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Volume 13

Number 1

UTILITY ARBORIST NEWSLINE

FOCUS ON INDUSTRY TRENDS AND INNOVATIONS

LEARN HOW
EMERGING
DRONE &
ROBOTICS
TECHNOLOGIES
STRENGTHEN VM

Pg.42

GET THE
BASICS ON
REMOTE
SENSING

Pg. 18





“Safety is a VALUE. If someone classifies it as a priority, I believe they may be in the wrong line of work.”

Joshua Pressley, Account Manager



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The 2021 Trees & Utilities Conference was held in person! Turn to **page 10** to read about the award recipients.

Remote sensing is the science of determining essential information about an object or phenomenon without making direct contact with that object. Turn to **page 18** to learn more!



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Turn to **page 38** to learn about how utility ROWs play a vital role in sustainable stewardship efforts.



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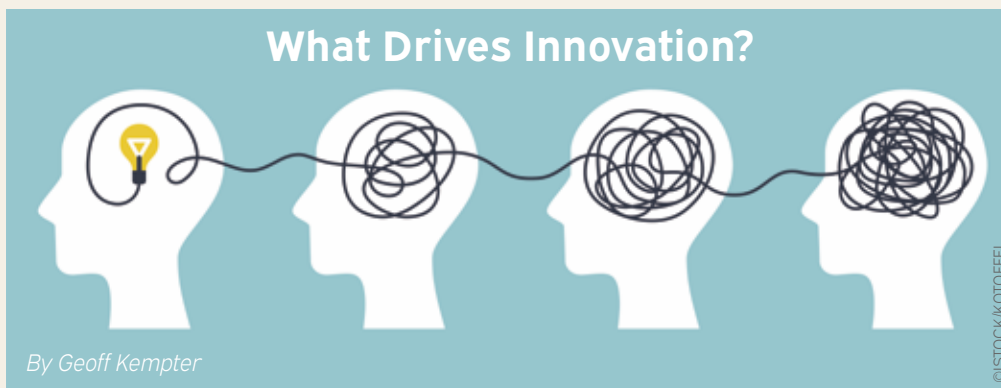
This is a list of common industry terms and acronyms frequently used in this magazine.

Best Management Practices (BMPs)
Corporate Social Responsibility (CSR)
Diversity, Equity, and Inclusion (DEI)
Environmental, Social, and Corporate Governance (ESG)
General Foreman (GF)

Geographic Information Systems (GIS)
Integrated Vegetation Management (IVM)
Light Detection and Ranging (LiDAR)
Low-Volume Foliar (LVF)
Rights-of-Way (ROW)

Tree Risk Assessment Qualification (TRAQ)
Utility Vegetation Management (UVM)
Utility Vegetation Management Association (UVMMA)
Vegetation Management (VM)

President's Message



The theme for this issue is industry trends and innovations, which begs the question: what drives innovation? Is it difficult problems to overcome, economic rewards, or the availability of new technology? Truthfully, it is a combination of all of these and more. Innovation often drives profound change, and often change is necessary. However, change—even when desperately needed—can be disruptive.

To put things in perspective, 30 years ago, there were no ISA Certified Arborists. Trees under powerlines were routinely topped or “hat-racked.” At the time, renowned tree pathologist Alex Shigo’s ideas about preserving the branch collar when pruning were controversial—nobody had heard of IVM—and aerial lifts that reached more than 55 feet were practically unheard of. The industry’s safety performance was dismal by today’s standards. And, there was only a handful of women working in utility arboriculture.

Things have certainly changed since then. Innovation has improved our practices, with better end results. But adapting to these changes was difficult for many practitioners.

It is important to remember that industry trends and innovations—and the changes that result—are a continuous process. Resting on our laurels will not cut it. In fact, a number of important factors are driving, or will drive, future innovation and significant change in the UVM industry.

1 A Shortage of Qualified Labor

This is a broad trend which has worsened since the COVID-19 pandemic. The UVM industry is competing with many others for able-bodied, relatively young workers with clean driving records. In our case, we also require that workers are willing to work outside, often in difficult conditions.

2 The Availability of New Technologies with Applications in UVM

Attend any UVM conference and there will be presentations about LiDAR, satellite imagery, artificial intelligence, cloud-based data management applications, and new types of equipment. While there is no question that many of these technologies have added considerable value, they often make unrealistic promises of huge cost savings, which can attract the attention of utility executives.

3 Climate Change

The evidence of rising temperatures is overwhelming. And the intensity and frequency of storm events is increasing around the world. When these effects are combined with invasive pests and other stress factors, the inevitable result is greater tree mortality, increasing tree failures, and impacts to utility facilities.

4 Increased Emphasis on Sustainability and Other ESG Concerns

This emphasis includes greenhouse gas emissions, habitat enhancement, and other performance measures that often spotlight utilities and their suppliers, many of which have large carbon footprints.

5 Prioritizing Arboriculture in Utility Arboriculture

It is well known that trees and branches falling in (not “grow-ins” following clearance operations) are the most significant cause of service interruptions. Yet, many utilities continue to focus on simply obtaining clearance rather than systematically reducing risk.

Addressing these trends will be a complex endeavor and will require innovation and creativity. We are challenged to evaluate and use new technologies and equipment to better leverage the limited monetary and personnel resources available to us, and to also improve our performance by targeting the vegetation most likely to cause service interruptions.

As for ESG, our industry is well positioned to help our parent companies improve their scores by adopting IVM best practices, including enhanced pollinator and other wildlife habitat. And, of course, there is always room for improvement in safety performance.

To meet these challenges, we also need to encourage our members and employees to take advantage of the knowledge and credentials available to them, including ISA Certified Arborist, Utility Specialist, TRAQ, as well as the Utility Vegetation Management Certificate Program offered by the University of Wisconsin–Stevens Point.

With more than 5,000 members, and an informed and capable staff, the UAA now enjoys strength in numbers. We will leverage our skills and influence to inform other stakeholders, and ensure that best practices are recognized and implemented. It won’t be easy, but it will be very rewarding. 🌳



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Executive Director Message



Does Innovation Have to Be Something **BIG** or **BRAND NEW**?

By Dennis Fallon

Years ago, on a fishing trip I had a chance encounter with a 1970 Polaris snowmobile parked under a spruce tree in central Minnesota. The owner told me the snowmobile had been purchased new by his grandfather. Now, it just sits under that tree. So, I made the owner an offer to buy it, thinking I could easily hike myself and my gear to fishing spots every winter. With this snow machine, I could effortlessly glide across frozen lakes in search of fish.

For the rest of that year, I attended swap meets—my toddler son in tow in a backpack carrier—to acquire parts for the snowmobile, which I spent many evenings assembling in my garage after everyone was asleep. My son would ride along entertaining himself by snacking on crackers and sipping juice boxes that often ended up on my hat or down my back. At one swap meet, I found an almost pristine copy of the book, *Polaris Pioneers, A Star is Born* by Jerry Bassett. The book salesman asked, “Have you ever wondered how that old snowmobile you have been working on came about?” And that made me curious enough to buy the book crammed with stories of innovation, setbacks, freezing test drives, and folks with a vision.

This edition of the *Newsline* has an overarching theme of innovation and industry trends. When I think about the concept of innovation, big changes and new inventions come to mind. However, writing this message made me reflect—does innovation have to be something big or brand new? After I spoke with folks at the 2021 Trees and Utilities Conference in Minneapolis, I realized that I am overthinking it. Innovation is simply the process of modifying something that exists by making positive changes—translated into our industry’s lexicon through the idea of continuous improvement. In my mind, I had it mixed up with invention or creating something novel. The same with my snowmobile; the folks in Northern Minnesota did not *invent* mechanized travel across the snow, but *improved* it, ultimately being able to commercialize as well as market their product.

Utility arboriculture is a target-rich environment when it comes to innovation, and the UAA membership and its committees are rife with forward-thinking individuals. Ask anyone who was formally trained on how to hip-thrust ascend into a tree if they wished concepts like friction savers or ascenders were available to them during those times. In a tone steeped with pride of perseverance, those early trainees can regale everyone with tales of woe along with overexertion.

Cultivating a climate of continuous improvement seems like a simple task welcomed by all. The reality is innovation

can be difficult, especially in environments where trust or other resources are limited. Resource limitation is only a portion of the resistance to continuous improvements. Innovating something that already exists amplifies the fact that someone already has an investment in that thing. Those investments can be emotional, financial, social, or institutional. The greater the investment is often translates into the greater effort required to demonstrate a positive change.

Response to innovation is critical, defining the capacity of innovation around you. Think about any situation where an observation or suggestion was rebuffed with simplistic responses like, “This is the way it has always been done,” or “That would be too expensive,” or “Why would we do that?” These responses often limit the sender from communicating future input, especially if their input is always rebuffed. The rebuffed statement examples here are easy for an observer to identify as straightforward pushback, and we train on this concept—especially when talking about a safety culture. The reality is that there are many more responses and actions in our industry holding back programmatic continuous improvement.

Picture yourself managing a VM program. You want to increase biodiversity in the corridors as an effort to build positive relationships with external stakeholders. More importantly, you want to drive down long-term cost inputs as the site is converted from incompatible to compatible species management over time, which requires less inputs to realize the desired outcomes. For this exercise, your scorecard metrics are based on what came out of the corridor versus what is still left after work teams are complete. The scorecard metrics are designed to drive desired outcomes based on established processes. The addition of innovation becomes difficult in the face of opposition. While no one may be verbally dissenting, failing to leave room for innovation in our performance metrics may act as silently rebuffing someone’s opportunity to effect innovation.

Continuous improvement (i.e., innovation) will have a hard time manifesting itself in an environment where our communication—verbal or not—is holding back ideas. If you feel like your team has more capacity for innovation, yet change is sporadic or underachieved, it might be time to review what impact nonverbal influencers are having on the team. 🌱



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UVM Summit UPDATE

By Paul Hurysz, Manager-
Transmission Contract Resources,
Duke Energy Corporation



GREETINGS, FELLOW UAA MEMBERS,

I hope this note finds all of you well. Just as a quick reminder, the Utility Vegetation Managers Summit is comprised of utility vegetation managers (investor-owned, electric and/or rural electric cooperatives, and municipalities) from across the country who focus on problems the UVM industry is facing. As a result, the Summit Committee presents information about relevant topics and industry problems, concerns, and opportunities, and the Summit attendees—as part of a collaborative effort—try to solve them. Teams are formed to report on BMPs that address the concerning issues and to share the findings with the industry.

This meeting of thought leaders occurs once a year and is open to utility managers across North America. Our next scheduled meeting is the week of May 16, 2022, and it will be hosted by First Energy in Akron, Ohio. If you have never attended, please consider doing so. It is a great opportunity to network with some of the brightest thought leaders in the industry!

2022 AGENDA

There are three topics of interest resonating with the UVM Summit and Best Practices Committee members this year. Each topic will be discussed and developed at length to make improvements throughout the three-day meeting (one full day bookended by two half days).

1 Wildfire Prevention

First, wildfire prevention and forest management are, and have been, topics of interest for the lower 48 states—particularly the Western states or provinces in North America—for a number of years. The subcommittee is developing solutions, such as using VM data and analytics to establish predictive modeling for wildfire prevention. This effort may also aid hazard tree programs and/or the use of fire retardants to minimize the effects that wildfires can have on utilities and their surrounding communities.

2 Technology

Secondly, with the technology focus, we have another team working on gathering information to improve general maintenance

activities with the use of technology. Predictive modeling, AI, and satellite and remote sensing technology are all being used today to help manage costs of VM programs. The goals are to improve reliability of electric utility circuits, streamline maintenance practices, improve worker safety, as well as develop quality assurance programs through change detection efforts, to name a few. This segment of our meeting intends to help us avoid the traps and mistakes while adding value to our maintenance programs.

3 Workforce Retention and Resource Management

Lastly, we have a not-so-new topic that has been amplified amid the COVID-19 pandemic. Workforce resources are extremely hard to come by these days, regardless of what industry you may be interested in. I recently saw a Domino's Pizza ad that claimed they were offering \$5k hiring bonuses.

The U.S. West Coast, and other areas in North America are currently developing workforce retention, professional services, and vocational training programs that are clearly having an impact on bringing high-quality talent into our industry—even during a worldwide health crisis.

The question is how can IOUs, co-ops, and REAs positively influence the success achieved in the West to move East for the betterment of their own workforce? In our opinion, it is not just a contractor problem. Resource shortages have a significant impact on everyone's safety, production, and financial performance.

INVITATION

I sincerely hope that you are interested in joining us. Feel free to reach out to me or the UAA staff if you would like more information, or are willing to help with the May summit preparation meeting.

We would love to have you participate in either or both. Please remember, participation is limited to utility vegetation managers. This meeting is designed to be solution focused (in terms of BMPs) as opposed to a marketing opportunity. We look forward to seeing you there!

Wishing you all the best. Take care and stay well. 🙏

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UAA 2021 AWARDS

By Brandon Hughson, Director-VM Services,
Rainbow Tree Company

★ THE NEWLY RENAMED WILL NUTTER SILVER SHIELD AWARD

This award, previously called the UAA Silver Shield Award, was renamed to commemorate Will Nutter. We unexpectedly lost him last September, and this name change is to honor him in perpetuity, keeping his name at the forefront of safety at the UAA. He was a huge proponent of making safety a leading value of the UAA and was a trailblazer in shifting safety from a priority to a value in our everyday lives—the reason the Silver Shield Award was created initially.

This award is given to those on the frontline of safety who may have an official or unofficial safety role within an organization. The recipients of the first official Will Nutter Silver Shield influence and promote a safety culture at every turn. The 2021 recipients were **Dan Mekkes** and **Bob Urban**.

Dan Mekkes (Townsend Corporation) has been active in the utility line clearance industry for approximately 25 years. He was involved with the ISA Tree Climbing Championship program and also served as a head judge or head technical judge for the last 13 years. He was a climber for six years, is a Certified Tree Care Safety Professional, and has been a Technical Training Specialist with Townsend Tree for the last 11 years. Mekkes is active on the UAA Safety Committee and has given hands-on learning experiences with live line demos at UAA Safety Summits across the country—one of his passions. He has been happily married for 32 years, raising two amazing children, and has two very special grandchildren he loves dearly. His biggest accomplishment, most recently, has been kicking cancer's butt with an all-clear diagnosis!

Our other award recipient was **Bob Urban** (ACRT). No matter what his role, he always walks the walk when it comes

The UAA has a long-standing history of recognizing individuals

and organizations who have made outstanding contributions to both the UAA and the UVM industry. At the 2021 Trees & Utilities Conference, held in person in Minneapolis, MN, we celebrated our award recipients once again!

For me, the 2021 UAA Awards this year seemed extraordinary. Maybe it was because we were in person, or the 555 attendees, but it truly was a highlight for me and many others.

Recognizing our industry leaders and their accomplishments and contributions within the UAA was the focus and goal of the UAA lunch. I think we hit the nail on the head! We were also able to reflect on a much-deserved recognition to one of the UAA's high-level leaders, the late Will Nutter.

The UAA Board of Directors voted unanimously to rename the UAA Silver Shield Award to the **Will Nutter Silver Shield Award**. We were honored to announce this change to his coworkers, friends, industry partners, and family, including his two brothers, Tony and Jo Nutter.

We closed a chapter in the UAA with **Phil Charlton**, UAA Past Executive Director, who received the President's Award from outgoing president Paul Hurysz.

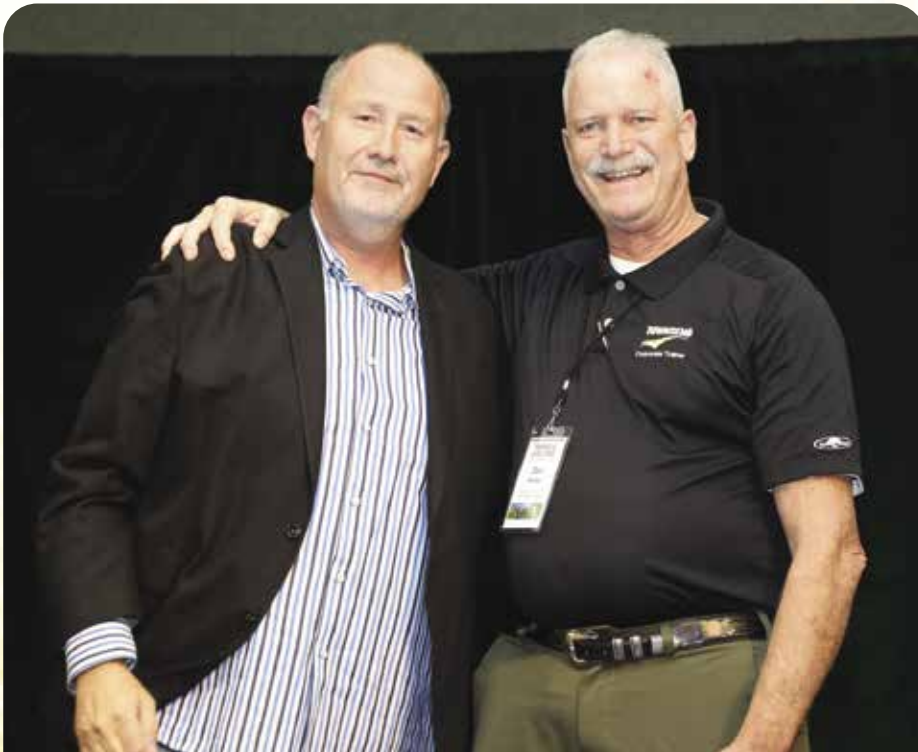
We gave accolades to an up-and-coming individual, **Carly Harrower** (ACRT Pacific), who has been an active participant in the UAA. Her contributions to our industry throughout this past year were acknowledged.

For someone who has been part of our industry for many decades, the UAA gave the Lifetime Achievement Award to **Joe Tommasi** for his contributions within his own company, The Davey Tree Expert Company, as well as his involvement in the UAA throughout his distinguished career.



Bob Urban, The Will Nutter Silver Shield Award (left, Tony Nutter)

to safety. He actively sits on numerous safety committees in his own company, our UAA organization, and throughout the industry. Continuing his passion for education, Urban presents safety topics at industry events, conferences, webinars, and more. He is currently a Senior Manager at ACRT and oversees the business development efforts in the Western U.S. Urban has served a total of 25 years in various roles at ACRT, including Field Supervisor, Operations Manager, Business Development Manager, and Director of Operations. He holds a degree in arboriculture from Paul Smith's College and is an ISA Certified Arborist and Utility Specialist.



Dan Mekkes, The Will Nutter Silver Shield Award (left, Tony Nutter)

“For me, the 2021 UAA Awards this year seemed extraordinary. Maybe it was because we were in person, or the 555 attendees, but it truly was a highlight for me and many others.”

for CEMA and most recently held a newly created position, VPM of Training and Change Management. He has been the PG&E point of contact between the UAA and Butte College for their work with the utility arborist program, designed to train California’s next generation of utility pre-inspectors and tree contractors. In his spare time, he enjoys spending quality time with his family, hiking with his golden retriever, and riding his motorcycle on the open road.

★ UTILITY ARBORIST AWARD

This award recognizes an individual who has made a significant contribution to the field of utility arboriculture. The 2021 recipient was **Rafael Estevez** (ECI), who is an experienced utility and technology professional with more than 10 years of experience. Estevez has served as Distribution System Forester and Eastern Region Forester for Duke Energy, and has held other leadership roles, such as the Director of Data Operations and a business advisor for an AI company. He is well-versed in distribution arboriculture and safety practices, and has led a rapid improvement event associated with the customer experience initiative. These efforts include updating distribution VM standards for maintenance, reactive, and hazard tree programs, evaluating possible emerging technologies, creating the QA/QC score sheet, and was a subject matter expert for the enable team. Estevez received a bachelor’s and master’s degree in forest management and an MBA from North Carolina State University and is an ISA Certified Arborist and Utility Specialist.



Rafael Estevez, Utility Arborist Award

★ RISING STAR AWARD

This award is given to individuals who are relatively early in their career, yet have already shown leadership of the organization and the industry.

Award recipient Carly Harrower has been with ACRT Pacific since 2014 as a Consulting Utility Forester. Harrower was quickly promoted just one year later to a supervisory position and again to Operations Manager in 2016. She is an ISA Certified Arborist and an active participant on the UAA Rights-of-Way Symposium Committee.

★ EDUCATION AWARD

This award recognizes an individual who has added to the knowledge and practices of the utility arborist. The Education Award was given to **Mike Thiffault** (PG&E). He is an ISA Certified Arborist with 17 years of experience in the industry, as well as a U.S. Marine Corps veteran. In 2017, Thiffault joined PG&E as a Vegetation Program Manager (VPM)



Mike Thiffault, Education Award



Carly Harrower, Rising Star Award

★ **LIFETIME ACHIEVEMENT AWARD**

This award is presented to people who has reached many milestones during their career. The 2021 recipient, **Joe Tommasi** (Davey Tree Expert Company), has been in our industry since 1972. He started out as a foreman and oversaw utility line clearance crews. Tommasi has worked as a director of safety, an operations manager, and Vice President of Corporate Safety. He was responsible for developing, implementing, and administering safety programs, which include management and personnel who achieve their incident prevention goals, claims and risk management, analysis of incident trends, joint development of incident prevention strategies, OSHA and DOT compliance, and the substance abuse policy.

Tommasi served as an expert witness before the federal courts and served on the National Safety Council. He has also been active, in various capacities, in the UAA with the ANSI Z133 Committee and task force with TCIA, ISA, and as an industry representative to OSHA. Tommasi has recently decided to retire and fill his time with new adventures with his friends and family.

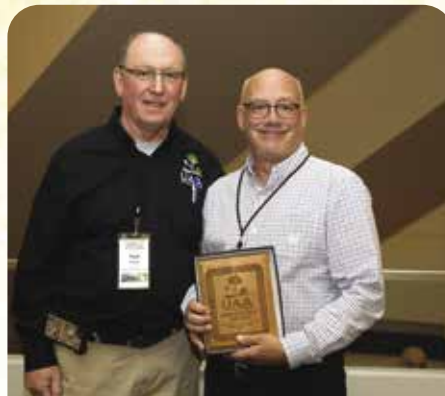


Joe Tommasi, Lifetime Achievement Award

★ **PRESIDENT'S AWARD**

This award is given by the outgoing president to recognize individuals they feel assisted them or the industry in extraordinary ways before, during, and after their term of office. The 2021 recipient was Past UAA Executive Director **Dr. Philip Charlton**.

"Phil Charlton has been—and most likely will continue to be—a mentor to many who have come before all of us. Phil doesn't care about recognition for himself but would rather the organization or his team receive it," said Past President Paul Hurysz, who presented the award. Many have looked to Charlton for guidance,



Phil Charlton, President's Award

calmness during storms, and knowledge and understanding of the UVM industry. The President's Award recipient is an icon in our industry. We wish him well with all his future endeavors, including retirement! We certainly hope he will not be a stranger and that he continues to be an active part of our industry.

★ **PinE AWARD**

The UAA is the leading North American organization for the enhancement of quality utility arboriculture and ROW management. Our success relies on the support we receive from all of our members, sponsors, and volunteers. Companies that go above and beyond to support our mission are recognized annually. UAA membership, sponsorship, advertising, active committee volunteerism, and many other means are assigned a value that equal to a PinE Score. This is reviewed by a committee of industry peers based on all of the listed items for the previous fiscal year and is scored and awarded at the UAA Annual Meeting. A tremendous thank you to the PinE recipients for their continued support of the UAA and its mission.

PinE AWARD RECIPIENTS

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GOLD

ACRT & ACRT Pacific

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 CN Utility Consulting, Inc.
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REMEMBERING *Dr. Ken Carvell*

By Kevin K. Eckert (WVU '78), President and Chief Consulting Arborist, Arbor Global USA/Arbor Global (Hong Kong) Ltd.

We have lost a great friend, mentor, and teacher with the passing of Dr. Ken Carvell ("Doc"), professor emeritus of West Virginia University. He passed away peacefully at age 96 on September 24, 2021, preceded by his beloved wife, Elsie, in January of 2018.

Doc grew up in North Andover, Massachusetts, and faithfully served his country in the 29th Infantry Division in the European Theater from 1943–1946 receiving both a Purple Heart and the Bronze Star. With degrees from Harvard, Yale, and Duke, he joined the WVU Division of Forestry in 1953, where he taught until retirement in 1988 as professor emeritus of forest ecology. He received numerous honors from WVU, community organizations, and associations. Many of his previous students honor and remember his immeasurable legacy.

Jim Bean: "I transferred to WVU from a small school in Pennsylvania. Fortunately for me, Doc was my advisor. The first time we met, he invited me to his house to go hiking. Trips with Doc always led to interesting sites and I learned a lot about West Virginia. He helped shape my career, and we kept in touch throughout the years. Doc was the most important mentor in my life. I cherished our friendship."

Chip Brown: "Doc introduced me to the utility industry. Doc was proud that so many WVU forestry students had found careers in the UVM business. He could talk to anyone and treated everyone with respect—no matter what. People were always surprised, based on his personality and demeanor, to discover his educational lineage. He and Elsie were always glad to see me when I'd visit, and my life has been blessed by knowing them."

Ed Cunningham: "I was fortunate to spend time with Doc and his research team throughout the U.S. I was invited to his family lake house in New Hampshire, sharing his passion of trees, plants, moss, birds, and obscure towns throughout the country. We enjoyed many picnics with his homemade root beer and quick-witted, dry sense of humor. He let me present our preliminary EPRI research results at the WV Weed Meeting in Charleston. Thanks to Doc, an entire generation of graduates got into the UVM field—including myself."

Kevin Eckert: "Doc was my second father—a caring, wise, and strong inspiration. I was a weak student, but Doc took me under his wing. During school, I enjoyed countless dinners, hikes, and interesting activities like caning chairs, making root beer, botanizing, ginseng hunting, stargazing, and listening to Doc's amusing stories and wisdom. When I had trouble finding work after graduation, Doc and Elsie housed and fed me and even had their dentist remove my wisdom teeth. My children and I spent many wonderful summers at their lake house relaxing, canoeing, and repairing maintenance projects. His fatherly, unselfish guidance was key to my successes professionally and personally. I miss him terribly."

Steve Genua: "A mentor, professional, and father, Doc nurtured all his students, myself included. I had a wife and child after my second tour in Vietnam, and Doc and Elsie put my family up for several weeks while I found a place and continued college. He wouldn't accept any money; however, the love he shared is still with me today."

Lynn Grayson: "Many WVU graduates have held leadership positions in the UAA and ISA and Doc Carvell is a common link among them. He not only taught us forest management, but showed us opportunities in fields not directly related. His evident care and devotion to his students carried on long after we graduated. Doc not only remembered our names years later, but could recollect specific details of our times together. Hopefully there are still instructors who care as much as Doc to inspire their students."

Ray Henning: "If it were not for Doc, I would not be where I am today. With every student's best interest at heart, he prepared them for lifelong careers in UVM by



teaching us how to use our forest management knowledge to manage utility vegetation. Doc grew my interest in botany, herbicides, silviculture, and UVM. He helped me find my first job as a utility forester, and was always interested in my career. He loved hiking, history, botanizing, and bottle hunting with anyone. His wife was his most valuable asset; she supported him in his career and looked after Doc's students, often serving them dinner. I will be forever grateful for his guidance. It was a privilege to be his student and friend."

Rick Johnstone: "Doc let us know that utilities needed to hire foresters and gave us a field demonstration of backpack herbicide spraying. I remember his guidance on natural herbicides and continue to use that education in my presentations, especially to the doubting general public. To this day, people are shocked to learn that plants actively fight each other for their growing space."

Ken Kirkham: "One of the most influential people in my life, Doc embraced me in graduate school and remained involved throughout my career. He counseled me throughout school, arranged an interview with my eventual employer of 37 years, and gave me support along the way. Doc and Elsie hosted me and others at their home regularly. We went on hikes where he patiently taught me vegetation identification. He and Elsie visited our family in Virginia and he seemed to know more about our area than I did!"

Tom Mayer: "Doc was wonderful mentor to us all—always informed, entertaining, and a pleasure to work with. While living in New York, I showed Doc a number of rare plants; he said it was his best plant day ever, a fair trade-off for the many plants and stories he

▶
Dr. Ken Carvell passionately shared his knowledge of vegetation hands-on during hikes.

shared. West Virginia foresters had Doc's portrait hung in Percival Hall, and I was honored to present the first Lifetime Achievement Award to him at the Forestry Banquet a few years ago. When measuring trees at a site, I heard a rattlesnake and told him to stay still. He said it was a cicada. After I found the rattler, Doc, with his understated, masterful wit, said, 'If he had bitten me, I might have dropped my diameter tape.' He will be sorely missed."

Michael A. Neal: "If you ever had the opportunity to walk in the woods with Doc, it was always an unforgettable experience. He knew every plant's common and scientific name, and the history of the area. As an instructor and mentor, I always wanted to learn more from him. He was the best teacher and I will never forget his impact. One of my greatest pleasures was presenting his President's Award at the ISA Conference in Pittsburgh."

Philip Ross: "Just before graduating, Doc walked me to his office where he handed me a stack of business cards and told me to reach out to some of the leaders in the field of UVM. I ended up at Appalachian Power for more than 36 years. I have met many foresters—great advocates of our profession—who Doc introduced to the field. Many of us owe so much to the dedicated educator whose top priority was helping his students succeed—even beyond the classroom." 🌲



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Our Problem with Innovation

By Phil Chen, Manager of Research & Development, CNUC

When we speak of innovation, technological breakthroughs often come to mind. In UVM, our mind conjures remote sensing, machine learning, and AI. What are they and what do they offer our industry in the way of solutions? Will someone innovate a “magic bullet” that can solve our UVM woes? Maybe they are just trends that will fade away like the names of artists who brought us the one-hit wonders of our childhood.

I entered the UVM industry from the world of forestry and natural resource management research. At the time, in those spaces, remote sensing was already heavily in use. Models were being developed to identify trees to species using high-resolution satellite imagery. Others worked on ways to quantify coarse woody debris in remote areas using that same imagery. While in school, in a remote sensing course, we did rudimentary machine learning through the process of image classifications to identify cover types.

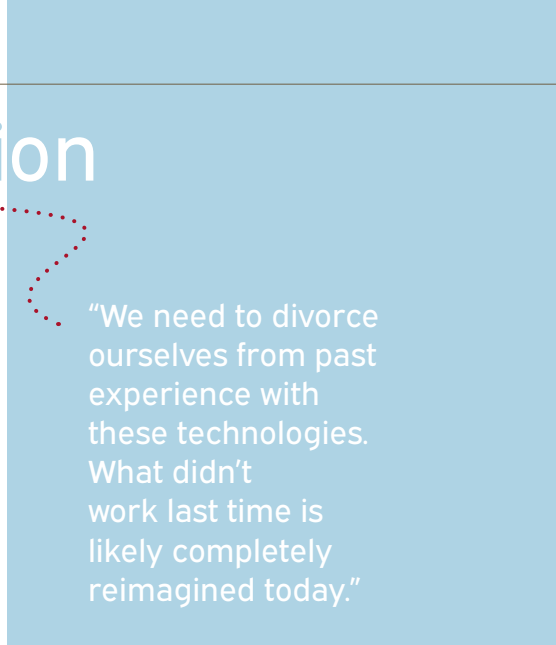
When I started in UVM in 2014, these tools were being used but were far from ubiquitous. Throughout the past seven years, I have seen these tools become more widely utilized and have used some myself. However, each conference brings concurrent sessions on the same solutions, and each time, I see people walk out of the room that haven't put these tools to full use. Even when the technologies are brought to the field, those efforts seem to produce neither breakthrough operational methods nor the blockbuster, industry-rattling results that were promised. Have technology companies failed to deliver or is there something else at play?

I would argue that we have an innovation-stifling triple threat on our hands. We are all at fault:

1. Innovation partners market products in a way that pits technologies against one another.
2. Too many utility decisions are informed by past experience and narrow perspectives.
3. We have a gross lack of data standards and consistency both within and among utilities.

● False Competition

We leave a conference thinking it is a rivalry between LiDAR, drones, machine learning, satellite imagery, boots on the ground, etc. None of these technologies function in this way. Each has strengths and weaknesses. Each excels in a particular area or set of projects and is near useless in other scenarios. I don't blame the technology companies; they are working to differentiate themselves in the marketplace. Yet, this often creates false dichotomies. None of these technologies are mutually exclusive and we all benefit from using them together.

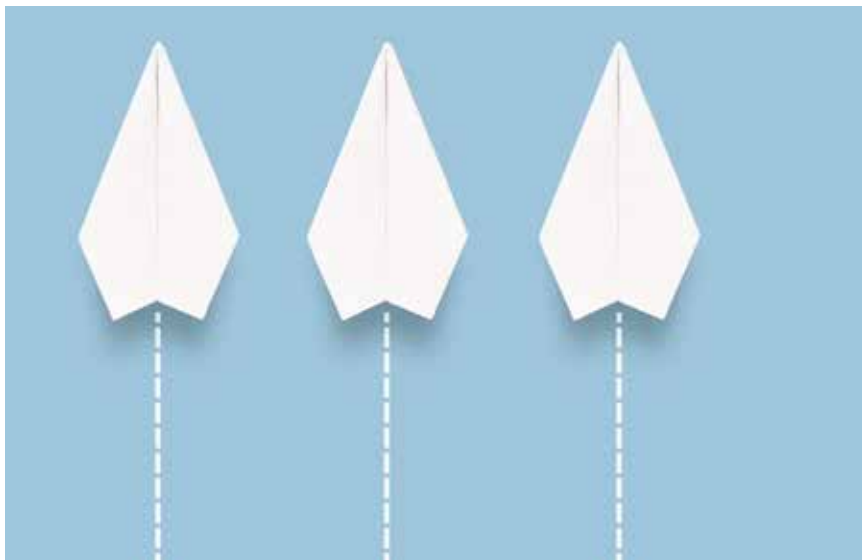


“We need to divorce ourselves from past experience with these technologies. What didn't work last time is likely completely reimagined today.”

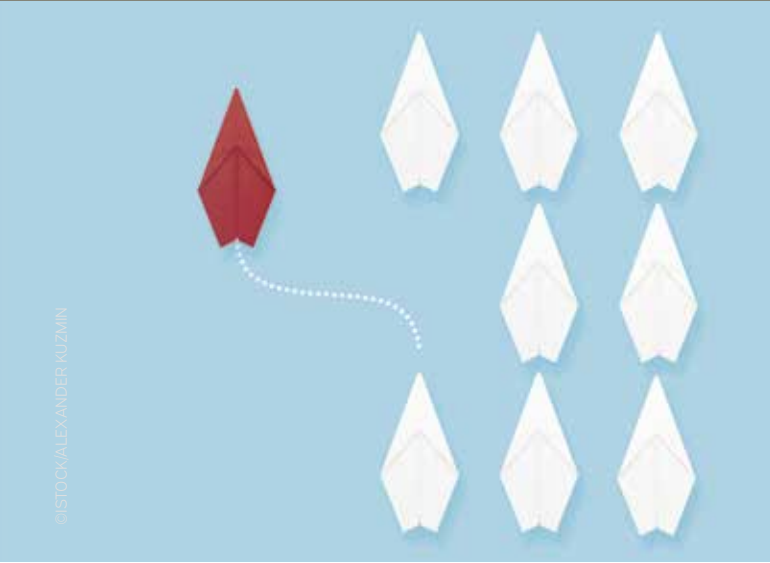
Our industry promotes the best practice of IVM yet tend to forget the “integrated” bit. Each tool and technology can produce powerful results when used in the right way, but none is as strong as all of them together. Let's add tools to our toolbox rather than looking to replace tools with new ones.

..... Diverse Perspectives ●

The utility sector has long been known for being slow to change. This has been exacerbated by the pace of the world and technology. SINTEF (Dragland 2013), one of Europe's largest independent research organizations, estimated that 90% of all data had been generated in the two-year period, 2011-2012. Since then, the pace has only accelerated. In 2020, it has been estimated that 2.5 quintillion (there are 18 zeros in a quintillion, FYI) data bytes are created daily (Durairaj



“The utility sector has long been known for being slow to change. This has been exacerbated by the pace of the world and technology.”



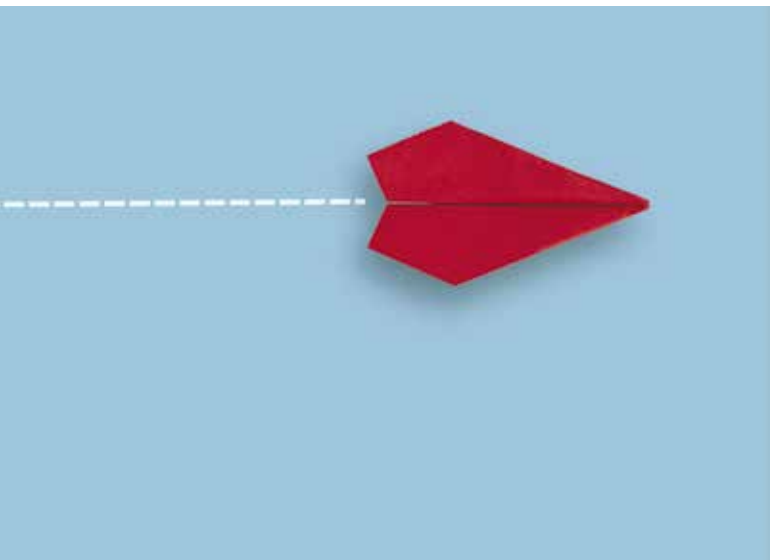
ISTOCK/ALEXANDER KUZMIN

2021). Soon, the 5G network will replace the 4G LTE standard, delivering data speeds one hundred times faster. This is all to say that tomorrow will offer something completely different than yesterday and unrecognizable from last year.

We need to divorce ourselves from past experience with these technologies. What didn't work last time is likely completely reimagined today. It may be time to take things back off the shelf and start experimenting. Additionally, we need to develop agile ways of testing and adapting, counter to our industry's reputation. Utility organizations are large and difficult to move in nimble ways. We need UVM departments to find pioneering ways to test these products. Find small projects with short time horizons to iterate and investigate; don't try to commit an entire program or long-term project. Start with small pieces and build to something larger.

● **Data Standards**

Finally, we have done ourselves harm in not setting standards for data collection, even within our own organizations. With the advent of machine learning and AI, we have an opportunity to leverage the massive amounts of data we collect each year in ways unimagined, yet this data goes largely unused due to our



own unintentional sabotage. What data we collect and in what way is highly inconsistent.

Even an individual utility likely does not have strong longitudinal data with consistency, let alone if we consider pulling data in from multiple utility sources. I've witnessed this firsthand with a recent study on the potential cost of deferring maintenance. We should do ourselves a future favor and develop data standards. When we do, let's make sure to include the innovation partners that will likely leverage the data to assist us when the time comes.

We can no longer play the part of the technologically naïve. Data and technology are just as much a part of this industry as chaps and chainsaws. We have a toolbox that grows in possibility by the moment, we need only seize it. Let's aid ourselves in the implementation of these advantages and not block our own progress. All the while reciting a mantra of "integrate, record, and adapt."

● **WORKS CITED**

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Remote Sensing 101: THE BASICS

By Jacob D. Hall, Director of Strategic Accounts; Ian Berdie, Vice President of Innovation and Development; Sam Johnson, Delivery Manager; Rebecca Lasica, Vice President of Commercial Sales; Jennifer Whitacre, Director of Strategic Accounts, NV5; and Martina Baccolo, Sales and Partnerships Manager, LiveEO

All photos are courtesy of NV5

INTRODUCTION

Remote sensing is the science of determining essential information about an object or phenomenon without making direct contact with that object. It has diverse applications in planning, engineering, construction, and maintenance of critical infrastructure. It is compelling for electric utilities that typically have considerable high-value assets—either long corridors for transmission or vast areas for distribution. This article will discuss the sensors and platforms utilities are operationalizing today, along with example use cases and applications.

Remote sensing utilizes two sensor types: active (LiDAR and synthetic aperture radar [SAR]) and passive (optical and imaging). Passive sensors detect and collect reflected solar radiation off the Earth's surface and atmosphere. Sensors are designed to detect emissions, from visible light in the shorter wavelengths to longer wavelengths our eyes cannot see, including near-infrared and thermal spectral reflections. Passive sensors rely on energy from the sun, where objects on the ground both absorb

and reflect solar radiation. They capture and record the reflected light in the form of a “spectral signature,” which is used to make an image containing data both visible and non-visible within each pixel. This reliance on sunlight requires passive imagery to be collected during the daytime. Alternatively, active sensors like LiDAR and SAR provide their own source of energy for illumination. Active sensors emit a beam of radiation towards Earth and collect the reflected signal. Unlike passive sensors, active sensors can obtain measurements anytime regardless of sun angle, day or night.

Combining passive and active acquisition technologies allows utilities to collect high-temporal, high-resolution, high-accuracy data to develop advanced analytics that support UVM and asset management. The most remote sensing technologies in UVM programs include LiDAR, multispectral or hyperspectral, orthoimagery, oblique, and satellite optical sensors. These enable various use cases for UVM such as optimization, vegetation species/health, asset inspection, asset management, tree inventory, risk assessment, and change detection. The table on page 19 provides a summary

of accuracies of both passive and active sensors currently used by utilities.

Accuracy, density, and resolution requirements vary significantly depending on the desired operational outcomes. Much of the LiDAR data available in the public domain is captured at a density of two points per square meter (ppsm), which has little value in most utility remote sensing applications. These data start to become interesting at 8 ppsm, but most vegetation management applications require 30 to 100 ppsm to provide reliable answers. Accuracies of 5 to 10 cm are standard requirements, and these are available in all low-altitude and ground-based platforms.

LiDAR data models the natural ground and built environment above it. In utility applications, this enables the capture of most, if not all, utility assets—structures, conductor spans, attachments, guys—and the natural ground and vegetation surrounding the assets. Modeling in 3D allows utilities to analyze the risk posed by each tree under various conditions and electrical loading scenarios, allowing vegetation managers to understand the position of the wire to the surrounding trees at peak demand.

Platform	Acq Height (ft)	Speed	Absolute Accuracy (cm)	Lidar Density (ppm)	Image Resolution (ft)
Fixed Wing Lidar	1,000–7,000	100–300 knots ¹	5–10 cm	2–100	0.25–1.0
Rotary	400–1,000	20–40 knots	2–10 cm	50–200	< 0.10–0.25
sUAS	100–400	10–20 knots	2–10 cm	80–300	<0.05–0.15
Mobile	On ground	20–60 mph	1–5 cm	1,000–4,000	0.10–0.50
Satellite	430–500 mi	Orbit	1.5–100 m	N/A	1.0–30

¹ 1 knot (kn) is equal to 1.15 miles per hour (mph)

MINIMUM MAPPING UNIT

The minimum mapping unit is one of the fundamental concepts of remote sensing. Simply stated, you cannot reliably map anything smaller than the resolution of your data. For example, if you have a 3 m pixel from a satellite system, you cannot map conductors, poles, or anything smaller than 3 m resolution. The dark color of the conductor and the green of the grass below will blend into an average color score for that pixel. Similarly, a LiDAR data set with less than 25 ppsm does not contain sufficient survey returns to model the catenary curve of a conductor. Orthoimagery with a pixel size less than 15 cm is insufficient for work planning, much like oblique imagery at resolutions less than 4 cm. Resolution of input data sources is fundamental to the analytics one can derive from these data, how they can be operationalized, and the efficacy from a remote sensing product that a utility can expect.

COMMON PLATFORMS AND APPLICATIONS OF REMOTE SENSING USED IN UTILITY VEGETATION MANAGEMENT

Most remote sensing platforms used by utilities have focused on LiDAR and oblique imagery collected from a rotary or fixed-wing aircraft. Recent advancements in large format sensors have introduced the advantages of fixed-wing aircraft, which can fly higher and faster than rotary craft but cannot often collect obliques at a high resolution. Dual ports within fixed-wing platforms enable co-acquisition of LiDAR and downward imagery with both systems inside the hull. At the same time, rotary aircrafts typically have exterior-mounted systems and forward-facing oblique camera systems. Both platforms use onboard computing systems, GPS, and inertial navigation systems (INS) to measure the position and orientation of the aircraft, including yaw, pitch, and roll.

TYPICAL APPLICATIONS: LIDAR AND IMAGERY

LiDAR and imagery (oblique and ortho) are the most common utility applications for automating vegetation measurement under the transmission conductors using a minimum vegetation clearance distance (MVCD). MVCD analyses include radial encroachments distances as recommended by NERC. Some utilities, in addition to NERC recommendations, use LiDAR for ROW danger-tree or hazard-tree analysis in support of optimization of activities including—but not limited to—pruning, tree work, hand clearing, or mechanical operations. Transmission tension section and wire positions, modeled using PLS-CADD, provide utilities with the ability to model weather cases, maximum operating conditions, and conductor blowout. Utilities have also deployed rapid reporting to detect tree-to-conductor clearances and mitigate risk before peak growing/peak load conditions occur. Further analytics approaches and considerations of slope, wind, historical outages, and drought conditions provide deeper insights into healthy trees with a higher likelihood of failure during high wind events.

LESS COMMON: HYPERSPECTRAL

Hyperspectral imaging is a specialized remote sensing application that can record hundreds of spectral bands in the visible and near-infrared. These data are trained through ground-truthing, enabling utilities to identify species of concern and carefully analyze tree health and other applications not available from multispectral imagery alone. Spectral signatures are developed from forest plots and ground sampling with machine learning applied to the entire scene. The resulting image and model, when combined with LiDAR, create a map of the vegetation density and species.

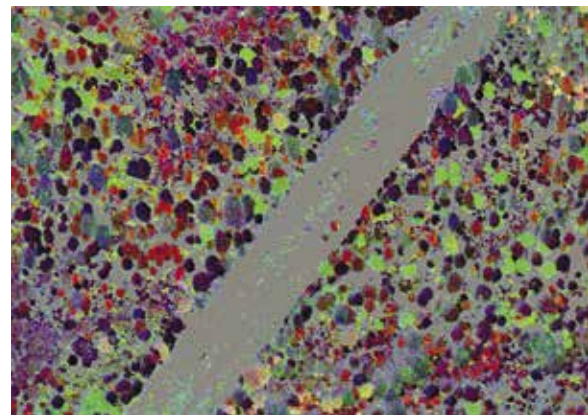
Specific applications include understanding low vegetation in the ROW



Infrared orthoimagery



Hyperspectral imaging



LiDAR data

for quantification of fuel types under the conductors. By identifying high-risk or incompatible species—including low and high grasses—the percentage of vegetation cover and species type aggregated to the span level can be determined. The data helps identify and prioritize fuel risk along the circuit. These analytics can also be used to determine the units and planning for herbicide treatment. In cases where off-ROW species tie to outages, other factors such as slope, percentage of overhang, and

historical wind can yield a deeper understanding of the likelihood of tree-to-wire contact, limb failures, and hazard trees. Additionally, the rate of mortality can also be measured using hyperspectral imaging.

CONDITION-BASED VEGETATION MANAGEMENT: DATA SCIENCE, RISK MITIGATION, AND OPTIMIZATION

Applications that have increased in use, such as optimizing work planning based on conditions rather than temporal cycles, have begun to emerge as ways to operationalize remotely sensed data that yield budgetary and reliability improvements. In recent years, vegetation managers have been issued a challenge to modify cycle-based UVM programs with risk-based assessments, move to condition-based programs, and reduce operation spend. Tools and technologies such as LiDAR are being used to describe vegetation risk to utility infrastructure coarsely. Still, there has remained a gap between these often-simple GIS deliverables and the tools needed to implement the results into complex and multi-faceted VM programs.

Through previous investigations of vegetation-caused outages and collaboration with experts within the VM field, utilities have identified several key attributes associated with vegetation-related outages that can be modeled directly from high-density LiDAR data and used to generate a combined LiDAR risk score. Once relative risk scores have been quantified, they can be included in actionable work plans. Additional analytics can include attribution of work units, determining equipment types, and identifying hazards within the ROW to avoid equipment rollover in blue sky and dark sky operations.

TRENDING SYSTEMS AND APPLICATIONS: MOBILE, UAV, MACHINE LEARNING, AI, AND SATELLITE

As utilities apply these technologies from transmission assets to distribution, mobile LiDAR and imaging platforms have increased in use. Ground-based systems collect from the roadway and typically rely on an aerial platform (fixed, rotary, or unmanned) to collect rear lot lines, alleyways, or hard-to-reach terrain. These platforms collect LiDAR and imagery at high resolutions and accuracies that yield other uses beyond VM. These include asset identification



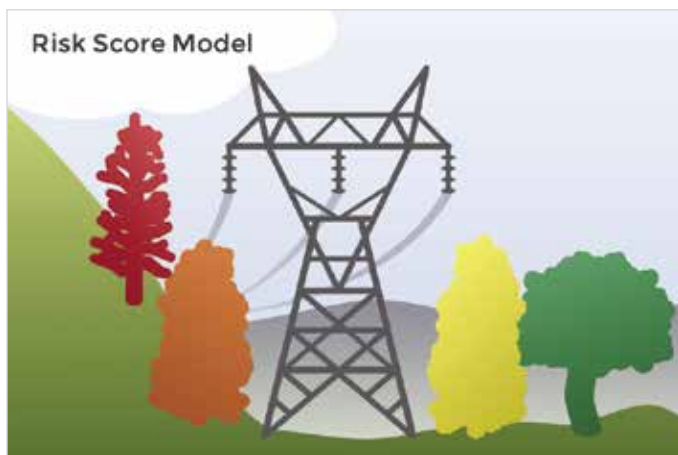
“Remote sensing provides powerful tools to utilities seeking to make better decisions for their critical infrastructure.”

and structure load analysis. Utilities have begun using these data to harden electrical distribution networks ahead of wind events, storms, and wildfires, while also determining joint use and third-party attachment viability.

Another application gaining momentum is the application of machine learning models to high-resolution oblique imagery to identify assets

and their conditions. Flashed insulators, broken cross arms, and even rust on towers can be identified using these types of automated routines. The challenge is that these machine learning algorithms require significant examples to train on. Many failures occur only rarely, so today, these automated surveys are best paired with a human inspector. However, leveraging high-resolution imagery reduces the number of times inspectors perform dangerous activities, altering rotary inspection flight profiles, and adding UAVs improves the safety of these inspections.

Satellite imagery for mid-cycle work completion auditing is also increasing for the early adopters of LiDAR, who have a highly accurate three-dimensional model of wire positions. Combining the coarser minimum mapping units from satellite imagery with its high-temporal frequency and 3D LiDAR datasets enables new monitoring use cases in UVM that would not be cost-efficient otherwise. Thanks to up-to-date satellite imagery





and vegetation classification, work completion auditing can be done remotely and throughout the season for hard-to-access areas. When the tree cover in the forest's periphery is being cleared, the remaining single trees are much more prone to storm damage than groups of trees. With regular updates on vegetation along the grid, these threats can be mitigated timely. Near real-time updates on vegetation location and condition along the entire network allow utility vegetation managers to detect fast-growing trees mid-cycle, identify and monitor invasive species, and react to deterioration of vegetation health in certain areas. When combining this near-real-time audit with canopy tree segments created from LiDAR, a utility can track trees over time and density of canopy to validate tree/prune, tree removals, and IVM prescriptions from a post-work satellite capture.

CONCLUSION

Remote sensing provides powerful tools to utilities seeking to make better decisions for their critical infrastructure. The impacts of using multiple data modalities for increasing cycle length, adding risk-based analyses, modifying pruning practices to enhance reliability, and enabling data-driven decisions that are critical outcomes of implementing any remote sensing tools discussed in this article. These technologies are not designed to replace the certified utility arborist, but provide a view of system-wide issues, optimize and quantify the location of work to be performed, supply workers with situational awareness in blue/dark sky environments, and provide tools for managing the effects of climate change on tree mortality. 🌱

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Carly Harrower



ACRT Pacific is honored to have employees who contribute to the industry daily. ACRT Pacific and our team members were recognized with two UAA awards at the Trees & Utilities Conference in October.

Carly Harrower, an ACRT Pacific senior operations manager, was named as the 2021 recipient of the UAA's Rising Star Award. This recognition is given to individuals who are relatively early in their career yet have already shown leadership in the organization and the industry.

Harrower joined ACRT Pacific in 2014 and has quickly worked her way up through the ranks. She is an ISA Certified Arborist and contributes to the steering committee for the Rights-of-Way Symposium by the UAA.

"We're thrilled for Carly to have been named this year's Rising Star Award recipient," said ACRT Pacific President Brian Joiner. "I can't think of a more deserving person to be honored with this award. It is a direct representation of her dedication to our organization and industry."

AN ORGANIZATION-WIDE EFFORT

ACRT Pacific was also honored with a gold-level PinE (Partners in Excellence) Award for its UAA involvement at a company level. This award is given to organizations whose membership in the UAA and supporting activities—such as sponsorship, active committee volunteerism, and more—quantifiably demonstrate active involvement throughout the association's previous fiscal year.

Organizations are given a PinE score based on these activities and are recognized at the UAA annual meeting. This year represents the fifth consecutive UAA PinE Award presented to ACRT Pacific.

"We are honored to be named as gold-level PinE Award recipients," said Joiner. "We offer our arborists a free annual membership to the UAA, and I'm proud of all of those who take an active part in the association to help achieve their goals." 🌱

Think about the many times when your organization has been under stress. In the UVM industry, we don't have to look far. Throughout the past two years, we have faced a global pandemic, back-to-back active storm seasons, labor shortages, and supply chain interruptions, to name a few stressors. When stretched, the goal for all of us is to recover quickly and emerge stronger. One key to success is proactively seeking and paying attention to early warning signals that we are approaching an overload situation or safety boundaries and have a plan to adapt.

WHAT IS PINGING?

At Lewis, we use the term “pinging,” which borrows from the echolocation of a submarine but refers to actively sending out our sonar and probing for signals of organizational stress.

A few years ago, when I first joined Lewis, I went out on storm with a seasoned division manager. We were at a large fairgrounds parking lot where Lewis trucks were staged awaiting tickets. What was immediately noticeable was that the Lewis teams, deployed from different regions nationwide, were not talking to one another. Fast forward: we now create structure and practices to build teamwork, collaboration, and engagement when on storm. We are one team with one mission.

During Hurricane Ida, our operations leadership formed a new, cohesive team and assigned field leadership from the diverse teams who mobilized from the responding partner utilities to lead the new team together. This allowed our boots on the ground, some of whom were deployed for weeks, to maintain stronger coordination and a high level of consistency during a situation of extreme variability.

DESTRESSING THE FRONTLINE

When on storm, our mission is to “destress the frontline.” To accomplish this, our leaders actively ping for signs of fatigue. We conduct teammate-to-teammate peer checks. We do everything within our power to support our teams with a clean place



to sleep, knowing that a good night's sleep is critical to keeping our craftworkers safe. We set the pace for safety.

We analyze our storm After-Action Reviews daily for trends and risks. This enables us to figure out where and what type of help is needed in real time. We are able to increase attention across the team and act to manage areas of high risk.

We ping frontline leaders and crews asking open-ended questions and listening for weak signals.

As risk increases (i.e., as we get closer to safety boundaries), we lower our risk tolerance and increase leadership touch points. We bring in extra safety and logistics support with goals of decreasing the load on the frontlines and bringing in a fresh set of eyes.

“During Hurricane Ida, our operations leadership formed a new, cohesive team and assigned field leadership from the diverse teams who mobilized from the responding partner utilities to lead the new team together.”



BUILDING RECIPROCITY FOR LEADERSHIP EFFECTIVENESS

Reciprocity is when a team is willing to sacrifice their individual goals to help a larger group achieve theirs. We see this clearly with utilities who are willing to provide mutual aid to others facing widescale outages and infrastructure devastation. We also witness it closer to home.

Years ago on storm calls, we would hear stories of heavily loaded operations leaders trying to find rooms on the way to storm or trucks rolling into a hotel parking lot only to discover the rooms had been given away. Sometimes teams would sleep in their trucks. At our corporate office, we embraced our mission during storm is to destress the frontline. We added flexibility and adaptability to our roles to reduce the pressure where we can, and we never say, “Not my job.”

CODESIGNING BETTER SOLUTIONS

Reciprocity is present when teams anticipate another's needs and offer help without being asked. We are now beginning to experiment more deliberately with corporate and operations spending a “day in the life” together to build knowledge of codependent roles. What's it like for our general forepersons to work out of their trucks all day long? Conversely, what's it like to respond to a multitude of varying IT requests all day long? These days are designed to give each team a better idea of what the other does and the challenges they face so they can codesign better solutions and offer each other help.

IN CLOSING

Most organizations have unofficial early warning signals of a system under strain but few well-defined strategies for noticing and managing these effectively. The key is to define your organizational pings and have strategies and capacities in place before they are needed.

For high-level strategies for managing overload and capacity strain, read the Lewis Sponsor Spotlight on page 30. 📖

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An Industry-Recognized Professional Credential

This comprehensive training program is designed and facilitated by industry professionals, who will provide you with the knowledge and skills needed to plan and manage sustainable UVM programs.

COURSES

The six project-based courses are:

- Introduction to Utility Vegetation Management
- UVM Program Management Fundamentals
- UVM Compliance and Stakeholder Management
- UVM Scope, Cost and Procurement Management
- UVM Safety, Risk and Quality Management
- UVM Program Planning



University of Wisconsin
Stevens Point

Our mission is to serve the utility vegetation management industry by providing an elite professional development program, offering current and future industry leaders with opportunities for professional certification through higher education and advanced training.

SCHOLARSHIPS

Utility Arborist Association (UAA) in cooperation with Pacific Gas and Electric (PG&E) is proud to offer full-tuition scholarships for the Utility Vegetation Management Certificate Program. These scholarships, which cover tuition for all 6 UVM courses, are available to residents of California and its bordering states. To apply for a scholarship visit the program page at www.pro-uvvm.org and look for this logo.



UAA SCHOLARSHIP PROGRAMS

MENTORSHIP

UAA Mentoring Program now accepting applications from students enrolled in the UVM Program. To apply go to: <https://form.jotform.com/210945721189157>

Questions regarding the scholarship and eligibility can be directed to info@uvmscholarships.org.

Thank you to our Sponsors



UVM Professional Development Program

By Jessica Tomaszewski, UVM Program Manager, University of Wisconsin-Stevens Point and Randall H. Miller, Director of Research and Development, CNUC

The UVM Professional Development Program (PDP) is a comprehensive, certificate-based college-level training program designed and facilitated by industry professionals who will lead participants through the knowledge and skills needed to plan and manage sustainable UVM programs. The UVM PDP emphasizes applied learning and provides opportunities for participants to think beyond their current daily individual tasks to what knowledge and skills they need to advance into management positions. It is a cooperative effort among the UAA, Utility Vegetation Management Association and the Wisconsin Forestry Center at the University of Wisconsin-Stevens Point.

✓ PROGRAM OVERVIEW

The program consists of two certificates and a credential preparation course, which are project-based. It is 100% online and courses are designed for applied learning for working professionals. There are no set days and times to engage with the course so participants can do the weekly course requirements on their own schedule. The goal of the courses is to enhance their understanding and application of industry best practices so participants can advance beyond their current roles to develop and manage comprehensive UVM management for their utilities or companies. The UVM PDP is designed and facilitated by industry professionals who blend their knowledge and experience with that of the participants to create a rich learning environment.

The UVM PDP is a pathway for UVM career development and advancement. Among those who would benefit from the program are crew supervisors who desire to advance to a management position, UVM managers who are responsible for one aspect of a UVM plan and want to explore other domains, and leaders on the utility crews who their employer wants to mentor and encourage to climb their organizational structure to a management position. The curriculum is challenging, and those considering participating should be prepared for the stretching their thinking and applying their learning.

UVM PROGRAM COURSE START DATES

Foundations in UVM Certificate (3, 4, and 5-week courses)					
	Winter 2022	Spring 2022	Fall 2022	Winter 2023	Spring 2023
All 5 courses are available each offering when minimum enrollment of 10 is met, must be taken sequentially	2/28/22	5/30/22	10/10/22	2/27/23	5/30/23
UVM Professional Certificate (10-week courses)					
All courses are available each offering when minimum enrollment of 10 is met, must be taken sequentially		4/4/22	9/12/22	1/9/23	4/3/23
UVM Credential (12-week course)					
				1/9/23	

The program is comprised of three stages: Foundations of UVM Certificate, UVM Professional Certificate, and UVM Program Planning Credential Prep Course.

✓ FOUNDATIONS OF UVM CERTIFICATE

The Foundations Certificate is a year-long program consisting of five courses of 3–5 weeks each. Foundations participants should be prepared to devote 8–10 hours a week to coursework. The courses begin with North American Electrical Systems. It is a five-week course, which explores energy generation, transmission, and distribution, and how it is impacted by VM. The second course is Utility Arboriculture and it also lasts 5 weeks. It focuses on growing conditions and how vegetation controls impact electrical systems and introduces IVM control methods. The third is a four-week Leadership and Organizations course. It introduces leadership styles and skills and how they impact UVM. It emphasizes organizational systems and the operational processes of a participant’s work. The fourth course is Program and Project Management. In this five-week course, participants examine all UVM program domains and project management concepts as they relate to a participant’s workplace. The final course is only three weeks and introduces IVM as a systematic approach to UVM and has participants systematically evaluating IVM.

✓ UVM PROFESSIONAL CERTIFICATE

The UVM Professional Certificate is the second stage of the UVM PDP, also lasting a year. It is comprised of three 10-week courses. Participants can expect to devote 10–15 hours a week for the duration of this slate of courses. The first course of this certificate is Compliance and Stakeholder Management. It focuses on program and project management processes attendant to managing regulatory compliance, stakeholders’ communications, and records documentation. Scope, Cost and Procurement Management teaches the necessity of a clear scope of UVM work to be completed, scheduling of resources used, budgeting, and procuring resources. UVM Safety, Risks, and Quality Management examines the title components integral to the development of any UVM program and project, emphasizing safety as a requirement for workplace culture.

✓ UVM PROGRAM PLANNING - CREDENTIAL PREP COURSE

The final stage of the UVM PDP is the UVM Program Planning Credential, which is a 12-week course and will demand 15–20 hours a week. It involves completing a UVM plan that addresses safety, compliance, best practices, ROW stewardship, IVM, and project management tools and processes. The idea is for participants to apply the concepts learned throughout the program to build a sustainable UVM program for their utility. To be eligible for the credential, the UAA requires participants to have completed the full UVM Certificate Program, have two years of work experience, be a UAA Member, and be committed to the UVM Code of Ethics and Professional Conduct. Plans written in this course will be evaluated by the UAA Credentialing Board who will issue the Certified Utility Vegetation Management Credential.

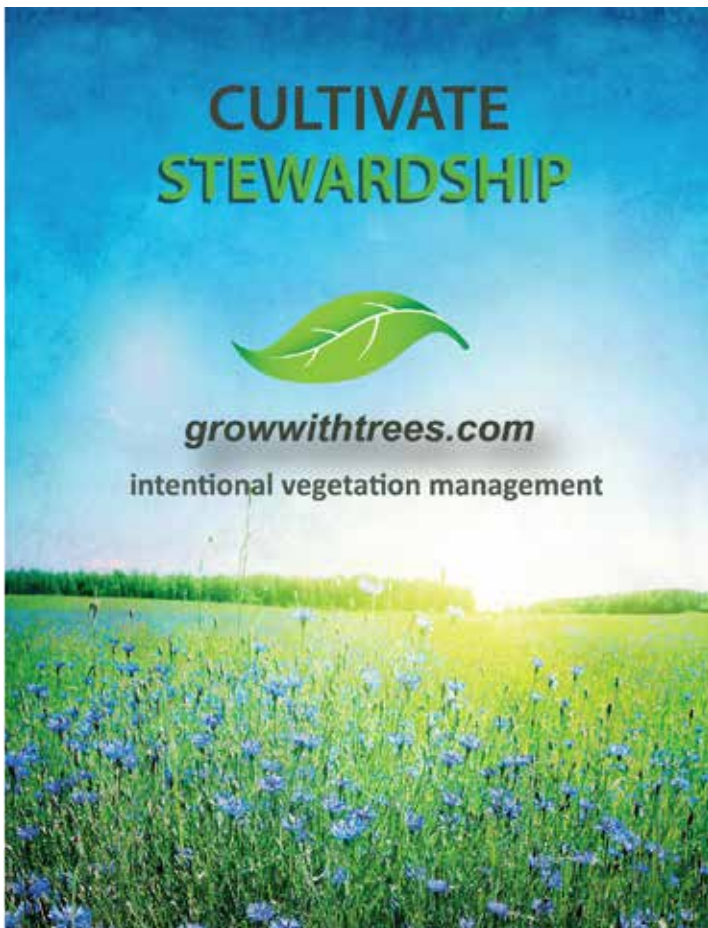
✓ “The program consists of two certificates and a credential preparation course, which are project-based. It is 100% online and courses are designed for applied learning for working professionals.”

✓ COURSE LOGISTICS

To be successful in the UVM courses, participants need to read the weekly module, participate in discussions, assemble weekly project task documents, and complete a final project. Each week, facilitators give feedback on the project task so that information can be incorporated into the final project. Participants can expect to have to devote 8–15 hours a week to their course work. The learning platform for the program is Canvas. Participants will be required to undergo 2–4 hours of orientation before the first class to introduce Canvas and full program information. During orientation, participants will learn course navigation, complete a time management exercise, and ensure they have the resources for success.

✓ SUMMARY

The UVM program expands on participants’ experiences with additional UVM knowledge and skills through applied learning opportunities. It is designed to take driven utility foresters and UVM professionals who aspire to lead in the UVM industry through a learning journey to build comprehensive UVM management plans. By working through all the UVM program domains, our UVM program graduates will be well-versed for leadership roles in our utilities and a fulfilling career, making sure our utility corridors are safe and wonderful assets to our communities. 🌳



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ACRT Industry Contributions Recognized by UAA

Bob Urban



At ACRT, safety is ingrained in our DNA. It comes first in everything we do—for our employees and customers. We’re proud to announce that ACRT and ACRT Services Senior Manager Bob Urban were honored with UAA awards at the Trees & Utilities Conference in October.

Urban was named the recipient of the 2021 Will Nutter Silver Shield Safety Champion Award, newly renamed in honor of Will Nutter, who passed away earlier this year. Nutter was the recipient of the inaugural Silver Shield Safety Champion Award presented by the UAA in 2016. This award is given to a person who is on the frontline of safety while influencing and promoting a safety culture at every turn.

Urban has more than 20 years of experience in the utility services industry, is an ISA Certified Utility Arborist, and is an advocate for safety throughout our organization and industry.

“This award symbolizes Bob’s commitment to safety throughout the ACRT Services family of companies and the industry as a whole,” said John Wasmer, ACRT Services’ executive vice president of revenue. “What an honor to be recognized with an accolade named for the late Will Nutter.”

Moving the Needle in the Industry

ACRT was also honored with a gold-level PinE (Partners in Excellence) Award for our UAA involvement at a company level. This award is given to organizations whose membership in the UAA and supporting activities—such as sponsorship, active committee volunteerism, and more—quantifiably demonstrate active involvement throughout the association’s previous fiscal year.

Organizations are given a PinE score based on these activities and are recognized at the UAA annual meeting. This year represents the fifth consecutive UAA PinE Award presented to ACRT.

“We’re grateful to the UAA to be recognized with the 2021 PinE Award,” said ACRT President Kevin Puls. “Our organizations remain focused on furthering the industry and promoting the importance of our work. Membership in the UAA is a great vehicle for those efforts.” 🌳

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Your sponsorship makes a difference!
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2021 PinE Award Recipients

PARTNERS IN EXCELLENCE PROGRAM

The Utility Arborist Association is the leading North American organization for the enhancement of quality utility arboriculture and right-of-way (ROW) management. Our success relies on the support we receive from all of our members, sponsors, and volunteers.

Companies that go above and beyond to support our mission will be recognized annually through our Partners in Excellence (PinE) Program.

Membership, sponsorship, advertising, active committee volunteerism, and many other means have been quantified and assigned a value, all adding up to equal a PinE Score.

All applications and supporting material of qualifying companies are reviewed and selected by the PinE Committee.

We want to take this time to congratulate and thank our 2021 PinE Award Recipients.

Your continued support of the Utility Arborist Association is greatly appreciated on many levels.

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BRONZE AWARD



Most of us have spent the last couple of years learning how to navigate through these strange times, both personally and professionally. The pandemic has caused pattern changes in consumption, making us adapt faster than ever. The push for more technology and digitalization drives many companies' strategies as they balance it with cybersecurity threats. Our committed effort for a healthier planet is propelling environmental stewardship across industries. Regulations continue to inspire new ways to solve common challenges. With all of this to consider, what trends are here to stay, and what innovations solve our most complex problems? We reached out to a few folks and asked them to reflect on innovation, trends, and what they see for the future of our industry.

INNOVATION

Principal Consultant John Goodfellow (BioCompliance Consulting, Inc.) kicked us off by reflecting on the innovation he has seen throughout his career:

"I went to work for a utility straight out of college—something that does not happen anymore. That was in 1978, 43 years ago. At that time, the predominant practice was to maintain the distribution system by laying out a grid. That is vastly different from what is now possible with spatial technology. A geographic grid has little to no relationship to a circuit and overcurrent protection, and only

the most basic information could be scribbled on paper maps. Today, utility arborists are in the field with up-to-date information on the circuit and related infrastructure, geographic feature, customer and property owner recodes, and workload and are able to create a site-specific VM prescription. The other thing worth mentioning is our industry's enlightenment as to tree biology and biomechanics. We have moved from a mindset of simply 'controlling' trees to embracing the idea that the 'M' in VM is about management. The widespread practice of 'round-over trimming' has been replaced by natural pruning methods and tree risk assessment has become an essential element in every VM program."

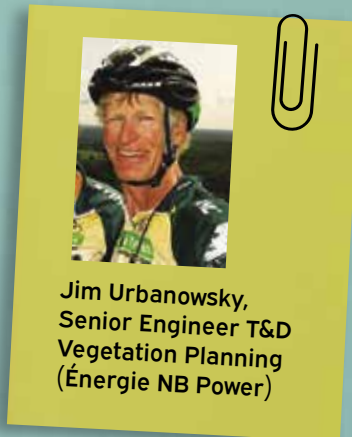
What trends are here to stay, and what innovations solve our most complex problems?

REFLECTIONS OF THE PAST

Phil Charlton, Past Executive Director (UAA) shared, "When I started, UVM was largely an art. Now, it is largely a science. When I think about innovation, I don't think in terms of a single tool but a collection of tools that provides managers an enormous amount of data that can drive decision-making and continuous improvement. The volume of data now available to managers is amazing and, at times, overwhelming. The art is in deciding which data to use to drive change."

"Our environmental efforts to improve VM across the industry driving IVM movement has been one of our most exciting innovations in recent years," stated Rich Hendler, IVM Specialist at ACRT Services. He went on, "Our effort to lower the volumes required for successful foliar and basal applications have been groundbreaking."

Recognizing innovative shifts in the industry is something Jim Urbanowsky, Senior Engineer T&D Vegetation Planning (Énergie NB Power), also made note of. He finds value in the move to the "digital work order management" he's seen throughout the duration of his career.



TRENDS

Charlton saw “more utilities starting to recognize that their ROWs represent an enormous asset and the land management strategies they adopt can contribute significantly to their company’s ESG commitments. Utility ROWs can be actively managed for species and biodiversity, along with the primary objectives of safety and reliability. Doing so benefits their customers, investors, and everyone’s future.”

Along those same lines, Hendler is glad to “return to more selectively in UVM with selective chemistry and an appreciation to leave beneficals. People are realizing that we don’t have to focus on 100% control.”

“Monetized risk across all utility asset classes—including vegetation—and optimization of maintenance requirements to return the highest impact on reliability improvement” is something Urbanowsky is seeing trend across our industry.

For Goodfellow, he thought “technological advances will continue, and the rate of



Rich Hendler, IVM
Specialist at ACRT Services

PRESENT & FUTURE OF THE INDUSTRY

By Renée Bissett, Chair and Director of Marcom, ACRT Services

change may accelerate. Let’s make sure we understand how to best apply it to our work. Simply acquiring increasingly precise data does not automatically make it relevant or useful.”

WHAT DOES THE FUTURE HOLD?

Hendler looks to the future and hopes to see “a more selective scope of work that requires habitat creation/conversion and not just maintenance of acres. We need to continue to think bigger and react with precise detail.”

“Managing lands near the energy infrastructure will have their programs increasingly influenced by environmental issues, such as climate change and catastrophic weather events, and those programs will be under increasing regulatory scrutiny. My hope is that our industry’s professionals are the leaders of that change, committed to continually striving to understand and implement sustainable practices,” said Charlton.

Goodfellow “enthusiastically supports our industry embracing the concepts of stewardship and sustainability. This trend is apparent in industry publications, presentations at meetings, and in conversations. This is a core value for many in the new generation of utility foresters and arborists, which makes me optimistic. It is not just public relations rhetoric. We manage millions of acres of land and many hundreds of millions of trees. It is our responsibility to ‘get it right,’ and the young women and men I have interacted with are definitely up to the challenge.” When asked to imagine the future of the industry, Urbanowsky painted a picture of a 20-year timeline:

- 5 years: Satellite analytics to supply vegetation inventories
- 10 years: Complete implementation of optimized vegetation maintenance planning
- 20 years: No more powerlines and a more intelligent way to generate electricity at point of demand (instead of burning something to boil water to turn a turbine, to transmit electrons across 200 million miles of powerlines which require tree maintenance)

ADVICE TO INDUSTRY NEWCOMERS

We also asked what advice they had for folks starting in our industry. Urbanowsky offered a formula he’s learned to appreciate over the years. “Manage distribution lines by ‘section’ (between protection points), undertake a forest inventory across your network, and rank all your circuits based on risk (risk=probability of failure [tree condition and proximity] x consequence of failure [customer type and quantity]),” he shared. “It takes a lot of years to learn and understand this formula, and even longer to get your utility to apply it.”

When thinking about our environment, Hendler wants people to “remember and rely on the basics of UVM. Chemical control to enhance and allow biological control to slow progression is important.”

What are innovations you have witnessed in your career or emerging trends you are seeing take shape now?



“Be inquisitive. Try to understand why things are as they are. Don’t settle for just focusing on ‘what.’ And don’t ever assume that the senior leaders in this business have it all figured out.”

– John Goodfellow

For Charlton, it’s about his industry peers. “The people in our industry I have admired most are the thought leaders. They are the ones always looking for a way to improve. It is easy to fall into a rut—to think the way we have always done something is the only way—and to resist change. My advice is to do what the industry leaders do. Always be seeking to learn and improve,” he said.

“Be inquisitive. Try to understand why things are as they are. Don’t settle for just focusing on ‘what.’ And don’t ever assume that the senior leaders in this business have it all figured out,” shared Goodfellow. “Early in my career, I would see sites with extensive tree-conductor contacts, but when I checked, there had been no interruption. I wanted to know why. Fast forward to today: an understanding of how trees present risks provides a basis for applying practices that mitigate or abate tree-related risk.”

What are innovations you have witnessed in your career or emerging trends you are seeing take shape now? What solutions are missing to manage our future? What advice do you have for the next generation entering UVM? We want to hear from you. Please reach out and consider sharing your thoughts with us. ✉

What advice do you have for the next generation entering UVM? We want to hear from you. Email us at newsline@gotouaa.org

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Four Strategies for Managing Overload

Overload is the relationship between demand and a system’s inability to meet that demand. Since systems differ among organizations, there may be things that larger companies manage easily but overwhelm smaller companies. Storm work provides many concrete examples. When managing one storm, an organization may be okay. Two or three simultaneously, however, may lead to overload. As an industry, we need to build in flexibility to respond effectively.

1 Add More Resources

During storms, utilities are willing to make significant financial investments outside of established vegetation management budgets to restore power as quickly as possible. Mutual aid kicks in to rapidly deploy line and tree crews from other areas. Craftworkers work 80-hour weeks to meet demand. Companies send in extra leaders and logistics support.

2 Shift Load

When deployed on storm, traveling crews have difficulty managing expense receipts, but the urgency remains. Shift the resource load to another team who can reprioritize their work and assist. Loads can be shifted in time, too. If a storm is coming, schedule preventative maintenance sooner to ensure vehicles are roadworthy.

3 Create Slack

When all hands are on deck, loosen policies or extend due dates to give team members more leeway. Proactively raise credit card limits to avoid inconveniencing traveling crews. In the office, instead of auditing every report, spot check for accuracy.

4 Shed Load

When capacity is strained, review your list of priorities and decide what to skip or postpone. As corporate teams shift to new roles during storm response, take something off their plates.

These four strategies can be leveraged to manage all types of constraint, but remember that employing these may lead to a game of Whac-A-Mole; when we sacrifice to meet other goals, some initiatives lose. Always review long- and short-term payouts to be strategic and deliberate. ✉

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Bill Pearson,
General Foreperson

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Learn more about Bill’s story, his views on DEI at Lewis, and his 37 years on the same utility contract at <https://bit.ly/3bax0AM>

A photograph showing the lower legs and feet of a person wearing light blue work pants and dark shoes, standing on a concrete path. The path is outdoors with grass and trees in the background.

At Lewis, our commitment to Diversity, Equity, and Inclusion (DEI) is key to the success of our business.



Environmental, social, and corporate governance (ESG) is a term that is being increasingly used in the face of climate change and a public that expects corporations to reflect basic human values in their business operations. ESG received a call to action in the report titled “Who Cares Wins.” The publication of this report in 2005, by most accounts, coined the term ESG. The report was a joint effort of 20 financial institutions from nine countries, with total asset management of more than 6 trillion U.S. dollars. Then United Nations Secretary-General Kofi Annan invited these institutions to develop guidelines and recommendations on how to better integrate ESG issues into asset management. The chief executive officers of the endorsing institutions supported this initiative. The United Nations Global Compact (see Figure 1) oversaw this collaborative effort that led to this report with necessary funding provided by the Swiss Government. Before we investigate how ESG impacts us today, we should learn about its history. Part one of this two-part article addresses where ESG grew its roots.

The Beginnings of Corporate Social Responsibility

Before the coining of the term ESG, the idea of socially responsible investing (SRI) dates back hundreds and, arguably, thousands of years. Various religious institutions either prohibited members from participating in business practices that would harm their neighbors or warned to avoid certain industries that could harm the health of workers if precautions are not in place. Some examples of these harmful or potentially harmful industries include slave trading, tanning, chemical production, arms production, liquor, and tobacco.

In the modern era, the idea of SRI evolved during the political climate of the 1960s. This includes boycotts of companies that manufactured and provided weapons of war and students demanding that university endowments no longer invest in defense contractors. While these examples do not point to a direct link between investment dollars being socially responsibly spent, this type of political climate raised awareness about social, environmental, and economic issues. These actions fostered the idea between corporations and investor responsibility. Some early examples of targeted investments include the United Mine Workers and International Ladies’ Garment Workers’ Union investing in medical facilities and union-built housing projects.

During the 1970s, several key events occurred to help propel the idea of corporate social responsibility (CSR). One such event occurred in 1971. Lawyer Paul Neuhauser organized the Interfaith Center on Corporate Responsibility to oppose the human rights abuses occurring under apartheid in South Africa. Paul drafted a proposal which was filed at General Motors in March of 1971. The proposal requested that General Motors withdraw its business from South Africa until apartheid was abolished. Although no actionable reduction in American investment in South Africa occurred in the early 1970s from this proposal, many organizations called for America to not invest in South Africa by the end of the decade.

One of the major milestone events surrounding ESG occurred on April 22, 1970. Junior Senator Gaylord Nelson of Wisconsin rallied 20,000,000 Americans to come together to protest environmental destruction. This day has subsequently been called

UN GLOBAL COMPACT

The UN Global Compact aims to mobilize a global movement of sustainable companies and stakeholders to do business responsibly by aligning their strategies with the 10 principles of human rights, labor, environment, and anti-corruption. Its other purpose is to strategically advance broader societal goals, such as the UN Sustainable Development Goals, with an emphasis on collaboration and innovations. The 10 principles are:

Human Rights

- **Principle 1:** Support and respect the protection of internationally proclaimed human rights
- **Principle 2:** Ensure that businesses are not complicit in human rights abuses

Labor

- **Principle 3:** Uphold the freedom of association and the effective recognition of the right to collective bargaining
- **Principle 4:** Eliminate all forms of forced and compulsory labor
- **Principle 5:** Abolish child labor
- **Principle 6:** Eliminate discrimination in respect of employment and occupation

Environment

- **Principle 7:** Support a precautionary approach to environmental challenges
- **Principle 8:** Undertake initiatives to promote greater environmental responsibility
- **Principle 9:** Encourage development and diffusion of environmentally friendly technologies

Anti-Corruption

- **Principle 10:** Work against corruption in all its forms, including extortion and bribery

Earth Day and led to the passage of first-of-their-kind environmental laws. These laws include the creation of the U.S. Environmental Protection Agency (December 2, 1970), Occupational Health and Safety Act (April 28, 1971), the Clean Air Act (December 31, 1970). The Clean Water Act was passed two years later (October 18, 1972), and the Endangered Species Act (September 18, 1973) and the Federal Insecticide, Fungicide, and Rodenticide Act (October 21, 1972) were passed one year later. These acts have protected millions of people from disease,

injury, and death and protected hundreds of species from extinction.

At that time—and to this day—the CSR movement was not without its detractors. In an essay titled “The Social Responsibility of Business Is to Increase Its Profits,” Milton Friedman introduced his shareholder value theory. The essay makes the case that a corporation’s only responsibility with maximizing profits to its shareholders is to do so within the rules of the game—“engaging in open and free competition without deception fraud.” He stated that the “doctrine of social responsibility would extend scope of the political mechanism to every human activity.” He further asserts that social responsibility is a collectivist and fundamentally subversive doctrine in a free society.

Two major events in the 1980s had direct results that further pushed the concept of CSR. First, the U.S. government passed the Comprehensive Anti-Apartheid Act which placed economic sanctions on South Africa and outlawed any additional investment. Secondly, there were several environmental disasters, the most prominent being the massive oil spill in the Gulf of Alaska from the Exxon Valdez tanker ship. As a result of this

disaster, the Coalition of Environmentally Responsible Companies, also known as CERES, formed, including major corporations which commit to driving sustainable businesses. This includes stabilizing the climate, protecting water and natural resources, and building a just and inclusive economy. Additionally, coalition businesses look to integrate sustainability into corporate decision-making.

The 1990s saw its share of key events leading up to the UN Global Compact and the publication of “Who Cares Wins” in 2004. In 1992, the Domini 400 Social Index (now known as the MSCI KLD 400 Social Index) was created. This groundbreaking index tracked sustainable investment through a capitalization-weighted methodology. Also in 1992, the United Nations Framework Convention (i.e., the Earth Summit) convened in Rio de Janeiro. An international treaty aimed to curb environmental impacts across the globe was signed by 154 countries. The key objective of the summit aimed to stabilize greenhouse gas concentrations to prevent human-induced interference with the climate and for economic development to proceed in a sustainable manner.

The concepts of the Earth Summit created the operational goals of the Kyoto Protocol in 1997. The pledge of 192 countries committed industrialized countries and economies in transition to limit and reduce greenhouse gas emissions in accordance with agreed individual targets. In 2005, the Kyoto Protocol entered into force after a complex ratification process. In addition to the goals of emission reductions, mechanisms are in place to allow for reduction of GHG emissions through emission trading, clean development, and joint implementation across Kyoto Protocol parties.

In 2000, the UN Global Compact was launched to urge companies to “align strategies and operations with universal principals on human rights, labor, environment, and anti-corruption, and take actions to advance those goals.” To date, 14,670 companies throughout 162 countries participate in the compact. The direct result of this compact created the report “Who Cares Wins,” leading to creating the term ESG.

Look for the continuation of this ESG article in the upcoming *Newsline* March/April issue. ♻️

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New Exam Content Outline for the ISA Certified Arborist Utility Specialist® Credential

By Luana Vargas, Director—Credentialing Services, International Society of Arboriculture

The ISA Certified Arborist Utility Specialist program has been in place since 1997 with the goal of testing and certifying individuals' achievement of a professional level of knowledge and skill in the utility sector of arboriculture. In North America today, over 2,500 credential holders have earned and maintain this and the ISA Certified Arborist® (maintaining the latter credential is a requirement for earning and maintaining the utility specialty) credential.

Much like arborists adhere to best management practices and industry-accepted standards in arboriculture (e.g., ANSI Z133 and A300 Standards for Tree Care Operations), ISA as a credentialing body adheres to *ISO/IEC 17024:2012 Conformity Assessment—General Requirements for Bodies Operating Certification of Persons*. As part of the best practices and standards for credentialing bodies, it is important to ensure the development and maintenance of certification examinations that are both reliable (consistently measuring what is intended to be measured) and valid (measuring the expected knowledge and skills associated with the tasks and duties performed by the professionals who are the intended target audience for the credential).

With the support of experts in multiple fields of practice, we perform many processes to ensure both the reliability and validity of ISA examinations. Namely, to ensure the validity of our examinations, ISA conducts a process called Job Task Analysis (JTA) approximately every five years for each of its credentials. This process reviews or develops the set of knowledge and skills that are essential for a professional earning a given credential. The outcomes of this process are exam domains and an outline that reflects current duties and aspects of the profession. At ISA, JTAs are conducted through the assistance of a psychometrician (an expert in the development of examinations for credentialing, educational, and/or employment purposes) and a group of Subject Matter Experts (SMEs) who are practitioners in the field.

In this effort, ISA is assisted by 16 volunteers who represent different segments of the industry and international geographic areas. This group of experts and practitioners composes the ISA Test Committee, and they are responsible for the development and maintenance of all ISA certification examinations, with the notable exception of the ISA Board Certified Master Arborist® examination.

In addition to the commitment and expertise provided by the ISA Test Committee, in October 2020, ISA partnered with the UAA to recruit additional SMEs to assist with the JTA process for the ISA Certified Arborist Utility Specialist credential. In addition to five subject matter experts from the ISA Test Committee with experience in the utility sector, the UAA assisted recruiting five additional SMEs to work on the latest JTA for this ISA credential.

Through multiple SME meetings and discussions, the examination outline for this credential was reviewed to ensure that it included the most current tasks and practices performed by professionals (minimally qualified candidates) in the utility

arboriculture field. As a result of this systematic process and based on agreement between the SMEs, a revised examination outline was created.

This revised exam outline was then used to create a validation survey that was sent out to ISA credential holders and others engaged in this field of arboriculture (ISA and UAA members). The validation survey was sent to 3,147 professionals, and 520 responded to the survey. Of the respondents, 51% of the responses met the inclusion criteria for the survey, which required completion of at least 70% of the survey and active participation in the utility field of arboriculture.

Through this validation survey, active professionals in the field used a 5-point scale to rate consequence, importance, and frequency of the tasks included in the revised examination outline. All the data and ratings were then used by the psychometrician to develop an examination blueprint. This blueprint determines the percentage of the exam (and as a result the number of items) associated with a given domain and task.

We also wanted to take this opportunity to share the results of the JTA process and the latest changes you will see in the examination outline for the ISA Certified Arborist Utility Specialist program. Please see Table 2 for the upcoming domain distribution expected for the new publication of this examination.

In addition to the systematic process that was followed for the analysis of the quantitative data collected through the validation survey and the resulting examination blueprint, ISA reviewed all of the comments submitted by practitioners who responded to at least 70% of the survey and are currently active in the field. Some of the comments are included here (provided in an anonymous manner to protect the privacy of survey respondents):

"While a specialist needs to know when, how, and where to prune far line clearance, they should also be aware and proficient in representing the interest of both their client/employer and the tree owner in finding solutions that benefit both and retain an acceptable appearance of trees pruned."

"I don't feel like utility arborist certification requires this sort of detailed knowledge of management-level decisions. Those qualifications will come separately from experience and management courses."

"I don't believe an ISA Certified Arborist Utility Specialist requires the competence to actually manage vegetation; that is what professional tree workers and licensed pesticide applicators do. However, a Utility Specialist must have a firm

Table 1. Domain Distribution in the Current Examination Outline for the ISA Certified Arborist Utility Specialist Program

Domain in the examination	Percentage of questions associated with this domain
Electric Utility Pruning	12%
Program Management	19%
Integrated Vegetation Management	31%
Electrical Knowledge	23%
Customer Relations	15%

understanding of IVM, as they are often overseeing and managing UVM programs and provide the work orders, scopes of work, and performance metrics for those actually conducting the management of vegetation.”

“Electrical knowledge is fundamental to utility arboriculture. Without a thorough understanding of electrical systems, utility arboriculture is ineffective.”

“Customer interaction and service are so important in this field. We are the ones that convey the messages appropriately to the customer/ audience. We take the rules and dissect them into terms the public can understand.”

An updated version (exam form) of the ISA Certified Arborist Utility Specialist examination will be distributed for those taking the examination on or after December 10, 2021. This

Table 2. Upcoming Domain Distribution for the Next Publication of the ISA Certified Arborist Utility Specialist Examination, Starting on December 10, 2021

Domain in the examination	Percentage of questions associated with this domain
Electric Utility Pruning	20%
Program Management	13%
Integrated Vegetation Management	18%
Electrical Knowledge	29%
Customer Relations	20%

means that if you are enrolled (or planning to enroll) for this program after this date, you should prepare for the examination using the newest version of the exam outline datemarked 2020/2021, which is available on the ISA website: www.isa-arbor.com/Credentials/Types-of-Credentials/ISA-Certified-Arborist-Utility-Specialist.

Finally, I want to take this opportunity to thank Dr. Steven Hirsch for his work as the psychometrician in charge of this project, Ruurd Van de Ven representing the ISA Credentialing Council, and especially the dedicated volunteer SMEs who assisted in this JTA: Bill Cohn (chair of the ISA Test Committee), Jodie Braskich, Jarod Cassada, Richard Karber, Andrew Rable, Karen Jenkins, Maegan Mullinax, Jody Rietjens, and Lenny Ortiz. The expertise and commitment shown by these volunteers throughout this project was crucial and is truly appreciated by ISA.

If you are an arborist practicing in the utility field and took the time to complete such a comprehensive survey: thank you. We are here to serve the industry, and your responses allow us to continue evolving alongside you and the profession. If you are not in the utility sector and have not responded to a JTA validation survey yet, stay tuned as we complete this process for at least one credential per year; the next one we are working on is the ISA Certified Tree Worker Climber Specialist® program. We look forward to your input as a professional working in the field!

AUTHOR BIO

Luana Vargas is an ISA Board Certified Master Arborist® (IL-4652B) and ATD Certified Professional in Talent Development. She serves the industry as ISA’s Director of Credentialing Services. 🌳

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“Three years ago, ECI was using paper time sheets. Imagine driving to an office an hour away to fax a paper time sheet to the manager of payroll and process because employees and contractors didn’t want to adopt electronic faxing.”

– Angela Lukstein, Business Consultant with ECI

Delivering Sustainable Solutions That Are Innovative by Nature:

DTE–Environmental Consultants, LLC Collaboration on Integrated Billing Leads to Innovative, Cost-Effective Improvements in Time Sheet and Billing Processes

By Joseph Fields, Business Development Administrative Assistant, Environmental Consultants, LLC



A long-term collaboration between DTE Energy and Environmental Consultants, LLC (ECI) on time sheet and billing applications has been successful. The goal of the initiative was to create a seamless, paperless, and efficient process for time sheet and billing between the client, DTE, and a third-party vendor, ECI.

The success of the initiative “reduces duplication and increases data accuracy, therefore saving time on both the client and the vendor’s end of the system,” according to ECI Payroll and Process Initiative Manager Michelle Dahms.

“One benefit is increasing efficiency in time sheet submittal. Whether we are working with billing or with our auditing organization, this process has become routable and fluid, shortens the cycle time, and upgrades visibility with our clients. Using PowerBI, we provide metrics and analytics to help our vendors in the process,” said Coleen Bedrosian, Manager of Billing, Unitization, and Inspection Teams at DTE. “We expose our hand and the vendor exposes theirs, and it gives visibility in the overall process. This provides better dialogue between DTE and vendors from beginning to end.”

DTE Manager of Technology Clarence Walton said, “From the field perspective, it eliminates the time taken to manually write down an employee’s time and have to go back and enter it electronically. With the process now entirely electronic, it allows employees to spend more time in the field providing their services to our customers.”

According to ECI, the benefits of having an integrated billing process are the elimination of the paper trail and streamlining the entire time sheet and invoice approval process. The strategic

decision to utilize DTE’s system and improve upon it is key to providing the client more accurate information by simply uploading a file and eliminating the chances of inaccuracies and human errors when entering the information.

“Three years ago, ECI was using paper time sheets,” said Angela Lukstein, Business Consultant with ECI, “Imagine driving to an office an hour away to fax a paper time sheet to the manager of payroll and process because employees and contractors didn’t want to adopt electronic faxing. This is monumental. We are getting on a streamlined time sheet system and getting accurate data about employees and equipment.”

These are merely some benefits that the integrated billing process can provide. However, without the addition and cooperation of the vendor and client, such as ECI and DTE Energy, an integrated billing system providing a streamlined setup for data collection would not exist. Selecting the right partner for this project, finding the right personnel, and addressing hurdles is key to its overall success.

“For ECI, our goal was to create a system or process to simplify timekeeping for our employees, while maintaining the utmost accuracy and efficiency for the

back office. This allows our employees and clients alike to spend more time focusing on their jobs and primary responsibilities,” said Caleb Williams, Midwest Business Development Regional Manager.

Emily Meyer, Billing Manager at ECI, said, “The billing department is more than just billing, in this case; it is customer relations. We are thinking about how this process will effect a group’s finances, and it is much more involved than what most people think.” Having that customer relations mentality is essential when it comes to taking this integrated billing process to the next level.

Lukstein (ECI) added, “Our data accuracy separates ECI from its competitors. We have streamlined the entire process to maximize time and cost efficiency on the next level. If employees are entering accurate information, it just flows through the process. So, the likelihood of errors occurring almost drops to zero, as long as the employees are entering their time accurately.”

“From the tree trimming perspective,” Walton (DTE) said, “we saw the benefits of using the integrated billing system with our trimmer execution vendors. Using our relationship with ECI, we wanted to extend these benefits with ease of access to the system on both sides. By creating efficiencies, this process will cascade out to the entire company. We can provide coaching on cash flow and analyzing efficiency in terms of the size and cost of the jobs to find out if we are also assigning and completing that work efficiently.”

During the pandemic, typical work practices were stretched to the max. Having this process in place for employees was key for their labor to be documented and logged appropriately.

“For ECI, our goal was to create a system or process to simplify timekeeping for our employees, while maintaining the utmost accuracy and efficiency for the back office...”

– Caleb Williams, Midwest Business Development Regional Manager.

“Due to COVID-19, our processes would cost more for someone to send it in with the potential for handwriting to be unclear and fraud to occur. For the integrated billing system, we needed to visualize the entire process,” Bedrosian (DTE) said. “When we called people together to show them, the first five minutes of the meeting was filled with ‘Why am I here?’ and ‘I have work to do,’ but by the end of the 40-minute meeting, the reactions were, ‘When is this system available?’ and ‘This is going to save me time and make my job so much easier!’”

“Major pushback came from the field employees, but when we showed them PowerBI and what more we could provide to customers, including the field employees, they accepted the process willingly. The unwillingness to change is always there, but people must let go of the past and accept how beneficial it will be to the overall success of the company,” said Bedrosian.

After the creation and implementation of an integrated billing process, many bugs may be identified and patched, along with human-error issues. These can vary from vendor to the client. Nevertheless, the primary element for a successful

integrated billing process is the obligation for client-vendor cooperation from start to finish.

“The billing department is constantly thinking how ECI can improve the entire process,” Meyer (ECI) said. “Data validation over data entry is one major aspect. The focus of the data validation process is: what is the data saying? We want it to be more analytical and processing rather than data entry.”

Lukstein (ECI) added, “Keeping other clients in mind during the development of this integrated billing process was the primary focus. We’re looking at more long-term benefits in the implementation process and thinking of data accuracy on the next level.”

“Using the integrated billing process, we are giving time back to the billing department and saving them an entire day of processing,” Dahms (ECI) commented. “The efficiency of accuracy is a benefit to the client and their employees, which is why we emphasize client collaboration in this process.”

Implementing an integrated billing process with a client is a key source of increasing time efficiency as well as cost efficiency, beginning with the time

sheet and billing process. This process demonstrates that clients and vendors—big and small—have a stake in the future growth of their company with the capability of providing more time serving their customers. With this integrated billing process developed in collaboration with DTE Energy, the future is bright for small and large utility companies across the nation.

AUTHOR BIO

Joseph Fields is the Administrative Assistant in the Business Development department at ECI and holds a Bachelor of Arts degree in Professional Writing from the University of Indianapolis.

Fields uses his prior experience of Standard Operating Procedure writing and editing in the nonprofit sector, as well as two years’ experience as a freelance journalist to contribute to ECI.

He has a study published on Humanities Commons titled “Thinking in Stats: A Study of Sports Writing” and many feature journalism pieces published in *The Banner Graphic* newspaper, a Rust Publishing owned entity. †



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BIOaudit: The New Biological ROI

Investing in the Science Behind VM
Enables Greater Decision-Making

By Dr. Anand Persad, Director of Research-Science & Innovation, ACRT Services

*BIOaudit helps professionals maintain native plant species to support pollinator health.
Photo courtesy of ACRT Services.*

What We Leave Behind is the Yardstick for Success

Across the nation, utility ROWs serve as diverse habitats for a variety of native plant, vertebrate, and invertebrate species. These habitats play a vital role in utilities' sustainable stewardship efforts. Greater focus has been placed on how utilities are managing these areas to not only ensure the health of the countless species that live and rely on them, but also to help utilities better understand the impact of their VM practices as well as demonstrate that they're promoting a healthier environment for future generations.

Maintaining key aspects of ROWs is essential to achieving these goals, particularly where IVM strategies are used to prevent invasive species from gaining a foothold and competing with native species. A vibrant native plant population is fundamentally crucial to the health of pollinators, invertebrates, and other organisms and forms the basis for good habitat quality.

While much research has been done on this topic through the years, there has never been a more urgent time for utilities, land management companies, and other similar organizations—that oversee ROWs and other green spaces—to better understand the health of these areas over time. What we leave behind is now the yardstick for success and prioritizing efforts to identify conditions that need to be addressed, as well as understanding the trends that impact the health of plants, insects, and birds in the future. Recognizing that biological ROI is tangible and quantifying biodiversity will enable data-driven cycle management and contribute to the most successful IVM strategies.

Research, Science, & Innovation and BIOaudit

ACRT Services has been actively involved in environmental stewardship initiatives for years, but in 2020, we made the decision to take that commitment a step further with the launch of our Research, Science & Innovation department. As the leader of the RSI team, I work closely with a group of ROW Science Advisors (RSAs) to not only partner with utilities on their environmental initiatives but also to identify strategic partnerships and educate our industry about the importance of quantifying the benefits and clarifying the science behind them.

Our team is focused on a number of efforts currently with utilities nationwide, one of which is a service line called BIOaudit™—a comprehensive solution that combines both

A vibrant native plant population is fundamentally crucial to the health of pollinators, invertebrates, and other organisms and forms the basis for good habitat quality.

highly trained talent with advanced software tools to analyze virtually every environmental aspect of ROWs and other green spaces. Everything from the soil to the sky and all that lives on it is considered on a seasonal basis over several cycles, from the condition and content of layers starting with soil health, ground cover, herbaceous and grass layers to other spaces including understanding the off-corridor and adjacent lands and impact on underwire growth. Biological layers give insight to change and how well a ROW is adapting to changing weather patterns and other impacts. Understanding this information enables utilities to become more proactive and involved in their system green spaces, in addition to measuring and tracking biodiversity to express the benefits of a healthy ecosystem.

BIOaudit consists of several technical components as well as ongoing surveys and sample collection: (1) field collection software, (2) a client portal, and (3) a public-facing website. The field collection software enables BIOaudit specialists to create and gather information on ROWs and green spaces.

Data is then loaded into the client portal where utility and project leaders can view, filter, and analyze the data as needed for proactive decision-making and allows VM leaders to compare IVM tactics, products, and materials with those results to make informed decisions about what should be done to promote green space health.

Bringing the Field to the Decision-Making Forefront

BIOaudit assessments and the overall work of the RSI team are focused around this end goal: field-derived, data-driven analytics combined with prescriptive tools to help quantify benefits and empower utilities to become better, more informed stewards of their ROWs and system territories. The program advantages are clear as well. Thanks to BIOaudit, VM leaders and the project managers supporting them are able to:

- Become more proactive with overall VM program planning
- Develop solutions for Rare, Threatened, and Endangered (RTE) species
- Identify invasive plant/insect species that impact ROW ecosystem health
- Support enhancement of pollinator health and native species in ROWs



The understanding of biological layers enables utilities to be proactive and involved in their system green spaces, tracking biodiversity. Photo courtesy of ACRT Services.

- More effectively cycle IVM chemicals to combat herbicide resistance
- Understand how ROW tree zones impact power transmission/distribution
- Contribute to and improve overall habitat quality and aquatic resources
- Leverage expertise from USDA-certified soil, plant, and eco-analytic laboratories

By linking the benefits of focusing on the science behind VM and environmental efforts with ongoing field operations, utilities and associated organizations will have a truly comprehensive solution that puts them in a stronger position than ever to deliver on their corporate sustainability and stewardship goals. While RSI is a fairly new department within ACRT Services, we are already at work with several utilities across the country, helping them analyze the biological health of their ROWs and make the decisions needed to make a more meaningful, long-lasting impact.

We look forward to sharing more with UAA Members in the months to come. Those interested in learning more about our work are welcome to reach out to me at apersad@acrtrinc.com.



Embracing new technologies aids in identifying invasive plant/insect species that impact ROW ecosystem health. Photo courtesy of ACRT Services.

AUTHOR BIO

Dr. Anand Persad is the Director of Research, Science, and Innovation at ACRT Services. He has an extensive background in arboriculture, invasive species, tree biomechanics, pollinator health, wetland restoration, avian studies, and more. He is the Research Committee Chair for the UAA and actively works with city, state, and federal organizations in taking innovation and technology from development to implementation. Persad holds a PhD in invertebrate ecology/entomology from the University of the West Indies. 🌱

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Utilities are consistently looking to optimize operations and costs, while improving safety and reliability. In response, utilities are taking a holistic approach to vegetation management (VM), which often leads to system-wide evaluations for optimizing resources and examining both infrastructure and internal field operations. Increasingly, this approach also means assessing existing software and investing in emerging, innovative technologies. Some of the reasons and drivers include:

- Reducing inefficiencies by capturing and storing data electronically
- Eliminating paper systems
- Ensuring integration among multiple business units to improve business insight
- Effectively responding to customer requests

Today's best VM technologies help create an information flow at every level of an operation that increases efficiencies, and also offering capabilities for forecasting and modeling, scheduling and managing ops, reporting, planning and prioritizing maintenance, and decision-making and future-planning support. They also collect, process, and visualize data, delivering a record system for VM, easily integrating with other software.

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Emerging Drone & Robotics Technologies Strengthen VM:

Technological Innovations Complement Utilities' Service Work

By Will Paden, President, Soaring Eagle Technologies

The future is here. Every day, we see digitization and automation taking on a larger role in many aspects of our lives. This includes the evolving technologies that make it easily viable to identify and prioritize infrastructure issues more efficiently and effectively.

The accuracy of UVM data enables decision-makers to plan, prevent, and prioritize efforts around vegetation and wildlife patterns, as well as mitigate the effects of plant life encroaching on utility ROW. Tech-enabled data is also leveraged to document changes—both negative and positive—in biodiversity and pollinators.

Additional government funds will be allocated to high-precision inspection services resulting from the House-approved \$1.2 trillion bipartisan infrastructure bill. It includes about \$65 billion for grid infrastructure and \$50 billion for cyber and climate resilience over five years!

Data analytics collected from UAS—such as satellites, drones, and robotics—all use artificial intelligence including high-tech sensors and high-definition cameras to facilitate ground patrols by arborists, line workers, and other inspectors.

By leveraging data that is more accurate and comparatively less expensive to obtain via traditional

means, VM program managers complement their current efforts to analyze the conditions of assets, while allowing them to deploy labor and resources more efficiently.

According to McKinsey Insights, “Skilled labor is becoming increasingly scarce—particularly in remote areas. Boosting labor productivity in maintenance is becoming more and more important.” With increased labor productivity, we also gain results in increased dependability of systems and ultimately lower operating costs. Importantly, the use of technology reduces employee risks and reduces liabilities, especially in hard-to-reach terrain.

In the words of David Groarke from Indigo Advisory Group, “Implementing effective asset maintenance and management, driven by current data that you can really trust, can reduce operational expenses by as much as one-third.”

BEYOND VISUAL LINE OF SIGHT AND VM

The most relevant technology being leveraged in VM is the use of drones with BVLOS capabilities. This acronym represents the capacity for a UAS pilot to deploy a drone to capture inspection images along hundreds of miles of transmission line at much lower costs than doing so with manned aircrafts (i.e., helicopter or fixed-wing aircraft).

BVLOS is the biggest, most scalable means to leverage drone technology for VM. It can easily cover 40 linear miles on one battery charge providing detailed imaging to create 4D linear models of assets and environments.

DRONES AND SAFETY

Even though the specialized aircraft used for inspections are equipped with technology that detects objects to avoid collisions, BVLOS operations require special FAA approvals, given

the risk factors involved. A keen focus on safety and training at every level in the organization is key. This is exactly what the FAA looks for before approving operators to conduct BVLOS operations. Hardly any drone operators in the industry have BVLOS FAA clearance.

To operate safely, given the associated responsibility and liability associated with operating in the same airspace as manned aircraft and around powerlines, it’s imperative for pilots to be trained and vastly experienced in manned aviation. Only veteran pilots and companies with stringent hiring and training criteria are versed in aeronautical decision-making procedures, risk mitigation, and operational requirements.

DRONE TECH AND ENVIRONMENTAL HEALTH

UAS technology offers an environmentally cleaner option for routine inspections. The use of drones

“Every day, we see digitization and automation taking on a larger role in many aspects of our lives. This includes the evolving technologies that make it easily viable to identify and prioritize infrastructure issues more efficiently and effectively.”

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replaces the use of fossil fuels consumed by helicopters. In addition, more accurate and efficient evaluations of critical infrastructure can now be carried out more often. The visual data collected is then catalogued and codified to establish patterns and determine criteria for critical repairs, maintenance prioritization, and long-term planning.

At a macro level, satellite feed technology is supporting environmental goals and enabling scientists to slow global warming by detecting culprits, mapping large methane emissions around the globe.²

Although the precision of the images does not match the level of detail of drone images and LiDAR, satellite imagery and GIS maps have greatly expanded opportunities for data integration, analysis, and modeling.

Up-to-date satellite imagery and other geospatial data is used for planning, land registration, disaster response, public health, agricultural biodiversity, research, and forestry.

LATEST INNOVATIONS

The latest innovations in drone and robotics technologies include ultra-light, autonomous aircraft designs that accommodate smaller spaces, while delivering greater efficiency and reliability.³ Yet the primary advances consist of higher-precision sensors with greater resolution of images, plus the evolution of the accompanying software to interpret the overwhelming data into actionable intelligence. These evolving technologies continue to make the work of UVM line managers more focused and efficient.

The recent UN Climate Change Conference UK 2021 (COP26), held in the fourth quarter of 2021 in Glasgow, Scotland, brought together parties from across the globe to encourage and “accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change.” The conference featured a presentation⁴ promoting the use of satellite imagery for organizations to conduct ecological surveys in a shorter amount of time and at a lower cost than with traditional methods. The featured AI-powered platform promised to help organizations, including utilities, energy, water, and wastewater companies, determine the best course of action to meet the sustainability goals with the ability to continuously monitor their large landholdings to track sustainability metrics, and enable these organizations to accomplish net zero emissions by 2030.

In terms of machine learning and AI, the future will only hold greater accuracy in data interpretation and prediction as hundreds of thousands of images are collected, catalogued, and interpreted.

According to one study,⁵ the overall drone inspection and monitoring market is projected to grow from \$9.1 billion in 2021 to \$33.6 billion by 2030, at a CAGR of 15.7% from 2021 to 2030. North America is estimated to account for the largest share of the drone inspection and monitoring market from 2021 to 2030. There is much work ahead in high-tech drone technology services, especially for companies vetted by the FAA with high safety standards.

OTHER APPLICATIONS

High-resolution aerial imaging and data is also leveraged to track wildlife and fishery migrations and to inform farmers with data to help maximize yield of crops. LiDAR-powered lawn care robotics solve big problem for utilities’ vegetation maintenance at solar and wind farms.



Vegetation Management and Agriculture Inspections, Soaring Eagle Technologies.

CONCLUSIONS

In the coming years, the use of machine learning/AI and data automation will continue to improve in detecting and predicting patterns and anomalies. They will filter out the amount of data end users will need to view to make decisions, saving time and money while reducing overall risk.

Utilizing drones versus traditional inspection systems is significantly safer, more efficient, and more accurate than traditional alternatives like ground-based visual inspections. The assessment work can be done at much lower costs than with manned aircraft operations. Utility inspections are highly technical flights, where the focus on safety and experience flying both manned and unmanned aircraft is paramount.

ABOUT THE AUTHOR



Will Paden is President of veteran-owned and operated Soaring Eagle Technologies. He has 2500+ manned flight hours as a 20-year manned-aviation as well as helicopter maintenance and operations veteran. Paden holds a bachelor's degree in business administration and management from Mississippi State University. Soaring

Eagle is strategically partnered with UATI, the Unmanned Aviation Training Institute, to provide all pilots with aviation training

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WILDLAND FIREFIGHTING:

Climate Change and Wildfires Presents a New Opportunity for Growth

By Jesse Bazergui, Project Manager,
Spectrum Resource Group Inc.



Spectrum Resource Group Inc. (SRGI) has recently added fighting wildfires to the extensive list of tasks we can perform. This has been a smart and necessary move, considering how frequent and intense wildfires have become in Western Canada. Most photos of wildfire fighting portray helicopters bucketing water over the flames; in reality, boots on the ground have proven invaluable. For instance, in the absence of water, crews can establish handguards. This is when crews will clear a path along the fire edge with chainsaws about 2 m (6 ft) wide, then dig a trench about 40 cm (16 in) down to mineral soil to stop a creeping ground fire.

Our team works long, grueling hours for days at a time to rein in the powerful conflagrations that have plagued our province's beautiful forests. A full deployment is fourteen 12-hour days in a row, and then three or four days off to reset. Often, crews will hike for hours

through dense bush just to reach the fire's edge to control the flank. And even then, the fire can sometimes jump the guard and destroy all the work the crew set in place. The work is hard. It requires a lot of strength, but it is worth it to protect British Columbia's unique beauty.

It is no mystery that manmade climate change has been a major factor in creating ideal conditions for wildfires to occur—more frequently and with increased devastation. Hotter spring and summer seasons combined with less snowpack than previous years, plus snowmelt occurring earlier than before, have all resulted in a fire season that begins earlier and lasts longer. These

“It is no mystery that manmade climate change has been a major factor in creating ideal conditions for wildfires to occur—more frequently and with increased devastation.”

profound effects were certainly felt this year with British Columbia breaking several heat records and the town of Lytton burning down. This confluence of circumstances has presented the opportunity for Spectrum to aid in the suppression efforts for BC Wildfire Service (BCWS). I was a part of a Type I unit crew for BCWS for three seasons,

from 2017–2019. I had about 220 fire days and have been deployed to forest fires all around British Columbia, as well as in Quebec and Alberta. When Spectrum decided to put together a Type III contract crew, I already had substantial and valuable experience in wildfire fighting.

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- › Virtual Work Planning
- › Work Quantification
- › Field Validation
- › End to End Work Management Solution
- › Tree Crew Mobile Work Orders
- › Progress Reporting

2. DCM: ASSET

- › Transmission and Distribution
- › GIS Conflation
- › Asset Inventory
- › Asset Defect Inspection
- › Connectivity and Engineering
- › Joint Use Inventory
- › End to End Work Management Solution

3. DCM: AUDIT

- › Transmission and Distribution
- › Regulatory Compliance Validation
- › Wildfire Risk Analysis
- › Reliability Risk Analysis
- › Asset Maintenance/Construction Validation
- › End to End Work Management Solution

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Since 1972 ECI has helped hundreds of clients in North America realize dramatic improvements in public & employee safety, service reliability, cost savings, risk, regulatory compliance, and overall operational effectiveness while improving the public's perception of utility vegetation management.



Crews, often new members, learn to dig a handguard.

and enjoy helping train our teams to preserve our forests and wildlife. Even with only our one Type III 5-pack on fires this year, I feel like we accomplished a great deal. In total, we had 42 fire days with most of them being on the Cutoff Creek Fire, south of Vanderhoof, which ended up being more than 33,000 HA (81,500 acres) in size. With most of our crew members

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being new to firefighting, they learned several new skills, such as creating fuel breaks, digging handguards, proper burning off techniques, and constructing water delivery systems for mop-up. For employees who work year-round, learning these tasks educates them on the prevention and reduction aspects of wildfires, in addition to suppressing them. Employees learn how fuel reduction can greatly lower wildfire intensity and how this can help the efforts of their fellow firefighters and the surrounding communities. In the coming years, I would like to see Spectrum put forward several contract crews for each season who will develop into Type II crews.

I'd like to see Spectrum add on even more services to help combat natural disasters. Structural Protection Units (SPU) are necessary for the wildfire

program. As a company, we can seek to cover all aspects of fuel load suppression, prevention, and reduction. This will allow crews to implement water delivery systems around various structures, such as houses, barns, and ranches that might be threatened by advancing fire fronts. With more work done trying to prevent wildfires from starting—or mitigating their strength—the easier it will be to contain them in the future. †

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How Resignation Is Affecting Vegetation and Asset Management

Millions of Americans are burnt out from high workloads caused by the pandemic and have decided to leave their current jobs. About four million workers called it quits in July 2021. Workers are looking for the flexibility to work remotely and are currently rethinking their career trajectory. How are these trends affecting vegetation and asset management in the utility industry? Is the industry at risk of losing workers?

Is the industry at risk of losing workers?

One silver lining is electric utilities and contractors are looking for creative ways to retain and grow their current workforce. Being a leading innovator, ECI assembled a team of virtual inspectors to take advantage of remote sensing data, AI and machine learning, cloud computing, and digital tools to perform everyday transmission, distribution, and VM and asset-related tasks. This approach brought new talent

to the industry and helped retain existing employees by providing an alternative career path for ECI field personnel.

ECI virtual inspectors work alongside field employees and complement existing operations to help drive efficiency. The virtual team performs these tasks from the comfort of their home offices and can be located anywhere in the U.S. ECI can reach a wider pool of talented professionals, including veterans and stay-at-home moms. Faced with these industry challenges, innovation and technology are essential tools in the toolbox that can help vegetation and asset managers overcome these obstacles. †

INCREASE SAFETY WITH GEOSPATIAL ANALYTICS



ACRT Services and Satelytics have partnered to help utilities identify system issues while reducing safety incidents and mitigating costs.

Utilities have thousands or even tens of thousands of line miles to manage. Identifying encroachments and other issues requires people to assess them one mile at a time — not only requiring significant time and resources but also putting field workers at risk. That's why ACRT Services and Satelytics have

partnered to offer geospatial analytics to the utility industry. As the first UVM organization to provide this solution, our family of companies is able to take our safety efforts further for you than ever before while reducing program costs, prioritizing work planning, and providing in-depth system data.

Get a new perspective.

Satelytics uses multispectral and hyperspectral images and data from satellites to analyze your service area.

Protect your people.

With precise areas of interest pinpointed, people spend their time more efficiently in the field, you reduce injuries and other safety incidents.

Prioritize remediation.

Rapidly identify areas at greater risk and dispatch people to address them, saving time and money.

See the whole picture.

Problem magnitude, location, and other qualitative information are provided with each image.

Validate faster and easier.

Using satellite images after work completion allows for faster verification that issues have been resolved.

Access historical data.

Past satellite imagery is available, allowing us to compare performance and system details over time.



Improve safety performance while streamlining VM processes with Satelytics from ACRT.

Contact us to learn more about our partnership and how it can help you.

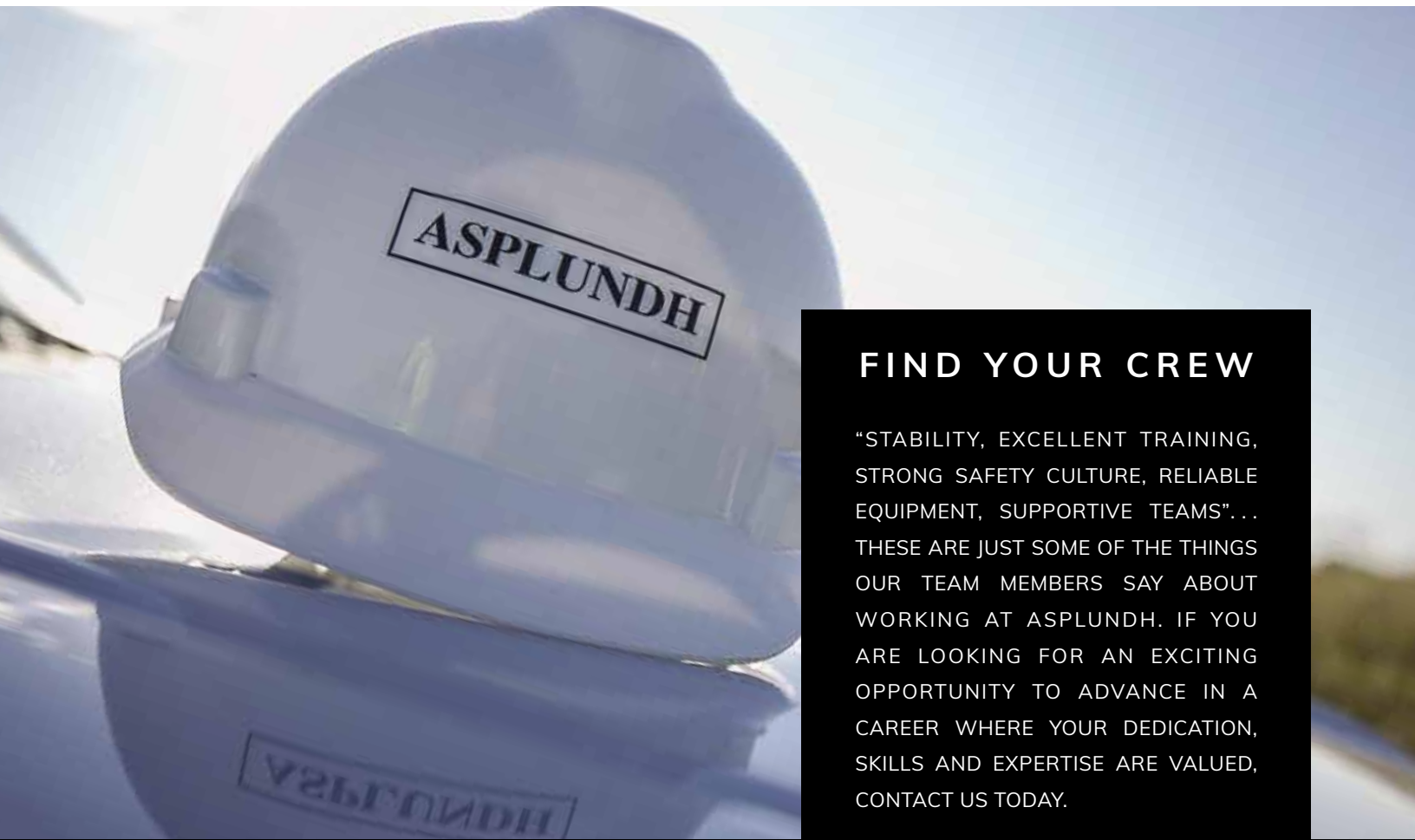
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