CAL FIRE California Climate Investments (CCI) Program - Forest Health Grant Applications (Research only) January 2019

Project Tracking Number	Applicant	Project Name	County	Requested Funds	Project Description
18-CCI-FH-0006-TCU	USDA Forest Service, Rocky Mountain Research Station	Improving forest ecosystem health and sequestering carbon through application of biochar	Calaveras, Almador	$437,253	This project will build on the existing U.S. Forest Service study designed to ascertain if biochar, applied to forest soils after fuels reduction treatments, can enhance soil carbon and water holding capacity making the residual forest and newly planted seedlings more resilient to climate change and insect attack. Our new work would also include a site at a State Demonstration Forest (likely Mount Zion) with similar treatments and sampling methods.
18-CCI-FH-0007-SHU	University of California Berkeley	What's the baseline? Carbon storage in a northern California mixed-conifer forest before fire suppression policies	Humboldt, Siskiyou	$60,528	My goal is to understand the impacts of disturbance on forest carbon cycling and to develop a baseline of forest conditions for Six Rivers National Forest, a high-priority landscape. Specifically, I will test the hypothesis that under the pre-settlement fire regime of frequent fire, the mixed conifer forests in the Klamath Mountains, stored less carbon in live tree biomass than under the current altered fire regime. By integrating paleo and modern data, I will quantify a long-term record (1000+ years) of the interactions between the fire regime and biomass storage in the mixed conifer forest.
18-CCI-FH-0023-LMU	Spatial Informatics Group - Natural Assets Laboratory	Development of a modeling framework to assess the co-benefits of planned fuel treatments in California	Plumas	$345,607	The research project will develop the applied research foundations for an operational web-based tool to assess stakeholder-prioritized benefits and co-benefits of fuel treatments across the State. This tool will bridge the gap between the latest insights gained in the scientific realm and implementing fuel treatments. Results could be used to develop the value proposition of fuel treatments by stakeholders to improve planning, facilitate consensus on optimal locations and prescriptions, and increase funding of fuel treatments.
18-CCI-FH-0030-TUU	University of California, Davis	Effects of salvage logging on the resilience and successional trajectory of high-mortality forests	Tulare, multiple	$219,017	Widespread salvage logging has been occurring throughout areas of recent severe tree mortality in the mixed conifer forests of California's Sierra Nevada, yet the effects of such treatments on ecosystem recovery are not well understood. Our observational study will examine paired treated (recent salvage) and untreated (no salvage) sites to assess forest ecosystem recovery in terms of carbon dynamics, tree regeneration, fuels, and understory plant communities.
18-CCI-FH-0032-AEU	University of California Berkeley	Keeping fire on the landscape: Consequences for carbon balance and forest resilience	El Dorado	$454,772	This research project quantifies the value of keeping fire in the Sierran mixed conifer forest. We build on the Fire and Fire Surrogate Study at Blodgett Forest where both prescribed fire and mechanical fuel treatments have been repeatedly imposed over the last 18 years. Specifically we will answer three high priority questions: What are the trade-offs between wildfire hazard and carbon storage for a range of fuel treatment strategies? Does a frequent-fire regime lead to a long-term reduction in carbon storage? Do treatments designed to reduce fire hazard also improve forest resilience?

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18-CCI-FH-0033-NEU	Board of Regents, NSHE, obo University of Nevada, Reno	Next generation tools for measuring and modeling surface fuel characteristics in the Sierra Nevada	Nevada	$791,498	We propose to use empirical measurements of water and energy states and fluxes in combination with remote sensing of forest canopy and fuel structure to (1) identify how climate, stand dynamics, and topography interact to change fuel moisture, load, and structure (2) determine the most parsimonious set of measurements and scales necessary to capture the role of fuel conditions in watershed-scale models, and (3) develop an improved measurement-modeling framework for determining how fuel reduction and forest health treatments can help mitigate the effects of climate change.
18-CCI-FH-0034-SLU	University of California, Davis	Impacts of Wildfire and Climate on Ecosystem Services in Southern California: Tool Development and Data Needs	Kern, Los Angeles, Monterey, Orange, Riverside, Santa Barbara, San Bernardino , San Diego, San Luis Obispo, and Ventura	$285,599	Our proposed project focuses on shrubland dominated ecosystems to advance our knowledge of carbon storage and integrate this information with an ecosystem services assessment tool. Specific research includes: (1) quantifying shrubland biomass; (2) implementing carbon emission models for shrubland fires, (3) investigating the recovery of carbon storage post-fire, and (4) compiling data on management treatment impacts on ecosystem services. Our output tool will allow users to access and query the impacts of wildfire, climate change, and management on services.
18-CCI-FH-0040-LMU	University of Washington	Using prescribed and wildland fire as a management tool to sustain and promote carbon storage and forest resilience	Butte, Plumas, Yuba, Sierra, Nevada, Placer, Eldorado, Amador, Calaveras, Tuolumne, Mariposa, Madera, Fresno, Tulare	$345,382	Fire changes a forest's carbon storage and its potential for sustainability. This study examines the preservation of carbon following fire and its viability based on how fire restructures forests to make them more resilient using lidar data. The results will (1) provide current maps of forest carbon and resilience and (2) provide managers with guidelines on when fire, and especially wildfire, can be used to sustain and promote carbon storage and forest resilience.
18-CCI-FH-0042-SHU	Trinity County Resource Conservation District	Wildfire and Fuel Treatment Effects on Wildfire Risk and Native Plant Habitat on the Weaverville Community Forest	Trinity	$84,167	This collaborative study seeks to provide relevant, scientifically-sound management information to local stakeholders about 2,130 acres of public land recently acquired by the Weaverville Community Forest. Using community research participation, this study will analyze both how wildfire risk and native plant restoration feasibility are distributed across this acreage, and how these attributes may be affected by past fuel treatments, past wildfires, and a warming and drying climate.
18-CCI-FH-0043-BDU	Regents of the University of New Mexico	The carbon consequences of catchment-scale prescribed burning	Fresno	$396,089	The objective of this project is to quantify the effects of catchment-scale (180 ha) prescribed burning on both carbon and high-severity fire risk. The results of this catchment-scale burn will be scaled to the watershed using LIDAR and modeling to estimate the effects of watershed-scale burning on these response variables. This project will also serve to build collaboration between USFS and CAL FIRE prescribed fire practitioners and provide a science workshop.

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18-CCI-FH-0048-KRN	Montana State University	Forecasting recruitment failure using ecohydrologic and plant hydrologic models in low-elevation forests	Amador, Kern	$398,782	The primary goal of this project is to predict the likelihood of recruitment failure in post-disturbance low elevation forests of the Sierra Nevada using a coupled ecohydraulic /plant hydraulics model. Land managers currently lack an ability to identify sites and conditions where natural regeneration is unlikely. Our model will allow us to mechanistically estimate the capacity of low elevation forests to naturally regenerate given projected future climate variability. We propose a framework that will support reforestation planning by enabling the managers to prioritize more efficient planting efforts.
18-CCI-FH-0052-MEU	The Regents of the University of California	Decentralized biomass torrefaction to reduce cost and improve utilization of woody biomass residues	Mendocino	$376,776	One of the biggest challenges related to forest treatment is the management of the treated biomass residues in a way that minimizes their costs and maximizes carbon emissions reductions. We propose to apply decentralized biomass torrefaction of unmerchantable tanoak in Jackson Demonstration State Forest as a possible approach to reduce the logistical costs of transporting biomass residues, and to increase the amount of carbon that can be mitigated.
18-CCI-FH-0053-NEU	University of California, Davis	Integrating climate change research and forest management to help forests adapt to climate change and increase resilience	Eldorado, Placer, Amador, Alpine, Nevada, Yuba, Butte	$373,148	This project integrates published climate change research results and data with ongoing forest health research and planning efforts for 2.4 million acres for the Central Sierra Nevada. The University of California will join ongoing landscape assessment and modeling efforts by The Nature Conservancy and the Tahoe Central Sierra Initiative to integrate climate change data, synthesize and analyze model outputs, and participate in round table meetings that seek long term forest resilience solutions to climate change, fire and drought.
18-CCI-FH-0054-SCU	The Regents of the University of California, on behalf of its Berkeley campus	Expanding the BioSum framework to test, score, and improve long-term forest health strategies	Alameda, state-wide	$437,706	While many schemes to reduce fire risk and promote forest have been put forward–with some having been implemented on small scales–there is no way to evaluate the efficacy of the various proposed statewide strategies for reducing risk and promoting forest health that is based on quantitative modeling of actual forest conditions state-wide. The proposed research will use BioSum forest modeling software to undertake state-wide evaluation of forest management interventions and to optimize those interventions for a relevant suite of indicators of fire risk and forest health.
18-CCI-FH-0055-MEU	Sonoma State University	Evaluating plot-level remote sensing tools to increase accuracy and efficiency of fuels management approaches	Sonoma, Mendocino, Shasta	$448,552	We propose a research study to evaluate the use of innovative remote sensing techniques to rapidly and more accurately estimate AGB, calculate AGB allometric relationships to tree properties (e.g., DBH, height) for a range of tree species, and estimate crucial fuels parameters to help validate or refine fire probability and behavior models across diverse California forests.
18-CCI-FH-0057-HUU	Regents of the University of California for UC Cooperative Extension	Improving Forest Biomass Determination and Interpreting Patterns of Forest Wildfire Resilience	Humboldt, Siskiyou	$697,525	The goals of this research are to: 1) provide tools for more accurate and more efficient regional carbon accounting in forest and woodland management and 2) to understand forest structural characteristics than support wildfire resilience

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18-CCI-FH-0059-FKU	University of California, Davis	Tree recruitment and forest expansion following reforestation	Fresno	$61,250	I will collect data on tree regeneration associated with conifers that were planted during a large-scale reforestation effort and which are now reproductive. I will evaluate whether seed availability is a likely constraint to recruitment and forest expansion following reforestation—or whether other conditions (e.g., other established vegetation) limit recruitment and forest expansion.
18-CCI-FH-0061-TCU	University of California, Davis	Threats for carbon storage in high montane forests in the Sierra Nevada	Inyo, Tulare, Fresno, Madera, Mono, Mariposa, Tuolumne, El Dorado, Alpine, Placer, Sierra, Plumas, Nevada	$66,892	Current methods of mapping carbon lack sensitivity in high elevation systems due to minimal data availability and high spatial heterogeneity. I will use NASA space-borne data in combination with aerial lidar and field measurements to map current carbon in high elevation forests along with change over the past 35 years. I will investigate the spatial distribution and scales of carbon change along with the nature of threats. I will provide these results to CalFire for the California Carbon Plan as well as to managers to determine whether or how to manage ongoing changes in disturbance regimes.
18-CCI-FH-0063-LNU	University of California, Davis	Using UAVs and big data to map live trees and predict postfire regeneration	Lake, Butte, Plumas	$222,166	We will substantially improve predictions of post-fire seedling recruitment using a novel “big data” approach. First, we will create spatially extensive (~300 ha) stem maps of seed sources (surviving trees) by collecting and processing UAV (“drone”) imagery. We will then apply a spatially-explicit optimization model to characterize (a) individual-tree dispersal patterns and (b) the joint contribution of multiple seed sources (mature trees) to seed rain. We will use our fitted model to make predictive maps of natural regeneration at high resolution (10 m) across large landscapes (~ 300 ha).
18-CCI-FH-0065-NEU	American Forests	California Adaptive Silviculture for Climate Change Project	Mendocino, Shasta, Trinity, Humboldt, Del Norte, Tehama, Siskiyou, Tulare, Sierra, Nevada, Plumas	$469,955	Partners will use the Adaptive Silviculture for Climate Change (ASCC) approach to integrate climate change science into silvicultural design and implementation through the development of collaboratively designed, locally-suited experimental trial sites. Four study sites will be situated across a broad spectrum of forest types and on varying ownerships. Phase 1 will design adaptive treatments (i.e., resistance, resilience, & transition) with local managers, stakeholders and regional scientists. A future Phase 2 proposal will implement the adaptive treatments on the study sites.
18-CCI-FH-0068-NEU	Biochar USA	Demonstration of Continuous Biochar Carbon Sequestration Machine	Nevada	$800,360	We seek $800,360 in grant funding to fabricate a patent pending machine that demonstrates the efficacy of biochar in eliminating fuel for wildfire, improving forest health, and sequestering carbon. Several local and regional jurisdictions and Silicon Valley tech entrepreneurs have expressed interest and may match but none has signed letter at submission.
18-CCI-FH-0074-FKU	University of California	Data-driven Geospatial Assessment on the Effectiveness of Fuel Treatment and Restoration on Fire Risk and Forest Health	Broader Sierra Nevada region	$284,957	We propose to systematically assess both short- and long-term consequences of past fuel and restoration management activities on wildfires and ecosystem health at a landscape scale in the Sierra Nevada region. Our strategy leverages on existing field measurements and takes full advantage of time stacks of vegetation and fire characteristics derived from multiple satellite remote sensing and geospatial datasets. The data-driven knowledge and cost-effective monitoring and analysis tools will contribute to identifying and prioritizing the location-based strategies with greatest benefits.
Total # Applications = 22		**Total Requested =**	**$8,057,981**		