

## **WETC Strategic Plan**

Last approved: January 17, 2018

### **Background:**

Wildland fire (e.g., prescribed fire and wildfire) is an integral and vital process in many ecosystems in the United States, with profound implications for nutrient cycling, successional dynamics, wildland habitat, climate change, as well as many other factors. Management of wildland fire, however, is becoming increasingly challenging due to altered ecosystems and associated fire regimes (i.e. due to fire suppression, invasive species, and climate change), as well as the public's more frequent and potent interactions with wildland fire (i.e. due to increasing development in the wildland urban interface). With this increasing complexity, effective management of wildland fire now requires scientific literacy in multiple fields, including physics, chemistry, mathematics, ecology, natural resources, atmospheric sciences and social sciences. For example, fire managers are often charged with running and interpreting mathematical models that predict fire spread patterns and its effects on vegetation, soils, and air quality. Many fire professionals, however, lack sufficient levels of scientific literacy, and professional fire training programs have been slow to incorporate key scientific concepts (Kobziar et al. 2009). Also, university educators often find the development of wildland fire courses challenging as information about wildland fire-related topics is highly fragmented. Since there is no "textbook" that encompasses all the key elements of wildland fire science and management, instructors end up drawing upon multiple sources, including sections of books, general technical reports, scientific papers, and videos.

Scientists and managers throughout the wildland fire professional community agree that it is vital for society to learn to live with wildland fire to sustain ecosystems and their services (Moritz et al. 2014). This will require a more sophisticated understanding on the part of the public on the science of wildland fire, especially because wildland fire managers strongly consider the public's sentiment in decision-making regarding management of wildland fire (Thompson 2014). While the public's knowledge of science related to use of prescribed fire and forest thinning are relatively sophisticated (McCaffrey 2015), their knowledge of the science used in wildfire management is relatively poor (Diaz et al. 2016), possibly in part because of often inaccurate and loaded coverage of wildfire events in mass media (Paveglio et al. 2011).

Previous studies have shown that the public typically seeks information on wildland fire from mass media (e.g., newspapers, television, radio) and interactions with land management agencies and their representatives, either indirectly through websites or directly through community briefings (Steelman et al. 2015). Managers have expressed many challenges in communicating to the public regarding wildland fire management, including lack of quality materials and lack of consistent messaging across land management agencies (Olsen et al. 2014). Given that local land managers are a trusted source of fire information for the public (Steelman et al. 2015), it is critical that they have quality materials that they can use to share wildland fire science to the public and media outlets. There are public outreach programs through the federal government to help the public learn about wildland fire, but there is no common resource to pull from for scientifically based information on wildland fire that is up to date and functional in connecting wildland fire science from fire ecology, fire effects on hydrology, vegetation succession, structure and composition, fire and climate change, fire behavior and modeling, smoke modeling and more.

**What we want to do:**

To address the challenges articulated above, we propose to develop educational materials addressing the science of wildland fire that can be used in multiple settings and for multiple audiences. Education materials include but are not limited to short videos, interactive activities, and displays. In our Pilot Project, we develop a series of short introductory videos related to wildland fire. In Phase I, we intend to produce additional educational materials for students and fire managers. In Phase II, we intend to focus on educational materials for the public and for professionals who interact with the public. All phases will be informed by formal needs assessments of targeted audiences and evaluation of products and outcomes. Many elements of Phase I and Phase II will be concurrent as resources become available.

*Pilot Project*

The WETC has piloted the development of education materials by producing The World of Wildland Fire (WOW Fire) video series, intended to house a series of short videos and related educational materials on all aspects of wildland fire. Initially, we have produced six videos that are available for free via our website ([www.worldofwildlandfire.org](http://www.worldofwildlandfire.org)). These videos are intended for use in university and professional training courses. As of January 2018, there were 356 subscribers to our YouTube channel and over 14,000 views of our most popular video. We expect these metrics to grow tremendously as we advertise these products to multiple audiences and create content more consistently. A formal peer-review process has been developed for all videos to ensure scientific accuracy.

*Phase I - Developing materials for students and fire managers*

As we learn about the needs of different audiences, we will continue to build a “moveable textbook” of short videos related to the science of wildland fire available on the World of Wildland Fire website. Videos may be ordered by track (topic area) and suggest related videos in other tracks. Hands-on exercises associated with the videos can be added where a physical interaction with the subject matter is possible. These videos can then be used for personal learning (similar to the KHAN academy - <https://www.khanacademy.org/>) or incorporated into elementary and high school curricula, university courses, or professional training courses. Our target audience for this phase is students in universities, elementary and high schools, as well as fire managers participating in professional development courses. Subject matter experts will be recruited to build different tracks, which will be filled with relevant videos and exercises as funding becomes available. All videos and related materials will receive a peer-review by a minimum of two subject matter experts to ensure scientific accuracy.

*Phase II - Developing materials for the public and those who interact with the public*

In this phase of the project we intend to target members of the public, both directly, and through groups that communicate with the public, such as popular media and agency representatives charged with public outreach. Targeting the public and mass media may require several paths and reformatting videos to be used for social media, mass media, and other venues. We will explore additional partnerships with museums, visitor centers, and other outlets to incorporate videos and related materials into public displays. Following a needs assessment of media outlets, we will explore ways to tailor existing education materials and our website to support their use by mass media.

## *Concurrent Phase - Needs Assessment, Evaluation, and Research*

### Needs Assessment

Development of materials for different audiences will be preceded by a needs assessment of each audience we hope to reach in the different phases of the project. Doing this needs assessment up-front with multiple audiences will allow us to consider the unique learning styles or information needs of different audiences in development and dissemination of education materials. For example, videos used in university and professional training classes would likely be around 7 minutes long, drive home key concepts and show examples. The same videos may work well for the public if the terminology is described. For use in popular media, however, the topic may need to be introduced in 30 seconds and then linked to additional sources for deeper knowledge. For college students and fire professionals, we may develop one subject matter area at a time. However, for the media and public, we may need to cover broadly several subject matter areas. Understanding these different audiences and their needs up-front will help us to build effectively and efficiently for multiple audiences.

### Evaluation and Research

Starting with Phase I, we will develop a formal evaluation of current and future products that will continue throughout the project. This will include a multi-pronged approach potentially including surveys, focus groups, interviews and other methods. We will evaluate if needs that were found through our needs assessment are being met, how well our video formats work in teaching core and advanced topics, if learning increases when embedding videos with other activities in the classroom and in informal settings, and how effective very short videos can be at capturing the public and directing them to a site for deeper learning.

Particular research topics tied to the evaluation piece could include:

- How does co-production of video scripts influence learning?
- How does media type and characteristics influence effectiveness in learning?
- Do we increase learning with the combination of videos and other activities (museum displays, touch screens, apps, small experiments...etc.)?
- Are our videos effective in facilitating self-guided learning?
- How do people come to self-guided sites and learning? Are the methods we use effective to get them there?

### **Who we are:**

The Wildfire Education Training Collaborative, a collaboration between universities, federal agencies, and non-governmental organizations. Our steering committee of 11 people represents seven institutions and government agencies. Overall we have ten partners in the project including:

Association for Fire Ecology (AFE)  
California Fuels Committee (CFC)  
Humboldt State University (HSU)  
Southwest Fire Science Consortium (SWFSC)  
National Wildfire Coordinating Group (NWCG)

North Carolina State University (NCSU)  
Northern Arizona University (NAU)  
University of Arizona (U of A)  
University of Idaho (U of I)  
US Forest Service Region 5 (USFS R5)

Additional partners, we hope to bring in to this project include:

Researchers and practitioners in environmental education

Mass media science writers

Public information officers from federal and state agencies

Subject matter experts in fields related to wildland fire (e.g., meteorology, human dimensions)

Science communication specialist