# FIRESCIENCE EXCHANGE NETWORK

## Fiscal Year 2020 Annual Summary

DOI Office of Wildland Fire

USGS science for a changing world

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*Research Supporting Sound Decisions*

**Created in 1998** as a partnership between the U.S. Department of Agriculture Forest Service and the Department of the Interior, the Joint Fire Science Program (JFSP) provides funding and science delivery for scientific studies associated with managing wildland fire, fuels, and fire-impacted ecosystems to respond to emerging needs of managers, practitioners, and policymakers from local to national levels. The JFSP provides leadership to the fire science community by identifying high-priority fire science research needs that will enhance the decisionmaking ability of fire and fuels managers, natural resource managers, and others to meet their management objectives. The program also meets the decision needs of those involved in developing and implementing fire-related policy.

The JFSP Fire Science Exchange Network (FSEN) is a national collaboration of 15 regional fire science exchanges that provides the most relevant, current wildland fire science information to federal, state, local, tribal, and private stakeholders within ecologically similar regions. The network brings fire managers, practitioners, and scientists together to address regional fire management needs and challenges. The objective of the network is to foster a dialogue in which scientists and managers help frame management questions and research needs to address during both planning and execution of research. In 2020, the FSEN celebrated 10 years of national collaboration.

Like many other programs in fiscal year (FY) 2020, the work carried out by the FSEN was significantly affected by the global pandemic. From March through the end of the fiscal year, all in-person engagements, conferences, workshops, trainings, and leadership briefings were canceled or postponed. Even with these challenges, the exchanges demonstrated a remarkable ability to adapt by finding new and innovative ways to connect with various audiences and successfully carry out their mission and work. Exchanges adapted their programs to maximize effectiveness by hosting many engagements via virtual platforms. This adaptation and resilience demonstrate that the organization is nimble and can adjust quickly to constituent needs. In this virtual environment, the FSEN maintained leadership in fire science communication and reached even broader audiences than before.

CALIFORNIA FIRE SCIENCE CONSORTIUM

**California:** *"The 2020 fire season exploded in August in the Northern California subregion, bringing unprecedented public and media attention to fire-related issues. The Northern California subregion of the California Fire Science Consortium embraced media opportunities, seeing them as an important venue for mass outreach on fire science, ecology, and management and opening new doors for policy work."*

# Fire Science Exchange Network Highlights: Building on Our Foundation While Adapting

The following are some highlights from FY 2020 annual reports submitted by the 15 exchanges on their progress and accomplishments in carrying out various FSEN activities.

## Workshops

Hosting and participating in workshops are critical in keeping organizations connected and informed about the latest wildland fire science, management approaches, and products and identifying potential gaps and opportunities. While a challenge, the exchanges have shown the effectiveness of hosting virtual workshops and keeping dialogue and interaction alive in a virtual setting. The following highlights show the various types of workshops held this past year.

**Great Plains:** In lieu of the 2020 annual FSEN meeting, the exchange hosted and continues to host a series of brown bag virtual meetings that have proved both relevant and popular.

**Great Basin:** Attended Oregon's Sagebrush Conservation biannual meeting, which allowed the exchange to reach a section of the Great Basin that has been underserved in prior years.

**Alaska:** Convened 2 half-day workshops with statewide interagency management meetings. These workshops are now an established part of the Alaska management community's annual calendar of events.

**Southwest:** Collaborated with the Association for Fire Ecology International Fire Congress, and hosted a workshop on fire ecology and management for nonscience professionals. Region district rangers asked for help communicating science to local elected officials.

## Webinars

The exchanges continue to deliver science and keep their constituents informed through webinars. Webinars continue to draw large participation across the FSEN. Exchanges delivered more than 240 webinars in 2020 (with participation from 11,500 people), a significant increase over 79 webinars in the previous year. This number once again speaks to the power of an effective transition to a virtual environment.

**California:** A prescribed fire on private lands outreach program originally reached more than 500 people in person and then by webinar.

**North Atlantic:** Held a series of webinars, workshops, and discussions to help increase the pace and scale of prescribed burning through coproduction of fire science in the scientist-manager community.

**Northwest:** Hosted eight webinars with more than 2,000 people participating during both live webinars and YouTube recordings.

## Training Sessions

Education is a key component for advancing wildland fire science and management in the face of stressors, such as climate change, COVID-19, and others. Trainings for various audiences—both technical and nontechnical—help advance science and facilitate shared learning of implementation on the ground. There was a slight increase in trainings held in FY 2020 (35) compared to FY 2019 (23).

**Great Basin:** Through its Fire Online partnerships with the University of Idaho, the exchange continued to increase the quality and quantity of Great Basin fire, ecology, restoration, policy, and technology topics presented in online coursework.

**Great Plains:** Conducted a hands-on prescribed burn training during the Society for Range Management annual meeting.

**North Atlantic:** At the request of the Northeastern Forest Fire Protection Compact training working team, the exchange organized a workshop on how to optimize fire education courses for a virtual environment.

**Oak Woodlands and Forests:** Hosted and codeveloped a technical training—the Fire and Fuels Monitoring Training—with the regional fuels program, including site hosts from the Hoosier National Forest.

## Syntheses

Written communication through syntheses, briefs, and newsletters are also important activities for science delivery. Exchanges continue to develop syntheses for their geographic regions. Twenty-three syntheses were published in FY 2020.

**Appalachians:** Funded the production of "Photo Guide for Estimating Fuel Loading in the Southern Appalachian Mountains," authored by Adam Coates and others.

**Great Basin:** A synthesis by Rick Miller and others, titled "The Ecology, History, Ecohydrology, and Management of Pinyon and Juniper Woodlands in the Great Basin and Northern Colorado Plateau of the Western United States," provides background on the past and present distribution of woodlands and when, how, and where management is recommended.

**Northwest:** Developed a synthesis on social vulnerability and wildland fire in the wildland-urban interface to clarify areas of debate, define and contrast approaches, and summarize findings that may help address vulnerability to wildfires and other natural hazards.

**Pacific:** Developed several products, including the "2019 Wildfire Summary in the Western Pacific," a technical guide on fuels management strategies for Pacific Islands, and a research brief on long-term ecosystem recovery after fire in Hawaii.

## Databases

Some exchanges have embraced developing databases to catalog fire science-related publications for their users. These systems are embraced by managers, scientists, and others to locate past webinars, videos, and publications on fire science. There was a slight increase in databases in FY 2020 (14) over FY 2019 (12).

**Lake States:** Continued to develop and enhance the searchable, online knowledge bank that includes more than 1,400 fire science-related publications.

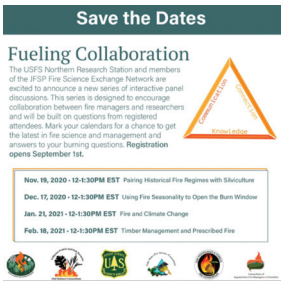
**Northern Rockies:** Hosts two searchable databases, including a searchable webinar and video archive to help managers, scientists, and others locate recorded webinars and videos on topics of interest and a research and publications database that has 612 new publications.

## Podcasts

Podcasts are currently popular and provide a platform by which people absorb information while on the go. Podcasts are slowly gaining traction among the exchanges. One notable example includes the Southwest, which funded a series of eight podcasts. These podcasts cover a range of topics, including wildfire and COVID-19 response, extreme fire, watersheds and water funds, good fire, and more. Downloads ranged from 207 to 375 per episode.

## Collaboration

Key collaborations over the past few years, that maintain reciprocal and iterative knowledge exchange between researchers and practitioners, have resulted in numerous funded research projects and partnerships. This is a strength of the exchanges in bringing managers, scientists, and users to the same table, leveraging resources, and effectively delivering science.




**Alaska:** Continued ongoing collaboration with the Alaska Wildland Fire Coordinating Group to develop the consortium's activities to meet the community's identified fire science needs. Also, the consortium invited Canadian managers and investigators to present at events and sought opportunities to contribute to Canadian efforts.

**Great Basin:** Partners (Bureau of Land Management, Utah Department of Natural Resources, and Natural Resources Conservation Service) asked the exchange to help coordinate and develop a plan that would help managers better communicate the science behind treating pinyon-juniper woodlands for sagebrush and sage grouse conservation.

**Lake States:** The consortium has been instrumental in supporting national forests, state natural resources departments, The Nature Conservancy, prescribed fire contractors, and others as they progressed from building awareness to successful implementation of growing season burns.

**Northern Rockies:** The network worked closely with the U.S. Forest Service Fire and Aviation Management team to host the regional National Fire Danger Rating System Update rollout workshops. The objective was to inform managers of changes to the system and the incorporation of new science regarding moisture dynamics, weather conditions, and fuel models.

**Northwest:** Partnered with Oregon State University on a Learn and Burn workshop for forest landowners. The workshop covered fire science, prescribed fire, smoke management, safety, and more.

**Appalachians:** Partnered to help plan the National Cohesive Wildland Fire Management Strategy Workshop, titled "The Cohesive Strategy in 2020: Dynamic Adaptation in a Novel World."

**Oak Woodlands and Forests:** Began production of a new series of interpretive signs supported by the Mark Twain National Forest on transverse shortleaf pine restoration sites.

**Pacific:** Hosted a wildfire meeting that brought together state representatives, farmers, and landowners to identify risk reduction strategies and funding opportunities for communities threatened by wildfire.

**Southern Rockies:** Partnered with the Mountain Studies Institute to further establish the Forest and Fire Learning Trail at Reservoir Hill in Pagosa Springs, Colorado, which was visited by Colorado Senator Michael Bennet.

## Students/Mentorship

Supporting the next generation of fire science practitioners means collaborating and educating them while still young. The exchanges have placed a strong emphasis on mentorship.

**Appalachians:** Continued to co-manage and mentor the Fire Tigers, a student fire crew at Clemson University, to ensure that fire science is a component of operational training.

**Lake States:** Continued to support student internships in projects developed by joint manager research teams. These projects contribute to advancing knowledge and building partnerships while also providing training in communicating across researcher and manager communities to the next generation of wildland fire professionals.

**Southwest:** Created a Southwest Fire Ecology Curriculum, utilizing the U.S. Forest Service FireWorks program as a guide. For students in Grades 6 through 8, the curriculum consists of an introduction safety lesson followed by 10 lessons on fire ecology, physical fire science, weather, vegetation types, and more.

## Delivering on National Projects: Success Stories

The JFSP Program Office provided funding to the Southern Fire Exchange and Southwest Fire Science Consortium to develop outreach materials focused on success stories of fire science delivery and implementation in their respective geographic regions. The following stories highlight the outcome of this successful project and serves as a template for other exchanges to follow in communicating their successes.

**Southern:** Published an article about duff fire science in the Longleaf Leader magazine and gave a presentation about duff fire science at the 8th International Fire Ecology and Management Congress. Launched a success story video about how JFSP investments in duff fire science research and communication have helped land managers improve longleaf restoration project outcomes.

**Southwest:** Produced a fact sheet, two GIS story maps, and a video focused on threatened and endangered species habitat, fire and archaeology, and fire safety research.

## Feedback and Testimonials

Responding to constituent needs drives the mission and work carried out by each exchange. The following quotes from some constituents highlight the importance and value of the FSEN.

**Alaska:** *"So helpful to have researchers connecting with operations so that outcomes are useful and relevant."*

**Southern Rockies:** *"I am super grateful to the SR Fire Science Network and the whole network of fire science consortia. I get email newsletters from three or four consortia, and the newsletters, links, and webinars are an essential part of how I keep up with fire science."*

**North Atlantic:** *"We are on different continents, so I expected there to be large differences in the issues we are facing. But now I see that these tools and methods can be applied anywhere."*

## Future Focus Areas

A common theme that emerged in most, if not all, exchange summaries was a growing emphasis to transition future activities to virtual platforms. That is, host more webinars, workshops, and conferences, and find innovative methods to make these meetings interactive and productive. How do we get the benefits of face-to-face interaction transferred to the virtual setting? While this will take time, the current transition to an effective virtual organization demonstrates that this is possible. The following highlights demonstrate future focus areas of emphasis by some exchanges.

**Alaska:** Managers require regionally relevant data for use in required fire management tools. Will work with managers, scientists, and tool developers to ensure that accurate data is available for use in the Alaska domain.

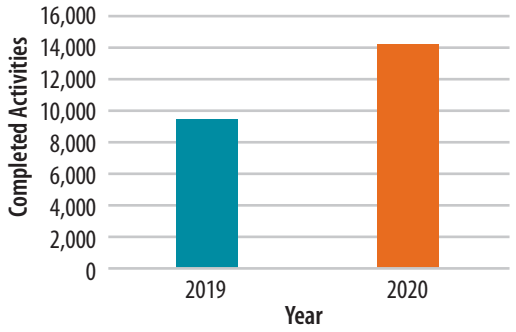
**Northern Rockies:** Will explore hosting several virtual events for managers and scientists. Expand outreach to tribal managers to build relationships and understand fire and fuels science needs of tribes in the region.

**Southern:** Intend to launch a new audio podcast with initial episode focused on duff fire science.

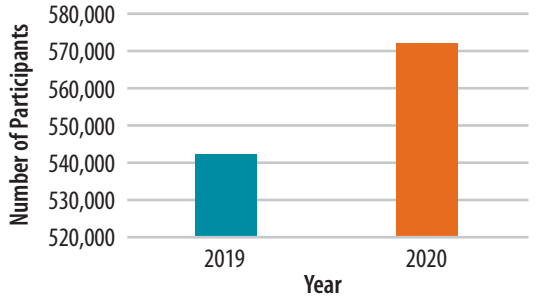
# FY 2020 FSEN Annual Numbers

Approximately 14,000 activities were carried out by the 15 members of the FSEN in FY 2020. This is an increase from 9,500 activities in 2019. There was a slight increase in participation in FSEN activities in 2020 over 2019 (570,000 versus 540,000 participants). Tables 1, 2, and 3 in the Appendix provide a breakdown of the number of activities and participants engaging in each activity and a breakdown of participation by organization.

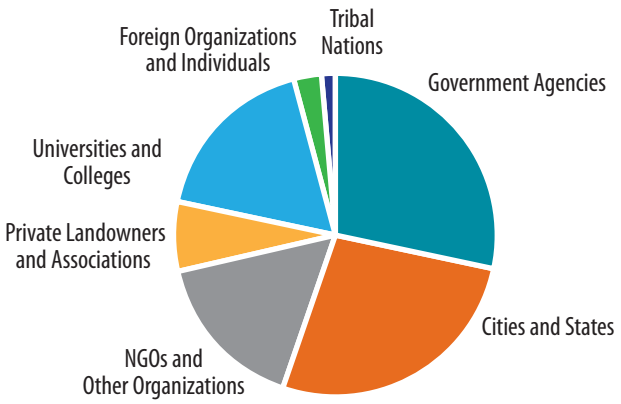
**FSEN Activities**
**(2019 versus 2020)**




**Participants in FSEN Activities**
**(2019 versus 2020)**




**Participants by Organization in 2020**
**FSEN Activities**

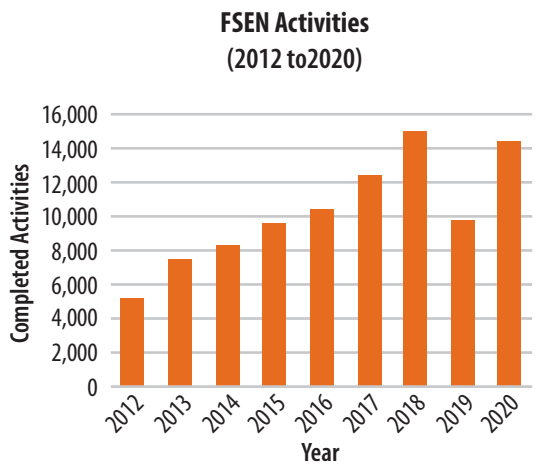


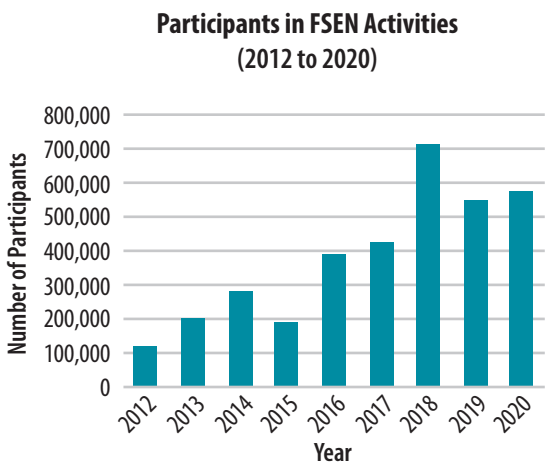

## Notable 2020 FSEN Activity Highlights

- Sent 7,823 tweets and posted 3,040 times on Facebook.
- Hosted 240 webinars.
- Developed 319 videos.
- Produced 157 newsletters.
- Hosted 62 workshops and conferences with 7,474 attendees.
- Developed 539 short courses and continuing education units with 885 participants.
- Participated in 177 leadership briefings with 2,466 leaders across various organizations.
- Hosted 31 field trips, tours, demonstrations, and road shows.
- Developed 212 blogs, fact sheets, and handouts.

# Ten-Year Summary of FSEN Activities

Annual activities completed by the 15 members of the FSEN generally increased from 2012 to 2020. This positive trend can also be seen in the number of participants engaging in FSEN activities. The highest number of activities and participants engaging in those activities occurred in 2018 (approximately 15,000 activities and 700,000 participants).



## Notable FSEN Accomplishments from the Last 10 Years

- Hosted 617 conferences and workshops with participation from 48,000 participants (overlap of participants).
- Developed 943 short courses and continuing education units.
- Hosted 904 webinars.
- Sent 48,405 tweets and posted 15,569 times on Facebook.
- Produced 3,885 blogs, fact sheets , newsletters, and handouts.
- Hosted 776 field trips, tours, demonstrations, and road shows with participation from 31,000 participants.
- Developed 1,177 videos.

Participation by organizations in FSEN activities increased between 2012 and 2020. The highest number of participants worked in government agencies, cities and states (including counties, local communities, and regional authorities), nongovernmental organizations (including consultants, Fire Learning Network, The Nature Conservancy, companies, private associations, and prescribed fire councils), and universities and colleges. Participation by private landowners and tribal nations almost tripled between 2012 and 2020.

# Appendix

**Table 1.** Number of 2020 FSEN activities by category.

| Activity Category | Activities |
|---|---|
| Academic Credit Courses | 18 |
| Bibliographies or Annotated Bibliographies | 5 |
| Blog Posts | 106 |
| Conferences or Symposia Presentations | 65 |
| Conferences/Workshops | 62 |
| Databases | 14 |
| Encyclopedias | 0 |
| Facebook Postings | 3,040 |
| Fact Sheets and Handouts Produced | 106 |
| Field Consultations and Expert Cadres | 178 |
| Field Trips, Tours, Demonstrations, or Road Shows | 31 |
| Guidelines or Guidebooks | 62 |
| Leadership Briefings | 177 |
| Newsletters Produced | 157 |
| Other Social Media Activities | 198 |
| Podcasts | 8 |
| Poster Presentations | 20 |
| Requests for Information, Assistance, or Referrals | 765 |
| Short Courses and Continuing Education Units | 539 |
| Syntheses | 23 |
| Talks and Personal Briefings about the Exchange | 175 |
| Training Sessions | 35 |
| Tweets | 7,823 |
| Video/Vimeo Productions | 319 |
| Webinars | 240 |
| **Total** | **14,166** |

**Table 2.** Number of participants in 2020 FSEN activities by category.

| Activity Category | Participants |
|---|---|
| Academic Credit Courses | 490 |
| Bibliographies or Annotated Bibliographies | 156 |
| Blog Posts | 3,906 |
| Conference or Symposia Presentations [1] | 4,106 |
| Conferences/Workshops | 7,474 |
| Databases | 2,504 |
| Encyclopedias | 0 |
| Facebook Postings | 168,069 |
| Fact Sheets and Handouts Produced | 15,626 |
| Field Consultations and Expert Cadres | 1,933 |
| Field Trips, Tours, Demonstration, or Road Shows | 2,767 |
| Guidelines or Guidebooks | 9,707 |
| Leadership Briefings | 2,466 |
| Newsletters Produced | 75,675 |
| Other Social Media Activities | 11,512 |
| Podcasts | 2,381 |
| Poster Presentations [2] | 1,031 |
| Requests for Information, Assistance, or Referrals | 1,232 |
| Short Courses and Continuing Education Units | 885 |
| Syntheses | 3,231 |
| Talks and Personal Briefings About the Exchange | 12,574 |
| Training Sessions | 869 |
| Tweets | 220,715 |
| Video/Vimeo Productions | 11,792 |
| Webinars | 11,482 |
| **Total** | **572,583** |

[1] Includes participants present for topic-specific discussions and not necessarily entire conferences.

[2] Includes participants engaged in poster presentations and not necessarily entire conferences.

**Table 3.** Number of participants by organization in 2020 FSEN activities.

| Organization Category | Participants |
|---|---|
| Agriculture Research Service | 12 |
| Bureau of Indian Affairs | 137 |
| Bureau of Land Management | 469 |
| Cities and Local Communities | 452 |
| Companies | 625 |
| Consultants | 537 |
| Counties/Burroughs/Parishes | 593 |
| Department of Defense, including Coast Guard | 169 |
| Fire Learning Network and The Nature Conservancy | 402 |
| U.S. Fish and Wildlife Service | 439 |
| Foreign Organizations and Individuals | 435 |
| U.S. Forest Service (National Forests, Grasslands, State and Private Forestry) | 2,347 |
| U.S. Forest Service Research | 573 |
| U.S. Geological Survey | 126 |
| National Aeronautics and Space Administration (NASA) | 12 |
| National Park Service | 388 |
| Natural Resources Conservation Service | 222 |
| Nongovernmental Organizations (includes those not previously listed) | 1,203 |
| National Oceanic and Atmospheric Administration and National Weather Service | 93 |
| Prescribed Fire Councils | 143 |
| Private Associations | 234 |
| Private Landowners | 1,105 |
| Regional Authorities | 146 |
| States | 3,433 |
| Tribal Nations | 219 |
| U.S. Fire Administration | 8 |
| University and College Faculty or Researchers | 2,050 |
| University and College Students | 1,004 |
| Bureau of Reclamation | 6 |
| **Total** | **17,582** |