

CAL FIRE California Climate Investments (CCI) Program - Forest Health Research Grant Applications -- FY 2020/2021 2021/2022

Project ID	Applying Organization	Project Title	County	Requested Funds	Brief Project Description	Research Project Type
20-RP-AEU-078	University of California, Riverside	Influence of prescribed burn season on tree survival, soil microbial resilience, and carbon cycling in mixed conifer forests	El Dorado	\$500,000	We leverage two existing long-term studies, Treatment Alternatives for Young Stand Resilience and Fire-Fire Surrogate, at Blodgett Experimental Forest to determine how prescribed fire season and forest age influence tree survival, soil microbial resilience, carbon strength, and greenhouse gas (GHG) emissions in mixed conifer forests. Our team will address whether conducting prescribed fires in spring vs. fall reduces or exacerbates GHG emissions to help inform forest management plans.	General
20-RP-AEU-118	University of Miami	Development of Subseasonal Fire Weather Forecasts for Prescribed Fire and Wildfire Decision Support: Accuracy and Reliability	Statewide	\$500,000	Fire weather forecasts are typically available for the next 7-14 days. This study will develop and extend fire weather forecast capability out to 6 weeks (i.e., subseasonal time scale), from seven global forecast models. Machine learning will help quantify and improve forecast reliability and accuracy. A prototype system will issue real-time forecasts to the public via a web application, which will allow for improved allocation of resources, planning, and public messaging for land and air managers, emergency response, and other stakeholders.	General
20-RP-AEU-172	Worcester Polytechnic Institute (WPI)	Development of Engineering Tools for Exposure Analysis at the WUI	Amador	\$500,000	This project will investigate fire spread between discrete fuels separated by a gap, specifically between discrete pieces of vegetation and between vegetation and structures through experiments and modeling. The goal of this project is to develop fire modelling tools that can be used by Fire Protection Engineers to better design the exterior of a house and surrounding landscape to withstand fire exposure.	General
20-RP-AEU-182	University of Nevada, Reno	Fuel succession: monitoring and modeling ladder fuels to balance fire risk and carbon retention	NV	\$499,997	We propose to 1) develop workflows for estimating ladder fuel characteristics from terrestrial laser scans (TLS); 2) use TLS to calibrate and improve fuel succession models; 3) simulate management scenarios and assess how they affect tradeoffs between fire hazard mitigation, C retention, and streamflow across the Sierra Nevada; and (4) use machine learning to analyze model outputs and identify the key factors influencing ecosystem responses to management in different locations.	General

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20-RP-BEU-061	University of California-Davis	Coast range fire, pest, and vegetation shift impacts to carbon storage: quantification of ecosystems and fire interactions	Monterey	\$472,156	This project aims to combine a landscape-level empirical dataset on fire and emergent disease with landscape modeling approaches to build an understanding of 1) total fire-driven carbon release for the major Big Sur wildfires of the past 14 years, 2) the role of tree mortality in contributing to these impacts, 3) carbon dynamics in widespread but understudied woody plant communities including chaparral and oak woodlands, and 4) tree mortality – fire interactions to identify potential management interventions that reduce these impacts.	General
20-RP-BTU-152	CrowdDoing	Recommendations for wildfire prevention measures and implementation using Analytics-based modeling and tools.	USA	\$427,500	<p>Today wildfire risks are managed with reactionary risk-transfer model. The property owner (household, business) secures property insurance. In the event of wildfire the insurance company pays the property owner. The insurance company, in turn, manages part of own risk of huge loss from wildfire loss via Reinsurance.</p> <p>We propose a less expensive strategic risk/reward model with supporting data to change stakeholder business plans for proactive investment. This project provides the reusable model.</p>	General
20-RP-CZU-038	California Polytechnic State University	The Impact of Pitch Canker on the Natural Regeneration Process in the Native Año Nuevo Monterey pine Stand Affected by the 2020 Stand Destroying CZU Fire	Santa Cruz	\$496,042	This project is based on Piirto's study of pitch canker in Año Nuevo Monterey pine at Swanton Pacific Ranch. The goals include: 1) working with CAL FIRE to collect pitch canker spore data; 2) track Monterey pine natural regeneration development and survival; 3) ascertain fire/pathogen interrelationships to understand how pitch canker impacts post-fire natural regeneration in native Monterey pine; and 4) to complete a data analysis for the 2001-2015 data set and manuscript development.	General
20-RP-CZU-086	San Jose State University Research Foundation	Investigating the significance of firebrand showers in wildfire progression	Santa Clara	\$499,970	The primary research objective is to investigate and quantify the role of firebrand shower and its subsequent spot fire ignitions in the rate of spread of wildfires. This will be done by developing physics-based modules for an experimentally validated firebrand shower model and bi-directionally coupling it with a mass consistent and high-resolution version of the WRF-SFIRE. The integrated model will be validated using the available and collected observational data as part of this work.	General

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20-RP-FKU-064	University of Washington	Improving predictions of fire impacts after mega drought: Lessons for carbon storage, defending the WUI, and improving resilience and recovery following the 2020 Creek Fire	Fresno	\$498,535	Our study will examine the 2020 Creek Fire as an example of a coarse woody debris fuel laden 'mass fire' to examine how pre-fire conditions relate to post-fire changes in forest structure and carbon, how pre-fire vegetation structures surrounding human structures related to their fate in the fire, and what these results suggest for forest management guidelines both to recover from 'mass fires' and for management to lessen the impact of future 'mass fires'.	General
20-RP-FKU-183	Pacific Southwest Research Station, USFS	Fire and old forest wildlife species - finding a balance	Fresno	\$399,900	We will evaluate whether small watershed units can sufficiently represent landscape level spacing of adult female fishers, an endangered species in the southern Sierra Nevada which can be challenging to manage for due to its rarity on the landscape and elusive nature. We will create and test an associated model which we anticipate could provide a strategic way to reduce risk of catastrophic fire while still maintaining old forest species (such as fisher) and habitat in the southern Sierra Nevada.	General
20-RP-HUU-073	University of Washington	Restoring Resilient Landscapes in the Western Klamath Region - implications for future fires, vegetation, habitat and carbon dynamics	Humboldt	\$499,716	We will use a simulation modeling platform to evaluate how to restore fire in the western Klamath Mountains and explore tradeoffs to carbon, wildfire emissions, and wildlife habitat. Specifically, we will evaluate restoration strategies within a potential operations delineation (PODS) framework and long-term implications for reducing risk to communities, culturally significant resources, and ecosystem values.	General
20-RP-LAC-120	TreePeople	Bigcone Douglas-fir Regeneration Study	Los Angeles	\$498,191	TreePeople, in partnership with California Botanical Garden, proposes to conduct a wide-ranging study of various regeneration methodologies and approaches to identify best management practices that produce successful establishment of Pseudotsuga macrocarpa in the Angeles National Forest. Research Questions: What reforestation methodology and practices will result in successful regeneration of Pseudotsuga macrocarpa in the South California Peninsular and Transverse Mountain Ranges?	General

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20-RP-LAC-174	Jet Propulsion Laboratory	Mapping Forest Structure and Fuel Loads Across California for Carbon Accounting and Management	Los Angeles	\$495,830	The proposal is focused on developing state-level maps (< 30 m) forest structure, fuel load, and carbon stock changes to allow implementation of management strategies for improving forest resilience including post-fire recovery, regeneration, restoration, and carbon sequestration.	General
20-RP-LMU-166	Sierra Institute for Community and Environment	Forest Products Business Clusters: Advancing the state of knowledge for development in California	Plumas	\$347,836	California's forested communities face wildfire threats. California has responded by articulating a vision of wood products manufacturing through forest products cluster developments (FPCD) for forest management and rural development. There is little empirical research available on FPCD impact. This research proposes to identify, assess, and examine challenges and opportunities of FPCDs. This research advances knowledge of whether and how FPCDs are a part of the forest management solution.	General
20-RP-LNU-049	UC Davis	Improving Climate-Based Seed Selection for Increased Carbon Sequestration	Yolo	\$299,807	The climate is changing faster than tree populations can evolve, resulting in climate-adaptation mismatch (CAM), between trees and the environment they grow in. CAM results in reduced growth and survival with large consequences for statewide forest health, carbon sequestration, timber production, fire severity, and habitat. This proposal focuses on combatting CAM by improving techniques for selecting seeds that are adapted to the climates of planting locations.	General
20-RP-LNU-087	UC Davis	Islands of resistance and resilience: serpentine outcrops as potential wildfire refugia across California vegetation types	Yolo	\$283,022	Here, we propose to use a unique long-term dataset to compare post-fire trajectories of plant communities and vegetation structure across major productivity gradients, with the goal of documenting how responses to fire vary across vegetation and soil types in California. Our proposed research will help tailor pre- and post-fire management to different vegetation and soil types to better conserve biodiversity and use management resources efficiently.	General
20-RP-LNU-096	The Regents of the University of California, Davis	Using early post-fire dynamics to improve predictions of forest recovery	Yolo	\$497,833	Emerging evidence suggests that early (0-2 year post-fire) dynamics, such as delayed mortality, can explain much of the unexplained variation in post-fire regeneration. We will take advantage of the rare research opportunity afforded by the 2020 California wildfires to quantify early post-fire dynamics and their relationship to initial and longer-term regeneration using coupled ground- and drone-based surveys. We will incorporate results into important reforestation decision-making tools.	General

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20-RP-LNU-108	University of California Davis	Impacts of changing fire regimes on chaparral ecosystem recovery in the North Coast Range	Yolo	\$499,466	Chaparral is increasingly threatened by changing fire regimes. Frequent fire results in shrub loss and type conversion, but their implications for carbon stocks are not well understood. We propose to investigate how frequent fire contributes to type conversion and carbon loss as well as how ecosystem properties confer resilience to frequent fire. This will help identify landscapes that are at greater risk of type conversion and in greater need of active management to manage carbon stocks.	General
20-RP-LNU-165	University of California – Davis	Conservation and Landscape Restoration Strategies for Blue Oak Woodlands	Statewide	\$491,196	In the last decade severe and prolonged drought with low precipitation and record high temperatures have resulted in high levels of tree mortality and decline in blue oak woodlands. These pressures on blue oak persist, making conservation collections critical to conserve biodiversity and maintain ecosystem integrity. A range-wide collection of blue oak would serve two conservation goals; a seed orchard for restoration and a progeny study for landscape genetic studies to guide restoration.	General
20-RP-LNU-169	University of California, Davis	Carbon Dynamics Investigator for California: An open-source platform for tracking carbon uptake and storage across California's forests	Research based in Yolo county, analysis Statewide	\$291,471	The overarching aim of this project is to understand forest carbon dynamics across California. By combining space-based data, lidar collected from a NASA sensor called GEDI on the International Space Station and solar-induced fluorescence (SIF) from a satellite called TROPOMI, this project will quantify carbon dioxide uptake and carbon storage in California's Forests with consistent, instantaneous, repeated measurements. The project will include an open-source data visualization platform to enable use by foresters and land managers.	General
20-RP-LNU-175	MYCO Soil	MYCO Excess Biomass Repurpose and Utilization	Placer	\$500,000	Native basidiomycete species will be collected, cloned and examined for fungiculture potential in which woody biomass is used as the main substrate. Biomass will be obtained from fuel reduction practices in high risk areas, identified, and mechanically processed into sawdust. Optimal growing substrates for each mushroom species will be identified using various sawdust composition ratios. Analysis will elucidate best candidate mushroom species and associated substrate composition	General

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20-RP-LNU-176	Rainforest Rising, Inc.	Droneseeding in Reforestation	Sonoma	\$37,775	This pilot project proposes to create the foundation for an efficient and economical method to scale up and accelerate large-scale reforestation in California.	General
20-RP-MVU-122	Point Blue Conservation Science	Forecasting the impacts of climate change, land use change, and management on wildfire risk and downstream impacts in Southern California's montane forests and surrounding shrublands	Orange, San Diego, Los Angeles, Riverside, San Bernardino, Ventura	\$499,723	Using a vegetation succession model, this project will explore how climate change, management actions, and projected residential growth in the wildland urban interface influence wildfire activity and downstream effects on vegetation type conversion, carbon release, and biodiversity in Southern California forests and shrublands. The resulting maps and spatial products will help managers prioritize locations for conservation action to protect co-benefits to humans and natural resources.	General
20-RP-MVU-151	The Regents of the University of California, Santa Barbara	Timing is everything: Prescribed burn season and the optimization of multiple management objectives	San Diego	\$251,289	This project explores how prescribed burns outside of black oak dormancy influence oak health and recruitment. Motivated by the management needs of the Cleveland National Forest, the goal of this project is to quantify potential tradeoffs between lengthening the burn window beyond oak dormancy to ease logistical constraints; retaining high cultural, carbon and habitat value mature oaks; and facilitating oak recruitment for future forest resilience.	General
20-RP-NEU-085	University of Nevada, Reno	Post-Fire Regeneration of Aspen Stands in California: Promoting a Vital Natural Resource in the Face of Intensifying Human Impacts	Inyo	\$498,721	Aspen are critical for hydrological cycles, carbon sequestration and biodiversity, but they are under threat from increased heat and drought associated with climate change and increased frequency and severity of wildfires. We will conduct landscape-level studies of the climatic, topographic, and biotic factors that influence aspen regeneration after fire, contributing to science-based management of a critical natural resource in the face of intensifying climate change and associated wildfires.	General
20-RP-RRU-140	University of California, Riverside	ADVANCING POST-FIRE HAZARD MONITORING AND MODELING TOOLS FOR STEEP CALIFORNIA SHRUBLANDS	Riverside	\$499,996	Our study will advance post-fire debris flow models by expanding hydro-geomorphic datasets on debris flow controls, and investigating the role of storm-by-storm dynamics and antecedent conditions in hillslope and channel domains. We will incorporate these dynamics to advance post-fire debris flow models, and use them to predict the impacts of pre-fire management and climate change scenarios on debris flow hazards, carbon storage, and pre-fire management approaches.	General

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20-RP-SCU-050	Regents of the University of California	Approaches to Quantifying Structural Ignition Risk in the Wildland-Urban Interface	Alameda	\$498,692	We propose using a combination of empirical, physical, and data-driven techniques to develop approaches to quantitatively model structural ignition by embers as well as structure-to-structure fire spread. These efforts will lead to improved prediction of potential wildfire impacts within the WUI under extreme weather conditions through studying ember generation, lofting, transport and likelihood of structure ignition, both by embers and by structure-to-structure fire spread.	General
20-RP-SCU-060	San Jose State University Research Foundation	HIZ Ecosystem: Potential plant driven extreme wildfire behavior in Home Ignition Zone	Santa Clara	\$495,466	While the Home Ignition Zone (HIZ) impacts structure survival and is regulated, little is known about some aspects of it. We will address HIZ knowledge gaps that influence its efficacy and ecological impacts, including: What fuel is in the 0-5 ft. zone? Does HIZ mitigation in the two to three zones meet recommendations or policies? What is the effect of failed irrigation on live fuel moisture during extreme weather? What are ecological impact of HIZ landscaping on nonnative plants?	General
20-RP-SCU-082	THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, DAVIS	Toward operational near-term forecasting of tree mortality at management-relevant scales using advanced probabilistic machine learning and dense time series of remote sensing imagery	Alameda	\$499,883	The project will develop models that forecast near-future drought/insect/disease-induced forest mortality occurrence and intensity at management-relevant scales of 30-m by combining Landsat multivariate dense time series, anomaly and disturbance detections by the Ecosystem Disturbance and Recovery Tracker (eDaRT), and advanced probabilistic mixture machine learning methods. Tests in multiple large pilot areas across California and field data will be used to evaluate model performance.	General
20-RP-SCU-083	Regents of the University of California	California Undervalued Timber (C.U.T.) research center	Contra Costa	\$479,112	The California Undervalued Timber (C.U.T.) research center aims to facilitate the development of new wood and engineered wood products from undervalued Californian timber sources, such as local hardwoods and small-diameter timbers. The CUT center will develop new wood products to the stage of proof-of-concepts and early phase performance tests. The center will serve as a long-term home for engineered wood products innovation in CA, revitalizing the University of California-Berkeley's now-dormant Forest Products Laboratory.	General

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20-RP-SCU-105	The Regents of the University of California	Colonial-era forests of the Sierra Nevada and Southern Cascade regions: Using archival data to quantify forest structure and composition	Alameda	\$208,743	Our goal is to reconstruct the structure and composition of the colonial-era forest across the Sierra Nevada and Southern Cascade bioregions. We will use historical data from the General Land Survey to build the most comprehensive and extensive perspective of what California's forest looked like prior to contemporary management. To help guide future management, we will compare differences in the historical forest to today's forest.	General
20-RP-SCU-123	Lawrence Berkeley National Laboratory	A modeling and scenario-planning platform to enhance California's resilience to wildfire and climate change	Yolo	\$499,999	This project aims to understand the resilience of CA's forests to climate change and increasing wildfires, and what are the controls on resilience. We will examine how fuel loading and treatments influence model projections of fire behavior with fuel-drought-climate feedbacks under future climate change scenarios. Specifically, how will increasing frequency of wildfire, combined with droughts, affect forest composition, recovery rates, fuel loading, and carbon emissions in CA forest ecosystems?	General
20-RP-SCU-128	Board of Trustees of the Leland Stanford Junior University	Using remotely sensed estimates of live fuel moisture content to determine its role in wildfire hazards	Santa Clara	\$447,433	This project aims to understand how live fuel moisture content (LFMC) – whose variations are poorly known - affects California wildfire risk. We will use new remote sensing data which, for the first time, map high-resolution LFMC across the state to study a) LFMC's effect on fire ignition (from electric equipment) and severity and b) how vegetation and geographic traits affect LFMC's response to drought stress. This will enable better short- and long-term fire management and more targeted PSPS.	General
20-RP-SCU-164	Coastal Quest	Develop and Pilot Methodology to Understand and Reduce Fire Impact in Coastal/Bay Watersheds	Santa Clara	\$500,000	This proposal requests funding to develop a state-wide framework for monitoring post-fire impacts on water quality and water infrastructure, and pilot test the framework in two watersheds in northern and southern California.	General
20-RP-SHU-094	US Forest Service, Northern Research Station	Adding Value to Burn Severity Mapping with Coordinated Pre-, Active-, and Post-Wildfire Monitoring in Northern California	Shasta (note, our broader area of interest is Northern California)	\$119,243	The Fire Behavior Assessment Team (FBAT) is the only team actively collecting ground data on wildfires and proposes to perform coordinated plot-based measurements of fuels, vegetation, active fire behavior, fuel consumption, and fire effects in Northern California to augment the archive that primarily contains data from fires in the Sierras. FBAT requests funds to hire two seasonal technicians and support pre-season coordination with stakeholders. Data will be used to support burn severity mapping.	General

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20-RP-TCU-103	Lawrence Berkeley National Laboratory	Modeling the Post-Fire Biomass Regrowth In California Under Current Climate and Climate Change	Tuolumne	\$357,371	The largest fraction of this carbon is the aboveground biomass (AGB). Our current understanding of AGB regrowth is limited yet it remains a key factor for determining ecosystem resilience, assessing the offset of emitted CO2, and supporting decision making and policy. Here, we address this issue with an integrative study that uses field data, remote sensing and modeling to quantify the trajectories of regrowth and associated AGB.	General
20-RP-VNC-051	California State University Channel Islands	Assessing the Potential for Riverscape Restoration to Disrupt Megafire Formation	Statewide	\$499,981	Megafires are particularly deadly, damaging, and expensive. They are also increasingly common in CA. We propose an alternative strategy to disrupt megafire formation: riverscape restoration. While riverscapes as fire breaks and fire refugia have been studied before, their potential to measurably disrupt megafires has not yet been quantitatively assessed. We will use remote sensing and modeling to evaluate how the 2020 megafires' behaviors would have changed under varying restoration scenarios.	General
20-RP-AEU-178	Worcester Polytechnic Institute (WPI)	Quantification of Firebrand Generation from WUI Fuels	Amador	\$100,000	This project will measure firebrand exposure of burning WUI through large-scale experiments and imaging-based measurement methods. The data from this project could be used to validate firebrand spotting models and provide a better understanding of firebrand exposure in WUI fires.	Graduate Student
20-RP-CZU-115	San Jose State University	The Influence of Prescribed Burning on Subsequent Wildfire Recovery and Fuel Consumption in Coast Redwood (Sequoia Sempervirens) Forests	Santa Cruz, San Mateo	\$24,299	Through a study in Big Basin Redwoods State Park following the 2020 CZU Lightning Complex Fires, sample sites without a history of prescribed fire will be compared to sites that were treated with prescribed fires to 1) assess the influence of prescribed fire on post-wildfire coast redwood forest vegetation recovery and 2) measure the effectiveness that prescribed fires had in reducing wildfire fuel consumption.	Graduate Student

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20-RP-CZU-144	The Board of Trustees of Leland Stanford Junior University	Assessing catastrophic wildfire risk in California's zombie forests	Calaveras	\$96,158	This project aims to identify, map, and inform co-designed adaptive management solutions for California's zombie forests — forests established under a prior climate regime that are now out of climate equilibrium — which represent a critical, and as yet unaccounted for, risk factor for catastrophic wildfire in California. We will develop a novel climate-niche modeling technique focused on vegetation disequilibrium, allowing us to identify zombie forests expected to be at especially high risk of type-conversion catalyzed by catastrophic fire.	Graduate Student
20-RP-FKU-074	University of California, Davis	Predicting the dynamics of fire-killed trees using tree-level and plot-level characteristics	Fresno	\$39,178	This study will characterize the dynamics of fire-killed standing dead trees (SDTs or “snags”) using a unique and extensive dataset tracking SDTs for 10 years following a 1994 wildfire in the southern Sierra Nevada. I will assess how plot-level characteristics (e.g., fire severity, solar radiation) and tree level characteristics (e.g., species identity, size) influence SDT longevity. This research will enable a more targeted approach to the management of wildfire-killed trees.	Graduate Student
20-RP-HUU-117	San Jose State University	Linking Social Dynamics to Private Land Management: A Study of Prescribed Burn Associations in Northern California.	Humboldt	\$35,999	This research focuses on exploring how social contexts in rural vs. urban/suburban spaces influence prescribed burning practices, and assessing current training events hosted by prescribed burn associations (PBAs) in terms of their impact on private landowner behavior. Semi-structured interviews will be recorded, transcribed, and thematically analyzed in order to better understand how landowner practices around prescribed burning have shifted over time as PBAs have expanded into California.	Graduate Student
20-RP-LMU-020	The Regents of the University of California, on behalf of the Berkeley campus	Assessing fuels treatment effectiveness: the influence of wildfire on treatment lifespan and aboveground carbon dynamics within 20-year-old treated units	Plumas	\$44,883	This project uses temporally rich data to explore the influence of wildfire on forest stand dynamics, treatment effectiveness, and carbon storage in twenty-year old fuels treatments. The study aims to understand the long-term efficacy of current treatment regimes on federal lands while providing California's forest managers with empirical (i.e. not modeled) information about the ability of treatments to reduce fire risk, preserve forest health, and sequester carbon in a post-fire environment.	Graduate Student

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20-RP-LNU-047	University of California Davis	Plant community response to increased fire frequency in northern California chaparral	Napa	\$64,831	Fire frequency has increased in chaparral shrublands with the rise of urbanization and an extended fire season. This departure poses severe effects on biodiversity and species composition, leading to exotic invasion and type conversion to grassland. This study will examine how increased fire frequency affects the composition of plant species in northern chaparral and will provide data to understand how and when chaparral communities lose resilience to invasion, thus informing management, planning, and restoration efforts in this region.	Graduate Student
20-RP-LNU-069	Sonoma State University	Assessing the utility of handheld LiDAR to quantify forest understory structure and evaluate change following disturbance.	Sonoma	\$77,367	This project will quantify forest structure changes in post-fire (Sonoma County) and managed stands (Mendocino County) via LiDAR voxel metrics. Data will be collected using a LiDAR handheld mobile laser scanner and validated using limited destructive sampling. This study will add to the relatively new and growing body of work on LiDAR remote sensing to measure forest structure as a component of forest health.	Graduate Student
20-RP-LNU-070	Sonoma State University	Evaluating the utilization of 3D physics-based fire models in conjunction with terrestrial remote sensing data	Sonoma	\$74,343	My proposed project seeks to expand upon the research conducted by the Bentley Lab at Sonoma State University and the USFS Rocky Mountain Research Station Fire Science Lab by integrating terrestrial laser scanning data with a physics-based model framework to estimate fire effects on biomass, forest structure, and tree mortality in a wildfire affected oak-woodland and managed conifer forest in California.	Graduate Student
20-RP-LNU-101	Northern Arizona University	Ecoacoustic response to Wildfire and Forest Treatment	United States	\$98,947	This project aims to quantify the impact of various forest treatment strategies and wildfire severities on biodiversity using ecoacoustic methods to quantify biodiversity and remote sensing vegetation characteristics to describe habitat quality in Sonoma County, CA. This includes applying innovative deep learning acoustic analyses and spatial modeling to map differences in biodiversity following forest treatments and wildfire.	Graduate Student

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20-RP-MVU-030	University of California Riverside	Indigenous burning, Prescribed Fire, and Goldspotted Oak Borer Management	San Diego	\$99,999	Agilus auroguttatus, goldspotted oak borer (GSOB), an invasive wood boring buprestid beetle, that has caused widespread oak tree mortality throughout southern California. The proposed research on indigenous burning and prescribed fire based on traditional ecological knowledge will investigate the potential of prescribed burn programs as a management tool for managing goldspotted oak borer infestations over large areas in native California oak woodlands.	Graduate Student
20-RP-NEU-053	University of California, Merced	Valuation of water and carbon benefits of forest restoration	Merced	\$99,939	This proposed research focuses on quantifying, valuing and monetizing benefits of forest restoration, especially water-related and carbon-sequestration benefits and developing an evaluation tool for decision making on the timing of implementation for maximizing the return on the investments. To illustrate the research process and results, this research will use the in-progress French Meadows Project in the American River watershed, plus the Yuba Projects in the Yuba River watershed as case studies.	Graduate Student
20-RP-ORC-147	University of California, Irvine	Informing California land management by understanding wildfire and forest die-off interactions	Orange	\$99,963	Climate change is increasing threats to California forest health from wildfires and drought mortality. CAL FIRE and other federal, state, and local stakeholders aim to tackle increasing threats to forest health by increasing investing in restoration. This proposal aims to understand interactions between restoration and forest disturbance under climate change through two research goals: Goal 1: Understand past wildfire and restoration impacts on drought sensitivity. Goal 2: Understand past forest die-off and restoration impacts on wildfire risk.	Graduate Student
20-RP-RRU-168	University of California Riverside	Effects of wildfire on soil emissions of NO and N2O	Riverside	\$99,862	Detailed understandings of the impacts of wildfire on ecosystem biogeochemical cycles are essential for predicting ecosystem recovery trajectories and supporting the protection and restoration of our local fire-affected ecosystems. To address this need, I propose tracking N cycling and measuring soil N gas emissions in the aftermath of the Holy Fire in the Cleveland National Forest.	Graduate Student

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20-RP-SBC-012	University of California, Santa Barbara	Restoration of native plants on fuelbreaks to reduce ignition potential and enhance ecosystem services	Santa Barbara	\$100,000	We are investigating how to reduce the ecological consequences of fuel modification by restoring a fuelbreak with native herbaceous species creating a green break that limits the impacts of non-native species, reduces ignition potential, and supports desired ecosystem functions. We also aim to conduct combustion tests of live plants in order to determine which species would be best suited for use on green fuelbreaks and to improve our understanding of live fuel combustion and its relation to wildfire behavior.	Graduate Student
20-RP-SBC-065	University of California, Santa Barbara	Quantifying the Relationships among Stand Structure, Fire Behavior, and Burn Severity from Prescribed Fire in California Foothill Oak Woodlands	Santa Barbara	\$90,163	This project will evaluate the relationships between 3-dimensional vegetation structure and fire behavior, burn severity, and mortality risk in California foothill oak woodland and savanna ecosystems. It will collect biological and physical data, relating field data to imaging lidar data, from two prescribed burn events in Santa Barbara County. The results of this project will form predictions of fire effects on oak populations, and inform fire management for woodland health and public safety.	Graduate Student
20-RP-SCU-163	University of California, Berkeley	Leveraging existing carbon incentive programs to increase utilization of woody biomass residues	Alameda	\$100,000	To achieve the goal of restoring one million acres of California's forested land each year, around 30 million tons of woody biomass will need to be removed from landscapes. Strategic investments in biomass utilization infrastructure and facilities will be critical to helping meet these goals. This proposed research will provide a quantitative assessment of the profitability of biomass utilization technologies and the financial impact of existing carbon incentive programs.	Graduate Student
20-RP-TCU-025	The Regents of the University of California (UC Davis)	Accounting for lags in post-fire mortality and their influence on disturbance severity assessment	Tulare	\$59,712	This project seeks to quantify lags in mortality that is visible more than 1 year but within 8 years after fire in high elevation forests of the Sierra Nevada. Delayed mortality will be assessed using high resolution aerial and satellite imagery, compared to standard satellite imagery sources, and analyzed for patterns to determine when lags may be most likely to occur. The project is distributed across many counties and CalFire units, from the central to southern Sierra Nevada.	Graduate Student

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Project ID	Applying Organization	Project Title	County	Requested Funds	Brief Project Description	Research Project Type
20-RP-LNU-106	Sonoma State University	Timely prediction of wildfire burn severity in California forests with spaceborne observations of 3D vegetation structure	Sonoma	\$492,779	This project demonstrates the value of GEDI spaceborne lidar for timely monitoring of forest structure for predicting future wildfire severity in North Coast, Central Coast and Sierran forests. We will use GEDI structural metrics to predict wildfire severity from large recent fires, detect disturbance for future wildfire severity prediction, create spatio-temporally continuous maps of structure and wildfire severity predictions, and compare our results to existing FRAP priority landscape maps.	State Forests
20-RP-MEU-028	Humboldt State University	Mitigating wildfire hazard in the redwoods: effectiveness and tradeoffs of fuels treatments	Mendocino	\$500,000	Two-part research project on Jackson Demonstration State Forest: 1. Establish replicated manipulative experiment comparing hazardous fuels reduction treatments including prescribed burning. 2. Using established multicohort silviculture experiment, compare activity fuels treatments following precommercial thinning done 10 years after various conifer partial harvest treatments. These long-term experiments give data into the future, while fire effects modeling for each treatment gives immediate wildfire hazard reduction guidance for north coast.	State Forests
20-RP-TUU-159	Board of Regents, NSHE, obo University of Nevada, Reno	Leveraging High-Resolution Pre- and Post-Disturbance Field Data to Assess Accuracy of Common Forest Inventory Datasets and Carbon Accounting Methods	Tulare	\$350,803	Strategic forest management relies on estimates of current and projected carbon derived from forest inventory data and modeling tools, such as the Forest Vegetation Simulator (FVS). Projections are, however, hard to validate given data and model limitations. To support model optimization and thus treatment prioritization efforts, we will assess the accuracy of FVS model output derived from forest inventory datasets of varying resolution against high-resolution pre- and post-disturbance datasets from two Demonstration State Forests.	State Forests
20-RP-SLU-058	Cal Poly Corporation (auxiliary of California Polytechnic State University, San Luis Obispo)	Understanding the costs and limits of vegetation management for wildfire mitigation in coastal California: a comprehensive ecological and economic study at the Soquel Demonstration State Forest	Santa Cruz	\$499,513	This project will compare the impacts of commonly applied forest health management approaches to fuels, carbon, and water at the Soquel Demonstration State Forest. We combine these with policy and economic modeling to identify optimal carbon storage and forest health treatments for the coast range.	State Forests

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Project ID	Applying Organization	Project Title	County	Requested Funds	Brief Project Description	Research Project Type
20-RP-AEU-153	California Council on Science and Technology	Development of science-informed recommendations to improve statewide tracking of the public health impacts of wildfire smoke	Sacramento	\$258,595	Smoke from wildfires kills more people than direct exposure to the flames. The California Council on Science and Technology seeks funding to develop recommended protocols to estimate public health impacts of wildfire smoke using available datasets. The intent is to help standardize efforts by researchers, governmental agencies, and other stakeholders to better understand the full costs of wildfire and to assess the effectiveness of prevention and mitigation efforts to reduce societal impacts.	Synthesis & Tool Development
20-RP-AEU-171	California Native Plant Society	"Working With Nature" Guide for Forest Health and Co-Benefits Practices	Sacramento (statewide)	\$497,830	The "Working With Nature" project will collate the expertise of land managers, ecologists, and researchers from across California into two products: a written guide (statewide) and an interactive decision support tool (for one region). Project proponents and land managers attempting to improve land health, reduce wildfire risk, or promote water or carbon storage will benefit from information on best practices to reach land health goals and the ability to develop specific project plans.	Synthesis & Tool Development
20-RP-CZU-124	University of California, Santa Cruz	A Decision Support Tool for Wildfire Risk Assessment Using a Scalable and Efficient IoT Ground Monitoring Network	Santa Cruz	\$498,955	We propose to develop a novel decision support tool to autonomously and continuously monitor environmental conditions relevant to wildfires and assess fire risk in real-time at landscape scale with adequate spatio-temporal resolution. Our tool consists of: a ground IoT network; wildfire risk assessment software to assimilate/process data from the IoT network; and user-friendly decision support tool which, based on wildfire risk assessment output, will inform stakeholders and the public.	Synthesis & Tool Development
20-RP-FKU-035	Conservation Biology Institute	Applying New Science to Develop a Collaborative Decision Support System for Forest Management in the Southern Sierra Nevada	Fresno	\$479,643	This project will advance work currently in progress by a federal/state/non-profit partnership to build a decision-support system for addressing critical forest management issues in the southern Sierra Nevada and apply it to the protection of giant sequoias, Pacific fishers, and mountain communities. The DSS will combine emerging wildfire science, spatial metrics of forest resilience, and forest growth simulation for prioritizing treatments that improve the resilience of natural and human communities to fire and climate change.	Synthesis & Tool Development

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Project ID	Applying Organization	Project Title	County	Requested Funds	Brief Project Description	Research Project Type
20-RP-LNU-090	University of California, Davis	Using Landscape, Climate and Environmental Risk Factors to Identify Priority Seed Collection Areas Across California	Yolo	\$339,807	California relies on post-wildfire reforestation and needs sufficient stocks of conifer seeds for climate-adaptive plantings. This project seeks to improve capacity to find and secure seed sources in the face of increasingly destructive conditions, by providing spatial tools that rank forest landscape risk factors and identify high priority areas for cone surveys based on landscape risk, inventories of available seed stocks, and the need to use climate change-suitable seeds for each location.	Synthesis & Tool Development
20-RP-LNU-092	UC Davis	Improving Climate-Based Seed Selection for Increased Carbon Sequestration	Yolo	\$299,807	The climate is changing faster than tree populations can evolve, resulting in climate-adaptation mismatch (CAM), between trees and the environment they grow in. CAM results in reduced growth and survival with large consequences for statewide forest health, carbon sequestration, timber production, fire severity, and habitat. This proposal focuses on combatting CAM by improving techniques for selecting seeds that are adapted to the climates of planting locations.	Synthesis & Tool Development
20-RP-LNU-116	University of California, Davis	Natural range of variation (NRV) assessment for southern California montane forests	Yolo	\$183,037	We will conduct a natural range of variation (NRV) assessment of the major compositional, structural and functional parameters that define montane forests in southern California. This research will fill a critical gap in our understanding of how these forests persisted and functioned prior to climate change and major anthropogenic impacts. It will serve as a baseline for measuring current and future threats, as well as a guide for restoration and conservation.	Synthesis & Tool Development
20-RP-LNU-177	Pepperwood Foundation	Field Testing the Land Tender Decision-Support Tool in a Wildfire-Impacted Landscape	Sonoma	\$254,974	Develop a web interface for accessing data and providing decision support for forest management. First, data on strategic areas, resources, and assets, hazards, and risk are developed and integrated into a GIS. These data inform an economic-based decision support tool for stakeholders to explore treatment scenarios. The outputs provide spatial treatment options that can be optimized to address specific interests such as restoration of forest resilience, carbon sequestration, and water security.	Synthesis & Tool Development

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Project ID	Applying Organization	Project Title	County	Requested Funds	Brief Project Description	Research Project Type
20-RP-MVU-155	Department of Earth and Planetary Sciences, UC Riverside	Use of multispectral sensor imagery to distinguish levels of Goldspotted oak borer (<i>Agrilus auroguttatus</i>) infestations in individual oaks.	San Diego	\$202,499	We propose to use a drone with multispectral sensors to improve early detection of Goldspotted oak borer (GSOB) damage to red oaks and to improve GSOB management decisions. Recent studies and new sensor technology make this project feasible. Our goal is to develop the capacity of CAL FIRE and partner agencies to use multispectral sensor system to inform GSOB management efforts, with the broader goal of promoting a self-sustaining drone survey industry for California oak woodlands.	Synthesis & Tool Development
20-RP-NEU-098	Board of Regents of the Nevada System of Higher Education on behalf of the Desert Research Institute	Development of Smoke Transport Probability and Risk Interactive Map from Trajectories and Climatology Analysis of 2-km CANSAC-Reanalysis Database	U.S.A	\$444,966	We will generate high-resolution smoke transport probability for the 2km-CANSAC reanalysis domain for use in prescribed fire planning and emergency response. Population, school, and hospital counts within each smoke transport region will be calculated for health risk management and messaging. Climatological fire weather metrics will also be generated. Training workshops will be held for stakeholders to improve the final product and demonstrate the intended use of the data for decision making.	Synthesis & Tool Development
20-RP-SCU-154	Regents of the University of California, on behalf of Berkeley Forests	BioSum: A Tool for Forest Health Management Decision Making	Alameda	\$359,322	Our project will use the USFS PNW's BioSum model to improve climate focused forest management planning and decision making, examining how proposed treatment alternatives perform at regional levels and across land-owner objectives, when tested against clear and benchmarks using a transparent model? We will work with decision makers and project managers to test different approaches, providing regional and project-specific guidance for applying best practices to achieve the "best" results based on management objectives.	Synthesis & Tool Development