



# FIRE SCIENCE

## DIGEST

*Research Supporting  
Sound Decisions*

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## Telling Fire's Story through Narrative and Art

*"The simplest way to describe fire worldwide is that there is too much of the wrong kind, too little of the right kind, and too much overall."*

- Historian Stephen J. Pyne

Modern works by highly skilled narrative authors and artists have become increasingly useful for telling the story of wildland fire in the United States. Using unconventional means—and with partial funding by the Joint Fire Science Program—creative individuals have spawned some colorful and heartfelt messages that convey insightful information about wildland fire, climate, and other elements of nature to an increasingly receptive public. Recent narrative works by well-known authors, such as Stephen J. Pyne, and creative art pieces by well-established and emerging artists have helped depict fire in a new light to audiences that scientists may rarely reach. This issue of Fire Science Digest describes recent books funded by the Joint Fire Science Program and other sources that focus on fire's ecological role in various regions of the U.S. and on associated fire management issues and events. For instance, Stephen Pyne has not only written an insightful overview of contemporary fire history between 1960 and 2013, but he has also interpreted what that history has meant for the evolution of federal agencies and fire management during that time. In addition, Pyne has produced an anthology of books describing regional fire histories, such as in the Southwest, Northern Rockies, California, Florida, and other regions, that add "local color" to the overall narrative of contemporary fire history. In addition, fire-centric art projects in Alaska, Arizona, and elsewhere have helped tell fire's story in America. Such efforts often were guided by regional fire scientists and educators to enlighten and promote a more fire-adapted society.





Jim Barker

"Spruce Fire," a fabric art piece by fiber artist Ree Nancarrow, exhibited during 2012 as part of the Joint Fire Science Program-sponsored project titled "In a Time of Change: The Art of Fire."

The story of wildland fire in the U.S. is a long and complex one that can be told from many perspectives. Much of the knowledge to date has come from scientific research—which often involves sophisticated technology such as computational modeling and satellite-based mapping, rigorous experimentation, tree ring investigations, and so on. But fire's story

can also be told using nonscientific venues, such as environmental narratives based on written records and personal observations from firefighters and land managers, or through highly creative and imaginative art, or by compiling oral history accounts from Native American elders and others.

As a funder of fire research in the U.S. since 1998, the interagency Joint Fire Science Program (JFSP) has supported numerous and diverse projects to describe fire's role in ecosystems. Although most projects have been based on formal scientific methods, the JFSP in recent years broadened its focus to include projects that diverge from standard experimentally based research and instead view fire from different cultural perspectives. This effort was partly a response to recommendations from JFSP-funded researchers (Swanson et al. 2011), who felt that humanities-based outreach efforts could help inform and engage the public about wildland fire issues. Several projects described in this article represent excellent examples of unique and creative approaches to telling fire's story in America. Why are such projects important? In the words of some recent JFSP principal investigators:

*“The arts and humanities have a powerful capacity to create lines of communication between the public, policy, and scientific spheres, as well as to contribute directly to the discourse. Previous efforts to engage the arts and humanities with science, the public, and policymakers have successfully generated excitement, facilitated mutual understanding, and promoted meaningful dialogue on issues facing science and society.”*  
(Trainor et al. 2013)

## Fire as a Cultural Narrative

Recent work by noted fire scholar and environmental historian Stephen J. Pyne illustrates how the history of wildland fire and the associated fire profession in the U.S. can be told by means of environmental narrative. Pyne has been a professor at Arizona State University since 1985 and is perhaps the country's foremost writer and lecturer on the history of wildland fire, as well as other topics in environmental history. Indeed, many labels can be applied to Pyne such as cultural fire historian, pyrogeographer, and, to quote his words, “pyromantic.”

During a recent interview, Pyne described his latest research project. Between 2010 and 2017, he authored a series of books that describe fire history and the evolution of wildland fire management in the U.S. over the past half-century. When asked how the

idea for the book series came about, Pyne said that the concept arose during conversations in the early 2000s with U.S. Forest Service (USFS) chief historian Lincoln Bramwell. Pyne had pointed out that most written histories about wildland fire tend to focus on either the era prior to the early 1900s, ending, for example, with the infamous Great Fire of 1910, or the reformation of fire policy that occurred in the 1960s and 1970s. He also felt that most books about recent

*“The arts and humanities have a powerful capacity to create lines of communication between the public, policy, and scientific spheres . . .”*

fire history tend to overfocus on the megafires of the past 20 years. Many informative narratives have been written about those periods, including a number of books by Pyne himself. However, Pyne and Bramwell agreed that today's fire managers and other interested readers could benefit from a broader perspective of fire history that includes a historian's interpretation about the evolution of modern

fire management that occurred during the post-1960 era. As Pyne pointed out during an interview, some of the most dramatic events and rapid evolutionary changes within the profession have occurred during the 50-year period between 1960 and 2010. Yet, until fairly recently, the profession lacked a cohesive and comprehensive treatise of the great changes in fire culture that occurred during that era.

Pyne's research was funded through a multiagency effort, with major support from the USFS, U.S. Department of the Interior, and JFSP. Research deliverables include a series of books published by the University of Arizona Press titled “Between Two Fires: A Fire History of Contemporary America” (Pyne 2015b) and a subsequent companion series of regional anthologies titled “To the Last Smoke” (Pyne 2016a, 2016b, 2016c, 2016d, and 2017). In the author's words, “Between Two Fires” provides the overall “play-by-play” narrative—that is, the historical events along with his informed interpretations. In contrast, the series “To the Last Smoke” provides the “color commentary,” including particular places, topics, and personalities of various regions, combined with Pyne's prose.

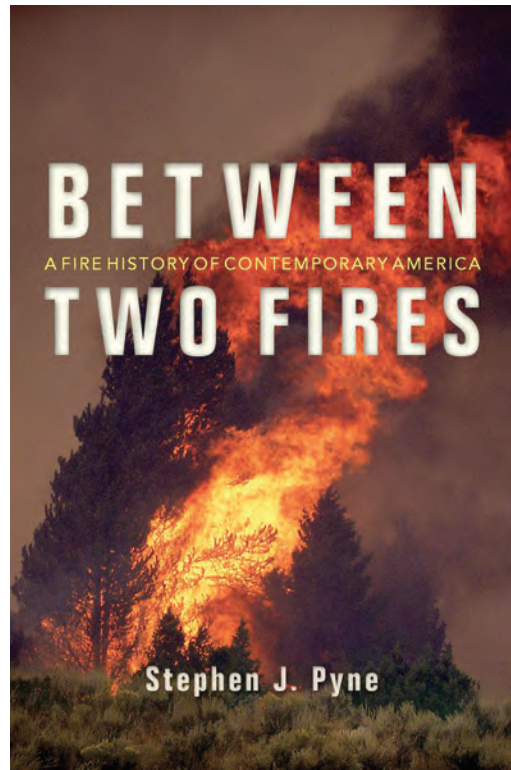
## Between Two Fires

The first book in Pyne's multiyear research project, “Between Two Fires,” provides the historical arc of the nation's fire culture between 1960 and 2013. The book provides a comprehensive overview and Pyne's

interpretation of cultural fire history. When asked how he came up with the title, Pyne said that it is meant in two senses. First, the title is a paraphrase of a well-known expression that refers to fire as a cleansing ritual, or rite of passage. However, the title also represents the various pairs of fires that inform the American fire scene—humanity’s fires versus nature’s fires, wildland fires versus prescribed fires, fires that burn living landscapes versus modern humans burning lithic (fossil) fuels, and big “blowups” that inspired past reforms versus recent megafires that are driving current agency reforms. So, wherever one happens to be in the book’s narrative, the reader is always poised between historical fires. Similarly, the American fire community found itself passing

between two cultures of fire, one forged by fire’s suppression and another shaped by fire’s management. In short, Pyne points out that periodic eruptions in wildland fires and how they are perceived have spawned irruptions in the associated fire culture.

As for study methods, Pyne compiled his pyrogeographical narrative by researching published and unpublished documents supplemented by personal interviews and site visits. He often found gaps in the historical record and a frequent lack of detailed, organized institutional sources that would allow the development of a continuous timeline of post-1960 fire history. Although fire records and “institutional memory” were lacking for some agencies, others had relatively complete documentation.



## Final Report Excerpts for Historical Narrative

The following excerpts from a JFSP final report (Pyne 2015a) provide examples of the historical narrative that Stephen Pyne developed for the book “Between Two Fires”:

- “Fire by prescription was the ruling concept of the fire revolution. In effect, prescribed burning was conceived as a unifying practice that would redirect fire control into fire management and one that could bond all regions. The southeast was making prescribed fire its informing practice. Western wildlands could absorb both the burning of logging slash and free-burning fires in wilderness under one amorphous concept. Fire by prescription was a doctrine that allowed for - was predicated upon - the continued control over fire. It just came by different means.”
- “For 50 years the country tried a philosophy of resistance. We sought to exclude a threat or when it appeared to suppress it. Then we adopted a philosophy of restoration. We would reinstate fire to something like its presettlement (or natural) state, or we would imagine what ‘desired future condition’ we wanted, and then move to create something like it.

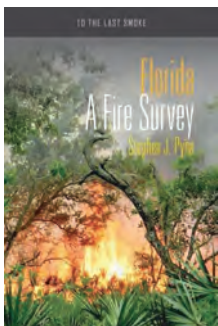
Either approach - a golden age in the past or a golden age to come - assumed that science would determine the ideal condition and then management would apply that knowledge to achieve it. This notion, too, seems to have exhausted its usefulness.”

- “Reconciling the many players in the American fire community is a political undertaking, not just a matter of mutual policies. The gamut of interested parties is breathtaking, from federal to state and local institutions to a boisterous civil society. Not only is some mechanism necessary to allow all members to participate, but the mechanism must be seen by all as legitimate.”
- “A striking feature of the American scene is its regional composition. Each region has its characteristic fires, preferred strategies, distinctive cultures, and legacies. These do not seem to transfer across regions. Landscape, in its etymological origins, refers to lands sculpted by people. The regions differ not simply in their physical environments but in the way cultures act on them.”

**To the Last Smoke.** During his writing of the overview narrative for “Between Two Fires,” Pyne also began developing a series of relatively short region-specific books that provide a more indepth look at the regional variation within the American fire scene. The series, “To the Last Smoke,” stemmed from Pyne’s identification of major fire “hearths”—that is, regions of unique fire culture. For example, Florida, California, and the Northern Rockies have been particularly rich in this regard, whereas other regions have been less so and thus have played lesser roles in influencing fire policies and practices.

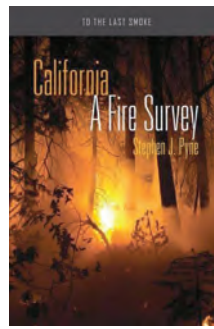
Pyne found much useful information, along with occasional gaps, while investigating regional pyrogeography. He also found distinct patterns of regional identity in terms of fire culture. For instance, whereas Florida’s fire story revolves around prescribed fire, California’s centers largely on fire suppression. And surprisingly, Texas lacked much fire identity until fairly recently—despite having a robust fire environment and despite having been the home territory of pioneers in fire science like Henry A. Wright.

Each of the five volumes in the series to date has a region-specific subtitle, a prologue and epilogue that summarize a given region’s role within the national scene, and a main body that contains essays focusing on prominent fire personalities, practices, and events that helped define the region. The following are descriptions of available volumes to date, as excerpted from the author’s website (<http://www.stephenpyne.com/works.htm>).



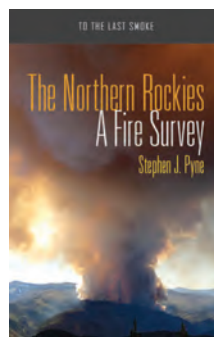
**Florida: A Fire Survey** (Pyne 2016b): “...explores the ways the region has approached fire management. Florida has long resisted national models of fire suppression in favor of prescribed burning, for which it has ideal environmental conditions and a robust culture. Out of this heritage the fire community has created institutions to match. The

Tallahassee region became the ignition point for the national fire revolution of the 1960s. Today, it remains the Silicon Valley of [prescribed] burning. How and why this happened is the topic of a fire reconnaissance that begins in the panhandle and follows Floridian fire south to the Everglades.”



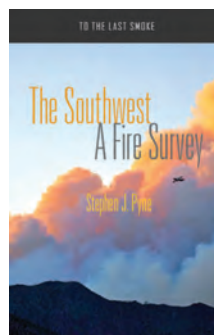
**California: A Fire Survey** (Pyne 2016a): “...explores the ways the region has approached fire management and what sets it apart from other parts of the country...what makes California’s fire scene unique is how its dramatically distinctive biomes have been yoked to a common system, ultimately committed to suppression, and how its fires burn

with a character and on a scale commensurate with the state’s size and political power. California has not only a ferocity of flame but a cultural intensity that few places can match. California’s fires are instantly and hugely broadcast. They shape national institutions, and they have repeatedly defined the discourse of fire’s history. No other place has so sculpted the American way of fire.”



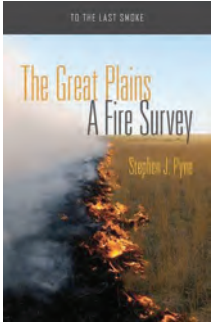
**The Northern Rockies: A Fire Survey** (Pyne 2016c): “The Northern Rockies remain one of three primary hearths for America’s fire culture. They hold a major fire laboratory, an equipment development center, an aerial fire depot, and a social engagement with fire—even a literature. Missoula is to fire in the big backcountry what Tallahassee

is to prescribed burning and what Southern California is to urban-wildland hybrids. On its margins, Boise hosts the National Interagency Fire Center. In this structured collection of essays on the region...Pyne explores what makes the Northern Rockies distinctive and what sets it apart from other regions of the country. Surprisingly, perhaps, the story is equally one of big bureaucracies and of generations that encounter the region’s majestic landscapes through flame.”



**The Southwest: A Fire Survey** (Pyne 2016d): “...provides a lively survey of what makes this region distinctive, moving us beyond the usual conversations of science and policy. Pyne explores the Southwest’s sacred mountains, including the Jemez, Mogollon, Huachucas, and Kaibab; its sky islands, among them the

Chiricahuas, Mount Graham, and Tanque Verde; and its famous rims and borders. Together, the essays provide a cross-section of how landscape fire looks in the early years of the 21st century, what is being done to manage it, and how fire connects with other themes of southwestern life and culture.”



**The Great Plains: A Fire Survey** (Pyne 2017): “...introduces a region that once lay at the geographic heart of American fire, and today promises to reclaim something of that heritage. After all these years, the Great Plains continue to bear witness to how fires can shape contemporary life, and vice versa. In this collection of essays...Pyne explores how

this once most regularly and widely burned province of North America, composed of various subregions of peoples, has been shaped by the flames contained within it and what fire, both tame and feral, might mean for the future of its landscapes.”

Note that the next volume in the series, tentatively titled “The Interior West: A Fire Survey,” is scheduled to be available in 2018. In the future, Pyne plans to produce volumes for the Northeast, Pacific Northwest, Alaska, and perhaps additional regions.

## Narratives by Other Authors

In addition to Stephen Pyne’s narratives about wildland fire history and fire culture in the U.S., the following are some examples of books that inform readers about wildland fire ecology, history, or federal policies and practices—as opposed to books that simply describe fire events.

Investigative journalist John Maclean’s books describe noteworthy and tragic fires, while incorporating some of the human dimensions, including agency policies and actions, that likely contributed to such events. These books include “Fire on the Mountain: The True Story of the South Canyon Fire” (Maclean 1999), “Fire and Ashes: On the Front Lines of American Wildfire” (Maclean 2003), and “The Thirtymile Fire: A Chronicle of Bravery and Betrayal” (Maclean 2007).

Retired USFS fire ecologist Stephen Arno is another fire history authority and author who has written numerous works on fire ecology, fire policy, and associated practices in the West over the past

40 years. Although most of his writings focus on technical science, such as research publications, Arno and various coauthors have produced several books that are tailored to environmentally oriented readers. For instance, the 2002 book “Flames in Our Forest: Disaster or Renewal?” (Arno and Allison-Bunnell 2002) is a comprehensive work about many aspects of basic fire ecology. The book includes fire history from the presettlement era to modern times and focuses on management implications and potential solutions to major ecological issues. Similarly, the book “Mimicking Nature’s Fire: Restoring Fire-Prone Forests in the West” (Arno and Fiedler 2005) guides general readers through the various historical fire regimes in the West and discusses the many serious ecological and fire management problems that affect today’s forests. Another example of a natural history narrative that includes the wildland fire theme is Fiedler and Arno’s (2015) book “Ponderosa: People, Fire, and the West’s Most Iconic Tree,” which describes the ponderosa pine’s (*Pinus ponderosa*) natural history in the Western U.S. Much of the book’s text is devoted to describing fire’s critical historical role in promoting that species’ survival.

Another author who has produced many fire narratives is Roland “Rocky” Barker, a longtime natural resource journalist with the Idaho Statesman newspaper in Boise, Idaho. Barker has frequently written about wildland fires in the region, and his book “Scorched Earth: How the Fires of Yellowstone Changed America” (Barker 2005) provides an evaluation of that seminal fire event as told through his firsthand account as a front-line reporter who spent months covering the story. In addition to describing early fire management policies and practices in the West, Barker shows how the news media often reported the “catastrophic” fire message during 1988 and other severe fire years and how federal agencies often were shown in a negative and unflattering light.

Interestingly, many authors of wildland fire narratives have written about wildland fires in the Western U.S. As Pyne recently pointed out, most of today’s perceived fire problems occur in the West, despite the fact that presettlement and modern fires have been prominent in other regions. Although many technical science publications describe fire history in the eastern half of the U.S. and Alaska, the literature contains few narrative works by cultural historians or environmental authors. However, some narrative accounts for such regions include “Fire in America: A Cultural History of Wildland and Rural Fire” (Pyne 1982) and “America’s Fires: A Historical Context

for Policy and Practice” (Pyne 2010). In addition, the Joseph W. Jones Ecological Research Center at Ichauway in Georgia sponsors several commercially available books that describe the natural history and management of longleaf pine (*Pinus palustris*) forests in the Southeastern U.S. For example, readers can explore various works in the Natural Georgia Series, such as “The Fire Forest: Longleaf Pine-Wiregrass Ecosystem” (Georgia Wildlife Federation 1997). This anthology by multiple regional ecologists and other science writers describes various elements of the longleaf pine ecosystem, including natural and cultural history, the critical role played by lightning- and human-caused fires, and regional conservation efforts.

### Fire as Artistic Expression

In addition to narrative authors, fire’s story also has been told by visual artists working in creative media. In fact, in recent years, the JFSP helped fund several such projects—ones that not only stimulate the senses but also help inform the public about fire ecology and fire management.

**Fire Art in Alaska.** Similar to other areas of the U.S., Interior Alaska has a long and rich history of both wildland fire and visual art. To meld the two themes, a collaborative art project named “In a Time of Change: The Art of Fire” was funded by the JFSP and developed by the Alaska Fire Science Consortium and the Bonanza Creek Long Term Ecological Research Site (Trainor et al. 2013). The project was initiated and coordinated by co-principal investigators Sarah Trainor, assistant professor of Social-Ecological Systems Sustainability at the University of Alaska-Fairbanks and Director of the Alaska Fire Science Consortium, and Mary Beth Leigh, associate professor of microbiology at the University of Alaska-Fairbanks. The goal of the project was to use art to help the public understand the functionality of fire in the ecosystems of Interior Alaska. It was also a chance to introduce new voices into conversations about fire science and management.

For this project, nine artists were selected through a competitive process to research fire-related themes and then produce art works in their respective specialty fields, such as painting, sculpting, photography, and mixed media. Before the artists began creating their final products, they were given the opportunity to participate in multiple field experiences to learn more about wildland fire ecology and management in relation to Interior Alaska’s changing climate. Artists attended four field trips orchestrated and led

by the Alaska Fire Science Consortium. Working in their respective media, the artists then produced fire-themed pieces, which included paintings, photographs, ceramics, drawings, prints, and other media. The primary exhibit of 52 art pieces, which was presented daily during August 2012 at a Fairbanks art gallery, drew more than 450 people to the opening reception, and more than 700 visitors viewed the free exhibit that summer. The pieces also were showcased during multiple public exhibits in Fairbanks and Anchorage.



Jim Barker

Fabric art by Ree Nancarrow titled “Spruce Wasteland-Hope,” which was exhibited during the JFSP project “In a Time of Change: The Art of Fire.”

The “In a Time of Change” project was highly successful, judging by the large number of exhibit attendees and from the many positive public comments that were received through a project evaluation, in which 94 percent of the respondents agreed that art can be an effective means to communicate scientific ideas. Trainor said of the project, “This is really about building connections between the artistic talent we have in Fairbanks and managers and scientists throughout the state to promote awareness of fire and fire sciences in Alaska.” This project has had impacts beyond Alaska. For example, several of the pieces were displayed at the National Science Foundation headquarters in Virginia, and Trainor and Leigh have delivered multiple invited lectures around the country discussing the process and impacts of linking science and art. Images of the art and further information about the project can be found at <http://www.frames.gov/afsc/artoffire>.

**Fire Art in the Southwest.** Inspired by the fire art project in Alaska, the JFSP partially funded another project in the Southwestern U.S. beginning in 2013. According to the Southwest Fire Science Consortium, the “Fires of Change” project was designed “to integrate fire and climate science with art to offer a unique interpretation for the...Arizona community.” This multipartner collaborative venture was headed by Andrea Thode, associate professor of forestry at Northern Arizona University and principal investigator for the Southwest Fire Science Consortium, with assistance by Barb Satink Wolfson, Southwest Fire Science Consortium coordinator. In addition to funding provided by the JFSP, the Southwest Fire Science Consortium and its collaborators, the Landscape Conservation Initiative and the Flagstaff Arts Council, procured a grant from the National Endowment for the Arts. During the 3-year project, scientists, environmentalists, educators, and 11 selected artists worked together to promote public awareness of fire’s ecological role and the role of modern fires during changing climatic conditions. In doing so, the project collaborators sought to build an understanding of modern fire management and promote progress toward a fire-adapted society.

As with the Alaska project, professor Thode and her coordinating team first organized workshops and a week-long field trip (or “boot camp” as one artist jokingly said) during which area scientists and forest managers helped educate the selected artists about various aspects of fire ecology and management. The artists then created a number of works that included photography, paintings, ceramics, sculptures, poetry, and other media. The “Fires of Change” exhibit was shown in Flagstaff and Tucson during 2015 and 2016 along with presentations from scientists, artists, and the curator. To more strongly tie the artwork with fire and climate science, journal article quotes were integrated into the exhibit as was a video discussing associated science themes. According to principal investigator Thode, the exhibits and lectures were well attended with about 2,700 people attending the Flagstaff exhibit and nearly 7,000 museum visitors tallied during the exhibit in Tucson. The exhibit is possibly scheduled in southern New Mexico during 2017 and 2018. For more information about the “Fires of Change” project, please visit <http://flagartsCouncil.org/2015/03/fires-change-exhibition/>.



Tom Alexander

Wooden sculpture “Broken Equilibrium” by Bryan David Griffith. The display was created by salvaging recently burned trees and trees felled during a forest thinning project.



*“In Western culture we traditionally view dualities—light and darkness, life and death, forest and fire—as opposing forces with horns locked in an epic struggle of good vs. evil. We fight nobly to preserve life and subdue death by taming nature to prevent unpredictable disasters like wildfire. My work explores the idea that these forces aren’t opposed, but rather part of the same continuous cycle. One can’t exist without the other.”*

— Bryan David Griffith, participating artist in the “Fires of Change” project



Tom Alexander



Tom Alexander



Tom Alexander

**Other Venues.** Fire's story has also been told through other artistic efforts. Examples include film projects, children's books and early-education curricula, and oral history projects. An oral history project titled "Fire on the Land" was produced by the Confederated Salish and Kootenai Tribes in western Montana and provides an example of fire-centric storytelling. Education specialist Germaine White of the tribes' Natural Resources Department guided the collection of oral histories from tribal elders who discussed past fire practices and the importance of fire in traditional tribal cultures. Subsequently, the staff produced a package of educational multimedia materials to help raise awareness of and appreciation for fire's past role and to build support for the use of modern-day prescribed fire. The JFSP explored this topic of traditional ecological knowledge in a November 2014 Fire Science Digest issue titled "Traditional Ecological Knowledge: A Model for Modern Fire Management?" For more information on "Fire on the Land," visit [www.csktribes.org/natural-resources](http://www.csktribes.org/natural-resources).

Modern dance performances have also been used to tell fire's story. For example, the CoMotion Dance Project in Missoula, Montana, developed a unique interactive program called "Fire Speaks the Land" that uses choreography, music, and narration to teach elementary and middle school students about Northern Rockies fire behavior and fire ecology. From 2014–2016, the JFSP's Northern Rockies Fire

Science Network worked with various partners to bring the show to about 2,400 students and teachers in the region. By all accounts, this science-based dance performance was well received. To learn more, visit <http://www.comotiondanceproject.com/performances/index.html>.

Not surprisingly, the internet has greatly facilitated the hosting, archiving, and locating of fire-related art and narrative works. A website named Ecological Reflections (<http://www.ecologicalreflections.com/>) serves as an online clearinghouse of art and science collaborations that feature many art and narrative projects related to wildland fire. For instance, the site contains a link ([http://www.ecologicalreflections.com/?page\\_id=586](http://www.ecologicalreflections.com/?page_id=586)) to several presentations that occurred during the "Words on Fire: Toward a New Language of Wildland Fire" conference in 2012. Funded in part by the JFSP, the session featured lectures, a panel discussion, and exhibits that highlighted the roles played by narrative and art in the wildland fire realm.

With continuing support from programs like the JFSP, scientists will continue to produce the technical information that is necessary for advancing the field of wildland fire management. But the multitalented community of historians, artists, and other creative individuals across the U.S. likewise will be indispensable for telling fire's long and complex story to help reach many different types of audiences of all ages.



A scene from the modern dance performance "Fire Speaks the Land," by the CoMotion Dance Project.

William Munoz

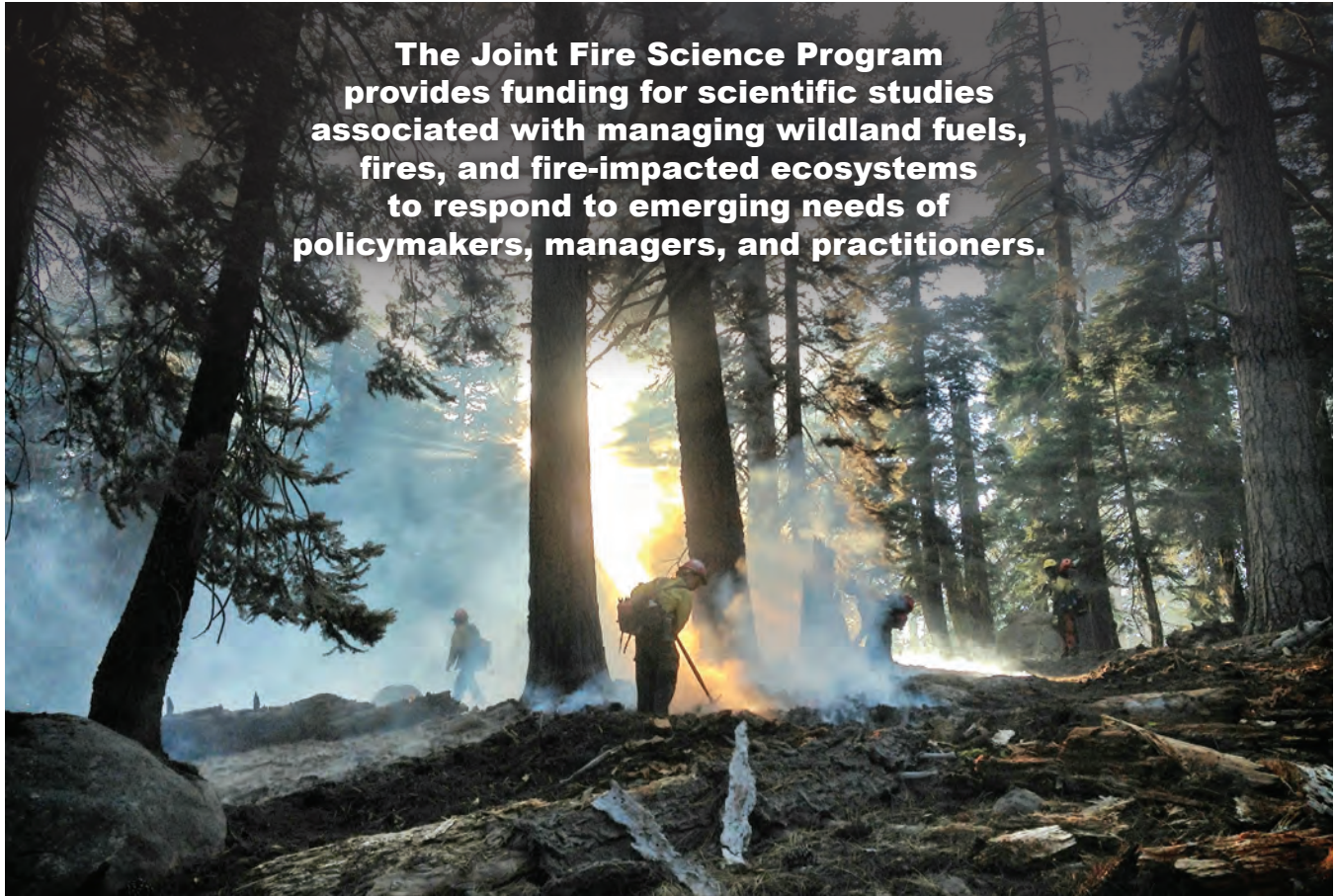
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## AN INTERAGENCY RESEARCH, DEVELOPMENT, AND APPLICATIONS PARTNERSHIP



**The Joint Fire Science Program  
provides funding for scientific studies  
associated with managing wildland fuels,  
fires, and fire-impacted ecosystems  
to respond to emerging needs of  
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