Resilient Communities

1. Case Study: *Evaluating socio-ecological resilience to variable severity wildfires in Jalisco, México*
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Introduction
Uncontrollable and devastating wildfires are becoming more frequent in many parts of the world. Climate change is expected to exacerbate the negative impacts of wildfires on biodiversity, public health, social wellbeing, livelihoods, built infrastructure, and on the overall stability of socio-ecological systems. Resilient responses to wildfires should aim to quickly restore the components, processes, and functionality of such systems within reasonable timeframes. Resilience to wildfires greatly depends on fire severity and its variability within the landscape. High-severity-stand-replacing fires often result in substantial physical and chemical alterations in soil properties, hydrologic responses, and ecosystem functioning. In addition, they can bring huge economic losses and human health impacts leading to negative ecological and social outcomes. On the contrary, low- to moderate-severity fires that typically leave most of the large trees alive result in structurally complex patches with different degrees of burned organic matter. These patches are more prone to restore ecosystem functioning following a fire event. Promoting resilience is central for sustainable planning and risk management. However, achieving socio-ecological resilience requires the recognition that fire severity is not only the result of biophysical feedbacks such as weather patterns, fuel type and soil drought, but it is also shaped by socio-political factors related to land-use and settlement patterns, management options, investment decisions, and stakeholders' actions and responses to wildfires. However, little is known about how social and political drivers can be conducive to variable fire severity and impact overall socio-ecological resilience. An extensive literature review will be carried out to identify the fire risk management strategies implemented in the last decade.

Objectives
- Evaluate socio-ecological resilience to variable fire severity in temperate forests of southeastern Jalisco, México.
- The study will include the temperate forested regions of La Primavera, Sierras de Quila and Tapalpa de Jalisco.
- Quantify and record fire severity in each region using the composite burn index derived from historic remote sensing data.
- Measurements of burn depths, damage to the canopy and vegetation regeneration to assess on-ground fire severity.

Hypothesis/Expected Outcomes
- Understanding the drivers of interannual variability in water resources for CA and MX can serve as support to creating long-term, community-focused solutions for the advancement of environmental, economic, and social sectors in both rural and urban regions.
- Implementation of participatory workshops with local stakeholders and community members to explore how their actions and responses are perceived to increase resilience.

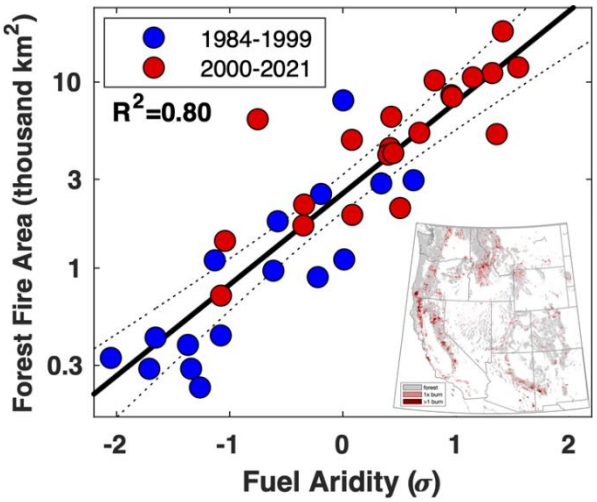

Figure A-2. Climate-Fire Relationship in the Western US Forests (Abatzoglou et al. 2021).