CAL FIRE California Climate Investments (CCI) Program - Forest Health Research Grant Awards -- 2019/2020

Project Title	Applicant	County	FY 2019-20 Funds Awarded (Phase 1 only)	Total Funds Requested	Project Description
Project Type: General					
Implications of increasing the scale of managed wildfire on forest carbon stocks and pyrodiversity	The Regents of the University of California on behalf of Berkeley Forests	Mariposa and Madera Counties	$281,222	$422,391	Managed wildfire is a promising approach for increasing the pace and scale of ecological restoration in California's fire-adapted forests. Many benefits of the practice have been documented, but implications for forest carbon dynamics, pyrodiversity, and biodiversity remain understudied. We propose to leverage and expand our long-term managed wildfire research program to fill these important knowledge gaps, and aid management of forests threatened by increasingly severity disturbances.
Assessing smoke-plume injection height as a function of sub-canopy wind convergence of prescribed burns in the Central Sierra Nevada	University of Nevada, Reno	Nevada/Sierra	$171,145	$171,145	During prescribed fires, we will study the subcanopy wind and pressure response with a network of met stations and concurrently measure plume rise dynamics with ground-based lidar. We will establish empirical relationships that correlate near-surface wind measurements and atmospheric stability with plume dispersion. In the future, a few well-placed sub-canopy wind speed deployments can be used to inform the fire management of conditions that will facilitate predicting fire behavior.
Public health effects of increased prescribed burns for wildfire management	Sequoia Foundation	Statewide, plus one community for an enhanced community engagement effort.	$315,000	$499,942	The study will describe the public health impact of increasing prescribed burns. Exposure data will be generated and analyzed to assess its impact on health outcomes, assessing effects under a baseline scenario and then projected increased target burn scenarios. The relationship between particulate matter (PM2.5) and health outcomes will be assessed using historical data and applied to target burn scenarios. Community engagement will assess symptoms and knowledge regarding prescribed burns.

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Project Title	Applicant	County	FY 2019-20 Funds Awarded (Phase 1 only)	Total Funds Requested	Project Description
Project Type: General (continued)					
Evaluating forest resilience and carbon recovery using a chronosequence of co-located pre-, active-, and post-wildfire measurements in California mixed-conifer forests	Michigan State University	Plumas	$284,509	$453,078	This project evaluates the influence of pre-fire conditions and fire behavior on forest carbon loss due to fire and its recovery over time, using a globally unique database of coordinated pre-, active-, and post-fire data collected from active wildfire incidents in California mixed conifer forests over a 17-year period. It will quantify immediate fire effects from the existing database and re-measure the existing network of plots to evaluate forest recovery and carbon resilience after fire.
Effectiveness and optimization of forest fuels reductions for biodiversity conservation in a changing Sierra Nevada ecosystem	San Jose State University Research Foundation	El Dorado	$250,113	$499,825	A century of fire suppression and changes in forest structure, coupled with anthropogenic climate change, have dramatically altered disturbance regimes in the Sierra Nevada ecosystem. We will explore how wildlife communities have been affected by recent forest management and severe wildfire across the Sierra Nevada bioregion, and model the future effects of alternative fuels reductions strategies and altered fire activity on species constraining the pace and scale of fuels restoration.

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Project Type: State Forests					
Simulating the heterogeneous consequences of widespread forest health treatments for California mixed conifer forest resilience to climate change and wildfire	The Regents of the University of California	Multiple counties in the mixed conifer forest zone	$282,202	$499,660	We will use data-constrained, process-based vegetation modeling to examine the long-term consequences of forest health treatments, specifically thinning and prescribed burning, on future forest CO2 emissions and resilience to drought and wildfire in a changing climate. We will support implementation of the Forest Carbon Plan by providing stakeholder-informed projections that vary in assumptions regarding management, future climate, and existing stand conditions across California's mixed conifer forest.
Sierra Nevada-wide provenance trials to support climate-based seed zones and reforestation efforts	Board of Regents, NSHE, obo University of Nevada, Reno	Nevada	$252,974	$499,745	Use of locally-adapted seed is the foundation of reforestation, but unprecedented megafires and rapid climate change are likely to drive regeneration failures under a business-as-usual reforestation policy. We will pair Sierra Nevada-wide provenance trials with landscape genomics to quantify seedling success and local adaptation to climate in five economically and ecologically important conifers. Our objective is to identify provenances with high tolerance for climatic variability to guide seed and species selection in reforestation.

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Project Title	Applicant	County	FY 2019-20 Funds Awarded (Phase 1 only)	Total Funds Requested	Project Description
Project Type: Graduate Student					
A physiological approach to assess the resilience of Sierra Nevada forest communities following prescribed burns	UC Santa Cruz	El Dorado	$88,238	$88,238	With fire becoming of increasing concern, it is critical to understand which vital functions of trees suffer most due to high temperatures. I will take a physiological approach to determine the effects of fire on xylem and cambium function in both lab and field experiments. I will use prescribed burns at four field sites across the Sierra Nevada to determine species compositions and ecological conditions that allow for resilient forest ecosystems following fire.
Vulnerability in California's carbon stocks: understanding post-fire regeneration in the state's high elevation forests	University of California, Davis	Tulare	$53,835	$53,836	Though California high elevation forests are seen as a reliable carbon sink by the state, recent changes in fire behavior and stand dynamics threaten to compromise their resilience. Similar changes in low elevation forests have resulted in inadequate tree regeneration leading to ecosystem degradation and carbon loss, but little is known about the response of high elevation forest to fire. I will provide the first empirical documentation of how fire severity and post-fire climate affect tree regeneration in California's high elevation forests.

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Project Title	Applicant	County	FY 2019-20 Funds Awarded (Phase 1 only)	Total Funds Requested	Project Description
Project Type: Synthesis and Tool Development					
Development of rapid-response post-wildfire water quality sampling guidelines to determine watershed and natural resource asset conditions and priorities for future recovery	Lawrence Berkeley National Lab	Butte	$50,000	$50,000	To aid in post-wildfire rapid-response and strategic decision support for water sampling, I propose to develop guidelines for post-wildfire water sampling strategies that agencies can use to develop rapid-response protocols and aid in strategic decision support for site and water quality constituent selection across watershed surface and groundwater systems. These guidelines will be developed based on a foundational science driven approach including fundamentals of flow and reactive transport chemistry and biogeochemistry in flowing waters.
Discretionary Award					
Addressing common misconceptions about dry forest restoration and fuel treatments	Unversity of Washington	Mulitple	$54,369	$54,369	We propose to synthesize recent literature supporting management that restores the role of fire to fire-adapted forests in the western United States. The synthesis will address common misconceptions about forest restoration and fuel reduction treatments as well as confusion in the literature around evidence for departures in current fire behavior and associated changes in spatial patterns of forest composition and structure. In a set of two peer-reviewed articles, we will summarize science-based recommendations and ongoing research needs for restoring structures and spatial patterns that demonstrated resistance and resilience to warmer climate, fire and other agents of change.

FY 2019-20
Total CAL FIRE-CCI Ir $2,083,607