California Energy Commission
Final Report

Technology/Knowledge Transfer Plan

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Acronym and Abbreviations

CALFIRE	California Department of Forestry and Fire Protection
CAM	Commission Agreement Manager
CARB	California Air Resources Board
CEC	California Energy Commission
CPUC	California Public Utilities Commission
IOU	Investor Owned Utility
LANDFIRE	Landscape Fire and Resource Management Planning Tools
NOAA-NWS	National Oceanic and Atmospheric Administration - National Weather Service
PI	Principal Investigator
SIG	Spatial Informatics Group
TAC	Technical Advisory Committee
UC	University of California
UCAR/NCAR	University Corporation for Atmospheric Research/National Center for Atmospheric Research
WUI	Wildland-Urban Interface
USFS	United States Department of Agriculture – Forest Service
USGS	United States Geological Survey

Purpose of Knowledge/Technology Transfer Plan

The purpose of this document is to describe the process by which knowledge and/or technology gained or developed through this project will be communicated and/or transferred to a broader set of interested parties and stakeholders. A successful transfer of technology and knowledge generated through this project will help to promote its use for supporting policy and informing electrical system operations and decisions associated with mitigating wildfire impacts and will build on the broader body of wildfire science. An effective transfer strategy will ultimately improve reliability of the electrical system and reduced costs for ratepayers.

Project Background

Issues Addressed by the Project

The impacts of wildfires in California have intensified in the past decades. Community development patterns near wildlands has increased the amount of wildland-urban interface (WUI) in the state. Climate change and past forest management has led to wildland fuel conditions that have increased the likelihood of fire behavior that exceed the predictive power of existing wildfire models (i.e., existing fire models underestimate the intensity and spread characteristics of wildfires observed in recent years). Additionally, the impacts of wildfire on the investor-owned utilities' (IOUs) electric grid have resulted in increased costs, reduced safety and weakened reliability to ratepayers — a situation that will likely worsen in a changing climate without improved mitigation strategies.

Wildfire science currently lacks sufficient information to forecast risk to natural and developed landscapes across California and are not able to predict extreme fire behaviors resulting from prolonged heat release by large woody fuels and deep duff layers typical of modern California forests. The current near-term risk fire-weather forecasts underestimate extreme weather events, surface fuel loads in elevated tree mortality areas and fire-spread dynamics due to omission of novel driving factors. For long-term planning, there is a lack of a comprehensive modeling framework to make mid- to late-century projections of fire risk. Consequently, IOUs, State agencies and stakeholders relying on the electric grid lack scientifically robust information and actionable insights to make effective near-term tactical and long-term planning decisions.

Project Summary

In Phase 1 of the project, the project team will advance wildfire science by incorporating the dynamics of tree mortality and weather information into next-generation wildfire models. The project team proposes to develop computationally efficient wildfire risk models to demonstrate the potential of the technologies to reduce the impacts of wildfire on the electricity grid. At both near- and long- term time horizons, the project team will compare different wildfire risk modeling approaches to converge on the

best approach to developing the next generation of wildfire models. In Phase 2, the project team will integrate risk forecast models at IOUs and support the Fifth Climate Change Assessment with future fire projections. The wildfire risk models developed as part of the project will be deployed on an open-source platform providing free access to IOUs and other stakeholders. Figure 1 provides a simplified overview of the project's workflow.
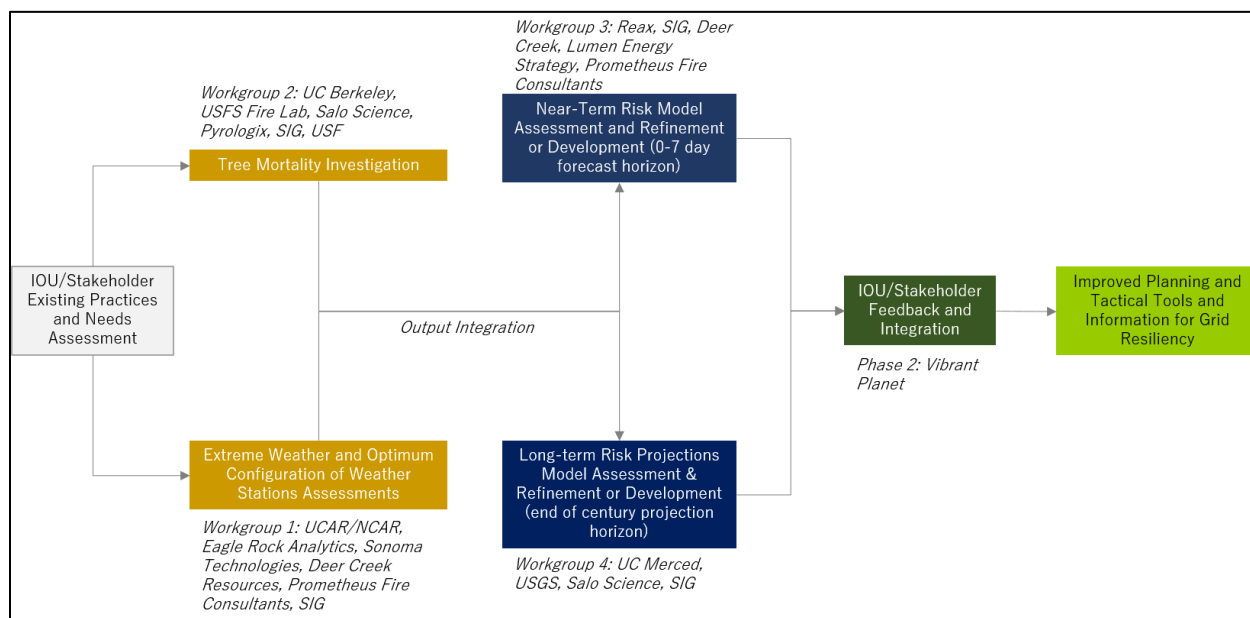

Figure 1. Overview of project workflow.

Technology or Knowledge that the Project Will Create

Through a partnership of technical experts, this project will research the emerging risks of wildfire on the electricity grid by incorporating the dynamics of tree mortality and extreme fire weather in next-generation near- and long-term fire models. The project will create technology and knowledge as follows:

- Advance science to support improved grid resilience to wildfire;
- Improve assessment methodologies of risks to the electric grid from wildfires now and under climate change; and
- Develop open source models that can feed into utility operations, management and planning.

Technology and Knowledge Transfer Plan/Process

The overall goal of this Plan is to provide specific guidance on the process for transferring technology and knowledge generated through this project to various audiences. Figure 2 provides a generalized model on how data and analysis produced by the project team will be translated into knowledge that is then consumable by different audiences.
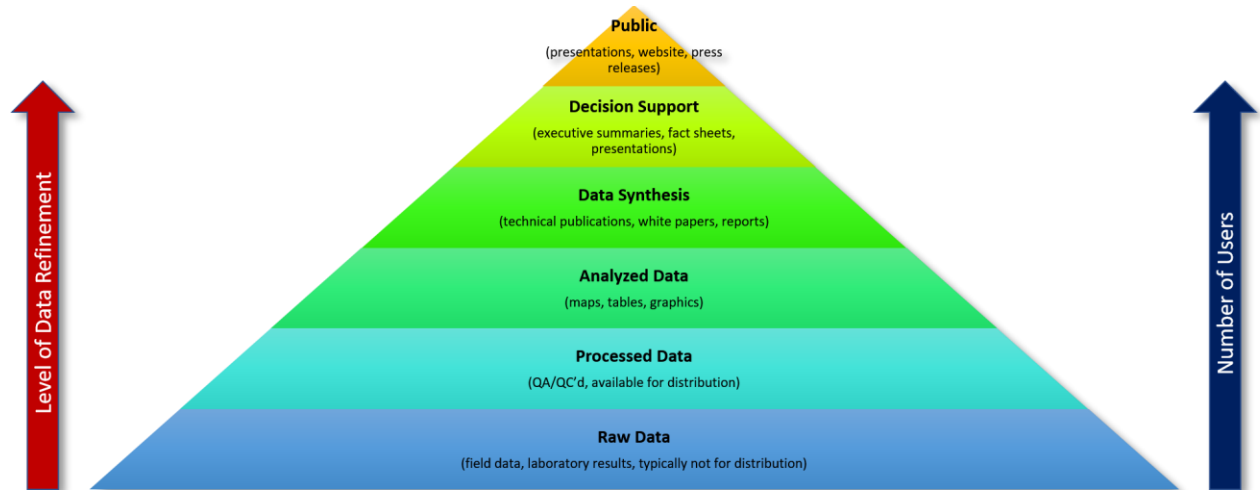
Figure 2. Generalized model that will be used to guide the translation of the of raw data into knowledge

The project team will be broken into four workgroups to address the different technical and knowledge generating aspects of the project. Workgroups are composed of technical experts from the project team and led by Workgroup Leads. The four Workgroups will focus on the preparation and delivery of tasks and products identified in the CEC grant agreement.

Goals and Objectives

Goals and objectives for technology and knowledge transfer are identified for each of the project's Workgroups as follows:

Workgroup 1 (Extreme Weather and Weather Stations)
The goals of Workgroup 1 are to: (1) develop a methodology for identifying optimal configurations of weather stations; (2) pilot test an upper-air profiler; (3) provide recommendations for future siting of weather stations; and (4) improve understanding of the relationship of historical weather conditions and wildfire in order to improve estimates of future wildfire risk. The knowledge/technology transfer objectives of Workgroup 1 are to:

- Apply an optimization methodology to inform the siting and configuration of weather stations by IOUs and transfer this technology to IOUs and stakeholders,
- Pilot test an upper-air profiler and transfer results and associated value for fire-weather forecasting technology to IOUs and stakeholders, and
- Analyze historical fire events to inform the development of statistical fire risk models for long-term projections and effectively communicate this information to Workgroup 4 for application in long-term model projections and to wildfire professionals and researchers

Workgroup 2 (Tree Mortality and Fuel Models)
The goals of Workgroup 2 are to: (1) develop repeatable and controlled fuel materials and mixtures that can be burned at laboratory scales; (2) devise experimental apparatus and test in a laboratory setting the predicted heat release rates across the range of fuel structures and environmental conditions found in wildland areas; (3) develop and employ a new fuel measurement and mapping system to resolve the essential fuel components and spatial heterogeneity in fuels occurring at multiple scales; (4) map current and projected future fuel conditions in areas of elevated tree mortality; and (5) evaluate how to

integrate the products into near-term risk forecast models and long-term risk projections. The knowledge/technology transfer objectives of Workgroup 2 are to:

- Assess and effectively communicate the state of wildfire science as it relates to risk forecasting for researchers, policymakers and professionals,
- Undertake laboratory testing of a range of forest fuel structures and environmental conditions to enhance the scientific community's understanding of wildland fires,
- Develop and communicate results of a new fuel measurement and mapping system, and fuel models of non-steady fire spread and behavior to form the building blocks of the next generation of wildfire models, and
- Provide to IOUs, stakeholders, and practitioners with a contemporary, state-wide tree mortality map with projections of fuels loads to inform fuel maps for California

Workgroup 3 (Near-term Risk Forecasting)
In Phase 1, the goals of Workgroup 3 are to develop the next generation of models to provide near-term risk forecasts at a 0-to-7-day temporal scale and at a fine (circa 30m) spatial scale to simulate spread of extant fire ignitions and enhance current models with best practice in wildfire risk modeling. The knowledge/technology transfer objectives of Workgroup 3 are to:

- Develop a near-term risk forecast modelling framework tailored to IOU and stakeholders needs for mitigating wildfire risk,
- Provide a value proposition of the benefits of a near-term risk forecast to IOUs,
- Support IOU understanding of the modelling framework through pilot/beta tests and user guide documentation,
- Based on the results of modeling efforts, communicate best practice in wildfire risk modelling for addressing weather-driven fire events, fire in the WUI and areas of elevated tree mortality to IOUs, stakeholders and practitioners, and
- Increase IOU awareness of potential enhancement to wildfire risk models including use of alternative datasets and fire spread models.

In Phase 2, Workgroup 3 primary objective is to integrate to the greatest extent practical the products developed in Phase 1 with IOUs and stakeholders through engagements (e.g., meetings, workshops, presentations) and by making underlying forecast model code available via an open source platform (e.g., GitHub, State code repository).

Workgroup 4 (Long-term Risk Projections)
In Phase 1, the goals of Workgroup 4 are to develop and effectively communicate specification of the next generation of coupled statistical/dynamical fire-climate-vegetation models to run long-term (to end-of-century) wildfire risk projections and incorporate best in-class science and technology to enhance the models. The knowledge/technology transfer objectives of Workgroup 4 are to:

- Develop and communicate a long-term risk projection modelling framework tailored to state agency and stakeholder needs for mitigating and adapting to wildfire risk, and
- Communicate best practices in long-term wildfire risk modelling for addressing weather-driven fire events and areas of elevated tree mortality to stakeholders and practitioners,
- Provide broad access to *long-term risk projections data archive* that includes: 1) a dataset containing the modeling outputs from the comparative analysis of long-term projection models, baseline projections and iterations as an exemplar of the model outputs, 2) a feature for user to upload information and stakeholders to view project outputs, 3) a set of open-source code for models, and 4) where datasets produced by third parties are available and accessible (e.g.,

downscaled climate data), guidance on how to access the dataset to be provided, instead of stored in the data archive,
- Coordinate with Cal Adapt and State agencies on data storage and in the development of a *planning support tool design brief* to describe how information on long-term projection modelling efforts will be integrated into State agency and stakeholder planning practices during Phase 2 of the project.

In Phase 2, Workgroup 4 primary objective is to develop and effectively transfer technology and knowledge as follows:
- Develop long-term scenarios of wildfire risk and communicate the potential impacts of land-use policies to state agencies and stakeholders.
- Coordinate the transfer of long-term scenarios for wildfire risk scenarios developed by Workgroup #4 with California's Fifth Climate Change Assessment collaborators and practitioners,
- Identify, coordinate and communicate design specifications for a web-based planning support tool with Cal Adapt and state agencies as appropriate,
- Provide a web-based planning support tool that can be used to inform state agencies and stakeholders on a variety of climate change adaptation policy options and implications, and
- Make underlying long-term model code broadly available via an open source platform (e.g., github, State code repository) and Cal-Adapt program, as appropriate.

Target Audience

Primary Audiences

Primary audiences are those institutions that we anticipate could directly benefit from knowledge and technologies created during the project. The following primary audiences will be engaged to disseminate technology and knowledge gained.
- California Energy Commission (CEC)
- Investor-owned Utilities (IOU)
- Publicly-owned Utilities (POU)
- Stakeholders – broadly defined as individuals, groups and institutions that have an interest in the outcomes of the project and are not specifically identified here. For example, telecommunications companies often co-locate communication infrastructure with electrical infrastructure and would be consider as a stakeholder.
- Practitioners – are researchers, agencies and/or institutions that are experts in wildfire sciences, fire suppression operations or forest management, or otherwise use wildfire sciences to inform policy, regulations, management strategies and/or operations.
- Technical Advisory Committee (TAC) – the TAC for this project is composed of individuals representing a range of technical expertise and are connected to institutions that can benefit from the project outcomes. For example, three IOUs, USFS, CALFIRE, CPUC, California Department of Insurance, and CARB will be represented on the TAC.
- California Public Utilities Commission (CPUC)
- California Department of Forestry and Fire Protection (CALFIRE)
- USDA Forest Service (USFS)
- Academia and Researchers

- California Department of Insurance
- California Office of Emergency Services
- Governor's Office of Planning and Research, California (OPR)
- California Air Resources Board (CARB)

Secondary Audiences

Secondary audiences are those institutions that we anticipate could indirectly benefit from knowledge and technologies created during the project. The following secondary audiences will be engaged to disseminate technology and knowledge gained.

- Ratepayers
- National Oceanic and Atmospheric Administration - National Weather Service (NOAA-NWS)
- US Forest Service – Wildland Fire Assessment System (WFAS) - National Fire Danger Rating System (NFDRS)
- California Tree Mortality Working Group
- USGS for LANDFIRE
- Regional and Municipal Land Use and Development Planners (e.g., through Integrated Climate Adaptation and Resiliency Program - Technical Advisory Council)
- Native American Tribes

Planned Activities

Planned activities broadly include presentations, reports, web-based materials, and code and file sharing activities as follows.

Presentations/Workshops/Meetings:
- Administrative Presentations – administrative presentations will be provided as requested by CAM or as scheduled in the project schedule (e.g., CPR Meetings).
- Agency-sponsored Workshop Presentations – the project team will participate in various agency-sponsored workshop presentation (e.g., CEC/CPUC Workshops) as requested by CAM. The project team has already participated in the CEC - IEPR Lead Commissioner Workshop of Climate Adaptation in California's Energy Sector (August 8, 2019) and anticipate participating in at least 4 more State-sponsored workshops over the duration of the project.
- IOU/Stakeholder Engagements – in-person or virtual workshops and other direct engagements will be held to improve understanding of project scope, to elicit input on their needs, and to identify opportunities to integrate project outcomes into operations or policy. Initial IOU/Stakeholder Engagements are scheduled for Fall of 2019 per Task 8 in Phase 1 of the project. Additional engagements are planned and are related to Task 9, 10 and 11 in Phase 2 of the project. The second round of IOU/Stakeholder engagements will be designed to facilitate: 1) the integration of near-term risk forecast models and tools into IOU and/or stakeholder operations, 2) opportunities to integrate project findings and products into the California Fifth Climate Change Assessment, and 3) input and feedback on specification for web-based planning support tool from IOUs, stakeholders and/or practitioners. Details of Phase 2 Task 11 user engagements will be summarized in the context of 1) Task 9 *Near-term Risk Forecast Integration Workplan* product and 2) Task 10 *Long-term Risk Projections Workplan* product.

- Professional Conference Presentations – various members of the Project Team will submit abstracts for presentation of project outputs at professional conferences. For example, the project PI will present a project overview at the Association for Fire Ecology – 8th International Fire Ecology and Management Congress in Tucson, AZ - November 18 to 20, 2019 and Workgroup 1 will present on MaxEnt analysis at the 2020 American Geophysical Union (AGU) Fall Meeting in San Francisco – December 2020. We anticipate that at least five presentations will be presented at professional conferences over the duration of the project.
- Project Team Meetings – regular Workgroup meetings and Project Team meetings will be held to coordinate project activities using the following formats.
  - Online/Virtual Meetings – GoTo, WebEx, or Zoom platforms will be used to host multi-person conference calls and webinars.
  - In-person Meeting – in-person Project Team and Workgroup meetings have been pre-approved by CEC and will be used to coordinate project activities.
- External Meetings – regularly scheduled external meetings will be held to share information, receive input and provide project status updates (e.g., TAC meetings, CPR meetings).

Reports and Documents:
- Administrative Reports (CAM) – reports will be produced that relate to administration and contract compliance (e.g., Critical Review Reports and Quarterly Progress Reports). These reports will be provided to CEC and CAM, and made available to a broader audience as appropriate.
- Guidance Documents – user guidance documents will be produced as deliverables of the project. These documents will provide advice in following procedures or processes.
- Project Reports – project reports are product deliverables. Reports will be made available to TAC, CAM, the project's internal file portal, and to other interested external audiences through the project's website.
- Professional journal articles and technical papers – when appropriate during and after the project, technical papers will be prepared and submitted to suitable peer-reviewed journals for publication.
- User Engagement Reports – Products from Task 8 and Task 11 include a *User Needs Assessment Summary* and an *Integration Workshop Summary*, respectively. The *User Needs Assessment Summary* will describe IOU and stakeholder needs associated with 1) fire-weather analysis and weather station equipment and placement, 2) tree mortality data and fuel models, 3) near-term forecast models and 4) long-term risk projections. The *Integration Summary* will describe options and opportunities for integrating project outcomes related to near-term risk forecast and long-term risk projections into IOU/stakeholder operations and planning, and opportunities for Project Team engagement on California's Fifth Climate Change Assessment. These products will be made available to TAC, CAM, the project's internal file portal, and to other interested external audiences through the project's website.
- Factsheets and Briefing Papers – topical factsheets (e.g., Appendix A) and or briefing papers will be prepared at the direction of the CAM as scheduled in the project's scope of work and disseminated to the target audiences as well as posted to the project's website.
- Workplans – will be developed and used to guide project activities and scope of project products.
- Press Releases – will be prepared and after approval by CAM, released to the press at appropriate intervals. Press release may also include radio interviews of key project team members.

Web-based/Internet
- Project Website – The Project Team will develop a project website to host project-related information and provide a portal for target audience and users to access finalized products.
- Webinars – topical webinars will be produced by the Project Team as directed by the project CAM.
- Webmap – when finalized, all static geospatial data products will be posted to an easily accessible on-line webmap for review and download. Examples of geospatial data that will be included on the project webmap include and are not limited to: optimal locations for weather stations layer, 'warning areas' and 'danger sites,' fuel load maps, topography, building footprints (existing), administrative boundaries, publicly available information on utility infrastructure, tree mortality data layer, historic fire progression maps, and current and projected land-use scenarios. The webmap will be linked to the project website.
- Open-source Code – all non-proprietary code for near- and long- term fire models will be made available under open-source licenses through an open source platform such GitHub and published in the State repository (code.ca.gov). All code will be open source, broadly available for public reuse, and in compliance with State policy on open source software. When possible, all code developed will be amendable to forming the basis for an operational tool in Cal-Adapt including knowledge transfer guidelines.
- Third-party data and software - Where data or software code produced by third parties are available (i.e., not proprietary) and used in this project, guidance on how to access the data and/or software will be included on the project website.
- Social Media Post – when appropriate, announcements of project activities will be posted to social media platforms such as Twitter, LinkedIn, Instagram and Facebook.

File Sharing Platforms (datasets, documents, data archives, container dockers)
- Google Drive – will be used to share files with internal users.
- Google Site – a file sharing platform has been developed on Google Sites for internal project team document sharing.
- Dropbox – will be used to share files with external and internal user.
- UC Merced servers – will be used to host data and code associated with long-term risk projection models.
- Reax servers – will be used to host data and code associated with near-term risk forecast models.
- Nextcloud SIG Server – will be used to archive all project files.
- ftp – will be used to share large files with internal and external users as appropriate.
- Cal-Adapt – will be used to share relevant model output datasets.

Roles and Responsibilities

Four Workgroups from the Project Team will primarily be responsible for creating and transferring knowledge and technology, including:
- Workgroup #1 - this workgroup is led by Janice Coen (UCAR/NCAR) and will focus on developing and presenting knowledge outputs related to historical weather associated with large fires and weather station configuration.
- Workgroup #2 - this workgroup is led by Scott Stephens (UC Berkeley) and will focus on developing and presenting knowledge outputs related to tree mortality and fuel models.

- Workgroup #3 - this workgroup is led by Chris Lautenberger (Reax Engineering) and in Phase 1 of the project will focus on developing and presenting knowledge outputs related to the development of next generation models for near-term risk forecasts. In Phase 2 of the project, near-term risk forecasts models will be presented to IOUs and stakeholders with the interest of integrating new models into operational practices as appropriate.
- Workgroup #4 - this workgroup is led by Leroy Westerling (UC Merced) and in Phase 1 of the project will focus on developing and presenting knowledge outputs related to the development of a next generation long-term risk projections model. In Phase 2 of the project, products relevant to long-term risk projections will be finalized and integrated into the 5th California Climate Assessment and Cal-Adapt.

Knowledge, information and outputs generated through Workgroups #1 and #2 tasks and products will be integrated, when applicable, into tasks and products produced by Workgroups #3 and #4 (Figure 1). Additionally, Workgroups #3 and #4 (with input provided by Workgroup #1 and #2) will facilitate engagements with IOU/Stakeholders over the course of the project to understand potential user and stakeholder needs and to integrate products and findings into operations, planning documents, policy and/or decision-making frameworks.

The Principal Investigator of the project is David Saah and will be charged with guiding the Project Team in the transfer of technology and knowledge to a broad and diverse audience as outlined in this plan.

Metrics

The following metrics are proposed to measure the effectiveness of technology and knowledge transfer:
- # of IOUs and stakeholder groups reviewing presentation materials associated with the project.
- # of agency-sponsored workshop presentations.
- # of professional/technical conference proceedings where project information is presented.
- # of papers published in peer-reviewed journals.
- # of factsheets produced and made widely available via web-based platforms.
- # of social media posts.
- # of press releases about the project that are published in newspaper or highlight on the radio.
- # of website visits, and/or download of accessible products from the project website.
- # of project products delivered to CEC on schedule.

Anticipated Barriers

The following are some anticipated barriers to the effective transfer of knowledge and technology:

- Existing IOU Wildfire Mitigation Plans and spending cycles may limit what proportion of investments in new weather stations can be influenced by the project products given the current project schedule.
- Upper-air profiler is a pilot test to demonstrate the potential value of advanced technologies and requires further IOU investment to integrate a wider array of upper-air profilers into the network of weather stations and current weather models, therefore it may not be possible to immediately realize the value of the data provided by upper-air profiler systems.
- The nature of basic scientific research means that the development and broad adoption of new fuel/spread models is uncertain within the project timeframe. Additional vetting of fuel/spread

models by the research community is expected before wide acceptance of their application into wildfire simulation models, including the information's role in the enhancement of near-term and long-term risk models.

- IOU integration of near-term risk forecast models will be dependent on the value proposition of the 0-7 day forecast and their implementation in operational practices. That is, each IOU will need to independently determine the extent that the next-generation model can be adopted into their operational practices – the Project Team cannot impose incorporation of the project findings onto IOUs operating procedures.
- Open source model collaboration will be dependent on cultivating an external community of fire-model developers. The project team will make a concerted effort to announce the posting of model code to a sharing platform, however, has little or no control over their participation to review, revise or otherwise participate in code development.

Knowledge Transfer Outputs, Outcomes, and Impacts

Outputs are the tangible products and actions taken by the project team to effectively transfer technology and knowledge to the target audience. *Outcomes* are the anticipated observed effects of the outputs. *Impacts* are the anticipated longer term or indirect effect of the outcomes. The following are anticipated outputs, outcomes and impacts expected from this project and the implementation of this Plan.

Outputs

The following outputs are proposed to facilitate the transfer of technology and knowledge:

Presentations:
- Administrative Presentations
- Agency-sponsored Workshop Presentations
- IOU/Stakeholder Engagement Workshops
- Professional Conference Presentations
- External Meetings
- Internal Meetings

Reports and Documents
- Administrative Reports (CAM)
- Guidance Documents
- Project Reports
- Professional journal articles and technical papers
- Factsheets and Briefing Papers
- Press Releases
- Workplans

Web-based/Internet
- Project Website
- Webinars
- Open-source model code
- Project Webmap Portal
- Social Media Posts

File Sharing Platforms (for datasets, data archives, container dockers) to be hosted on one or several of the following:
- Google Drive
- Google Site
- Dropbox
- UC Merced server
- Reax server
- Nextcloud SIG server
- ftp
- Cal-Adapt

Outcomes

The Project Team is composed of world-renowned wildfire scientists and meteorologists, each will contribute to the credibility underlying the project products and to the effectiveness of communicating scientific concepts to different types of audiences. This, in combination of the diversity of technologies and knowledge transfer mechanisms listed in this plan will assure information is made available to the range of identified primary and secondary target audiences and enhance transfer outcomes.
Through the effective implementation of the Technology and Knowledge Transfer Plan, the following outcomes are anticipated:
- More efficient and targeted investment in weather station network through better information.
- Alternative options aside from ground weather stations pilot tested.
- Classification of historical fires by environmental drivers.
- Advancing near-term risk forecasting.
- Performance metrics for analyzing spread models.
- Advancing long-term wildfire risk projections

Impacts

We anticipate the following impacts from the project and implementation of this Plan:
- Improved stakeholder and researcher understanding of factors that drive catastrophic wildfire events.
- Full or partial stakeholder adoption of information provided from optimal weather station configuration analysis.
- Stakeholder, natural resource manager, and researcher use of tree mortality data products to inform forest management and wildfire mitigation actions.
- IOU, State agency, and stakeholder awareness and incorporation of near-term risk models into operational practices.

- Incorporation of climate change adaptation policies and strategies resulting from long-term projection products into state and local planning documents
- Reduced barriers for sharing of information, tools and datasets with wildfire and earth scientists outside of the project team.

Appendix A. Initial Project Factsheet

EPIC PROJECTS ENERGY INNOVATION

CALIFORNIA ENERGY COMMISSION

Comprehensive Open Source Development of Next Generation Wildfire Models for Grid Resiliency

The Issue

Many aspects of wildfires in California have changed in the past several decades, including climate patterns and the development of human infrastructure near wildlands. The resulting impacts of wildfire on the IOUs' electric grid have resulted in increased costs, reduced safety and weakened reliability. Wildfire science lacks the fundamental underpinnings to forecast risk in a changing climate. Operational wildfire behavior models are empirical and cannot be adapted to predict extreme fire behaviors. Therefore, IOUs, State agencies and stakeholders relying on the grid lack scientifically robust information to make effective near-term management and long-term planning decisions.

Project Innovation + Advantages

The proposed research will advance wildfire science by incorporating the interaction of tree mortality and extreme fire weather in next-generation fire models. The project will develop zero-to-seven-day risk forecasts for the grid with predictive capabilities, computational efficiency and scalability. To support planning, the team will develop long-term fire projections using a coupled fire-climate-vegetation statistical and dynamical model to integrate the latest climate projections, tree mortality, development in the wildland-urban interface, and adaptation strategies. At both time horizons, the team will compare different approaches to addressing the multiple technical dimensions and converge on the first best path to the next generation of wildfire models. To integrate the models into electric utility management and planning, the team will facilitate workshops with IOUs. To support the Fifth assessment, the team will develop a web-based scenario analysis tool to visualize and manipulate the impacts of climate change and landscape/urban adaptation strategies on the grid.

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Program: EPIC
Agreement Number: EPC-18-026
Award: $5,000,000
Co-funded Amount: $1,656,600
Project Location:
Project Term: 7/29/2019 to 3/28/2024
Project Status: ACTIVE

The development of next-generation wildfire risk forecasting models to provide actionable insights to make effective near-term management and long-term planning decisions

BENEFITS

The project will aid regulators and stakeholders in meeting statutory goals by addressing critical fire science gaps and applying the science to provide advanced forecasting capability. Specifically the project will: 1) Provide breakthroughs in the science of measuring, modeling and analyzing extreme weather events, tree mortality and fire spread at scale; 2) advance risk-modeling frameworks to include, identifying where wind extrema can occur, statewide maps of fuel loads in areas of elevated tree mortality, parameterization of fire risk models to incorporate latest science, and signals or tip-offs where risk forecasting underestimates fire risk due to gaps in science; and 3) advance the integration of science and technology.

Lower Costs: The primary project benefit results from improved decision-making by IOUs to reduce the cost of wildfire impacts to the grid. The decision-support tools developed during the project will be integrated into IOU operating practices to deliver a more reliable, safe and cost-effective grid.

Greater Reliability: With the use of more granular, dynamic fire-spread models, mitigation activities can be more precisely configured, making them consequently less extensive in scope. Such improvement in management will reduce fire damage to grid infrastructure and outages that would result from such damage. Examples of fire-hardening efforts against major fire events include pole pretreatments, equipment replacements or upgrades. Examples of measures to minimize de-energization impacts include splitting the distribution network and distributed/off-grid resource investments.

Increase Safety: Safety will be improved as IOUs can better plan for maintenance cycles to avoid areas of elevated fire risk reducing the risk of injury and loss of life.

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