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NOVEMBER 2018 - VOLUME 27.4

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**November 2018**  
*Volume 27 Number 4*

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*Scenes from the "Women In Fireline Leadership" group gathered as part of the Prescribed Fire Training Center in Florida. For more on women (and men) and fire, see our continuing coverage on gender and wildfire in our "Diversity" features.*

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# WICKED PROBLEM - COMPLEX SOLUTION

By Alen Slijepcevic

We are living in a time where fire management has become a topic for public discussion more than ever in our lifetimes. We have witnessed for the second year in a row, large and deadly fires in California and across western United States. This year also has seen deaths in Greece, large forest fires in Sweden within the Arctic circle, and across the United Kingdom and Germany. As we enter an already hot and dry summer in northeast Australia and a potentially hot summer in southeast Australia, all indications are that we will see a significant fire season.

The fire issues are very complex and we as fire and land managers are under constant public scrutiny. Misguided policies and lack of foresight have led to the current situation where we are underprepared for climate change. The fire problems ahead are so large and complex that no country on its own will be able to deal with them. We are all constrained by the political environments such as short-term thinking driven by the election cycles, ongoing debates in some jurisdictions on whether climate change is real or not (although the scientific evidence is irrefutable) and similar distracting discussions. There are also constraints in thinking within the fire community imposed by lack of diversity within organizations and agencies. We need to engage all voices and communities in the solutions.

To deal with this complex problem, it is more than ever important to work jointly across all fields of fire management. It is also fundamental that we work together across the jurisdictional boundaries. Although we like to think that we are different and that our problems are different than the problems of other jurisdictions, the reality is that we have more that connects us than points of difference.

This is always highlighted when we come together

at international conferences, conduct study tours between jurisdictions, exchange staff on secondment (temporary) assignments, support each other with suppression, or work on joint research projects.

There have been great opportunities sharing some of the newest research – recently at the 8th International Conference on Forest Fire Research in Coimbra, Portugal, followed by stimulating presentations and discussions at the 15th International Wildland Fire Safety Summit and 5th Human Dimensions of Wildland Fire Conference in Asheville, North Carolina, in December 2018.

Looking ahead, new research and operational practices and policies will be explored at the 6th Fire Behavior and Fuels Conference in Albuquerque, USA; Sydney, Australia; and Marseille, France in April 2019, which will allow us to explore problems and solutions across three continents.

In a further effort to bring us closer together in thoughts and deeds, the IAWF Board is working on a number of discussion papers that will be published early in 2019. It will be very important to hear opinions of a wide wildland fire community in teasing out what are the important issues and what are we doing in different parts of the globe to overcome them.

Just as we're working to gather a range of voices and insights for the discussion papers, we are always looking for articles to be published in the Wildfire Magazine. Articles that focus on the work we do on the fire ground, and that demonstrate best practices, and that don't shy away from the fire issues of our time. Now, we are also looking for articles that are written in languages other than English. So, if you have an idea, please contact the Managing Editor Ron Steffens and discuss it with him.

CONTACT THE  
**IAWF**

1418 Washburn St.  
Missoula, MT 59801  
ph: 406-531-8264  
execdir@iawfonline.org

Submit articles, queries & comments:  
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"Uniting the Global Wildland Fire Community"

A PUBLICATION OF THE  
International Association of Wildland Fire  
www.wildfiremagazine.org  
www.iawfonline.org

## EDITORIAL

**Ron Steffens** - Managing Editor  
editor@wildfiremagazine.org

**Dennis Hegg** - Sales Manager  
Dennhegg@gmail.com

**Mikel Robinson** - Administration  
execdir@iawfonline.org

PRINTING BY: **Century Publishing**, Post Falls, Idaho

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WILDFIRE, Volume 27, Issue 3 (ISSN: 1073-5658) is published by International Association of Wildland Fire, a 501(c)3 nonprofit organization. The magazine supports IAWF's core mission – "Uniting the global wildland fire community."

Address: International Association of Wildland Fire,

1418 Washburn, Missoula, MT, 59801 USA.

Phone: (406) 531-8264 • Email: execdir@iawfonline.org.

Editorial Email: editor@wildfiremagazine.org.

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# The Camp Fire burns Paradise, and we must act

When a vegetation fire burns vegetation — grass, brush, trees or a mix — we act as fire managers, fire responders, firefighters and medics — the whole array of ICS roles we've been trained for. When a vegetation fire burns into and becomes a conflagration of structures, we work all our regular roles and add the urgency of evacuation managers. We're the ones who save lives, the ones who witness lost homes (sometimes the firefighters' own homes). And sometimes we mourn those who have lost their lives to the fire. Some of this we've trained for, but who can truly prepare for the destruction seen in the Camp Fire?

Our habit of naming fires has become another way to toll the bell that tolls for us all. The Camp Fire tolls in Paradise, the Woolsey Fire tolls in Malibu. Before that, flames destroyed communities, and lives were lost, from California to Greece, from Portugal to South Africa. Now Australia is burning as are so many places beyond our focus.

This issue of *Wildfire* comes too soon afterwards to directly address these most immediate losses — so here, in the *Briefing* that frames each issue, we offer our condolences and support for you who have lost family, friends, colleagues, homes, communities. To which we add our faith that you — survivors and firefighters — will be supported by those around you. And our commitment that our profession, and our institutions and governments, will support you.

We also offer compassion and support for our colleagues who have worked these fires, and those who have worked all the fires. The work we do is rewarding but takes its toll, regardless of the scale of the fire. But it's this challenge, season after season, during our working lives and often in retirement, that helps us build our sense of "best practices." We use our after-action evaluations to ask if we could do it better, safer next time, and we seek help from our fire-scientist colleagues. After all, what is the our most basic concept — the fire triangle — but science, put to the ground.

Like most firefighters, we at *Wildfire* are committed to the insights and application of fire science. Last issue we examined how fire science helps us live with wildfire. In this issue, two recently retired fire-science managers (one a past president of IAWF) observe that unified fire science in the US (in the form of the Joint Fire Science Program) is being threatened by budget cuts that can only be thought of — considering the huge losses we've faced from wildfires — as either petty, misguided or cruel.

In this issue we offer examples of how fire science pays off — in the form of a wildfire-smoke primer crafted by a writer from the Centers for Disease Control, and in an interview of a firefighter-turned-scientist, Sara Brown, who's our *Fired Up* honoree for this issue. These are just two examples of fire science dividends, the knowledge that helps us manage fire more effectively and build safety into our work and our communities.

Wildfire management and science occurs within our governance and social systems, which holds relevant discussions about funding priorities and an analysis of which approaches work best and where. But has this happened, in the public sphere? To cut wildfire science programs — when our communities are burning, smoke and fire risks are increasing, and people are dying — is simply bad logic, and bad-hearted to boot.

Beyond science, this issue continues to share insights about who we are as a community of fire professionals. In particular, we examine the role of gender and diversity in our profession, including initiatives that seek to engage the work and insights of women into our fire management and fire science workforce. Journalist Emily Wolfe observes that a more diverse workforce won't change the physics of the fire triangle but may "change how we interact with fire."

In another reflection on gender and fire, we share a preview and reflection on a new documentary, "Wildland." Our essayist-reviewer examines the life lessons learned as an all-male 20-person fire crew works the firelines of the US West. The film follows

young men who face the challenge of fire (and thus take steps toward managing their own lives), and Amanda (Stamper) Rau examines their story while reflecting on her own experiences as a woman building a role in what's been a male-dominated field.

All these reflections remind us: our profession is a community and a part of the larger communities we serve — and our workforce becomes stronger when we include those community members we serve.

And we need all our strength. Some we serve are hurting, and some of our own profession too. In the past year, colleagues have shared news of survival, their houses spared while the homes of neighbors burnt.

And in these past weeks, friends have lost houses — the photo above shows the scorched trees of Paradise but only the foundations of homes, one of which was a friend's. As we go to press, the death toll is 85, with 11 missing, and 14,000 homes burned.

Amid the shock of this destruction, a few of our leaders appear to trivialize and politicize. The burned town of Paradise was mislabeled “Pleasure” at a time when neither word fit. The accepted and essential science of climate change has been demeaned, and grand-standing displaces (temporarily, we hope) the authentic, science-based commitment to the cohesive strategies we need to manage our “wicked-problem” wildfires.

This issue features fire science and smoke, women and men — a



*Drone imagery documents the burnt neighborhoods of Paradise amid scorched trees. For more, see [www.buttecountyrecovers.org](http://www.buttecountyrecovers.org).*

community of voices, speaking differently and thus enriching our ability to listen — and listening, I sense, may give us the heart we need to bridge our way into our profession's future, and to speak and act against the bullies, harassers and nonsense that undercut us.

It is our commitment to action that Paradise deserves. Our best memorial is to act for our profession, so the next Camp Fire won't toll so many bells.

The rains have come to Paradise, the fires out and the risk of flood rising, and recovery begins. We help where we can, with donations or in-person, and seek to learn from your fortitude, you who have survived the Camp Fire — since some day we may all need help to find a route through the burning hours and hot seasons ahead.

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U.S. Forest Service photo

# Culture and Leadership

## CULTURE HAS ENORMOUS IMPLICATIONS FOR LEADERSHIP

Over my career, my international and cross-cultural experiences have been some of my most enjoyable and rewarding ones. Whether I was organizing or attending an international conference, serving on the IAWF Board of Directors, collaborating with a co-author from another country, or doing a little consulting far away from home -- whatever the role or purpose, I have benefitted from every opportunity to work with colleagues from cultures other than my own and to try my hand at leading cross-culturally. My participation in the IAWF afforded me many of those opportunities.

The Association is dedicated to communicating with the entire wildland fire community and providing global linkage for people with shared interest in wildland fire and comprehensive fire management. Partnering on events like the recent 8th International Conference on Forest Fire Research serves to actualize the commitment that the IAWF has made. I remember fondly my opportunity to attend this excellent conference while serving as IAWF President.

The IAWF is an international organization and it is a leadership organization -- a challenging combination. International organizations, and an international organization whose mission is leadership in particular, require leaders who can adapt quickly to different environments and work effectively with partners personnel with attitudes, values, and cultural practices different than their own.

Culture has enormous implications for leadership. Four

elements -- the leader, the led, the context and the situation -- make up the leadership environment. And culture represents an important element of both the context and the immediate situation. Within the leadership environment, relationships and influence -- which are dependent on communications, shared values, emotional and social intelligence, character, and trust -- all coalesce to catalyze leadership. As one might imagine, both culture and context have direct influence on how one can apply all of those leadership catalysts in a given situation.

The research is pretty darned clear. When it comes to leadership, there are significant national and cultural differences in work-related attitudes and values, which are generally clustered by language, religion, geography and level of economic development. This is really important, because many of the dominant leadership theories were developed in North America or Europe, by Americans and Europeans, studying Americans and Europeans. So, we must always ask whether a leadership practice we are fond of makes sense cross-

culturally, even when it has served us well in our usual work environment. This would be true for a would-be leader hoping to influence individual people of different cultural backgrounds as well as for a would-be leader seeking to apply their experience in a new cultural setting. And we cannot assume that a manager, successful in one national or organizational culture, will be successful in another.

Leaders must make an effort to understand, and remain sensitive to, the culture of which they have become a part.



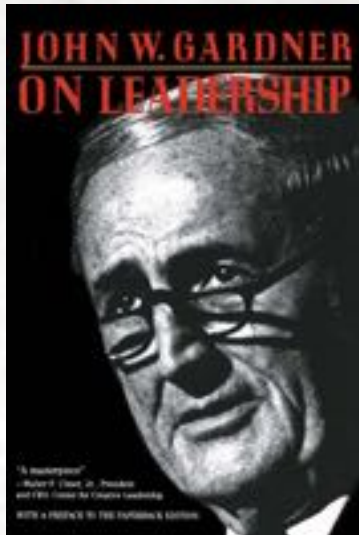
For example, people regard influence differently by culture/cultural cluster, and credible research indicates that the effectiveness of influence tactics varies by culture. Consequently, cultural differences in the leadership environment have enormous implications for a would-be leader's influence tactics and application of power. Leaders must make an effort to understand, and remain sensitive to, the culture of which they have become a part. In addition, we must recall that organizational cultures are embedded within the broader societal culture and that there is constant interplay between the two. At the bottom line, unless they attend to culture, a successful leader employing what is normally an effective leadership approach in one cultural context may fail miserably in another context.

The good news is that the research indicates that while cultural differences certainly impact leadership practice, the basic functions of leadership appear to be universal. It seems that culture is most important in practice. In other words, even if a basic function of leadership -- like establishing and maintaining trust -- is universal, would-be leaders may perform this function differently as demanded by the cultural context. This corresponds with what we know from situational leadership theory. We know that, when it comes to leadership, the situation matters and is indeed a major element of the leadership environment.

I have always been inspired by John Gardner, and consider his classic book *On Leadership* a go-to text.

Among other accomplishments, Gardner was a World War II veteran, served as Lyndon Johnson's Secretary of Health, Education and Welfare, founded both Common Cause and Independent Sector, resigned as HEW Secretary to protest the Vietnam War, received the Presidential Medal of Freedom, and has a center for youth leadership at Stanford University named after him.

I find Gardner most articulate on the subject of culture. According to Gardner, "How a group moves to meet universal human needs is determined by the culture; and how leaders conduct themselves must take culture into account." Gardner was quite clear on why he believed that leaders must understand culture, and his argument is compelling. According to Gardner, "Much of culture is latent. It exists in the



minds of its members, in their dreams, in their unconscious. It can be discerned in their legends, in their art and drama of the day, in religious themes, in their history as a people, in their seminal documents, in the stories of their heroes."

Basically, Gardner holds that culture infuses every fiber of people; it is just part of us. Gardner was talking broadly about social culture, but much of what he said applies directly to organizational culture as well. One must understand and attend to the culture of those we hope to lead; without doing so, leadership success will prove, at best, elusive -- and more likely, improbable.

Leadership is both situational and contextual, and culture -- whether national, ethnic, or organizational -- matters as it profoundly contributes to both the greater context in which we attempt to lead as well as the immediate situation. However, despite the influence of culture, it is also pretty clear that all leadership contexts are distinct from one another; we never really find ourselves in exactly the same situation. In addition, we might as well assume that, regardless of what generalizations we can make about the influence of culture, individual people will interact with each one in somewhat unpredictable ways within the culture.

I have found this uniqueness of leadership context and the general unpredictability of people to be true whether we are talking about the interplay of leadership and societal or national culture, or the interplay of leadership and organizational culture. Each organization's culture is unique and can include distinct sub-cultures within that culture. As leaders, we cannot predict the interaction of each individual within the organization's culture, but we can think about how the organization's culture contributes to individual behavior and the interaction between people.

Culture has big implications for leadership, and would-be leaders, because culture directly influences two of the key elements, context and the situation, that make-up the leadership environment. In addition, within the leadership environment, leadership is catalyzed by relationships and influence; and both culture and context have direct influence on how one can practice relationship-building and influence tactics in a given context. Consequently, a savvy leader will set about purposefully understanding and adjusting for the culture in which they hope to lead.



**Mike DeGrosky** is Chief of the Fire and Aviation Management Bureau for the Montana Department of Natural Resources and Conservation, Division of Forestry.

He taught for the Department of Leadership Studies at Fort Hays State University for 10 years. Follow Mike on Twitter @guidegroup or via LinkedIn.

# IAWF AWARDS EARLY CAREER & EMBER HONORS

IAWF RECOGNIZES TWO FIRE SCIENTISTS  
Dr. Nicholas Skowronski & Dr. Marty Alexander  
for the promise and significance of their work

*The 2018 IAWF Early Career Award in Fire Operations and the Firebreak Award for Excellence in Fire Management will be announced and presented at one of our upcoming conferences.*

## Early Career Award for Dr. Nicholas Skowronski

The 2018 recipient of the IAWF Early Career Award in Fire Science is Dr. Nicholas Skowronski. Nick is a research forester with the Northern Research Station, US Forest Service. His award was presented by Alen Slijepcevic, IAWF President, at the Fire Continuum Conference in Missoula.

The Early Career in Fire Science award is to recognize a promising early-career professional who has demonstrated outstanding ability in the field of wildland fire science. "Early career" is nominally taken to include professionals who are within ten years of having earned their highest degree or are under 40 years of age when nominated.

Nick's current research focuses on the quantification and analysis of the structural characteristics of forest canopies and how this relates to carbon and water cycles. He has recently been using a newly emerging remote sensing technology called LiDAR which actively characterizes the canopy with a laser beam. His work is split between developing methods for using LiDAR and other remote sensing techniques for wildfire mitigation and studying how forest functionality changes after disturbance.

### A few comments from the folks who nominated Nick:

"Dr. Skowronski has a proven capacity to involve people beyond the realm of wildfire research and encompasses the spirit of true inclusivity and collaboration. He has great experience in the field conducting prescribed fire research and is also the successful founder and lead scientist of the North Atlantic Fire Science Exchange."

"Dr. Skowronski has a solid record of published and impactful research. He continues to make important contributions concerning the application of remote sensing and LiDAR to wildfire management. Dr. Skowronski appears to interact with a variety of managers, academics, and practitioners--he serves as a bridge between knowledge development and practice. He also serves as the PI for the North Atlantic Fire Science Consortium, which demonstrates a commitment to outreach."

"Nicholas Skowronski has a strong authorship to merit his nomination of this award. The versatility of his work indicate that he has strong cross-disciplinary skills that are greatly underrepresented and greatly needed in the world

of wildfire research. Additionally, his experience "walking the walk" elevates his qualifications to receive this award, as all wildfire science should seek to answer questions and improve our on-the-ground understanding of wildfire.  
**Congratulations, Nicholas.**



Nick Skowronski, recipient of the 2018 IAWF Early Career Award in Fire Science.

## Marty Alexander receives Ember Award

The 2018 recipient of the IAWF Ember Award for Excellence in Wildland Fire Science is Dr. Marty Alexander. His award was presented by Alen Slijepcevic, IAWF President, at the Fire Continuum Conference in Missoula.

The purpose of the "Ember Award" is to recognize sustained excellence in wildland fire research and to encourage innovation, exploration, application, and dissemination of important research results. The name "Ember" reflects the fact that research and science often move slowly, and their benefits or impacts may not be apparent for years. The award was established to recognize sustained and excellent research contributions to wildland fire science, innovative solutions to important wildland fire challenges, and effective and appropriate communication of wildland fire science and research results. The first Ember Award was presented in 2006 with eight total recipients to date.

Dr. Alexander has had an exceptional 40 year record creating knowledge, packaging and disseminating it to the global wildland fire community. He has continually elevated his professional standing to the point where he is now recognized as the premier expert on many aspects of wildland fire. He has collaborated with colleagues across North America, Europe, the Near East, and 'down under' to develop innovative solutions to crucial wildland fire challenges. With more than 350 publications to his credit, including 61 peer-reviewed articles. According to Google Scholar Citations, his publications have been cited 5,634 times.

His effectiveness as a communicator is further attested to by the roughly 150 invited speeches/lectures given and his interview record with media giants including BBC, CBC, and Discovery Channel Canada. Marty's sustained research excellence and magnitude of their global impacts are affirmed by the dozen+ major awards he has received, including the Canadian Forestry Achievement Award and the coveted James G. Wright Award for career achievement in forest fire research. He was identified in 'Forest Fires: A Reference Handbook' as one of 23 individuals that have influenced wildland fire policy and knowledge globally. Marty is smart, intellectually honest, professionally passionate and holds everyone to the same high standards.

**Marty has had an outstanding career, with just a few of this accomplishments listed below.**

- He is one of four architects of the Canadian Forest Fire Behavior Prediction (FBP) System.
- Co-authored the FBP 'Red Book' field guide which has been copied internationally.
- He co-developed the new generation of practical-oriented models and system software for predicting crown fire initiation and spread as well as other aspects of extreme fire behavior.
- He has authored seminal publications on fireline intensity and crown fire behavior exemplified by three chapters on fire behaviour in the 2014 book 'Fire on Earth: An Introduction', and the co-authored 2015 book 'A Guide to Rate of Fire Spread Models for Australian Vegetation'.
- He co-authored a prescribed burning fuels and fire behavior documentation manual that has been emulated by organizations worldwide.
- Popularized the wildfire behavior case-study concept within Canada and elsewhere.
- Conceived the concept of the Canadian Forest Fire Danger Rating System Users' Guide which has been extensively replicated.
- Helped develop fire management applications and interpretive aids nationally and globally.
- Initiated and coordinated a series of fire weather seminars designed to enhance information and technology transfer of fire research results.
- Developed a classification system to describe and communicate fire behavior information used globally by fire managers, fire behavior analysts (FBAN's), and fire scientists.
- Co-founded the two Canadian Interagency Forest



Marty Alexander receives the Ember Award from IAWF President Alen Slijepevic (right) and Executive Director Mikel Robinson (left).

Fire Centre fire behavior training courses – Advanced Wildland Fire Behavior and Wildland Fire Behavior Specialist – and has trained several generations of fire operations staff and FBANs.

- A key member in developing Canadian CD-ROM based training courses for fire behavior, firefighter safety, and fire danger rating.

***Congratulations Marty on this well-deserved award.***

## **A Thank You Note from the 2018 Ember Award Recipient**

I'm deeply humbled to have received the Ember Award for there are many deserving folks out there. It is indeed a very great honor to receive this award and to be included in the list of previous award recipients, all of whom I view as either wildland fire science icons and/or as personal mentors.

Space does not permit me to acknowledge all the many individuals who have in one way or another contributed to my receiving the Ember Award. However, I would like to acknowledge the following:

- First and foremost is my wife Heather (of 43 years) who kept the home fires burning raising four children while I was away in the field or out of town on other business. Her support over the years has certainly made this all possible.
- Wally Lancaster, Jack Barrows, Jack Dieterich, Jim Davis, Bill Furman, Mike Fosberg, John Deeming and Dave Sandberg for their support and encouragement very early on in my fire research career.
- Brian Stocks and the late Dennis Dube who have been long-serving mentors. Others from the Canadian Forest Service fire research group include Bruce Lawson, Charlie Van Wagner, Rob McAlpine, Bill de Groot, Kelvin Hirsch, Steve Taylor, Mike Wotton, Tim Lynham, Doug McRae, Brad Hawkes, Mike Weber, Mike Flannigan, Murray Maffey, John Mason, Gary Hartley, Jack Bell and George Dalrymple.
- Phil Cheney and Miguel Cruz with Commonwealth

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Scientific and Industrial Research Organization of Australia, Chris Trevitt with the Australian National University, Grant Pearce with the Scion Rural Fire Research of New Zealand, and Murray Dudfield with the National Rural Fire Authority of New Zealand.

- To many members of the operational fire management community in Canada for their support over the years, namely Rick Lanoville (Northwest Territories), Terry Van Nest, Dennis Quintilio, Rob Thorburn, Howard Herman and Dave Finn (Alberta), Al Beaver and Kris Johnson (Yukon Territory), Dana Hicks and Judi Beck (British Columbia), and Bill Droog (Ontario) as well as Dave Thomas (U.S. Forest Service) and Frank Cole (Alaska).
- To several members of academia, including

Peter Murphy (U of Alberta), Brigitte Leblon (U of New Brunswick) and Mike Jenkins (Utah State U) as well as many graduate students but especially Nathalie Lavoie, Steve Otway and Wesley Page.

- Special thanks to Dale Wade for nominating me and to the award selection committee for considering me as deserving of the award.

There are many others who have contributed, challenged and enriched my work in wildland fire science. To you all I am most grateful.

Sincerely,  
Marty Alexander, Conferences, leadership, and mentoring

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# 2018 STUDENT SCHOLARSHIP RECIPIENTS

Scholarships support researchers focused on the Bolivian savanna and human behavior in fires.

*Each year the IAWF awards two graduate-level scholarships typically valued at \$3,000 USD to Master of Science (M.Sc.) or Ph.D. students studying wildland fire or wildland fire-related topics. Student submitted essays are evaluated by an international panel of fire science experts and one award recipient is chosen for the Masters level and one for the Doctoral level. The IAWF has been presenting this award annually to members of the fire science community since 2007.*

## We are pleased to announce this year's recipients.



### **Joanne Kingsbury**

PhD Environmental Science, The Ohio State University, Columbus, Ohio, USA

Jo Kingsbury is a PhD student in the Environmental Science Graduate Program at The Ohio State University and is based within the School of Environment and Natural Resources. She is originally from the Isle of Arran in Scotland and completed her BSc Honors degree in Zoology at the University of Glasgow in 2011. While studying for her undergraduate degree, she spent her summers leading student expeditions to Latin America where she fell in love with tropical ecology and birds.

After graduating, she worked for four years with the Royal Society for the Protection of Birds (RSPB) as a project officer in landscape-scale conservation. Her current research focuses on understanding how fire shapes habitat for globally threatened birds within Bolivia's Beni Savanna

Ecoregion, one of the earth's most remote and threatened savanna systems. The Beni is critically understudied compared to other savanna systems globally and currently its habitats and biodiversity are experiencing extreme pressure from altered fire regimes associated with widespread cattle-ranching.

Rangeland fire-management has altered historic wildfire patterns, changing the frequency, seasonality, extent and severity of fire-events. Understanding the fire ecology of this region will be vital to the future conservation of its habitats and species. She is working collaboratively with the local Bolivian Birdlife International partner Association Civil Armonia, who own and manage protected land within the Beni. They have implemented multiple experimental burns to study how fire interacts with flooding and grazing to shape avian habitat (vegetation structure/composition) and resources (food/nest sites). Results will be used to build a predictive model to test how fire can be used to protect bird communities. Her work thus aims to develop more sustainable fire-management regimes and predictive tools for land managers that will help to balance agricultural and conservation priorities within this region and more widely within Latin America.



### **Lauren Folk**

Masters of Applied Science in Civil Engineering, Carleton University, Ottawa, Ontario, Canada

Lauren is pursuing her Master of Applied Science in civil engineering at York University in Toronto, Canada. Previously, she studied at Carleton University where she completed her bachelor's in Architectural Conservation and Sustainability Engineering in 2017. Lauren has long been passionate about sustainable development and finding ways to help improve the lives of others. She has been conducting research on human behavior in fire (HBiF) since her junior year, transitioning her research focus from long term care home evacuations during her undergraduate degree to community resilience and wildland urban interface (WUI) evacuations for her master's thesis.

She spent three months interning at the National Institute of Standards and Technology (NIST) in 2017, researching the factors affecting protective action decision making during wildfires and hurricanes. Lauren is now collaborating with community partners to improve the safety of evacuation routes for vulnerable Canadian WUI communities by incorporating HBiF into evacuation modelling and planning. She hopes that her research will help to improve wildfire safety in WUI communities and to further the study of HBiF in North America.

# A FUTURE WITHOUT THE

by John Cissel and Tom Zimmerman

## A history of success in fire science

In the Federal Fiscal Year (FY) 1998 Appropriation for Interior and Related Agencies, Congress established funding and direction to initiate the Joint Fire Science Program (JFSP). Federal wildland fire management agencies developed the Joint Fire Science Plan to provide program direction. Under the guidance of an interagency Governing Board, the program matured into a full-featured science program that uses a multi-faceted process to determine research priorities; conducts efficient and open proposal solicitation, review, and funding procedures; and has an effective, collaborative science delivery and exchange mechanisms.

As documented by four successive program reviews since 2002, JFSP has been a highly successful and integral component of the interagency wildland fire management program. With a relatively limited budget, it has improved efficacy and accountability of agency activities by funding research on timely and important topics. These reviews clearly identified the critical role JFSP has played in catalyzing collaborative efforts across management and science boundaries, and in articulating an interagency, management-driven science agenda.

However, as JFSP enters its 21st year, current trends are placing its future at risk. Recent annual federal budgets have yielded progressively declining funding levels and now, the proposed Federal Fiscal Year 2019 President's Budget includes no funding for JFSP. This paper highlights the unique values and importance of the program and illustrates the magnitude of impacts that will result from implementation of such drastic funding proposals.

## Budget history

JFSP was initially funded in federal FY 1998 at \$8 million, half from Department of the Interior (DOI) and half from Forest Service, U.S. Department of Agriculture. This funding was doubled in FY 2001. JFSP funding held steady until dropping to \$14 million in FY 2006, then to \$13 million in FY 2012. Funding dropped again in FY 2017 to \$9 million, then to \$3 million (all DOI) in FY 2018. The proposed FY 2019 President's Budget eliminates the program.

## Program organization and focus

JFSP program organization reflects a unique focus on management-driven research questions. A 12-person Governing Board, comprised of employees of the agen-

cies that fund JFSP plus a US Geological Survey member, provides guidance and direction to the research questions selected for study, selects specific research proposals for funding, and selects new science and science exchange projects funded by JFSP. In addition, a unique program investment strategy, developed with input from land management and fire organizations and other stakeholders, maintains a balance among the types of science investigations, the mix of issues addressed, science exchange priorities, and short-term versus long-term investments.

## Research

JFSP research has been an important and highly relevant component of wildland fire science. It has funded a significant portion of wildland fire and fuels research conducted in the USA, averaging 28 peer-reviewed studies annually. Most studies are collaborative projects involving federal land managers and federal and university scientists. State, private, and NGO scientists and managers have also made important contributions. An important characteristic of JFSP research is that investments directly translate into research accomplishments. JFSP does not fund salary for permanent employees, including tenured faculty, and in-kind and contributed costs of funded proposals have historically averaged approximately 60% of the total requested funds. This means that JFSP capitalizes on the existing capacity of federal and university scientists to conduct value-added research.

Another key aspect of JFSP is the open proposal solicitation and independent peer-review processes. Open proposal solicitation means anyone can submit proposals that address research questions listed in proposal solicitations. Simply put, JFSP accesses the entire talent pool. Having open access to university scientists is significant because federal science agencies alone do not present the diversity of skills, experience, and innovation found within the university system. JFSP has funded scientists from 153 universities, including 77 that were the primary funding recipient and home institution for the principal investigator (Table 1).

Table 1: JFSP research participation (last 10 years).

Employer	Funded Investigators	Proposal Acceptance Rate
University	580	19%
US Forest Service	340	30%
US Geological Survey	44	22%
Other	81	12%



# JOINT FIRE SCIENCE PROGRAM?

"The JFSP represents the gold standard in recognizing gaps in knowledge and partnering to meet research needs." - From the 2017 JSFP Program Review

Independent peer review is a cornerstone process of high-quality science. JFSP regularly convenes independent peer-review panels to evaluate scientific merit and management relevance of submitted proposals. Only the highest-rated proposals are considered for funding. This means that a wide range of experience, skills, and knowledge is used to evaluate the research questions identified by managers, and that each study meets a peer-review quality standard. In addition, fire and fuel managers participate as full members of JFSP peer-review panels which helps assure that funded proposals have direct management relevance.

As an indicator of productivity, JFSP research constitutes a significant portion of published wildland fire and fuels research. On average, JFSP research results are published in 44 journal papers annually, including 20%-40% of the US based science papers in the *International Journal of Wildland Fire* and the *Journal of Fire Ecology*, two of the more important science journals for wildland fire. JFSP research results appear in many other publications including federal science papers, book chapters, conference proceedings, etc. (Table 2).

**Table 2 - JFSP Science Outputs (2007-2017)**

Research Product	Number
Journal articles	526
Government science publications	228
Dissertations, theses	100
Books, book chapters	28
Other	1,696

Research outputs are important, but not the ultimate goal for JFSP. The JFSP Governing Board has long sought to evaluate the management-relevant outcomes of JFSP investments. According to an analysis by Hunter (2016), 86 of 122 (71%) of sampled agency fire planning and policy documents cited JFSP results. Hunter (2016) also showed that 41 of 48 (85%) of sampled JFSP projects were cited in agency fire planning and policy documents. This emphasizes the continuing value of JFSP research results for managers.

JFSP plays an indispensable role in the overall wildland fire research infrastructure. Research agencies and universities depend on JFSP funds to support value-added research on high-priority management issues. Elimina-

tion of JFSP means that the limited and shrinking pool of research funds available elsewhere will be increasingly allocated to cover fixed costs (e.g., laboratories and permanent employee salaries) and new research to address agency management priorities will be significantly diminished. Overall research capacity will be significantly damaged. This is particularly true for universities where the largest and most diverse set of skills resides, and where there are few sources of alternative wildland fire research funding.

## Science exchange

Science exchange among scientists and managers has been central to the mission of JFSP since its origin. The first phase of science exchange was viewed as technology transfer and focused on the transfer of science to managers by scientists. Technology transfer was an explicit proposal evaluation criterion and funding decisions by the Governing Board were based in part on planned science delivery.

After the first JFSP program review (Abbey et al. 2002) recommended that JFSP do more to promote science delivery, the Governing Board invested in program-level science delivery capabilities. A communications specialist was hired and a science delivery plan was developed. Two important changes resulted from these actions. First, science delivery was recognized as a more complete system of problem and research question development that engaged managers in science implementation and facilitated exchange of science results interpreted and demonstrated in manager-relevant terms. The second change saw development of multiple science delivery products including science briefs, digests, and syntheses. These products have been widely disseminated and broadly used.

A second program review (Jones et al. 2009) again emphasized that JFSP needed to do more in terms of science delivery. This time, the Governing Board decided a major change in scope would significantly improve the effectiveness of JFSP science delivery and exchange. This set the stage for creation of the JFSP Fire Science Exchange Network (FSEN). Funded in several rounds of proposal solicitation starting in 2009, the network has grown to include 15 exchanges covering the entire US (Figure 1).

The FSEN engages practitioners, scientists and citizens in a wide-ranging set of activities to inform research agendas and accelerate understanding and adoption of fire science. The FSEN reported 12,218 individual activities reaching 417,419 participants in FY 2017, an increase of approxi-



mately 50% from FY 2014 in both categories. An independent evaluation of FSEN effectiveness conducted by the University of Nevada, Reno (Copp et al. 2017) stated that:

- The FSEN is increasingly achieving intended outcomes as well as outputs.
- Exchange users demonstrate higher levels of confidence in their ability to find, interpret, and apply fire science.
- Exchange users report better engagement with fire scientists, and increased use of fire science by fire managers.

The FSEN has become the ‘go-to’ source of the latest fire science information for many wildland fire and fuels practitioners and citizens throughout the country, and is seen by many in the broader land management community as a model for innovative science exchange.

## Students

An often overlooked but important contribution of JFSP has been support for university undergraduate and graduate students. These students are the wildland fire managers, scientists, and leaders of tomorrow. The management-driven research focus of JFSP exposes students to managers and management issues early in their career, often in ways that directly impact their careers and the agencies that employ them. From 2011 to 2017, 1,000 students were directly involved in JFSP research (594 undergraduate students; 208 masters students; 198 doctoral students).

In collaboration with the Association for Fire Ecology (AFE), JFSP developed and sponsors two unique programs

that directly support engagement of students with fire and fuels managers. The GRIN (GRaduate INnovation) program provides limited supplemental awards to graduate students to enhance student exposure to wildland fire, fuels management, and policy. GRIN awards produce tools useful for fire and fuels managers. Since 2011, 50 students have successfully competed for GRIN awards (27% award rate). Many former GRIN students have successfully entered the fire science and management profession and are making substantial contributions, including professors in fire science at universities and coordinators within the FSEN. JFSP also sponsors travel grants that support student interaction with managers. Over 230 students from 49 universities have received travel grants (average of \$630 per grant).

## Can existing federal research appropriations make up for the loss of JFSP?

One assertion is that existing federal research programs can absorb the loss of JFSP without real consequence, but in reality, this is not possible.

Eliminating JFSP will result in loss of:

- Manager-driven research agenda.
- A strategic approach to science and science exchange investments.
- A significant portion of the total wildland fire and fuels research conducted in the US.
- A highly leveraged and value-added means of conducting research.
- Involvement of university scientists.

- Independent peer review of all funded research.
- Student understanding of management issues.
- The Fire Science Exchange Network.
- Major contributions to wildland fire journals and conferences.

The Forest Service is the only real candidate agency to absorb the loss of JFSP because it is the only agency that has a broad-based wildland fire research appropriation. Other agencies (USGS, NASA, EPA, ARS, NOAA) have scientists engaged in fire and fuels research but are narrowly focused or largely dependent on external funding for wildland fire research. Forest Service research is also coping with significant budget cuts and is not in a position to take on new work without new funds. In fact, loss of JFSP would significantly erode USFS research capacity as budget cuts to the agency have made operating funds increasing difficult to come by. Funding trends for Forest Service research are on a long-term downward trajectory. Despite greatly increasing expenditures for wildland fire over the last 20 years, wildland fire research funds show a downward trend. Appropriated wildland fire research funds are actually lower now than in FY 2000, and National Fire Plan funds used for research, which have been as high as \$22 million dollars (FY 2002) are slated to be eliminated in the FY 2019 President's Budget. The combined effect of cuts to JFSP and Forest Service research is doubly impactful since JFSP funds have greatly leveraged Forest Service funds to create large-scale collaborative studies that may no longer be possible.

USGS has a unique role with the DOI management agencies and has many excellent scientists with relevant expertise, but is missing expertise in large elements of the JFSP mission (e.g., smoke, fire behavior, social science, fire weather, incident management, human health). USGS scientists largely depend on external funding sources for fire research because USGS does not have a wildland fire research appropriation.

## Options

Given the reduced operations of JFSP in FY 2018, and the potential that JFSP could be eliminated in FY 2019, what are the options the wildland fire community should be considering? The contributions of JFSP are substantial and loss of the program will have significant effects in both the short and long terms. These effects are not intrinsically associated with the personnel or particular administrative history of the program, but are the deliberate result of specific values and policies, namely:

- An investment strategy focused on the needs of managers.
- Open proposal solicitation and competition, and independent peer-review.
- High leveraging of program and agency funds.
- Strong commitment and outstanding record of science delivery and exchange.

In theory, any or all of the specific practices that support these policies could be adopted by a new or revised science investment program. However, it has taken 20 years for JFSP to fully develop the infrastructure and procedures necessary to maximize the value of these practices and to ensure fair and equitable management. Disbanding JFSP and starting a new program in the future with a similar or revised mission will incur significant start-up costs and take time to mobilize.

Given the magnitude of impacts that would result from the loss of JFSP, we can only offer one option that will fully address the wildland fire community science needs. It is a straightforward option: restore JFSP funding to past budget levels (\$12-16 million). Full operations could be restored fairly quickly. Wildland fire challenges continue to grow and research that supports the interaction of managers and scientists to address these challenges is urgently needed.

An option that does not address wildland fire science needs, but will address the community's short- and mid-term science delivery requirements is to continue funding for FSEN but eliminate new research. At a minimum, this capacity is needed for the next 3-5 years as research already funded by JFSP is completed and enters an active science exchange phase. In the long run, maintaining a vigorous science exchange capacity may not be needed if new research is not also funded.

We considered an option that would reboot JFSP with a new strategic focus, but the recent JFSP program review conducted by agency leaders (Berg et al. 2017) did not identify any need to change the focus of JFSP, nor has the interagency JFSP Governing Board identified a need to change program focus.

In our opinion, JFSP has been a vital component of the wildland fire and fuels community for 20 years and loss of the program would be highly damaging. However, the current threat to JFSP's future indicates that agency and congressional leaders may not appreciate the vital roles that JFSP plays in the wildland fire enterprise.

To the extent this is true, JFSP may benefit from a sustained period of enhanced engagement with interagency leaders, practitioners, and stakeholders. Such engagement could help clarify top priority issues facing managers in the next 3-5 years. Identified issues could include research or science exchange needs, or other opportunities to work across the science-management boundary to improve fire science application.

These needs are reasonably well understood, but a period of enhanced engagement could sharpen the focus of future research questions and science exchange needs, and could lead to new understanding and priorities. Importantly, such an exercise could also build understanding of the critical role JFSP plays in the wildland fire community, especially among agency leaders.

## To face the wildfire challenge, fund the Joint Fire Science Program

This analysis describes the impacts of the loss of JFSP to the wildland fire community and presents some options for the future. In our view, without JFSP, links between research and management will be weakened, and a standard for addressing knowledge gaps and meeting research needs will be lost. These losses are significant and wide-ranging and will not be made up by federal agencies individually, or collectively. In addition, ending this program is not consistent with statements in the Federal Wildland Fire Management Policy and the National Cohesive Wildland Fire Management Strategy Guiding Principles that call for basing fire management plans, activities, and decisions on the best available science, knowledge, and experience. With wildland fire presenting greater challenges to natural resources and society each year, it seems incomprehensible to de-fund indispensable programs that advance overall management capabilities. We urge reconsideration of full funding for JFSP and continued engagement of JFSP with interagency managers to ensure future research and science exchange needs are well understood and articulated.

### Authors' note

Both authors have been directly engaged with JFSP in the past and have detailed knowledge of JFSP practices. However, both are now retired and not affiliated with JFSP or federal government research. The opinions in this paper are strictly that of the authors and do not represent any official input or opinion of JFSP or government agencies.

## Acknowledgements

The content of this paper has been improved by external reviews. The authors gratefully acknowledge the contributions of Nate Benson (Fire Science and Ecology Program Lead, National Park Service), Molly Hunter (Research Scientist, University of Arizona), and John Laurence (retired, formerly Forest Supervisor, Wallowa-Whitman National Forest, and US Forest Service Research Program Manager) for their reviews of this paper.

## REFERENCES

- Abbey R., P. Roussopoulos, M. Beighley, L. Hartmann, M. Kearney, P. Seamon, T. Sexton, J. Stubbendieck, S. Vail, M. Walker, J. Whitney, and J. Youtz. 2002. Joint Fire Science Program Five Year Program Review Report. DOI/USDA Forest Service paper on file JFSP program office, Boise, ID. 36 p.
- Berg K., V. Christiansen, C. Dawe, J. Freemuth, M. George, J. Glenn, J. Laurence, B. Rice, T. Patel-Weynand, C. Wilcox, M. Jones, and C. Gucker. 2017. 2017 Joint Fire Science Program Review Report. DOI/USDA Forest Service paper on file JFSP program office, Boise, ID. 10 p.
- Copp C., B. Davis, W. Evans, and L. Singletary. 2017. Joint Fire Science Exchange Network 2017 Evaluation Report: A National Cluster Evaluation of the Fire Science Exchange Network Processes and Impacts. University of Nevada, Reno. 56 p.
- Hunter, Molly. 2016. Outcomes of fire research: is science used? *International Journal of Wildland Fire* 25(5) 495-504.
- Jones B., C. Joyner, K. Brandel, S. Cutter, J. Douglas, L. Decker, R. Eardley, G. Morgan, R. Wills. 2009. Joint Fire Science Program 5-Year Program Review Report. DOI/USDA Forest Service paper on file JFSP program office, Boise, ID. 20 p.

**Note:** Most data in this paper are excerpted from evaluation reviews and annual reports on file at the JFSP office, Boise, ID.

## ABOUT THE AUTHORS

**John Cissel** is retired BLM and USFS and served as the former JFSP Program Director; BLM Research Coordinator, Oregon State Office; and Research Liaison, HJ Andrews Experimental Forest.

**Thomas Zimmerman** is Wildland Fire Management Portfolio Manager, Management and Engineering Technologies International, Inc. (METI); Past President IAWF; and Retired USFS as former Wildland Fire Management RD&A Program Manager, Rocky Mountain Research Station.

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# Fuel, Oxygen and Heat

Angie Matos, crew boss of the Custer Gallatin Regulars crew boss, scouting line placement ahead of the all male crew. Goodwin Fire, Prescott National Forest. This issue features photos of and by Matos as part of Wildfire Magazine's reporting on the changing roles of gender and wildfire. (Right) Brainstorming notes from a workshop on workplace culture, aimed in part at building a firefighting workforce that includes women.

*By Emily Stifler Wolfe*

***In the male-dominated world of wildland fire in America, the Bureau of Land Management is working to address the gender discrimination, harassment and assault that have been endemic to the culture for over a century.***

Jenna Lyons loved fighting fire. Part of an elite hotshot crew that deployed to fires around the West, she spent two summers in her early 20s hiking into the backcountry, carrying a loaded pack and sleeping on the ground for weeks at a time. Her crewmates, all men, were good friends, and together they cut down trees, dug fire line for 13 hours straight, and worked all night setting prescribed burns.

But there was one thing she loathed. At the end of a long day, she'd walk into the fire camp cafeteria and several hundred men from other fire crews would look up from their plates, visually undressing her. The soot and dirt covering their faces contrasted the whites of their roaming eyes. "It's the most disgusting feeling I've ever had," Lyons said.

She wanted to disappear. Often the only woman in the room, Lyons knew her crewmates had her back, but still. She'd look down at her phone, or go eat alone in the crew vehicle. It happened on almost every big fire.

The male-dominated world of wildland fire in America grew out of a culture laid down more than a century ago. Back then, civilian men were pulled from

saloons and brothels to fight the Great Fire of 1910, which burned 3 million acres in the Northwest. Today, stories like Jenna Lyons' are familiar to the few women who work in the field, and because firefighters work together across organizational boundaries, these experiences aren't confined to a particular government agency.

In March 2018, PBS NewsHour ran a two-part story about gender discrimination, sexual harassment and assault in the Forest Service's fire program, exposing a workplace in which perpetrators are rarely punished, and reporting can stifle or end a victim's career. Since then, dozens of women have told me that the policies in place to prevent these problems are not effective.

This wasn't the first time the fire services were in the hot seat. In 2016, Yosemite Chief of Fire and Aviation Kelly Martin testified before Congress about the harassment she experienced during her career, and numerous allegations of sexual misconduct came out of Grand Canyon National Park.

In response, the Bureau of Land Management's Fire and Aviation leaders created a task force focused on diversity and employee well-being. Launched in November 2016, the Employee Centered Retention Team found that BLM suffered from the same issues as other firefighting agencies. They're now working on education and mentorship programs, and on May 1 published a long-term plan to diversify hiring and improve retention.

The BLM's efforts aren't just about gender par-



## To better fight intensifying wildfires, the Bureau of Land Management works to diversify its ranks.

ity. According to the Union of Concerned Scientists, wildfires in the West now occur nearly four times as often as they did in the 1980s, burn more than six times the land area, and last almost five times as long. Increasing diversity on fire crews is about the need to fight fire more effectively in the face of a warming climate.

“I’ve always learned that if you have the same kind of people with the same backgrounds, experiences and education, when faced with challenges, they’re most likely going to come up with some of the same solutions,” said Howard Hedrick, second in command of the BLM fire program. “If you have a more diverse group, I think you’ll come up with much better solutions.”

The conversation right now is focused on women, especially since the #MeToo movement brought the topic to the forefront. But in the long run, Hedrick said, this will also be about hiring a workforce with ethnic, racial and educational backgrounds representative of the communities they serve—and treating them well enough that they stay.

*“I couldn’t speak up.  
I have to work with these people.”*

BLM manages a 10th of the country’s landmass, or 247.3 million acres, more than any other government agency. Housed under the Department of the Interior, the agency oversees grazing, oil and gas leases, recreation, conservation and other uses. As of July 2017, it had more than 10,400 employees, and nearly 3,000 in its fire program. Of those in fire, 18 percent were women. Among firefighters, particularly the high-level hotshot and smokejumping teams, the ratio is much lower.

The agency’s 11 hotshot crews employ one to three women on a typical 20-person team, and this year there are three female smokejumpers of 140 nationwide. The six- person engine crews that comprise most fire line employees usually have one or two women, or none. Between all federal firefighting entities—the BLM, the Forest Service, the National Park Service, the Bureau of Indian Affairs, and the U.S. Fish and Wildlife Service—the number of women in permanent fire operations positions hovers around 12 percent.

Few women and minorities apply to work on the fire line in the first place, and retention is difficult for all employees. The job’s physical nature is self-selecting, plus most positions are seasonal, based in remote locations, and require long stints away and out of cell reception—all of which double as risk factors for harassment and assault.

Simply injecting women into the workforce isn’t effective. Armed forces in Canada, Norway and Australia have used the critical mass approach to gender integration, a social theory suggesting that 15 to 30 percent of a minority is necessary for that group to succeed. But fire leaders still remember the 1981 settlement to a class action lawsuit that forced the Forest Service in California to match the civilian workforce’s gender ratio, at 43 percent women. To fulfill the consent decree, as it’s still known, women were sometimes promoted over more qualified men, leading to resentment, attrition and degradation of institutional knowledge.

That resentment still lingers. “I was told three years ago during a friendly conversation with a male coworker that I was only hired because I was female,” wrote Lorena Williams in a High Country News opinion piece published in March. “Women are often seen as intruders, as tokens who were only hired to meet some kind of quota. We are treated as pariahs in our professional fields, regarded as little more than sexual-harassment cases waiting to happen.”

**For fire to occur, you need fuel, oxygen and a heat source. Diversity won’t change that, but it can change how we interact with fire.**

Even so, she wrote, firefighting culture is not inherently hostile. “For every coworker that has excluded me from the ‘boys’ club,’ 10 others have made me feel welcome and safe in a professional work environment.”

Like Williams, the women I interviewed for this story said their experiences on the fire line were generally positive. They spoke highly of male coworkers and friends, and of the work itself. But at some point, almost all commented on the gender-related conflict they put up with to succeed.

“On one side of the fence, this job is so cool,” said Lacey England, a former firefighter with the Gallatin helicopter rappel crew in Montana. “I get to go places, work really hard, be outside, work with good people. But on the other side of the fence is my daily environment. This culture I’m working with wears me down a little bit more every day. ... That’s why women leave. It’s just not worth it.”

***“This culture I’m working with wears me down a little bit more every day. ... That’s why women leave. It’s just not worth it.”***

Sixteen firefighters attended the Women and Leadership conference at Boise State University in September 2016. Afterward, they were supposed to brief fire leadership on what they learned. Instead, half of them recounted the discrimination and harassment they’d experienced on the job.

Some of them cried. Jolie Pollet, then second in command of the BLM fire program, still calls it the “gut punch session.”

“Here I was—a woman—I can’t just say, ‘Thanks for your time. Have a good year,’” Pollet said.

So, Pollet and Hedrick, head of BLM fire at the time, hired the diversity and inclusion task force. The assignment: Identify core challenges in the agency’s fire program.

With 29 years of fireline experience between them, the three women on the task force devised a plan that included the lowest ranking firefighters and went up the chain of

command. They drove to five Western states over three months in early 2017, meeting with more than 150 employees to gather information on workplace culture. Early on, at a district in Utah, they asked a group of mostly men about family-life balance and the lack of female firefighters, but the conversation stalled. So, they switched tacks. “How is it for you, having a family?” they asked. “What do you struggle with?”

“You could see the looks on their faces,” said Tiffany Fralie, a member of the task force. “We heard, ‘I don’t have a relationship with my kids,’ and, ‘I’m divorced now because I’m never home.’”

After airing their own frustrations, many men relaxed enough to discuss women on the fire line, and harassment. Female firefighters, however, rarely opened up. In one instance, a woman pulled them aside afterward. “I couldn’t speak up,” she said. “I have to work with these people.”

That May, 100 BLM leaders met in the conference room at the Red Lion Hotel in Boise, Idaho, to learn about the initiative.

They talked about how strength and toughness were often valued in hiring and promotion, above communication and emotional intelligence. They brainstormed ways to improve work-life balance for firefighters. And they discussed how those with families needed more support—especially women, who are often pushed out of the career during or after pregnancy.

After the two-day training session, reactions were mixed. “One of the comments was, ‘I thought this stuff ended in the ‘70s,’” said task force member Jamie Strelnik.

When the assignment ended soon after, that summer’s massive fire season was already ramping up. Ten million acres burned nationwide, 153 percent of the 10-year average. The team figured the project was over, but a handful of participants from the training ran with it. Some started mentorship programs at home. One male supervisor helped a female engine boss return to the work after having a baby.



## *"I thought this stuff ended in the '70s ..."*

Success will require buy-in from leaders at all levels, and those people have limited resources and competing needs—like putting out fires. Other challenges include the inherent elitism of a life-and-death job, the current political climate, and the fear of speaking out.

"You don't want to be labeled as that person," said Fralie, who experienced harassment while working on an engine crew years ago. Coworkers would ask what she thought of women in porn magazines, and made explicit comments directed at her about the size of their genitalia, but she didn't recognize it as harassment because she was so assimilated to the culture. Now the acting center manager of a fire dispatch center in New Mexico, Fralie says reporting a transgression would still be hard.

"It hurts you professionally and in your personal life, because most of the people you work with are your friends," she said. "It's not a culture where we're free to talk about things or call people out."

The two firefighters on the second BLM diversity and inclusion task force are now bucking that trend, both personally and professionally.

In February, Strelnik went public about the repeated sexual harassment and retaliation she experienced over her 17-year Forest Service firefighting career, a #MeToo moment she says was made possible by the catharsis of working on the initiative. Amos Lee, a supervisory engine module leader at BLM's Boise District, isn't ashamed to say he wants to spend time with his family instead of being gone for six to nine months each year. Many firefighters do, he says.

This time the assignment is focused on implementation. The project list includes providing family housing and childcare facilities for employees in rural areas; re-evaluating physical testing requirements; and supporting independent, state-level education and mentorship programs. One of their top recommendations is hiring a permanent diversity and inclusion employee, a position BLM fire leadership is now in the process of creating.

Because the task force is based at the National Inter-agency Fire Center in Boise, which houses all federal wildland firefighting entities, their work has the potential to influence fire culture across the board. And the Forest Service is following suit. Interim (now permanent) chief Vicki Christiansen rolled out an action plan that has included listening sessions with all 30,000 employees, establishing a support structure for victims, and chartering an employee advisory board to gather ideas and solutions for improving the work environment.

For fire to occur, you need fuel, oxygen and a heat

source. Diversity won't change that, but it can change how we interact with fire. In the dry heat of August 2001, Sara Brown flew into a small, backcountry blaze in Zion National Park with another female firefighter. As the helicopter pilot circled the landing zone, a quarter-acre fire smoldered around a single, tall ponderosa pine. On the ground, alone, they saw no flames or smoke coming from the tree. Brown's partner suggested they cut it down in case there was a fire at the top. This is how firefighters have done things for a century, and how they are trained today. But Brown, who had more experience, took a step back.

"It was a big, beautiful, living tree," she wrote later. "If it wasn't obviously burning, why cut it?"

They put out the ground fire, camped under the stars, and found not a sign of smoke in the morning. As they hiked away, Brown looked back at the plateau and saw the lone tree on the horizon. She knew they'd made the right choice.

Now a Ph.D. fire ecologist studying the intersection of social pressures and fire science, Brown says we have built ourselves into a dangerous, expensive, ecologically unsound realm, in terms of fuels and our perceived control of fire. "We are quickly realizing that we probably never had control, and we certainly aren't going to have control in the future."

Brown says the change that's needed—allowing more fires to burn, and increasing use of prescribed fire—will require altering the political landscape and public perception, as well as a major perspective shift for fire managers.

"Hopefully that shift in the relationship to fire will allow a more diverse view to truly be at the table," she said. "I think women have a strong role in making that shift."



Members of the Prescribed Fire Training Center's "Women in Fireline Leadership" receive an operational briefing before heading out to the lines for ignition and monitoring. (Prior Page) Angie Matos and Nicole Castillon continue igniting on a PFTC prescribed fire in Florida.

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Freelance writer **EMILY STIFLER WOLFE** was the founding editor of Mountain Outlaw magazine, where this article was originally published. Reporting for this story was also supported by the Solutions Journalism Network.



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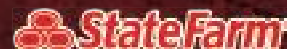
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Aidan Ostrowski (center, above, and on right) wrangles hose on the Soberanes Fire in central California in the summer of 2016, considered at that time one of the most destructive and expensive fires in US history. Photos are excerpts from the film, "Wildland." Photos by Kahlil Hudson.

### An essay-review by Amanda Rau

Films about wildland fire are uncommon, often tending toward the sensational. Documentary films about wildland fire are even more rare, and typically do not provide more than a view from a distance. Direct experience holds the greatest potential to accurately represent this profession, both the hands-on details as well as its transformative effects on people. As the filmmakers Alex Jablonski and Kahlil Hudson discovered, completing basic training and fitness testing to become wildland firefighters in order to fully embed with a Gray-back Forestry initial attack hand crew, provided the best way to capture the intimacy between young men and fire.

It is not uncommon for a film about wildland fire to feature few if any women. It is none the less bold to give a film set within the last few years a name to remove all doubt. I contacted Alex Jablonski to express my dismay about the working title of the initial trailer release, "Young Men and Fire," named after Norman Maclean's seminal 1993 novel about the tragedy on the 1949 Mann Gulch Fire.

He explained the intent in making a film intentionally focused on masculinity in modern America, inspired by

a book set in the 1940's, one that still remains relevant today. I contacted John Maclean, Norman's son, to inquire about whether he was aware of the film, which he was not, and he proceeded to contact the filmmakers and post to Facebook about it, thereby generating a fair amount of backlash in response. John eventually took the post down after deciding that he did not want to force the issue, realizing that the filmmakers were humbled by the large response and were willing to consider changing the title.

By the time "Wildland" first aired on the PBS series Independent Lens, I had laid aside my grievances. A film intentionally focusing on masculinity with a nod to a book that explored in earnest the deeper underpinnings of fire's draw had to be worth watching. What began as a film intending to explore fire and masculinity with a close-up lens ultimately succeeded at transcending gender with human experience.

In my early twenties, deep in my head and contemplating the nature of existence as a Philosophy undergraduate at the University of Oregon, I decided to complete the training and fitness requirements to

# “Wildland”

## A documentary film about young men and fire.

*ABOUT THE FILM: “WILDLAND” takes viewers inside the lives and experiences of a group of men who battle wildfires. The television version of the documentary debuted nationally on PBS’ Independent Lens on October 29th which launched a grassroots theatrical on-demand campaign for the release of the 77-minute director’s cut of the film, set to begin exhibition in movie theaters January 16, 2019. Film-makers Alex Jablonski and Kahlil Hudson’s cinematic version, shot using 6K cameras, includes nearly 30 minutes of additional footage.*



become qualified as a wildland firefighter so I could work for a private contracting company on a hand crew. Among my female friends were a few who fought wildfires during the summer and returned with strong biceps and confidence evidenced in their swagger and the boots they continued to wear well after getting back.

I am still beholden to the memory of that that first encounter with a burned forest near Sisters, Oregon

in 1999, spending hours mopping up in wonder of the transformation before me, and within. It was like Philosophy in action. Little did I know at the time that the seasonal work I relished, a welcome respite from academia, would become a lifelong endeavor, including well over a decade of federal service, culturally and socially distinguished from the contract firefighters who are the subject of “Wildland”, yet ultimately the same. Once any



Crew Boss Tim Brewer during a hike out on a fire in California.

firefighter is engaged in the work, whether mopping up, conducting a burnout, or digging direct hand line, the distinctions between agencies and affiliations fall away.

Lacking the motivation of a criminal record, or desire to prove myself as a man to work in wildland fire — yet inspired by my friends and the desire to work outside and earn money to get through school — I too had countless experiences similar to those explored in “Wildland.” Exposing the side of wildland firefighting that enables a transcendence of culture and society, be it a rejection of status as a millennial or rising above a life of crime, the film demonstrates the transformative aspects of wildland fire and the subtle side of firefighting not often explored. The beauty of light passing through smoke filtered by the charred remnants of forest canopy at the golden hour, slow time passing on a cold black piece of steep ground, doing things you did not know you were capable of, the hustle of hotline, feeling exceptionally alive, waiting between fire assignments for that fire call, saying goodbye to people, pets, and places as you love for what may be several weeks or more, making tough decisions about risk and putting the fire out, making sure everyone goes home, discovering a part of yourself you did not know existed. In short, the film bears witness to the seemingly ineffable experiences of doing work that thousands of people experience in their own way every summer.

“Wildland” explores the wildland fire environment through the eyes of firefighters with grace, from the monotony of mop-up, to the intensity of direct attack. They range from young men looking for a chance to test their grit, to those looking for a second chance to live life on the right side of the edge. The filmmakers spent a summer working alongside the crew and filming, hanging out at the base, becoming one of them, thereby providing a uniquely intimate portrait, captured through honest stories and interviews of men with a common goal despite disparate backgrounds, working hard to overcome internal and external struggles at once. Cameo characters include Aidan and Charlie, who met at bible school and are united in a desire to overcome the malaise of their generation in favor of experience shepherded by Ray Bradbury’s “Dandelion Wine.” The film explores the simultaneously ecstatic and imperfect experiences of life. We meet a former tattoo artist who knew he would soon be too old for this kind of work and had always wanted to do it, young men already caught in the downward spiral of the legal system trying in earnest to catch a break and find a way out, and older men like Crew Boss Tim Brewer leading and mentoring, having found their own redemption through a journey in wildland firefighting.

“Wildland’s” presentation of working class men as a lens through which to view masculinity in America is as tran-



WILDLAND IS A SPIRITUAL JOURNEY...  
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- SIERRA

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scendent as the element of fire in transforming these men into better people. The story of young women, as much as any marginalized group, finding their way in the world through work that transforms people alongside the landscape, could as easily be told, and hopefully will someday.

It would be an oversimplification to focus on the fact that this film portrays a certain kind of firefighter, akin to the men who were picked up off the streets and from the bar back in the early days to perform work that most were unwilling or unavailable to do, rather than those coming from federal, state, county, and municipal governments who make up the majority of the wildland firefighting workforce today. Firefighters are indeed a proud group, and would generally prefer to be portrayed as heroes, stewards, and professionals, before being cast as humans with troubles finding redemption in hard, dirty, dangerous manual labor. Yet as Ed Floate — the seasoned former smokejumper working for Grayback tasked with turning a motley crew of men into a fire crew capable of keeping up with the tough act of their peers in

the public sector — so plaintively states, "Fighting fire is just long hours of hard, boring work punctuated by moments of sheer terror." "Wildland" respects the element while illuminating the humbleness of the work itself.

The film ends abruptly and with an awkward transition, ultimately mirroring the way in which the life of a firefighter swings from being away from home, sleeping on the ground, living presently and in the moment with rules of engagement at times being the only unchanging aspect in the midst of uncertainty, and working long hours in a challenging environment with an awe-inspiring element, to suddenly being back in civilization.

"Wildland" does not try to glorify wildland firefighting, explore its tragedies, or critique, formulaic clichés all too commonly used to describe the element and the work. It offers a raw yet softened view, amplifying humanism over heroics, and vulnerability over ego, gently approaching harsh, difficult, and dangerous work to attune to the moments and reflections of men as they and the landscapes where they find themselves working change together.



Grayback 7A hikes out at the end of a long shift.

**Amanda (Stamper) Rau** started her career in fire management as a member of a 20-person handcrew in 1999. In 2001, after finishing her BA in Philosophy at the University of Oregon, she returned to fire management, working on hotshot crews, handcrews, and engines; as a fuels technician on the Deschutes National Forest; and assistant fire management officer in fuels management on the Ochoco National Forest and Crooked River National Grassland.

She studied Natural Resources at Oregon State University and completed a Masters in Natural Resources, Fire Ecology, and Management at the University of Idaho in 2012. She has since worked for the Prineville Bureau of Land Management as a natural resource specialist coordinating post-fire emergency stabilization and rehabilitation; as invasives program manager for the Deschutes and Ochoco National Forests and Crooked River National Grassland; and fire management officer for The Nature Conservancy's Oregon Chapter. She's a fourth-generation Oregonian whose family settled in the Willamette Valley in the late 1800's.

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# “Wildland” filmmakers designate on-demand screening as fundraisers to help those suffering from California wildfires

**WHAT:** The new feature documentary “Wildland” takes an in-depth look at the vigorous training and work of wildland firefighters. The film is based on prior fire seasons, though the men profiled in the film were assigned to the 2018 fires in California. Produced by Finback Films, directed by Alex Jablonski and Kahlil Hudson (both certified wildland firefighters themselves), the film is being released by FilmRise as a Gathr “On Demand” theatrical distributed film. This technology allows anyone to present the film at a movie theater locally, at a time and place of their choosing, and at no cost by simply using social media and personal connections to sell a pre-determined number of tickets. Ticket buyers make tax deductible charitable donations during the online ticketing process at check-out. The film and platform provide an opportunity for audiences anywhere in the country to come together and help raise much needed monies to assist wildfire fighters, their families, and those who have been tragically impacted by the devastation of these fires by bringing people together in local movie theaters. The filmmakers of “Wildland” will also be donating a portion of their proceeds from sales to help firefighters.

**WHERE:** Anyone in the United States wishing to help in this unique way can visit [www.wildlandfilm.com](http://www.wildlandfilm.com), where they can find an existing screening and purchase a ticket or to sign up to become a “Wildland” “movie captain” at a theater in their area. All screenings will promote and benefit four charities including: The Wildland Firefighters Foundation, The American Red Cross, California Community Foundation Wildfire Relief Fund and the California Fire Foundation. In addition, anyone presenting a screening of “Wildland” can also make their screening a personal fundraising event for a charity, individual, or organization of their choosing.

**WHEN:** “Wildland” will be released in theaters starting in January, however the charitable donations begin immediately as tickets are reserved in advance and are on sale now for futures screening dates. Donations will be distributed directly to the selected charities immediately following each screening from anyone pre-ordering tickets via the Gathr ticketing website. Details on how to host a local screening and FAQs can be found on the film’s official website: [www.wildlandfilm.com](http://www.wildlandfilm.com).

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# Health Effects of Wildfire Smoke

## *Tools you can use*

*Where there's fire there's smoke, and in the past years, smoke and smoke management has grown into a key issue for fire managers and the public. This smoke primer by a leading CDC health communicator can help clear the smoky air. The online version has links to references.*

**By Scott Damon**

A nearing wildfire can be a terrifying situation for a number of reasons. People worry about not being able to evacuate in time. They worry about losing their homes, land, and possessions. And even if their home is not directly in the wildfire's path, they and their loved ones can be exposed to dangerous smoke.

The Center for Disease Control (CDC), Environmental Protection Agency (EPA) and other government agencies are working to help educate people on how to stay safe from wildfire smoke, and have developed a number of tools for communities, medical providers, and firefighters.

Some key terms, actions to take, and information guides to consider include the following.

### PARTICULATE MATTER

Wildfire smoke contains a variety of air pollutants that can have an effect ranging from mere annoyance to severe health consequences. Wildfires expose people to the by-products of burning vegetation, such as trees and grasses, and when wildfires impact communities, emissions from burning structures and furnishings, such as plastics, can release a variety of air toxics and chemicals into the air.

Short-term exposures to particulate matter (PM), also known as particle pollution, are the main public health threat from wildfire smoke. These fine particles are respiratory irritants, and exposures to high concentrations can cause persistent cough, phlegm, wheezing, and difficulty breathing. Exposures to fine particles can also affect otherwise healthy people, causing respiratory symptoms, short-term reductions in lung function, and pulmonary inflammation.

### PM HEALTH EFFECTS

Immediate effects can include:

- Coughing and trouble breathing
- Stinging eyes
- Scratchy throat
- Runny nose
- Irritated sinuses

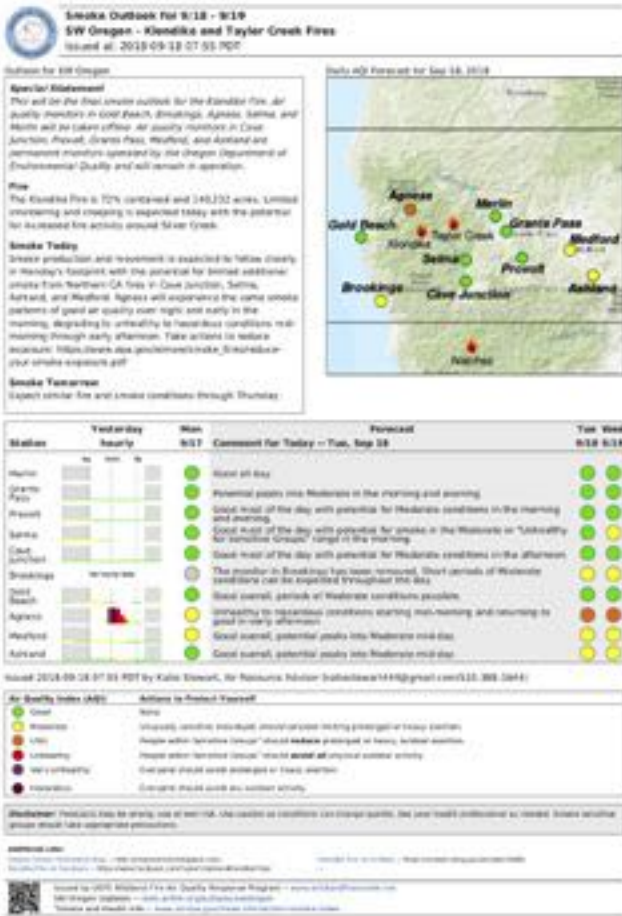
More serious outcomes can include:

- reduced lung function,
- bronchitis,
- exacerbation of asthma and heart disease, including heart attacks, heart failure, and abnormal heart rhythms, and
- premature death.

Short-term exposures (i.e., days to weeks) are also linked with increased premature death and aggravation of pre-existing respiratory and cardiovascular disease. The effects of exposure can be worse for people with asthma, chronic obstructive pulmonary disease (COPD), other respiratory conditions, or cardiovascular disease (CVD) as well as pregnant women, children and older adults. Someone with asthma or COPD can suffer a respiratory attack that results in a trip to the ED. For someone with CVD, excessive smoke inhalation can increase the risk of heart attack.

### TAKING ACTION TO REDUCE EXPOSURE

Providing information to at-risk populations may increase their willingness to take action to reduce exposure and risk. To be effective, this information must be consistent among agencies. That's why CDC, EPA, and several other federal and state agencies have teamed up to develop and update an array of tools for clinicians, public health officials, firefighters, and the



An example of a Smoke Outlook. In this case it's the closing report for the smoky 2018 fire season in southwest Oregon, with smoke levels showing some yellow and red but mostly dropping toward green.

cluding current and forecasted air quality levels, is on the interagency AirNow website ([www.airnow.gov](http://www.airnow.gov)). Information about the status of current fires is on the Fires: Current Conditions web site ([https://airnow.gov/index.cfm?action=topics.smoke\\_wildfires](https://airnow.gov/index.cfm?action=topics.smoke_wildfires)). In addition, EnviroFlash, a free service offered by state or local environmental agencies in partnership with the EPA, provides daily e-mail forecasts or real-time updates based on the location and AQI level that the user selects.

### WILDFIRE GUIDE AND FACT SHEETS

Wildfire Smoke: A Guide for Public Health Officials, more often called simply the "Wildfire Guide," was first developed in 2001 and later revised and updated, in 2008, by the California Department of Public Health, along with other state and federal agencies. It was updated again in 2016 to reflect a much stronger fire-related evidence base through a collaborative effort of many partners, including EPA; CDC; the US Forest Service; the National Park Service; Lawrence Berkeley National Laboratories; the Pediatric Environmental Health Specialty Units network; and the California Department of Public Health, Air Resources Board, and Office of Environmental Health Hazard Assessment. The Guide helps local public health officials prepare for smoke events, take measures to protect the public when smoke is present, and communicate with the public about wildfire smoke and health. The Guide includes information on the composition and characteristics of wildfire smoke and the health effects of smoke exposure, including which populations are most vulnerable to those effects, specific strategies to reduce smoke exposure such as communicating about PM levels and other public health actions, and advice on unified public health response to a wildfire smoke event. In

addition, the Guide features several short fact sheets for the public, covering topics including preparing for fire season, reducing exposure, protecting children, indoor air filtration, respirator use, and protecting yourself from ash.

### PM WEB COURSE FOR HEALTH PROFESSIONALS

Evidence has shown that the public is much more likely to take action to reduce air pollution exposure if informed about the risk from a health professional. This is why EPA and CDC developed a web course for health professionals, "Particle Pollution and Your Patients' Health," that offers continuing education credits for doctors, nurse and health educators. This course provides the most up-to-date information

public to help protect not only the most vulnerable populations, but anyone who might be at risk of wildfire smoke exposure.

These tools all utilize the Air Quality Index (AQI). The AQI is EPA's nationally uniform index of both real-time and forecasted air quality for specific regions. Simply put, the AQI is a yardstick that runs from 0 to 500. The higher the AQI value, the greater the level of air pollution and the greater the health concern. The AQI focuses on health effects different individuals, depending on their risk factors (e.g., asthma, COPD, age), may experience within a few hours or days after breathing polluted air.

For example, an AQI value of 50 represents good air quality with little potential to affect public health, while an AQI value over 300 represents hazardous air quality. AQI values below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is considered to be unhealthy—at first for the most vulnerable groups, then for everyone as AQI values get higher. Information about the AQI, in-

## Wildfire Smoke

A Guide for Public Health Officials  
 Revised May 2016



about the health effects of PM, the most important pollutant in wildfire smoke for the relatively short-term exposures (hours to weeks) often experienced by the public.

The web course provides a general overview of the mechanisms underlying the effects of particle pollution on the heart and lungs, its clinical effects, and actions that healthcare professionals can take to encourage at-risk patients to lower their exposure and risk. It further describes the biological mechanisms responsible for the cardiovascular and respiratory health effects associated with exposure to PM, and provides educational tools to help patients understand how PM exposure can affect their health. It also shows how providers can help patients learn to use the AQI to protect their health. While the course focuses on all types of PM exposures, exposure scenarios, and health effects, it is especially useful for dealing with smoke events, including a section on high PM events, such as wildfires, and steps individuals can take to reduce smoke exposure during such events.

The PM web course is designed primarily to assist healthcare professionals in protecting the health of their patients at highest risk from the adverse effects of wildfire smoke. It can also be used by state, local, or tribal organizations to help design smoke management programs, implement basic smoke management practices and develop required or voluntary mitigation and/or emergency response and contingency plans. Tools included in the course can be downloaded without taking the course and include pieces covering how smoke from fires affects health and even tips on reducing emissions from wood-burning appliances.

## CDC INFORMATION

In addition to these, CDC features a wealth of informa-

tion on wildfire smoke and health on its web pages. CDC provides information for members of the public at risk of wildfire



smoke exposure, tips for pregnant women and parents of young infants, and other advice focusing on air quality and health.

**About the Author:** Scott Damon is the Health Communication Lead for the Asthma and Community Health Branch at the Centers for Disease Control and Prevention (CDC). In this role, he develops and oversees CDC's communication on asthma and respiratory health issues, including biomass burning, air pollution, and indoor air quality issues like carbon monoxide and mold.

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**Leadership and commitment – “Making the best of what you have!”**

*By Mikel Robinson*

The International Association of Wildland Fire is proud to represent the field of wildland fire management and have such an outstanding membership made up of passionate, committed, progressive, and enthusiastic individuals. We are always seeking to recognize members and individuals making a difference with significant contributions in today's environment and for the future in the field of wildland fire management.

We feel very fortunate in this month's Wildfire issue to be able to provide dual recognition to an individual as an IAWF award recipient and a Fired Up honoree. Dr. Sara Brown is our 2017 recipient of the IAWF Early Career Award in Fire Operations and also our Fired Up Honoree for January, 2019. Sara is the Acting Director for the US Forest Service's Human Performance and Innovation Organizational Learning Research, Development and Application (RD&A) Program of the Rocky Mountain Research Station. She is stationed in Bend, Oregon USA. Wildfire Magazine was able to speak with Sara following the 2017 IAWF Awards Presentation Ceremony in Boise, ID. She has graciously consented to allow us to combine that interview and the Fired Up writeup into a single article to share with all IAWF members in Wildfire.

**Wildfire:** Sara thank you for granting us this time to talk with you. What we want to accomplish is to provide an interview with you as an IAWF award recipient as well as present IAWF members a synopsis of where your career has taken you and contributions you have made and are making to advancing wildfire activities in all areas. Why don't you tell us your title, and your home location and your position and your organization you work for?

**Sara:** All right. Well my title just switched. I previously, when I got the award, I was Deputy director of two research development application units in the Rocky Mountain Research Stations of the Forest Service and I have just been, what you consider it to be upgraded to acting director. Replacing my former supervisor, who is retired. So, I guess as of today, I am the Acting Director of the two Research, Development & Application (RD&A) Human Performance and Innovation organizational learning program units for the USFS Rocky Mountain Research Station.

**W:** Congratulations on that! Your career to date has exposed you to pretty much all aspects of fire management. Can you tell us about your career and what attracted you to get into this field.

**S:** Yeah that's a good question. I started out as a high-school student on a youth Conservation Corps in Oregon where I had the opportunity for a three-month summer period to be on a trail crew. I found that I really loved the outdoor aspect and I loved the crew aspect of being with good people. So, the following summer I



applied for a job with a local fire crew, thinking that would be an enjoyable way for me to spend the summer but also would allow me to pay for college expenses. I started with a Type 2 crew on the Willamette National Forest and worked for four seasons on my way up to being a squad boss. During that time, I graduated from college, received a Bachelor of Science and environmental science degree. I decided that I was having just too much fun with fire to quit, so I took a job with the Zion Helitack Crew based out of Zion National Park. There I met two smokejumpers who I really connected well with and they convinced me that I should try out to be a smokejumper.

The following year I applied and was accepted at the Boise smokejumper base. I attempted rookie training but I failed, washing out my first year. Instead, I spent that season on a Hotshot crew, which was a disappointing turn of events at the beginning of the season, but I realized I needed another season of fire before trying rookie training again, which I did the following year. I was able to complete my training at the Redmond Smokejumper base in Oregon where I spent one season.

After a long, fun season I got an offer to transfer up to West Yellowstone, where I continued smoke jumping for the next four seasons. During that time, I realized that I really wanted to continue along the educational path that I started, so I pursued a Master of Science Degree focused on fire ecology at Washington State University during 2005 and 2006. I sort of stalled out on my thesis and was getting

frustrated with some issues that had been going on, so I decided to apply for a PhD that would allow me to finish my Master's Degree and then continue working toward a doctorate. I applied for a program in ecology through Colorado State and found a wonderful advisor, who was willing to take me on right before the start of the 2007 fire season. I went back to smoke jump at West Yellowstone thinking that would be one of my last seasons for a while because I would commit to doing research in the summer.

Unfortunately, in 2007 I had a fairly serious, mid-air-collision parachute accident that was an operational career-ender for me. I broke both of my legs and my right wrist. After many surgeries, I ended up with an amputated right leg below the knee. I am now thankful for making the decision to amputate, because it has allowed me to again run and hike and bike and do many of the things that that I've always loved to. I remember calling my advisor from the hospital to explain that I would probably not be able to start my PhD with her in the fall, that I had been in a terrible accident.

She convinced me otherwise. She said, "nope, unfortunately you've committed your time to being my teaching assistant and you are going to do that. I will do whatever it takes to get you to where you need to go." I said, "I don't think you understand, I'm in a wheelchair with two broken legs that have to be elevated and I'm right-handed and I broke my right wrist." "Well," she said, "we'll figure it out," and she

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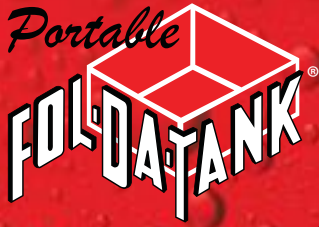
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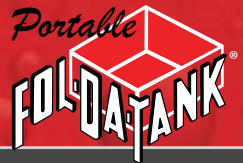
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came to my house and figured out how to wheel me around in a wheelchair and get me around from class to class.

Her name was Indy Burke. A fantastic advisor throughout my PhD program. She took a job at the University of Wyoming my second year. I followed her to Laramie, where I graduated with my PhD in ecology with a specialty in pyroecology in 2011. As many PhD students are convinced, I took the traditional academic route and applied for two things at once. As I was graduating, Indy suggested that I start applying to academic jobs to get experience applying because it's a really competitive field, and at the same time, I applied for a postdoc position at Michigan State University. It was focused on how to teach science and would allow me to learn how to teach. I was offered a job at New Mexico Highlands University, teaching in their newly-created fire science program. I had also been accepted into the post doc position, so I had a tough decision to make: did I want to give up my postdoc and just teach? Did I want to give up my teaching to do the postdoc? I talked with both groups and decided to take on both at the same time because it was a good pairing.

While I was teaching at the University, I could use the skills I would gain at my postdoc. I wore two hats for a couple of years, which allowed me to learn a lot about teaching in an actual teaching environment, which was a pretty amazing. I spent four years at Highlands, working and teaching in the fire science program. I had both undergraduate and graduate students that I conducted research with. I took one of my students to present at a conference in Boise and I ran into some old firefighting colleagues who I really connected with.

One of them, Matt Carroll, said that I really had to talk to his supervisor, that he was starting up a new, interesting group. I figured I had better talk with this guy. Thinking at the very least, maybe we could collaborate through my teaching job.

Ivan Pupilidy and I had a great lunch together, and pretty soon I was thinking less about staying at Highlands, and more about joining Ivan's group in the Forest Service, because it had aligned almost all my previous experiences, and all the things I really cared about. Ivan was starting a research, development and application unit that was focused on applying research to understanding and preventing accidents in the Forest Service. Since I had experience with a serious accident, I started thinking about how that affected me personally, and how it affected the program at large. I thought what a cool way to apply research, which I have been doing for the past eight years. I did a lot of thinking about fire ecology and how we could potentially protect and improve the safety of firefighters. It just felt like the right thing to do to switch from teaching at Highlands, to coming back to the Forest Service to work in a group that was thinking about research in this way. I joined Ivan's group in August of 2015 and I have been there ever since. Ivan and I sort of co-led/co-managed two groups for the past year-and-a-half or so before he retired. Our group has been doing a whole bunch of cool, theoretically innovative work for the Forest Service.

**W:** So now you've been operationally on the ground. You've been in research and academia. And now you're in research development and application and have a



direct impact on operations. Is there one position that you have enjoyed the most; I don't want to pin you down about your favorite position, because maybe every position just gets better than the last.

**S:** That's an interesting question that's hard to answer. I'd think I would say all my positions have been great and enjoyable. Each of them at the time may have been my favorite position for one reason or another. I really loved fighting fire at the operational level. It is physically challenging, it is mentally challenging, it is filled with lots of good people. You get to see lots of beautiful and remote places. I really loved that part of almost all my operational fire career. On the academic side, the teaching at Highlands - the students were amazing. I really miss teaching students who are excited about new concepts and ideas. The job I have now, offers the opportunity to make big change in the Forest Service. Or at least we have led ourselves to believe that we have the ability to effect change in the Forest Service - to help the agency and employees shift toward a safer direction and do that in a really thoughtful, purposeful way.

**W:** You are definitely in the right field at the right time, and you've been in it long enough to see issues develop and come and go and more. You have faced challenges. Professionally what do you think are the

biggest challenges you have faced in your career?

**S:** I think there has been one primary challenge and I really see it clearly now. That is the relationship that we have as humans in the United States with fire. Throughout my operational career, I never felt good about the fact that we were tasked with putting out every fire. There was an underlying discomfort even though I did the job and I followed through with what my mission was, which was to suppress fires. There were so many opportunities I can think back on during my operational days where I wish I had been in a position to say, "No I think we should just let this one burn." I think we would have seen great ecological benefits. This has carried over in my academic world both in school, learning about fire ecology and teaching fire ecology, and in fire management.

Thinking about our relationship with fire and the fears that lots of people have around fire and the desire to control what I believe...what I understand is an uncontrollable natural force, but it is necessary for life and diversity is quite a conundrum. So throughout my school and my academic career that challenge was what I thought about almost daily as I went about teaching courses to students who would probably become managers of landscape that are adapted to fire. Now in my current job, I see many accidents that we



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would all like to prevent in the future. And almost always, when I look deep in my heart, I know that the accident ultimately could have been prevented had we had had a different relationship with fire. If only we could start managing fire differently. I think throughout my entire career that has been the central theme, the central challenge.

**W:** Thank you for that compelling response. Do you have any particular accomplishment that you feel has been your most rewarding one or one that you are most proud of?

**S:** Boy I don't really know? It was a big accomplishment for me to pass rookie training and become a smoke jumper. Although it is a bit bittersweet given my accident in that field, I think I am in a place now that I can look back and say that was an accomplishment that I worked really hard physically and mentally to be able to make it through and join that group of people. I would actually say that is my biggest accomplishment.

**W:** Your nominations for the early career award said that you received the national smoke jumper courage award. Could you tell us a little bit about that?

Sara: Yes, that was actually a big surprise to me. It was really neat because it was presented to me by a local smoke jumper that I didn't even know that lived in Laramie. It's sort of funny, everywhere I go, there seems to be a smoke jumper that has been a part of the community over the years. To be presented this award by a local smoke jumper and get to know him and talk about what smoke jumping was like for him in front of everybody was pretty cool. But as I understand it, I was selected for the award because I had been smoke jumping for five seasons and then had the accident. I had some challenges, obviously, associated with that, but was able to sort of make lemonade out of lemons, I guess, which is sort of the smoke jumper way. (e.g. given an active fire assignment, the way to get through it is to put on a happy face, look for the positive, put your head down and get the job done). This motto is sort of what I applied to my life and my accident. You make the best of what you have. I think the group, for whatever reason, decided to recognize that, which is kind of appropriate since I got a lot of that determination from being a smokejumper. It was a pretty cool acknowledgment.

**W:** What year did you get the award?

**S:** I believe 2009.

**W:** Congratulations on that! And of course, congratulations on the early career award in fire operations. Your work that you are doing is changing the face of wildland management and trying to prevent accidents. Trying to learn from that, promoting innovation and advancing learning, are all key to the operational part of management. Wildfire: Do you think with the challenges facing wildland fire today and, in the future, that there are additional skills and knowledge that our people better need to be prepared for success?

**S:** Yes, our group has talked about this a lot. This is one of our major, major tasks to think about. There are no easy or simple answers. But where our group has landed is that there's a lot to be learned in the social science arena. Understanding people, understanding the complexity around people, understanding the qualitative world. This is not what my classical ecology background trained me in, but what I have come to realize is sort of that intersection between understanding things like climate change, ecology, and some of the hard sciences, coupled with that human side. So really, it's the human dimension of fire. I don't think we have fully explored as an agency, or as a country, or as a fire community, all of the benefits that exist around the social aspect a fire. The connection and networking between people. The interaction between us and the environment. And as an example, I think we're really good as a fire fighting organization, we can train firefighters and apply the same old tactics. We know what used to work under certain conditions. And we're really good at applying those tactics. But what we haven't really been very good at is changing along with the environmental changes and the social changes. We need to figure out a way to combine social sciences and an understanding of complexity with the understanding of the environment, the entire social and physical and political environment and keep our tactics and our strategy in that dynamic mode. I think there are gains to be made there.

**W:** Very good. Do you have any quotes or sayings that you think about or rely on your daily duties? And if you don't we don't have to worry about it.

**S:** I guess I don't really have any quotes or sayings. One that we have been joking a little bit about, but also kind of not joking about it, is the definition of insanity -- [that] doing the same thing over and over and hoping for different results is the definition of insanity. I think we've done a lot of that and with good intentions. But it's time that we do something different, with a different, better result.

**W:** Okay. Do you have anyone you would view as a great inspiration to help you get to where you are today?

**S:** Oh man. I have tons and tons of those people. I can't think of just one in every single position that I have had, which has been a lot positions. It seems like I have had sort of one or two mentors, a combination of both men and women. One that stands out that has affected me across my academic and social professional life has been my graduate advisor Indy Burke. But, it seems in every position I have had someone to mentor me. Like recently, Ivan Pupulidy, my supervisor. He is a mentor that I am sad to see retire. But I am also happy that he is retired - for his sake. He will be doing great things in the next chapter of his life So, every position I seem to find that person. I am very fortunate.

**W:** Very good. Do you have any advice to offer to anyone aspiring to move into the wildland management

field and any advice to help them be successful?

Sara: Boy. I'm not sure I have advice. I think to be in this field, you really have to have a passion for the field. I think that passion can develop once you're in the field. I know people who go into fire and find that they really love the job and love the people. I love the diversity of types of jobs one can have in the field. I would say that sticking with the topic of fire has been really good for me to be able to have one theme that sort of runs through my career. I've taken very different approaches to that one theme throughout my career which has kept it interesting and I feel like I've always been growing. Continuously challenging yourself, might be the best advice that I can give. If you find that you have a passion for fire, find ways to continuously grow within that field. I think if you are growing yourself, you can't help but be providing the field where it kind of fits along with your personal growth. Sort of a selfish, yet hopefully also non-selfish way to give advice there.

**W:** So back to the Fired-Up initiative. What we do with this section in Wildfire Magazine is to recognize individuals or groups for the contributions they are making. You have already provided us with highlights of your career, but we would like to hear more about you and your unit are doing. Can you tell us a little more about what the RD&A does? What is your mission is how and many people work there? What your impact is on fire reviews and learning center, training courses and things like that.

**S:** Yes. You caught us at an interesting time period during the transition from Ivan retiring to whatever the future holds. We have come up with a new structure, a proposed new structure for our RD&As. We think it's going to be successful, but with that being said it hasn't gone through all the hoops to get 100% signed off yet. So, I hesitate to put it out there but, I think I'll be bold and go ahead and share it and hope it will be reality. We used to have two RD&As in this area. They were separately funded, but had overlapping missions or goals.

One is called Innovation and Organizational learning, IOL is the acronym. That group has been tasked with managing the Forest Services' coordinated response protocol and learning review, which is a long-winded name for what we would think of as traditional accident investigation. So, if there is a fatal or serious accident, our group helps put a team together and we will go and conduct a Coordinated Response Protocol. The overall idea is to coordinate so that the folks that have gone through a traumatic experience are only interviewed as few times as possible. We try to coordinate with law enforcement. We try to coordinate with the peer support system and we try to coordinate with the learning review team that is tasked with interviewing folks to understand and learn from what happened. One of the powerful pieces of the learning review is that the

employees that just went through the traumatic, negative outcome will not be punished in any way by sharing what happened. You have to a punishment-free environment for people to want to tell you the real story. And for the agency to be able to learn from mishaps and accidents even when terrible, terrible outcomes have happened. This side of our group puts on an annual, week-long training to train individuals who are interested in participating on the team.

On the other side of the house is the Human Performance group. This group specializes in wellness, wholeness of employees, work-life balance. They manage programs that help teach employees how to be resilient. Our Human Performance Group trains champions in this wellness program so they can bring the message back to their local units. This group is also involved with new employee orientation and exploring all kinds of ways to create resilience in our workforce. We have learned over the past two and a half years that it has been really hard to do the third task. We have been tasked with shifting the culture of the Forest service toward a more learning-oriented agency. To create a learning organization out of the Forest Service---which is a challenging task. It is a big agency, and it is spread across a continent. This goal requires that we are doing big, long-term sorts of projects. So, what we proposed to do is to set up a third unit, a third group of people within our unit, that looks at that learning organization level work. This third group had been working on what we are calling call the meta-review, where we have looked over the last 10 years in terms of accidents and incidents that happen in fire and we are looking for similarities and differences.

We are now trying to understand the conditions in which these accidents occur in the hope of learning, at a big agency-wide level, ways that we can approve and review the likelihood of future accidents and incidents. So, the third group will be focused on the long-term big learning project like the meta-review. As far as people go, we are a fairly small group right now. We have big plans to hopefully grow in the future. Right now the Coordinated Response Protocol and learning review part of the house has two dedicated folks. The human performance side of the house, right now is two folks, maybe I should retract that, and we'll say four folks with the hopes of growing. We are hoping that the new group, the long-term learning organization group will have three or four folks that will be working on this program of work. So that's our proposed structure and how we hope to work moving forward. We meet regularly, we are talking about how each other's work impacts the various groups and how we can interact and network and work together, because we're all very much linked.

*To learn more about our Fired Up initiative and to nominate a Fired Up honoree, visit <https://www.iawfonline.org/fired-up/>.*



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