



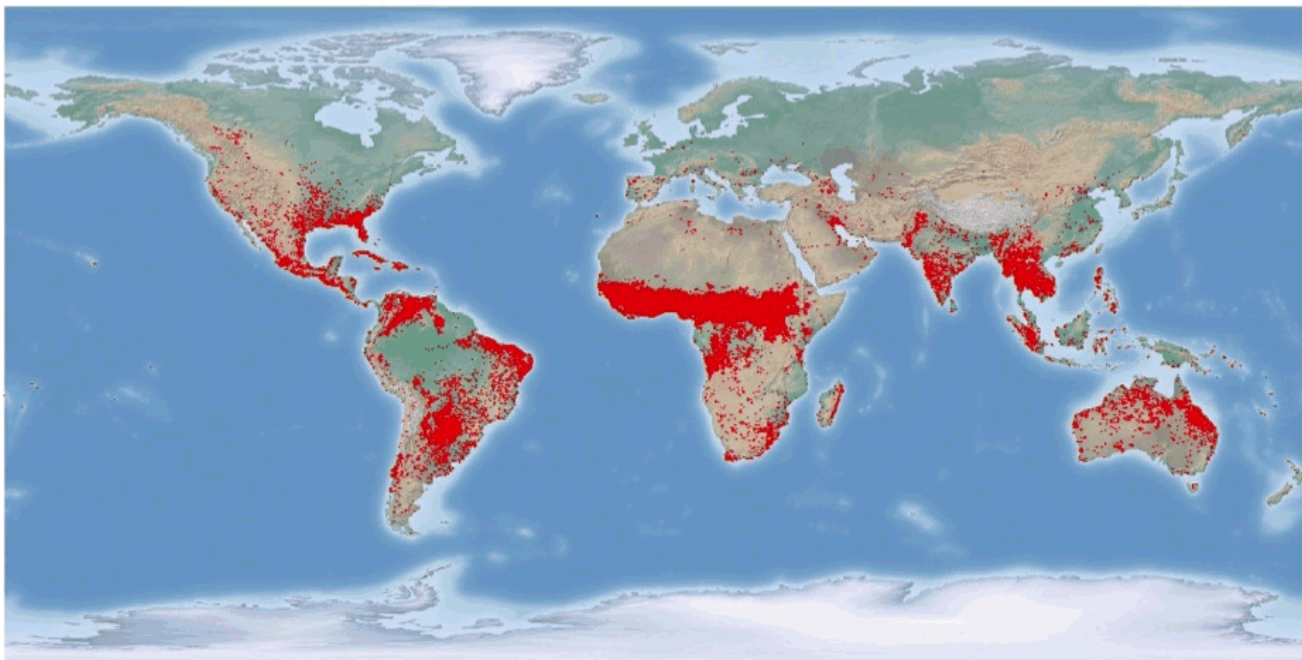
Critical Gaps in Wildfire SES & the Consequences

Max Moritz
UCCE Wildfire Specialist
mmoritz@ucsb.edu

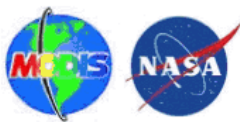
June 13, 2024



2012 MODIS Active Fire Detections from the Aqua and Terra Satellites

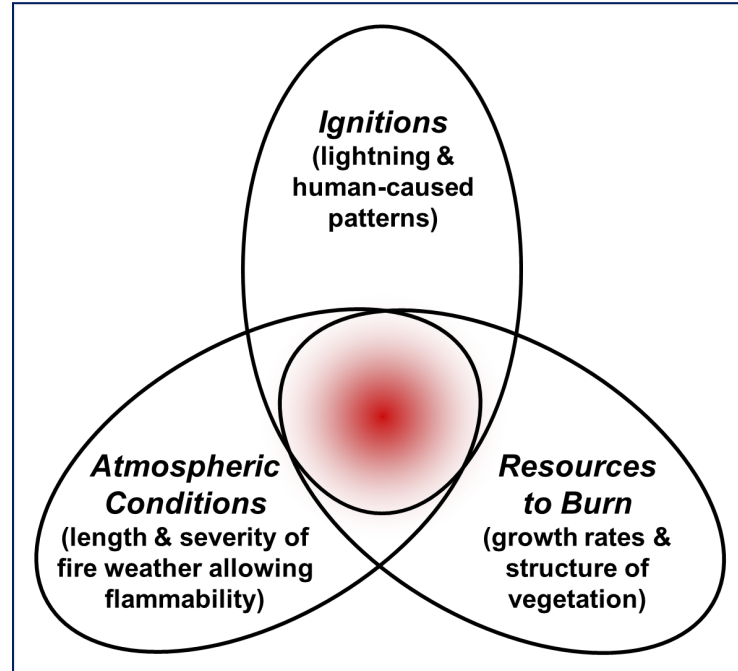


January February March April May June July August September October November December



Active fires, shown in red, are detected using MODIS data from the Aqua and Terra satellites
Source: NASA Fire Information for Resource Management System (FIRMS) <https://earthdata.nasa.gov/firms>

Pyrogeography: How to Think

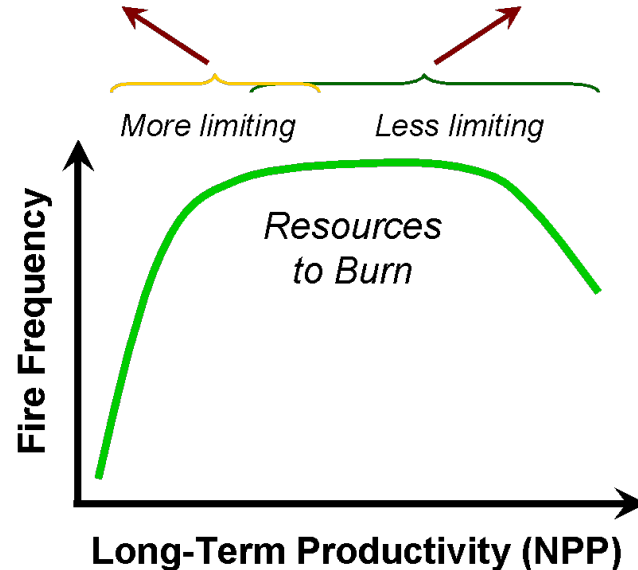


(Moritz et al. 2012)

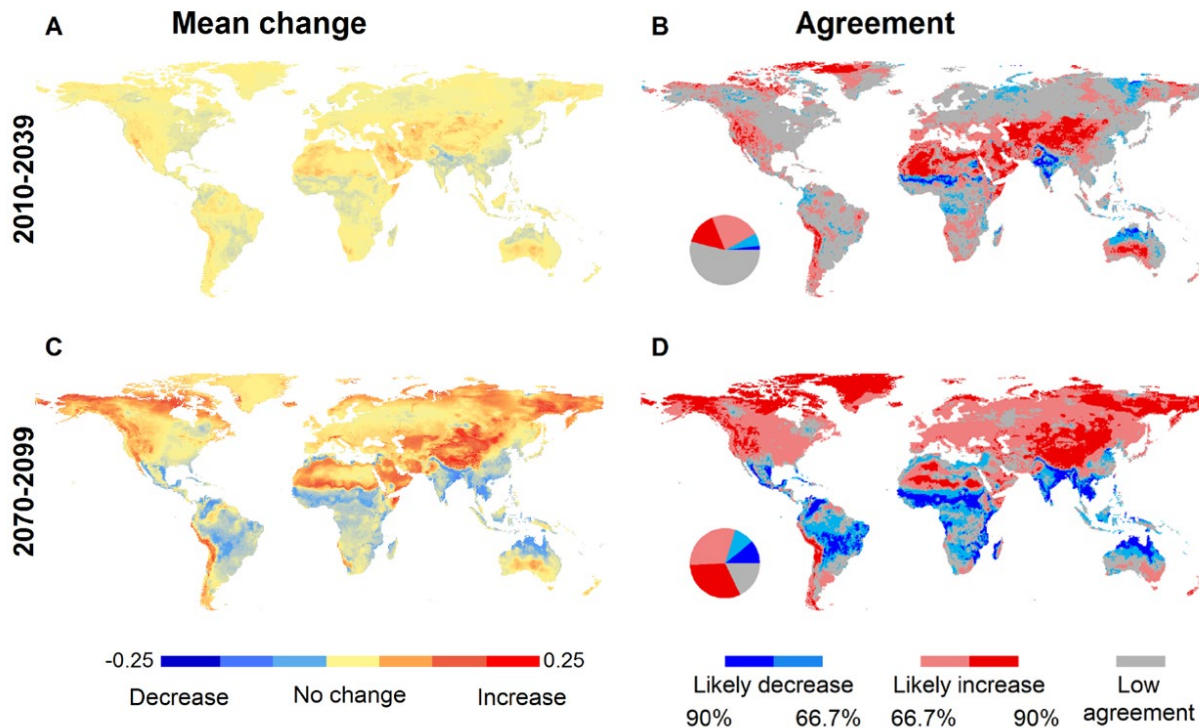
Pyrogeography: How to Quantify

Sensitivities: changes in environment that support biomass growth (e.g., precipitation pulses)

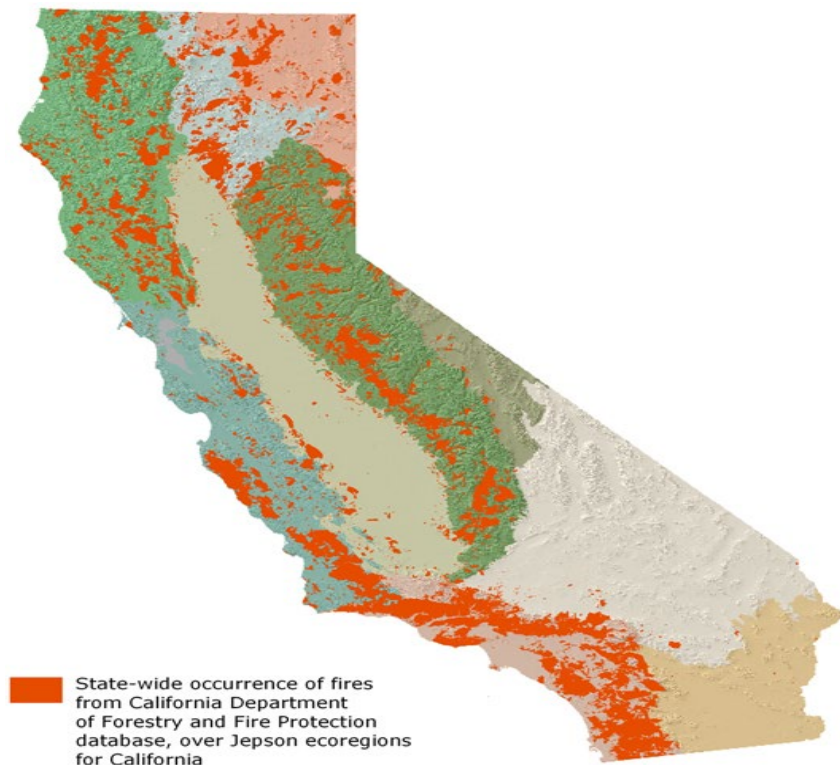
Sensitivities: changes in ignitions, fire-conductive atmospheric conditions (e.g., droughts, hot & dry winds)



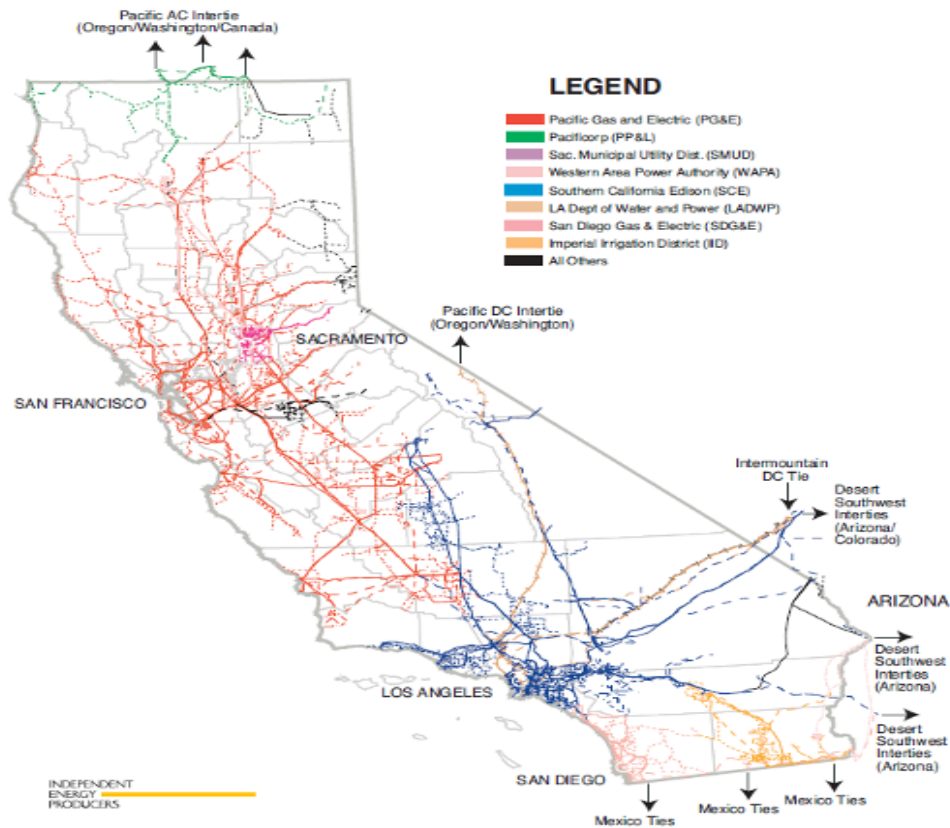
Global Ensemble Model Projections



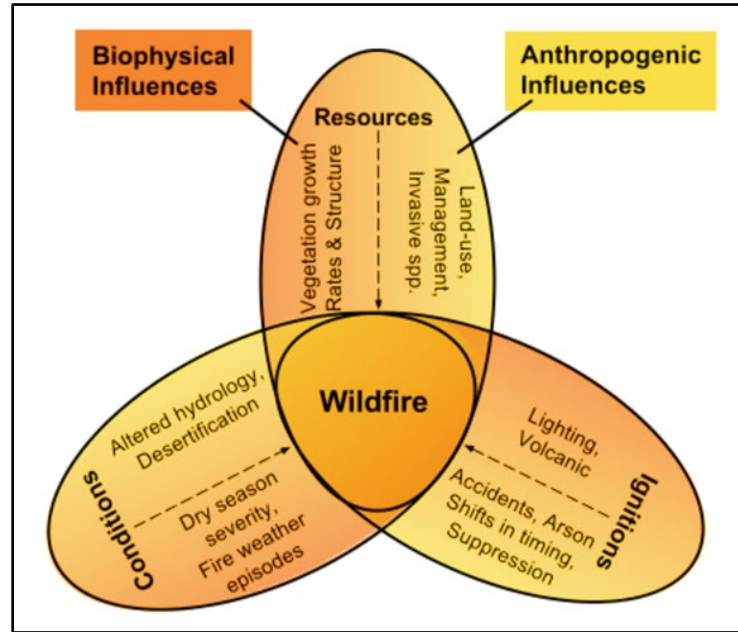
Finer Scale: Humans?



California's Major Electric Transmission Lines Map
The Power of California

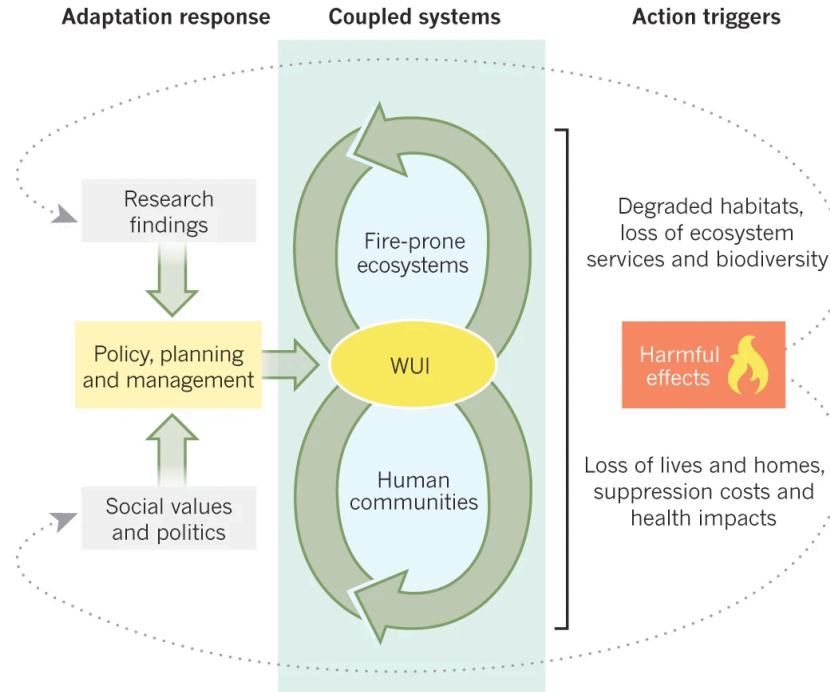


Pyrogeography: Human Influences!



(Mann et al. 2016)

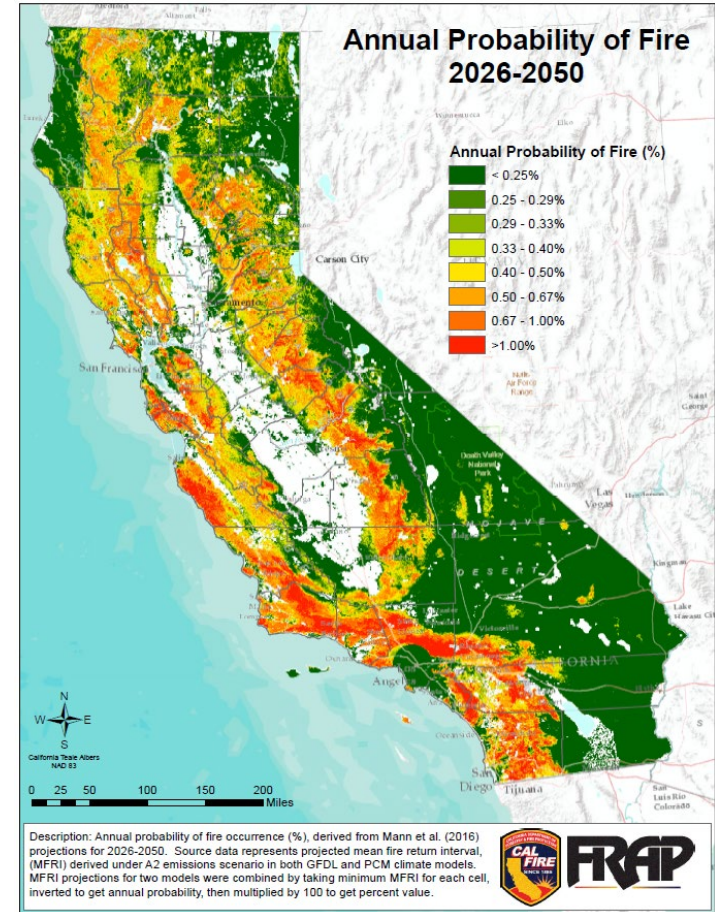
The Wildland-urban Interface (WUI) Focus



(Moritz et al. 2014)

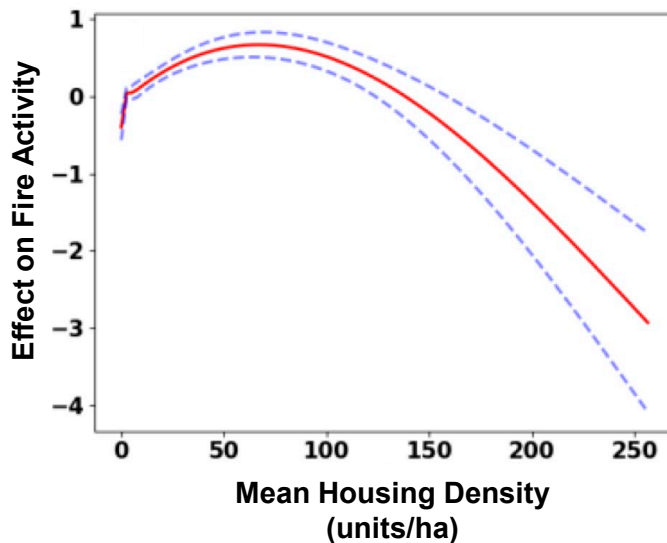
SES Gaps: Landscape/Ecoregion

Just how important
are humans?



SES Gaps: Landscape/Ecoregion

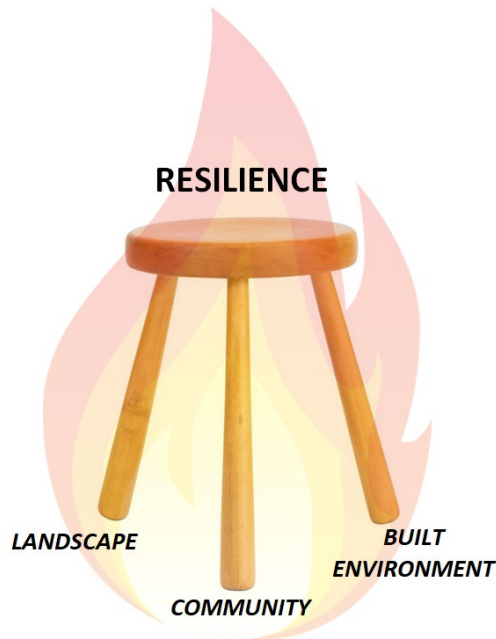
**Very Important,
but Largely
Unknown!**



(Park et al. 2021)

SES Gaps: Local/Community

**Risk Reduction
Requires an
Integrated
Approach...**

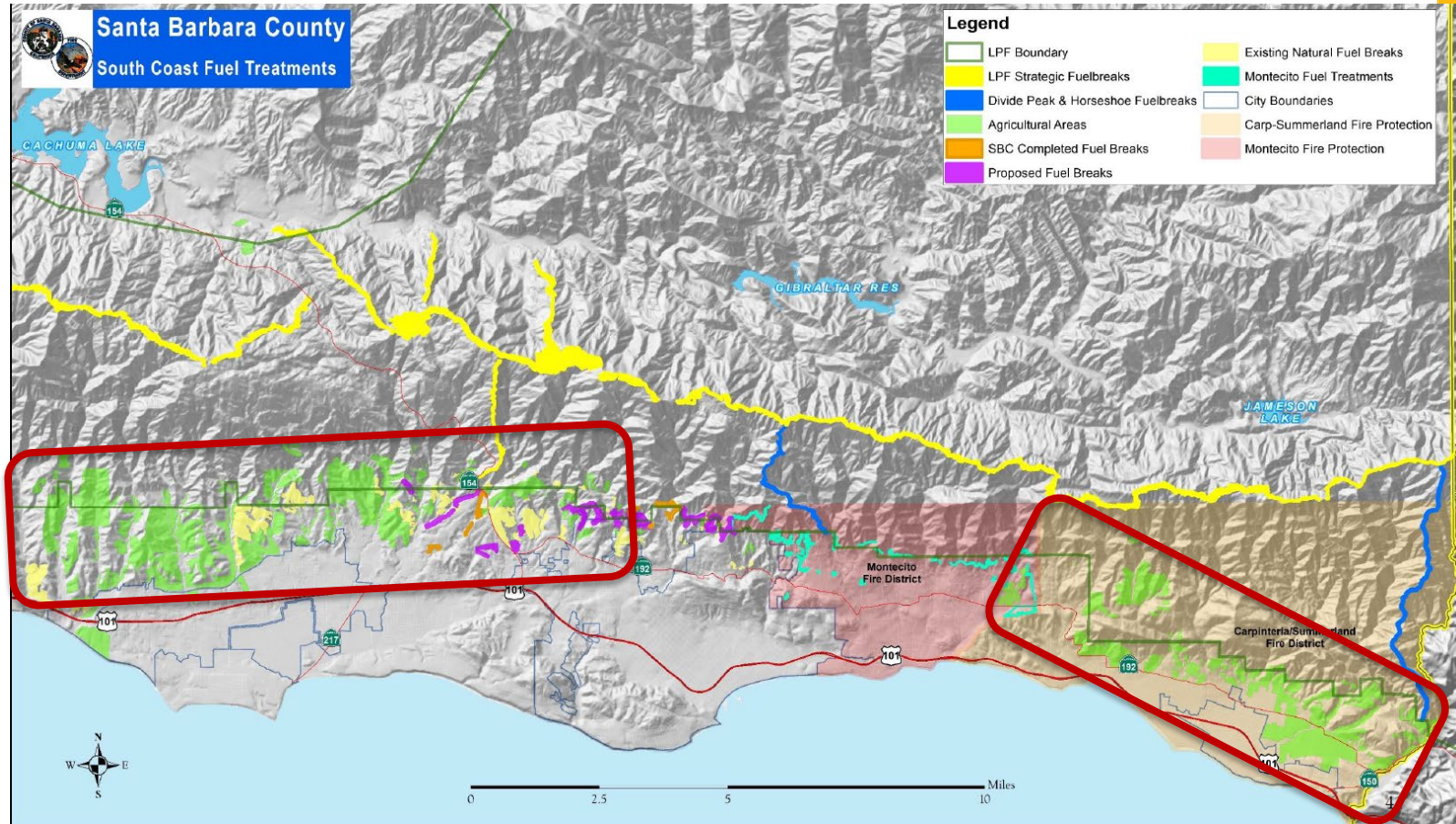


(Moritz et al. 2022)



Santa Barbara County South Coast Fuel Treatments

- Legend**
- | | |
|------------------------------------|---------------------------------|
| LPF Boundary | Existing Natural Fuel Breaks |
| LPF Strategic Fuelbreaks | Montecito Fuel Treatments |
| Divide Peak & Horseshoe Fuelbreaks | City Boundaries |
| Agricultural Areas | Carp-Summerland Fire Protection |
| SBC Completed Fuel Breaks | Montecito Fire Protection |
| Proposed Fuel Breaks | |



SES Gaps: Local/Community

**Mapping,
Valuing, &
Maintaining
WUI “Buffers”**



(Moritz et al. 2022)

Scales of WUI Decisions

Ecosystem
Services

Land Use/Urban
Planning

Atmospheric/Clim
ate Science

Landscape
Architecture

Vegetation
Modeling

Behavioral
Economics

Fire Science/
Pyrogeography

Infrastructure
Design

Plant Ecology/
Ecophysiology

Materials
Engineering

Risk
Perception



Critical Gaps in Wildfire SES

What we don't know:

- **What drives the flammability & survivability of WUI landscapes.**
- **How to translate that knowledge into Sustainable Development Standards.**

Thank you

