

# Wildfire Resilience Initiative Grantee Convening

Report on Progress, Challenges, and Opportunities

APRIL 27–MAY 2, 2025 | GRANLIBAKKEN TAHOE, TAHOE CITY, CA

GORDON AND BETTY  
**MOORE**  
FOUNDATION







**Above: FireSat mission, Earth Fire Alliance. Courtesy of Muon Space.**

**Cover: Today's land stewardship decisions can benefit future generations. Courtesy of Colette DeGarady.**

**Right: Aspen Island at the Hart Prairie in Arizona. Courtesy of Rick Braveheart & Neil Chapman.**

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This report summarizes the progress, challenges, and opportunities of the six strategic areas within the **Gordon and Betty Moore Foundation's Wildfire**

**Resilience Initiative.** Drawing from April 2025 grantee presentations and reflections, this document presents a synthesis of the strategies: early-fire interventions, pre-fire (community) and pre-fire (ecosystem) interventions, deeper understanding, enabling conditions, and measurement and evaluation. Grantees have made significant advances in defining and measuring ecologically beneficial fire, developing strategic workplans to achieve healthy ecosystems and resilient communities, and expanding early detection technologies. However, common barriers include insufficient data, fragmented communication, and misaligned incentives. Opportunities for the coming year lie in increased use of Select Pilots to Achieve Resilience by Key indicator (SPARKs) as testbeds and demonstration sites, testing of indices currently in development, and enhanced interactions for grantees (e.g., virtual webinars for the full group).

TREX participants and Burnbot Drone deployed during TREX training prescribed burn. Courtesy of Marion Wittmann.











## SYNTHESIS BY STRATEGY

### Early-fire interventions

**Progress:** The development of satellite technologies, including [deployment of the first FireSat satellite](#) in early 2025, represents significant technological advancement in the last year, and provides new platforms for ignition detection and fire behavior data. Innovation competitions like [XPRIZE](#) are catalyzing new fire intelligence and suppression tools. With successful demonstrations held at Sikorsky in November 2024 and in San Bernardino chaparral ecosystems in April 2025, [Rain](#) has also advanced as a fast intervention response at initiation of fire — allowing for improved suppression response and management of wildfire to minimize both human and ecosystem harms, and charting the course for autonomous aircraft to combat extreme wildfire.

**Challenges:** Technical and cultural challenges impact the early-fire interventions strategy group. First, we often lack intelligence adaptable to multi-tier technical competency for rapid ingestion and decision-making capabilities. Scale issues hinder the integration of local databases (e.g., prescribed burns) with global observational data — localized information does not lend itself well to large-scale response programs. Tensions between human and artificial intelligence-based decision-making systems have also emerged. Finally, with continued reliance on human intervention, aerial response capabilities will be hampered in extreme weather conditions.

**Opportunities:** Imaging technologies to survey fires have successfully been detecting reignitions, with good responses from users. Opportunities for the tech community to coordinate technology adoption nationally and internationally could advance this performance, as would evaluating the repeatability of technologies' successful metrics, scaling, and coordinating with and across agencies. Integration with on-the-ground efforts (e.g., decision support centers and SPARK projects) could enable better management of beneficial wildfire and suppression of fires that pose risks to communities and ecosystems.

### Pre-fire community interventions

**Progress:** Using a consistent set of objectives, SPARK project leads have completed their multi-year workplans and compared those as a group as part of a Learning Exchange activity at the 2025 grantee convening. Their time together also included a tour of the Tahoe Sierra geography, where efforts have been focused to roll out a comprehensive approach to wildfire resilience, including the use of [XyloPlan](#) to prioritize treatments to disrupt fire pathways, [BurnBot](#) to implement those vegetation treatments, vulnerability assessments within the built environment using [Hussam Mahmoud's AGNI-NAR](#) model, [Fire Aside](#) to collect parcel level data for capture in a [WUI Data Commons](#) for visibility to risk transfer brokers and the broader industry, and partnership with multiple stakeholders in Lake Tahoe, including the [North Lake Tahoe Fire Protection District](#), and the [Tahoe Fund](#) to organize and communicate the process and measurable results for reduced vulnerability to extreme wildfire events. This provides one example of strategic alignment and a

Top: Prescribed burn at Observatory Mesa, Arizona. Courtesy of Neil Chapman and Eric O'Conner.

Bottom: Resilience in Smithers, British Columbia. Courtesy of Marion Wittmann.



Dillingham, Alaska during a Basic Wildland Fire and Chainsaw training for Bristol Bay residents, October 2024. Courtesy of Misty Nielson.

consistent framework that can be applied for the place-based pilots, and, eventually, for other counties to replicate and achieve the Wildfire Resilience Initiative’s goals and overarching outcome. Generally, the pre-fire community workplans include establishing baselines of vulnerability and risk, identifying “mitigations that matter” to disrupt fire pathways into developed wildland-urban interface communities<sup>1</sup> and from structure to structure within them, and establishing buy-in and fostering action at the parcel level and community scale, to roll up to county-scale implementation and sustained funding.

**Challenges:** In communities, gaps persist regarding a perceived lack of urgency, community motivation, and workforce capacity. Further impacting communities, and particularly WUI communities, the insurance market is not fully aligned with or able to capture and reflect mitigation measures in the pricing of risk, creating a mismatch in valuation and risk and hazard assessment.

**Opportunities:** New community toolkits and marketing campaigns to deploy tools known to improve wildfire resilience (such as the Tahoe Sierra SPARK activities described above and the work through the WUI Data Commons project) can help to overcome barriers to action and implementation.

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<sup>1</sup> As defined for the Wildfire Resilience Initiative, these are communities with conflagration potential as determined by a structure separation density of less than 100 feet.



## Pre-fire ecosystem interventions

**Progress:** The pre-fire (ecosystem) interventions strategy has made meaningful progress increasing wildfire resilience across fire-adapted landscapes in western North America. As above, SPARK project leads have completed their multi-year workplans and compared those through the 2025 grantee convening Learning Exchange. SPARK leads and other grantees, including [EDF through the Million Acre Prototype project](#), have developed integrated approaches that combine historical fire data, climate trends, habitat conditions, and best practices to inform stewardship activities in relevant geographies to enable an increase in ecologically beneficial fire. These interventions promote ecological resilience by supporting watershed health and biodiversity conservation. Work to advance this strategy has also included the development of practical tools, from spatial models and best-practice manuals like [BurnPro3D and other platforms from the WIFIRE lab at UC San Diego Supercomputing Center](#), to forest conservation planning work by [Pacific Forest Trust](#), while new stewardship-based economic models are likewise being explored to ensure long-term project finance.

**Challenges:** Despite these advances, the group faces key challenges. Scientific models and tools can be difficult to scale or adapt across highly varied ecosystems, especially in regions like Alaska and Boreal forest where data are lacking. Coordination remains complicated due to misalignment among federal, state, and tribal fire management systems. Agricultural interests and communities concerned about smoke limit acceptance of managed wildfire and prescribed and cultural burning. Evolving conditions, changing federal funding flows, and fragmented communication systems further complicate efforts to maintain consistent progress. Dissemination of successful program results and broader adoption remain key hurdles, especially in translating work across geographic and institutional boundaries.

**Opportunities:** The grantees within this strategy see opportunities to define and measure “beneficial fire” by ecosystem, and the sharing of tools, metrics, and adaptive learning as promising ways to unlock cross-strategy alignment and improve communication with stakeholders. The group proposed the creation of a grantee navigation dashboard to facilitate collaboration, as well as a year-round series of webinars and policy trainings. Additionally, the rising societal awareness of wildfire as a shared challenge presents a timely avenue to expand engagement.

## Deeper understanding

**Progress:** The deeper understanding grantees continue to produce [analyses and published results](#) that address knowledge gaps across multiple fields including ecology, monitoring and measurement, engineering, and atmospheric sciences. Notably, research carried out by the [Western Fire and Forest Resilience Collaborative](#) (WFFRC) and the [POLIS Wildfire Resilience Project \(UVic\)](#) partnered with the [Bulkley Valley Research Centre](#) has advanced efforts to define ecologically beneficial fire across multiple scales — its locations, frequency, and ecological value — with the WFFRC team



[highlighting that 60% of wildfires in the western U.S. between 2010 and 2020 were ecologically beneficial](#), and the POLIS Wildfire Resilience Project highlighting [opportunities for fire to contribute to wildfire resilience](#). Deeper understanding grantees developed improved decision-making tools that integrate planning, science, and traditional knowledge, enabling beneficial fire and fire planning. Modeling fire effects can also contribute to enhanced local government planning, via spatially explicit alignment with fire risk, fire deficits, and fire surpluses.

**Challenges:** A lack of persistent data, both in terms of spatial and temporal availability, pose challenges for research, especially in linking fire effects to consequences across scales and specifically around biodiversity and water quality and quantity. Translating science into action remains an uphill climb due to changes in public funding and the necessary but slow shift in long-held mental models about fire, as well as integration difficulties across disciplines and fractured communication efforts.

**Opportunities:** Strengthening the links among local, regional, national, and global scales, initiative grantee expertise, and knowledge/action (via SPARKs and other networked communities, and driven by quantifying the benefits of beneficial fire) offers an opportunity to accelerate progress toward the strategy-level goal of increasing ecologically beneficial fire. Other cited opportunities include the development of a rapid-response messaging framework before the next disaster occurs, and leveraging tools from across strategy areas, such as FireSat.

## Enabling conditions

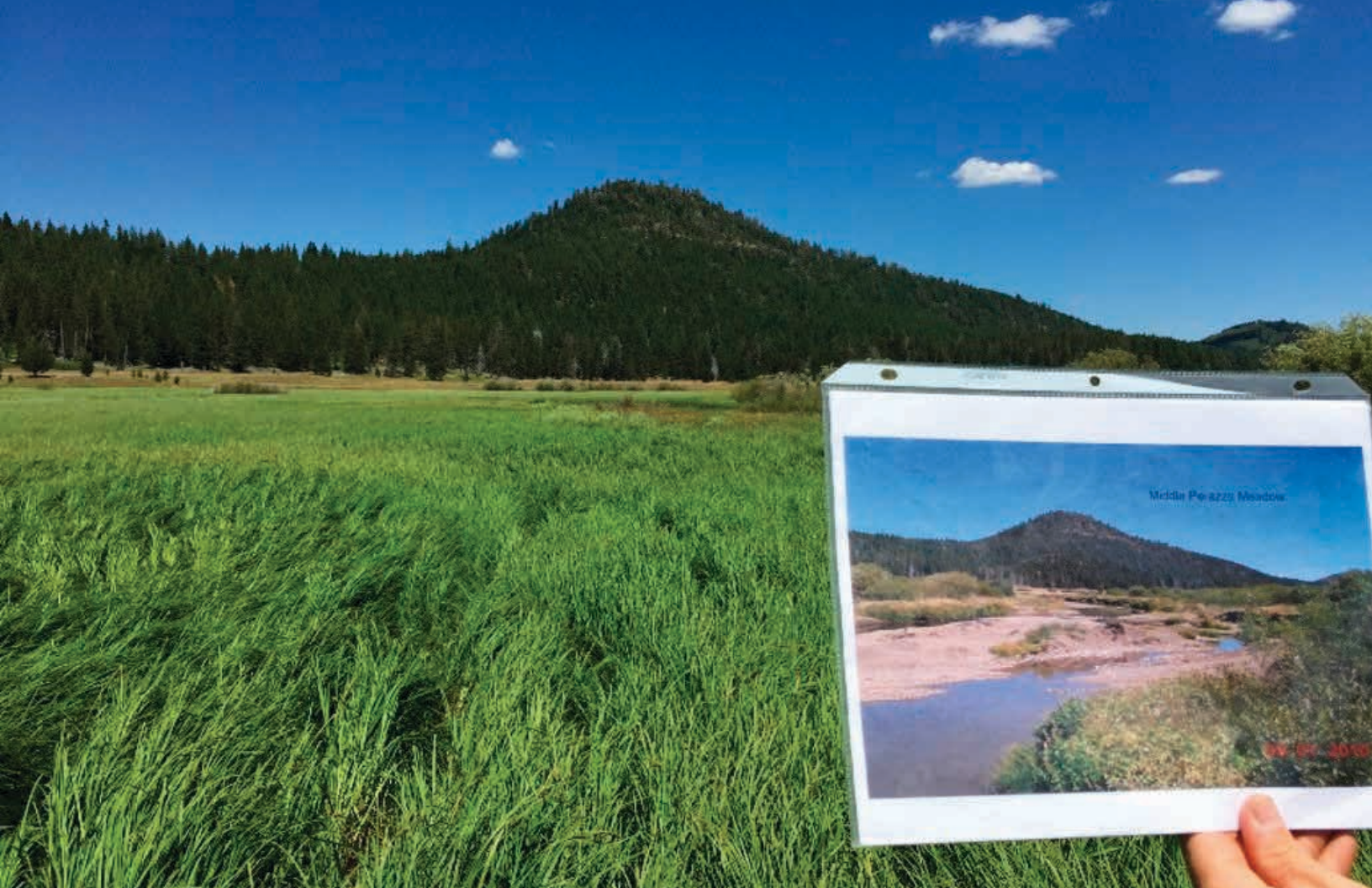
**Progress:** In the last year, grantees have developed an educational campaign to advance implementation of the federal Wildland Fire Mitigation and Management Commission Recommendations ([Alliance for Wildfire Resilience](#)), launched a statewide coalition in California to support larger and more stable wildfire resilience funding ([Community Initiatives](#)), and supported journalists and policymakers to advance wildfire literacy and resilience ([Southern California Wildfire Institute for Journalists](#)). Collectively, these efforts have helped align technical work with real-world decision-making.

**Challenges:** Those working on wildfire resilience often focus on one dimension of the challenge and can lose sight of a larger cohesive strategy. Enabling conditions grantees reaffirmed the need for messaging that underscores the need for holistic upstream solutions.

**Opportunities:** Primary opportunities identified included the need to improve communications capacity to accelerate learning and alignment around the most effective wildfire resilience solutions. Offering a series of opt-in webinars, quarterly, where participants make connections more frequently than through the annual grantee convening, and distilling and regularly disseminating grantees' scientific findings, can help accomplish this.

Top: Perazzo Meadow — before and after. Courtesy of Matt Winter, NFWF.  
Bottom: Tree mortality in the Sierra Nevada. Courtesy of Genny Biggs.











## Measurement and evaluation

**Progress:** UC Santa Barbara National Center for Ecological Analysis and Synthesis has made tremendous advances in the development of the [Western Wildfire Resilience Index \(WWRI\)](#). The Index is nearing launch in late 2025 and incorporates both social and ecological metrics, utilizing developed novel data layers on species traits, building codes, evacuation access, and community characteristics and informed by an expert working group and advisory committee. The WWRI development team is using SPARKs as case studies for adaptive management.

**Challenges:** Key challenges include fragmented data, lack of consensus on definitions of resilience, and difficulty aligning social and ecological data scales. Grantees identified gaps due to uncertainties in availability of data typically provided by the U.S. Federal government or differences in Canadian data that are available, paucity of data for social domains, and the fact that forest ecosystems dominate both the research and data availabilities with notable gaps for natural habitats, carbon and biodiversity, and temporal lags or gaps in datasets. Further, while the Wildfire Resilience Initiative uses a formal definition for resilience — i.e., “the ability of a system (both ecosystems and connected communities) to react to perturbations, internal failures, and environmental events by absorbing the disturbance and/or reorganizing to maintain its functions, whether the changes are gradual or abrupt or both, and to include the capacity of ecosystems, people, and communities to adapt, persist, develop, or even transform into new development pathways in the face of dynamic change”<sup>2</sup> — there exists a lack of consensus generally on the term’s definition and interpretation.

**Opportunities:** Opportunities exist to pilot shared learning frameworks using SPARKs and to define and monitor ecologically beneficial fire metrics. To support a shared understanding of risk and resilience, opportunities to compare locale scale data to the index scores could improve understanding of the Index’s sensitivity to real-world actions. With public release of the Index, we will gain opportunities to track the use and uptake of the information, which can be used to gather more data on which domains are more important to society — and potentially to develop a resilience “handbook.”

Top: Rain Industries performs a demo of an autonomous Black Hawk equipped with Rain’s software prepositioned seven miles away. Courtesy of Maxwell Brodie.

Bottom: Lara Kueppers, with Erica Siirila-Woodburn, examining vigorous aspen regeneration one year after the 2023 Lowline Fire in Gunnison County, CO. Courtesy of Jessica Katz.

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<sup>2</sup> Definition developed by the Center for Law, Energy & the Environment at UC Berkeley.



## CONCLUSION

At this third gathering of the Moore Foundation’s wildfire grantees – and the second since the Wildfire Resilience Initiative launched – grantees demonstrated meaningful progress in advancing their strategies despite a challenging funding environment. Through collaborative sessions, programming aimed at communications, and informal networking, participants deepened alignment within the six strategic areas of the initiative, identifying shared challenges and opportunities. Many reported discovering actionable ways to partner with other grantees, both within their strategy area and with SPARK grantees, fostering a sense of momentum and cohesion. The strong turnout, high engagement, and emphasis on appreciation and alignment underscored the commitment of grantees to sustain and scale their wildfire resilience work even as they navigate extreme wildfire events (such as the Los Angeles Fires of January 2025) or celebrate advances in their collaborative grantwork or within their communities, where paradigms around wildfire resilience have begun to surface.

At the 2024 Wildfire Resilience Initiative grantee convening, we surveyed attendees at the conclusion of the meeting. Last year, grantees reported feeling “energized,” “connected,” “committed,” and “inspired.” We issued the same survey this year and above all, grantees responded in 2025 with “inspired” and “connected.” Other responses included “optimistic,” “hopeful,” “motivated,” “aligned,” and “educated.” Grantees have recognized major obstacles to achieving healthy fire-adapted ecosystems and resilient fire-prone communities, yet they are actively sharing insights, adapting their approaches, and making meaningful progress despite these challenges.

Hart Prairie Preserve in  
Flagstaff, AZ. Courtesy of  
The Nature Conservancy  
& Neil Chapman.





## WILDFIRE RESILIENCE INITIATIVE GRANTEE CONVENING

### ANNEX A: ATTENDEES

Alaska Venture Fund  
Alliance for Wildfire Resilience  
Aspen Policy Academy  
Bulkley Valley Research Centre  
California Academy of Sciences  
California Department of Forestry and Fire Protection (CAL FIRE)  
California Fire Chiefs Association  
California Wildfire and Forest Resilient Task Force  
California Polytechnic University, San Luis Obispo  
Cary Institute of Ecosystem Studies  
City of Flagstaff  
Climate and Wildfire Institute  
Climate Resilience Fund  
Cold Springs Rancheria  
Colorado River Sustainability Campaign  
Colorado State University  
Conservation Innovations Group  
Conservation X Labs  
Convective Capital  
Conversa Corps Incorporated  
DBL Partners  
Earth Fire Alliance  
Environmental Defense Fund  
Filisinger Energy Partners  
Fireball Information Technologies, LLC





Members of the Western Fire and Forest Resilience Collaborative gather at the UC Santa Barbara Sedgwick Reserve for a working science retreat.

Flagstaff Fire Department

Google.org

Inside Climate News

Institute for Journalism & Natural Resources

International Association of Fire Chiefs

Karuk Tribe

Megafire Action

Milliman

National Aeronautics and Space Administration

National Fish and Wildlife Foundation

Northern Sierra Partnership

Northeastern University

O'Herron & Company

Pacific Forest Trust

Pacific Gas & Electric

POLIS, Centre for Global Studies, University of Victoria

Rain Industries Inc.  
Resilient Cities Catalyst  
Resources Legacy Fund  
Santa Barbara County Fire Safe Council  
Sierra Business Council  
Spirit Bear Ventures  
Stanford University  
Susan Bell & Associates  
Tahoe Fund  
Texas A&M University  
The Nature Conservancy  
The Stewardship Network  
United States Fire Administration  
United States Forest Service  
University of California, Berkeley  
University of California, Cooperative Extension  
University of California, Davis  
University of California, San Diego  
University of California, Santa Barbara  
University of Colorado, Boulder  
University of Montana  
University of Wisconsin–Madison  
Vanderbilt University  
Virridy  
Walton Family Foundation  
Western Fire Chiefs Association  
Western Fire & Forest Resilience Collaborative  
XPRIZE  
XyloPlan Risk, Inc.





TREX training prescribed burn. Courtesy of Jeff Rumans Photography and BurnBot.



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