



INTRODUCTION

As wildfire risk continues to spread to previously unaffected regions in the United States, utilities are increasingly dealing with damaged and destroyed assets – from poles and towers to substations and transmission lines. These losses are costly and disruptive, severely impacting their ability to maintain reliable service and adding to the challenges of operating in high-risk areas.

States in the West, like California, Oregon, and Washington, are frequently in the news for massive fires. As of October 18, 2024, 6,934 wildfires had burned 1,000,000+ acres in California alone. The *Park Fire*, which started on July 24 and burned until September 26, scorched 429,603 acres – nearly half the size of Rhode Island.

WILDFIRES OCCURRING MORE FREQUENTLY IN ATYPICAL GEOGRAPHIES

But now, we're seeing fires in places where they are extremely rare.

- In 2023, Canada's wildfire season burned over 15 million hectares (over 37 million acres), an area larger than England and about the size of North Dakota
- 2023 also brought the *Matt's Creek Fire* that burned 11,020 acres in Virginia
- In 2016, a massive fire swept through the Great Smoky Mountains of Tennessee
- Similarly, the *Highway 31 Fire* in Myrtle Beach, South Carolina, burned 19,130 acres in 2008, destroying 76 homes, damaging 97 more, making it the most destructive fire in the state's history
- In New Jersey in 2007, the *Warren Grove Fire* burned 18,000 acres, injuring two people, destroying four homes, and damaging 53 more

WHITE PAPER INCLUSIONS

In this 12-page white paper, we explore how climate change is affecting wildfires and how organizations can address wildfire mitigation in the most efficient manners possible.

- The Expanding Challenge for Utilities
- Why Wildfire Mitigation Matters
 - Addressing the Broader Causes of Wildfires
 - Protecting Utility Assets with Vegetation Control
 - Applying California’s Lessons Across the U.S.
 - Potential Losses and the Value of Early Action
 - Potential Losses for Companies
- Community Risks and Costs
 - The Role of Vegetation Control in Mitigation
 - Vegetation Control Process:
 - Risk Assessment
 - Mitigation Efforts
 - Project Overview
- The Current State of Mitigation
- Conclusion / Key Take-Aways
- Credits
- Why Celerity / Clear Path?

THE EXPANDING CHALLENGE FOR UTILITIES

For many utilities in these newly affected areas, adapting to new challenges is difficult. Their primary model for wildfire mitigation has been shaped by California's extensive experience. California's utilities have invested billions of dollars to try and reduce their risk from wildfires, which are now the greatest natural threat they face.

OF WILDFIRES BY STATE EAST OF THE ROCKIES, 2022

STATE	# OF FIRES	# ACRES BURNED	STATE	# OF FIRES	# ACRES BURNED
Alabama	2,357	26,331	Missouri	1,314	17,620
Arkansas	2,010	30,954	Mississippi	1,696	15,338
Connecticut	93	262	North Carolina	3,665	20,000
Delaware	12	32	Nebraska	24	1,125
Florida	2,334	37,929	New Hampshire	358	145
Georgia	3,489	14,534	New Jersey	2,011	10,630
Iowa	123	2,722	Nevada	431	23,863
Illinois	95	630	New York	151	2,066
Indiana	57	132	Ohio	557	3,995
Kansas	35	20,364	Pennsylvania	506	3,203
Kentucky	1,677	51,003	Rhode Island	30	23
Louisiana	2,166	33,401	South Carolina	1,617	6,592
Massachusetts	2,014	2,117	Tennessee	1,653	20,283
Maryland	160	1,577	Virginia	847	7,698
Maine	550	318	Vermont	81	86
Michigan	459	11,441	Wisconsin	1,278	2,185
Minnesota	2,037	33,969	West Virginia	617	14,319

FIRES EAST OF THE ROCKIES IN 2022
<https://www.iii.org/table-archive/23284>

LEVERAGING KNOWLEDGE GAINED FROM THE WEST

While wildfires can ignite from various sources including lightning, human activity, and power lines, utilities are particularly vulnerable to the damage they cause, losing key infrastructure and facing service interruptions.

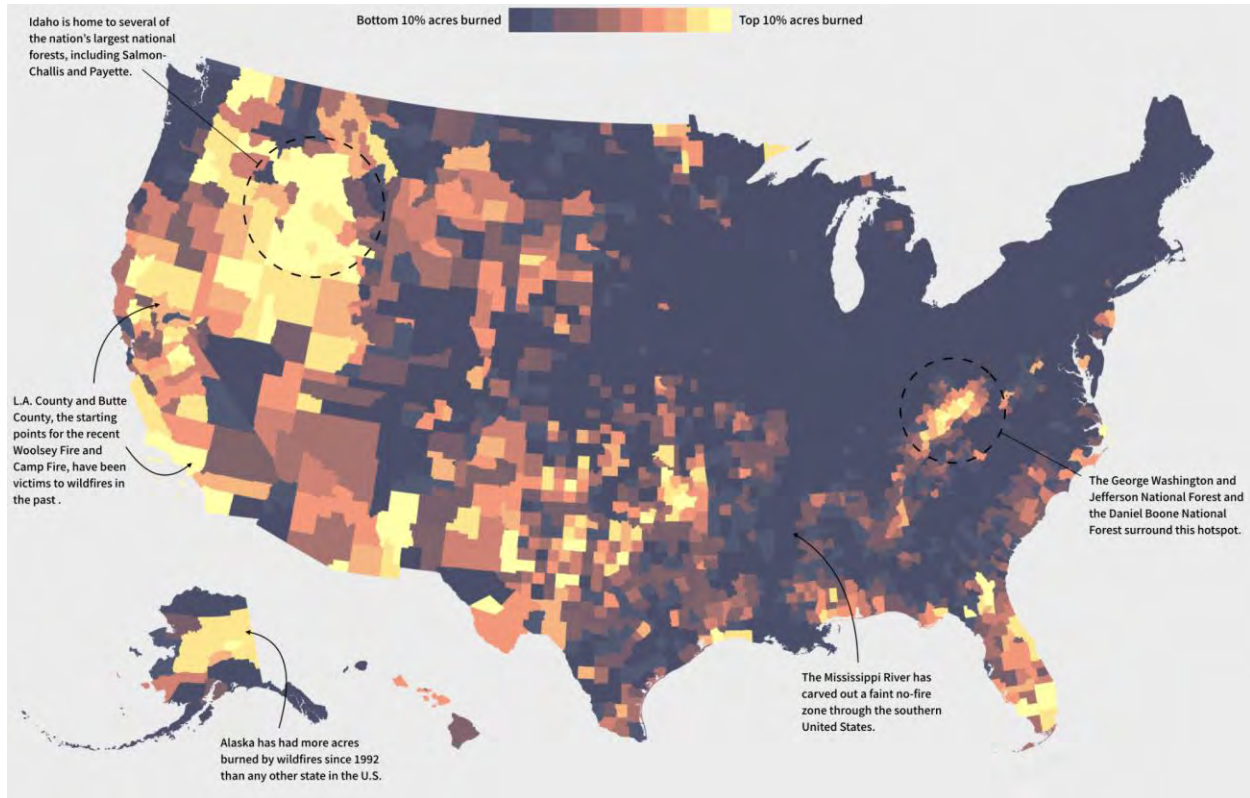
For utilities east of the Rockies, addressing wildfires and incurring associated costs may not be feasible. However, there is an opportunity to learn from the strategies developed in California and adapt them to regions facing newer risks.



Smoke from a forest fire in New Jersey's Pine Barrens darkens the sky in the harbor at Barnegat Light (2007)- [Thisisbossi](#)

GROWING WILDFIRE OCCURANCES EAST OF THE ROCKIES

While many would expect to see cities in California, Arizona, and even Alaska on the list, it may surprise some to see communities in Florida, Mississippi, Georgia, Kentucky, Louisiana and even as far north as Virginia and Pennsylvania. While wildfire mitigation is part of western utilities' annual reality, it's increasingly becoming a threat farther east.



Source: <https://thedataface.com/2018/11/public-health/wildfires-map>
Headwaters Economics published a list of [Communities Threatened by Wildfire, 2000-2017](#)

WHY WILDFIRE MITIGATION MATTERS

ADDRESSING THE BROADER CAUSES OF WILDFIRES

It's important to recognize that the increase in wildfire risk is due to a combination of environmental changes. Factors such as climate change, prolonged droughts and unchecked vegetation growth have created conditions where wildfires spread more easily. Higher temperatures and changing weather patterns have made vegetation drier and more flammable, turning forests into potential tinderboxes. These factors place additional pressure on utilities to protect their infrastructure.

For instance, in regions like California, utilities have implemented automatic power shutoff systems that disconnect power when conditions become hazardous, such as during high winds or extreme heat. These technologies not only help prevent fires but also protect utility assets from damage during active fire events.

PROTECTING UTILITY ASSETS WITH VEGETATION CONTROL

Vegetation Management remains one of the most effective strategies to limit wildfire risk. Reducing flammable material around power lines and substations can prevent fires from spreading into utility corridors, safeguarding infrastructure. While upgrading equipment and deploying advanced sensors is part of the solution, controlling the amount of fuel around utility assets is crucial.

Utilities can implement triggered spark gaps, arcing horns and similar technologies designed to reduce the risk of sparks igniting fires. Additionally, vegetation control efforts, including brush clearing and maintaining safe distances between trees and power lines, help limit the damage caused when fires occur. These efforts, while initially costly, are essential in preventing more significant losses down the line.

APPLYING CALIFORNIA'S LESSONS ACROSS THE U.S.

What we've learned from utilities' responses and preparations for wildfire mitigation comes, very often, from California. California's utility companies have faced challenges in dealing with wildfires that have cost hundreds of billions of dollars. Their experience, particularly in high-fire threat areas, provides valuable lessons that can be adapted to the needs of utilities in the Midwest, East Coast and other regions now facing increased fire risks.

The time has come for utilities in these regions to consider wildfire mitigation strategies. By applying lessons learned from California, they can develop strategies that suit their unique environmental conditions and economic realities. While large-scale investments may not be possible for all, targeted measures like vegetation control, automated shutoff systems and strategic deployment of fire response units can significantly reduce risks.

POTENTIAL LOSSES AND THE VALUE OF EARLY ACTION

The losses for utility companies extend beyond legal liabilities. Wildfires can disrupt utility services for extended periods, leading to significant revenue losses. Power shut offs to prevent fire spread may impact customers far from the immediate threat zone, affecting businesses and residential customers alike.

Wildfires can also destroy billions of dollars' worth of infrastructure, from power lines to substations. The cost of replacing these assets can be crippling. Moreover, the damage to a utility's reputation in the wake of wildfires can be severe, particularly in areas with competitive markets where customers may seek alternative providers.

Early investment in wildfire mitigation is, therefore, not just about preventing fires but also about protecting a utility's ability to operate. By taking proactive measures, utilities can minimize service disruptions and protect their assets, ensuring they remain resilient in the face of growing wildfire threats.

POTENTIAL LOSSES FOR COMPANIES

While economic losses from lawsuits dominate headlines, there are many more immediate and common losses that utilities can suffer:

- Service Disruption

Wildfires can disrupt utility services for extended periods. A large-scale wildfire can result in electricity shutting off for thousands or even millions of people. Shutting off power for safety reasons means that even people outside the danger zone may lose power, negatively impacting the utility's ability to bill for electricity. This can also make the utility liable for business losses when power is cut, and businesses cannot operate.

- Loss of Assets

Wildfires can destroy billions of dollars' worth of assets in just a few days. Lines, transformers, towers, poles, and wires can all be destroyed beyond repair. The loss of assets can cripple a utility, and greatly extend the time it takes to restore power to the community.

- Reputational Damage

While larger companies may survive reputational damage, in areas with higher competition or where companies are small enough to be bought out, wildfires caused by a utility could easily shut a company down. Additionally, a reduction in reliability due to wildfire impacts can negatively affect a provider's local reputation.

COMMUNITY RISKS AND COSTS

Community risks from wildfires can be even more impactful:

- Taxpayer Costs

FEMA and state agencies are often called in to clean up after wildfires. This is a massive financial burden for the government and taxpayers. Wildfire mitigation by utilities, reducing the risk to their equipment can help reduce these costs significantly.

- Natural Habitat

While California's natural habitat often gets the most attention, the loss of habitat throughout the U.S. due to utility-caused wildfires is significant. Wildfires that occur in unpopulated areas still result in the loss of wildlife, habitat, and often valuable timber for the timber industry. Fires may also affect industries like mining and oil exploration.

- Air Quality

For those living east of the Rockies, the last five years have brought several summers where smoke from wildfires burning millions of acres in Canada has drifted hundreds of miles south, blanketing areas with dense smoke. This impacts human health, leading to lawsuits from those suffering from asthma attacks or other breathing issues exacerbated by the smoke. It can also result in federal fines and criminal charges for violations of air quality standards.

- Water Quality

Wildfires release massive amounts of toxins that can enter the water supply of areas far from the fire itself. Ash and other byproducts of wildfires can easily contaminate the water supply of nearby towns.

- Equipment Damage

Blowing ash and particulate matter can clog air filters in buildings, heavy equipment, cars, and other equipment. These costs typically fall on local communities, but as utility-caused wildfires become more publicized, the repair costs may end up being charged to utility companies.

WILDFIRES ARE NATURAL

There have always been wildfires, forest fires, and brush fires. The difference now is that the scale of these fires is often much larger than it used to be. This is exacerbated by a changing climate, which is making many areas much drier, with stronger winds and fewer rainy days than in the past. Forests along both the west and east coasts, which once received regular rain to keep fuel moist, are now experiencing extended drought conditions.

The question for leaders in government and business is, *“Will it cost us less to mitigate wildfires now, or should we wait until a wildfire occurs and pay for everything that happens, including the loss of life?”*

THE ROLE OF VEGETATION CONTROL IN MITIGATION

While upgrading and updating a utility's infrastructure is critical, one of the simplest ways to reduce wildfire risk is by reducing or eliminating fuel. Vegetation control is at the heart of wildfire mitigation. Controlling the amount of wood, grass and other flammable materials around transmission lines can significantly affect a fire's ability to start or spread quickly.

Triggered spark gaps, arcing horns and other parts of transmission lines are designed to spark and transfer energy when needed in microseconds. This can prevent the entire system from being overloaded and avoid the destruction of massive amounts of equipment.

The downside, of course, is that these sparks can ignite fires.

THE VEGETATION CONTROL PROCESS

A well-structured Vegetation Control Process includes multiple integrated factors to help utility organizations plan, prevent, and protect against potential wildfires and the damage they create.

- Risk Assessment

The entire process starts with a risk assessment. Vegetation Control experts evaluate the network, understand the risks posed by the equipment itself, and assess the amount of growth and overgrowth near transmission and power lines. This gives the utility a clear idea of what needs to be done to reduce the proximity of fuel to limit damage to utility assets during fires and to reduce potential for ignitions from utility operations.

- Mitigation Efforts

The next step is to deploy the right people in the field to eliminate fuel. This includes cutting grass, chopping down trees, and removing brush. The goal is to remove all potential fuel and keep it away from lines that could spark and ignite it. This work should not be delayed until a drought. Pole hardware can also be set to automatically shut off power from tree contact if fire is detected in the area. Vegetation should be removed and then maintained over time to prevent regrowth into dangerous conditions.

- Project Overview

It's important that an expert manager oversee the project. This includes someone who understands the specifics of what needs to be mitigated, the scale of the project, and how the work is progressing. Specific locations can be complex in terms of what fuel needs to be removed, how it should be removed, and what needs to happen afterward to maintain it. This requires long-term project management, though not necessarily daily maintenance.

THE CURRENT STATE OF MITIGATION

In California, where wildfires have been endemic for several decades, we are now seeing fewer massive out-of-control fires each year. While wildfires continue to burn in California, fewer of them are caused by utilities. This improvement is due to wildfire mitigation efforts.

California utilities are not only upgrading their infrastructure by undergrounding or hardening lines in high risk areas, improving grid resiliency and upgrading electrical operations, but they are also removing fuel from underneath transmission lines, trimming trees around local power lines and strategically placing wildfire control units throughout the state.

The key to doing this well is analyzing data from a myriad of points. This includes looking at weather patterns, dominant winds, temperature increases, the age and fragility of infrastructure, the types of fuel present, and their likelihood of igniting.

Conducting this level of analysis requires a lot of expertise and uses artificial intelligence and machine learning to gather data from hundreds of sources and compile it into a complete report that guides leadership decisions.

CONCLUSION

In conclusion, it's paramount that utility organizations are fully prepared to combat the inevitable. As wildfires continue to become more prevalent in the entire continental US and beyond, it's more critical than ever to ensure organizations are prepared to address the immediate and long-term ramifications that wildfires create.

KEY TAKE-AWAYS

- Wildfire mitigation is no longer just a West Coast issue – it is now an imminent threat throughout the U.S. that demands immediate action
- The massive fires in California, the terrifying fires in Australia, wildfires raging through the Amazon, and large fires throughout Asia and Africa show us that wildfires on a large scale are becoming a global concern
- Particularly for those utilities east of the Rockies, we have the opportunity to address this problem earlier than their counterparts in California did
- The window to mitigate wildfires is, unfortunately, very small
- Higher temperatures, stronger winds, and changing weather patterns are increasing annually
- 2023 was the hottest year on record globally, and 2024 is on track to break that record
- Each year, as the planet heats up, vegetation dries out, winds strengthen, and the risk of wildfire grows exponentially
- Now is the time to look at wildfire mitigation, even in places where wildfires are uncommon
- By starting immediately, utilities have an opportunity to trade billions of dollars in damages and liability for millions in prevention

ABOUT THE AUTHORS

Mike Tilly, P.E. – Vice President of Business Development

Michael Tilly, P.E., is a seasoned executive in the Electric Power Industry, harnessing a rare blend of strategic foresight, entrepreneurial acumen, and technical proficiency. With over three decades of dedicated service, he brings a rich tapestry of experience spanning capital and resource management, strategic business development, and in-depth knowledge of vegetation management intertwined with power infrastructure. Mike is focused on the strategic development of long-term client relationships in a widely expanded geographic footprint by creating best-in-class service experiences for all of our programs.



Chris Farley - Vice President of Utility Consulting Services

Chris brings 30 years of utility consulting experience across a broad range of areas including asset management, strategy, product development, sales, technical implementation, and analysis. Chris has worked extensively in both the operations and regulatory environments, collaborating with cross-functional teams to identify risk and drive project success. Chris graduated from Boston College with a Bachelor of Arts degree in Political Science.



ABOUT CELERITY

Celerity is an agile risk optimization company that helps public utility organizations convert complex data into precision, actionable intelligence to mitigate risk, optimize assets and maximize project results. Blending extensive client experience with deep vendor-side acumen, Celerity data scientists orchestrate precision data analysis, strategic consulting, and project management services to solve complex energy challenges via acute listening, proactive thinking and relentless grit.



Based in Walnut Creek, CA with remote offices nationwide, Celerity energy engineers perform a critical, leadership role as strategic liaisons between data, assets and the teams that make projects happen in the field.

ABOUT CLEAR PATH

A subsidiary of parent company Celerity, Clear Path Utility Solutions provides world-class construction management, vegetation management, emergency / non-emergency management, quality support and pre-inspections services to utility companies in North America.

Clear Path Utility Solutions orchestrates a critical leadership role between construction companies and vegetation field services, providing advanced emergency and non-emergency response services to help utility companies assess, plan, and execute vegetation projects in the field as they evolve.



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WHY CELERITY / CLEAR PATH FOR WILDFIRE MITIGATION?

Celerity / Clear Path Vegetation Management (VM) expertise, and more specifically Wildfire Mitigation acumen, lies in delivering comprehensive solutions that blend industry-leading practices with innovative strategies to enhance utility operations. These services are based on a holistic understanding of the global needs of the utility and can provide a multiplier effect on reliability and cost-effectiveness for downstream activities.

- Industry veterans with 30+ years of experience from both inside the utility and contractor sides
- Advanced analytical approaches based on state-of-the-art data collection and analysis
- Commitment to safety and regulatory compliance using industry benchmarks
- Innovative emergency response strategies based on hard-won experience in critical situations
- Data-driven decision-making and reporting systems using cutting-edge software

Feel free to contact Mike Tilly at m.tilly@clearpathutilityconsulting.com for additional insights and strategic recommendations on to arm your utility organization with the intelligence it needs to combat wildfires and the damages they levy.

For additional information on Celerity / Clear Path Utility Solutions services and expertise, feel free to visit us at <https://www.consultcelerity.com/utilities-vegetation-management/> to take a deeper dive.