Building Wildfire Resilience in the West Series

SUMMARY REPORT

September 2020

HOSTED BY:

GORDON AND BETTY MOORE FOUNDATION

WILLIAM + FLORA Hewlett Foundation

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OVERVIEW

On the heels of the "Building Wildfire Resilience" series, California, Oregon and other western states were engulfed in catastrophic wildfire. Every record has been shattered in 2020 in terms of acreage burned, wildfire severity, human infrastructure lost, and air quality impacts, and the "fire season" has only just begun. We are moving swiftly to provide opportunities for the funding community to take action, from immediate funding opportunities, including but not limited to disaster relief outlets, as well as organizing deeper, ongoing discussions about fundamental solutions, from scaled forest/landscape restoration to building a new restoration and bioeconomy, and from public education about what's at stake to lasting policy change.

The purpose of the Building Wildfire Resilience Series was to help funders and impact investors better understand the full range of challenges and opportunities in the age of megafire; how megafire intersects with other key issues and funding areas like public health, equity, climate change, water, land use policy, etc; and what the most promising solutions are. Below you'll find an overview of what we learned; the next step in which we hope you'll participate; and Zoom summaries, recordings, and learning materials for all six sessions.

WHAT WE LEARNED:

2020 is not a "freak" year.

Megafire is the new abnormal and will only get worse with hazardously overgrown forests, climate-driven aridification (the atmosphere, due to higher temperatures and lower humidity, is pulling moisture from vegetation making it tinder dry), failing energy infrastructure, and increasing numbers of people living in the wildland urban interface.

Megafire is a public health crisis.

Highly toxic smoke, carrying not just CO2 but also ozone, benzene, carbon monoxide, and fine particulates, has pushed air quality into the "hazardous" zone throughout urban and rural areas of western states. Cardiopulmonary emergencies increase dramatically during intense smoke events and researchers are seeing higher rates of cancer, endocrine disruption, and lung disease among firefighters. COVID-19 compounds the problem with overwhelmed emergency and medical services, and higher rates of COVID infection with immunosuppressed, irritated lungs.

Wildfire illuminates inequities in our society.

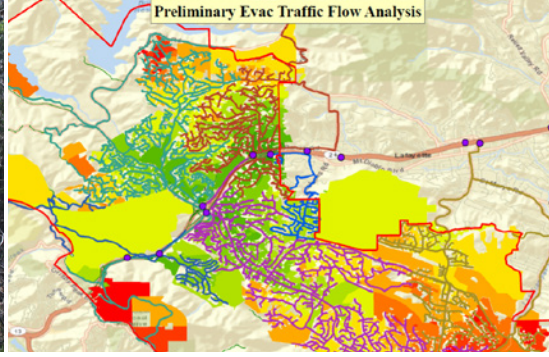
Communities of color, undocumented individuals, and indigenous communities are disproportionately impacted by wildfires and toxic wildfire smoke. They are more likely to experience asthma, cancer, and cardiopulmonary diseases – and wildfire smoke exacerbate these conditions – and live in place with higher exposure to wildfire impacts. Yet, they have fewer resources to cope with these impacts. For instance, indigenous communities are critical knowledge holders of fire management practices, yet are some of the most financially under-resourced and vulnerable in the face of catastrophic wildfire.

Megafire has major impacts on water availability and quality, and is contributing significantly to climate change.

75% of water originates in forested headwaters where trees store snowpack and filter water before it heads downhill to urban and agricultural areas. Western forests can store as much or more carbon than tropical rain forests but catastrophic canopy fires (in contrast to low intensity "normal" ground fires) release massive amounts of carbon and often sterilize seed stock. The era of megafire will see water reliability decline and, in many places, the permanent loss of forests, the greatest carbon sequestration engines ever built.

There are solutions to megafire and we need to act collectively and in coordination.

These solutions are far-reaching, including restoring western forests; growing a "restorative" workforce; creating a climate-smart biomass industry; advance smart land use policies; and support wildfire detection, planning and response. These solutions require coalition building, data and technological infrastructure, community outreach, multi-sector partnerships.



THE NEXT STEP – JOIN US:

We are organizing small group, interactive discussions among funders and thought leaders and people on the front lines focused on five key solutions areas. Agenda for the sessions include:

- Learn and exchange ideas about high-impact ideas and solutions
- Share what you are currently funding and the successes and challenges you are encountering
- Discuss aligned and potential pooled funding opportunities

We invite you to participate in one or more of the following discussions, starting with these four topics **– please email the host if you are interested in participating:**

1. Technology to advance community and ecosystem resilience

Co-hosted by the Gordon & Betty Moore Foundation and Google.org

New and re-imagined technologies hold promise for ongoing efforts to improve wildfire resilience in our ecosystems, institutions, and communities. The Gordon and Betty Moore Foundation and Google.org are facilitating dialog and supporting grantees focused on critical data and technological solutions, including early fire detection and response, improved modeling, evacuation planning, alert systems, real-time air quality monitoring, smart grid technology, and forest resilience decision support and monitoring.

Host: **Genny Biggs, Gordon & Betty Moore Foundation**
genny.biggs@moore.org

2. Coalition-building and policy advocacy

Co-hosted by The William & Flora Hewlett Foundation and Smart Growth California

The Hewlett Foundation is supporting grantees that are building diverse and inclusive coalitions of wildfire experts and other wildfire-impacted fields (such as climate, public health, labor, water, and more) to strengthen state and federal policy advocacy for building wildfire resilience of communities and wildlands. Hewlett's strategy is centered on four states and four areas of focus, but we welcome conversations with funders interested in any area of wildfire resilience policy, in any geography. The four states: California, Washington, Colorado, Montana. The areas of focus: (1) prescribed fire policy and management; (2) tribal leadership for wildfire resilience; (3) land use planning and development in the WUI; and (4) funding for wildfire resilience.

Host: **Jennee Kuang, The William & Flora Hewlett Foundation**
jkuang@hewlett.org

3. Equitable solutions to wildfire

Hosted by Philanthropy California

The 2020 wildfires, on the heels of national uprising for racial justice, have illuminated long standing inequities in U.S. society. Philanthropy California is facilitating dialog and action among California funders on equitable strategies that reduce the risk and impact of wildfires to our most vulnerable communities. Discussions will focus on culturally-competent, community-based solutions that address vulnerabilities to wildfire smoke and disaster impacts.

Host: **Alan Kwok, Philanthropy California**
akwok@ncg.org

4. Advancing climate friendly forests

Co-hosted by The William & Flora Hewlett Foundation and Philanthropy California

Many western forests, when healthy, store more carbon than tropical rainforests. Yet nearly all western state forests now emit more carbon than they store due to megafire and tree mortality. In fact, according to climate scientist, Daniel Swain, half of the wildfires we see today can be directly attributed to climate change. This will only worsen with the dangerous, new forest-climate feedback loops that are underway if we don't intervene. Forest resilience and carbon drawdown can be restored but cultural, financial, and bureaucratic hurdles abound. Philanthropy California is focused on what it will take to deliver radically different forestry and where the opportunities lie to bridge the transition to climate friendly forests.

Host: **Jennee Kuang, The William & Flora Hewlett Foundation**
jkuang@hewlett.org

Future work sessions may include:

- **Market mechanisms in building wildfire resilience:** Harnessing market mechanisms such as forest restoration bonds and opportunities to influence the insurance industry so that the risk from wildfire is embedded in development costs.
- **Workforce opportunities and economic transition:** Opportunities for job creation through prescribed burns, vegetation management, home hardening, and forest restoration, as well as opportunities in supporting the biomass industry.
- **Establishing the narrative on building wildfire resilience to drive engagement:** Educating the public about what's at stake, building public and political will to invest in/incentivize/engage in solutions.

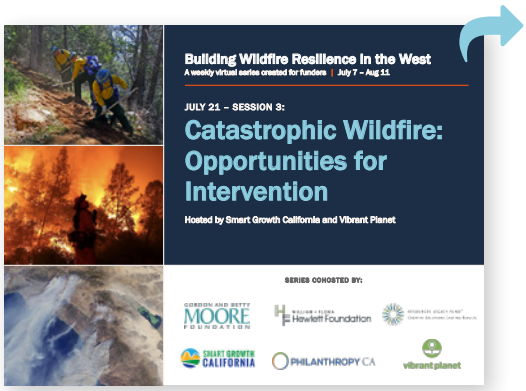
If you are a funder and would be interested in hosting one of these workstreams please let us know. Contact: **Allison Wolff** / allison@vibrantplanet.net.

SUMMARIES, RECORDINGS, AND LEARNING RESOURCES FROM THE "BUILDING WILDFIRE RESILIENCE" SERIES

Recording links to all sessions:

Session 1 | The Convergence of COVID-19 and Wildfire

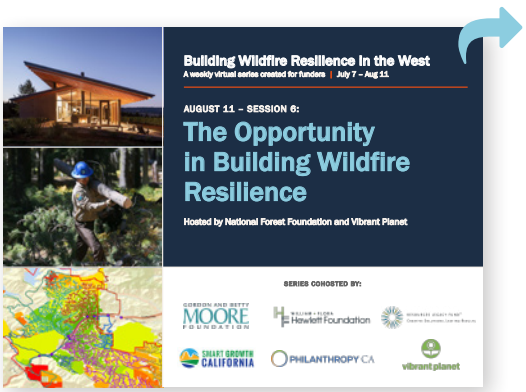
Session 2 | Megafire: The New Abnormal



Session 3 | Catastrophic Wildfire: Opportunities for Intervention

Session 4 | Shaping the Future of Climate Change, Water, and Wildfire

Session 5 | How Wildfire Disproportionately Impacts Vulnerable Communities



Session 6 | The Opportunity In Building Wildfire Resilience

SUMMARY SESSION 1

The Convergence of COVID-19 and Wildfire

Below is a brief summary of the conversation, along with potential philanthropic actions. If you missed the session or want to share it, we've made the Zoom recording available.

- With COVID-19 and Wildfire, we are dealing with parallel, intersecting disasters which will exacerbate one another.
- In a year with no COVID, wildfire smoke carries dangerous particulate matter, PM 2.5, into communities and urban centers which leads to premature cardiovascular problems, immune suppression, and lung inflammation. With COVID now in the mix, we have a recipe for increased disease severity.
- Add to this picture, long standing structural and social inequities – poor air and water quality plus other physical and mental health stressors – making vulnerable communities even more vulnerable with the convergence of COVID and wildfire smoke. We are talking about who dies and who lives and we must contend with these issues to achieve resilience.
- State budgets within CA for preventive wildfire treatments and home hardening have remained a priority. However, firefighting team budgets across the West have been cut, requiring them to do more with less resources and at greater risk with COVID in base camps, evacuations, and rescues. Technological innovation from early fire detection to public communications to evacuation planning to tree/house level decision support is increasing capacity but more funding and innovation is needed.
- Kate Gordon, Director of OPR, talked about the critical need for multi-year funding to enable continued integration of climate action/resilience planning, codesigned and developed with/by local communities who know what they need best. The state of CA is also working with local communities to ensure that development only happens where we already have towns, power and other infrastructure to avoid new development into the wild-urban interface, leveraging SB 743.
- Groups working on the front lines (like CAUSE), who normally work on power building, have no choice but to pivot to direct humanitarian aid for the most vulnerable, including undocumented workers who don't qualify for unemployment and health insurance, and have no access to air filtration. Funding is needed at the regional scale to work on issues like environmental and climate justice, and economic empowerment, because not every organization can scale up efforts on their own – particularly with crisis after crisis hitting vulnerable communities, requiring increasing focus on humanitarian aid/direct assistance.
- Two-thirds of US agricultural workers work in California. They are at highest risk with COVID-19 and wildfire,

with crowded congregate housing, lack of air filtration and protective equipment, and without access to unemployment and health insurance.

Philanthropic actions:

- Addressing the baseline conditions within which many people are living – bringing together public safety, environmentalism, and environmental/ climate justice – must be a priority.
- Supporting groups like CAUSE and community foundations (e.g. Latino Community Foundation and Sierra Health Foundation) who are providing critical safety nets for our most vulnerable, and engaging vulnerable communities in power building, is a way to address immediate needs (response and recover) as well as crucial fundamental improvements to equitable wellbeing and resilience.
- Consider integrated strategies to empower communities economically with restorative timber and innovative wood products that reduce unnatural, hazardous forest fuels and build landscape and community resilience to wildfire.
- Investments in protective mechanisms and emerging technologies are also crucial – e.g. community driven notification systems which specifically identify people who need additional help and assistance; evacuation plans co-designed with local communities, house/tree level decision support. Investments in technological and public communication innovation can help – we're happy to make recommendations.

Learning resources:

Wilder Than Wild, a documentary about the catastrophic wildfire situation. Our group has been granted access for a limited amount of time. https://vimeo.com/417284595 Password: W1LDF1RE

Fire in Paradise, Frontline's Documentary about the 2019 Butte County fire that burned Paradise, CA.

Gone: Decades of greed, neglect, corruption, and bad politics led to last year's Paradise fire, the worst in California history. It should never have happened. It will happen again. By Mark Arax, in the California Sunday Magazine.

How Wildfires Make Covid More Dangerous, from The New York Times, Climate Week series, July 8, 2020

SUMMARY SESSION 2

Megafire: The New Abnormal

Below is a summary of session 2, Megafire: The New Abnormal, with philanthropic opportunities embedded. If you missed the session or want to share it, we've made the Zoom recording available.

Dr. Michael Mann, Climate Scientist

- Dr. Michael Mann opened the conversation with a climate change perspective on wildfire, with abnormal wildfires burning in Australia, Siberia, and the Western US being linked to climate change. In recent months the Arctic has been hotter than Florida.
- Climate change is also causing strange temperature waves in the jet stream which will cause a future of heat waves and floods.
- California is hardest hit in the US with the worst drought worst in 1200 years...and yes, we are still in it.
- We continue to break temperature records, year over year, and month over month. This means tinder dry forests, more extreme wind events. This in combination with hazardously overgrown forests, due to fire suppression, will continue to cause massive loss of lives, communities, and ecosystems, as well as impacts to water supply and air quality.

Margo Robbins, Cultural Fire Council Member

- Margo Robbins took us back in time to the history of cultural fire in the West. Nearly every inch of the West was tended with cultural fire for 20,000 years until Native Americans were removed from much of the land, and with them, regenerative fire.
- Low intensity fire plays a major role in the Western US's fire adapted ecosystems, cleaning, cycling nutrients, and regenerating forests, berries, and brush the tribes use in daily life. Without fire, the ecosystem becomes overgrown, choked, and ladder fuels for catastrophic fire build up.
- In addition to working on gaining more rights for the Indigenous Peoples' Burn Network to expand family burns, Fire Councils are training up teams all over the state to do prescribed burns.
- Environmental regulations and funding are the biggest hurdles to scaling up healthy, regenerative fire practices on this land and we truly need a cultural shift from fighting fire to one that embraces living in a fire adapted landscape. There are also two world views on fire colliding around how we regulate and manage prescribed and wildland fire vs what the Yurok need to heal the land.

Stephen Pyne, Forest & Wildfire Historian at Arizona State University

- Stephen Pyne took us through European American history with forests in the west, where The Lorax truly did play out in real life. America in the late 1800s was the Brazil of its day. All but 3-4% of old growth was clear cut for railroads, mines, and to build the West.
- We had some big fires due to poorly managed forests back then, with railroads playing the same role in sparking large fires as power lines do today.
- We declared war on fire after WWII, calling in surplus equipment and airplanes to replace the on-the-ground effort begun by the CCC Western forests…and fire suppression technology continued to improve with increasing numbers of people moving into the wildland urban interface. Forests, as a result, have become hazardously overgrown.
- We have created the "Pyrocene era" – the convergence of all types of fire, from the atomic bomb, to the burning of fossil fuels, which, with climate change and hazardously overgrown forests, has created the advent of megafire.

Helge Eng, Deputy Director of Resources at CALFIRE

- Helge Eng talked about the need for forest restoration – mechanical thinning of small trees and prescribed burns – to restore forest resilience to climate change and wildfire. Many Western forests are so overgrown that they fight for resources, becoming tinder dry in a warmer, drier climate which makes them susceptible to wildfire, drought, and disease.
- Western forests store more carbon that tropical rainforests and, in the West, ¾ of the water supply comes from forested areas. CA alone could lose up to Ð of its forests in the next few decades to climate change and wildfire, which will be devastating to the climate, water supply, and human health.
- The biggest challenge and opportunity is to inspire a new generation of young people into a restorative workforce. With COVID 19 derailing college for many young people, perhaps this is an opportunity for mass inspiration and mobilization.
- Helge also talked about the need for investments into innovative wood products that can create demand for small wood and biomass. Cross laminated timber, bioenergy, biofuels and biochar are all promising carbon negative innovative products that need innovation and investment to rapidly scale.
- Finally, a need for more science and predictive modeling tools that can help drive forest unit level and landscape scale scenario building, to weigh trade-offs and inform decisions.

Dr. Kimi Barrett, Headwaters Economics

- Dr. Kimi Barrett talked about solutions in land use policy and home hardening opening with Dr Jack Cohen's quote: "Wildfires are inevitable but disasters don't have to be."
- We have earthquake and hurricane resistant structures, why not wildfire resistant? We know how homes burn down and we know how to make them resilient, yet we have a vast legacy of homes with shake roofs, wood decks, wood siding, petroleum based materials, and propane tanks. Of course our houses burn, and only add fuel to catastrophic fires.
- Need 100% community compliance or it doesn't work – that's why land use planning is so important in addition to building codes. Some communities have adopted model WUI fire codes such as Austin TX.
- With the cost for defensible space and home hardening being a minimum of $10k, this quickly becomes an equity issue and an opportunity for philanthropic capital to build resilience in the most at-risk communities.
- Land use planning tools that incorporate the latest science and data, hazard assessments, community-level capacity building, and continued scientific research are needed to build community resilience.

Learning resources:

Wilder Than Wild, a documentary about the catastrophic wildfire situation. Our group has been granted access for a limited amount of time. https://vimeo.com/417284595 Password: W1LDF1RE

Trump's plan for managing forests won't save us in a more flammable world, experts say, Washington Post

'Fire is medicine': the tribes burning California forests to save them, The Guardian

They Know How to Prevent Megafires. Why Won't Anybody Listen?, ProPublica

A Waze for wildfires: Learn how tech is enabling better, earlier wildfire detection, TED Ideas

There's a new way for investors to turn a profit while helping California prevent fires, CNBC

SUMMARY SESSION 3

Catastrophic Wildfire: Opportunities for Intervention

If you missed the session or want to share it, we've made the Zoom Recording available. We are happy to connect you directly with any of our speakers for follow up questions – just email allison@vibrantplanet.net.

This session provided a high level overview of resilience building solutions, from early fire and evacuation technology to innovative finance to powering rural economies and democratizing wildfire resilience.

Hilary Franz, Commissioner of Public Lands in the state of Washington

- Hilary Franz opened the conversation by describing Washington State's 20 year Forest Action Plan, a great example of government stepping in to create the conditions for building social and economic value.
- The WA Forest Plan takes a watershed approach (vs adhering to property lines) and takes into account Washington state's mapping of high risk wild-urban interface areas, population growth, development patterns, and now COVID impacts to inform land use planning. The plan, in addition to mitigating wildfire risk and addressing development pressures, is creating hundreds of jobs in a time of high unemployment with COVID, and helping to kick start new climate friendly industries like Cross Laminated Timber (CLT) which uses biomass piles that are typically burned in high value products.
- WA is considering new programs to finance their Forest Plan execution including property insurance surcharges on auto and home policies, water surcharges, and philanthropic capital
- "We can no longer wait for crises to be upon us to get proactive."

Maite Arce, CEO and President of The Hispanic Access Foundation (HAF)

- Maite Arce talked about the daily burdens Latino communities face that are only exacerbated by wildfire – e.g. the average Latino person in CA spends 57% of their income on housing, and often lacks renters insurance; 12% don't have access to a car. Add to this the lack of Spanish language public communications/ alert systems and wildfire evacuations and access to support services challenging, if not impossible.
- Hispanic communities have higher rates of lung disease, 4X rates of COVID-19 hospitalizations, and often no health insurance; wildfire smoke increases COVID rates further.

- HAF develops crucial, culturally-relevant toolkits and recently a film, I Am Cheo, to empower Latino communities. They run employment programs that introduce Latino youth to natural resource jobs with USFS, Park Service and US Fish and Wildlife.

Nick Goulette, Executive Director of The Watershed Center

- Nick talked about their strategic investments in community leaders and technology to transform how we're living with fire in the rural West and democratize wildfire resilience.
- Because of the wicked nature of wildfire, we need to get out of silos, bridge ideas and values, and replicate good practices by connecting communities across the west.
- The Watershed Center brings leaders together in peer networks to shift social and institutional systems across agencies, academia, tribes, and local community organizations restore landscapes and reintroduce regenerative fire. There are now 17 formal Prescribed Burn Associations in California (https://calpba.org/ca-pba-about), with many more in formation.
- Time to scale up these proven programs – need more of those with access, money, and power to participate in the networks and get behind locally-driven programs, and the The Watershed Center's technical and human infrastructure that connects fire safe communities together.

Zach Knight, CEO of Blue Forest Conservation and creator of the Forest Resilience Bond

- Zach Knight talked about their market driven, public-private partnership to reduce catastrophic wildfire
- If forests die and burn, water supply is at risk. The solution: reduce wildfire fuels that have built up with 130 years of fire suppression, and ecologically restore forest's natural structure and diversity, making them, once again, resilient to wildfire, climate change, and disease.
- This is simply a finance problem: $58B needed to do restoration at the scale needed in the West, yet the USFS only has $424 million to spend. Funding has to come from elsewhere.
- The Forest Resilience Bond is profitable for investors and represents hundreds of millions in ROI in avoided loss of carbon and avoided water impacts.
- Need $100 million in investments in Yuba watershed (a high fire danger, key tributary to the Sacramento River Delta) alongside National Forest Foundation, Gordon and Betty Moore Foundation, and other initial investors, over the next five years, to fully execute the Yuba restoration project.
- The Forest Resilience Bond is an early manifestation of Environmental Markets/Ecosystem Services valuation at play to move funding where it's needed to maximize the benefits of nature.
- See this How it works video to learn more.

David Winnacker, Fire Chief in Orinda, CA

- David Winnacker addressed how technology is helping firefighters build community resilience.
- Fire is spread due to topography, weather, and fuels. If you disrupt one of these factors, fire is stoppable.
- Removing forest and man made fuels stops fire – defensible space, fuel breaks, and home hardening (ember resistant roofs and vent retrofits) are crucial.
- Technology innovation is rapidly evolving in early fire detection and evacuation planning and execution, including:
  - Integrated ground-space based systems for early fire detection: A combination of ground sensors and cameras, and satellites, plus data processing power makes early detection possible. Real-time weather and fuels data can help firefighters allow low risk fires to run and regenerate fire adapted landscapes or put out potentially catastrophic fires and execute efficient evacuations. (Video showing the ground sensor to camera to satellite integration test the team successfully executed in April).
  - Universal notification systems that cross political/community/agency boundaries are crucial to coordinating evacuation and response – innovation needed.
  - Centralized evacuation planning and systems, integrated with common consumer apps like Google Maps, plus time-phased decision support for evacuations, are in development and will save lives.
- Opportunity: We're sending previously incarcerated people home, in a COVID driven recession. Chief Winnacker is developing a pilot program, standing up fuel mitigation crews of previously incarcerated individuals. Helps those previously incarcerated do meaningful, critical work and possibly build careers in natural resources and fire fighting, Funding needed: $500k for pilot program in Orinda.

Learning resources:

Previews and published works from speakers in Session 4 | Shaping the Future of Climate Change, Water, and Wildfire

Gone In A Generation, Across America Climate Change Is Already Disrupting Lives, Washington Post, Jan 2019

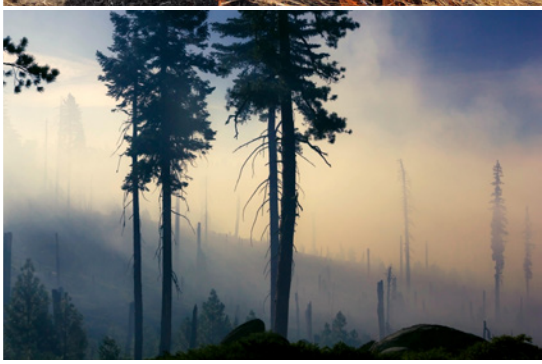
Opinion: Managing for disturbance stabilizes forest carbon, Matthew D. Hurteau, Malcolm P. North, George W. Koch, and Bruce A. Hungate, Proceedings of the National Academy of Sciences of the USA, May 2019

American Forests Co-Authors New Study on the Impacts of Forest Management on Soil Carbon, June, 2019

Protecting Headwaters, November 2018, a 4-page policy brief from PPIC that highlights key takeaways from headwater forest management research.

Climate Change and California's Water, PPIC Fact Sheet, September 2019

Wilder Than Wild, a documentary about the catastrophic wildfire situation. Our group has been granted access for a limited amount of time. https://vimeo.com/417284595 Password: W1LDF1RE



SUMMARY SESSION 4

Shaping the Future of Climate Change, Water, and Wildfire

If you missed the session or want to share it, we've made the Zoom Recording available (recordings of sessions 1-3 down below).

Daniel Swain, Climate Scientist, Institute of the Environment & Sustainability, UCLA

- Daniel Swain opened the conversation on ways climate change is changing the character, severity, and frequency of wildfire.
- The role of warming and "aridification": As temperatures rise so does the gap between how much water is actually in the air and how much could be in the air. Warming dramatically increases atmospheric water demand, plus soil evaporation, dries living vegetation creating a tinder box.
- More than half of the observed increase in Western US forest area can be directly attributed to climate change; in CA, climate change has more than doubled the occurrence of extreme fire weather conditions between 1980-2018.
- The area burned by wildfire has tripled since 1980; annual wildfire extent in CA has increased 40% per decade; wildfire in the Arctic (boreal forest, tundra, & peatlands) has also increased dramatically in recent years (e.g., ongoing record fires in Siberia)

Jad Daley, President American Forests

- Jad Daley talked about how forests are delivering a massive climate change solution: 753MMT of CO2e sequestered per year in the US. Many forests in CA and the west store more CO2 than tropical rain forests.
- However, tree mortality from drought and bark beetle, plus catastrophic wildfire is rapidly shifting the stability of our forest carbon sink. Many western forests have flipped from being net carbon sinks to net carbon emitters.
- The carbon loss due to megafire from trees and forest soil is profound. The 2018 wildfires in CA released 68 billion tons of CO2, equivalent to powering the entire state for a year.
- We need more investments in forest carbon offense and defense – replanting heterogeneous, climate resilient forests post catastrophic wildfire and restoring living forest resilience by clearing hazardous ladder fuels left from 130 years of fire suppression, deployed in a carbon negative biomass industry (e.g. Cross Laminated Timber or Biochar)
- Modeling possible treatment scenarios along with wildfire and climate scenarios is another area that needs investment to drive the right forest restoration planning and monitoring; crucial to obtaining a forest carbon credit to finance Western forest restoration.

Christina Burri, Watershed Scientist, Denver Water

- Christina Burri shared their ground breaking Forests to Faucets program which is funding the restoration of 2.5 million acres of forests with USFS and CO State Forests to ensure a reliable, clean water supply for 1.5 million in the Denver area.
- In contrast to historically low intensity fire, megafire scorches vegetation and soil, and sterilizes the seed stock, turning lands into moonscapes. There is nothing to hold soil when rains and snow runoff come, causing mass amounts of debris and sediment to fill watershed areas and reservoirs.
- Denver learned costly lessons after major fires (e.g. Hayman fire in 2002) with impacts to water infrastructure and overall health of the watershed. They invested $28 million in clean up, $18.5 of that on dredging sediment from the reservoir. Erosion only accelerated overtime thus the reservoir continues to fill with debris and sediment 17 years later.
- Denver water shifted its strategy to focus proactively on building forest resilience throughout watersheds with prescribed burns and ladder fuel removal, restoring a more historical mosaic structure that keeps low intensity wildfire from turning into megafire. They are seeing ROI in the $ billions.

Ellen Hanak, Vice President and Director of the Water Policy Center

- Ellen Hanak took us to CA where water funders and utilities are also investing in forest health.
- Overgrown forests in the West are unresilient because they are fighting for dwindling water availability. When trees don't have enough water to produce their protective shields, bark beetles wipes them out, to the tune of billions of dead trees in N. America.
- Overgrown forests may also contribute to drought. Promising data showing that thinning overgrown forests can enhance snowpack storage in forests (vs snow evaporating from overgrown forest canopy), and increase runoff and groundwater recharge.
- The State of CA is moving water money from SB901 into forest stewardship, with downstream beneficiaries investing in source water forest health.
- Suggestions for philanthropists include: public-private partnerships for forest management, public education about the benefits of healthy forests/addressing knowledge gaps on the role forests play in storing and filtering water and storing carbon; and closing gaps in wildfire emergency planning, preparedness, and home hardening; investing in kickstarting a carbon negative biomass industry.

We are happy to connect you directly with any of our speakers to follow up – just email allison@vibrantplanet.net.

Learning resources:

A Climate Reckoning in Fire Stricken California, New York Times, September 2020

American Lung Association's 20th Annual State of The Air Grades Reveal Wildfire and Extreme Heat Impacts on Clean Air Progress

Gone In A Generation, Across America Climate Change Is Already Disrupting Lives, Washington Post, Jan 2019

Opinion: Managing for disturbance stabilizes forest carbon, Matthew D. Hurteau, Malcolm P. North, George W. Koch, and Bruce A. Hungate, Proceedings of the National Academy of Sciences of the USA, May 2019

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Climate Change and California's Water, PPIC Fact Sheet, September 2019

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SUMMARY SESSION 5

How Wildfire Disproportionately Impacts Vulnerable Communities

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Seth Shonkoff, Executive Director, PSE Healthy Energy

- Seth Shonkoff took us through PSE's hot-off-the-press research focused on the public health dimensions of wildfire
- PSE's research explores the public health impacts of extreme wildfire events (e.g. air quality, water, soil/crops, mental health) as well as wildfire risk management tools, including power shut offs, Rx burns, biomass utilization for energy and chemical fire suppressants.
- Strategic deployment of distributed clean energy resources as backup power during public safety power shutoffs, could be life saving for hospitals, and emergency workers.
- Traditional bio-to-energy cogeneration plants have high emissions rates, however, new low/zero emissions gasification technologies could be rapidly scaled to create energy at local scales (e.g. Sierra Institute's leadership on a 5 MW gasification plant at the Plumas County Hospital).

Will Barrett, American Lung Association

- Will Barrett shared results of their State of the Air 2020 Report.
- Ozone and particle pollution continue to rise across the west. Both cause a range of health issues from asthma to lung cancer to premature death.
- 98% of Californians live in counties with a failing grade
- CA cities dominate the lists of the most polluted in America. Los Angeles is #1 in the US. Bakersfield is the most polluted by year-forund particles in the US.
- Climate change is exacerbating wildfire threat: 2016-2018 are 3 of the 5 hottest years on record and also when 5 of the 10 most destructive wildfires in CA history happened.
- Air pollution from wildfires may make Coronavirus more lethal.

Gabriela Orantes, Just Recovery Fellow, Latino Community Foundation

- Gabriela Orantes talked about how they work across the disaster spectrum: relief, recovery, and resilience building.

- During relief efforts moving cash to the local level was crucial for life saving medical support.
- LCF works with a network of trusted partners in each community, making rapid deployment of resources to families and workers who need them efficiently.
- In addition to direct interventions and relief efforts, LCF leverages disasters like wildfire to illuminate long standing inequities (e.g polluted air, lack of adequate affordable housing with air filtration, polluted water) – and mobilize funding to solutions.
- LCF employs civic engagement, leadership development, arts and culture, and grassroots movements to build local power among vulnerable communities, adding up to a just recovery.

Ashley Conrad-Saydah, founder Sowing Change (and ex Deputy Secretary for Climate, CalEPA)

- Ashley Conrad-Saydah talked about the gaps we have in data collection and use to better understand upstream causes and downstream impacts of issues like wildfire.
- There is a need for more accurately defining and spatially representing disadvantaged communities to reframe the issues and drive improved decisions and funding models.
- Just in the last few years, we have access to data that can scale down to the local level which is crucial for contextual decision making.
- A few key platforms have emerged, including CalEnviroscreen, WA state's wildfire vulnerability framework, PLOS ONE, dimensionalizes wildfire vulnerabilities, and CA Building Resilience Against Climate Effects (CalBRACE), which was particularly effect in assessing Tuolumne County, a high wildfire danger region.
- Ashley talked about what's currently funded and not. Key funding opportunities include: proactive local community engagement and planning, sustainable economic development, nature-based circular economy research, local personnel, and land use interventions.

Learning resources:

The Public Health Dimensions of California Wildfire and Wildfire Prevention, Mitigation and Suppression, PSE

Stanford researchers discuss widlfires' health impacts, Stanford News

State of the Air Report 2020, American Lung Association

New Tools Indicate How Thinning and Fire Affect Forest Water Use and Boost Runoff, June 2020, UC Merced

In Wildfire's Wake, Another Threat: Drinking Water Contamination by InsideClimate News, February 2020 (online news article).

Megafires Are Getting More Dangerous – But We Can Better Prepare for Them by Zócalo Public Square, July 2020 (webinar recording and summary)

Wilder Than Wild, a documentary about the catastrophic wildfire situation. Our group has been granted access for a limited amount of time. https://vimeo.com/417284595 Password: W1LDF1RE

Additional resources:

American Lung Association:

- American Lung Association Fact Sheets
- **Protecting Lung Health During Wildfires** Español | Chinese | Vietnamese | Tagalog | Russian

Department of Homeland Security

- **Ready.gov/wildfires**

Centers for Disease Control & Prevention (CDC):

- **COVID-19 Considerations for Cleaner Air Shelters**
- **Wildfires**

U.S. Environmental Protection Agency (EPA):

- **Check your air quality** (AirNow.gov)
- **Fire and Smoke Map** (view current fires)
- **Smoke Ready Toolbox for Wildfires**
- **Wildfire Smoke: A Guide for Public Health Officials**
- **Using a mask if you must go outdoors** (2-page flyer)
- **Home air cleaners**

DisasterAssistance.gov:

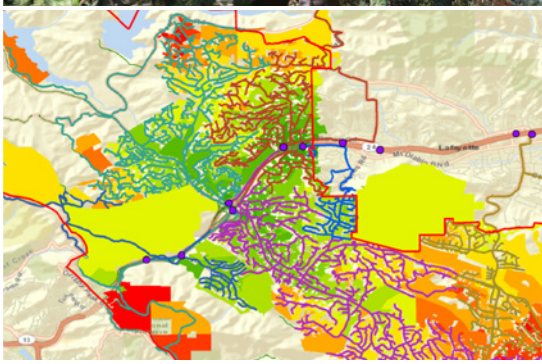
- **Recovery help to receive disaster assistance**

For Health Professionals:

- **EPA: Particle Pollution & Your Patients' Health course website**
- **Lung Association Webinar on Tips to Protect Lung Health During Wildfire Season**

Animated videos:

- **Tips To Protect Lung Health During Wildfires** English | Spanish



SUMMARY SESSION 6

The Opportunity In Building Wildfire Resilience

If you missed the session or want to share it, we've made the Zoom recording available. We are happy to connect you directly with any of our speakers for follow up questions – just email allison@vibrantplanet.net.

Mary Mitsos, CEO and President, National Forest Foundation (NFF)

- Mary Mitsos schooled us on the vast USFS land – 193 million acres – and the role of NFF to engage Americans in their national forests and grasslands, amplify the USFS's work, and bridge the agency with private donors, contractors, volunteers, and nonprofits to get more work done on forests.
- Mary shared NFF's work on several crucial projects, including their partnership with Blue Forest Conservation in the Yuba River Valley where public and private funding flowed through NFF to facilitate upstream forest restoration in a crucial, high wildfire risk tributary to the Sacramento Delta; their work pioneering forest resilience bonds; and their work on the Tribal Firewood program to get wood from forests into tribal areas made inaccessible with COVID.

Nathan Truitt, VP Strategic Partnerships, American Forest Foundation

- Nathan Truitt talked about the importance of engaging families and individual land owners in forest restoration – they represent the second biggest land ownership in the country at 175 million acres, with majority acreage of 20-500 acres; their participation is vital for achieving conservation impact at scale.
- Majority of land owners struggle financially, making restoration and wildfire mitigation impossible.
- AFF is exploring new ways of helping bridge the financial gap for small landowners with two programs: 1): Verified, measurable, conservation impacts that are valued and paid for by a market of funders; 2) Payments to small forest owners for measurable and verifiable reduction in average wildfire losses from entities with a financial stake in loss avoidance (insurers, municipalities, companies, etc).
- AFF is also on the forefront of paying small forest landowners to store carbon, starting with their Pennsylvania pilot that includes 100 landowners who own 8500 acres and generate 195k tons of carbon sequestration. Planning to scale to new regions, including the western US, and they are working on a verified carbon offset for stabilizing forest carbon in wildfire prone areas.

- Nathan talked about 3 roles philanthropy can uniquely play: 1) expeditionary capital for research methodology design, landowner research, and data-driven technology platforms; 2) funding pilots ~$500k-1.5 million in grants or Program Related Investments (PRI) to validate these program hypotheses; 3) Bridge financing to scale pilots and connect them to commercial capital markets ~$10 million in PRIs.
- Benefit is leverage: e.g. if AFF is able to scale the carbon plan, every $1 in grants and donations would result in $25 of private capital for regional forests.

Ken Alex, President, Project Climate

- Ken Alex focused mainly on models for scaling natural climate solutions, but first warned that our systems are fragile and they can crash. Fast.
- He also talked about lessons from Black Lives Matter protests – resilience doesn't exist without fairness, justice, and equal opportunity.
- On models for scaled natural climate solutions, Ken talked about:
  - GrizzlyCorps, a new Americorps program focused on training young people to work in natural landscape resilience building in both forests and ag lands;
  - Strategies for transferring development rights and giving land owners credits for environmental enhancements and enabling forest and other landscape resilience efforts to be monetized;
  - A new proposed climate center at Tahoe that would bridge science to land management practices and policy work, using technology (or scitech) and convening as the bridge and making winning practices replicable throughout CA, the West, and the World.
- Finally, Ken plugged his new radio show, Climate Break. Tune in! www.climatebreak.org

Kat Taylor, Co-Founder and Co-Chair of Beneficial State Bank

- Kat Taylor started us off with a song, as she often does, then reminded us of the social inequities that, no matter what field we work in, create massive disadvantages for people of color.
- Kat shared the underpinnings of Beneficial State Bank which set out to change the role of banks in communities and the role they play in shaping the global economy. They intend to fix banking, so that it aligns with values, and builds resilience, equitably, and rewards regeneration vs extraction.
- Kat talked about investments the bank has made in industries like cross laminated timber which can use hazardous, small biomass from forests to reduce wildfire risk and create beautiful buildings that are more fire resilient than concrete and steel buildings, have lower operable and embodied carbon, flex beautifully in earthquakes, and feel good to work in. CLT for affordable housing is a no brainer.
- Kat also shared her and the bank's work in healthy food and its link to healthy soil through regenerative farming, and how TomKat Ranch is part of a large rangeland monitoring network across CA to track positive changes to soil, water, biodiversity and other key metrics.
- We discussed that landscape scale monitoring and restoration/regeneration needs to happen from source water to ag lands throughout the country to connect effects (e.g. headwater forest restoration can increase water availability in ag lands and urban areas).
- Learn more about Beneficial State Bank and its impact.

Steve Frisch, CEO, Sierra Business Council

- Steve Frisch took us into their work at the local community level tackling forest, economic, and community resilience with a systems approach that includes workforce development, small business loans for forestry equipment, equipment loan/sharing programs, streamlining restoration permitting processes, and building a carbon negative biomass industry.
- He emphasized the opportunity for the philanthropic/impact investing community to help kickstart and scale up a biomass industry to use hazardous biomass cleared from overgrown forests in productive ways. Currently biomass is mostly burned or degrades releasing large amounts of CO2 and methane when it could be used in a regenerative, circular bioeconomy.
- Finally Steve took us through a pyramid of bioeconomy products from industries like energy, heat and fuels that can use large amounts of biomass to high value bio-based pharmaceuticals and chemicals.

Learning resources:

From National Forest Foundation:

- **Yuba Water Agency and USFS video** about protecting water supplies by restoring forests.
- LA Times **news article on Forest Resiliency Bonds**
- Arizona Central **news article on the need for forest restoration in Arizona**

- Coconino County YouTube **video about the need for restoration and partnership on Bill Williams**.
- NFF **press release on Bill Williams**
- NFF **press release on Tribal Firewood Program**
- Navajo-Hopi Observer **news article on Tribal Firewood Program**
- Arizona Daily Sun **news article connecting forest restoration to climate change and carbon storage**
- Flickr folder of **photos from Bill Williams Mountain Project**

Last chance to see **Wilder Than Wild**, a documentary about the catastrophic wildfire situation. Our group has been granted access for a limited amount of time. https://vimeo.com/417284595 Password: W1LDF1RE

Thank you to our hosts: