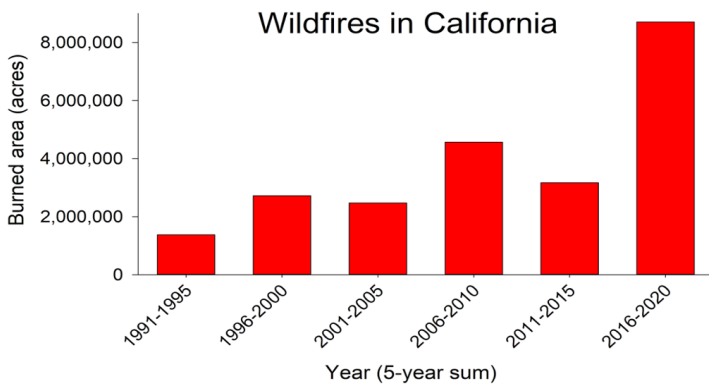




# Do We Have The Science, Tools, and Policies Needed to Predict Wildfire and Its Impacts in California?

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*Despite the state's international leadership on climate change, California can and must do more to confront the wildfire crisis that has ravaged our state; in 2020, property damages exceeded \$16B. Wildfire season regularly brings months of polluted air and unpredictable energy grid shutdowns, hitting the most vulnerable communities especially hard, while damaging the state's economy and infrastructure. Wildfire may be the gravest and most immediate threat posed by climate change in California. This threat is shared by nearby states and provinces in western North America and by fire-prone regions worldwide. Getting ahead of this impending climate and wildfire catastrophe requires a vision and strategy that will accelerate learning and rapidly transform new insights into effective practice. California needs a coordinated, long-term research and policy strategy to address climate and wildfire, and associated impacts. Climate scientists across California and beyond are calling for the creation of a new organizational structure that can effectively coordinate and act on the best available science and technologies, working in close partnership with key stakeholders across the state and beyond. The Climate and Wildfire Institute will advance the state's understanding and capabilities through the development of emerging and innovative tools and policies. Such an Institute will help California accelerate its understanding of this crisis and meet the challenge head on.*



## CURRENT CHALLENGES AND MAJOR GAPS

There are several knowledge and data gaps in climate and wildfire science, technology, and policy impeding California's ability to predict wildfire and manage wildfire risk.

**Major Applied Science Gaps.** Forecasts of wildfire vulnerability lack sufficient detail to inform practice. For example, winds play a critical role in fire spread across the landscape, but surface winds are poorly simulated in weather and climate models. Contemporary fire spread models do not account for recent increases in tree mortality and have limited ability to model fire risk in the wildland-urban interface. Even the most sophisticated vegetation models do not predict interacting effects of novel ecosystems and changing fire regimes. Given the necessary scale of fuel treatments, better understanding of the trade-offs among effectiveness, expense, and emissions is needed.

**Major Implementation Gaps.** Wildfire policy does not fully incorporate the differential and inequitable impacts of wildfire vulnerability risk on people and their communities. For example, misperceptions of wildfire risk and how climate change affects that risk make difficult to incorporate emerging wildfire risk signals into equitable insurance pricing. There are also limits to the current legal, policy, and governance structures for risk mitigation and compensation.

**Major Coordination Gaps.** Fire, vegetation, climate, air quality, and hydrology models are not built into a coordinated framework, making it impossible to fully quantify costs and benefits of management. The development of new and consistent policies across jurisdictions is constrained by institutional barriers. The infrastructure to provide useful information to all stakeholders is only slowly being built and is vastly under-resourced.

## A PUBLIC-PRIVATE SOLUTION

The Climate and Wildfire Institute (CWI) will build an active and integrative science-to-solution pathway to speed the transition of innovations in understanding to innovations in practice (see schematic below). This pathway will coordinate basic and applied research, tech transfer, and decision support from the Institute's inception, to ensure relevant scientific information is in the hands of the policy community as early as possible and on a continuous basis.

**The CWI represents a partnership of public, private, and academic entities** operating as an independent non-profit to maintain its identity as a source for highly credible information and its ability to respond quickly to emerging needs. The CWI will leverage, coordinate, and build upon existing efforts; be responsive to pressing needs of stakeholders; and provide a collaborative forum for scientists, policy experts, policymakers, and the private sector to discuss concerns and priorities. The Institute will NOT be oriented around academic research, but instead will develop climate solutions in close collaboration with state, federal, tribal, local, and private entities in need of high-quality science and technology services. **Regional hubs** are envisioned throughout the state in different wildland-urban interfaces. Possible locations are in Lake Tahoe and Stunt Ranch in the Santa Monica Mountains, a site affiliated with the UC Natural Reserve System. The Institute's physical presence must reflect the diversity of ecosystems and fire regimes across California and beyond, including the urban and rural communities affected by wildfire.

## Science-to-Solution Pathway

