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Volume 14

Number 1

UTILITY ARBORIST NEWSLINE

FOCUS ON VEGETATION INDUSTRY PERSPECTIVES

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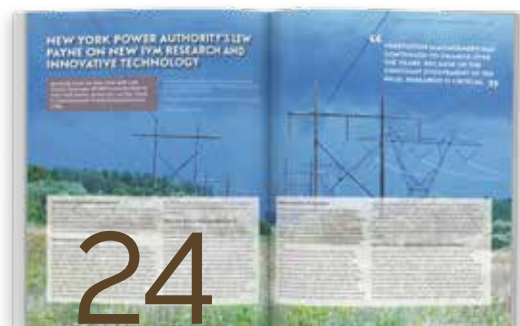
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Turn to **page 20** to learn how urban foresters with competing priorities can collaborate in shared spaces.

Turn to **page 24** to learn about New York Power Authority's new IVM research and technology.



Part 2 of the UAA 2022 UVM Summit continues on **page 44**. Learn about remote sensing and AI in vegetation management.

This is a list of common industry terms and acronyms frequently used in this magazine.

Artificial Intelligence (AI)
Best Management Practices (BMPs)
Diversity, Equity, and Inclusion (DEI)
Environmental Protection Agency (EPA)
Environmental, Social, and Governance (ESG)

Federal Energy Regulatory Commission (FERC)
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President's Message



Tim Walsh

WE GROW
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WHEN WE
SEEK INPUT
FROM
OTHERS.



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How do you describe what you do professionally to family and friends, or people you sit next to on an airplane? Our perspective of professional vegetation management is perpetually shifting, as it should. Think back to your mindset pre-pandemic, five years ago, or even 15 years ago and how it has evolved. Imagine how you might describe it by the time you retire! Our own viewpoint is shaped by the people we surround ourselves with, what aspects of VM we focus on, and the curveballs the world throws at us.

We tend to focus primarily on the things that are right in front of us daily, and this shapes our perspective. We can get lost in our own little worlds, often surrounding ourselves with others who think the way we do. While this isn't always bad, it can create "echo chambers" where we only hear things we already believe.

In this edition of the *Newsline*, we are thinking about perspectives of and in our profession. I believe that the external and internal views are linked. One of the many strengths of the UAA is the diversity of perspectives that our membership, staff, volunteers, and board members represent. Diversity has always been important, but even more so as we are coming out of the COVID-19 pandemic. The last few years have caused us all to become aware, painfully at times, of how uncertain the world is.

The acronym often used in Human Performance Improvement (HPI) is VUCA: volatility, uncertainty, complexity, and ambiguity. While the world has always been uncertain, the pandemic has shown us how "VUCA" things can be. Diversity *always* has had value in our organizations, but in times of extreme uncertainty—like we are still living—it is essential. We want diverse perspectives and opinions. Diversity of perspective comes in many forms. We focus on ensuring that we have true cultural diversity, inclusion, equity, and justice in our organizations, which provide varied perspectives and opinions. This topic

deserves continuous attention that we must always keep in the forefront of our minds.

We should also seek input from every level of our organizations and profession. Varying levels of experience, different positions, and different ways of thinking combine to provide a broad range of information and allow for better decisions. One of the key concepts of HPI is seeing the field-level craft workers as problem solvers. The old view of safety was that the employee was the problem needing to be fixed. We want to involve all levels of our organizations in creating sustainable solutions.

These concepts also apply to the UAA and the entirety of our profession. While many of us have likely spent most of our careers focused on one aspect of professional VM, we are stronger when we seek input from others. Within the UAA, we see this strength on our board and in our committees. We have representatives from contractors, utilities (IOUs, co-ops, municipalities), academia, consultants, and researchers all working together to advance the mission of the UAA.

If we only look to others like us for solutions—those who look like us, act like us, speak like us, and have the same education, experience, and interests as us—we are creating a professional echo chamber. We need to embrace the many varied perspectives that we have within professional VM, listening outside of our group as well. This is one reason why we have built and should maintain strong relationships with other green organizations, such as the Arbor Day Foundation, the ISA and its chapters, the Tree Care Industry Association, American Forests, and many others.

I challenge us to incorporate as many perspectives into our thought processes and decision-making as possible. While we don't always have to change what we do based on other views, opinions, and perspectives, our outcomes will be better when we do. 🌱

“Think back to your mindset pre-pandemic, five years ago, or even 15 years ago and how it has evolved. Imagine how you might describe it by the time you retire!”

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Executive Director Message



Dennis Fallon

Last October, the 13th Environmental Concerns in Rights-of-Way Management Symposium—one of my favorite events because of its diversity—had just concluded in Charlotte, North Carolina. Participants came from at least four continents with research topics as diverse as the audience. It seems fitting to write about this conference for the *Newsline* issue that focuses on vegetation management industry perspectives.

The ROW Symposium, first started in 1976, has two objectives: “To present a forum for discussion of the environmental impacts which result from siting, constructing, using, and maintaining ROW. A second objective is to draw together and publish practical information about ways to reduce those impacts and develop multiple uses of ROW which cross rural areas.” When you think about potential impacts, there is very little that does not fit under this large umbrella. This has to do with *everything* we do at work and *everyone* we meet while we are doing it. Because of the broad umbrella, the ROW Symposium draws some fantastic perspectives.

The proceedings began with representatives of the Catawba Nation, who taught the audience some of their language, gave insights on how they culturally interact with the environment—incorporating corridor management—and shared a friendship dance with the audience. By implementing IVM in the corridors near tribal lands, plants once bountiful on the Piedmont savannah are now found almost exclusively in the areas where early successional plant communities are maintained. These plants are important to the Catawba Nation's traditions, and managing early successional plant communities is an important part of the local utilities' maintenance programs.

Harry Sideris (Duke Energy) was the keynote speaker and emphasized how ROW are a utility's asset and should be managed as such. Sideris described the industry's journey to carbon-free emissions by 2050, including how society will achieve this. Most of us will be retired by 2050, yet our current actions, interactions, and decisions will have an impact on the outcomes associated with the efforts to get society to carbon-free power—an entire generation away. Thinking about work-decision impacts across an entire generation can reframe perception. We go from measuring outcomes of single tasks to encapsulating careers' worth of task outcomes that compound.



A Catawba Nation representative led the audience in a friendship dance, signifying collaboration and camaraderie in an ever-changing world.

The ROW Symposium brought science and research from many areas, including discussions about advancing technologies and applying them to manage ROW that historically have not been in the UVM space. Research is showing the tested applications may improve accuracy and add efficiencies. One application that I found extremely interesting was applying the use of detector dogs with trained handlers to aid in locating threatened and endangered species in corridors before maintenance crews begin work.

Questions were posed from a discussion I had that will likely drive some UAA committee work this year: what impact does the defining narrative on a task have on the individual taking it on, and how does that narrative impact their outlook on their role?

For example, someone's task is currently described as “Treating as many noncompatible plant communities as possible.” If that description is reframed to “Identifying as many compatible plant communities as possible and treating the site to encourage more of the compatible plant communities through maintenance activities,” how does the latter impact how the worker feels about their role?

At face value you might be thinking *Why does asking such a philosophical question about a worker with a backpack sprayer matter so much?* Think about the impact from one's outlook on their role. Will this person tell their friends to come work here too? It is clear that we can attract more workers into our space if our current workforce understands the positive impacts of their role along with the tasks they perform in that role.

I've heard that someone's perception is their reality, and perspectives frame perceptions. This simple observation is powerful once we are willing to think objectively. Perspectives can be divisive if we allow ourselves to be subjective in analyzing data. The ROW Symposium series is the place to prove out perspectives through research and demonstrative trials. The next will be held in the spring of 2026 in Vancouver, Canada. You have three years for travel arrangements or, if you are so inclined, write a paper, present your findings, and publish in the peer-reviewed proceedings. See you there! 🌿

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Summit Committee Update

*By Adam Johnson, Chairman; Contract Manager,
Transmission Vegetation Strategy and Execution;
Duke Energy Corporation*

The Utility Vegetation Manager's Summit Committee continues to focus on UVM industry challenges by pursuing critical topics of emerging issues and developing recommendations for best management practices. These discussions provide collaboration among participating utility vegetation managers for a global perspective on impacts to program success and potential resolutions, based on research and application of techniques. In an effort to address some of the well-known topics among the UVM community, the 2022 Summit topics included:

- UVM workforce recruitment and retention
- New technologies and innovations in remote sensing and advanced planning
- Wildland fire prevention and mitigation techniques

The team has also provided a three-part series of articles related to each topic and potential best practices as proposed by our forum of industry leaders, the second of which may be found in this issue.

As we close the chapter on 2022, the committee is actively preparing for the 2023 Utility Vegetation Manager's Summit, hosted by FirstEnergy. We hope you will join us in Akron, Ohio, May 16–18, 2023. The following topics of interest are currently being considered.

Safety of Lone Workers

UVM is comprised of certain activities that require individuals to work alone in remote locations, which provide specific challenges for worker safety. Regardless of the location, these individuals may also incur hazardous situations that arise from hostility towards them, their company, or the represented utility. Understanding the requirements to protect these lone workers and innovative mitigation techniques or applications is vital to program success and worker safety.

Tree Failure Reporting: The Need for Consistency

Regulatory compliance can require standard reporting requirements for vegetation-related outages across the transmission electric utility grid. However, certain benefits may be possible with the establishment of consistent reporting structure and language across the U.S. for all voltage circuits.

Mechanized Equipment Innovations: Offsetting Industry Labor Challenges

As the business world continues to struggle with labor shortages and the impacts to safety, productivity, and financial performance, mechanical equipment innovations offer a variety of benefits to fill the gaps. We look to explore



the pros and cons of modernized equipment utilization to increase efficiency and reduce the need for manual applications.

UVM Program Funding: Solutions for Present and Future State

Modern socioeconomic challenges have required just about every individual and business to “do more with less.” UVM programs have been impacted by this mantra as we continue to operate among the modern landscape and improve grid reliability while navigating funding and resource constraints.

Remote Sensing and Advanced Planning: Update from the 2022 Summit

As a popular topic across UVM programs, technological solutions for work planning efficiency have been explored by managers around the globe to include predictive modeling, remote sensing, and other AI applications. The team plans to revisit this discussion from our 2022 summit to provide additional information and updates for how these applications continue to add value to maintenance programs.

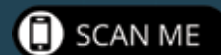
The Summit Committee has not been immune to the standard practice of “change” within our industry. With a new chairman, champion, and new faces on the committee, the only static characteristics seem to be those concerning issues across the industry—and the desire to provide awareness of mitigation techniques and potential resolutions. After a successful term as the UAA Champion and Past President, Paul Hurysz has moved on to the next challenge in his career path. Hurysz's leadership, dedication, knowledge, and thought-provoking character will be greatly missed among our team. With his vision for innovation and safety, there's no doubt that Hurysz will continue to impact our industry in a positive manner. As he departs, we would like to welcome Brandon Hughson as our new UAA Champion for the committee. Hughson is no stranger to UVM industry challenges and serves as the president of Growth Solutions based in Minnetonka, Minnesota. We look forward to benefitting from his knowledge and contributions in the future! 🌱



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▲ A presenter from the Catawba Indian Nation discussed the importance of the plant communities in their area and the history regarding how they managed the flora and fauna with prescribed fire.



▲ The Catawba Indian Nation sharing a friendship dance with attendees.



The Environmental Concerns in Rights-of-Way Management 13th International Symposium

On October 9–12, 2022, the 13th International Symposium on Environmental Concerns in Rights-of-Way Management (ROW13) was held in Charlotte, North Carolina. This event included 336 industry practitioners from around the world, representing diverse backgrounds such as environmental, operations, academia, industry, sustainability, permitting, technology, and the regulatory community. The symposium was comprised of presentations, discussion sessions, and exhibits of the latest technologies and research to achieve the environmental goals of industry practitioners. Additionally, ample time was allocated throughout the symposium for participants to reconnect and network, given the long hiatus since the previous symposium due to the pandemic.

Originated in 1976, this symposium series continues to highlight how we can meet the needs of our growing population that puts significant demands on infrastructure and our natural resources. We are challenged with constructing, operating, and maintaining these ROW in a safe and efficient manner while minimizing the environmental impact associated with these activities. When done properly, these ROW can not only serve their intended purpose but also provide ecological benefits.

The symposium began with a Sunday field tour, hosted by Duke Energy, in which more than 70 participants were able to visit the Latta Nature Preserve, McGuire Nuclear Station Switchyard and adjacent transmission and distribution lines, and the Cowans Ford Hydroelectric Station. During the tour, participants learned from Duke Energy and Mecklenburg County SMEs about their

VM program, stakeholder engagement process, commitment to environmental stewardship, energy generation, and delivery. Participants visited ROW that are actively being managed, in partnership with various stakeholders, for rare and threatened plant species, such as the Georgia aster (*Symphyotrichum georgianum*) and Schweinitz's sunflower (*Helianthus schweinitzii*).

The symposium opening remarks were delivered by Dennis Fallon (UAA Executive Director), Travis Rogers (ROW13 Chair), and Tom Johnson (the local chair), followed by an interactive history lesson on the Catawba Indian Nation who, according to archaeological records, have inhabited the area along the Catawba River for more than 5,000 years. Additionally, the presenters from the Catawba Indian Nation discussed the importance of the plant communities in this area and their spoken history regarding how they managed the flora and fauna with prescribed fire.

Harry Sideris (Duke Energy) provided the keynote address, during which he shared an overview and background on Duke Energy and discussed some of the pending challenges and opportunities facing Duke and the industry in the future. Following the keynote, the opening plenary panel—consisting of Randy Veltri (Duke Energy), Lea Millet (EPRI), and David Butler (Cahaba Riverkeeper)—was designed to represent different and unique perspectives related to the siting, construction, use, and maintenance of ROW.

On day two of the symposium, an academia panel, featuring Dr. Carolyn Mahan (Penn State University), Ben Ballard (SUNY), Chris Halle (Sonoma State), Gabe Karns (Ohio State), and Kim

Russell (Rutgers University), highlighted their areas of ROW research, followed by a panel discussion on how to initiate and develop effective partnerships with the industry. On the final day, the plenary consisted of a fireside chat with Amy Huber (Jacobs) and Cathy Hope (Duke Energy), where they discussed their thoughts on the future of ROW development and operations, and where we go from here.

At this year's symposium, both academia and the industry provided 54 presentations within the following focus topics: indigenous engagement and stakeholders; ecology; planning/evaluation and assessment; VM; technology; regulatory and permitting; and reclamation, mitigation, and restoration. Each abstract submission and corresponding paper underwent a comprehensive peer-review process. A special thanks to all of the authors for their extensive work and to the peer reviewers who unselfishly committed time to ensure the high quality of papers you'll find in the proceedings. Thank you to the Program and Steering Committees for your leadership, countless hours volunteered, and guidance, along with the UAA in making the ROW13 Symposium a meaningful event.

In today's social climate, the environmental concerns related to ROW establishment and management are rapidly evolving. This symposium is the perfect venue to bring leaders from industry and ROW research together to share, discuss, and learn how best to meet the growing energy and transportation demands while ensuring we're protecting and enhancing our natural resources for generations to come.

Join us at ROW14, taking place in spring 2026 in Vancouver, British Columbia, Canada. 🌱



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Taking a Proactive Approach to Industry Trends and Challenges

The confluence of environmental changes, weather-related events, destructive wildfires, increasing regulatory scrutiny, knowledge gaps from generational workforce turnover, and consumer demand for higher levels of engagement and service have made the utility sector's business environment more complicated than ever. In turn, utilities are struggling with public perception while simultaneously seeking to optimize operations and maintenance costs and improve employee safety, system reliability, and customer experience.

The most proactive utilities and consultants will prove the most successful in these turbulent and unpredictable times. That requires taking a holistic approach to vegetation management programs (VMP) and a hard look at resource optimization, infrastructure, and internal and field operations—in addition to using appropriate technology to support their efforts whenever possible.

There's simply no standing put anywhere within the utility ecosystem. To stay relevant, today's VMP providers must meet current challenges, while anticipating, monitoring, and responding to emerging trends. They must support and foster transparency, integration, and accountability, as well as agility and flexibility. To that aim, ARBORMETRICS is continuously improving our software and services by:

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- Protecting and managing pollinators and their habitats
- Taking a leadership position in everything from employee engagement to technology enhancements to safety fleet management

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Safety Tools



By Craig Kelly, Editorial Committee
Champion, UAA Board of Directors



Stay tuned for more
Safety Tools columns
throughout this year
in every issue of the
Newsline.

Safety is a core value to the UAA. We consider it just that: a value more than a priority. Priorities can change frequently but values like safety should never waver.

The *Newsline* Editorial Committee continues to come up with new ideas to improve the publication. This year, there are a few changes and additions to expand the magazine, and I'm hopeful you'll see the value of these. Since safety is a core value at the UAA, the committee decided to begin each issue with a safety message, beginning in this January/February 2023 issue. This first installment of "Safety Tools" revolves around general safety and its overall importance, where subsequent messages will be focused on the specific theme of each *Newsline* issue.

I've known some folks who, at one point, considered safety boring. But for many of these folks, safety has become one of their main concerns over the last decade. They now recognize the importance of how keeping the workplace safe has a significant and direct impact on many key performance indicators, such as fewer incidents resulting in fewer occupational health costs, reduced downtime, reduced retraining time, and improved employee retention and satisfaction. We as workers appreciate safe working environments, which is a sign that

our employers care about our well-being.

Some of the same people who were previously bored had felt that safety came after productivity, not recognizing the financial impacts safety has on an organization. Recently, the Workplace Safety Index from Liberty Mutual reported that companies could see upwards of a \$4 ROI for every dollar spent on a workplace safety program. This really shouldn't surprise anyone leading a company, since the company could experience serious economic troubles if employees were injured, or worse, killed on the job (the exact reason the Occupational Safety and Health Act is in place). Serious legal and financial troubles loom following a serious injury or fatality (SIF).

Looking at it through a different lens, statistics show that productivity is a byproduct of being safe, not the opposite! Eliminating or decreasing workplace hazards have proven that employees stay invested in their task and do their best work.

It's all about having a good **safety culture** and **safety climate**, and that's what we all deserve. One might ask, *What's the difference?* A safety culture is formed by attitudes, theories, ethics, procedures, and rules made of what is considered appropriate and/or undesirable. The culture specifically focuses on how safety is thought of in an organization and whether it's a value or not. Safety climate is the direct reflection of the *health* of the safety culture—more how to measure the culture. It tells us what we need to know to tighten our operations and reduce preventable losses.

Let's make sure that we have a safety culture and climate that protect our professional arborists, tradespersons, individual contributors, and management. We owe it to ourselves, and most importantly, we owe it to them and their families. 🌲

“

**ELIMINATING OR
DECREASING
WORKPLACE
HAZARDS HAVE
PROVEN THAT
EMPLOYEES STAY
INVESTED IN THEIR
TASK AND DO
THEIR BEST WORK.**

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DEVELOPING THE UVM INITIATIVE

By Lawrence J. Kahn; Professor, Distinguished Research Fellow, Director of the UVM Initiative; Tulane University Law School

At its heart, utility vegetation management is dedicated to saving lives and property. The safe and reliable delivery of energy is heavily dependent upon successful UVM operations.

According to studies conducted by the Arbor Day Foundation and the University of Nebraska, UVM is a \$10 billion a year industry in the U.S. alone, nearly half of which is spent in California. Each state in the U.S.—plus its territories—has its own public utility commission that regulates UVM activities. At the federal level, FERC and NERC also have governance over UVM activities. Additionally, the Department of Energy and several other agencies, including the Fish and Wildlife Service, the EPA, the Forest Service, and many other land management or safety-related federal agencies (as well as their state-level counterparts), all have oversight over UVM activities.

When trees conflict with utility lines, as anyone in the UVM space knows, disaster can follow quickly. Each year, billions of dollars in damages and lost productivity occurs from wildfires and severe storm-related outages stemming from conflicts between trees and powerlines. Generally, these losses produce lawsuits against utilities, who are also dealing with numerous other tree and powerline-related legal challenges. PG&E's \$71 billion bankruptcy in 2019—the nation's fifth-largest bankruptcy and third-largest non-bank-related bankruptcy—was the direct result of a tree and powerline issue that led to one of the most disastrous wildfire seasons on record.

Despite the huge dollar values involved in contracts, the massive amount of regulatory activity, and the numerous lawsuits, there is a surprising lack of legal expertise on the subject of UVM. That's not to say that there aren't any lawyers involved—there are in fact several very talented attorneys who provide service to the UVM industry. However, all of these attorneys, until recently, have been self-taught. There have been no continuing legal education courses dedicated to UVM law and policy, nor a single course taught at any law school anywhere in the world on this subject. Until now.

With the help of Stephen Cieslewicz, one of the best-known names in UVM, Tulane Law School's internationally renowned programs in environmental law and energy law recognized this gap and developed the Tulane Law School Utility Vegetation Management Initiative (UVMI) in December 2020. The purpose of the UVMI was to develop an organized method of holistically studying UVM law, practice, policy, and procedure. I was named the director of this initiative to develop and establish the program of study and how to mentor and attract talented law students to learn this area of the law, helping them disseminate information that they develop. The overall plan was to prepare students entering the practice of law with enough knowledge to be able to capably assist government, utilities, the industry, academia, and nongovernmental organizations and to simultaneously develop an understanding of UVM law as a distinct area of practice. This mission was accomplished during winter break 2020 while using MS Teams, Zoom, WebEx, and other virtual tools and methodologies as a result of pandemic-related travel and gathering restrictions. These efforts were supported with a generous unrestricted grant from Asomeo Environmental Restoration Industry, LLC (AERI), a California-based company that provides UVM services.

We began with a three-phase approach:

1. Teach the students UVM from the best minds in the industry.
2. Initiate student-led research compiling all of the UVM laws, regulations, ordinances, and rules across all of North America and present their findings at international conferences.
3. Engage the students in co-authoring law review-style papers on important issues in UVM.

Four students were selected for the first class during the 2020–2021 academic year. They learned about the UVM industry and its challenges from stalwarts such as Steve Cieslewicz (co-founder of CNUC, principal investigator of the 2003 Northeast Blackout, and Past President of the UAA); Dr. Phil Charlton (then Executive Director of the UAA); Attorneys Randy Gimple (Carlson Calladine & Peterson), Richard Finn (Burnham Brown), and Dan Altman (Oncor Electric); Dan Lambe (President of the Arbor Day Foundation); Professor John Ball (South Dakota State University and committee leader for ANSI Z133 2022 update); Hon. Paul Kjellander (President, Idaho Public Utility Commission and President of NARUC); Alison Silverstein (Director, American Counsel for an Energy-Efficient Economy); utility arborists Loren David (now with PG&E) and Clark Maki (AERI); public advocate Edith Lee-Payne; and many others.

The first class of students' research papers were extraordinarily ambitious, with targeted publishing in early 2023. Three students had the opportunity to present their preliminary findings on both the compendium and their independent research at international conferences (held virtually) in Canada at both the Professional Vegetation Managers Association and the Integrated Vegetation Management Association conferences, while the fourth student had the opportunity to present his findings at the 26th Annual Energy & Environmental Law Summit later that year.

Three of those students have gone on to practice in UVM (including one former student who is now the policy advisor to the Public Utility Commission of Texas), while the fourth student from that class is being considered for a clerkship opportunity with a federal judge upon graduation.

This pattern was continued the following year of the program with eight students. These students have all worked on amazing independent research projects and are likewise rounding the corner on completing their papers. Many have had the opportunity to travel—with thanks to a generous grant from Essential Vegetation Management Services, LLC—to attend major industry conferences to present their research findings. The following are the students' research projects and where they were (or will be) presented.



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Ryan Anderson (J.D. 2022): "OSHA Needs to Take a Leading Role in Improving Safety in the UVM Industry"

- International Professional Vegetation Managers Association Spring Conference (Edmonton, Canada—March 2, 2021)
- International Integrated Vegetation Managers Association Spring Conference (Winnipeg, Canada—May 8, 2021)

Timothy Brannan (2L): "Resolving Avian Issues in Siting Wind Energy Projects"

- ROW Sustainability Summit (Penn State—June 28–30, 2022)
- ROW Sustainability Webinar (Tulane—November 2022)
- 13th International Symposium on Environmental Concerns in Rights-of-Way Management (North Carolina—October 9–12, 2022)
- Trees & Utilities (TBD—2023)

Garrett Clark (2L): "Opportunities for UVMI Collaboration Between Municipal Utilities and Sister Agencies in Municipal Government"

- Trees & Utilities (TBD—2023)

Michaela Fonte (LL.M. 2022): "Understanding the Link Between UVM and Economic Infrastructure Investment in Developing Nations"

- Trees & Utilities (TBD—2023)

Corinne Geekie (J.D. 2022): "Social Justice Concerns in UVM: Providing Canopy Cover in Disadvantaged Neighborhoods"

- International Professional Vegetation Managers Association Conference (Edmonton, Canada—March 2, 2021)
- International Integrated Vegetation

Managers Association Spring Conference (Winnipeg, Canada—May 8, 2021)

Cheri Hasz (J.D. 2021): "Is Texas Best for Business? Texas Can Achieve Better Reliability Without California-Style Regulation"

- International Professional Vegetation Managers Association Conference (Edmonton, Canada—March 2, 2021)
- International Integrated Vegetation Managers Association Spring Conference (Winnipeg, Canada—May 8, 2021)

Cassandra Hemmer (2L): "Do Trees Have Legal Standing?"

- ROW Sustainability Summit (Penn State—June 28–30, 2022)
- ROW Sustainability Webinar (Tulane—September 2022)
- Trees & Utilities (TBD—2023)

R. Michael Herman (3L): "The Rise of the ESG Statement: Opportunities for Electric Utilities to Capitalize on Successful UVM Programs"

- ROW Sustainability Summit (Penn State—June 28–30, 2022)
- ROW Sustainability Webinar (Tulane—September 2022)
- Trees & Utilities (TBD—2023)

Alexandra Keiser (3L): "The Case for Rural Electric Cooperatives to Utilize UVM to Fund Conversion to Clean Energy Solutions"

- ROW Sustainability Summit (Penn State—June 28–30, 2022)
- ROW Sustainability Webinar (Tulane—September 2022)
- Trees & Utilities (Milwaukee—September 20–22, 2022)

Lakshmi Kumar (2L): "20 Years On: Lessons Learned from the North American and European Blackouts of 2003"

- Trees & Utilities (Milwaukee—September 20–22, 2022)
- 13th International Symposium on Environmental Concerns in Rights-of-Way Management (North Carolina—October 9–12, 2022)

Charles Lally (3L): "Understanding Wildfire Mass Tort Litigation"

- Trees & Utilities (Milwaukee—September 20–22, 2022)
- 13th International Symposium on Environmental Concerns in Rights-of-Way Management (North Carolina—October 9–12, 2022)

Steven Moctezuma (3L): "A Proposal for Resolving Small Claims in UVM"

- 26th Energy & Environment Law Symposium (Tulane—March 2022)

Additionally, the UVMI is undertaking research on a wide variety of other topics, including:

- CapEx vs. OpEx for UVM
- Demarcations of responsibility
- Rule of 70 to guide work allocation
- Use of satellite technology to guide better UVM practice
- Use of satellite technology to resolve social justice challenges
- Pollinator protection policies

The UVMI is extremely grateful for the generous support and guidance it has received from its panel of expert advisors.

To submit requests for research assistance or for more information on the Tulane UVMI, please reach out to Lawrence J. Kahn at LKahn4@Tulane.edu. 📧

TEK and Cultural Burning

By M.K. Youngblood, Safety Manager, ACRT Pacific

Vegetation management is always evolving. Early in America, indigenous communities managed their ancestral lands in a variety of ways. For thousands of years prior to colonization, fire was integral to many indigenous people's way of life. Indigenous people, on what is now called Turtle Island (North America), used fire to travel, manage the land for cultivation of fauna (animal life) and flora (plant life), hunt game, and more. Fire was a tool that promoted ecological diversity and reduced the risk of catastrophic wildfires—something many states are seeing an increase in, specifically on the West Coast. With the new business of wildfire season seemingly being year-round, it appears new—or rather, old—techniques need to be used to combat this.

There are some new terms being used in VM regarding this practice: traditional ecological knowledge (TEK) and cultural burning; periodically, they go together. TEK is defined by the U.S. National Park Service as the ongoing accumulation of knowledge, practice, and belief about relationships between living beings in a specific ecosystem that is acquired by Indigenous people over hundreds or thousands of years through direct contact with the environment, handed down through generations, and used for life-sustaining ways. This knowledge includes the relationships between people, plants, animals, natural phenomena, landscapes, and the timing of events for activities such as hunting, fishing, trapping, agriculture, and forestry. It encompasses the worldview of a people, including ecology, spirituality, human and animal relationships, and more. In stark contrast to Western society science, TEK uses more holistic and inclusive beliefs.

Many indigenous communities and tribes use traditional cultural burning practices with TEK to cultivate their lands. This typically uses a small, controlled fire to provide a needed result monitored by a tribal burn boss or traditional practitioner of fire. The U.S. Forest Service has seen the value of these traditional fires and has adopted some of the uses in clearing ladder fuels from heavily forested areas that are at risk of a catastrophic fire, and many other entities are taking notice. According to Frank Kanawha Lake (research ecologist with the U.S. Forest Service and wildland firefighter and descendant of Karuk, a tribe in Northern California), "Cultural burning links back to the tribal philosophy of fire as medicine. When you prescribe it, you're getting the right dose to maintain the abundance of productivity of all ecosystem services to support the ecology in your culture" (Roos 2020). Most cultural burns use low-intensity fire to aid in burn recovery, as seen in **Figure 1**. This creates a manageable

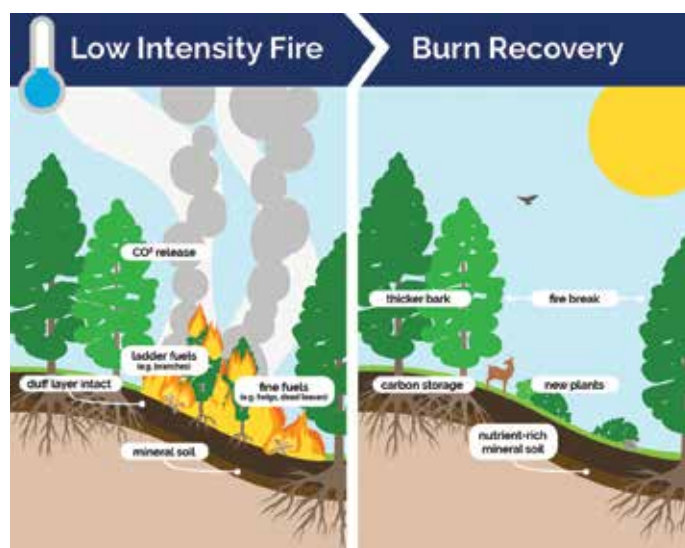


Figure 1. Image courtesy of ACRT Services.

fire and allows for better burn recovery.

The low-intensity fire cultural burning occurs when conditions are best: cool, moist, and low wind speeds. However, depending on the specific vegetation targeted for cultivation, it may occur in various months. Some of the most critical aspects are that the fuel load needs to be low and lit on a high incline to force the fire to work slowly downhill to prevent the fire from fuel loading uphill and blowing up into a monstrous, uncontrollable fire—not unlike the Hermits Peak Fire in New Mexico set by the U.S. Forest Service, which escaped containment and caused millions in damage.

High-intensity fires differ due to the damage that the fire does, wiping out the duff and creating hydrophobic soil which can create erosion issues, mudslides, and flash flooding issues (**Figure 2**). Indigenous peoples knew this and thus managed their lands with TEK, passing down that traditional knowledge through many generations to today. Currently in the Central Valley of California, there is a resurgence of TEK usage and cultural burning thanks to North Fork Mono tribal elder Ron Goode, who has decades of cultural burning experience, and the next generation of tribal burn bosses like Ray Gutierrez, a Wuksachi tribal member who has advanced degrees in forest ecology. Gutierrez is merging his traditional knowledge with academia to help cultivate gathering materials such as redbud

PHOTO COURTESY OF ACRT

**“The leader has to set the example.
And if they set a good example, then
people will follow and be successful.”**

Bladimir Cardenas Jr.

LEWIS

Front Line
LEADER

There's a difference between a boss and a leader, according to Bladimir Cardenas Jr. "A boss commands respect – a leader earns it." Blad has been a General Foreperson at Lewis since 2017, and in that time, he's earned the respect of his crews through leading by example.

Blad is one of the many General Forepersons here at Lewis who lead our front line every day. We celebrate their contributions to innovation, safety, and operational excellence. Follow us on LinkedIn to hear more of their stories.

<https://www.linkedin.com/company/lewis-tree-service-inc>



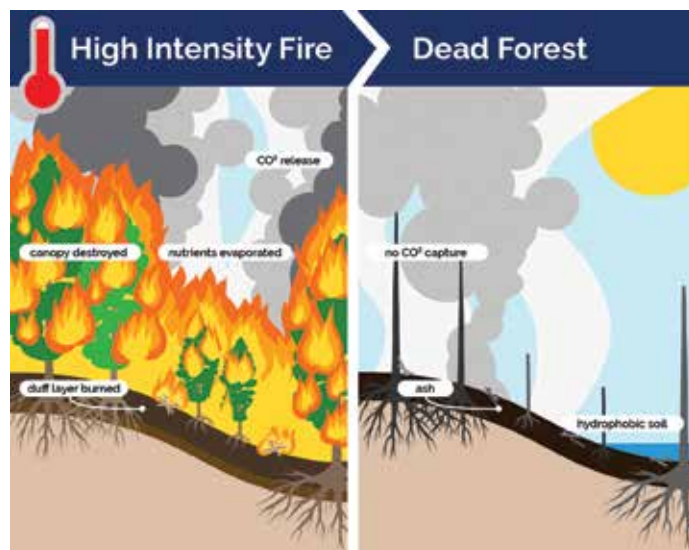


Figure 2. Image courtesy of ACRT Services.

(*Cercis occidentalis*) and sourberry (*Rhus trilobata*). According to Mono elders, sourberry sticks, which are used for basket making, need to be cultivated with fire otherwise the plant grows up bushy and the shoots grow crooked, unsuitable for basketry. Mono elder Julie Dick Tex stated, "A gentle fire clears the brush, regenerates the plant, and coaxes new shoots straight toward the sun."

What does this mean for VM, one might ask? A well-balanced approach to the future of our industry is the answer. By utilizing indigenous best practices and Western science—acculturating the best of both—the industry will become more resilient and foster mutual respect for tribal and non-tribal knowledge. Cultural burning and TEK can be summed up with one quote by Mono elder Ron Goode, "There's a difference between cultural burning and just setting fire on the land. We use fire as a tool" (Kerlin 2022).

Sources

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Roos, Dave, "Native Americans Used Fire to Protect and Cultivate Land," History. com. September 18, 2020, <https://www.history.com/news/native-american-wildfires>.

About the Author

M.K. Youngblood serves as the safety manager at ACRT Pacific. He has more than 30 years of public service and first responder experience with core proficiency in American Indian law, American Indian culture, and disaster cleanup. Youngblood also serves as a certified instructor for the U.S. Department of Energy (National Nuclear Security Administration and Center for Radiological Nuclear Training), U.S. Emergency Management Institute, and Center for Domestic Preparedness. He holds a Bachelor of Science degree in emergency management and a Master's degree in public administration, both from Concordia College, in Moorhead, Minnesota. ☸

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Tracy Barefoot

Putting Customers First: TRACY BAREFOOT

At ACRT, we have grown our business by taking care of people. That means a strong commitment to our customers and the customers they serve. It also means a culture where we train and grow our team to support our customers.

ACRT Consulting Utility Forester (CUF) Tracy Barefoot recently received a Going the Extra Mile (G.E.M.) Award for her contributions resulting in exceptional customer service. She was nominated by ACRT Operations Manager David Leary.

Before starting a project that would require taking crews through a Fall Creek Highway entrance in Texas, Barefoot contacted the customer to outline her plan of taking one crew through the entrance at a time to minimize congestion. She also identified a location approximately one mile away from the entrance where all the crews could safely be staged to review the job details for the day.

"Tracy Barefoot has established a solid working relationship with our customers and coordinators as a reliable representative for the utility in resolving customer service matters and exceeding expectations in her field performance in coordination with contractor tree crews. From the customer's perspective, Barefoot has positioned herself to be indispensable to the vegetation management program," said Leary.

A contract manager for the customer thanked Barefoot for her time and effort on the project. They shared, "Thanks for your extra time and effort on this. Not to mention all the work you have done for the co-op in all the other areas you are working in. The co-op is a better place because you're here. Just wanted to let you know how much you are appreciated here."

People like Tracy Barefoot are the key to our success at ACRT. Learn more about our family of customer-service-minded employees at acrt.com/careers. ☸

MANY
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COMMUNITIES
AND TRIBES USE
TRADITIONAL
CULTURAL
BURNING
PRACTICES
WITH TEK TO
CULTIVATE
THEIR LANDS.



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BEYOND SILOS:

How Urban Foresters with Competing Priorities Can Collaborate in Shared Spaces

By Kieran Hunt, Municipal Manager, Asplundh Technical Services

Urban forests, such as that of Branch Brook Park in Newark, New Jersey, span landscapes, borders, watersheds, and public to private spaces, bringing together multiple urban foresters and stakeholders for planning and management. Photo courtesy of Kieran Hunt.

Reprinted with permission from *City Trees*, the magazine of the Society of Municipal Arborists.

When someone mentions an “urban forester,” I picture a municipal or consulting arborist who is the “arborist of record” for the town: the person responsible for determining whether a tree presents excessive risk that needs to be addressed. More precisely, though, that person stewards populations of urban trees on a forest scale. Managing for species and age diversity, resilience to storms, equitable distribution of aesthetic and environmental benefits, and other forest population dynamics are what separates the urban forester from arborists and other professionals.

By that definition, however, there are often several urban foresters operating in the same area: municipal foresters, utility foresters, urban natural area managers, community foresters, and watershed stewards are urban foresters who may have overlapping management areas. Each one of these has to be a skilled juggler, coordinating with multiple stakeholders, managing conflicting priorities, and dealing with unexpected circumstances. The skilled urban forester will navigate this maze while prioritizing the needs of the people and trees in their communities.

Overlapping management areas can lead to tension and conflict between natural resource managers. How we navigate these conflicts has a lasting impact on the urban forests we manage and the communities of people living in them.

COMPETING PRIORITIES

At the beginning of my career, I worked for a small consulting company whose services focused on urban forest management planning, tree inventory and mapping, protection and

mitigation planning for construction near trees, and training for tree care and urban forest management. We were also the arborist of record for several municipalities, and I enjoyed helping communities plan for the future of their urban forests and documenting their present state. This type of planning work brought me into contact with numerous stakeholders and natural resource managers working and living in the communities I served—and we did not always see eye to eye.

Common disagreements centered around species and site selection, clearance pruning, whether trees should be removed, and where to focus limited resources to maximize urban forest benefits. When I focused on the situation and the professional I was working with, it was difficult to find a path forward. I found the most success if we focused on the stakeholders each of us represented and communicated their wants and needs. In that light, it became significantly easier to find common ground and come up with shared goals that we could all accept and be comfortable with.

COMMUNICATION IS KEY

One of my starkest examples of poor communication occurred during a conference bringing together arborists, urban foresters, and shade tree commissioners. Three representatives from local utilities came to present overviews of their forestry programs and participate in a round table discussion for attendees to ask questions. During the discussion, a handful of attendees began to shout about trees that were butchered and ruined in their towns. Several had brought signs showing pictures of disfigured trees and bold messages against



*Kieran Hunt performs an outage investigation after this mature northern red oak (*Quercus rubra*) failed and knocked down five spans of high-voltage powerlines in New Jersey. Photo courtesy of Kieran Hunt.*



*Trees have evolved to compete for available growing space, sometimes creating awkward interactions with the built environment, as is the case for this sassafras (*Sassafras albidum*) in New Jersey. Photo courtesy of Kieran Hunt.*

utility pruning, and they quickly turned the discussion into a demonstration.

It was only a small portion of the crowd causing the fuss, but it so derailed the discussion that the session was forced to conclude early. Little practical conversation had occurred and I left disappointed. I wanted to hear how the utilities would have responded to the hard questions, some of which had been on my mind for a while. How do they determine clearance distances? Where do they draw the line between an acceptable amount of pruning and a tree that should be removed? Why don't they update their infrastructure or bury the lines? It planted the seed for me to start thinking about answers to some of those questions and how two different types of urban foresters—utility foresters and shade tree commissioners—might be able to find common ground.

FORESTS AND PEOPLE

As a consultant, I enjoyed taking the temperature of towns and neighborhoods as I inventoried. My work took me from 1 square mile (2.6 square km) towns to the five boroughs of New York City. In some areas, residents would literally run outside shouting at me to not plant a tree, while others would shout to not remove one. I worked with municipalities to create planting plans to

mitigate inequity in canopy, but when I'd arrive on planting day expecting the residents to be pleased, I'd find them refusing the new trees because they didn't believe the city would maintain them.

Community foresters showed me the effect trees have on disadvantaged and underserved neighborhoods, while seasoned municipal arborists introduced me to various strategies for management cycles and breaking city forests into neighborhood "stands." I learned how to work with multiple stakeholders with overlapping (and often competing) interests: parks departments, shade tree commissions, business administrators, councilpersons, engineering departments, departments of environmental protection, and residents themselves.

Through all of this, my discussions with other foresters brought me back to questions of different management strategies and how they affected residents and other stakeholders. Does the forestry department allow adjacent residents to have a say in what trees are planted on the ROW? Is the planting strip between the sidewalk and curb really the best place to focus planting? How do we decide pruning dosage and cycle length on a limited budget? Do councilpersons get special treatment? Which stakeholders have a financial responsibility to assist in caring for public trees, if any? My

discussions with foresters and stakeholders included some of these difficult questions and how various strategies might affect the stakeholders involved.

CHANGING ROLES WITHOUT CHANGING PRIORITIES

After a few rewarding years in consulting, I accepted a job offer with Asplundh and moved squarely into UVM. My new role was to assist a local utility in planning and executing tree work around high-voltage powerlines in a densely populated area. I made the move with mixed feelings; if I were to believe some of my peers in the consulting field, I'd just traded my tree-hugger hat for one that valued infrastructure above trees. I stepped into UVM with specific intentions: trees must be managed for competing interests and human health and well-being must always come first. As a budding urban forester with a passion for communication—working with people and navigating difficult discussions—I felt I was well-qualified to help bridge the gap between UVM, other urban foresters, and community members who'd be affected by our decisions.

Early on, I was surprised by how receptive most residents and municipal tree managers were to line clearance pruning. Many asked for extra pruning or removal. Of the people who didn't want their trees pruned, most hesitation seemed to stem from previous lack of notification or other dissatisfaction with past work. Even then, they would usually come around once the amount of pruning and reasons for it were properly explained.

STAKEHOLDER DISCOVERY: WHO CARES ABOUT THESE TREES?

This receptiveness to utility pruning opened my eyes to a whole new level of stakeholder complexity in urban forestry. There were municipalities where I would have significant pushback from the shade tree commission but strong support from residents. Other areas were the opposite. I came to realize that my initial impressions about utility pruning from dealing with shade tree commissions and other urban foresters weren't necessarily indicative of what the general public felt and that my best success would come from listening to the entire range of stakeholder views I could discover in the area. I got to know the municipal and county foresters in my territory, along with parks directors, environmental protection personnel, railroad representatives, public works directors, community foresters, and watershed managers—anybody who had a stake or vested interest in the urban forest and was willing to talk to me.

This added a considerable amount of time and effort to planning line clearance work, but it saved even more trouble in the end. The effect was profound. Local urban foresters recognized the extent I'd gone to ensure that their stakeholders were consulted. They received fewer calls from residents and municipal employees asking or complaining about our work, making their job easier. We were able to team up on trees we both wanted work on, saving both of us time and money we'd have spent on separate visits. I developed strong working relationships with the natural resource managers in my area and adapted my management to each community's respective work culture as much as I could. This built trust, made it

easier to work together, and smoothed tensions when complex or delicate situations arose.

HOW FORESTERS OVERLAP

Municipal arborists may manage their urban forests for equitable distribution of environmental benefits, species and age diversity, and compatibility with the built environment. Utility foresters may manage their urban forests for low-growing (compatible) species, compatibility with the built environment, and planning maintenance to maximize value for the ratepayer. Urban natural area managers may manage their urban forests for invasive species mitigation, ecological health, and watershed protection. Community foresters may manage their urban forests for equitable distribution of environmental benefits, equitable distribution of green spaces for recreation, and quality of life for underserved neighborhoods.

Some of these goals are the same, some may differ in their order or priority, and some directly conflict. The best way to prevent conflict, tension, and the formation of silos is to continuously work together so all overlapping natural resource managers understand the priorities of the others, where those priorities come from, and which of their stakeholders overlap. This base understanding provides us with a starting point for compromise, finding shared goals, and working together.

FINDING SHARED GROUND

As a utility arborist, I had to learn to answer those difficult questions that had come up when I was consulting. It turned out that what appeared to be aggressive pruning was often just the removal of water sprouts that had regrown from the previous maintenance cycles. When we needed to prune a significant amount of live tissue to mitigate unacceptable risk, local urban foresters often still opted to keep the tree in the hopes that it would recover, and we would instead team up on other trees that posed more immediate risk. Maintenance decisions were often dictated by the utility's need to balance pruning frequency with regulations. As a monopoly, the utility was limited in how much it could charge, which included tree maintenance costs. Infrastructure was routinely updated and improved, hardening the system against tree-caused outages.

The utility employed skilled arborists to ensure that UVM work was performed according to industry standards and best practices. Utility pruning is always a tradeoff between the appearance of the trees and the safety and reliability of a critical service. Most importantly, hazards to human health and well-being were mitigated, because when the power goes out, people suffer and can be endangered. The communities we served were generally satisfied with the work we performed, and local foresters worked with us so we could serve our mutual and separate stakeholders.

I entered the urban forestry world specifically because I am passionate about trees and people. As long as we keep the intersection between trees and people in the forefront of our conversations, urban foresters and other natural resource managers can work together to manage our trees ethically and sustainably. We'll likely also find that we have quite a lot in common. 🌱



Overlapping management areas can lead to tension and conflict between natural resource managers. How we navigate these conflicts has a lasting impact on the urban forests we manage and the communities of people living in them.





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TECHNOLOGIES



NEW YORK POWER AUTHORITY'S LEW PAYNE ON NEW IVM RESEARCH AND INNOVATIVE TECHNOLOGY

Excerpts from an interview with Lew Payne (Manager ROW/Environmental at New York Power Authority) on the Trees & Lines Podcast: Fresh Perspectives on UVM.

By Tej Singh, Chief Operating Officer; Dr. Phil Charlton, Principal Advisor; and Sally Lechin, Director of Marketing and Communications, Iapetus Infrastructure Services

This article has been republished from *T&D World*, Sept. 26, 2022

Photos courtesy of NYPA.

Long-Range Vegetation Management

For over twenty years, Lew Payne has continuously worked on developing a long-range, system-wide IVM plan for the New York Power Authority (NYPA). Their system, according to Dr. Phil Charlton, sets the standard in IVM. According to Payne, this doesn't just happen overnight. It's important to think long-term to effectively establish the correct strategies.

The Challenges of a Heavily Regulated State

Although the NYPA is a state-owned utility, there are still regulations that must be followed. Some of these regulations include protections for wetlands and the use of herbicides. Using herbicides can become quite a tricky situation as every state has different regulations. For example, just because an herbicide is approved for use in one state, it does not mean it can be used in another. In New York specifically, utilities must have herbicides approved by the state even after they have been approved by the EPA. These regulations are enforced by New York's Department of Public Service, and they specify that there must be a long-range VM system in place. As a state agency, the NYPA is exempt from this. However,

the NYPA chooses to comply by having a well-established VM plan and taking steps to fulfill wetland and herbicide regulations.

How Is GIS Used in Vegetation Management?

In 1998, the NYPA started using geographic information systems (GIS) as a core management tool for its vegetation program. According to Payne, with GIS, multiple layers can be captured such as regulations, landowners, plant and profiles, and easements. Since its earliest days, the NYPA has taken a vegetation inventory. This process is conducted by walking the ROW to classify land use and cover types. Treatments are also prescribed through the examination of the densities and heights of compatible and noncompatible vegetation. Polygons, or areas that contain homogeneous vegetation, are identified by vegetation crews. The data for the corresponding treatment plans is then digitally recorded along with herbicide use and weather conditions. The NYPA uses this data for a process called reverse invoicing. Once polygons are completed and checked off by forestry staff, the VM crew can go in and pull out the completed ones to bill them.

“

VEGETATION MANAGEMENT HAS CONTINUED TO CHANGE OVER THE YEARS. BECAUSE OF THE CONSTANT EVOLVEMENT OF THE FIELD, RESEARCH IS CRITICAL.”

Managing Vegetation with Vegetation

Payne practices a strategy that he likes to call “managing vegetation with vegetation.” This refers to managing the compatible biodiverse ecosystem and prescribing treatments. The non-compatibles are targeted by encouraging compatible vegetation. The encouragement of compatibles allows the early succession of plant communities to establish and compete for resources. This benefits the environment by decreasing the number of herbicides Payne and his crews utilize.

One downside to this process is that Payne is finding that the compatibles have become much too dense. The reason for concern is that the density causes the non-compatibles to become hidden, making it more difficult to identify them among the compatibles. To combat this issue, Payne is focusing on making access for crews easier by mowing narrow strips (5–10 ft. wide) under conductors. With this strategy, the escapes will remain alive and be able to penetrate the compatibles easily. Payne has been able to implement this effectively in New York. However, we know that there are different rules and regulations around the country.

So, the question remains: Could this process be applied in other regions? Payne believes it is possible if utilities have “... a true understanding of the principles of vegetation management. ... Integration vegetation management should be able to be done across North America,” he stated. Phil explained, “The Power Authority is one of eight utilities that has achieved the ROW steward accreditation for excellence in IVM”.

Bats, Pollinator, Herbicide, and Drone Research

Vegetation management has continued to change over the years. Because of the constant evolvement of the field, research is critical. For instance, Payne is currently researching how endangered bat populations are impacted by tree cutting and ROW management. The second topic of research Payne engages in is pollinator research. New York is currently working toward upgrading its systems to shift to a more renewable approach to doing business. Because of this change, mats are being put on the ground for up to twelve months. Payne is looking into the impact these mats have on insects and pollinators. Together with Electric Power Research



Institute (EPRI), Payne is asking, *When the mats are pulled out, will the pollinators be able to return?* Another area of research Payne participates in is testing the application of herbicides using drone technology. Currently, Payne is researching whether drones can be used in areas where it is difficult for crews to work. Using drones could facilitate the herbicide process and make operations more efficient.

With all the data Payne has collected over the years, he has been able to come up with a vegetation inventory. Last year, Payne added a "pollinator habitat scorecard," where he and his crew ranked different areas in terms of importance to pollinators. Some of the aspects monitored include the flowering resources, invasive species, and the types of pollinator communities that are present. Payne has garnered around 1,200 of these scorecard sites that he can use to analyze rankings.

LiDAR

Payne shared that he currently only uses LiDAR on a quarter of his system every year. This means that it is only available to him every four years. When asked where he would invest capital if his IVM budget was doubled, Payne said that he would use LiDAR for his entire system every year. By using LiDAR in this way, Payne explained that he could track changes better.

Getting Involved in the Industry

Payne currently chairs multiple committees that have allowed him to share his ideas and advance his vegetation strategies. The Environmental Energy Alliance of New York is an organization consisting of subcommittees made up of various utilities. Involvement in these subcommittees has helped Payne understand utilities and come up with helpful solutions for them. Payne also chairs a Category Six Pesticide Training Committee where utilities, chemical companies, and other shareholders gather to hold industry discussions. Some other groups Payne has joined include CEATI and the North American Transmission Forum.

Taking a Sustainable Approach

"Almost every utility has a sustainability group," Payne said. These groups are paying attention to programs with a sustainable approach and reporting back to CEOs. One of the things Payne is focused on is sharing the sustainable benefits his programs bring so he can get better leverage and funding. Currently, Payne holds a partnership with the Davey Resource Group to work on an ESG program that measures the footprints of some of the equipment Payne's company is using. The social



aspect, Payne shared, deals with interacting with landowners. By working with sustainability groups, the NYPA gets to look at the indices they report on and get credit for some of these targets.

Looking Ahead: What's in Store for Vegetation Management?

From the first VM plan to the implementation of herbicide standards, IVM has continued to develop and change over the years. With the ever-evolving technological landscape, it is inevitable for the industry to transform into a more digital space. The way the upcoming fourth generation of industry leaders is using technology is a good indicator of how the industry will change in the future. "If you want to see where technology is going, start watching fifteen-year-old kids out there . . . because they're the ones who are going to bring that new technology to the table," Payne said. He also believes that IVM will be practiced with a more sustainable approach and that "there's going to be a lot more focus on protecting species out there."

About the Author

Payne has over 35 years of industry experience and is currently the Manager of Rights-of-Way and Environmental Services for the New York Power Authority (NYPA), where he oversees the transmission system. The NYPA leads the transition to a carbon-free, economically vibrant New York through customer partnerships, innovative energy solutions, and the responsible supply of affordable, clean, and reliable electricity. The company practices IVM and has developed a system that has been in place for over twenty years. According to Payne, the NYPA has 1,400 miles or 23,000 acres of transmission ROW.

Quotes have been modified for length and clarity. The Trees & Lines podcast is available on Spotify, Google, Apple, BuzzSprout, and YouTube. Follow on LinkedIn. 🌲

SPOTLIGHT ON THE ENVIRONMENT

REPORTING ON BIODIVERSITY



By Phil Chen, Manager of Research and Development, CNUC

Each year, more organizations are producing corporate sustainability reports (CSRs) or are following one of the environmental, social, and governance reporting frameworks. When we think of ESG reporting or CSRs, our minds may jump to decarbonization efforts, reducing waste, establishing diverse supply chains, or adding transparency to the makeup of the board of directors. Biodiversity reporting provides an opportunity to report on something which is directly connected to the work we do in UVM.

Biodiversity is highly topical now. The World Wildlife Fund Living Planet Report for 2022 reported that there

has been an average 69% decline in the relative abundance of monitored wildlife populations around the world since 1970. Additionally, the monarch butterfly (*Danaus plexippus*) was placed on the IUCN Red List of Threatened Species as endangered due to habitat destruction and climate change in the summer of 2022. The work happening on ROWs with the implementation of IVM has real, positive implications for the development of

habitat on ROWs. Building habitat on ROWs not only naturally builds biodiversity within the ROW but also leads to greater connectivity in the landscape, positively contributing to biodiversity in the surrounding area.

As UVM professionals, we have an opportunity to share the good work happening on ROWs with the public. The public would benefit from the increased internal visibility of how vegetation departments contribute to their organization's sustainability. Through biodiversity reporting, you can provide disclosures, allowing your stakeholders to see that your department is aware of sensitive species and areas of high biodiversity value. Additionally, you can add a narrative that describes the direct and indirect positive impacts the UVM work happening on your system contributes to biodiversity.

There are additional benefits to your program in developing biodiversity metrics for your system. First, while determining what is relevant to your system to develop your metrics, the UVM team can deepen their

knowledge and understanding of the ecosystems on your systems and the dynamics at play—a key step in IVM. As you begin to collect biodiversity metrics, you will establish baseline conditions of the vegetative communities on your system. As you collect this same data again in the future, this baseline will give you a place for comparison. Comparing biodiversity metrics provides another way to evaluate the impacts and effectiveness of your selected control methods.

We know that a primary objective of IVM is to establish stable compatible plant communities that can provide biological control. Shifting plant communities takes time. If we do not have condition data to compare against, it is difficult to implement adequate continuous improvements and adjust management methods or timing. Shifts in plant communities can be subtle and slow, in particular, so having metrics specific to your system and goals that you can compare over time is crucial. This ability to continually measure biodiversity on your system will allow you to move your biodiversity reporting for CSR and ESG reporting to include quantitative metrics alongside your narrative sections, providing more transparency to the positive contributions of the UVM department. 🌱

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ARBOR-SPEAK:

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The “Mezcla” or mix of English and Spanish arboriculture language that tree crews and leaders need to learn to use.

By James W. Beery; CSP, CUSP, CTSP, CHMM, CHCM, CHST; ISA Certified Arborist WE-14250A and Safety Supervisor; Wright Tree Service

In an industry filled with hazards and variables, communication amongst tree crews, crew members, and their leaders is critical to obtaining quality, meeting production goals, protecting the environment, and of course, ensuring the health and safety of crew members. When communication is absent or hindered, errors and risks to crew increases. In many of the incident investigations I've been involved with, communication challenges have been a contributing factor almost every time. Either a worker did not know or understand what was happening or they did not realize the full extent of the dynamic. Maybe they couldn't participate fully in discussions or job briefings. People have told me they felt left out of the job hazard analysis, but kept quiet.

It all comes down to language; they didn't speak the language or the leader giving the briefing did not speak theirs. When asked, leaders typically said, “We make ourselves understood.” However, in my experience, this doesn't seem to be the case. A few examples:

- I conducted a tailboard training in a yard that was staffed with at least 30% of workers who spoke limited English. The moment I began conducting the training in Spanish, they fully engaged—they wanted to hear it in their own language.
- I observed training given in English where a few of the workers were trying to interpret in tiny groups, but there was little engagement and only one question was asked through an interpreter.
- I presented a training in Spanish to a group of 90% Spanish speakers. In that case, the English speakers felt left out—a weird reverse dynamic.

But time is limited for all this work. I can repeat the training in English, but then crews spend twice the time. It's time-consuming and, even worse, damaging to the flow. My Peruvian wife, who has worked for 40 years as a professional simultaneous interpreter, can do it. But she is unique and practiced. Training is the worst scenario for going back and forth; it just kills it. In a bilingual presentation, if I am training in English, the Spanish captions

are at the bottom, and vice versa when Spanish is the main language. But there is only so much room on a slide.

The industry is growing fast. Our workforce is diversifying naturally to fill the need. Like in many professions, English has typically been the dominant language. But no more. Our executive team has recognized this trend and the growing need for workers. Many of them will be immigrants who come from Mexico, South America, and Central America. Our leadership wants to help streamline immigration to make that expansion happen.

If you are a hard worker and want to work in utility line clearance, then we want you regardless of where you come from. But we are a profession that demands precision work amongst dynamic hazards and risks, and we need to train and communicate to manage those risks. I moved my entire life to Peru in 2000. Being a reverse immigrant for those 20 years, I get it. I needed to learn Spanish in order to work. I feel the pain of someone who takes a job where almost everyone around you speaks the dominant language and you don't. At first, I had to ask others what was going on. I felt left out, not because they excluded me but because they moved in a fast-paced work environment.



INTERPRETER CHALLENGES

- **There is a continued reliance on interpreters when you don't learn a second language. It's a crutch, perpetuating the cycle.**
- **Interpreters often can't keep up with the presenter or can't remember every line, leading to things getting lost (literally!) in translation.**
- **When interpretation is done consecutively, the time needed to interpret often doubles the total time of the event. The rushed training may lack full conversion from the English to Spanish, so the Spanish usually suffers.**
- **To be good, translators and interpreters must learn the content or meaning of the material itself.**
- **Trusting your interpreter is critical. One really must trust their interpreter not to inject their own ideas into the translations.**

Our work environment is fast-paced and dynamic, then multiplied by complexity and divided by language—it's just math. In this industry, we deal with 99.999% variables. How can we communicate those without knowing the language of our workers? We need to train quickly, constantly, and consistently. There is no room for hot-dogging and individualism when it comes to methods and techniques. We need a uniform approach for success. Language and proper translations are key to achieving that.

The veterans of our industry must pass along their knowledge to the next generation of workers. The new workforce, wherever they come from, is our reality. So is the challenge of language. How do our veterans pass that skill set on to them if they don't speak a second language? How do they answer a question or respond to feedback? The future of leadership in our industry is going to be filled with people who have bilingual skills, English-Spanish in particular. Leaders, get on board now or get passed up.

There are also workers who enter the workforce with varying or lesser skill levels or substandard habits obtained outside the utility line clearance specialty. A non-Spanish-speaking veteran charged with training and guiding new workers lacks the ability to communicate effectively to change that. The U.S. Army, a great example, writes policies and procedures to be taught at 8th-grade-level training. The Army is considering dropping to a 6th grade reading level to accommodate the changing culture of degraded education. Crew members with varying levels of education would probably need to be at 6th grade levels as well. I'm not saying they aren't intelligent. No way! I think they are quite astute at managing their risks. My point being is this will help ensure we effectively present our rules to crews with a higher likelihood they will get it.

As previously mentioned, workers who are unable to identify job-site hazards and manage the associated risks due to lack of communication are not acceptable to us. As the Spanish-speaking workforce grows and English-speaking veterans can't or don't want to learn the language, that environmental, health, and safety gap grows even more. Our industry is not shrinking. It's exploding! As it rapidly expands, the pressure to staff more yards and deploy more crews across a wide geographical area increases daily risk.

Jargon is also a challenge. Our policies and work methods are mostly written in official terms, often without adjoining graphics. These sophisticated writings struggle with translated styles, quality, and the cumbersome length of direct translations, and I have seen mistakes. Translators need to understand the work they are being asked to explain. Even with a great translation, people like to speak in jargon. Our policies and work methods are often written by legal minds, suited for compliance, but not always written in a way that is conducive to learning. I'm a smart guy, but reading a poorly formatted work method is difficult. Imagine frustrated crews attempting to read but their eyes glaze over from lack of understanding and interest. Work methods and training usually end up as "useful" jargon which, to me, means it is shorter and quicker. But jargon, like translations, can change not only over time but by region. Wright Tree Service has contracts in 48 states, Canada, and Puerto Rico—everywhere I go, I hear different jargon.

TRAINING AND WORK METHOD CHALLENGES

- **The quality and amount of technical Spanish materials for our industry is low, and accuracy depends on the translator's industry experience, or lack thereof.**
- **Writing translations is very time-consuming.**
- **Translations via computer software have limitations and usually must be fixed by human translation, wasting time. Computer translations can get so muddled, it's easier for translators to start from scratch. That's expensive!**
- **Matching line-by-line bilingual materials from official sources is helpful, but difficult to find.**
- **The non-bilingual speakers get bored easily waiting for their language to be used. The bilingual people hear it twice. Having mixed crowds can discourage questions or feel unbalanced and risks team cohesion.**
- **Policies and work methods can't always be a literal translation, especially where risk and legal departments are concerned. Many Spanish words have double meanings that can be lost in translation putting the company at risk.**
- **Videos often don't match between the two languages.**



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Why Is Learning a Second Language so Difficult?

- **Age.** It's never too late, but the earlier you start, the better. Start now! I learned Spanish at age 38. Spanish was hard, but I did not give up!
- **Desire to learn.** Attitude can make or break you when learning a new language. Quitting or being content with lower proficiency levels can make a person embarrassed, driving them further away from the language.
- **Fear.** The fear of speaking a new language in front of others and making mistakes is a major factor. You have to get past sounding "stupid." My experience is no different. It takes practice and pain, but it pays off.

“

The future of arboriculture and utility line clearance leadership will be those who are bilingual, mostly English–Spanish.

”

How Can I Learn a Second Language?

- **Formal classes.** I opted to take condensed classes as opposed to the full-semester classes, which sped up the process.
- **Immersion.** Surrounding yourself with a culture or group is probably the best of all. I moved my life to Peru for more than 20 years, both living and working in Spanish. It's extreme but effective.
- **Confidence.** Accept that some people will make fun of you, but that goes away with time.
- **Solicit help.** Asking the crowd you are talking to is a good

SOLUTIONS

- Good sources of English–Spanish is the ANSI Z133.1-2017 and TCIA. One can read line by line and get the exact same message.
- You can use a translator or interpreter at first but listen, learn, and study. Don't wait too long before jumping in solo!
- Glossaries are helpful and should be readily available. Just remember not all glossaries are complete and the source is important to know.
- Use images and graphics with descriptions and definitions. In training, you can point at them and ask participants what to call it in Spanish.
- When learning another language, identify the main topic early on. Then, explain your way around your lack of terminology or grammar for things like the past, present, and future tenses.
- Incorporate more practical training combined with other methods, like hands-on training.
- Develop a standardized English–Spanish spreadsheet with key terms for each specific topic in the procedure.

tool, but verify what is being said. Accept unsolicited help if they are sincere and trustworthy.

- **Read materials.** Gather materials from official sources in both languages. The government, ANSI, and Husqvarna usually have the best translations compared to more informal sources.
- **Practice.** Read other languages and content ahead of time, repeatedly. Be more exact. Read to others. Do this until your proficiency increases.
- **Think in the other language.** This is hard. But when you can do it, that will be a good sign for you.
- **Listen to music.** Music is not always as helpful as people say it is, but it depends on the music. Lyrics can be a good source of words and phrases.
- **Watch TV.** Watch the news, movies, TV shows—it's visual. It can help your vocabulary and listening skills.

Final Thoughts

The future of arboriculture and utility line clearance leadership will be those who are bilingual, mostly English–Spanish. I want to be a part of that. I wouldn't be surprised to hear that native Spanish speakers are learning English at a faster pace than the other way around. If that's true, it's likely that the future leadership of arboriculture and our industry will come from native Spanish speakers who learn English. 🌱

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Seeing the True Benefits of Investing in DIVERSITY & INCLUSION

By Nate Demby;
T&U Empowering
Women in
Vegetation
Management
Workshop Panelist,
Division Manager;
Wright Tree Service



Nate Demby (center) speaking with Maegan Mullinax (left to right), Lindsey Boyle, Susan Rossbach, and Caitlyn Pollihan at the 2022 Trees & Utilities Conference.

“Diversity and inclusion does not belong on a checklist. Where do you belong?”

—T&U Empowering Women in Vegetation Management Workshop Panel



The 2022 Trees and Utilities Conference was an unforgettable experience for me. With more than 800 attendees and the opportunity to meet and socialize with professionals and innovators, this conference had something for every person and organization involved in this vital industry.

My personal experience began with the honor of participating in the Empowering Women in Vegetation Management Workshop, which was the first event on the conference schedule and a wonderful launching pad for the week’s activities. I was tremendously humbled to be the first male on a strong and focused panel discussion, and I was welcomed by four distinguished and accomplished women: Lindsey Boyle (PG&E), Caitlyn Pollihan (ISA), Susan Rossbach (Brains4Drones, LLC) and Maegan Mullinax (ACRT Services).

The panel discussion spanned the entire spectrum of complicated issues that women experience in this profession. I was truly educated by the variety, depth, and intelligence of my co-panelists and the audience in attendance.

I was asked whether men could relate to what it might be like to be the only woman in a male-dominated environment. I expressed that while I have been the only person of my demographic in many rooms, I cannot understand the exact dynamic faced by women in our industry. I cannot assume how it feels, but I can do my part to ensure that feeling is less and less prevalent by promoting acceptance and inclusion.

It is clear to me that diversity of all kinds is desperately needed to ensure we, as an industry, are



equipped to handle the changing relationship between trees and utilities. As a father of five daughters, I feel an internal drive to make this career path viable and beneficial for everyone. Our industry has just begun seeing the true benefits of invested inclusion. And as events and collaborations like Trees and Utilities continue to thrive, so will the people and the possibilities.

As a person responsible for the care and environment provided for many people, it is my utmost honor and responsibility to be mindful of the obstacles in the way of true innovation. Trees and Utilities helped me to expand my vision, see the segments of the population that are ready for investment and opportunity, and align my efforts to accommodate change.

The panelists and participants in the Empowering Women in Vegetation Management Workshop offered me a safe learning environment that was judgment-free, honest, and forgiving. This same environment is what I desire to provide for the women and men of this industry. We will measure our success through the amount of change that we can affect together. This experience has highlighted the fact that we are all stewards of someone else's experience in this industry, and we have an active part to play in its health and ability to grow. By relying on each other and seeking those often-uncomfortable answers, we realize the solutions are already present—they simply need to be heard and empowered. 🌳



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System Resilience: How Trees and Vegetation Cause Power Outages

By John W. Goodfellow, Principal Consultant, BioCompliance Consulting, Inc.

The challenge trees pose to the reliability of overhead distribution systems is well recognized, as vegetation is a dominant cause of service interruptions at many utilities. Some of the ways trees cause interruptions are well understood. The damage to overhead electric distribution system infrastructure by the structural failure of branches and whole trees is obvious, particularly during adverse weather events. This is known as the mechanical mode of failure. As a result, work continues to advance our knowledge of the structural integrity of trees, both in terms of whole tree failure and the failure of individual branches within a tree's crown. Findings from these efforts support assessment of the likelihood of structural failure of a tree, which is a core consideration in Tree Risk Assessment.

This article focuses on another important mechanism by which trees create risk to an overhead electric power system. Trees in contact with energized

conductors have the potential to provide a pathway for the flow of fault current. This is known as the electrical mode of failure. Traditional assumptions and beliefs regarding the "electrical mode of failure," largely based on anecdotal observations, have guided decisions made by utility operations and engineering staff over the years. It's important for utility arborists to understand how a tree that contacts an electrical conductor but does not result in physical damage of overhead conductors creates risk.

THE ELECTRICAL MODE OF FAILURE

All tree contact with an energized conductor will result in a fault. The tree or branch provides a "short circuit" pathway for the flow of current between energized conductors or from an energized conductor and ground (or neutral). The contact typically begins as a high-impedance (resistance), low-current fault. Only under a specific combination of conditions does the fault pathway

become more conductive. In these cases, the fault pathway evolves from high to low resistance, resulting in high levels of fault current. High-current faults are reliably detected and interrupted by an overcurrent protection device, such as a fuse or recloser. Once an interruption occurs, it may or may not result in an outage to end-use customers. This is largely dependent on the design of the protection system. In contrast, many tree-conductor contacts remain as high-impedance faults. In this case, high impedance of the pathway limits the level of fault current to a low level which may not be detected and interrupted. These high-impedance fault pathways provided by trees have the potential to persist.

FAULT EVOLUTION

When a branch or stem provides a fault pathway between two areas of unequal electrical potential, fault current begins to flow. Under high-voltage stress gradients and a relatively conductive

pathway, the branch begins to char, which provides a conductive carbon track. As the pathway becomes more conductive, the charring becomes more energetic and the charring increases. It continues until, at some point, the gap between the points of unequal potential along the carbon track is bridged and a high-current fault occurs.

However, most tree-conductor contacts do not evolve into low-impedance, high-current faults. Often the electrical stress gradient and conductivity of fault pathway provided by the tree or branch are quite low. In these cases, the pathway experiences resistance heating. As low levels of current flow through the high-impedance branch, heat is generated, driving off water and reducing conductivity. The branch simply warms and dries out, causing an increase in resistance and a decrease in the fault current level.

In actuality, both the growth of a conductive carbon pathway and resistance heating and drying will occur concurrently. Effectively, there is a race. If fault current flowing through the branch is warming and drying the branch faster than the development of an increasingly conductive carbon pathway, no electrical flashover occurs. If, on the other hand, the voltage gradient is sufficient to generate localized dry-band arcing, a conductive fault track develops. This charring results in the fault pathway becoming increasingly conductive. If the charred pathway reduces impedance faster than heating that drives off moisture and increases impedance, the gap is bridged, resulting in a high-current fault and subsequent interruption.

The level of fault current associated with tree-conductor contact is influenced by characteristics of the power system involved and by the fault pathway provided by the tree. There are four important factors that determine the potential level of fault current that flows.

1. Voltage Gradient

The voltage gradient is a function of the voltage differential between two points and the distance between them. Tree contacts involving higher-voltage gradients are much more likely to result in a low-impedance, high-current fault, which can be detected and interrupted by the overcurrent protection system. Higher operating voltages and shorter distances between areas of unequal electrical potential (i.e., voltage) result in pathways with higher-voltage stress gradients.

Common operating voltages on distribution systems range from less than 5000 V (2.4/4.8 kV) to nearly 35,000 V (199/34.5 kV). This wide range in nominal voltages is an important consideration, both in terms of the difference in voltage between two energized phases and from energized phase to ground (neutral or earth). So too is consideration of the distances involved. "Compact" multi-phase designs with close spacing between energized conductors create higher gradients. Phase-phase voltage gradients are by definition higher than phase-neutral gradients, and the lowest voltage gradients are created across a long fault pathway from energized phase to earth.

Equally important to reliability, there appears to be a voltage gradient threshold below, which it is unlikely that a tree in contact with energized conductors would result in an interruption.

2. Diameter of the Pathway

The diameter of the fault pathway provided by the tree is an important consideration. Large diameter pathways are much more conductive, and therefore more likely to cause a fault than small diameter contacts. Obviously, pathway diameter can vary

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Showing Significant Performance in Safety: Holli Pruhsmeier

Safety is at the heart of our utility vegetation management solutions at ACRT Pacific. Nothing is more important than sending people home safely at the end of each day—whether they are members of our organization or not.



Holli Pruhsmeier

Holli Pruhsmeier, an ACRT Pacific pre-inspection manager, recently received a Going the Extra Mile (G.E.M.) Award for her significant performance in safety. She was nominated by ACRT Pacific Operations Manager Brandon Covert and ACRT Pacific Safety Manager M.K. Youngblood.

One morning while on the job, Pruhsmeier was driving behind a vehicle in the straight lane and while crossing through the intersection, a vehicle that should have yielded instead crashed into the vehicle in front of her.

Pruhsmeier safely pulled over to the side of the road, retrieved her safety cones, and placed them around the scene to aid with traffic control. She made sure the victims were safe and then began directing traffic. In addition to managing traffic, Pruhsmeier was able to comfort the victims as they experienced their first motor vehicle accident just minutes prior.

Once emergency services personnel arrived, she provided a statement and additional information and was later dismissed from the scene.

Covert, one of Pruhsmeier's supervisors, shared, "On two separate occasions, Pruhsmeier has been recognized for her focus on safety and safety awareness. In the most recent safety incident, she came across a vehicle accident in which she was not involved. She was able to assist with traffic by putting out her cones and waving traffic through. She was also able to speak with the people in the accident and comfort them until emergency services were able to be on-site."

Learn more about ACRT Pacific and our culture of safety at pacific.acrt.com/about/safety. 🌿

from small twig to main stem and trunk of the tree. Research has shown that the corresponding impedance varies by three orders of magnitude (from 100 Ω /ft in a main stem to as much as 100,000 Ω /ft for small-diameter twigs).

3. Physical Characteristics of the Branch

There are readily observable differences in conductivity that can generally be explained by the physical characteristics of the bark. Some of this variation in conductivity is related to differences in bark characteristics between species. Another factor is the age or origin of the branch that is providing the fault pathway. Smooth, thin, early bark is more conductive than older, thicker, irregular, corky bark. These differences are significant enough to warrant consideration in designing preventive and corrective line clearance pruning specifications: the physical characteristics of the regrowth response following proper pruning is less conductive than the exaggerated "sucker" growth following improper or excessive pruning.

4. Phase Configuration

An electrical fault is created when the tree or branch provides a pathway between two areas of unequal electric potential. Recent work by EPRI has demonstrated that the orientation of individual conductors and neutral is a factor to consider. Simply put, the likelihood of a failed branch striking, remaining in contact, and providing a fault pathway between areas of unequal potential varies by line design. Branch retention is higher with horizontal phase configurations than with offset or vertical designs. Tree contacts begin as high-impedance, low-current events. If an initially established pathway is not persistent, it is unlikely that an interruption and outage will occur.

APPLYING THE LESSONS LEARNED

Interruptions and subsequent outages due to the electrical mode of failure are initiated by the sudden introduction of a suitable fault pathway into contact with conductors. This occurs in cases of branch failure or deflection or by changes in the position of conductors (sag and swing), rather than by trees growing into contact with conductors. The greatest risk is that a large-diameter pathway encounters a high-voltage gradient where it didn't previously exist.

Focusing solely on fixed clearance



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distances from conductors misses an opportunity to improve reliability without increasing cost. The lesson here is that the purpose of condition assessment and vegetation maintenance inspections is to identify and reduce the likelihood of developed branches contacting conductors. Tree-conductor clearance alone is one step removed from reliability.

New, soft, small-diameter vegetative growth that grows into contact with an energized distribution conductor experiences resistance heating. This leads to drying, wilt, and often dieback of living tissues. This is the cause of the discolored foliage in proximity to an energized conductor. These fault pathways are less conductive than when the fault was initiated. This reality is reflected in NESC Rule 218, which focuses on tree-conductor contacts that have the potential to damage a conductor. "Grow-in" faults involve very low levels of current with no possibility of damage to the conductor. Trees growing into contact with conductors energized at distribution system voltages present minimal risk.

The threat trees pose to reliability varies by type of line. Voltage gradients vary by an order of magnitude on a typical circuit. They are highest on multi-phase lines and lowest on single-phase line segments with open spacing between an energized conductor and neutral. Ironically, the compact designs that are often used to avoid tree clearance problems on restricted ROW are among the least tolerant of tree-conductor contacts. Preventive vegetation maintenance plans need to reflect this understanding of risk.

The persistent carbon track created during a low-impedance, high-current fault event irrevocably alters the conductivity of the fault pathway. In

most cases, the carbon track provides observable evidence of the high-current event. This is an important consideration in conducting post-interruption investigations. Too often the default assumption is that if you can't find the cause, it must have been a tree. Look for evidence.

Finally, research work to date has not identified any unique characteristics of the fault pathway provided by a tree that suggests it is a leading cause of momentary outages. We know that once the fault pathway is well established in the branch, it retains its low-impedance conductive characteristics. The fault pathway may be transient. For example, when a broken branch lying across two phases is ejected or burns through and falls clear of contact during the high-current event. An argument can also be made for intermittent contact with reintroduction of the fault pathway provided by the tree, though the unique circumstances involved would be infrequently encountered. It is more likely that trees cause momentary interruptions in the same manner as other sources of faults. And it is the overcurrent protection system that manifests the event in terms of a momentary or sustained interruption.

CONCLUSION

Trees can have a significant impact on the reliability of overhead distribution systems. The risk they pose varies with a number of important attributes. Contemporary VM programs based on an understanding of these factors can demonstrate improved cost efficiency and effectiveness. This approach requires a prescriptive application of maintenance resources, focusing on risk mitigations as well as productivity and workload reduction. 🌳

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JOINING FORCES to Restore Communities



In the aftermath of a severe storm event, communities come together to rebuild. Whether it's neighbor helping neighbor or local businesses lending a hand, collective community action is an integral part of post-storm relief. This is also true for the utilities, tree crews, and linemen who band together to bring power back to communities after a storm.

Hurricane Ian made landfall in Ft. Myers, Florida, on September 28, 2022. The Category 4 storm brought 155 miles-per-hour winds to the Southeast U.S., making it the fourth-strongest storm to hit the state. Vegetation falling on utility lines caused 2.6 million people in Florida to lose power. Since the storm's passing, crews have been on-site seven days a week, working tirelessly to clear ROW of trees and other brush and repairing the poles and lines.

Local Davey line clearance crews were on-site for the aftermath of Hurricane Ian, working alongside out-of-state Davey offices and utility line repair crews.

Residential tree and landscape teams based in Indiana, Michigan, Texas, and other states sent line clearance crews to work alongside Florida-based teams to clear fallen trees, hazardous tree limbs, and any other vegetation from ROWs so line crews could repair utility infrastructure. The crews worked with Tampa Electric, Duke Energy, Florida Power & Light (FP&L), and other utility companies to help restore their customers' power.

"Over the past several days, these crews have helped tremendously," said Tristan Rutland (MDR Powerline, a subcontractor offering utility lineman support, based in Columbia, Mississippi) during the initial weeks of storm recovery.

For Juan Avalos, senior supervisor for Davey's FP&L account, collaborative aid came in a familiar form. With FP&L's main service area in need, Avalos said his crews worked alongside familiar faces they have worked with before from both line and tree disciplines—creating a united front to restore power for the communities they call home.

The Bigger Picture of Power

In today's world, electricity is essential. And after a weather event, power becomes even more critical as first responders rely on it to do their jobs. Hospitals, fire stations, and police stations need power to care for hurt citizens and protect the public from other safety risks after a storm event. In such a dire time of need, any utility worker at a storm response site has the same mission: to help restore an important utility to a community that is recovering and rebuilding after a destructive weather event.

Davey Utility Solutions wants to express gratitude to the linemen and tree clearing crews who worked diligently to turn the lights back on in Florida communities affected by Hurricane Ian. We are proud to be in an industry that is on the front line of helping to restore communities after devastating storms. 🌳



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SHAWN HUFF



We have come a long way since the day I responded to an ad for “Tree Trimmers Wanted” at a workforce center in Storm Lake, Iowa. It has been a long road filled with many adventures but, to think about it retrospectively, this journey—my 22 years of experience—has equipped me perfectly for the role I am in now. I am currently supervisor of vegetation management at OG&E Energy Corp. My current role is definitely my favorite, but I have many fond, fun memories being a foreman on a tree crew.

When I started in this industry, I was just trying to find a job to get me to my next career path. That dramatically changed when a decision was made by Jim Puentes, from MidAmerican Energy, to invest in better pay and benefits for the guys working on his system. That moment showed me there was a real career opportunity right where I was.

I have had some amazing mentors over the years. Because my career journey has been such a winding road, filled with various side quests, I have been blessed with the opportunity to work directly with folks like Will Nutter, Jack McCabe, and Richard Bewley, among others. I can remember early on, while being a supervisor for Wright Tree, having many meaningful and influential conversations with Will. The encouragement he gave from his unique vision on our industry helped me see the future needs and challenges that the industry would face. Will also ensured

that I was equipped with the training necessary to tackle those challenges.

When I transitioned into my role at Davey Resource Group is when I met Jack McCabe. He showed me a real vision of the technology revolution that was coming. Jack put forth expectations that challenged my perceptions of what I thought I was capable of and really drove me to be a better manager.

Richard Bewley was and still is quite a mentor to me. I took to his leadership style as his contractor and appreciated how he encouraged me over the years. He always was willing to lend his experience and knowledge to help me in whatever role I was in at the time. I learned from him that sharing with and helping others has a greater impact on the industry than trying to keep things to yourself for selfish ambition. All three of these men taught me to be a better person in life and in our line of work.

I have known for a while that I wanted to supervise a vegetation program. As the challenges of the industry (e.g., workforce, regulations) increased, it created a more focused vision for the lengths we need to go to succeed. I think this current role

gives me the greatest ability to impact people in this industry in a positive way. Sometimes utility companies become their own worst enemies when trying to solve real-life problems. Solving the problem of “high costs” should never come at the expense of the men and women working in the field. Those folks are not just vital to the success of our programs but the success of their own families. I feel any solution we, the utility, implements should keep that in mind.

Aside from my mentors, one unique resource that I have found helpful is *Incident Prevention Magazine*. With all the emphasis on safety, it always surprises me when I learn that people don't know about it. I have found a lot of useful, applicable information in this publication.

A fun fact about me is that I am a Star Trek fan. My favorite series is *Star Trek: The Next Generation*. I have admired Captain Picard and his leadership style from the beginning. He is thoughtful, full of grace, sets high expectations, helps his people achieve them, seeks council from those around him, and never presents himself as having all the answers. He is the type of leader I strive to be. ☸

“

When I started in this industry, I was just trying to find a job to get me to my next career path.

”



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Part 2: 2022 UAA System Utility Vegetation Managers Summit

Remote Sensing and Artificial Intelligence in Vegetation Management

By Marvin Mantos, Manager, Distribution Vegetation Management Support, FirstEnergy Corp.

Peer reviewed by Luke Henne, Advanced Transmission Forestry Specialist and Crystal Kenmuir, Supervisor, FirstEnergy Corp.

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This is the second of a 3-part series outlining industry challenges and BMPs derived from the 2022 UAA Best Management Practices Utility Vegetation Managers Summit. Topics covered include UVM workforce recruitment and retention; artificial intelligence for identification and management of vegetation risk; and wildland fire risk mitigation and prevention. Join us in Akron, Ohio, for the next Best Management Practices Summit in May.

At the 2022 UAA Managers Summit, teams of volunteers chose to explore topics of interest having an impact on UVM programs and report to the summit participants. One of the teams elected had researched remote sensing and artificial intelligence for UVM. The team members participating, representing seven different electric utilities, were Heather Green (Liberty Utilities), Cindy Musick (Rappahannock Electric Cooperative), John Stout (NIPSCO), Venti Korichkov (Eversource Energy), Jimmy Bent (Duke Energy Corp.), Phil Ross (Appalachian Power), and Marv Mantos (FirstEnergy Corp.).

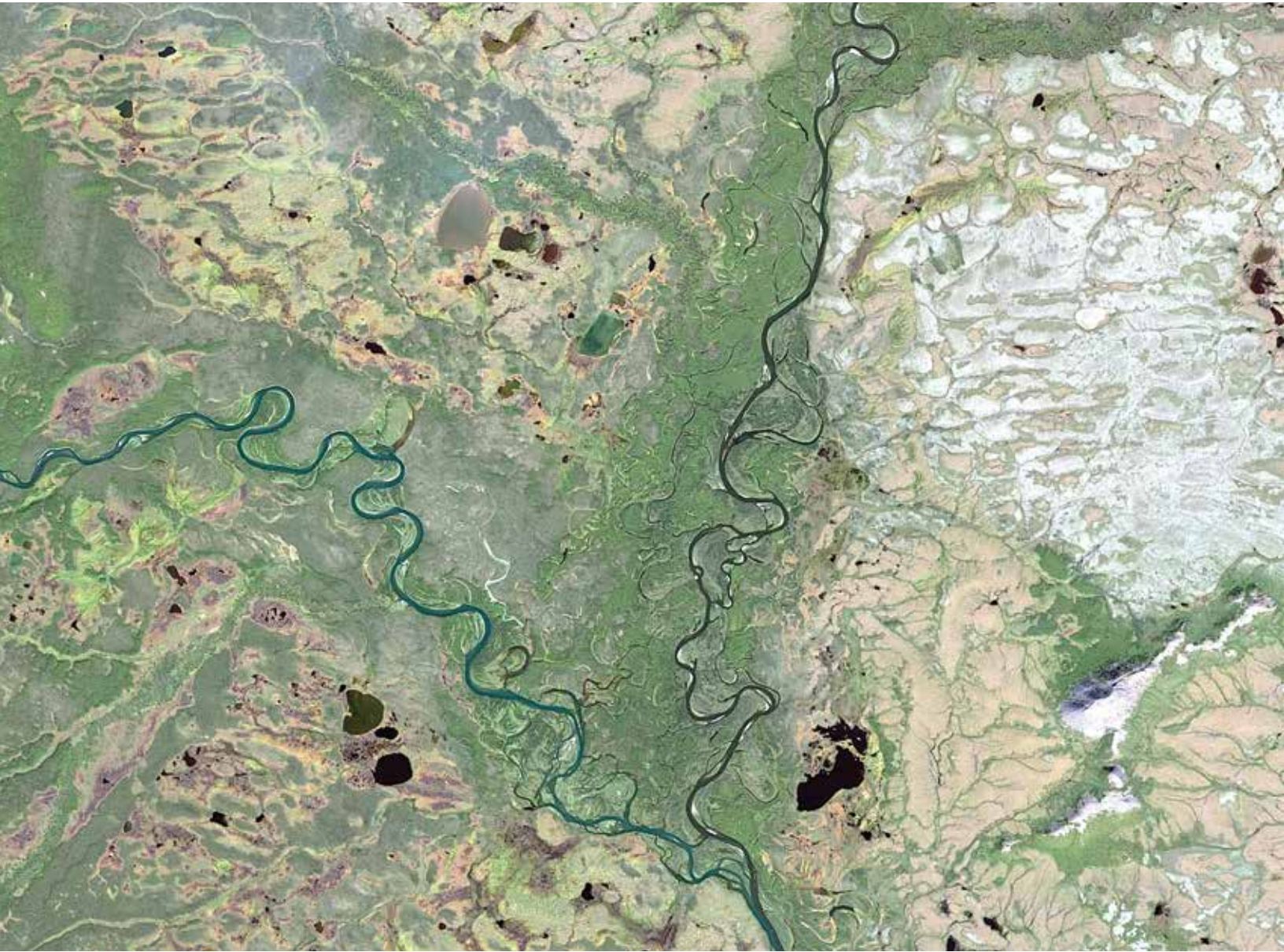
As practitioners of VM—not data scientists—we collaborated on research, conducted interviews with SMEs, and held group discussions to explore the use of remote sensing and AI technologies. We approached our exploration of modern technologies available to the industry based on the premise questions:

- What are the reasons to pursue technological solutions?
- What technological solutions are available and practical for today and in the future?

REASONING FOR TECHNOLOGICAL SOLUTIONS

We identified the following four reasons to pursue technological solutions for UVM:

1. **Improve system performance.** An electric utility universal goal is to deliver safe and reliable electricity to residential and commercial customers. With the societal



dependency on electricity also comes the expectation that electricity will always be available. We in the energy industry realize that we cannot eliminate outages entirely, but we are constantly pursuing better reliability to meet the ever-increasing expectations set by customers and regulators. We search for ways to identify the biggest threats to reliability so we can try to address them.

2. **Reduce cost.** The single most limiting factor for a UVM program is the budget. We are often asked to do more with less. So naturally, vegetation managers become quite good at analyzing their programs and generating ideas to eliminate, avoid, or postpone costs. We search for ways to perform our maintenance in the most cost-effective way possible.
3. **Combat loss of labor.** Our industry has been struggling to find the necessary numbers of capable utility arborists to perform the required maintenance on our facilities. We often lose qualified contractors and staff to other companies or industries which leads to a cycle of hiring and retraining. We search for ways to reduce or replace the worker hours typically needed to perform UVM work.
4. **Safety.** Employing technology in place of manned work, we can reduce exposure to hazardous or even dangerous conditions for our employees and the public. We can reduce the number of foot patrols for employees while still identifying potential threats to the electric infrastructure.

Based on these reasonings for using technology, we can improve reliability, better understand cost, support a sustainable labor force, and increase the safety of our employees and the public.

TECHNOLOGICAL SOLUTIONS TODAY AND THE FUTURE

To answer the second question, we first had to recognize the reality that technological advancements are continually being introduced to UVM programs. Through the history of UVM, we have seen mechanical advances, from handsaws and axes to chain saws, from ladders to lift trucks, and from free-climbing to ropes and ascenders. We have also witnessed the dawning of the digital era: transformation from paper maps to digital maps, from clipboards to

tablets, and most recently, revolutionary opportunities with mechanized vegetation control and computerized technologies.

Our focus in the remaining discussion is the computerized technologies that have been developed. The following are examples of currently available computerized technological tools, which are continually evolving and improving.

LiDAR

Light detection and ranging is a remote sensing method that uses light in the form of a safe pulse laser to measure ranges to the earth. The light pulses, combined with other data recorded by the airborne sensor system, generate precise three-dimensional information about the shape of the earth and its surface characteristics. Electric utilities generally gather LiDAR data with fixed-wing aircraft, helicopters, drones, and land vehicles.

When there is no canopy to prevent visualization of electrical assets, LiDAR can be very precise in measuring vegetation proximity to the assets. This would include vegetation beside and beneath conductors as well as the heights of adjacent trees. LiDAR sensors may include options to collect multispectral data, which involves the acquisition of visible near-infrared and shortwave infrared images in several broad wavelength bands. With the use of multispectral imagery, dissimilar materials reflect and absorb light differently at different wavelengths, which may make it possible to identify tree species or tree health.

Gathering information using LiDAR can simplify compliance and regulatory system reviews by producing highly accurate data for reporting. LiDAR can also reduce the number of manned aerial patrols and ground patrols, which reduces risk exposure to employees. LiDAR data collection can cost seven to eight times as much as ground patrols, with an added cost for data storage. The data can also be collected at different resolution qualities; the higher the resolution, the better the accuracy and the higher the cost.

Satellite Imagery

Satellite imagery, also known as earth observation imagery or spaceborne photography, are images of earth collected by imaging satellites operated by governments and businesses around the world. Satellite imaging companies

sell images by licensing them to governments and businesses. Satellite imagery comes in three types: (1) visible imagery, (2) infrared imagery, and (3) water vapor imagery.

Visible imagery, which is exactly what it sounds like, requires daylight and clear skies to take images of the earth's surface. Infrared imagery can be acquired day or night and measures the infrared energy of objects. This type of imagery also requires clear skies to take viable images of the earth's surface. Water vapor imagery is used to analyze the presence and movement of water vapor moisture in the upper and middle levels of the atmosphere; it does not focus on the earth's surface.

COMPLIANCE and **GOVERNMENTAL AGENCIES** have driven the need for **IMPROVED RELIABILITY** on transmission systems, making transmission companies the initial key driver and user of these technologies today.

Satellite imagery is available at a lower cost than LiDAR and can be refreshed more often. Unfortunately, it is of lower resolution and currently does not provide the accuracy of LiDAR, as its data output does not provide a three-dimensional data set. Satellite imagery could be particularly useful in applications where precise measurements are not required.

Artificial Intelligence

Artificial intelligence is another tool that is available for use to make VM program enhancements. The term "artificial intelligence" means a machine-based system or virtual engine that can—for a given set of human-defined objectives—make predictions, recommendations, or decisions influencing real or virtual environments. Modeling, a specific type of AI, is the creation, training, and deployment of machine learning algorithms to emulate logical decision-making based on available data. To make the model data useful, it is combined with visualization software, such as GIS mapping, dashboards, and aerial or satellite imagery. Utilities can create a model using internal databases and/or external databases that can be found on the internet at no cost. The creation of

such models can enable a utility to make data-driven VM decisions. Data modeling can be used to support cycle length and budget decisions with the potential to improve reliability metrics and overall customer satisfaction.

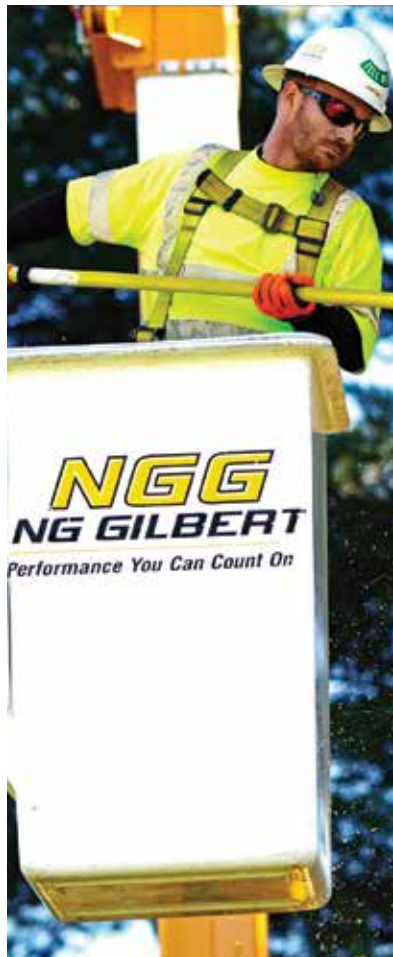
These computerized technologies have been maturing at an exponential rate while becoming more accurate, agile, and cost-effective. As the need for better, more cost-effective, efficient, and safer ways of performing UVM arises, the technologies are being pushed to new levels to help drive goals.

THE UTILITY OF REMOTE SENSING AND AI TECHNOLOGIES

Through this exercise, we concluded that the use of these remote sensing and AI technologies are becoming more widely used and accepted in managing vegetation programs, and their use will continue to increase in the future. As new challenges in UVM are identified, so too are new uses for these technologies. As vendors explore these technologies, intertwine them, and make them available through pilot programs, utilities have the opportunity to understand the technology and identify how it can be utilized to see the benefits of the financial commitments made.

Currently, costs may be a concern to potential users of the technologies. These costs are expected to become more affordable as advances are made. Computerized technology has created a greater need for imagery and LiDAR data. The need for data has driven an even more cost-effective option of utilizing publicly available data sets for little to no cost. These data sets are often collected and provided by federal, state, and county government agencies and can provide a viable opportunity to begin to understand the high-level benefits of these computerized technologies.

Compliance and governmental agencies have driven the need for improved reliability on transmission systems, making transmission companies the initial key driver and user of these technologies today. As utilities seek affordable ways to provide the same heightened level of reliability on distribution systems, these technologies are being adapted and refined to assist in this effort as well. As data resolution and availability increases—with decreasing costs—it becomes clear that the potential for using these technologies to assist in distribution UVM will increase in the near and long term. 🌱



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Prioritizing Your Vegetation Management Program

By Kevin Puls, President, ACRT Services



I often get asked, "How do I prioritize my vegetation management program?" The context in which this is asked has always interested me. Typically, it is referring to how to best spend the finite amount of budget dollars for the greatest return of safety and reliability.

However, there is an alternative context to the question. Specifically, "What are you doing to prioritize the VM program in your organization?" This question is sometimes answered with silence, blank stares, or a defensive response about operations and limitations. After all, the VM professional operates in a truly thankless realm. When things go right, the lights stay on and no one gets hurt. The typical measure of effectiveness for VM programs is failure indices.

Most VM managers know firsthand where their programs stand during lean years and budget cuts. They feel helpless and typically accept it as a part of the job. However, they are not helpless. They often have the tools available to them to change this narrative. They just don't realize it.

While utilities commonly conduct town hall meetings and deliver direct mail materials to educate their customers regarding the VM program, how often does the VM manager provide direct education to utility employees? When is the last time a town hall was held at a linemen's meeting? Unfortunately, this is often overlooked.

All members of the organization must understand the needs and functions of the VM department. A great way to create internal advocates is to utilize the three E's: Engage, Educate, and Excite. Every employee of the utility is a potential advocate for VM and is customer facing—not only at work but in the public.

Some positions have more customer contact than others, such as call center representatives and servicers. But we have all been asked questions as utility employees about various programs and initiatives outside of our departments. When non-VM department employees can answer questions regarding the tree work being conducted in their neighborhood, it generates trust and provides credibility to the program. These questions may be asked while attending church, checking out at the grocery store, or even at a party.

Increased support from within the organization will go a long way with the public. Increased knowledge and trust in the VM program will foster support at all levels throughout the organization. It will increase the level of collaboration across departments and may keep your budget from being the first on the list to be cut when the meters spin a little slower than normal.

Internal town halls are a great tool and use of VM managers' time. All departments have small meetings periodically. Get on their agenda and customize the message to your audience. Be prepared for tough questions and focus on spotlighting the hidden positives of your program. Be empathetic to their own experiences and develop rapport.

Internal organizational newsletters are great for communication; offer to become a regular contributor. Give updates and tell your success stories. Offer tree-of-the-



All members of the organization must understand the needs and functions of the VM department. Photos courtesy of ACRT Services.

month articles. Stay in the view of all your coworkers.

Create reports and share them above you in the organization to educate and demonstrate changes within the industry regularly. Become a SME rather than just another employee. Challenge yourself to become integral within the organization and when you have a need or an idea, it will not be the first time you are heard from by the leadership team.

Prioritize your program, within the utility.

About the Author



Kevin Puls is the president of ACRT. He has been with the company for more than 25 years and began his ACRT career as a work planner. He worked his way

up to become an operations manager, senior operations manager, and director of operations. He attended Mount Union College where he obtained a bachelor's degree in biology and holds an MBA from Ashland University. Kevin also serves as director on the Utility Arborist Board. 🌳

Regional Meeting Update

2022 UAA Western Regional Meeting

The UAA Western Regional Meeting was held in early November 2022 in El Dorado Hills, California, near Sacramento. The event was a great success with more than 115 attendees, and the rainy weather held off. The UAA has not held one of these events in the West since the 2019 event in Auburn California—and it was great for everyone. As one of the attendees said, “It was like a big family reunion.”

The Western Regional started many years ago back in the mid to late '90s as a one-day indoor conference in the Sacramento area with mostly local UVM practitioners attending. Our late friend Nelsen Money had an idea to hold this regional meeting for those who were not as fortunate to attend the larger conferences, such as the ISA Conference and Trade Show or Trees and Utilities. Between 2012–2014, the meeting morphed into a two-day field tour and began to attract folks from different utilities in the western region. Eventually, the Western Regional Meeting settled into a one-day classroom and one-day field tour event. Due to the skill of the Western Regional Planning Team, the event has sparked increased interest, moving from 40 attendees in the '90s to well over 100 today. Hats off to the UAA staff and the Western Regional Planning Team!

On November 2, the presentation session of the event was held. There were a myriad of presentations covering current activities and challenges in UVM. All talks were given in a format allowing for some great open Q&A. There were panels who discussed education advancement, professional development, and creative solutions for fire mitigation (weather station data and system hardening activities). There were also presentations about aerial vegetation management (aerial pruning with helicopters), laws and regulations from the local El Dorado county agricultural commissioner, designing a wood management program (after hazardous trees are felled), and creating defensible space around substations and other assets.

On November 3, the group loaded into

two tour buses and headed out for the field tour day of the event. The first stop was at an equipment demo site where the group was exposed to some newer, more efficient, and clearly safer tree removal and debris management equipment. There were three different stations at this stop, and the group spent well over two hours witnessing what this new equipment could do.

The second stop was a debris processing yard. The attendees watched from afar on a mountaintop while machines ran like worker ants, moving tree boles into processing chippers and then front-end loaders to take the chips to trucks to be hauled off to a local cogeneration plant. Then branches and smaller debris were placed in an air curtain for burning. The fascinating presentation was followed by a wonderful lunch from our lunch sponsor.

After lunch, attendees traveled north to the Rio Bravo Rocklin co-gen plant where the chips were being taken for processing. The plant manager explained how the material is processed and converted into energy, ultimately delivered to clients in and along the grid. The group then headed to the final stop: a drone demonstration of herbicide applications and transmission tower inspections. All attendees at this site were in awe of the capabilities of the drones applying herbicide—water was used for the demo—and the close-up HD camera, reading numbers similar in size to those on a credit card from approximately 40 feet away. The amazing drone demonstration closed out this wonderful event.

Even if you are from the East Coast or Midwest portions of the country, the Western Regional Meeting is an event you don't want to miss. The event is limited in attendees due to the buses, so if you're interested, watch for the next event in the *Newsline* and other notifications to register early—the 2022 event sold out!

Once again, congratulations to the planning team! A job very well done. And for those who attended, thanks for joining us and we'll see you next year in Arizona! 🌵



MENTORSHIP:

Paying It Forward to Help Our Industry



By Craig Kelly, Principal Safety Program Manager, PG&E



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Most of you have or have had mentors throughout your career and personal lives—I certainly have. There is a special person I look up to in my family, and there are several of you reading this piece I consider professional mentors. Each and every one of you have contributed to my success as professional, and I thank you.

Either for work or outside of work, mentorships exist and are formed by a structured learning relationship between two individuals. Professionals who participate in mentorships are engaged, productive, happy, and creative when their needs and the needs of the organization—family or company—are on the same page.

Those UVM industry professionals who have been around a while (you know who you are ... I'm one of them) are challenged to perform an appropriate level of knowledge transfer to ensure our younger colleagues are successful. How do we engage in knowledge transfer in our industry? The answer is to become a MENTOR. It's by us, the "old guard," passing on what we know, how we know it, the lessons we've learned, the hardships and success we've experienced, and the steps it took to get there. This can all be done by raising your hand, engaging with a younger colleague, and embracing and supporting them by providing a

high level of coaching a development. Then, watch them shine!

We have been lucky enough to be successful in a very close-knit industry, and it's now up to us to pay it forward. Paying it forward enables our industry to continue its overall success. And by engaging in a mentorship program, witness how far the positive ripples reach. At a recent UAA conference out West, a few people commented on how I have provided positive guidance over the past 25 years. I'm very proud of these colleagues and am extremely humbled by their comments. I have always endeavored to be a positive influence in someone's career and, apparently, I have succeeded. I was lucky enough to have mentors in the industry who taught me the importance of coaching and guiding others. Help our future!

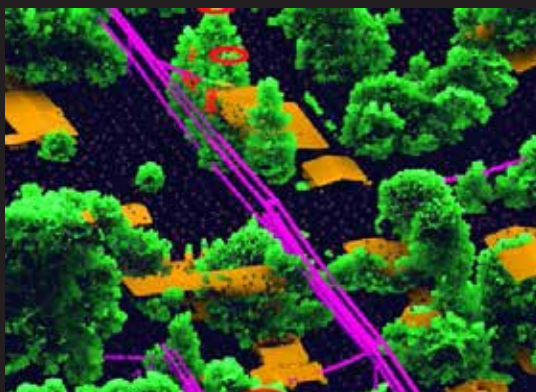
For the younger UVM practitioners, in 2023 the UAA anticipates efforts to develop and promote a mentorship program. I encourage you to keep an eye out for future news. However, don't hesitate one second! Reach out to one of the old guards and ask if they would kindly work with you to provide some guidance and coaching. With our industry's culture of paying it forward, I'm sure there are many who would be more than happy to engage and watch you succeed as a professional. ☸



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