



California Energy Commission Research & Development

California's Fourth Climate Change Assessment & Adaptation Opportunities in the San Joaquin Valley

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Energy Research and Development Division

November 9, 2018
Fresno, CA





California's Fourth Climate Change Assessment: An Interagency Effort

California's Fourth Climate Change Assessment: A product of CNRA, OPR, CEC

Secretary Laird, Director Ken Alex, Chair Weisenmiller

Executive Management Team (CNRA, OPR, CEC)

Keali'i Bright, Louise Bedsworth, Drew Bohan, Pamela Doughman

Steering Committee: Climate Action Team Research Working Group

Staff Management Team

Louise Bedsworth, Joseph Wraithwall, Nuin-Tara Key, Leah Fisher, Jamie Anderson, Susan Wilhelm, Guido Franco, Pamela Doughman

Energy Sector Research

Susan Wilhelm,
CEC

CNRA-funded Research

Jamie Anderson,
DWR

External Collaborators

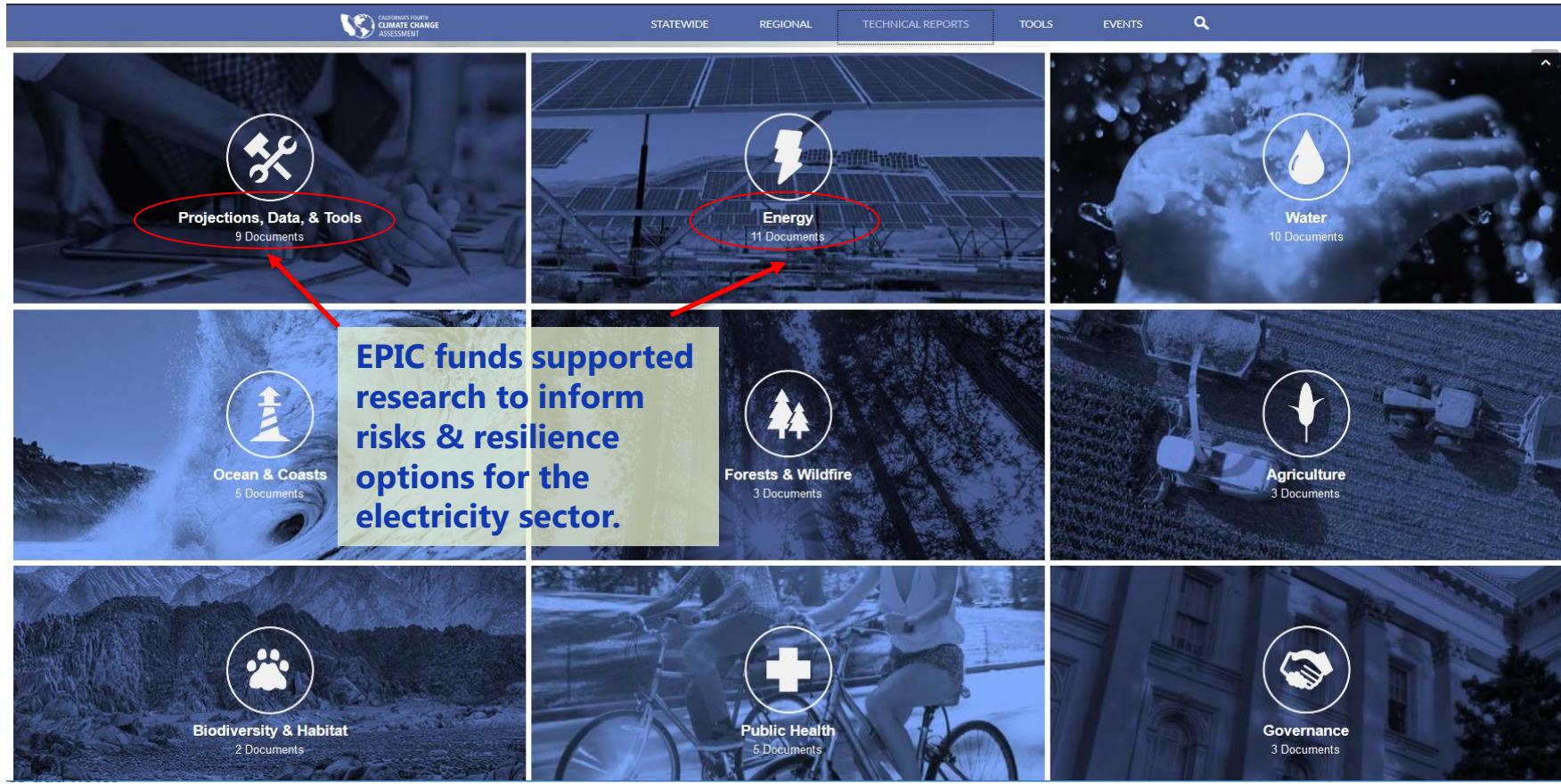
Joseph Wraithwall,
CNRA

Statewide, Regional, and Topical Reports

Guido Franco, CEC

Externally funded technical reports, strong coordination across agencies and between state and research teams enabled the Assessment to substantially broaden its scope and develop synthesis products geared toward practitioners and policy-makers.

California's Fourth Climate Change Assessment: A Multisector Effort



STATEWIDE REGIONAL TECHNICAL REPORTS TOOLS EVENTS

Projections, Data, & Tools
9 Documents

Energy
11 Documents

Water
10 Documents

Ocean & Coasts
5 Documents

Forests & Wildfire
3 Documents

Agriculture
3 Documents

Biodiversity & Habitat
2 Documents

Public Health
5 Documents

Governance
3 Documents

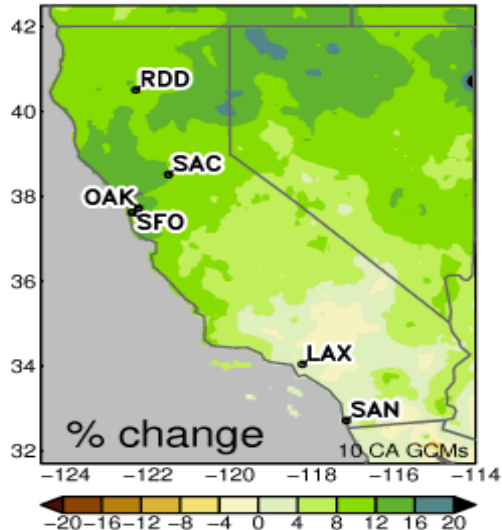
EPIC funds supported research to inform risks & resilience options for the electricity sector.

Climate Scenarios for California Suggest Severe Impacts to Water Resources

Wetter winters, drier springs expected by mid-century in California.

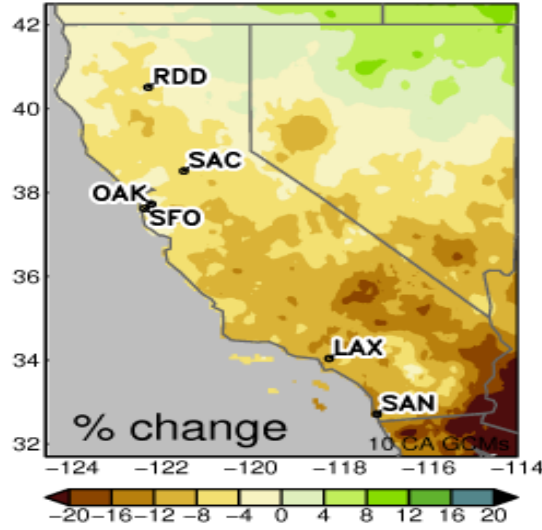
10 models

DJF avg precip change by 2040–2069 rcp45



10 models

JAM avg precip change by 2040–2069 rcp45



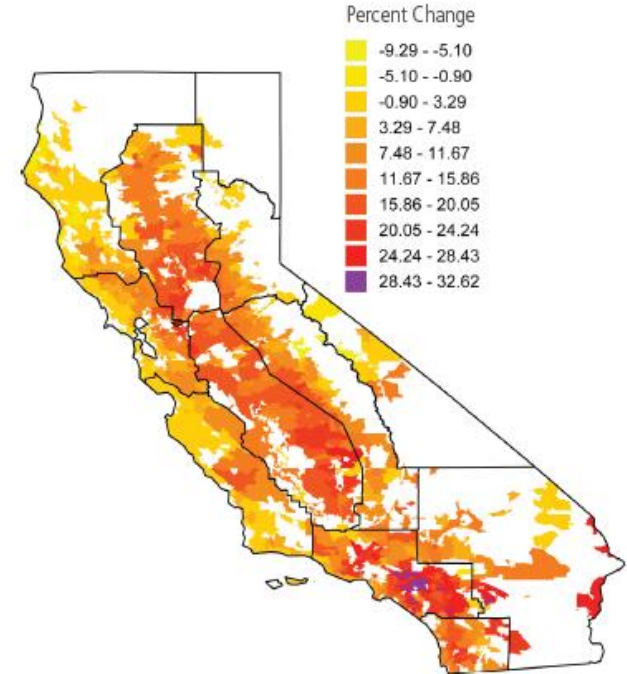
Source: Pierce, D. W., D. R. Cayan, J. F. Kalansky (2018). *Climate, Drought, and Sea Level Rise Scenarios for the Fourth California Climate Assessment*. Publication Number: CCCA4-CEC-2018-006.

Climate-Related Impacts to California's Energy System: Demand

Substantial changes in peak residential demand

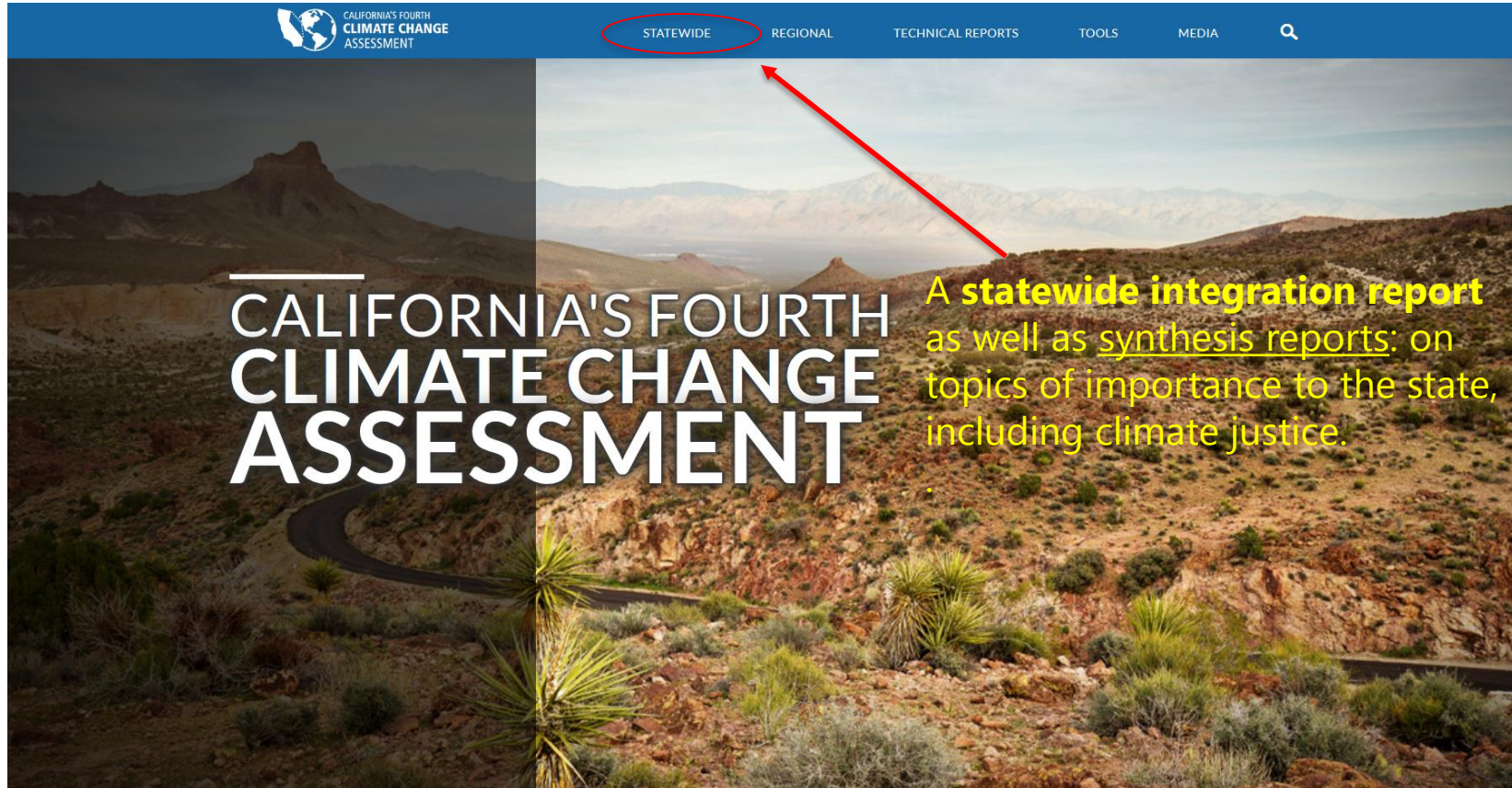
- Total and peak residential electricity consumption projected to rise due to increased use and adoption of air conditioning.
- Demand increases especially in inland and Southern California.
- Increased residential electricity consumption approximately offset by decreased demand for natural gas (end-use basis).

Figure*: Projected end-of-century change in annual residential electricity consumption relative to 2000-2015 baseline.



* Data source: Auffhammer, Maximilian (2018). *Climate Adaptive Response Estimation: Short and Long Run Impacts of Climate Change on Residential Electricity and Natural Gas Consumption Using Big Data*. Publication Number: CCCA4-EXT-2018-005. Figure source: Bedsworth, L., D. Cayan, G. Franco, L. Fisher, S. Ziaja (2018). *Statewide Summary Report*. Publication Number: SUMCCCA4-2018-013.

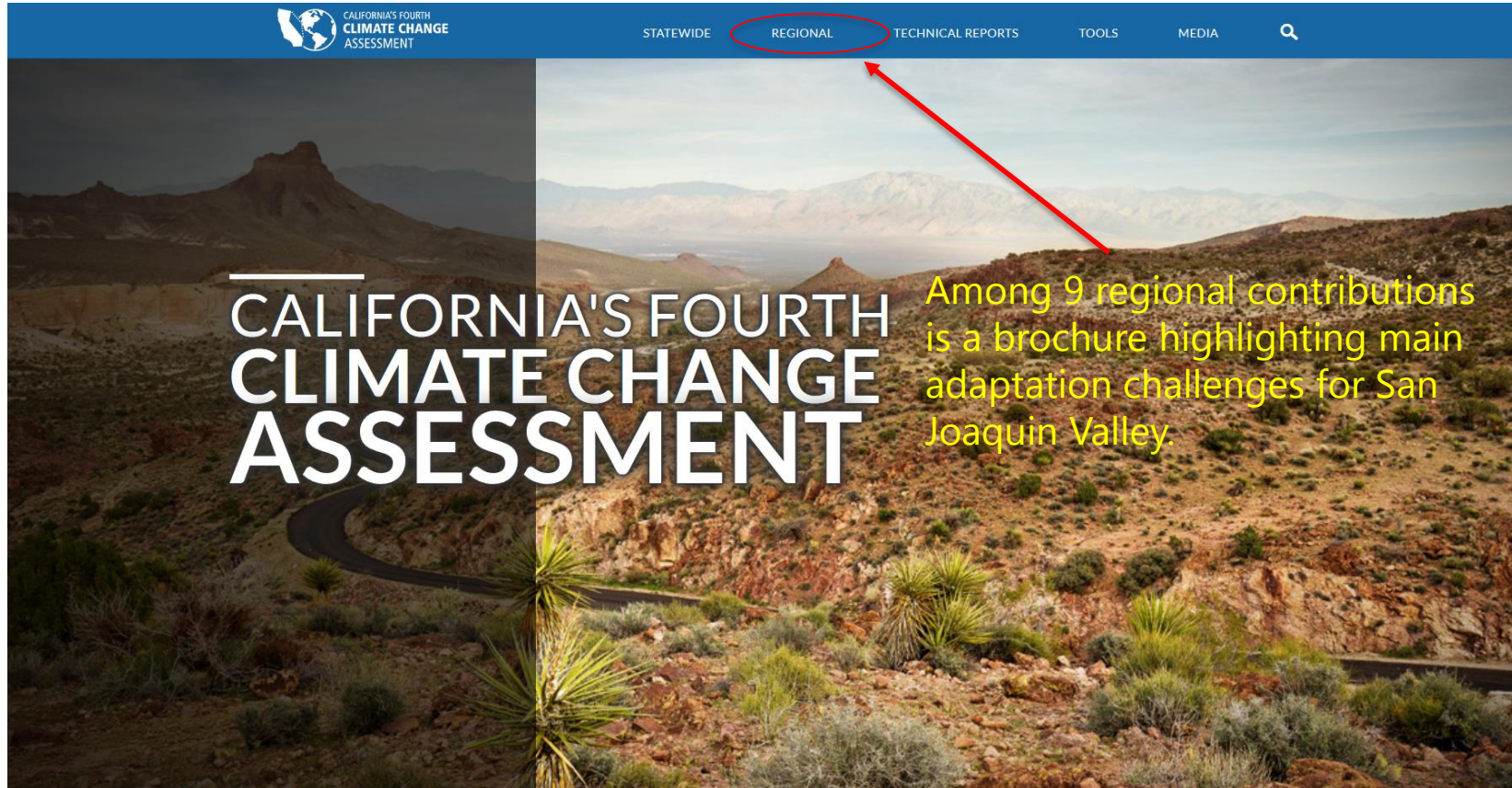
Research & Interactive Tools Illuminating Adaptation in San Joaquin Valley

A screenshot of the website for California's Fourth Climate Change Assessment. The header is blue with the logo on the left and navigation links in the center: "STATEWIDE", "REGIONAL", "TECHNICAL REPORTS", "TOOLS", "MEDIA", and a search icon. The "STATEWIDE" link is circled in red, with a red arrow pointing from a text box to it. The main content area features a large landscape image of a desert valley with a winding road. Overlaid on the left side of the image is the text "CALIFORNIA'S FOURTH CLIMATE CHANGE ASSESSMENT" in white. To the right of the image, there is a text box with yellow text.

CALIFORNIA'S FOURTH
CLIMATE CHANGE
ASSESSMENT

A **statewide integration report** as well as synthesis reports: on topics of importance to the state, including climate justice.

Research & Interactive Tools Illuminating Adaptation in San Joaquin Valley





Key Findings of Importance to San Joaquin Valley

As discussed in the statewide report:

- **Water shortages, warmer temperatures, and development** of agricultural land will challenge agriculture production.
- **Agricultural communities are vulnerable** to drought-related impacts such as reduced employment associated with switching to crops that do better in water shortages and losses in the dairy sector.
- **Delta water exports** are projected to be reduced, and levees' **flood-related vulnerability** is exacerbated by sea level rise and subsidence.
- Estimates of damage from climate change in California are dominated by human mortality, coastal property damage, and droughts & mega-floods. **Increasing resilience of vulnerable populations** is critical.



How are EPIC Funds Helping to Address Resilience?

The Energy Commission's EPIC funds support research & development regarding:

- Viable, resilient paths for **deep reductions of greenhouse gas emissions**, with electrification playing a central role.
- Support of **Advanced Energy Communities** that use advanced technologies to enhance resilience/reliability, environmental performance, and security of energy systems in disadvantaged communities.
- Ensuring the transformation of California's energy system **benefits disadvantaged communities**.

These topics will be explored at a workshop in Fresno on December 4.

Research & Interactive Tools Illuminating Adaptation in San Joaquin Valley



The screenshot shows the homepage of the California's Fourth Climate Change Assessment website. The background is a landscape image of a winding road through a desert valley. The main title "CALIFORNIA'S FOURTH CLIMATE CHANGE ASSESSMENT" is prominently displayed in white text. The navigation bar at the top includes links for STATEWIDE, REGIONAL, TECHNICAL REPORTS, TOOLS, and MEDIA. The "TOOLS" link is circled in red with a red arrow pointing to it. Below the navigation bar, there are three tool highlights: "cal-adapt", "°CHAT", and "CoSMoS".

CALIFORNIA'S FOURTH CLIMATE CHANGE ASSESSMENT

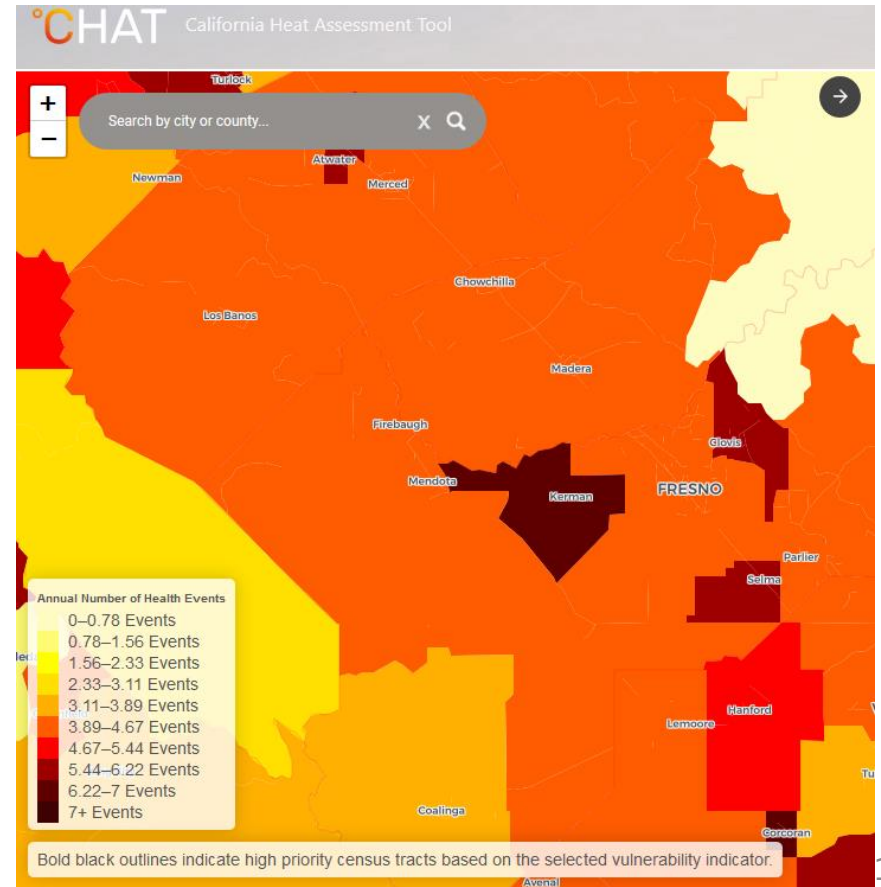
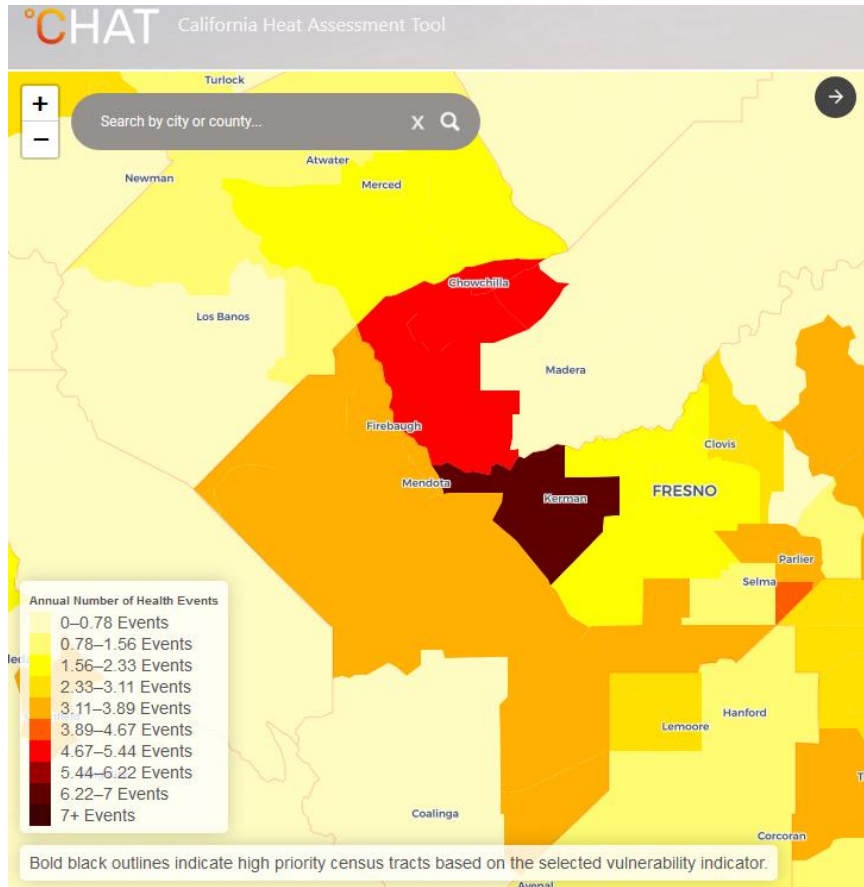
cal-adapt
www.Cal-Adapt.org
Cal-Adapt is the State's portal for the climate projections produced for the Fourth Assessment, enabling data downloading and visualizations of climate scenarios at the local level and wildfire projections for the entire state.

°CHAT
www.Cal-Heat.org
Cal-Heat is a new tool funded by the Fourth Assessment to inform local public health officials' initiatives to protect the public during climate-exacerbated extreme heat events.

CoSMoS
COASTAL STORM MODELING SYSTEM (COSMOS)
The CoSMoS model, partly funded by the Fourth Assessment, provides information about the complex interplay of coastal dynamics and climate change for California's coast.
View updated CoSMoS results on these websites:

- Hazard Exposure Reporting and Analytics (HERA)
<https://www.usgs.gov/apps/hera/>
- Our Coast Our Future Flood Map
www.OurCoastOurFuture.org

Heat Health Events Increasing in SJV





Public Health Implications of California's Climate Policy

As discussed in the statewide report:

- **Deep reductions in GHG emissions improve air quality** through reduced emissions of health-damaging pollutants such as particulate matter (PM), nitrous oxides (NOx), and volatile organic compounds (VOCx).
- California's **low-carbon energy future** would reduce air pollution mortality by about 55% by mid-century.
- These **public health benefits accrue at the local level**, bringing immediate air quality benefits to vulnerable populations.

From a public health perspective, California's low-carbon future appears to be no-regrets even if California goes it alone.



Upcoming Workshop in Fresno to Focus on San Joaquin Valley Climate Adaptation



DEC
04

San Joaquin Valley Regional Climate Symposium

by Local Government Commission (LGC)

Free

DATE AND TIME

Tue, December 4, 2018
10:00 AM - 2:00 PM PST

[Add to Calendar](#)

Register

LOCATION

Fresno Council of Governments
2035 Tulare Street
Suite 201 - Sequoia Room
Fresno, CA 93721

[View Map](#)



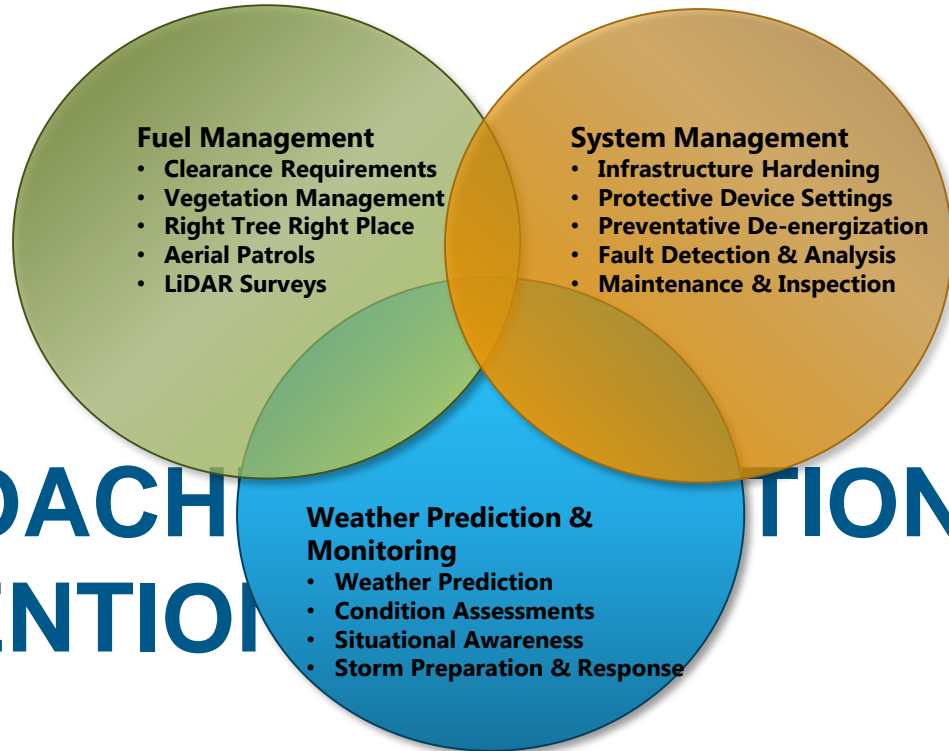
<http://www.climateassessment.ca.gov/events/>



Ignition Prevention Research

2018 EPIC Fall Workshop

David Erne
November 9, 2018
California Energy Commission



APPROACH TO PREVENTION



*Formed in July 25, 2018
Public Workshop*

*Identifying research
priorities*

*Coordinating research
program efforts*

Sharing information


A  Semptra Energy utility



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IGNITION PREV
COORDINATION
GROUP



ON RESEARCH
WORKING



Technologies to
identify conductor
pre-failure
conditions

Technologies that
identify fault types
and locations on
distribution lines

Best application of
multifunction
reclosers and
controls

Maintaining power
for critical facilities
and along egress
routes

POTENTIAL RESEARCH OPPORTUNITIES FOR
THE ENERGY COMMUNITY

NEXT STEPS

Refine Research Areas

- Conduct market research

Oct – Dec, 2018

Public Workshop

- Convene working group to coordinate efforts
- To be held in SoCal

Jan, 2019

Develop & Publish GFO

- Develop scope
- Publish GFO

Feb – Jul, 2019



Questions

David Erne

David.Erne@energy.ca.gov

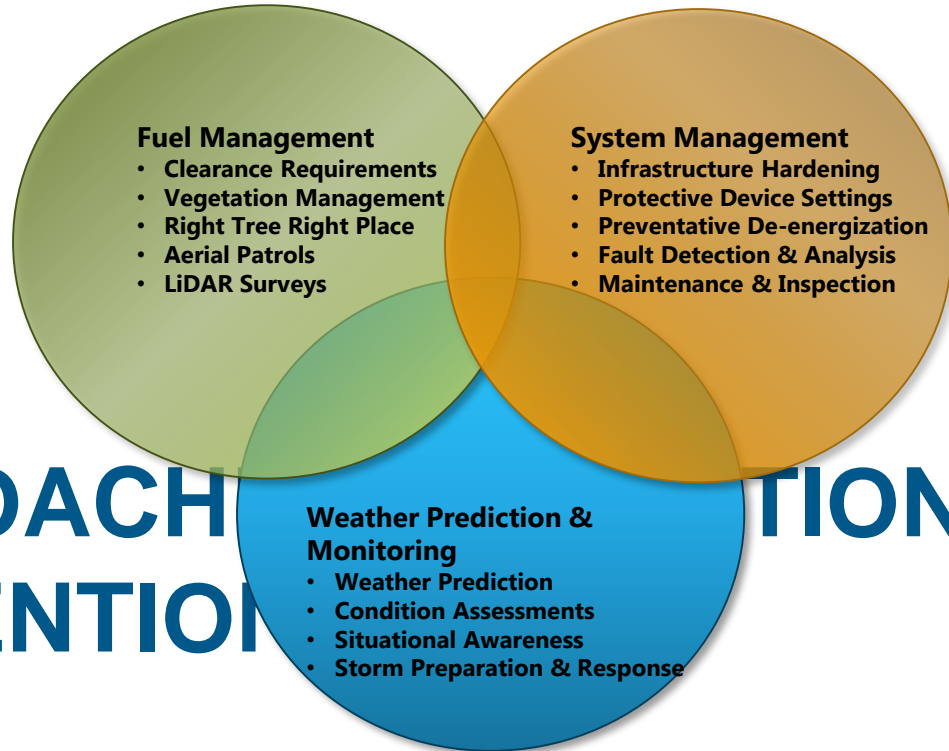
(916) 327-1399



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