California Energy Commission

DRAFT Report

# User Engagement Summary

## Project ID#: CEC EPC-18-026

June 26, 2020

Prepared for California Energy Commission

Prepared by Spatial Informatics Group and Reax Engineering

**Primary Author(s):**

Kim Carr (SIG), Maria Theodori (Reax), Shane Romsos (SIG), Christiana Darlington (Clere), and Jeanne-Pierre Wack (SIG)

**Contract Number:** EPC-18-026

**Prepared for:** California Energy Commission



## DISCLAIMER

Table of Contents

## EXECUTIVE SUMMARY

Through a California Energy Commission EPIC grant and match funding, Spatial Informatics Group (SIG) assembled the Pyregence Consortium to advance wildfire science by incorporating the dynamics of tree mortality, extreme weather, and climate change information into next generation near- and long-term wildfire models.

Critical to the success of this project is the establishment of relationships with potential users of project outputs. These relationships provide an opportunity for the Consortium to gain a better understanding of the programs that are currently ongoing and the tools being used within different organizations, and to gain a deeper appreciation of their needs as related to wildfire science, wildfire risk models and operational tools.

This User Engagement Summary provides an overview of the conversations with potential users of the science, models and tools that are being developed by the Consortium. Also described herein are the likely users of project outputs, the approach that was used for determining and engaging with key stakeholders, and a summary of the needs, insights and challenges expressed to the Consortium's User Engagement Team through interviews and email communications.

Key highlights from user engagement efforts include:

- The Pyregence Consortium has now established working relationships with likely project output users at Investor Owned Utilities (IOU), State and Federal land and emergency management agencies, along with Tribal organizations. The project team intends to maintain these relationships over the course of project work, as stakeholder input is paramount to product development such that project outputs meet end-user needs.
- The Consortium has established a deeper understanding of each organization's wildfire programs, models and tools currently used, including where information and data gaps exist.
- Overall, the engagement efforts reaffirmed that there is a demand for proposed outputs of this project and that potential users (IOUs, tribal organizations, State, and Federal agencies) can benefit from the ongoing developments of the Pyregence Consortium.

Potential users and stakeholders principally indicated:

- Guidance for the placement and configuration of weather stations across the State is needed immediately as most IOUs are actively planning and installing weather stations for the purpose of improving situational weather condition awareness across their respective service territories. State and Federal stakeholders likewise indicated the need for a comprehensive weather station network configured in a standardized way to capture a wide range of weather measurements along with a system to readily access weather station data.
- Statewide high-resolution information on the condition of vegetation and fuels is needed. Specifically, users indicated the need for data that is updated more frequently, and at a more fine-scale resolution, than vegetation and fuels data that is currently available (e.g., LANDFIRE). This information would help to target locations more efficiently for fuels reduction treatments and would improve the accuracy of wildfire forecast and spread models.
- Some of the IOUs are currently using third-party near-term forecast tools yet still indicated there is value in developing the open-source wildfire models that are scoped for the Pyregence project, and further expressed interest in working with the Consortium to beta test models and tools

developed by the project. Other IOUs were enthusiastic to start using Pyregence near-term risk tools right away. The urgent need for the development of near-term risk tools was also expressed by regulators as well as State and Federal land and emergency management agencies.

- Several organizations represented by IOUs and State, Federal and Tribal stakeholders provided input on the temporal resolution or time-cadence of outputs produced by long-term wildfire projection models. Of greatest value would be the ability to generate long-term wildfire activity projections from 1 to 3 years out. This capability would especially be important for informing IOU wildfire mitigation plans and State and Federal agency strategic/work planning documents. Projections capable of predicting wildfire outputs out 10 to 20 years was also identified as a need for longer term strategic planning. Wildfire forecasts beyond that time frame are informative for climate change vulnerability and resilience assessments, however, well beyond typical planning horizons for most organizations that were interviewed.
- For both near- and long-term forecast models and tools scoped for the project, organizations indicated the need to improve forecasting of potential consequences to people and property. Risk modeling outputs related to loss of life, smoke emissions, structure damage, and impacts to critical infrastructure associated with downstream users of electricity (such as refineries and gas pipeline pumps) were specifically called out.

## INTRODUCTION

California is at a critical inflection point. Wildfire threats in California are ever increasing with substantial changes in fire behavior driven by higher fuel loads, more frequent extreme weather events and sprawling development in the wildland urban interface. Organizations need better information on changing wildfire risks for strategic planning and operations, and to effectively implement mitigation and adaptation measures. Access to this critical information has multiple barriers including fragmented silos of science and technology and black-box software that is often behind paywalls.

To address these challenges, the California Energy Commission EPIC program has funded a project that is being led by the Pyregence Consortium to develop and deliver the next-generation open-source wildfire models for electric grid resiliency. The new models developed by the consortium will be based in new science on extreme weather and fuel characteristics and will provide actionable information at a finer-scale resolution than currently available for the State of California. Two groups of model frameworks and associated tools will be developed to forecast wildfire activity – one modeling framework will create near-term (0-5 days) wildfire activity forecasts, and the other will create long-term wildfire projections (to end-of-century).

Critical to the success of the project is establishing relationships with potential users of project outputs to ensure that users are aware of the project's scope of work and developments. Moreover, creating an open dialogue with potential users allows the project team to gain an understanding of users' institutional insights related to wildfire science and modeling needs, such that the resultant products fill existing market gaps. This user engagement summary provides a synthesis of engagement efforts and interviews conducted with key stakeholders and potential users of products produced through this project.

## USER ENGAGEMENT APPROACH

The User Engagement Team (UET) was composed of individuals with experience in carrying out stakeholder meetings. The steps that were followed to engage with potential users of the project outcomes are shown in Figure 1 and explained below.

1. *User Engagement Plan and Review Relevant Documents* – As a first step, the UET reviewed the project scope of work, schedule, and initial project fact sheet to become familiar with the project elements. Additionally, the UET reviewed 2019 Wildfire Mitigation Plans and Utility Wildfire Mitigation Maturity Model Surveys that were submitted to the California Public Utilities Commission (CPUC) by each of the Investor Owned Utilities (IOU). These reviews provided insight into which organizations, users and stakeholders should be contacted. At this step, a user engagement plan was initiated.

2. *User and Stakeholder Identification* – A list of Federal and State agencies, tribal organizations, institutions/organizations, and utilities with interest and/or land management authority in California wildfire issues was generated and included in the user engagement plan. The UET then generated an initial list of likely users and stakeholders within those institutions that should be contacted based on the UET's institutional knowledge, review of relevant documents and websites, guidance from the project Technical Advisory Committee (TAC), and communications with the California Energy Commission – Commission Agreement Manager (CAM). In situations where a contact from an institution could not be identified, a series of phone calls within an institution were made to track down the appropriate individual and/or other contacts in the wildfire domain were queried to help pin-point the most appropriate

individual. The list was then vetted by the project workgroup leads and finalized. The UET viewed the individuals on the list as an entry point to the institution with the expectation that other individuals within the institution would be included in scheduled engagement events. Appendix A provides a list of organizations that were contacted.

3. *Introductory Contact* – Emails and/or phone calls were used to introduce organizations to the project and our desire to interview them. Included in introductory contacts was a project overview, purpose of user engagement, and examples of products and tools.

4. *Provide Questionnaire* – During this step, the UET worked with project workgroups to develop a list of questions for different user groups (see Appendix B). The questionnaire included a description of the project and why user input was needed. Questionnaires were tailored to specific users as appropriate.

5. *Follow-up Contact* – Phone calls and/or emails were used to follow-up with users, after the initial call and while they were completing the survey, to answer questions and clarify aspects of the survey. Likewise, phone calls and emails were used to engage users after the UET had an opportunity to review user responses. In some situations, the UET needed to facilitate responses to the survey. In such instances, a member of the UET worked with individual users via phone call or in-person meetings.

6. *Summarize Input* – As a final step, all meeting notes were compiled and summarized to prepare this document.

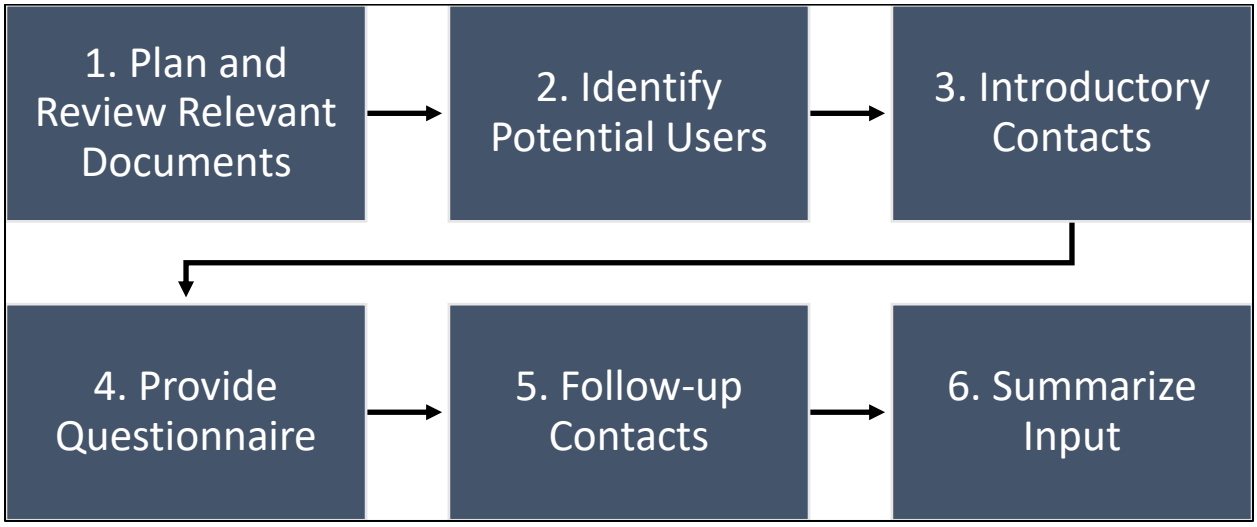


*Figure 1. Process used to carry out user engagement.*

## KEY FINDINGS

Between February 20, 2020 and June 19, 2020, several virtual meetings were held with relevant organizations in California, spanning across utility companies, emergency management agencies, and State, Federal, and Tribe land management entities (see Appendix C). The input received from IOUs and other stakeholders is grouped according to the project workgroups for efficient integration to developing products. The following is a summary of inputs received.

## Extreme Weather (Workgroup #1)

The goals of this workgroup are to develop a methodology for identifying the optimal location and configurations of weather stations, and to develop an understanding of the relationship between weather extrema and damaging wildfires.

Interviews indicated that there is a need for analytical methods regarding weather station placement, especially considering the perceived deficiencies of the Remote Automatic Weather Stations (RAWS) network. State and Federal fire managers have concerns about weather data availability, data quality, and the lack of weather station configuration standardization, particularly the low height of wind sensors at RAWS. Users of the existing RAWS network indicated that they need finer-resolution spatial fire weather data and additional data to calibrate all data measured at RAWS. There was interest expressed in learning from the upper air profiler pilot test and how measures of 3-D atmospherics can be used to evaluate fire spread and smoke dispersion. State and Federal stakeholders also indicated the need for forecast models to be improved to account for weather input uncertainties.

Across IOU organizations interviewed, there is a need for improved methods and guidance to ensure that the chosen locations for existing and planned weather station installations are such that:

- The network of weather stations provides necessary coverage for monitoring of the service area and surrounding lands.
- There is an optimal density of weather stations to balance efficient allocation of resources and data collection needs.
- Stations in the same area are placed on separate circuits for redundancy during PSPS events.
- Demands of urban areas under various weather conditions are monitored.
- Coordination with appropriate land management agencies could be streamlined such that permit approvals processes for weather station installations can be carried out in a timely manner.
- More research/information is needed on vertical profile and critical layers to inform weather station siting and extreme weather conditions.

## Fire Behavior (Workgroup #2)

The goals of Workgroup #2 are to:

- Develop repeatable and controlled fuel materials and mixtures test specimens that can be burned at laboratory scales.
- Devise experimental test in a laboratory setting that can be used to help predict heat release rates across the range of fuel structures and environmental conditions found in wildland areas.
- Develop and deploy a new fuel measurement and mapping system to resolve the essential fuel components and spatial heterogeneity in forest fuels occurring at multiple spatial and temporal scales.
- Map current and projected future forest fuel conditions in areas of elevated tree mortality.
- Evaluate how to integrate the products into near-term wildfire risk forecasts and long-term wildlife risk projections with an emphasis on the wildland-urban interface, when possible.

Conversations with IOUs and State, Federal and Tribal organizations resulted in the following key input:

- There is a need for statewide and high-resolution information on the types and condition of vegetation and fuels. Specifically, users indicated the need for data that is updated more frequently, and at a more fine-scale resolution, than vegetation and fuels data that is currently available (e.g., LANDFIRE). This information would help to target locations more efficiently for fuels reduction treatments and would improve the accuracy of wildfire forecast and spread models.
- Areas classified in currently available fuel models as 'non-burnable' do not represent the realities of wildfire burn patterns, for example, as experienced in the recent past where high-density, 'non-burnable' urban areas were consumed. Input received requested that the Consortium allocate effort to refine fuel models to better represent the burnability of these 'non-burnable' and urban zones. The results of such an effort could be used to improve fire spread and risk models.
- Surface fuel data is poorly represented in currently available fuels models, especially in forest vegetation types. Effort should be made by the Consortium to improve this deficiency.
- There is a need to better represent extent and structural characteristics of shrub communities in vegetation datasets and vegetation growth models.
- Live fuel moisture models need to be improved for application in a variety of fire potential indices.

## Forecast Tools (Workgroup #3)

The focus of this workgroup is to develop the next generation of forecast models for predicting near-term fire weather, fire spread and fire risk up to 5 days in the future. Feedback for the Forecast Tools Workgroup that was provided by IOUs and State, Federal and Tribal organizations is summarized as follows:

- State and Federal stakeholders indicated that there are several emerging third-party fire spread models currently being evaluated for both tactical and forecast simulations, as well as fire spread to evaluate burn probabilities and hazards. Some IOUs and State fire management agencies indicated that they are currently using Technosylva's '*Wildfire Analyst*' for fire spread modeling. Models and tools produced through the Pyregence project will add to the suite forecast tools currently available to them and has the potential to support the needs of State's Wildfire Forecast and Threat Intelligence Integration Center authorized under Senate Bill 209.

- These stakeholders indicated that a framework for impact and risk assessment, both short-term forecasted impacts and hypothetical central-tendency impacts would provide a powerful tool for understanding linkage between fire hotspot importance relative to potential damage. While the front side of the hazard modeling is relatively straightforward, models need to be improved to account for weather input uncertainty and ignitions associated with ember cast.

- Comparison across available fire spread and fire risk forecast models was requested. For example, comparing the accuracy of fire spread outputs modeled in the Pyregence project with those outputs produced by Technosylva's Wildlife Analyst.

- Wildfire impact analysis of negative fire effects, such as habitat lost, homes destroyed, community populations effected, soil loss, and other effects, needs more work and perhaps could be an added focus of the Pyregence project.

- Pursuing the development of an open-source web-based near-term fire forecasting tool is well supported. For such a tool, consideration should be given to how the web-tool is accessed – that is, built to accommodate different levels of user access, such as a 'public' portal and 'professional' portal. A 'professional' portal would provide more analytical options. Concerns were also expressed related to providing the public access to fire risk information as it could be used for nefarious purposes. Users suggested making the site password protected such that a user's account could be recorded and tracked as appropriate.

- A desired added feature to forecast models would be the ability to evaluate the trade-offs between full suppression or allowing for some managed fire (or "let it burn") for multiple benefits, especially ecological benefits.

- Some fire management agencies indicate the tool could be used to inform fire management during incidents. However, several warned that improved certainty in model outputs would need to be built in to ensure firefighter safety. Reducing model uncertainty was a desire commonly expressed.

- State fire management agencies indicated that there is interest is analyzing and learning from large, extreme wildfire events, even events that pre-date the large increase in fire size and intensity (e.g., 2013 King Fire).

- Fire forecasting in urban and WUI areas is important, as is atypical wildfire behavior in the wildlands. These topics are major gaps in available science and data yet are critical to knowledge that would adequately inform policy making.

- A robust and refined model for spotting (ember cast) is another important and under-developed component of fire spread and fire risk forecasts.

- Modeling of plume-dominated fires (not only wind-driven fires) is a desired future feature of wildfire forecasts.

- A balance is needed in the consistency across modeling systems for computing efficiency i.e. high-resolution wind field computing is very expensive compared to the available fire science for fire spread.

- Incorporating vegetation flammability into the models is a unique way that Pyregence tools can evaluate ignition potential.

- Some indicated that the Pyregence effort is a step toward supporting more cohesive wildfire forecasting and other predictive services because the project integrates many sources of spatial data into one platform.

## Scenario Analysis (Workgroup #4)

The focus of this workgroup is to develop the next generation coupled statistical fire-climate-vegetation models to run long-term (out to end-of-century) wildfire risk projections.

Conversations with IOUs and State, Federal and Tribal organizations resulted in the following input:

- Of greatest value would be the ability to generate long-term wildfire activity projections from 1 to 3 years out. This capability would especially be important for informing IOU wildfire mitigation plans and State and Federal agency strategic/work planning documents. Projections capable of predicting wildfire outputs out 10 to 20 years was also identified as a need for longer term strategic planning. Wildfire forecasts beyond that time frame are informative for climate change vulnerability and resilience assessments, however, well beyond typical planning horizons for most organizations that were interviewed.
- Long-term wildfire modeling could help to facilitate the use of managed fire. For example, a US Forest Service climate adaptation strategy is to reduce wildfire risk by burning more acres using managed and prescribed fire. Long-term model outputs could potentially be used to assess trade-offs between prescribed burns and mechanical fuels reduction treatments.
- Consideration should be given to incorporate the effect of improved fire suppression technologies (i.e., fire suppression effectiveness expected to improve over time), structure and infrastructure hardening and wildfire risk.
- Similar to desired outputs described for the near-term forecast model, long term models should have the ability to generate outputs related to impacts to people and property (i.e., smoke emissions, structures, communities, electric utilities, etc.). For example, the California Department of Insurance (CDI) currently relies on actuarial approaches to determine how many structures burned in the last 25 years in a certain location. To determine risk and associated insurance rates, the gap needs to be filled between projecting fire over near- and long-term time frames and CDI's current approach of estimating the probability of homes that are likely to burn in a specific location at one time.
- Organizations requested that the full range of vegetation types that occur in California be used within models for long-term wildfire activity projections. This input was made in reference to the long-term wildfire modeling efforts under the 4$^{th}$ Climate Assessment where only Sierra Nevada forests were modeled.
- Additional work is needed with organizations to work through urban land use and land management scenarios that are desired to be modeled.

## Conclusion

Engaging with potential users and stakeholders has been a valuable exercise for the Pyregence Consortium as well as for those who were receptive to the engagement and collaboration, including IOUs, State and Federal land and emergency management agencies, and Tribal organizations. The effort discussed herein was an opportunity to establish relationships with key organizations to the project's success, raise awareness of the project's scope of work, and open a dialogue for continued input and feedback cycles regarding product development as the project moves forward. Maintaining relationships with potential product users through sustained outreach and engagement is paramount to the Consortium activities; the products must be robust and flexible enough to meet the needs of each interested organization. The knowledge that was shared and gained through user engagement activities provides the Consortium with a deeper understanding of the various existing wildfire programs, models and tools currently being used, including where information is deficient and data gaps exist. Moving forward, this knowledge will be integrated to enhance the research and developments of the project. Overall, feedback from organizations reaffirms the demand for next generation wildfire models and reveals the excitement for the promising benefits of the ongoing work under the Pyregence Consortium.

# APPENDIX A. Organizations Contacted

| Organization | Organization Category[1] | Organization Subcategory | User Category[2] | Key Contact |
|---|---|---|---|---|
| San Diego Gas and Electric | IOU | Electric Power Provider | P | Brian D'Agostino |
| Pacific Gas and Electric | IOU | Electric Power Provider | P | Bereket Habtezion |
| Southern California Edison | IOU | Electric Power Provider | P | Robert LeMoine |
| PacifiCorp | IOU | Electric Power Provider | P | Heide Caswell |
| Liberty Utilities | IOU | Electric Power Provider | P | Eliot Jones |
| Bear Valley Electric Service | IOU | Electric Power Provider | P | Paul Marconi |
| California Public Utilities Commission | SA | Regulatory | P | Koko Tomassian |
| California Air Resources Board | SA | Regulatory | S | Adam Moreno |
| California Department of Forestry and Fire | SA | Fire Suppression and Regulatory | P | Dave Sapsis |
| California Office of Emergency Services | SA | Emergency Services | P | Kit Bailey |
| California Governor's Office of Planning and Research | SA | Planning | P | Nuin-Tara Key |
| California Strategic Growth Council | SA | Planning | P | Leah Fisher |
| US Forest Service – Region 5 | FA | Land Management | P | Randy Striplin |
| Bureau of Land Management | FA | Land Management | S | James Newman |
| California Energy Commission | SA | Regulatory | P | Alex Horangic |
| California Department of Insurance | SA | Regulatory | S | Mike Peterson |
| Sierra Nevada Conservancy | SA | Provide Resources to Land Managers | S | Nic Enstice |
| California Tahoe Conservancy | SA | Land Management | S | Forest Schafer |
| Bureau of Indian Affairs | FA | Tribal Land Management | S | Gerald Jones |
| Tule River Tribe | FRT | Native Tribe | S | Brian Rueger |
| Hoopa Valley Tribe | FRT | Native Tribe | S | Jeff Lindsey |

[1] IOU = Investor Owned Utility; SA = State Agency; FA = Federal Agency; FRT = Federally recognized Tribe

[2] P = Primary user; S = Secondary user

# APPENDIX B. Stakeholder Questionnaire

Core to developing next-generation near- and long-term wildfire risk models, this questionnaire has been developed to elicit responses from stakeholders that rely on risk forecasts for decision making. Stakeholder responses provided through this questionnaire have and will help the project team in designing and developing useful wildfire risk forecast and projection models.

*Questionnaire Prompt*

*We have organized key questions into the following categories: 1) Weather Stations, 2) Tree mortality, 3) Near-term Forecasting, 4) Cost-benefits, and 5) Long-term Projections. Please respond to all questions to the best of your or your staff's ability. If the question is not applicable or outside of your expertise, please note in the space provided.*

*General Information*

*Name:*
*Position:*
*Institution/Company/Agency:*
*Duration in Current Position:*
*Duration at Institution/Company/Agency:*

*Weather Stations*

- *Where have surface weather stations have been placed in your service area? Can you provide GIS data that represents the distribution of currently used weather stations?*
- *Are additional weather stations planned to be placed in the service area? When are these expected to be installed? Can you provide GIS data that represent the distribution of planned weather stations?*
- *What methodology or approach are you currently using to inform the placement of additional weather stations (e.g., historic weather patterns)? Is there a document that you could provide that summarizes your approach to informing the placement of weather station and their associated configuration?*
- *What are the siting criteria for weather stations? For example, does a station have to be near a source of electricity? Is there a critical distance from cell tower that needs to be met? Are certain types of land ownership at these locations required or excluded?*
- *Are there additional siting considerations you would like us to know or to investigate during this project?*
- *During proposal development, we asked about locations of utility equipment/assets, information beyond what is currently publicly available. Can you share additional information regarding utility asset locations that are a concern for you and should be of concern for us?*
- *Are upper-air profilers being used to inform decisions? Are there plans to deploy them?*
- *Do you have cost information on weather stations? Are there ways to reduce costs?*

*Tree Mortality and Fuels*

- *How do you currently address fire spread in areas of elevated tree mortality?*
- *Which fire spread models and fuel datasets do you currently use?*

*Near-term Risk Forecasting*

- *What methods are currently used to quantify probability and consequence of fires impacting the electrical grid? This includes active fires and fires that may be ignited over the next 7 days.*
- *What approaches are currently used to quantify costs associated with wildfires impacting the electrical grid?*
- *On a scale of 1 to 10, how important to the business needs of your organization is quantifying 7-day risk associated with:*
    - *Wildfire impacts to the electrical grid from active fires as well as not-yet ignited fires*
    - *Utility-caused fires and associated liabilities such as structure losses, suppression cost recovery, and impacts to the electrical grid*

*Cost-benefit of Near-term Risk Forecasting System*

- *What approach(es) is/are currently used to quantify costs from wildfires?*
- *What methods are currently used to quantify probability and consequence of fires impacting the grid infrastructure?*

*Long-term Risk Projections*

- *Can you provide a description of the existing practices and/or current priorities for projecting long-term fire risk (10 to 100 years out)?*
- *What available tools are used for long-term projections of wildfire impacts to electrical infrastructure?*
    - *What is the resolution, accuracy, timeframe?*
    - *Is long-term risk modeling tool provided by a third party? If so, how is the information delivered from third party to you, or is this modelled internally?*
    - *Why do you prefer this information/tool over others?*
- *How do you use information on long-term wildfire risk projections in the decision-making processes related electrical infrastructure maintenance and risk mitigation planning?*
    - *Which team/staff/department retrieves the information on long-term projections and how do they process it before communicating analysis to decision-makers? How often, what format, how is the importance level flagged? What does the decision-making "workflow" look like?*
- *What are the planned and potential adaptation strategies that would be implemented to address future wildlife risk?*
    - *Can you provide a list of planned and potential climate change adaptation strategies that will be implemented to mitigate long-term fire risk?*
    - *What is the adaptation planning horizon? That is, how far in the future do you look to generate adaptation actions (e.g., 2030, 2040, 2050, end of the century)?*
- *What are the challenges and opportunities for viewing information on long-term projections of wildfire impacts to electrical infrastructure?*
- *Please describe or characterize an extreme fire event that could impact your infrastructure?*
- *Can you quantify the risk of infrastructure impairment given exposure to an extreme fire event?*
- *Can you quantify the downstream service impacts of an infrastructure impairment due to extreme wildfire (duration, service area, economic impact, cost of repair, etc.)?*
- *Can you describe a scenario for an extreme event that could produce severe infrastructure impairment and sustained service disruption?*

*Other*

- *Is there additional information not addressed in the questionnaire that you believe would benefit the outcomes of this project?*

*Project Involvement*

- *Are you interested in being kept up to date on progress with EPIC project outputs?*
- *Are you interested in testing near-term risk forecasting tool?*
- *Do you want access to code repositories?*

# APPENDIX C. Outreach Effort Summary

A summary of user engagement meetings, including the organization, meeting dates, and personnel that were involved in meetings, is provided. Additional communications regarding the project also occurred via email with Liberty Utilities.

**Investor Owned Utilities**

| User Organization | Meeting Dates | Contacts |
|---|---|---|
| Pacific Gas and Electric (PG&E) | June 4 | Scott Strenfel<br>Bereket Habtezion<br>Ashley Helmetag |
| PacifiCorp | May 18<br>June 1 | Heide Caswell<br>Pavel Grechanuk |
| San Diego Gas and Electric (SDG&E) | May 8 | Brian DAgostino<br>Chris Arends<br>Katie Giannecchini<br>Carrie Bowers<br>Steve Vanderburg<br>Daryll Pina<br>Beth McCrindle<br>Mark Mezta |
| Southern California Edison (SCE) | March 26<br>May 7 | Thomas Brady<br>Christine Angulo<br>Robert LeMoine<br>Tom Rolinski |

Note: Bear Valley Electric Service (BVES) was contacted as part of this effort but no response was received.

**State, Federal and Tribal Organizations**

| Users Organization | Meeting Dates | Contacts |
|---|---|---|
| Bureau of Indian Affairs | March 10<br>April 17<br>April 21 | Nathan Gogna, Fire Management Officer<br>Gerald Jones, Regional Forester<br>Gerald Jones, Regional Forester |
| Bureau of Land Management | Feb 24<br>April 6<br>April 7 | Chris Heppe, District Manager, Motherload<br>Scott Lucas, State Fire Management Office<br>James Newman, GIS and Modeling Lead |
| CAL FIRE | April 3<br>April 14 | Dave Sapsis, Fire & Resource Assessment Program<br>Phillip Selegue, Predictive Services |
| California Air Resources Board | March 6<br>May 5 | Adam Moreno |
| California Department of Insurance | April 1<br>April 15 | Kevin Stein, Delos Inc. CEO (insurance sales)<br>Mike Peterson, Deputy Commissioner, Climate & Sustainability |
| California Energy Commission | March 30 | Tom Gates, Tribal Liaison<br>Alex Horangic<br>Al Alvarado<br>Joseph Merrill<br>Justin Cochran |

| Users Organization | Meeting Dates | Contacts |
|---|---|---|
| | | Gordan Schremp |
| California Office of Emergency Services | March 1 | Kit Bailey, Assistance Fire Chief |
| California Public Utility District | March 14<br>April 4<br>May 15 | Koko Tomassian |
| California Strategic Growth Council | June 18 | Leah Fisher |
| California Tahoe Conservancy | Feb 27 | Forest Schafer, Program Supervisor, Community Forestry |
| Governor's Office of Policy and Research | June 18 | Jennifer Phillips<br>Nuin-Tara Key |
| Sierra Nevada Conservancy | Feb 26<br>March 23<br>March 27 | Nic Enstice, Regional Scientist<br>Alex Vance, Manager, Partnerships & Community Support (Tribal Liaison)<br>Sarah Campe, South Area Representative |
| Tule River Tribe | April 13<br>April 14 | Kerri Vera, Environmental Protection Director<br>Brian Rueger, Forest Manager |
| USDA Forest Service | Feb 20<br>Feb 25<br>March 1<br>March 12<br>March 22 | Jerry Bird and Jason Ko, Regional Foresters Representatives<br>Rowena Yeahquo, Tribal Coordinator<br>Randy Striplin, Fire Ecologist<br>Kristen Allison, Fire Planner<br>Stacy Drury, Fire Ecologist<br>Patrick Doyle, Fuels Planner |

Note: As directed by CEC staff, California Indian Forest and Fire Management Council and Intertribal Timber Council were researched and contacted but no response was received.