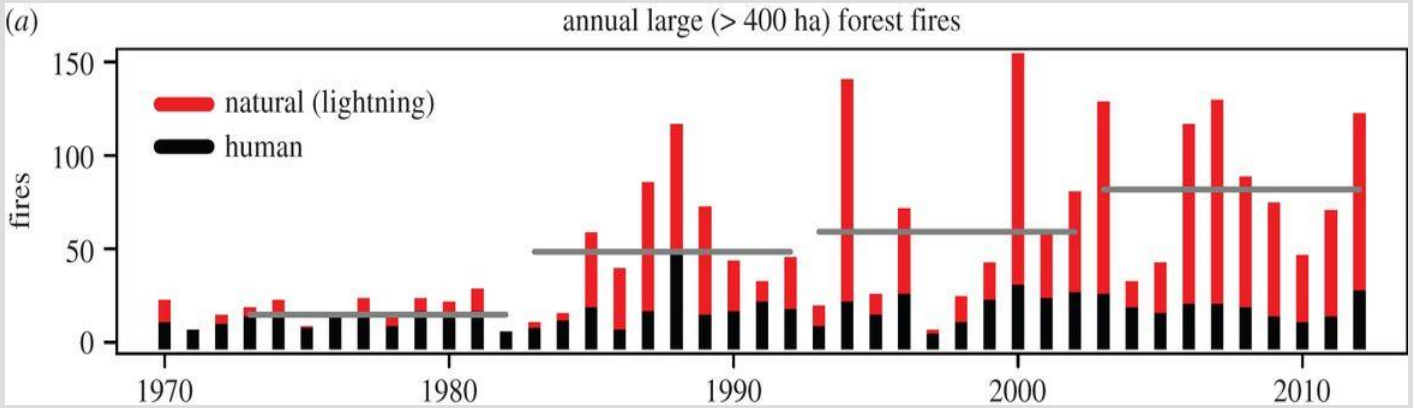
Liang, Hurteau and Westerling, 2017 Scientific Reports

WILDFIRE ACTIVITY

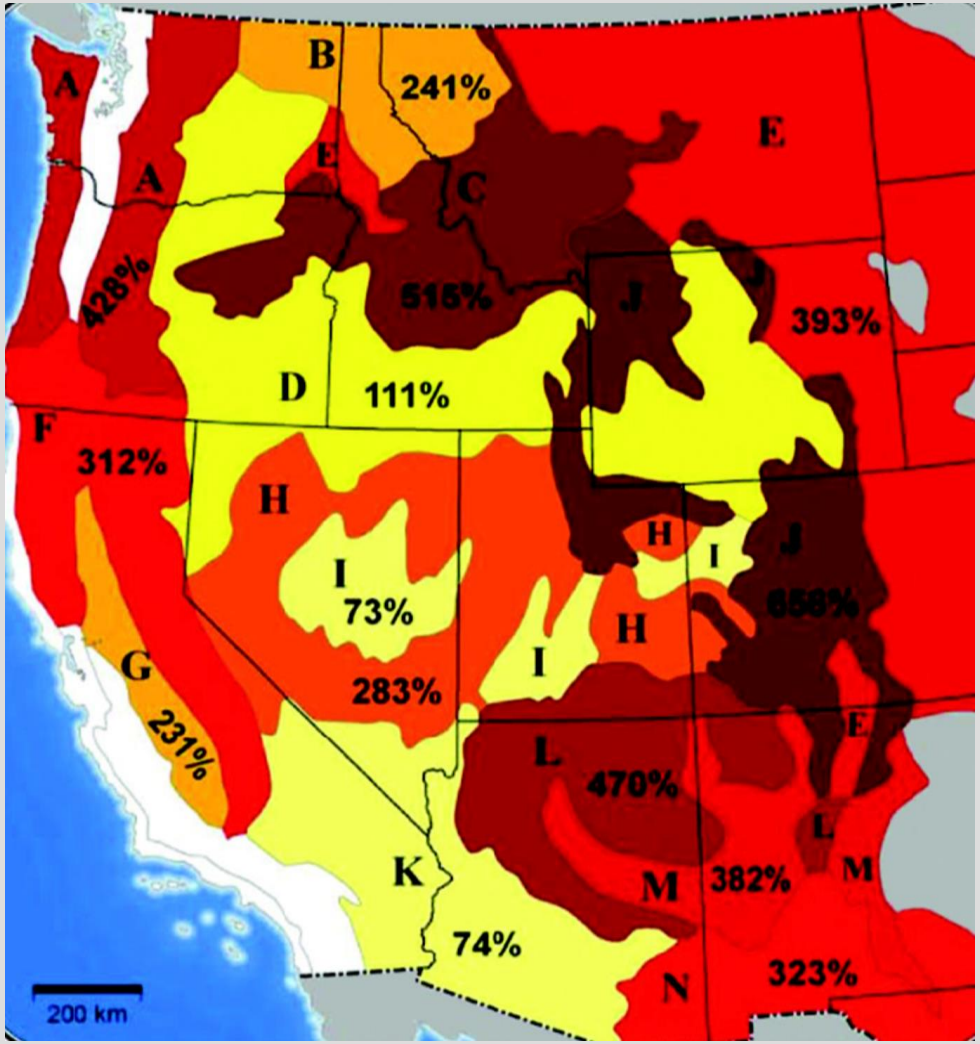
1.8˚F increase = >300% increase in area burned



Source: CAL FIRE FRAP

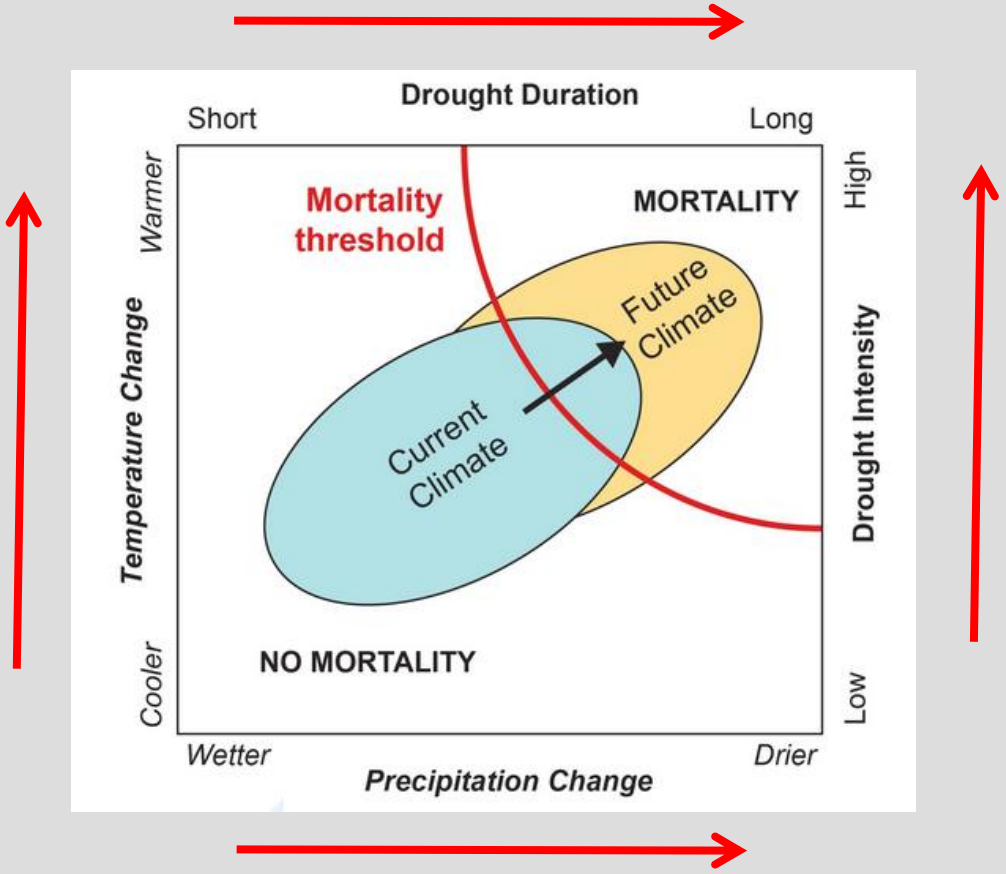


Westerling 2016 Phil. Trans. R. Soc. B



National Research Council. 2011; Taylor and others 2016 PNAS

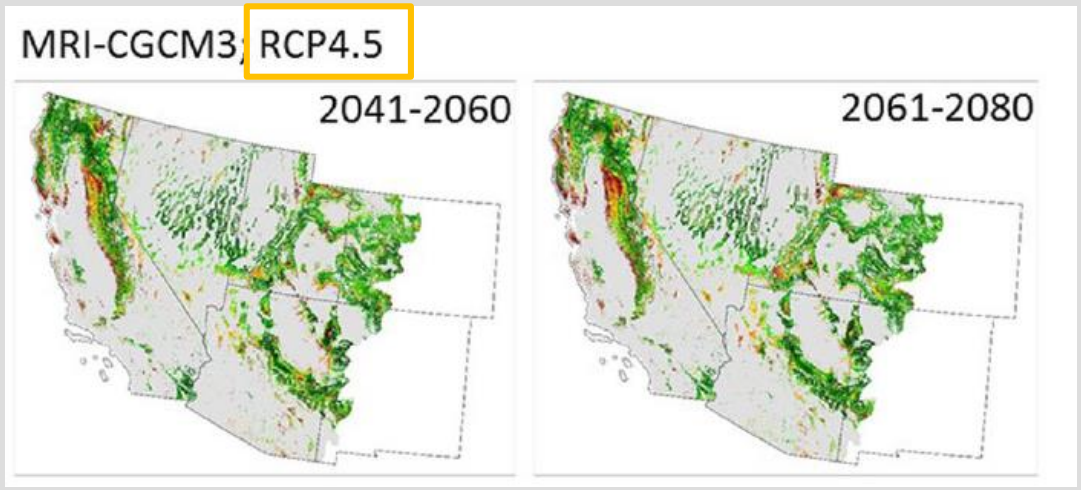
CLIMATE CHANGE AND EXTREMES DEMAND WILL FORCE CLIMATE ADAPTATION

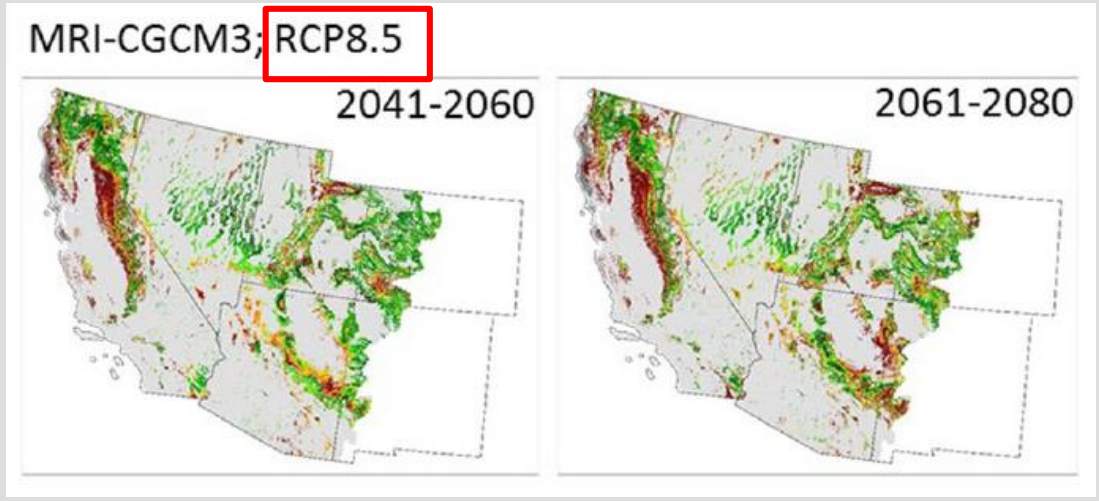


Allen and others 2010 Forest Ecology and Management

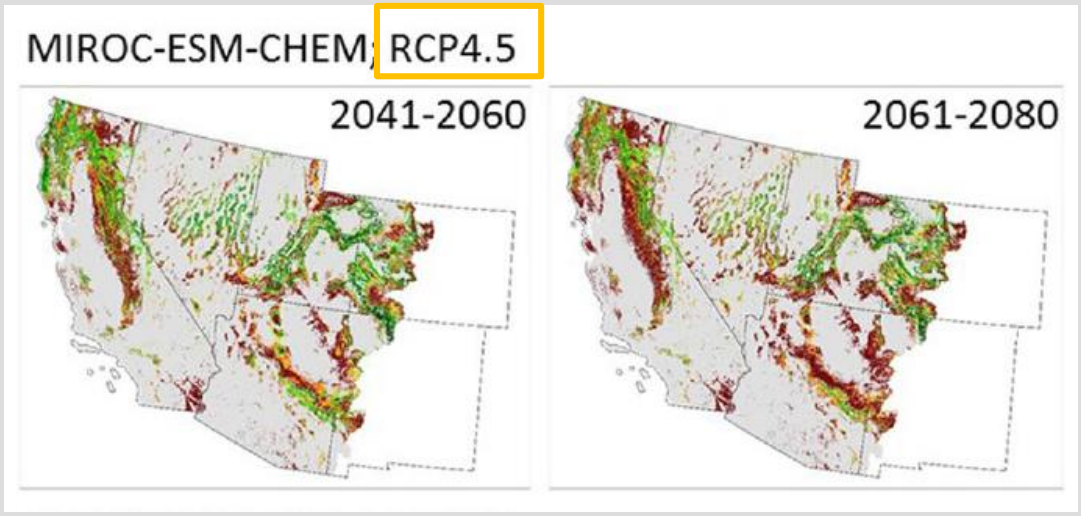
SPECIES DISTRIBUTION HAS, IS & WILL CHANGE

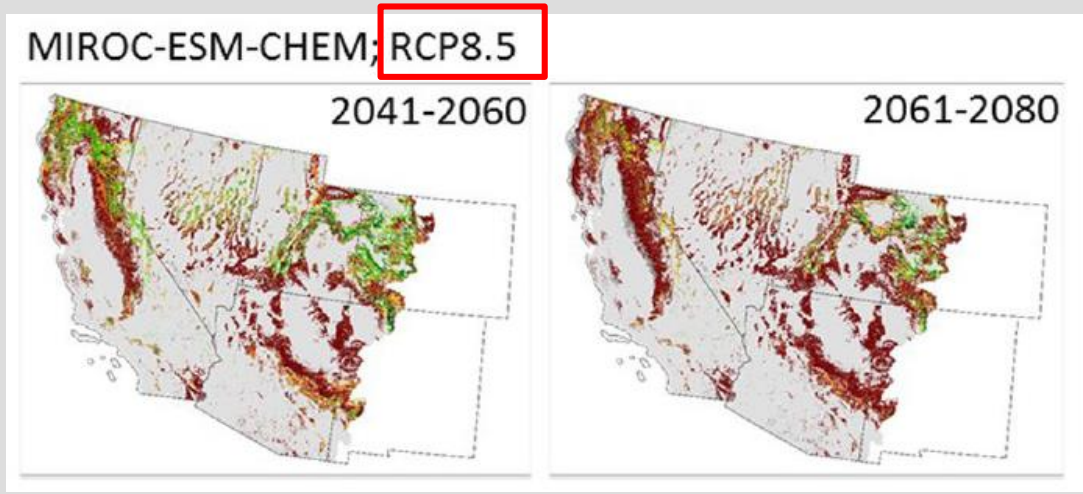
Wet and Warm Future



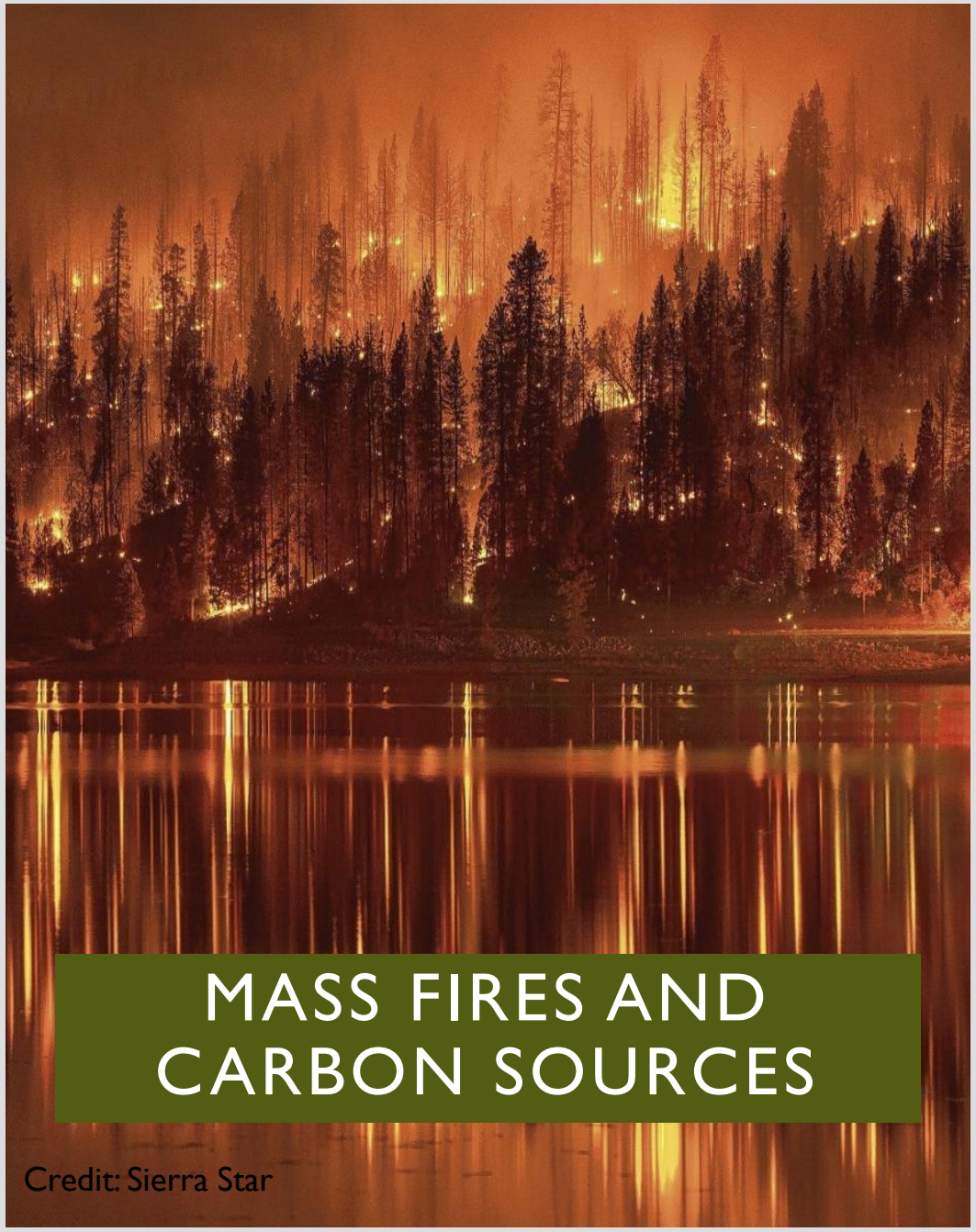


Hot and Dry Future



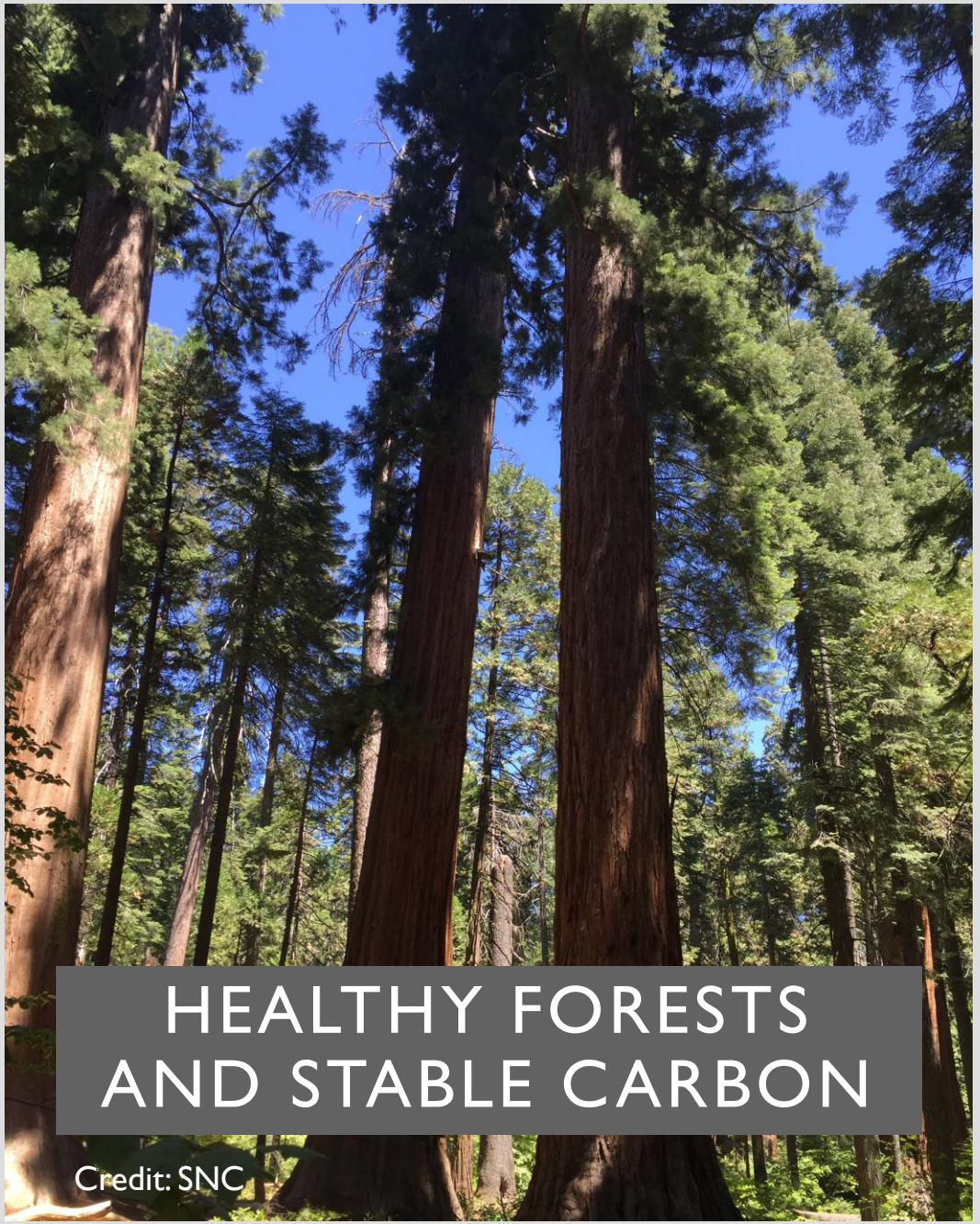


James Thorne and others, 2017 Climatic Change



MASS FIRES AND CARBON SOURCES

Credit: Sierra Star



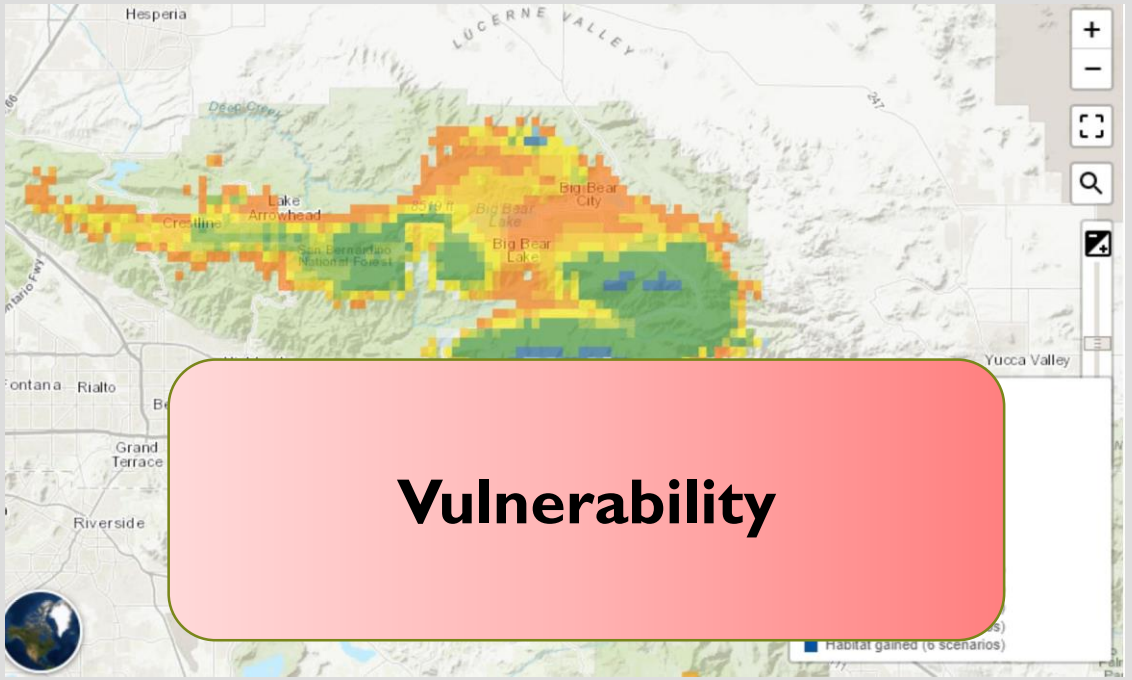
HEALTHY FORESTS AND STABLE CARBON

Credit: SNC

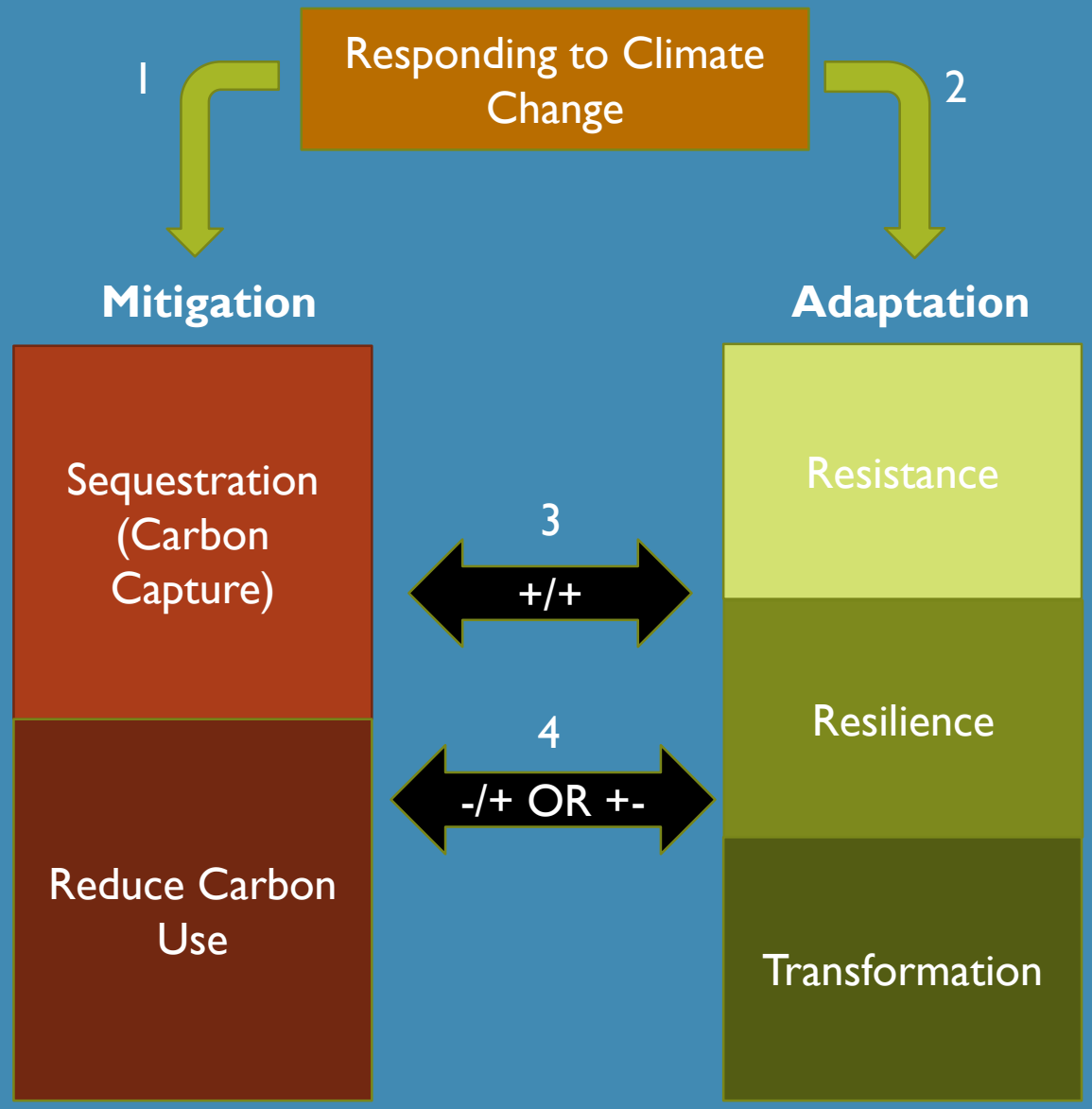
Sensitivity

Exposure

Adaptive Capacity



Vulnerability

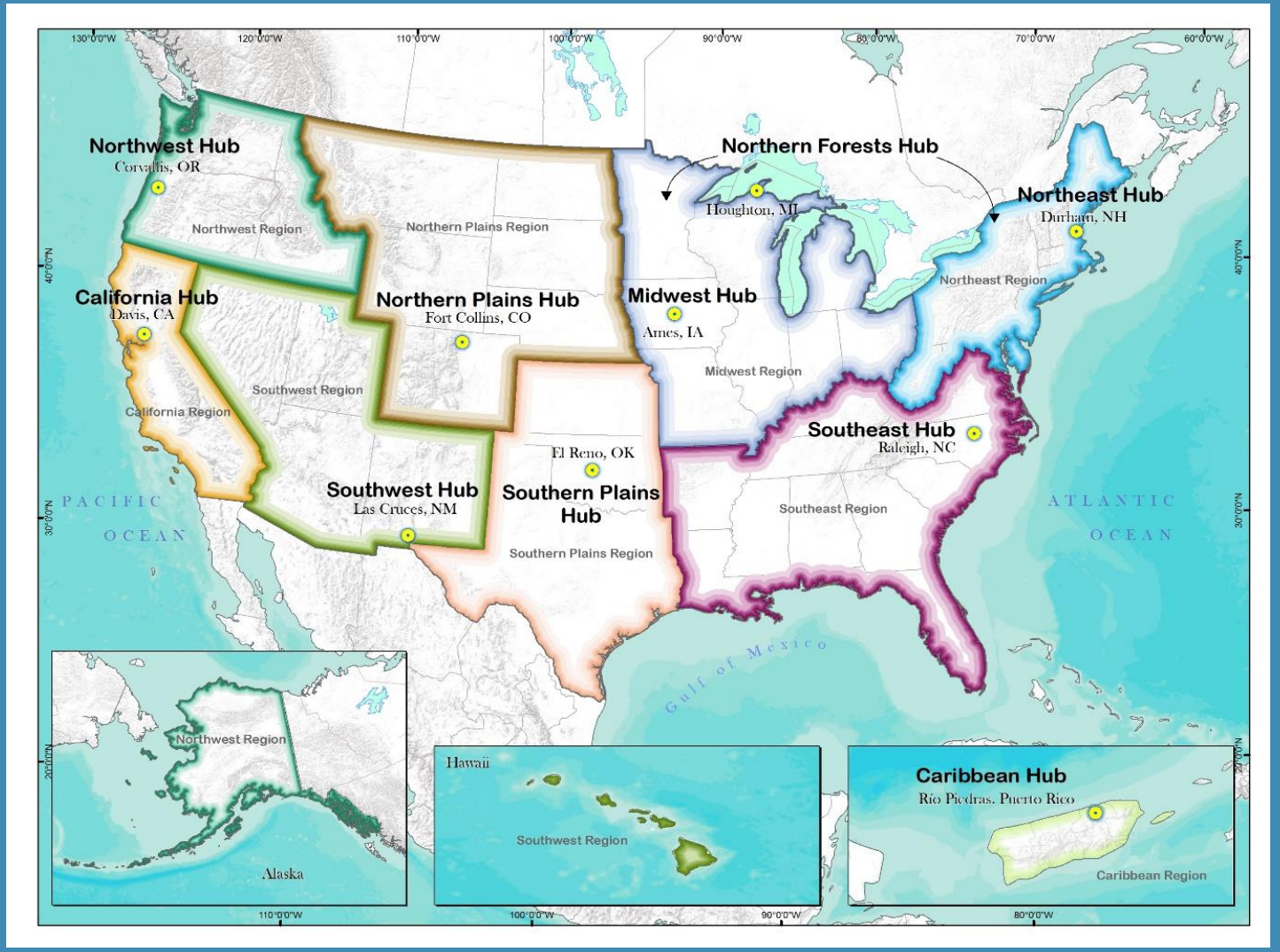


Hypothetical management approaches to address climate change. It is widely Accepted that actions that results in (1) **mitigation** are highly desirable but that (2) **adaptation** actions are necessary. Often there are (3) **co-benefits** where actions deemed critical to realize adaptation goals also meet mitigation interests as well, hence the term co-benefits. At the same time, efforts to advance a systems adaptive response could come at a carbon savings – these are Considered (4) **tradeoffs** – where one climate change response goal Comes at the sacrifice of another. Details around the various mitigation or adaptation strategies are addressed in the text.

Reforestation

Regeneration

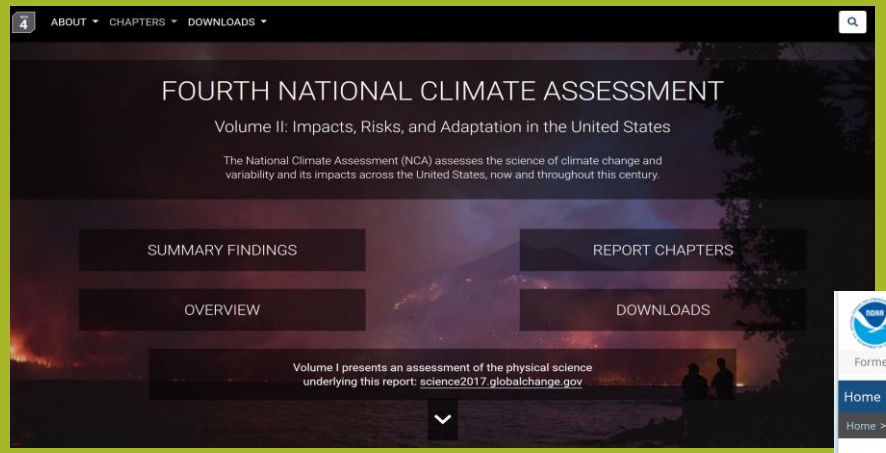
Climate Filter



CONTACT US:
HTTPS://WWW.CLIMATEHUBS.OCE.USDA.GOV

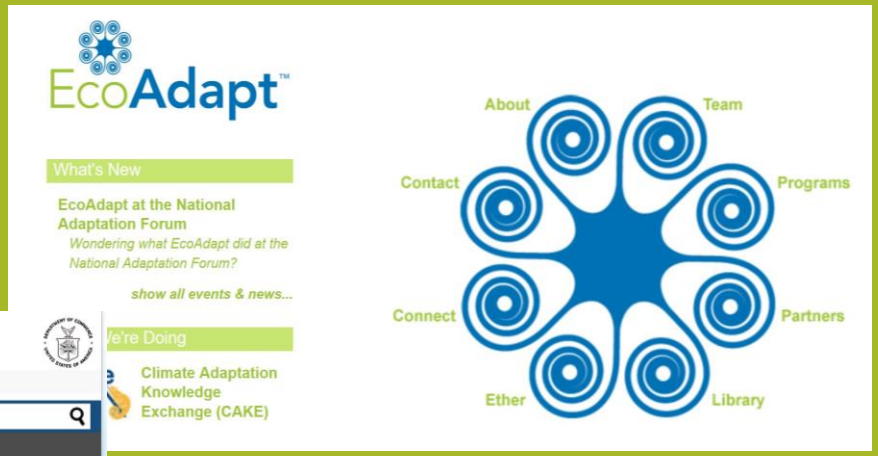
CLIMATE RESOUCES

National Climate Assessment 2014 & 2018



NOAA Climate At a Glance

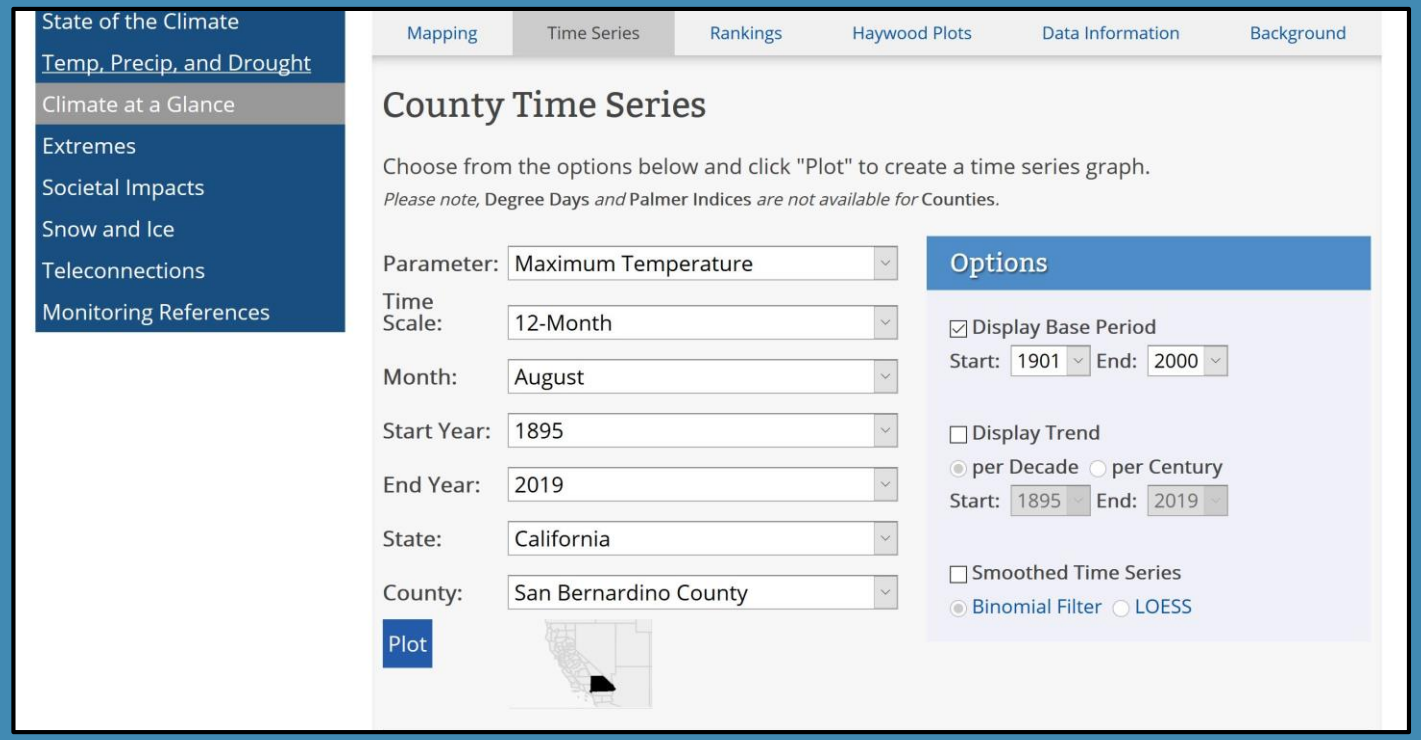
EcoAdapt

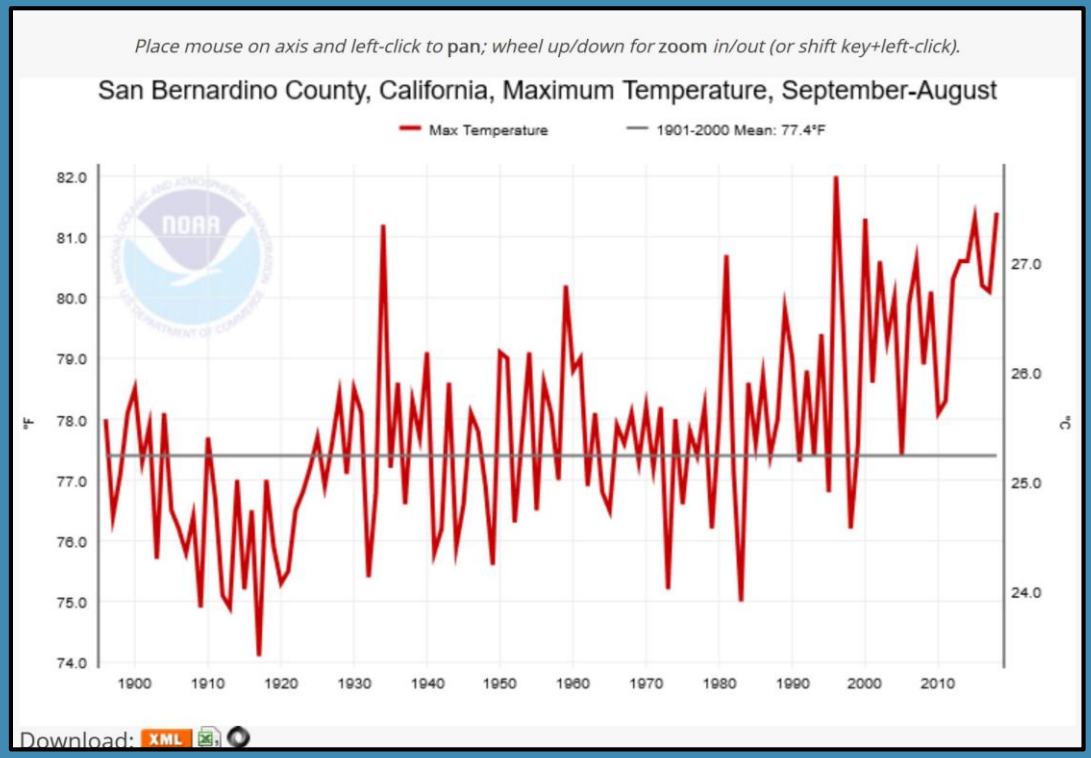


California Climate Assessment 2018

CalAdapt

INCREASING TEMPERATURES – REGIONAL AND HISTORICAL





Centers for Environmental information, Climate at a Glance: County Time Series, published June 2019, retrieved June 9, 2019 from https://www.ncdc.noaa.gov/cag/

PROJECTING TEMPERATURE, EXTREME HEAT & PRECIPITATION