Joint Fire Science Program Regional Consortia 2013 Evaluation Report

A National Cluster Evaluation of Consortia Process and Impacts

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Table of Contents

Table of Contents continued

Table of Contents continued

Executive Summary

The National Evaluation of the Joint Fire Science Program (JFSP) Consortia aims to assess the processes and outcomes of consortia programming at the aggregate national level. This ongoing evaluation includes four components: An online survey, targeting the fire science information-related experiences and opinions of fire managers/practitioners (Consumers), fire researchers/scientists (Producers), and members of the general public; a webmetrics component including quantitative and qualitative elements; an evaluation resource guide designed to assist consortia in evaluating their regional activities; and a qualitative interview component exploring the perspectives and experiences of key consortia personnel. The current report presents results obtained from the **third wave (Wave 3)** of data collection from the online survey and webmetrics evaluation components. In addition, it provides the results of analyses comparing mean survey responses across waves and consortia funding years, which illustrates consortia progress toward their shared goals.

Seven JFSP consortia participated in the online survey this year, actively recruiting participants between March 2013 and July 2013. A total of **339** individuals participated. Most participants were Consumers (71.5%) followed by Producers (19.8%) and members of the General Public (7.3%). The number of Wave 3 survey participants was substantially lower than the number of participants in Waves 1 and 2. This may be due to competing survey requests sent close to the time of the Spring 2013 online survey launch and to general survey fatigue of consortia listserve populations. The national evaluation team will work with the consortia to address these issues and increase response rates in future waves.

Online Survey Results

As in prior years, results from Wave 3 of the online survey were quite positive, with the majority of respondents to all three survey frames (Consumer, Producer, and General Public) reporting favorable opinions and experiences regarding fire science information. The following findings were particularly noteworthy:

- The majority of both **Consumers** and **Producers** were familiar with their consortium's programming and believed that their consortium has helped increase fire science information accessibility and applicability.

- Most **Consumers** agreed that they often draw on fire science research when making work-related decisions, suggesting behavioral change and a movement towards medium-term outcomes of consortia programming.

- The majority of both **Consumers** and **Producers** reported positive experiences with their consortium's website, indicating that the sites were user-friendly and provided a wide variety of up-to-date fire science information.

- Overall, both **Consumers** and **Producers** had positive attitudes toward one another. Yet, current results revealed some discrepancies between these two groups:

    - Producers viewed themselves as more approachable than Consumers perceived them to be.
    - Producers' agreement that Consumers valued their experience and expertise was stronger than Consumers' agreement that Producers valued *their* experience and expertise.
    - Both Consumers and Producers expressed a desire to work with one another, but this desire was more strongly expressed among Producers.

- **General Public** respondents expressed a very strong interest in learning more about fire science/management issues.

- **General Public** respondents cited interactive, face-to-face learning opportunities and the internet as their top preferred sources of fire science information.

- The internet was by far the most frequently accessed fire science information source among **General Public** respondents.

Comparative Analyses

The national evaluation team compared mean responses of survey participants affiliated with consortia in their first year of funding with those of survey participants affiliated with consortia in their second year of funding. Two data sets were developed from the national survey data so that Wave 1 data could be compared to Wave 2 data (see p. 44 for further explication of this data analytic process). These comparisons between first and second year data provided a method of tracking consortia progress toward their shared goals while considering consortia differences in funding and development.

Analyses revealed numerous statistically significant positive changes in mean survey responses from FY 1 to FY 2, indicating that consortia programming is improving fire science delivery. The majority of positive changes were observed among Consumer respondents, but statistically significant positive differences among Producers and the General Public also were noted.

Statistically Significant Differences in Consumer Responses from FY 1 to FY2

Compared to FY 1 respondents, FY 2 respondents were more likely to agree that:

- Fire science information is easy to find and easy to understand
- During the past year, I have changed at least one thing in my work based on what I've learned about fire science
- The consortium has helped improve the accessibility of fire science information in my region
- The consortium has helped improve the use and application of fire science information in my region
- The consortium has helped to improve policy regarding fire management in my region
- The consortium has helped improve communication among Consumers and Producers of fire science information in my region
- I would recommend consortium involvement to my co-workers
- My consortium's website is user-friendly, provides a wide variety of fire science information, and provides practical information I can use in my job
- My consortium's website provides information that is current and up-to-date and organizes the information I need in one convenient place

In addition, FY 2 respondents were more likely than FY 1 respondents to report that **they used information obtained from their consortium's website in their job.**

Statistically Significant Differences in Producer Responses from FY 1 to FY2

Compared to FY 1 respondents, FY 2 respondents were more likely to agree that:

- The consortium has helped to improve the accessibility of fire science information in my region
- The consortium has helped improve the use and application of fire science information in my region
- The consortium has helped improve policy regarding fire management in my region
- The consortium has helped improve communication among Consumers and Producers of fire science information in my region
- My consortium's website keeps me informed of current research findings

In addition, FY 2 respondents were more likely than FY 1 respondents to report that **they used information obtained from their consortium's website in their job.**

Statistically Significant Differences in General Public Responses from FY 1 to FY2

Compared to FY 1 respondents, FY 2 respondents were more likely to agree that:

- Fire science information is easy to find
- I plan to use what I've learned about fire science to protect my land/community
- I am concerned about fire danger in my community

Webmetrics Results

The webmetrics component of the national evaluation includes two elements. The quantitative component assesses the impacts of consortia websites in terms of the number of users reached, the extent to which users *engage* with the sites, and the performance of specific website features or pages. The qualitative component examines the operation of the consortia websites in more detail and solicits feedback from those most familiar with their consortium's website (e.g., Coordinators and/or PIs, Webmasters) regarding purpose, target audiences, and website-related challenges. The qualitative webmetrics component is intended to complement the qualitative components, and key findings from both elements are highlighted below:

- There was a decrease in mean total and unique website visits from Wave 2 to Wave 3. This may be because six of the consortia had only recently launched their websites and submitted webmetrics data for the first time in 2013.

- Visitor loyalty numbers remain steady, indicating that consortia sites are successfully retaining users.

- Users are directed to consortia websites through several traffic sources (e.g., search engines, referrals, Mailchimp). Yet, most consortia representatives were unaware of any other websites that included links to their consortium's site.

- Consortia representatives reported updating their websites more frequently than in prior years; however, the average reported amount of time spent on the sites per week did not increase from Wave 2 to Wave 3.

- Consortia continue to experience challenges in designing, organizing, and maintaining their websites, and many may greatly benefit from outside assistance.

- Only one consortium has conducted a regional-scale evaluation of their website, although most other consortia have plans to do so in the future.

These 2013 results are the first in which all JFSP consortia are represented across online survey and webmetrics components. Due to consortia support and participation in the national evaluation, adequate national data have been collected to establish a baseline for future assessment. Comparative analyses assessing initial consortia impacts are highly encouraging, indicating that the consortia have made significant progress towards many shared objectives.

Introduction

During the past several years, there has been an increasing emphasis on federally funded program accountability. Programs must clearly demonstrate the impacts of their efforts in order to secure future funding and support; this is often best accomplished through theory-driven evaluations examining multiple facets of program activities and outcomes. To this end, the national cluster evaluation of the JFSP regional consortia employs a mixed-method approach grounded in the Logic Model to assess the processes and outcomes of consortia activities. As each consortium is diverse and in varying stages of development, the present evaluation is conducted at the aggregate level to track consortia progress toward their shared goals related to the enhancement of fire science delivery. Results are intended to: 1) Assist the JFSP Board in determining how to improve and support future consortia performance and success; 2) Provide feedback concerning consortia progress toward their goals to help maximize the impacts of outreach and educational activities; and 3) Facilitate the development of JFSP Best Practices toward reaching consortia goals.

The national cluster evaluation of the JFSP contains four components: A web-based survey targeting fire managers/practitioners, fire researchers/scientists, and members of the general public; a webmetrics piece of both quantitative and qualitative data regarding the individual consortia websites; development and distribution of an evaluation resource guide to help consortia build capacity to conduct regional-scale evaluations; and interviews conducted with consortia personnel to capture the successes and challenges encountered in increasing the accessibility and applicability of fire science information. Findings from the qualitative interview component were presented in a separate report distributed in Summer 2013. The current report focuses on the findings from the **third wave** of the online survey and webmetrics components of the JFSP consortia evaluation.

This report begins with an overview of the online survey component of the JFSP consortia evaluation, which focuses primarily on respondents' perceptions and behaviors regarding fire science information accessibility and applicability. Findings from the Spring 2013 survey are presented, followed by results from statistical tests comparing mean responses across survey waves and consortia funding years. Next, this report summarizes results obtained from the qualitative and quantitative webmetrics components of the JFSP consortia evaluation. Implications of both online survey and webmetrics findings are explored in respective summary sections.

The results from Waves 1 and 2 of the national evaluation are intended to provide a basic understanding of participants' attitudes and experiences of fire science information delivery, and to establish a baseline for tracking future consortia progress. The current report is more comprehensive than in prior years, as 2013 marks the first year in which all 14 JFSP consortia were represented in both online survey and webmetrics data. Though the national evaluation still seeks to enhance the understanding of participants' most current perspectives on fire science information accessibility and applicability, its focus has shifted toward assessing consortia programming impacts and outcomes.

Online Survey Component

While the JFSP consortia are unique entities, they share the same primary objective: To improve fire science delivery by increasing the accessibility and applicability of fire science information. Though each consortium has developed a unique set of outreach and educational activities intended to further this objective, many similarities emerge upon examining individual consortium goals as proposed to the JFSP Board. For instance, many aim to improve relationships between fire practitioners and scientists, provide more interactive learning opportunities for fire practitioners, and to synthesize and clarify current fire science research results. The online survey was developed in collaboration with consortia PIs and Coordinators to assess progress toward these and other shared goals, as well as the effectiveness of common consortia strategies aimed at facilitating goal attainment.[1]

As with other national evaluation components, the online survey aims to enhance continued understanding of the impacts and obstacles consortia experience in striving towards shared goals. To achieve this understanding, new survey data must be collected at regular intervals. All consortia have the opportunity to redistribute the online survey each spring and are required to do so at least once every two years. Survey redistribution requirements and recommendations for each consortium depend upon the individual funding and renewal schedule. Thus, data collected during each annual wave of survey distribution reflects a slightly different group of participating consortia. Slight modifications to help improve the survey may be made between annual distributions; however, the content remains similar across waves to facilitate analyses of trends over time.

The online survey is intended as an aggregate assessment to account for consortia diversity. Despite annual variations in consortia participation, the overarching objective of the survey is to assess JFSP consortia progress toward their goals *as a whole*. This section first reports the comprehensive results obtained from the Spring 2013 online survey, which was distributed by seven of the JFSP consortia. This analysis summarizes consortia constituents' most current opinions and experiences regarding fire science delivery, and also will be used in the future as a comparison point from which to track future consortia progress. Next, this section reports the results of statistical analyses comparing survey responses from consortia in their first year of funding to consortia in their second year of funding. These are the first comparative analyses that include all 14 JFSP consortia and reveal several statistically significant positive impacts of early consortia programming.

Three frames of the Online Survey were developed in order to capture the perspectives and experiences of these distinct audiences. The first targets *Consumers* of fire science information, or fire managers/practitioners, whereas the second targets *Producers* of fire science information, or fire researchers/scientists. The third frame is intended for members of the general public which are essentially all other respondents who may be exposed to consortia outreach or educational activities but do not identify as fire science professionals. When

[1] Please refer to the 2010-2011 Report for Wave 1 results and a more comprehensive discussion of online survey development and design.

possible, items in the Consumer and Producer survey were constructed to be complementary or parallel. The three survey frames, however, also contain many unique items and often use different language and phrasing. The General Public version in particular differs from the other two frames; it is more focused on basic experiences and preferences regarding fire science information. Thus, following a description of the survey method and participants, this section presents specific results for each frame separately.

Method

Five of the more recently funded JFSP consortia and two original consortia actively recruited participants for Wave 3 of the online survey. Each participating consortium launched the survey between March 2013 and July 2013, at a time deemed most appropriate for a consortium depending on its stages of development, location, and fire season. "Contact lists" with potential participants' names and email addresses were used by each participating consortium for recruitment purposes; these were developed by compiling existing email lists, contacts from prior needs assessments, and registrants at websites and various educational activities. To reach as many participants as possible, a "snowball" sampling strategy was used, whereby existing contacts were encouraged to forward the survey invitation to any other qualified or interested participants. University of Nevada, Reno Institutional Review Board certification was sought and obtained for all data collection activities described in this report.

Recruitment followed the Dillman method (Dillman, Smyth, & Christian, 2009), which recommends that participants receive three separate invitations to participate in survey research: An initial recruitment notice, a follow-up reminder, and a final reminder. All participating consortia forwarded these invitations via email (staggered across approximately six weeks, with two weeks between each distribution) to all those on their respective contact lists. Participants accessed the survey via the link included in all recruitment emails. Upon entering Survey Monkey (the online survey host site), participants were asked to select their primary identification (Consumers of fire science information, or managers/practitioners; Producers of fire science information, or researchers/scientists; or the General Public, encompassing landowners/community members not currently employed in a fire science profession). Based on these responses, participants were electronically directed to the appropriate survey frame. Participants subsequently responded to a variety of multiple choice items depending on survey frame. Upon completing the survey, participants were thanked and redirected to the JFSP website home page.

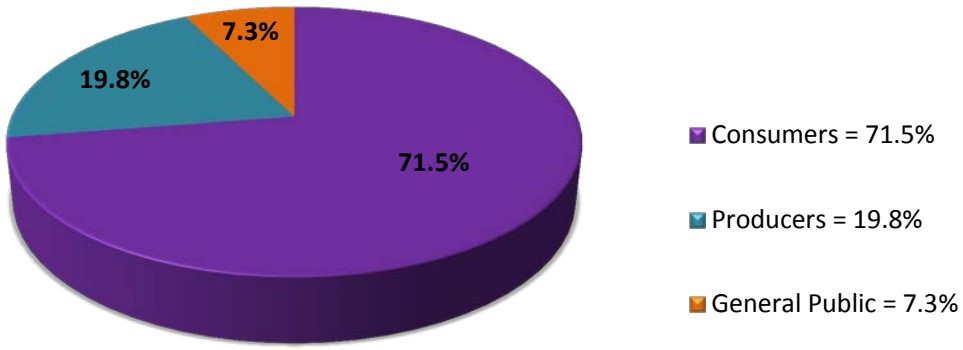
Participants

A total of **339** individuals accessed the Spring 2013 online survey and agreed to participate, and **290** (85.5%) of these participants completed the entire survey.[2] Among those who began the survey, 71.5% (*n* = 246) identified themselves as Consumers of fire science information, 19.8%

[2] The percentage of respondents who completed the entire survey is similar to that obtained in survey years 2011 and 2012. There were no noticeable patterns regarding attrition, with individuals discontinuing participation at various points throughout the survey. All responses up to the point of discontinuing the survey were included in analyses.

(*n* = 68) identified themselves as Producers of fire science information, and 7.3% (*n* = 25) identified themselves as the General Public/community members (see Figure 1). Participant demographics (e.g., gender, age, ethnicity, and role) are reported below for each survey frame.

Figure 1. Primary Identification of Survey Respondents



Seven consortia actively recruited participants for the Spring 2013 survey. To minimize survey fatigue among their regional respondents, the Alaska, California, Lake States, Southern Fire Exchange, Southwest, and Tallgrass consortia were not required to redistribute the survey and thus did not actively recruit 2013 survey participants.[3] Yet, many participants affiliated with these consortia responded to the survey due to the snowball sampling procedure and regional geographic "overlap" across consortia. As a result, only one of the existing JFSP consortium and one newly implemented consortium were not represented in the 2013 online survey.

In the Spring 2013 survey, participants were asked to identify the primary consortium in which they worked or lived. Table 1 displays the frequencies of survey respondents per frame who were primarily affiliated with each consortium. Consumer and Producer participants also were asked to identify any other consortium in which they worked. Over half of both Consumer respondents (55.1%) and Producer respondents (67.2%) indicated that they worked in more than one consortium. The extent of consortia "overlap," (i.e., individuals identifying with multiple consortia) appears to be rising, particularly among Consumers. In the 2012 survey, 21.3% of Consumer respondents and 47.1% of Producer respondents reported working in more than one consortium.

[3] The Southern Rockies consortium distributed the online survey in the fall of 2013 and the responses obtained are not included in this report.

Table 1. Number of Online Survey Respondents by Consortium

Consortium	Consumer *N*	Producer *N*	Public *N*	Total *N*
Alaska	0	0	0	**0**
Appalachians	24	6	3	**33**
California	0	2	0	**2**
Great Basin	19	9	1	**29**
Great Plains	31	3	5	**39**
Lake States	0	1	0	**1**
Midwest Oak	42	11	5	**58**
Northern Rockies	24	5	1	**30**
Northwest	12	10	2	**24**
Pacific	4	6	2	**12**
Southern Fire Exchange	21	4	2	**27**
Southern Rockies	5	0	0	**5**
Southwest	3	0	0	**3**
Tallgrass	13	3	1	**17**
National Level	3	1	0	**4**
Other	4	0	0	**4**

***Note:** These figures reflect the number of participants who completed the entire survey and explicitly identified their primary consortium via a multiple choice survey item.

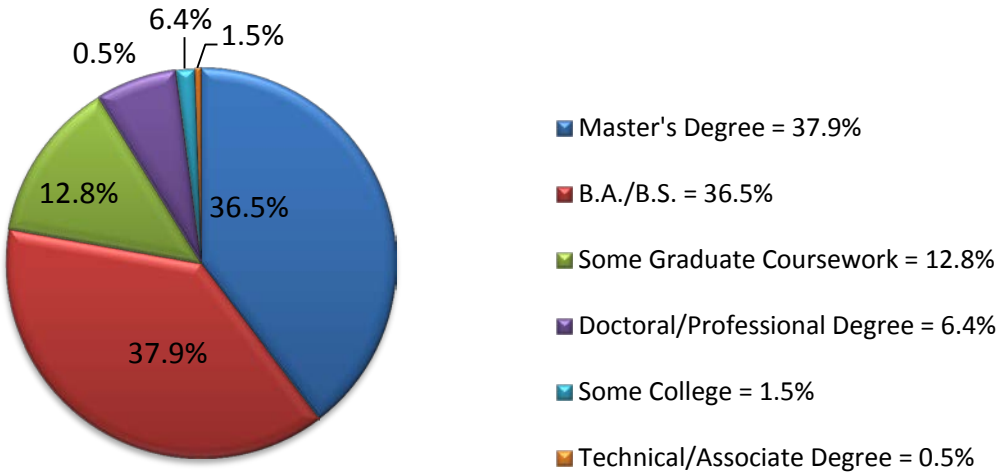
Consumer Survey Results

Consistent with findings from Waves 1 and 2 of the online survey, Consumers were by far the most represented group of participants. Nearly three quarters (71.5%, *N* = 246) of total survey respondents identified as Consumers of fire science information, working as fire managers, practitioners, or technical specialists. As Consumers are the primary target of consortia outreach and educational activities, the Consumer survey also is the most extensive of the three frames. Consumers were asked to respond to a variety of multiple choice items, including those targeting their experiences with fire science information and information producers; opinions and experiences regarding their regional consortium and their consortium's website; experiences with fire science information sources; and perceptions of obstacles to accessing and applying fire science information. As with the other survey frames, Consumer items primarily targeted consortia progress toward their shared goals, effectiveness of broader educational activities/interventions designed to increase fire science information access and applicability, and identification of strengths and challenges in improving fire science delivery. Whenever possible, items were constructed to assess short- and medium-term outcomes of consortia programming in terms of the Logic Model (i.e., changes in awareness, knowledge, attitudes, motivations, behaviors, and policy/practices).

Consumer Demographics

Consumer survey respondents were primarily male (72.4%) and Caucasian (91.7%). Other reported ethnicities included Multi-Ethnic (2.6%); Hispanic/Latino (1%); American Indian (1%); Asian/Pacific Islander (0.5%); and Black (0.5%). The mean age of Consumer survey respondents was 46.8 years. Consumer respondents were experienced and well-educated. Average reported length of time working as a fire practitioner/manager was 19.6 years, and the majority had earned a Bachelor's or post-baccalaureate degree (see Figure 2).

Figure 2. Consumer Educational Background



The majority of respondents described themselves as either natural resource specialists (44.6%) or fire managers/practitioners (34.2%). Additional reported roles included "Other," which included forester, ecologist, policy analyst, and a conglomeration of other specializations; line officer/decision maker (5.7%), firefighter (3.1%), land management support (2.6%) and urban planner (1.6%; see Figure 3). Half of Consumers were affiliated with federal organizations (50.0%), followed by state agencies/organizations (26.0%); non-profit organizations (10.6%); or university-based (4.9%; see Figure 4).

Figure 3. Primary Role of Consumers

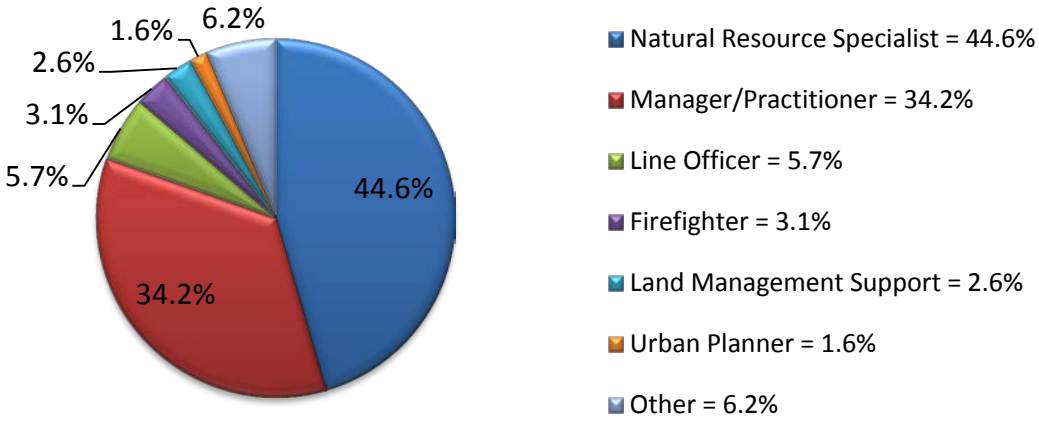
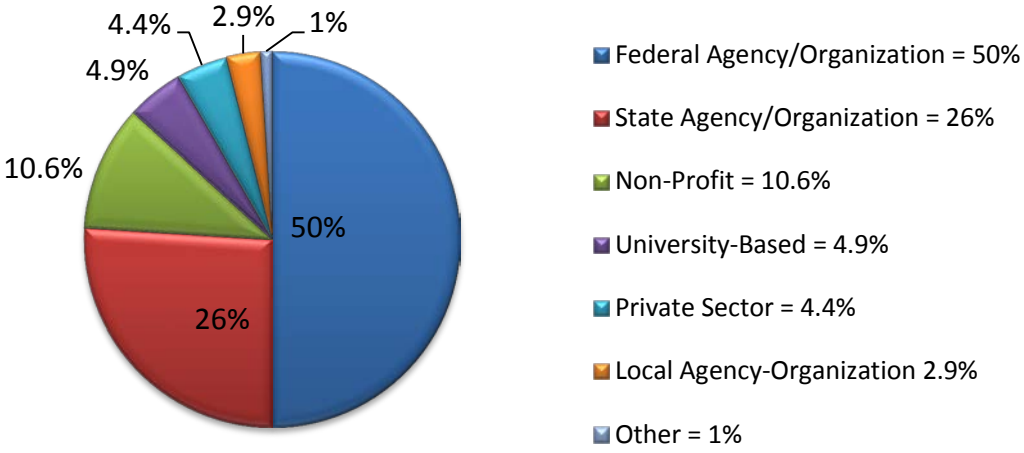


Figure 4. Affliation of Consumers



Experiences with Fire Science Information and Information Producers

The first section of the Consumer survey instructed participants to indicate their level of agreement with 13 statements targeting their perceptions and experiences concerning fire science information and fire science information producers. In addition, this section included two additional categorical response items regarding collaboration between fire science information Consumers and Producers. These items were designed to yield basic information regarding the accessibility and applicability of fire science research results and tools from the manager/practitioner perspective, as well as to help determine the extent to which increases in fire science knowledge impact decision-making and behaviors. In their proposals to the JFSP Board, most consortia emphasized the importance of fostering communication among Consumers and Producers of fire science information as a means of ultimately enhancing fire science delivery. Thus, several items in this section also focus on Consumers' perceptions and experiences regarding fire science information producers to obtain a better understanding of the relationships between these two groups. According to the Logic Model framework, most items were constructed to assess short-term (e.g., changes in beliefs, attitudes, awareness, and knowledge) and medium-term (e.g., changes in decision-making and behaviors) outcomes of consortia programming. Initial changes and improvements in these areas are detailed in the Comparative Analyses section of this report.

Responses to the first 13 items in this section occurred on a 5 point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree. Table 2 displays Consumers' mean responses to items targeting their basic experiences and opinions concerning fire science information. All mean responses occurred at the positive end of the scale, indicating relatively favorable evaluations of fire science information accessibility and applicability. Consumers expressed the strongest agreement with the statement, *"Fire science information enhances my effectiveness on the job,"* and were least inclined to agree with the statement *"Fire science information is easy to apply to my specific problems,"* though mean responses to this item still fell on the positive end of the scale. This is consistent with key issues highlighted by consortia in their funding proposals; namely, that Consumers face challenges in accessing fire science research results and tools relevant to their work and/or in translating and adapting extant fire science information for their own use.

Table 2. Consumer Perceptions and Experiences Regarding Fire Science Information Accessibility and Applicability: Mean Responses

Item	Mean (SD)
Using fire science information enhances my effectiveness on the job	**4.00** (0.61)
Fire science information should be shared more frequently within my agency/organization	**3.91** (0.72)
I trust fire science research findings	**3.78** (0.69)
I often draw on fire science research when making work-related decisions	**3.70** (0.81)
Fire science information is easy to find	**3.54** (0.77)
During the past year, I have changed at least one thing in my work based on what I've learned about fire science	**3.50** (0.81)
Fire science information is easy to understand	**3.43** (0.76)
Fire science information is easy to apply to my specific problems	**3.29** (0.75)

***Note: (**5 point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree)

Table 3 displays Consumers' mean responses to items targeting their perceptions and experiences concerning producers of fire science information (i.e., fire science researchers/scientists). All responses to these items were at the positive end of the scale (with the exception of the negatively framed items), suggesting that Consumers have relatively favorable opinions of fire science information producers and their work.

Table 3. Consumer Perceptions and Experiences Regarding Fire Science Information Producers: Mean Responses

Item	Mean (SD)
Fire science researchers/scientists are willing to directly work with me if I have questions about research or how to apply fire science at my job	**3.42** (0.71)
Fire science researchers/scientists are easy to approach	**3.42** (0.71)
Fire science researchers/scientists value my knowledge and experience as a field professional	**3.39** (0.87)
Fire science researchers/scientists are reluctant to study problems and issues suggested by local managers/practitioners*	**2.82** (0.92)
Fire science researchers/scientists rarely provide information that helps me address the management problems I face*	**2.56** (0.87)

***Note**: The last two items in this table are negatively framed. As all responses occurred on a 1 (Strongly Disagree) to 5 (Strongly Agree) scale, lower mean values on these items would indicate more positive perceptions and experiences regarding fire science information producers.

Table 4 displays the frequency of responses to the two categorical items regarding Consumers and Producers working together. Half of all Consumer respondents (50.0%) reported that they had worked with fire researchers/scientists on a research or management project, and most (79.2%) said they would like to work with or continue working with Producers.

Table 4. Consumer Perceptions and Experiences Regarding Working with Fire Science Information Producers

Item	Yes	No	Unsure
Have you worked jointly with fire researchers/scientists on a research or management project?	**50.0%**	**50.0%**	**N/A**
Would you like to work/continue to work with fire researchers/scientists on a research or management project?	**79.2%**	**1.8%**	**19.0%**

Items Regarding *Consortium* Efforts

Due to the varying developmental stages of the consortia, it was expected that some respondents would be unfamiliar with their regional consortium and its link to regional fire science activities and outreach efforts. Thus, prior to receiving any survey items explicitly referencing consortia, respondents were asked whether they were aware of a fire science and delivery Consortium supported by the Joint Fire Science Program in their region. Most were indeed aware of their regional consortium (84.8%) and were subsequently asked to respond to seven items regarding their opinions and experiences about their consortium. The remaining 15.2% of respondents who indicated that they were unaware of their regional consortium skipped these items and continued on to the next portion of the survey.

Responses to items pertaining to respondents' consortium occurred on a 5-point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree. As shown in Table 5, all mean responses fell at the positive end of the scale. Responses to the item, "*The Consortium has helped improve fire management policy in my region,"* trended towards neutrality/uncertainty, which reflects the increased time needed for more medium-term outcomes to emerge. Importantly, respondents indicated the highest level of agreement with the statement that *"The Consortium is needed to help coordinate sharing of fire science information in my region."*

Table 5. Consumer Opinions and Experiences Regarding their Regional Consortium

Item	Mean (SD)
The Consortium is needed to help coordinate sharing of fire science information in my region	**4.05** (0.66)
The Consortium has helped improve the accessibility of fire science information	**3.95** (0.75)
I would recommend Consortium involvement to my co-workers	**3.92** (0.73)
The Consortium has helped improve the use and application of fire science in my region	**3.68** (0.79)
The Consortium has helped improve communication among fire managers/practitioners and fire researchers/scientists in my region	**3.67** (0.78)
The Consortium has made it easier for my agency/organization to accomplish its goals	**3.22** (0.81)
The Consortium has helped improve policy regarding fire management in my region	**2.99** (0.77)

***Note:** (All responses occurred on a 5-point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree)

Perceptions of Consortia Websites

A review of initial and renewal funded proposals reveals that all JFSP consortia aim to establish and continuously improve individual websites. These sites are critical in fostering consortia progress toward their overarching goals. Lack of time and the observation that "fire science information is not available in one convenient place" are commonly cited obstacles to accessing and applying research results and tools. Consortia websites help organize fire science research results and resources for busy fire science professionals and other interested users; websites also inform users of continuing learning opportunities and consortia-sponsored activities. Websites incorporating interactive components (e.g., communication forums, features allowing managers/practitioners to submit questions to researchers/scientists) also may help foster relationships between fire science information Consumers and Producers.

The purposes and impacts of the consortia websites are further discussed in the Webmetrics section of this report. Considering the importance of these websites in enhancing fire science delivery, we continued to explore Consumers' experiences and opinions regarding their consortium's website using six multiple choice items and one open-ended response item in the online survey.

Because the consortia are all in varying phases of website development and improvement, it was expected that some respondents would not be able to report on their experiences with their consortium's website. Prior to receiving any website-related items, Consumers were first asked if they had visited their consortium's site. Over three quarters (77.8%) indicated that they had and were asked subsequently to respond to relevant items. The remaining 22.2% of

respondents did not receive any other items about their consortium's website and were electronically redirected to the next portion of the survey.

Quantitative Consumer responses

Respondents indicating that they had visited their consortium's website were next asked to respond to five Likert scale items where 1 = Strongly Disagree and 5 = Strongly Agree. Mean responses to this item set indicate that users were satisfied with site content, with most agreeing that their site provided a variety of current and practical information (see Table 6). Consumers also were asked whether their consortium's site included an interactive feature ("*Does your consortium's website provide a forum where you can share information and ask questions?*"*).* Most respondents were "not sure" if their consortium's site offered this type of feature (61.3%). Over one-third of respondents said that their consortium's site *did* provide an interactive forum (35.7%), and 3.0% specified that such features were not available on their consortium's site. Thus, though responses to website-specific items were generally quite positive, they do suggest that consortia may wish to improve the general organization of fire science information within their sites and further promote interactive website components. That is, many sites include interactive components, but users are still unaware of them or may not understand how to use them.

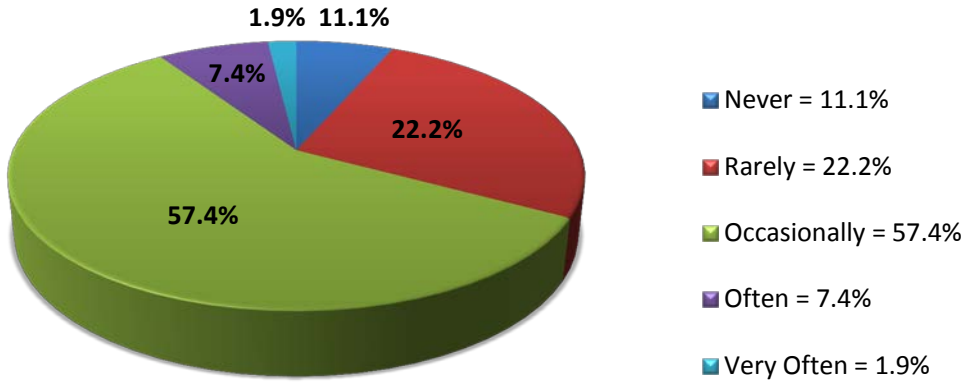
Finally, users were asked to indicate how often they used information obtained from their consortium's website in their job during the past year on a 5-point Likert scale where 1 = Never and 5 = Very often. Results suggest that most respondents applied such information on-the-job "*occasionally*" (*M* = 2.75, *SD* = .74; see Figure 5 for response frequencies). As detailed in the "Trends across Funding Years" section of this report, the reported application of fire science information obtained from consortia websites has increased since the 2012 survey distribution. It takes time for a user to become familiar with their consortium's site, access and digest its contents, and apply what they have learned in their job.

Table 6. Consumer Responses Regarding their Consortium's Website

Item	Mean (SD)
My Consortium's website provides information that is current and up-to-date	**3.83** (0.61)
My Consortium's website provides a wide variety of fire science information	**3.80** (0.64)
My Consortium's website is user-friendly	**3.75** (0.55)
My Consortium's website provides practical information I can use in my job	**3.67** (0.65)
My Consortium's website organizes the information I need in one convenient place	**3.59** (0.70)

***Note:** All responses occurred on a 5-point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree

Figure 5. Frequency of Consortia Website Information Use by Consumers on the Job



Qualitative Consumer Responses: Additional Survey Responses Concerning Consortia Website

After responding to the closed-ended items about their consortium's website, Consumers had the opportunity to provide suggestions, thoughts about website features or organization, or other experiences with the site. A total of 37 Consumers responded.[4] The most common themes expressed in such commentary are outlined as follows:

- **Website related challenges.** Several respondents expressed concern about their consortium's website. Concerns generally fell into two main categories: (1) poor website functioning and (2) feelings that the information provided was not relevant or biased.

    1. Respondents' statements about poor website functioning expressed desire for their consortium's website to include features similar to neighboring consortium's site or general difficulties of use:
        - *"I feel the format of the SFE website is easier to use (compared to my consortium), it looks more modern and professional and is more up to date. I can generally find links quicker on that site"*
        - *"I have tried to use the website, it is not specific to my area and is not very user friendly. For this reason I do not frequent it. I can get my information from other places easier"*
        - *"Not always clear on how to go from the main site to the consortium sites"*

[4] A thorough analysis of all commentary provided is beyond the scope of this report; however, a complete text of all open-ended comments offered here and elsewhere in the report is available upon request.

2. Other respondents stated that they felt the posted information on their consortium's site was either not applicable for the work they do or was pushing a particular agenda/viewpoint:
    - *"As you add more information and pages, please add more management-relevant materials. Science that does not address my daily job does not interest me or my co-workers"*
    - *"It tends to cite and research topics favorable to their interest. It never expresses differing viewpoints"*
    - *"Strong open woodlands / savanna bias, which may turn away many traditionally-trained foresters and silviculturists who appreciate BOTH closed-canopy forest structures and open woodlands and savannas for their oak regeneration potential. Foresters frequently butt heads with wildlife biologists and ecologist types when the latter feel compelled to convert all closed-canopy forests into woodlands and savannas"*
    - *"Fire Consortium must realize fire is only a tool and not the tool. They must realize that Social, Biological, and Economics must be taken into account when managing the forest. When fire becomes THE tool often the social and economic aspects are ignored"*

- **Suggestions for improving websites.** Many respondents had recommendations for elements they would like to see: (1) website features added and (2) specific topics of interest addressed.

1. Website features to add:
    - *"I think the website does a good job of collecting the relevant research and posting new research articles, but I think what would be useful is a forum for discussion of some of those publications … Perhaps a "brown bag" webinar type format could be organized around specific articles, such as the Brose or Arthur oak-fire synthesis-type publications, which came out last year. Such a structured format might facilitate some dialog around those important studies with a core audience and under some temporal limitations, unlike an open web forum/community board discussion"*
    - *"It would be helpful if there was a wider searchable database of papers and an annotated bibliography. A list of scientific experts and their contact info would also help. I really like the research topic summaries provided on the site and the list of key papers"*
    - *"Keep research information and findings in easy to use language for field managers. Provide information that managers can use in their management"*
    - *"More applied information would be ideal - Case studies of actual users and how the Consortium has helped them improve or safely use more fire on the ground"*

2. Specific topics of interest:
    - *"More information regarding invasive species control"*
    - I *"would love to see a re-work of the FEIS fire effects database on plant species specific to the Appalachians* [sic]. *Most of the current database is western species only"*
    - *"To properly integrate fire science information fire science needs to study, 1) The need for wildlife interior habitat vs. fragmented fuels. 2) Timber is a renewable resource that small communities depend on to fund schools, road maintenance. Burning the timber resource does not facilitate those objectives. 3) Forest access is a hot topic. The public wants more access, but funding road maintenance is not supported by congress"*
    - *"There should be a study done to compare, a. How timber harvesting in the 70's facilitated and supported fire suppression. b. How the current bug kill and fuel conditions affect fire suppression. c. How does sustained yield integrate with fire suppression, wildlife interior habitat, forest access, hydrology, range, aquatic resources at the stand, watershed and forest scales. Note 1 Logging crew provided standby firefighting resources. Note 2 What are the economic implications of forest management and fire management actions?"*

- **Positive comments about websites.**
    1. Some respondents expressed positive views about social media that support website goals, particular website features, as well as the consortia themselves:
        - *"The Facebook page provides really accessible information and exchange in addition to the website"*
        - *"The archived workshops and webinars that can be accessed and viewed using these websites (are) a very good feature. I think overall the website is attractive, easy to navigate, and very useful to fire practitioners [sic] in the area of coverage. Thanks for the good work!!!"*
        - *The "website manager has reached out to managers and offered to help post specific information for a project. Their flexibility was very helpful. Great new ideas are in the works like the consortium map showing where what research is taking place and how to get more information"*
        - *"Love the Great Basin JFSP!"*

Although comments come from a limited sample and may or may not represent majority views, common themes nonetheless highlight areas for consortium consideration. Feedback suggests that consortia should continue enhancing site organization and making their sites user-friendly. Steps should be taken to reach out to website users to discover the best ways to present information. Whereas differences of viewpoints concerning the most up-to-date fire science are unavoidable, consortia may facilitate fire science translation by directly addressing concerns and framing information in a manner most suitable for its intended audience.

Experiences with Fire Science Information Communication Sources

The JFSP consortia have proposed and implemented numerous strategies for disseminating current and practical fire science information to Consumers. Such plans include the development and expansion of web-based sources of fire science information, synthesizing fire science information via newsletters, fact sheets, and brochures, and increasing the number of interactive and hands-on learning opportunities available to Consumers (e.g., workshops, conferences, field demonstrations). Accordingly, the online survey examined Consumers' basic experiences with 11 common communication sources of fire science information. Consumers were first asked to indicate how often they had accessed information from each communication source during the last year; responses occurred on a 5-point Likert scale where 1 = Never and 5 = Very often. Next, Consumers were asked to rate the usefulness of the information they had accessed from each communication source on a 5-point Likert scale where 1 = Not useful and 5 = Very useful. Such responses may help focus consortia efforts towards disseminating fire science information via preferred and the most "useful" communication sources.

Table 7 displays Consumers' mean responses to items assessing perceived usefulness of fire science information obtained from common communication sources and the frequency with which respondents accessed information via these sources. Responses to these items were more variable than those to other survey items, as indicated by larger standard deviations. This may be attributable to differences in learning opportunities extended to Consumers, varying levels of exposure to communication sources, and individual learning preferences.

Table 7. Mean Ratings of Fire Science Information Communication Sources: Frequency of Access and Perceived Usefulness

Communication Source	Often Accessed Mean (SD)	Usefulness Mean (SD)*
Communicating with co-workers	**3.50** (1.21)	**3.75** (1.02)
Journal articles, papers, or professional reports	**2.96** (1.06)	**3.56** (0.98)
Workshops or trainings	**2.21** (0.95)	**3.54** (1.18)
Communicating with researchers/scientists	**2.32** (1.01)	**3.50** (1.29)
Professional meetings/conferences	**2.15** (0.99)	**3.47** (1.22)
Research briefs, fact sheets, brochures	**2.83** (0.88)	**3.39** (0.97)
Web-based sources	**2.95** (0.96)	**3.35** (1.01)
Field tours/demonstration sites	**1.87** (0.90)	**3.35** (1.40)
Webinars/teleconferences	**2.39** (1.06)	**3.28** (1.19)
Newsletters	**2.76** (0.94)	**3.10** (1.05)
Videos	**1.94** (0.91)	**2.94** (1.26)

***Note**: Because some Consumers had little or no experience with some of these fire science information sources (i.e., had never accessed during the past year), not all respondents provided usefulness ratings. *N*s for usefulness ratings ranged from 141 (*Videos*) to 187 (*Research briefs, fact sheets, brochures*).

As Figure 6 demonstrates, the top three most frequently accessed communication sources (*Communicating with co-workers, Journal articles, papers, or professional reports, Workshops or trainings*) also were rated as providing the most useful fire science information. These findings suggest that Consumers are receiving helpful information via highly accessible and time-effective sources; they also highlight the importance of inter-organization sharing of fire science information as *Communicating with co-workers* was the top rated source. More notable discrepancies occurred, however, between frequency of participation and ratings of usefulness for sources such as *Workshops/trainings* and *Communicating with researchers/scientists*. It is understandable that Consumers will have fewer opportunities overall to access such sources. Yet, these relatively high usefulness ratings support continuing efforts to offer more interactive learning opportunities and foster communication among fire science information Consumers and Producers.

Figure 6. Fire Science Information Communication Sources: Mean Ratings of Usefulness and Frequency of Access

Consumer Perceptions of Obstacles to Accessing and Applying Fire Science Information

In the final section of the Consumer survey, respondents were asked about their perceptions of obstacles to the accessibility and application of fire science information in their region. Specifically, they were presented with five potential obstacles, and instructed to indicate the extent to which they faced this obstacle in accessing relevant fire science information on a 5-point Likert scale where 1 = Strongly Disagree (that I face this obstacle) and 5 = Strongly Agree (that I face this obstacle). These items are included to help illuminate general strengths and gaps in consortia programming. Results from prior and future waves of the online survey can be used to determine if such gaps are being addressed effectively (see "Trends across Funding Years" section).

Table 8 displays Consumers' mean responses to items assessing their perceptions of obstacles to accessing and applying fire science information in their region. Responses to the obstacles items were more neutral than responses to any other item set in the survey, and do not indicate any strong deficiencies in consortia programming. Current results indicate that Consumers perceive lack of communication both *between* and *within* agencies and organizations as the top obstacles to accessing and applying fire science information. In prior waves of the online survey, "*Fire science information is not available in one convenient place*" was the top-rated obstacle; this year, it has dropped to the third top-rated obstacle. Consortia efforts to organize and synthesize fire science information via their websites and written products were likely critical in addressing this barrier. An increased focus on improving both inter- and intra- organizational communication may be warranted, considering the extent to which Consumers report learning through personal and on-the-job encounters.

Table 8. Obstacles Consumers Face in Accessing Relevant Fire Science Information

Obstacle	Mean (SD)
Lack of communication *between* agencies and organizations in my region decreases the accessibility of fire science information	**3.28** (0.96)
Lack of communication *within* agencies and organizations in my region decreases the accessibility of fire science information	**3.17** (0.96)
Fire science information is not available in one convenient place.	**3.08** (0.92)
I have few opportunities to communicate with fire scientists/researchers	**3.04** (1.02)
Available fire science information and/or research results are difficult to apply in the field	**2.99** (0.91)
Available fire science information and/or research results are not presented in a way that managers/practitioners can easily digest and understand	**2.98** (0.90)

***Note:** 5-point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree

Producer Survey Results

The Producer survey frame is intended to complement the Consumer frame and provide a more comprehensive understanding of JFSP consortia processes. Though many consortia efforts primarily target Consumers, Producers can provide further insight regarding the relations between Consumer and Producer groups as well as additional perspectives on their regional situation (e.g., perceived impact of consortia programming, obstacles in disseminating information). A total of **68** respondents (19.8% of the entire sample) self-identified as fire science researchers/scientists, and were thus directed to the Producer survey frame of the Spring 2013 survey. The Producer fame is somewhat similar in structure and content to the Consumer frame. Producers responded to items concerning their experiences with fire science information and fire science information Consumers, fire-science related activities within their region, and perceptions of obstacles to the dissemination of fire science information. Like Consumers, Producers also were asked about their experiences and opinions regarding their specific regional consortium and their consortium's website. The Producer frame is shorter than the Consumer frame, primarily targeting perspectives and behaviors regarding the dissemination of fire science research results as well as attitudes towards Consumers.

Producer Demographics

Producer respondents were equally split among males and females (50.0%) and the majority was Caucasian (91.1%). Other reported respondent ethnicities included "Other" (5.4%); Multi-Ethnic (1.8%); and Black (1.8%). The mean age of Producers was 43.5 years, and they had worked as researchers/scientists for an average of 14.8 years.

All respondents completing the Producer survey had earned a college degree. Over half (57.6%) held a Doctoral or Professional degree, and nearly one-third (28.8%) held a Master's degree (see Figure 7). Though most Producers strictly identified themselves as fire science researcher/scientists (78.3%), some were student scientists/researchers (6.7%), natural resource managers/specialists (6.7%), or indicated more specialized roles using the "other" category (e.g., weather, forester, research ecologist; 5.0%; see Figure 8). Producers most commonly worked for a Federal agency/organization (42.6%), followed by a University-based organization (39.3%); State agency/organization (8.2%); and 8.2% worked for a non-profit organization (see Figure 9).

Figure 7. Educational Background of Producers

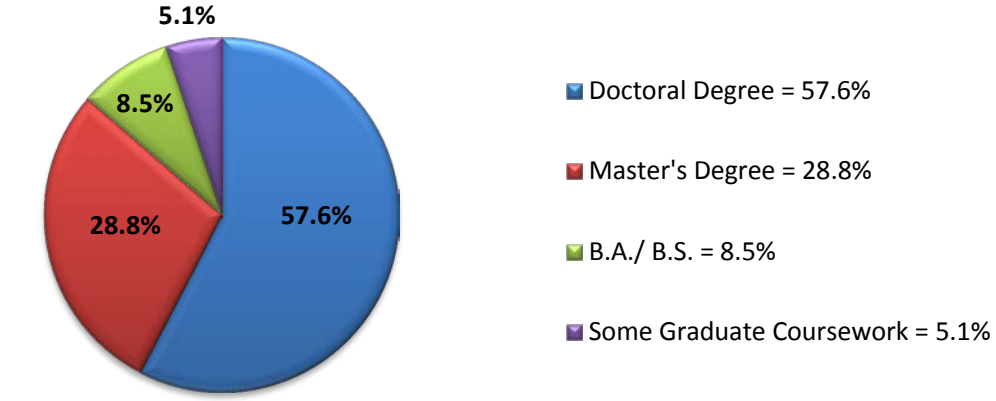


Figure 8. Primary Role of Producers

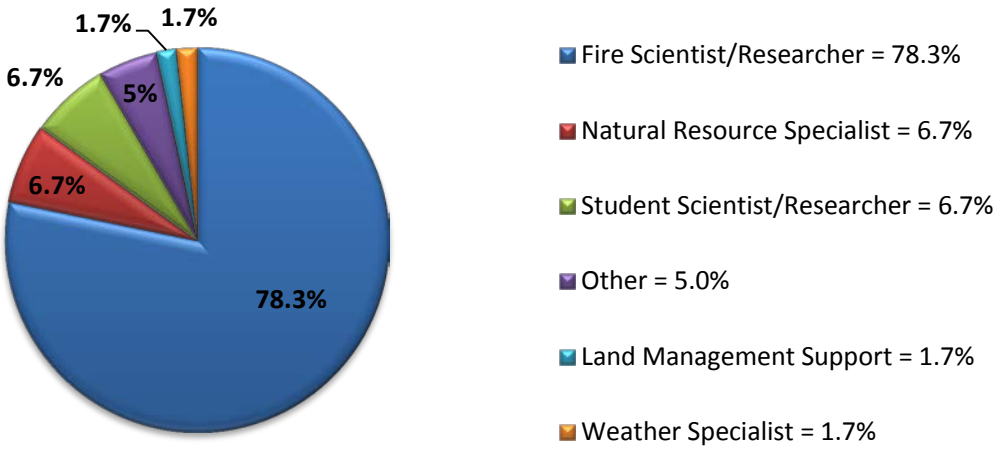
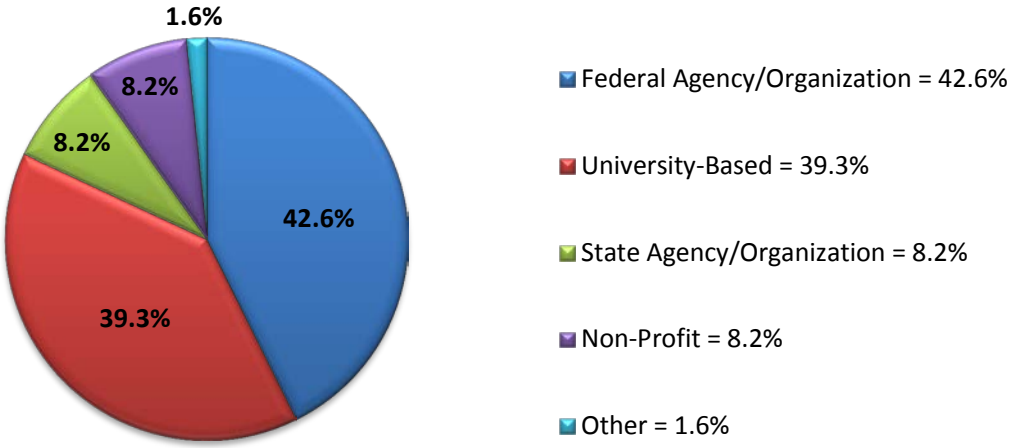


Figure 9. Affiliations of Producers



Producer Experiences with Fire Science Information and Information Consumers

Producers were first asked to complete a series of 11 items concerning their "experiences with fire science information and Consumers of fire science information." Responses to the first 9 items occurred on a 5-point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree. Some of these items were complementary to those appearing in the first section of the Consumer survey frame (e.g., Consumers were asked if they trusted fire science research findings whereas Producers were asked if they believed that Consumers trusted fire science research findings; Consumers were asked if researchers/scientists were easy to approach, and Producers were asked if they considered themselves approachable). Other items focused on Producers' willingness to research applied problems and to communicate findings to Consumer audiences. In addition, Producers received two categorical response items asking whether they had worked with managers/practitioners and whether they desired to do so in the future. Consistent with the Logic Model approach to evaluation, items were constructed to assess short-term (e.g., changes in attitudes, beliefs, and behavior intentions) and medium-term (e.g., changes in actual behaviors) outcomes of consortia programming.

Producers' mean responses to the first nine items are displayed in Table 9. Overall, Producers expressed favorable attitudes towards fire managers/practitioners and research endeavors targeting this population. In particular, Producer responses indicate a strong dedication to improving managers'/practitioners' work-related decisions. In addition, the majority of Producers agreed or strongly agreed that *"Interacting with managers/practitioners enhances my effectiveness on the job.*"

Present results indicate that both Producers and Consumers have favorable perceptions of one another. There were some slight differences, however, between Producer and Consumer responses to parallel survey items. For instance, Producers' agreement with the statement, "*Managers/practitioners value my knowledge and experience as a fire scientist"* (*M* = 3.88, *SD* = .72) was slightly higher than Consumers' agreement with the statement, "*Researchers/scientists value my knowledge and experience as a field professional*" (*M* = 3.38, *SD* = .87). Though Consumers considered Producers to be approachable (*M* = 3.42, *SD* = .71), Producers rated *themselves* as even more approachable (*M* = 4.28, *SD* = .58). Finally, although half of Consumers reported working with a researcher/scientist on a research or management project, the majority of Producers (84.4%) reported working with managers/practitioners on such a project (see Table 10). Further, though most Consumers (84.8%) said that they would like to work/continue working with Producers on a project, almost all Producers (96.9%) said that they would like to work jointly with managers/practitioners on a project. Although minimal, these differences suggest that there is some disconnect between the ways in which Consumers perceive Producers (regarding their approachability, willingness to collaborate and study applied problems, etc.), and Producers' self-perceptions.

Table 9. Producer Research Practices and Experiences with Fire Science Information Consumers

Item	Mean (SD)
Through my role as a researcher/scientist, I hope to improve how managers/practitioners make work-related decisions	**4.53** (0.53)
Interacting with managers/practitioners enhances my effectiveness on the job	**4.50** (0.62)
I make an effort to present information to managers/practitioners in a way that is easy to understand	**4.48** (0.59)
I consider myself approachable to managers/practitioners	**4.28** (0.58)
Managers/practitioners value my knowledge and experience as a fire scientist	**3.88** (0.72)
I believe that managers/practitioners trust fire science research findings	**3.66** (0.72)
I often present or publish fire science information for manager/practitioner audiences	**3.53** (0.94)
I am sometimes hesitant to study problems and issues suggested by local managers/practitioners*	**2.33** (0.94)
I prefer that my research be focused on theoretical issues, rather than on applied management problems*	**2.02** (0.77)

***Note*: The last two items in this table are negatively framed. As all responses occurred on a 1 (Strongly Disagree) to 5 (Strongly Agree) scale, lower mean values on these items would indicate an increased willingness to examine local and/or applied fire management issues.

Table 10. Producer Perceptions and Experiences Regarding Working with Fire Science Information Consumers

Item	Yes	No	Unsure
Have you worked jointly with fire managers/practitioners on a research or management project?	**84.4%**	**15.6%**	**N/A**
Would you like to work/continue working with fire managers/practitioners on a research or management project?	**96.9%**	**0%**	**3.1%**

Items Regarding *Consortium* efforts

As with Consumers, it was anticipated that some Producers would be unfamiliar with their regional consortium at the time of survey distribution, and thus not equipped to respond to consortium-specific items. Accordingly, Producers were first asked if they were aware of a fire science and delivery consortium supported by the JFSP in their region prior to receiving any items referencing the JFSP consortia. Only a single respondent (1.6%) indicated that they were *not* aware of their regional consortium; this respondent was electronically redirected to the next portion of the survey. The remaining (98.4%) were then asked to respond to seven questions regarding their consortium's efforts.

The consortium-specific items included in the Producer frame were identical to those in the Consumer frame, with responses occurring on a 5-point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree. Mean responses were relatively positive and very similar to those obtained from Consumers. The majority of Producers agreed that the consortium was needed and would recommend consortium involvement to their co-workers, but were less certain regarding the effects of their consortium's activities on regional fire management policy (see Table 11).

Table 11. Producer Responses Regarding their Regional Consortium

Item	Mean (SD)
The Consortium is needed to help coordinate sharing of fire science information in my region	**4.21** (0.75)
I would recommend Consortium involvement to my co-workers	**4.15** (0.81)
The Consortium has helped improve the accessibility of fire science information	**3.85** (0.83)
The Consortium has helped improve communication among fire managers/practitioners and fire researchers/scientists in my region	**3.79** (0.79)
The Consortium has helped improve the use and application of fire science in my region	**3.52** (0.83)
The Consortium has made it easier for my agency/organization to accomplish its goals	**3.19** (0.70)
The Consortium has helped improve policy regarding fire management in my region	**3.03** (0.81)

Perceptions of Consortia Websites

Most consortia websites target both Consumers and Producers of fire science information. Like Consumers, Producers may use their consortium's site to access current fire science research results, obtain information on learning and funding opportunities, and to network with other fire science professionals. In addition, interactive websites may provide more efficient means for Producers to share information regarding their current research projects and facilitate the application of their knowledge and expertise to Consumer problems.

Most Producers (85.0%) indicated that they had visited their consortium's website, and subsequently responded to 5 website-specific items using a 5-point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree. Some of these items were identical to those included in the Consumer survey frame (e.g., "*My Consortium's website is user-friendly"; "My Consortium's website provides a wide variety of fire science information"*), whereas some differed according to the specific needs of Producers (e.g., "*My Consortium's website helps keep me informed of current research findings"; "My Consortium's website provides a way for me to share my research products or fire science delivery activities"*).

Producers' mean responses to these website-specific items are displayed in Table 12. Most Producers agreed with Consumers that their consortium's site was user friendly, provided a wide variety of fire science information, and organized they information they needed in one convenient place. Though over one-third of Producers (35.2%) confirmed that their consortium's site provided a forum to share information or ask questions, over half (55.6%) were unsure if such features were offered. The remaining 9.3% said that no interactive features were included in their consortium's site.

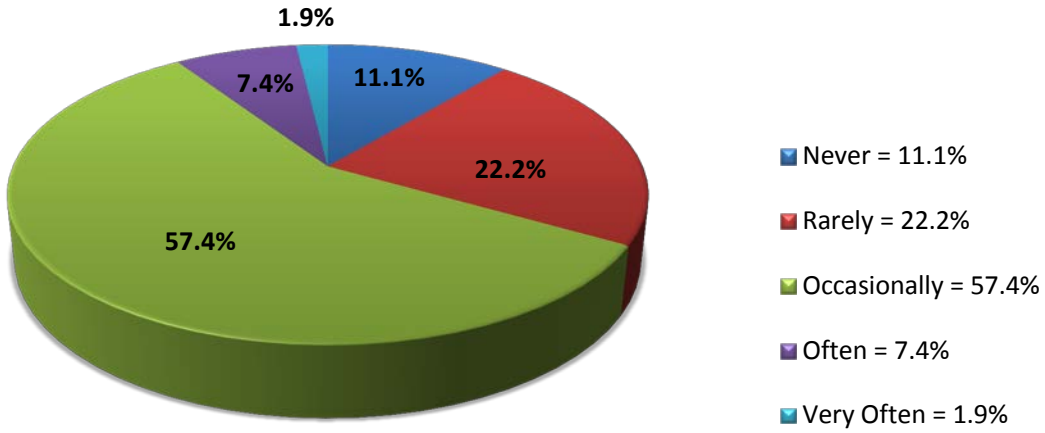
Like Consumers, most Producers said that they had "occasionally" (M = 2.67; SD = .85; see Figure 10 for response frequencies) used information obtained from their consortium's site at their job during the past year. Again, considering the recent establishment of many consortia sites, the finding that most Producer respondents reported using information obtained from their consortium's website is encouraging. Further, much of the fire science information these sites provide is likely intended for Consumer applications. It should be noted that more than one Producer respondent commented that their consortium's site was still in development at the time of survey distribution, which made evaluating the site difficult.[5]

[5] Because Producers provided a relatively small number of open-ended comments about their consortium's website (n = 12), they will not be discussed in detail here. The complete text of all Producer commentary is available upon request.

Table 12. Producer Opinions and Experiences Regarding their Consortium's Website

Item	Mean (SD)
My Consortium's website is user-friendly	**3.71** (0.76)
My Consortium's website provides a wide variety of fire science information	**3.66** (0.87)
My Consortium's website helps keep me informed of current research findings	**3.52** (0.52)
My Consortium's website organizes fire science information and other useful tools in one convenient place	**3.52** (0.91)
My Consortium's website provides a way for me to share my research products or fire science delivery activities	**3.45** (0.90)

Figure 10. Frequency of Consortium Website Information Use by Producers on the Job



Producer Perceptions of Obstacles to Fire Science Information Dissemination and Application

As described earlier, Consumers were asked about their perceptions of obstacles to accessing and applying fire science information. Because Producers focus on the development, execution, and distribution of fire science research, they were correspondingly asked to share their perceptions of obstacles related to the effective *dissemination* and application of fire science information. Again, these items are intended to highlight gaps and strengths in consortia performance related to the overarching objective of improving fire science delivery. Data

obtained from prior and future survey distribution waves can help determine the extent to which strengths are being maintained and/or enhanced and to which gaps are being addressed.

Producers responded to these six items using a 5-point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree. Producer items were similar to those included in the Consumer survey, with the exception of "*Managers/practitioners seem unreceptive or disinterested in current fire science research and information*" (see Table 13 for Producer mean responses). Both Producers and Consumers identified the same two top obstacles to the dissemination (accessibility) and applicability of fire science information: Lack of communication *within* agencies/organizations, and lack of communication *between* agencies/organizations. In the past two waves of survey distribution, Producers selected *"Fire science information is not available in one convenient place*" as the top obstacle. Just as in the Consumer frame, this obstacle dropped to the third top-rated this year.

Consistent with survey results from prior waves, most Producers did not implicate lack of opportunities to communicate with managers/practitioners as an obstacle to fire science information dissemination and application. Most also did not agree that "*Managers/practitioners seem unreceptive or disinterested in current fire science research and information.*" Consumers were only slightly more inclined to cite limited communication opportunities with researchers/scientists as an obstacle. Yet, it is important that consortia continue in their efforts to increase Consumer awareness of such communication opportunities (e.g., via professional meetings/conferences, workshops, or interactive websites) and of Producers' willingness to work with fire managers/practitioners.

Table 13. Producer Perceptions of Obstacles to the Dissemination or Application of Fire Science Information

Obstacle	Mean (SD)
Lack of communication *within* agencies and organizations in my region decreases the accessibility of fire science information	**3.40** (0.99)
Lack of communication *between* agencies and organizations in my region decreases the accessibility of fire science information	**3.38** (1.05)
Fire science information is not available in one convenient place.	**3.34** (0.82)
Available fire science information and/or research results are difficult to apply in the field.	**2.95** (0.88)
Fire scientists/researchers have few opportunities to communicate with managers/practitioners	**2.79** (0.94)
Managers/practitioners seem unreceptive or disinterested in current fire science research and information	**2.61** (0.98)

General Public Survey Results

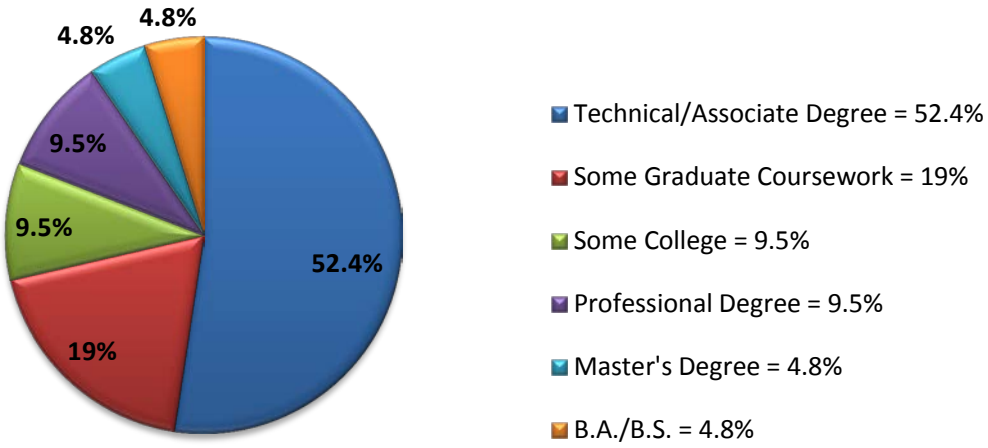
The General Public survey frame was intended for all other target audiences of consortia efforts and activities who were not primarily employed in fire management or research-related fields. This audience is highly diverse, including homeowners, large and small private landowners, retired fire science professionals, elected officials/decision makers, and other interested community members. The term "General Public" may be somewhat misleading, as several respondents had occupational and/or educational backgrounds in fire science-related fields (but were not currently employed in such professions). Understandably, those most affected by wildfire and those most interested in fire science-related issues also would be more likely to be exposed to consortia educational and outreach efforts (and hence more likely to participate in the online survey). It is important to note, however, that the majority of General Public respondents categorized themselves as large or small private landowners.

Only a few consortia have specific plans to increase fire science information accessibility and applicability among the "General Public," which again encompasses a variety of populations. Consequently, the General Public survey is the smallest of the three frames, both in number of respondents **(*N* = 22)** and in scope. Most General Public respondents identified with the Great Plains (22.7%), Midwest Oak (22.7%), Appalachians (13.6%), Northwest (9.1%), Pacific (9.1%), and Southern Fire Exchange (9.1%) consortia (see Table 1 for specific Participant x Consortium breakdowns). This survey frame contains two main item sections: one focusing on experiences with fire science information, and the other assessing perceptions and experiences concerning various sources of fire science information.

General Public Demographics

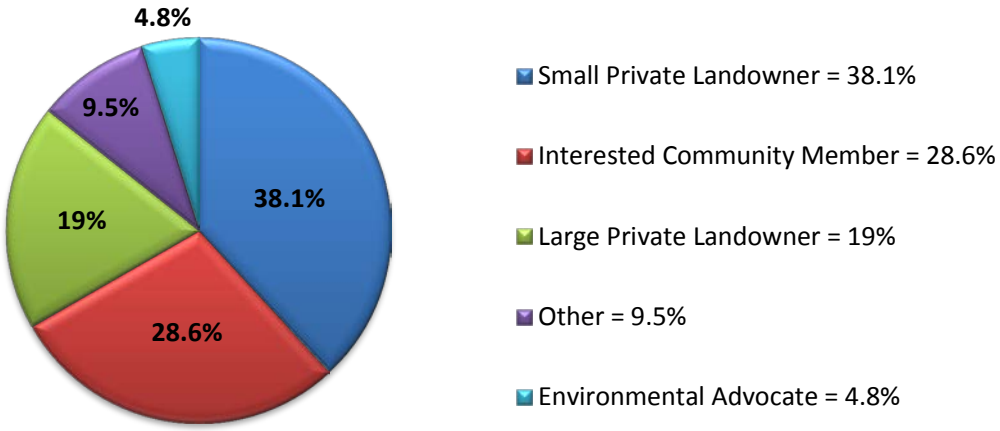
Three-quarters (75.0%) of General Public respondents were male. Most were Caucasian (90.0%), followed by Asian/Pacific Islander (10.0%). The mean age of participants was 50.9 years. A little more than one half (52.4%) held a Technical/Associates Degree, 19.0% completed some graduate coursework, 9.5% earned a professional degree, 4.8% earned a Master's Degree, and 4.8% held a Bachelor's Degree (see Figure 11).

Figure 11. Educational Background of General Public



Respondents indicated a wide variety of roles, demonstrating the diverse nature of the General Public survey sample (see Figure 12). Over one-third (38.1%) of respondents primarily identified themselves as small private landowners, 28.6% were "interested community members," 19% identified themselves as large private landowners, 4.8% were "environmental advocates." Approximately 9.5% of General Public respondents did not explicitly identify with any pre-determined response categories and selected the "Other" option. In elaborating on their "Other" role, respondents generally indicated significant involvement with fire science-related issues (e.g., *"biologist," "volunteer firefighter" or belonging to multiple categories*).

Figure 12. Primary Role of General Public



General Public Experiences with Fire Science Information

General Public respondents were first asked to respond to a series of 13 items concerning their experiences with fire science information and fire management issues using a 5-point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree. Some of these items were similar to those in the Consumer survey frame, targeting the ease of accessing and understanding fire science information. Whereas many of the Consumer items referenced work-related practices, however, General Public items targeted beliefs, opinions, and behaviors regarding fire science information at a broader level. For instance, General Public respondents were asked about their basic awareness of fire science/management issues, their intentions for applying fire science information, and the degree to which they shared fire science information with others.

General Public respondents' mean responses to the first series of items are displayed in Table 14. As was the case with prior online survey waves, current findings indicate a strong interest among the General Public to learn more about fire science/management issues. General Public respondents reported positive perceptions of fire science information regarding usefulness and trustworthiness. They also reported actively applying and sharing their fire science knowledge. These findings may constitute initial evidence of consortia impacts on both short-term (e.g., attitudes, knowledge) and medium-term (e.g., behavioral intentions, behaviors) outcomes.

General Public respondents were least likely to endorse the statement, "Fire science information is easy to find" (though mean responses still fell at the positive end of the scale). This suggests that consortia should continue efforts to increase awareness of convenient means of obtaining fire science information among targeted General Public groups (e.g., private landowners). Continued development and promotion of consortia websites should help enhance the General Public's access to fire science information, particularly if the sites are user-friendly. Consortia targeting members of the General Public without web access may need to consider alternate strategies to facilitate ease of accessing fire science information.

Table 14. General Public Experiences with Fire Science Information and Fire Management Issues

Item	Mean (SD)
I am interested in learning more about fire science/fire management issues	**4.24** (0.54)
The fire science information I have received seems trustworthy and credible	**4.09 (**0.53)
Overall, the fire science information available to me has been useful.	**4.09** (0.61)
I have shared or discussed information that I have learned about fire science with others	**4.00** (0.69)
My awareness of fire science/fire management issues has increased during the past year	**4.00** (0.87)
Fire science information is relevant to my needs	**3.86** (0.66)
I plan to use what I've learned about fire science to protect my home/land/community	**3.86** (0.64)
Educational materials about fire science (e.g., fact sheets, videos, web-based) are easy to understand	**3.82** (0.59)
I am concerned about the effects of fire on my environment	**3.82** (0.96)
I have changed one or more of my behaviors as a result of what I have learned about fire science	**3.73** (0.77)
I am concerned about fire danger in my community	**3.45** (0.74)
Fire science information is easy to find	**3.23** (0.92)
*I'm unsure of where to go or who to contact if I have questions about fire science or fire management issues	**2.41** (1.18)

***Note*:** The last item in this table is negatively framed. As all responses occurred on a 1 (Strongly Disagree) to 5 (Strongly Agree) scale, lower mean values indicate *more* certainty about where to go/who to contact regarding fire science/management issues.

General Public Experiences with Fire Science Information Communication Sources

Like Consumers, General Public respondents completed a series of items about their experiences with a variety of fire science information communication sources. Specifically, they were asked to indicate the frequency with which they accessed information from seven different communication sources during the past year using a 5-point Likert scale where 1 = Never and 5 = Very often. In addition, they were asked to rate the usefulness of information they had received from each communication source, with responses occurring on a 5-point Likert scale where 1 = Not useful and 5 = Very useful. These responses may help consortia tailor their outreach and educational efforts according to community members' preferred communication sources and highlight any limitations in source accessibility.

Table 15 displays General Public mean responses to items concerning their experiences with fire science information communication sources; these results also are graphically depicted in Figure 13.[6] The sources rated as most helpful were often, but not always, among the most frequently accessed. For instance, the General Public respondents rated *Communicating with fire management/extension professionals* as the most useful source of fire science information; they also had relatively high ratings of the usefulness of *Group instruction, classes, or demonstrations*. Thus, like Consumers, it appears that the General Public respondents benefit from interactive learning opportunities, though engagement in such opportunities is understandably limited by time and resource constraints.

Internet was by far the most frequently accessed source, and was rated as the second most useful source of fire science information. A follow-up survey question asked General Public respondents whether the fire science information they received from web-based sources was current and up to date. Most respondents agreed (61.9%) or strongly agreed (9.5%) that the information accessed from web-based sources was current; 14.3% of responses were "neutral," whereas 4.8% strongly disagreed that such web-based information was current and up-to-date.

Table 15. General Public Mean Ratings of Fire Science Information Communication Sources: Frequency of Access and Perceived Usefulness

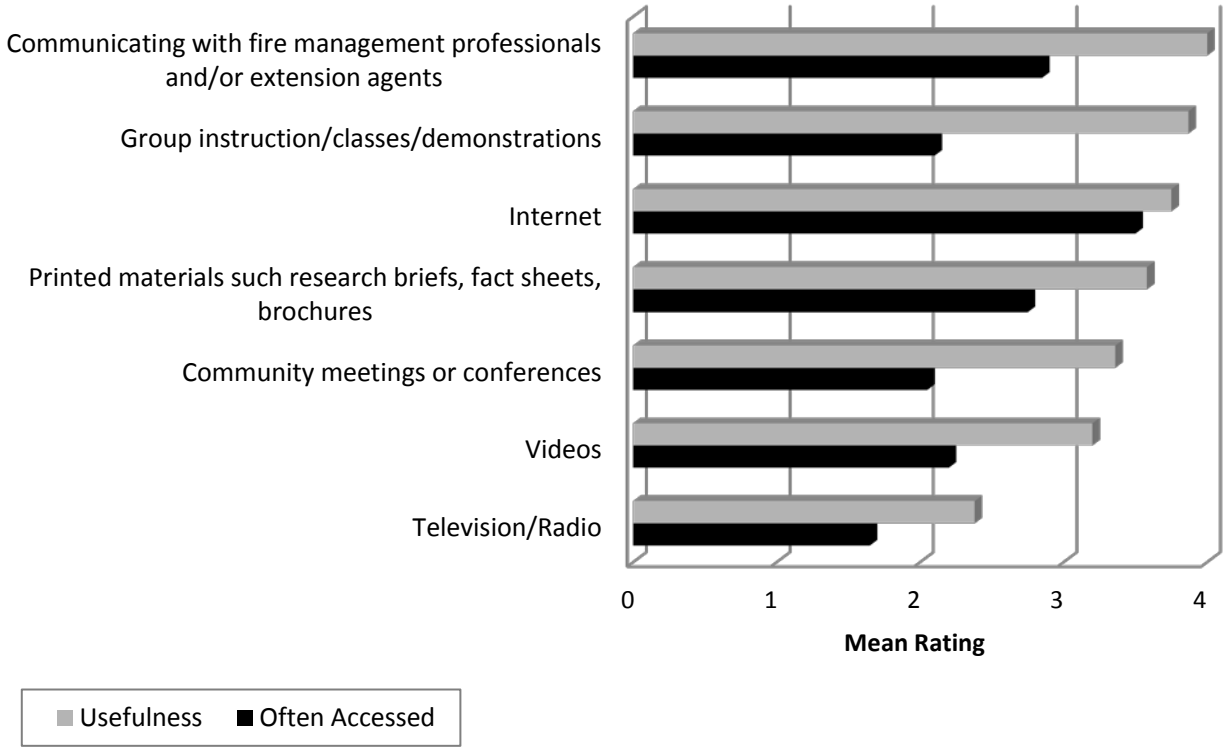
Communication Source	Often Accessed Mean (SD)	Usefulness Mean (SD)*
Communicating with fire management/extension professionals	**2.85** (0.67)	**4.30** (0.57)
Group instruction/classes/demonstrations	**2.10** (0.97)	**3.87** (1.06)
Internet	**3.50** (1.10)	**3.75** (1.16)
Printed materials such as research briefs, fact sheets, and/or brochures	**2.75** (0.91)	**3.58** (0.96)
Community meetings or conferences	**2.05** (0.95)	**3.36** (1.08)
Videos	**2.20** (1.01)	**3.20** (1.21)
Television/radio	**1.65** (0.75)	**2.38** (1.19)

Note: Because some of the general public had little or no experience with some of these fire science information sources (i.e., had never accessed during the past year), not all respondents provided usefulness ratings.

[6] As General Public Respondents were likely unfamiliar with some of the communication sources more common to Consumers (e.g., Professional meetings/conferences, field demonstrations), they were asked about their experiences with seven different sources rather than 11 (as in the Consumer survey). Due to role differences, several communication sources presented to the General Public also differed from those presented to Consumers.

Approximately 10% of General Public respondents reported that they had not accessed fire science information from web-based sources. Taken together, these findings highlight the importance of consortia websites in enhancing fire science delivery among members of this diverse group. As the vast majority of General Public respondents reported using the internet to obtain fire science information, promoting consortium sites (and, for those consortia targeting the General Public, offering relevant information and resources) may be conducive to increasing fire science information accessibility and application.

Figure 13. Fire Science Information Communication Sources: General Public Mean Ratings of Usefulness & Frequency of Access



Online Survey Component: Trends Across Funding Years

Data obtained from the first two waves of the online survey helped clarify the current *situation* of fire science delivery among JFSP consortia in their early phases of development. That is, results provided an initial understanding of respondents' fire science information needs, experiences, and opinions, which may be useful to consortia in developing and modifying future outreach programming. In addition, findings from the first two survey waves were used to establish a baseline from which to track ongoing progress toward shared consortia goals.

This section presents the results of analyses conducted to explore the early impacts of consortia efforts on respondents' perceptions of fire science information and information delivery. Data were aggregated and analyzed to account for the significant time lapse between the funding and establishment of the eight "original" JFSP consortia and the six more recently funded consortia. First, data from all respondents who participated in the 2011 wave of the online survey (only distributed to constituents affiliated with the original eight consortia) were combined with data from respondents who participated in the 2012 survey wave who were uniquely affiliated with one or more of the six recently funded consortia.[7] The "Funding Year 1" (FY 1) data captured responses pertaining to consortia in the initial year of funding and serve as the baseline. Next, data from 2012 survey participants affiliated with one or more of the original eight consortia were combined with data from 2013 survey participants affiliated with one or more of the six newer consortia. This "Funding Year 2" (FY 2) data served as the comparison group and included responses from constituents of consortia in their second year of funding. Table 16 shows the consortia and survey year represented in the FY 1 and FY 2 data sets.[8] It should be noted that not all consortia actively participated in the online survey in 2012 and 2013, nor were all consortia required to do so. Because of the "snowball" sampling strategy and geographic overlap of consortia boundaries, responses from individuals affiliated with all 14 JFSP consortia were included in both FY 1 and 2 data sets.

Comparisons of FY 1 and 2 survey responses revealed many positive, statistically significant changes regarding participants' perceptions of the accessibility, quality, and applicability of fire science information. Though many of these changes appear small in relative terms of the figures presented, they demonstrate scientifically valid advancements in consortia progress. Most of these changes emerged in comparing responses to the Consumer survey frame, which is not surprising given that the majority of survey participants identify with this group, which is the primary target audience for most JFSP consortia. Yet, some statistically significant positive changes also were observed among Producer and General Public respondents. Results from comparisons conducted within these respective frames are presented below.

[7] The 2011-2012 versions of the online survey allowed participants to "select all that apply" when asked to indicate the consortium in which they lived or worked. Thus, the primary affiliation of those selecting more than one consortium could not be determined. To help ensure the validity of the categorization of responses as pertaining to either "Funding Year 1" or "Funding Year 2," respondents indicating that they were affiliated with both original and recently funded consortia were excluded from analyses.

[8] Precise estimates of the number of participants affiliated with each consortium could not be obtained due to the "select all that apply" option included in the 2011-2012 survey versions.

Table 16. Consortia Represented in Funding Year 1 and Funding Year 2 Data Sets

Consortium	Funding Year 1		Funding Year 2	
	Survey Year	Participated?	Survey Year	Participated?
Alaska	2011	Yes	2012	Yes
Appalachians	2011	Yes	2012	No
California	2011	Yes	2012	Yes
Great Basin	2011	Yes	2012	No
Lake States	2011	Yes	2012	Yes
Southern Fire Exchange	2011	Yes	2012	Yes
Southern Rockies	2011	Yes	2012	Yes
Southwest	2011	Yes	2012	Yes
Great Plains	2012	Yes	2013	Yes
Northern Rockies	2012	Yes	2013	Yes
Northwest	2012	Yes	2013	Yes
Oak Woodlands	2012	Yes	2013	Yes
Pacific	2012	Yes	2013	Yes
Tallgrass Prairie	2012	Yes	2013	No

Note: Responses from affiliates of all 14 JFSP consortia were included in data sets for both funding years, but the data sets were comprised primarily of responses from individuals affiliated with consortia that actively participated (i.e., distributed survey recruitment emails).

Consumer Trends

Funding Year 1 responses to items in the Consumer survey frame were compared with FY 2 responses to the same items. Most comparisons were conducted using Independent samples t-tests, a statistical procedure that assesses whether responses to the same item provided by different groups of respondents (e.g., respondents in the FY 1 and 2 data sets) differ from one another to an extent greater than would be expected by chance. Comparisons that yield probability or "*p*" values that are less than .05 indicate that there is less than a 5% likelihood that the difference is spurious or due to chance, and are termed "statistically significant."

The FY 1 data set included a total of **1,098** Consumer respondents, and the FY 2 data set included a total of **580** Consumer respondents.[9] There are likely several factors contributing to the decrease in respondents from FY 1 to FY 2. General survey fatigue may have played a role, which was likely compounded by additional survey participation requests sent to many consortia constituents just prior to the Spring 2013 online survey launch. Over time, consortia recruitment efforts for the online survey may have become less active compared to recruitment efforts during the initial survey waves. For instance, potential survey participant lists may be growing at a slower rate, or some deviations from distribution protocol may have occurred. Finally, the requirement that all JFSP consortia actively participate in the online survey during

[9] The total number of respondents from each Funding Year varies across items as some individuals skipped questions or did not receive particular items based on their prior responses (e.g., those indicating that they had never visited their consortium's website were not redirected to the series of items regarding their experiences with the website.

their first year of funding may have increased participant numbers for the FY 1 data set. It should be noted, however, that all statistical tests conducted account for sample sizes so that significant results cannot be attributed to discrepancies in the number of responses between FY 1 and FY 2 groups.

Experiences with Fire Science Information

Upon examining FY 1 and FY 2 Consumers' experiences and opinions about fire science information, two statistically significant differences emerged (see Table 17). First, FY 2 participants were significantly more likely than FY 1 participants to agree that, "*fire science information is easy to find*." Second, FY 2 participants were significantly more likely than FY 1 participants to agree that "*fire science information is easy to understand*." A comparison of responses to the item *"During the past year, I have changed at least one thing in my work based on what I've learned about fire science"* approached statistical significance, indicating a positive trend toward behavioral change in applying fire science research results and tools.

Table 17. Significant Differences in Consumer Responses Regarding Experiences with Fire Science Information

Item	FY 1 Mean (SD)	FY 2 Mean (SD)	*p* value
Fire science information is easy to find	3.33 (.85)	3.54 (.82)	< .001
Fire science information is easy to understand	3.30 (.80)	3.38 (.77)	.046
During the past year, I have changed at least one thing in my work based on what I've learned about fire science	3.39 (.93)	3.48 (.93)	.052

* ***Note*:** Responses measured using a 5-point Likert-type scale, where 1 = Strongly disagree and 5 = Strongly agree

Opinions and Experiences Regarding JFSP Consortia

Prior to receiving any questions pertaining to their regional consortium, FY 1 and 2 participants were asked if they were aware of a JFSP fire science and delivery consortium in their region. Chi-square tests[10] indicate that FY 2 participants were significantly more likely than FY 1 participants to indicate that they were aware of a regional JFSP fire science consortium (76.6% vs. 67.7%, $p < .001$). Those indicating that they were aware of their regional fire science consortium (FY1 $N = 727$, FY2 $N = 445$) comprised the comparison samples used to assess changes in perceptions of the impacts of consortium efforts. Comparisons yielded many positive significant changes between FY 1 and 2 participants' opinions and experiences regarding their regional consortium (see Table 18). These included changes in perceptions of more medium- and long-term impacts of consortia programming. Specifically, FY 2 participants were significantly more likely than FY 1 participants to agree that "*The Consortium has helped improve the use and application of fire science information in my region*" and that "*The Consortium has helped improve policy regarding fire management in my region.*"

[10] Chi-square tests determine whether there is a statistically significant difference between the responses of two groups on categorical (e.g., yes/no) items.

Table 18. Significant Differences in Consumer Responses Regarding Opinions and Experiences with their Consortium

Item	FY 1 Mean (SD)	FY 2 Mean (SD)	*p* value
The Consortium has helped improve the accessibility of fire science information in my region	3.55 (.76)	3.83 (.74)	< .001
The Consortium has helped improve the use and application of fire science information in my region	3.39 (.74)	3.69 (.73)	< .001
The Consortium has helped improve policy regarding fire management in my region	3.03 (.74)	3.13 (.78)	.027
The Consortium has helped improve communication among fire managers/practitioners and fire researchers/scientists in my region	3.46 (.78)	3.60 (.75)	.002
I would recommend consortium involvement to my co-workers	3.85 (.75)	3.95 (.72)	.030

*__Note__: Responses measured on a 5-point Likert-type scale, where 1 = Strongly disagree and 5 = Strongly agree

Opinions and Experiences Regarding Consortia Websites

Only respondents who indicated that they had visited their consortium's website were directed to questions specific to their experiences with those sites. Less than half (47.5%) of FY 1 respondents reported visiting their consortium's website, compared to 66.1% of FY 2 respondents. Chi-square tests revealed that this difference was statistically significant, $p < .001$. The comparison sample for website-specific items included **1,041** respondents from FY 1 and **561** respondents from FY 2. The numerous positive statistically significant changes in responses to website-related items between these two funding waves are displayed in Table 19.

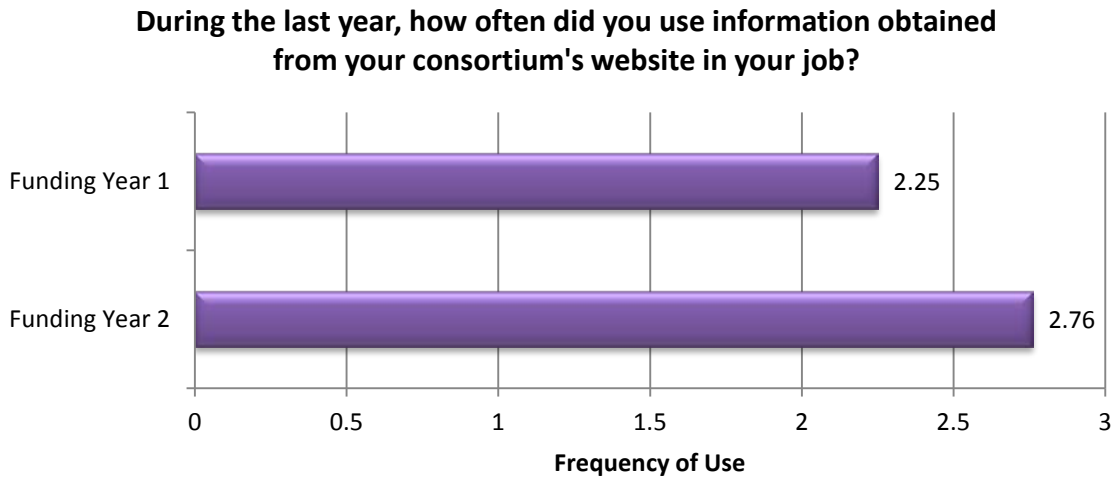
Table 19. Significant Differences in Consumer Responses to Website Items

My Consortium's website…	FY 1 Mean (SD)	FY 2 Mean (SD)	*p* value
Is user-friendly	3.63 (.63)	3.78 (.58)	< .001
Provides a wide variety of fire science information	3.64 (.69)	3.83 (.64)	< .001
Provides practical information I can use in my job	3.52 (.74)	3.74 (.69)	< .001
Provides information that is current and up-to-date	3.68 (.65)	3.91 (.62)	< .001
Organizes the information I need in one convenient place	3.40 (.75)	3.59 (.72)	< .001

*__Note__: Responses measured on a 5-point Likert-type scale, where 1 = Strongly disagree and 5 = Strongly agree

Two additional website-related questions were added to the 2012 and 2013 versions of the online survey. The first asked participants to indicate how often they used information obtained from their consortium's website in their job. Analyses indicated significant differences between FY 1 ($N = 140$) and FY 2 ($N = 392$) respondents, with FY 2 respondents indicating that they used information obtained from their consortium's website more often ($p < .001$). This comparison is displayed in Figure 14.

Figure 14. Significant Difference in Consumer use of Consortium Website Information



***Note*:** Responses measured on a 5-point Likert-type scale, where 1 = Never and 5 = Very often. FY 1 *SD*= .93; FY 2 *SD* = .73.

The second question asked participants if their consortium's website provides a forum where they can share information or ask questions. Figures 15 and 16 display the percentages of participants answering "Yes," "No," and "Not Sure" for FY 1 and 2. Chi-square tests revealed that the difference between FY1 and 2 responses was statistically significant ($p < .001$), with a higher percentage of FY 2 respondents indicating that they were aware of such a feature included in their consortium's website.

Figure 15. FY 1 Respondent Awareness of Interactive Website Features

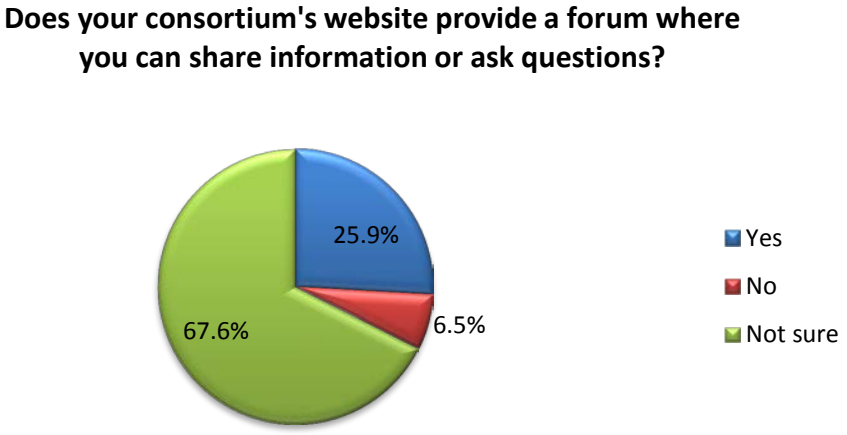
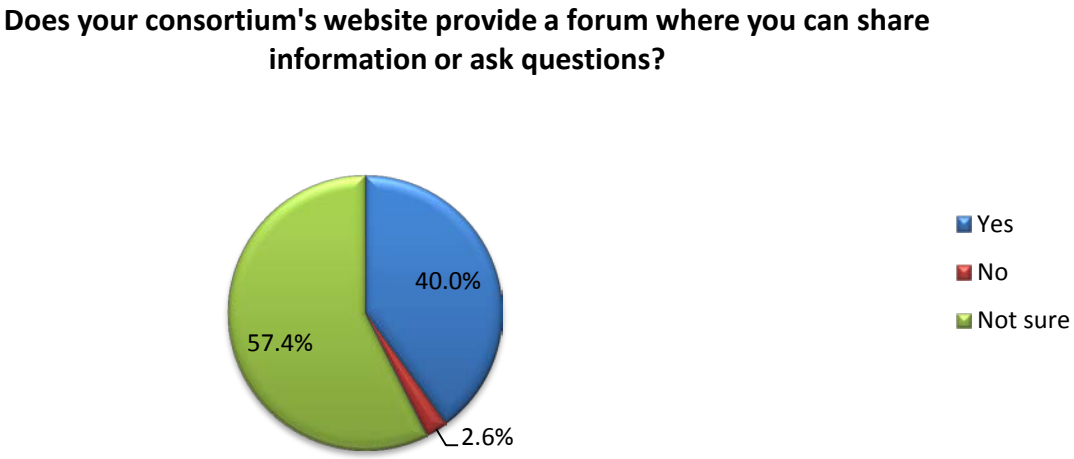


Figure 16. FY 2 Respondent Awareness of Interactive Website Features



Experiences with Fire Science Information Communication Sources

Analyses revealed numerous significant differences in both the frequency with which Consumers accessed fire science information from certain communication sources and their ratings of usefulness of the information obtained from these sources across FY 1 and 2. Overall, these findings indicate that the consortia are not only increasing Consumer access to a variety of sources of fire science information, but also are increasing the relevance and/or applicability of the information provided.

Table 20 displays descriptive and *p* values for all significant differences in Consumers' reported frequency of accessing fire science information through particular sources across FY1 and 2. The largest increases in frequency of access were for *newsletters* and *webinars/teleconferences*. The reported frequency with which Consumers accessed information from each source listed in Table 20 increased from FY 1 to FY 2 with the exception of *workshops or trainings.* Funding Year 2 participants reported accessing fire science information from these more interactive communication sources less frequently than FY 1 participants.

Table 20. Significant Differences in Frequency of Consumer Access of Fire Science Information by Communication Sources

Communication Source	FY 1 Mean (SD)	FY 2 Mean (SD)	*p* value
Web-based sources	2.90 (1.11)	3.02 (1.05)	.028
Research briefs, fact sheets, or brochures	2.67 (.94)	2.83 (.89)	.001
Newsletters	2.37 (1.00)	2.69 (1.01)	< .001
Webinars/teleconferences	2.01 (1.08)	2.36 (1.12)	< .001
Workshops or trainings*	2.29 (1.03)	2.16 (1.01)	.011
Videos	1.78 (.91)	1.89 (.91)	.027

*__Note__: Responses on a 5-point Likert-type scale, where 1 = Never and 5 = Very often
Denotes a significant decrease in frequency of access

The communication sources with significant increases in access across FY 1 and 2 were generally the same communication sources with significant increases in ratings of usefulness of information obtained from that source (see Table 21), although there were no significant increases in Consumers' ratings of usefulness of information obtained from *web-based sources*. It also should be noted that there were no significant differences in Consumers' ratings of the usefulness of information obtained through *workshops or trainings* despite the significant decrease in access of these sources from FY 1 to FY 2. The most substantial difference in Consumers' ratings of usefulness was for information acquired through *webinars/ teleconferences*, with a mean increase of .42 across funding years. No significant differences emerged in comparing FY 1 and FY 2 Consumer responses regarding access or usefulness ratings of information obtained from the following communication sources: *Field tours/demonstration sites; professional meetings/conferences; journal articles, papers, or professional reports; communicating with researchers/scientists; and communicating with co-workers.*

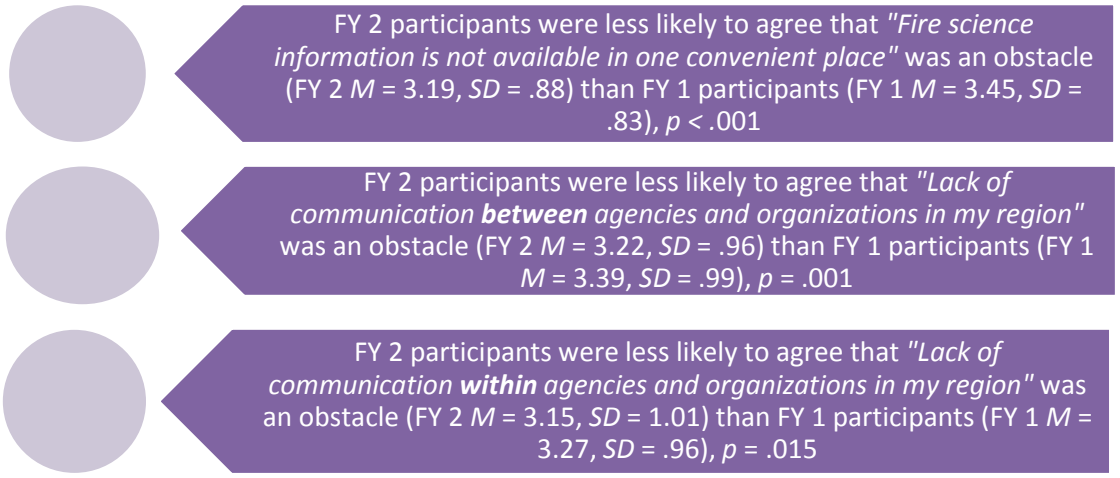
Table 21. Significant Differences in Consumers' Ratings of the Usefulness of Fire Science Information Obtained from Communication Sources

Communication Source	FY 1 Mean (SD)	FY 2 Mean (SD)	*p* value
Research briefs, fact sheets, or brochures	3.19 (.98)	3.40 (.92)	< .001
Newsletters	2.78 (1.01)	3.08 (1.03)	< .001
Webinars/teleconferences	2.79 (1.30)	3.21 (1.20)	< .001
Videos	2.64 (1.21)	2.84 (1.26)	.014

***Note*:** Responses measured on a 5-point Likert-type scale, where 1 = Not useful and 5 = Very useful

Obstacles to Accessing and Applying Fire Science Information

Comparisons between Consumer responses in FY 1 and FY 2 not only revealed positive perceived changes in fire science delivery, but also revealed significant decreases in perceived obstacles to accessing and applying fire science information. Specifically, the three following significant differences emerged:



These findings re-affirm that the JFSP consortia are effectively consolidating and providing fire science information. Findings also suggest that consortia are helping to increase both inter- and intra-agency communication, which in turn is facilitating sharing and use of fire science research results and tools.

Producer Trends

All JFSP consortia recognize fire science information Producers as a critical audience. Producers' participation and engagement in consortia efforts are needed to improve the dissemination and relevance of fire science research results and tools, as well as to improve relationships among Producers and Consumers. Producers typically comprise a much smaller proportion of online survey respondents compared to Consumers (approximately 20% vs. 70%, respectively). This is partially because there are much fewer fire researchers/scientists than fire managers/practitioners overall. In addition, some consortia have reported challenges in fully engaging members of the Producer community.

Sample sizes for comparisons conducted between FY 1 and FY 2 respondents to the Producer survey frame were understandably much lower than the sample sizes obtained for similar Consumer comparisons. The FY 1 data set for Producers included a total of **248** respondents, and the FY 2 data set included a total of **144** respondents. Despite these smaller samples, several significant differences emerged when comparing FY 1 and FY 2 Producer survey responses. Most of these differences were positive and pertained to Producers' experiences and opinions regarding their regional consortium. As with the Consumer comparisons, Independent samples t-tests were used to determine whether Producer FY 1 and FY 2 responses significantly differed.

Experiences with Fire Science Information and Information Consumers

Only one statistically significant difference was noted for Producers in comparing FY 1 and 2 responses within this item set. There was a small but significant decrease in Producers' agreement with the statement, *"I often present or publish fire science information for manager/practitioner audiences"* from FY 1 (M = 3. 68, SD = .94) to FY 2 (M = 3.47, SD = .85), p = .029. This was the only significant negative change observed in all analyses comparing FY 1 and 2 Producer survey responses.

Opinions and Experiences Regarding JFSP Consortia

As with the Consumer survey sample, Producer respondents were asked if they were aware of a JFSP fire science and delivery consortium operating in their region prior to receiving any questions specifically pertaining to their consortium. The proportion of FY 2 respondents indicating awareness of their regional consortium (87.7%; n = 138) was greater than the proportion of FY 1 respondents indicating awareness (81.1%; n = 238), though this difference was not statistically significant. Only those individuals indicating that they were aware of their regional consortium were included in the following analyses.

Comparisons revealed many positive statistically significant changes in perceptions of consortia impacts in Producer responses from FY 1 and FY 2. Figures regarding these significant changes are displayed in Table 22. The greatest difference was observed in response to the item, *"The Consortium has helped improve the accessibility of fire science information in my region*."

Table 22. Significant Differences in Producer Responses Regarding Opinions and Experiences with their Consortium

Item	FY 1 Mean (SD)	FY 2 Mean (SD)	*p* value
The Consortium has helped improve the accessibility of fire science information in my region	3.54 (.80)	3.82 (.76)	.002
The Consortium has helped improve the use and application of fire science information in my region	3.34 (.75)	3.59 (.79)	.005
The Consortium has helped improve policy regarding fire management in my region	3.03 (.67)	3.20 (.73)	.029
The Consortium has helped improve communication among fire managers/practitioners and fire researchers/scientists in my region	3.56 (.79)	3.83 (.71)	.002

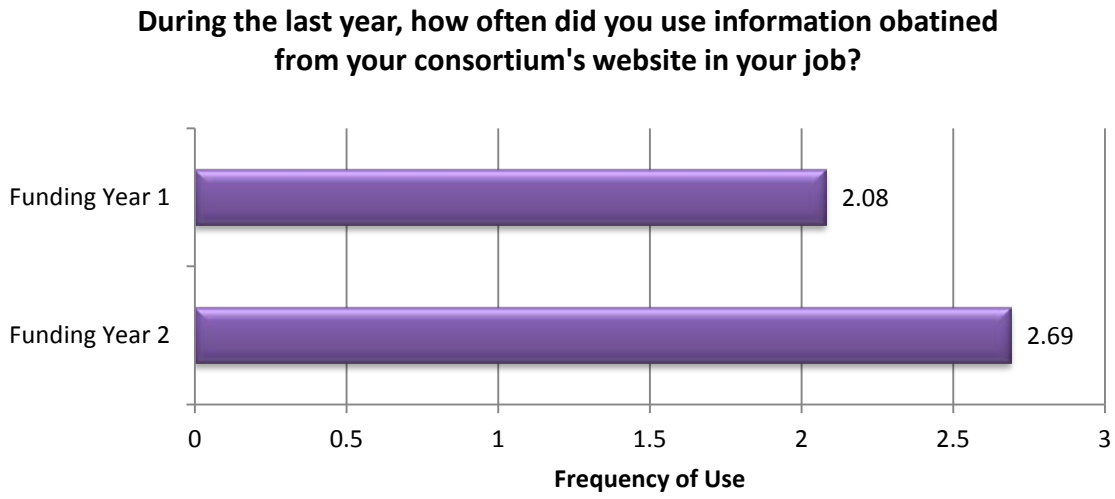
* ***Note*:** Responses measured on a 5-point Likert-type scale, where 1 = Strongly disagree and 5 = Strongly agree

Opinions and Experiences Regarding Consortia Websites

As in the Consumer survey frame, Producer frame respondents were asked whether they had visited their consortium's website prior to receiving any items regarding their experiences with the website. Over three-quarters (75.2%; *n* = 139) of FY 2 respondents reported visiting their consortium's website compared to 59.1% (*n* = 103) of FY 1 respondents. This increase was statistically significant, *p* = .002.

Though Producers are an important audience for all consortia websites, Consumers are the *primary* audience, and many more Consumers than Producers have participated in the online survey. As a result, there were fewer significant differences in Producers' opinions and experiences regarding consortia websites as compared to the Consumer sample. Yet, two important statistically significant positive changes were observed in comparing Producer responses from FY 1 and FY 2. First, Producer respondents in FY 2 were more likely to agree that, "*My consortium's website keeps me informed of current research findings*" (*M* = 3.67, *SD* = .83) than FY 1 respondents (*M* = 3.46, *SD* = .83), *p* = .05. Second, Producer respondents in FY 2 reported using information they obtained from their consortium's website in their job more frequently than Producer respondents in FY 1 (*p* < .001; see Figure 17). This is particularly notable because it indicates a change in behaviors or application of fire science information across FY 1 and 2.

Figure 17. Significant Difference in Producer use of Consortium Website Information



***Note*:** Responses measured on a 5-point Likert-type scale, where 1 = Never and 5 = Very often. FY 1 *SD*= .94; FY 2 *SD* = .78.

Obstacles to Dissemination and Application of Fire Science Information

Analyses revealed one statistically significant difference in Producers' perceptions of obstacles to the dissemination and application of fire science information from FY 1 to FY 2. Producers in FY 2 were less likely than FY 1 participants to believe that "*Fire science information is not available in one convenient place*" was an obstacle (FY2 *M* = 3.39, *SD* = .89; (FY1 *M* = 3.63, *SD* = .84), *p* = .008). As mentioned earlier, this trend also was observed among Consumers and suggests that many consortia efforts to summarize and integrate fire science information have been successful.

General Public Trends

Most consortia have chosen to focus their efforts on Consumer and Producer populations during these initial two years of development. Only a handful of consortia have identified members of the General Public as a target audience, and this audience represents around 10% of online survey respondents. The comparison sample for General Public respondents was substantially smaller than the Consumer and Producer samples, comprised of **42** respondents in FY 1 and **84** respondents in FY 2. Comparative statistical tests take sample size into account, and significant differences are less likely to emerge in smaller samples. Despite the much smaller sample sizes, Independent samples t-tests revealed positive significant differences between participants in the General Public frame from FY 1 to FY 2.

Experiences and Opinions Regarding Fire Science Information and Management Issues

Between FY 1 and FY 2, three notable positive changes occurred in General Public respondents' perspectives on fire science information and fire management issues:

- FY 2 participants were more likely to agree that *"Fire science information is easy to find"* (FY 2 *M* = 3.31, *SD* = .93) than FY 1 participants (FY 1 *M* = 2.95, *SD* = 1.00). This difference approached statistical signficance, *p* = .051
- FY 2 participants were more likely to agree that *"I plan to use what I've learned about fire science to protect my home/land/community"* (FY 2 *M* = 4.12, *SD* = .85) than FY 1 participants (FY 1 *M* = 3.80, *SD* = .72), *p* = .042
- FY 2 participants were more likely to agree that *"I am concerned about fire danger in my community"* (FY 2 *M* = 4.02, *SD* = 1.03) than FY 1 participants (FY 1 *M* = 3.31, *SD* = 1.26), *p* = .001

The significant positive change in General Public respondents' plans or intentions to *use* the fire science information/tools they have learned is particularly encouraging. This finding represents a step towards consortia achieving medium-term or behavioral program impacts.

Because six of the JFSP consortia participated in the online survey for the first time in 2012, 2013 marks the first year in which comparative analyses included data representative of all 14 consortia. These analyses yielded highly promising findings which indicated progress toward several shared consortia goals. JFSP consortia survey recruitment efforts were critical in providing FY 1 and FY 2 sample sizes required for valid statistical comparisons. As adequate data have been collected to establish a "baseline," future analyses of online survey data will primarily focus on tracking progress and demonstrating the positive impacts of consortia programming. Yet, ongoing and increased online survey participation from JFSP consortia constituents is needed to conduct such analyses.

Online Survey Component: Summary and Implications

The purpose of the online survey has shifted in accordance with the development of the JFSP consortia throughout the past three years. One of the primary objectives of the first two survey waves was to provide data which could be used as a baseline to track consortia progress toward their shared goals. Because adequate data were collected during these first two years to establish a solid baseline, the primary purpose of the current and future survey waves is to assess the impacts of consortia programming; that is, to help determine the extent to which consortia efforts are making a difference. Though continued assessment of consortia progress over time is critical, annual findings from the online survey also provide valuable information about consortia constituents' current perspectives on fire science information delivery issues.

Current Perspectives

Participation in the 2013 online survey was significantly lower than that in 2011 and 2012. Yet, these results still can contribute to the understanding of current experiences and opinions regarding fire science information delivery and help inform consortia efforts. Consistent with results from prior survey waves, findings from the 2013 survey were quite positive. The vast majority of participants was familiar with their regional consortium's programming and believed that their consortium was making a difference. Such findings indicate that the consortia are making substantial progress towards *awareness* objectives.

> *"The Fire Science Delivery Consortium represents a very effective method to deliver new information on fire sciences. I use it a lot."*
>
> -Consumer Respondent

Overall, Consumers and Producers had favorable perceptions of their consortium's website. Respondents' open-ended commentary about their consortium's website, however, was less positive than those provided in past survey waves. Some of these comments noted that their consortium's website was still developing and thus incomplete, which may be expected given that a few newer consortia had only publicly launched their sites a few months prior to the 2013 online survey distribution. Other commentary expressed frustrations over poor site organization and navigability, and also over a perceived lack of relevance of website content to their specific regional issues. In addressing some of these challenges, consortia may consider adopting a common template that can help improve organization and user-friendliness, discuss ideas and strategies with those responsible for other consortia websites, and further investigate constituents' website-related needs.

Results from the 2012 online survey revealed some discrepancies between Consumers' and Producers' perceptions of one another and their expressed willingness to collaborate. Though these discrepancies were relatively small, they were replicated in the 2013 survey results. Both Consumers and Producers had favorable attitudes toward one another, but Producers viewed

themselves as more approachable than Consumers perceived them to be. Producers' agreement that Consumers valued their experience and expertise was stronger than Consumers' agreement that Producers valued *their* experience and expertise. Finally, though the majority of participants in both groups reported that they would like to collaborate with Consumers/Producers, the desire to collaborate was substantially higher in the Producer group.

> *"If there is a way to get scientists to be more engaged with managers from the beginning… from the design of projects all the way through to actually presenting them to managers on the ground or at the District/local level, I think delivery of fire science would be immensely improved"*
>
> -Producer Respondent

Findings from the Qualitative Interview component of the national evaluation indicated that several consortia continue to face challenges in strengthening trust and positive relationships between Consumers and Producers. It is important to note that these challenges appear to be related to beliefs and behaviors of both Consumer and Producer groups and unique regional circumstances. It is important for Producers to have a current understanding of Consumers' fire science research and information needs and make efforts to address these needs, but it also is important for Consumers to trust and adopt the findings from such scientific endeavors. The "Interviews with JFSP Consortia Leadership and Staff" report describes numerous strategies (all proposed by consortia representatives) for facilitating collaboration and communication among Consumer and Producer groups.

As in prior survey waves, Consumers rated *Communicating with co-workers* as both the most frequently accessed and most useful source of fire science information. Also consistent with prior survey findings, discrepancies between ratings of the frequency of access and usefulness of interactive learning opportunities were quite large. That is, *workshops or trainings, professional meetings/conferences, and field tours/demonstrations sites* were rated as highly useful but among the least frequently accessed communication sources. The most time-effective and convenient fire science information sources will always be the most frequently accessed; such sources (e.g., web-based, written materials) also were rated as highly useful. Yet, consortia should continue their efforts to increase the availability and accessibility of interactive learning events that further promote *comprehension* and provide opportunities for *conviction*.[11]

In all three survey waves, members of the General Public have comprised less than 10% of total participants. The number of General Public respondents in the current survey wave was particularly low given the decreased overall response rate. These respondents, however, expressed positive perceptions and experiences regarding fire science information delivery. The majority agreed that their awareness of fire science/fire management issues had increased over

[11] Please see the "Interviews with JFSP Consortia Leadership and Staff" report for further discussion and strategies regarding increasing interactive learning opportunities.

the past year and that they had engaged in *behaviors* (medium-term outcomes) related to fire science information delivery (e.g., most reported sharing fire science information with others).

General Public respondents also expressed a strong interest in learning more about fire science/fire management issues. They rated *Communicating with fire management and fire science professionals, group instruction/classes/demonstrations, and Internet* as the most useful fire science information communication sources. *Internet* was also the most frequently accessed source of fire science information among General Public respondents. Like Consumers, members of the General Public seem to prefer interactive learning opportunities, and efforts should continue to extend such opportunities to this population. These findings also highlight the value of consortia websites in disseminating fire science and management information to the General Public.

Though only a few consortia initially identified the General Public as a target audience, representatives from additional consortia discussed aspirations to extend consortia programming to the General Public during the qualitative interviews conducted in the winter of 2013. The potential value of doing so was noted by both Consumer and General Public participants in the Spring 2013 survey:

> *"The efforts that are making the most difference are those that are also bridging the gap with non-professional interested persons… This takes different skills and approaches"*
>
> -Consumer Respondent

> *"Any and all education is useful. Even if only to bring up science based info at the local coffee shop when the conversation is fire! And with the last two years our area has had--fire is OFTEN a topic"*
>
> -General Public Respondent

Tracking Progress

Statistical comparisons of mean responses from participants affiliated with consortia in their first year of funding (FY 1) and participants affiliated with consortia in their second year of funding (FY 2) revealed many positive changes that are likely the result of consortia efforts. These findings indicate that the consortia are making substantial progress toward their shared goal of increasing fire science information accessibility. There were significant positive increases in evaluations of fire science information accessibility (e.g., the belief that fire science information is easy to find) among respondents to all three survey frames from FY 1 to FY 2. Results also suggest that the consortia increased fire science information accessibility through syntheses and coordination, with both Consumers and Producers being significantly less likely

to believe that *"fire science information is not available in one convenient place*" was an obstacle to fire science delivery in FY 2 than in FY 1.

Comparative analyses revealed positive changes in mean responses to survey items regarding behaviors as well. Though most of these differences in mean responses are small, they are statistically significant and demonstrate consortia progress toward achieving medium-term outcomes necessary for long-term environmental, social, and political impacts. Specifically, results indicate that Consumers were more likely to apply what they have learned about fire science in their work in FY 2 than in FY 1. Both Consumers and Producers were significantly more likely in FY 2 to report using information obtained from their consortium's website. In addition, findings revealed significant increases in Consumer and Producer perceptions that the consortia are helping to improve both the *application* of fire science information and communication between fire managers/practitioners and researchers/scientists. Significant changes in actual collaboration between Consumers and Producers and in their attitudes toward one another did not emerge, but will continue to be explored in future survey waves.

Not only do findings from comparative analyses indicate increased access to a variety of fire science information communications sources, but they also yielded significant improvements in the perceived usefulness of many of these sources. Despite some of the more critical commentary provided by 2013 survey respondents, comparisons between FY 1 and FY 2 results revealed significant improvements in Consumers' experiences with their consortium's website. Both frequency of access and perceived usefulness significantly increased for written products (e.g., research briefs, newsletters) and webinars from FY 1 to FY 2. No positive significant changes were noted in accessibility and usefulness ratings for more interactive communications sources such as workshops, conferences, and field tours/demonstration sites. It is anticipated that such changes will emerge in future comparative analyses given the increased consortia focus on providing activities that promote *comprehension, conviction, and commitment.*

Participation

The online survey is perhaps the most critical component of the JFSP evaluation. Though the consortia are still developing, comparisons across survey waves reveal that their efforts are helping to improve fire science delivery. Results from the first three survey waves also have been used to help understand current perspectives and experiences regarding the access and application of fire science information. Finally, the online survey provides a means for interested consortia to obtain pieces of consortium-specific evaluation information that could not be easily gathered through other regional evaluation activities (i.e., by incorporating consortium-specific items that are only received by primary affiliates of that consortium).

The cooperation of the JFSP consortia has been essential in ensuring the success of the online survey. Consortia are responsible for identifying and compiling a participant sample, disseminating the survey requests, and follow-up with respondents and the evaluation team. Because of these consortia efforts, we were able to collect and analyze substantial amounts of national data which permitted statistical comparisons.

Despite these consortia efforts, the number of respondents to the 2013 survey decreased substantially compared to the 2011 and 2012 surveys. As previously mentioned, this decrease is likely attributable to a variety of factors. One likely contributing factor is "survey fatigue" among some potential participants. This poses a challenge as individual consortia need to routinely solicit constituents' participation in surveys related to regional evaluations or needs assessments. Coordinating the timing of survey participation requests (e.g., allowing at least a 3 month time period between major requests) may help minimize survey fatigue; a more specific and targeted explanation of the purpose and importance of the national online survey also may encourage participation. Further suggestions for increasing survey response rates are discussed in the "Interviews with JFSP Consortia Leadership and Staff" report.

Ultimately, the decreased response rate to the 2013 survey is a concern, as continued participation and adequate sample sizes are needed to demonstrate further consortia impacts. Response rates to continuing surveys can ebb and flow (Dillman, Smyth, & Christian, 2009) especially in the JFSP consortia target population whose participation may be significantly influenced by external events (e.g., wildfires, travel, trainings, etc.). It is impossible to control all of the factors affecting survey response rates; however, there are actions that can be taken to help address several of these factors. Continuing collaboration between the JFSP consortia and the national evaluation team should help ensure the success of future online survey waves.

Webmetrics Component

The consortia websites are perhaps the primary means of increasing fire science information accessibility and applicability among Consumers, Producers, and the General Public. These websites serve as a convenient "one-stop shop" for practical fire science information, aim to engage the fire community through interactive online features, and notify users of learning and funding opportunities.

The webmetrics component of the current evaluation includes both quantitative and qualitative assessments. The quantitative piece involves collection and analysis of common "web analytics" or indicators regarding website users and utilization. The qualitative piece focuses on the operation and purpose of consortia websites and consortia social media accounts. In addition, the qualitative piece draws on the perspectives of those most responsible for their consortium's site to better understand site performance and website-related challenges.

Limited quantitative and qualitative webmetrics data were collected during late summer of 2011 and were presented in the 2011 Evaluation Report. A second wave of webmetrics data was presented in the 2012 Evaluation Report. The third wave of webmetrics data presented here still should be interpreted as a baseline assessment because it is the first year that the majority of consortia provided complete datasets (n=10) or almost complete datasets (n=3). Upon collecting more standardized and consistent future data, the evaluation team can conduct comparisons and trend analyses with the intent of: 1) Assessing basic impacts of consortia websites regarding the dissemination of fire science research results and tools; 2) Illuminating Best Practices and features of effective consortia websites; and 3) Addressing any challenges to the successful dissemination of current, practical, and synthesized information via consortia websites.

Quantitative Webmetrics Component

All JFSP consortia embed an appropriate analytics package (e.g., Google Analytics) to collect monthly data pertaining to individual website users and patterns of utilization. Consortia are tasked with reporting these monthly data to the evaluation team bi-annually through the use of an Excel template specifying the quantitative indicators of interest.

Unlike Wave 1 and Wave 2 that collected data for only six months, Wave 3 data collection was expanded to nine months (January 2013-September 2013) to align with the fiscal year. In addition, Wave 3 was the first time most consortia had established websites and could provide comprehensive data sets. Thirteen consortia with established websites submitted data fall of 2013 and were included in Wave 3 analyses. Those responding consortia with missing data fields may have experienced some routine challenges in data collection such as missing data for a specific month; however, missing data has declined significantly over time. Site address issues excluded all quantitative data pertaining to one consortium's site, though it should be noted that this consortium complied with all webmetrics data submission requests. This consortium's site address closely resembles that of a popular overseas website, and many visitors landing at

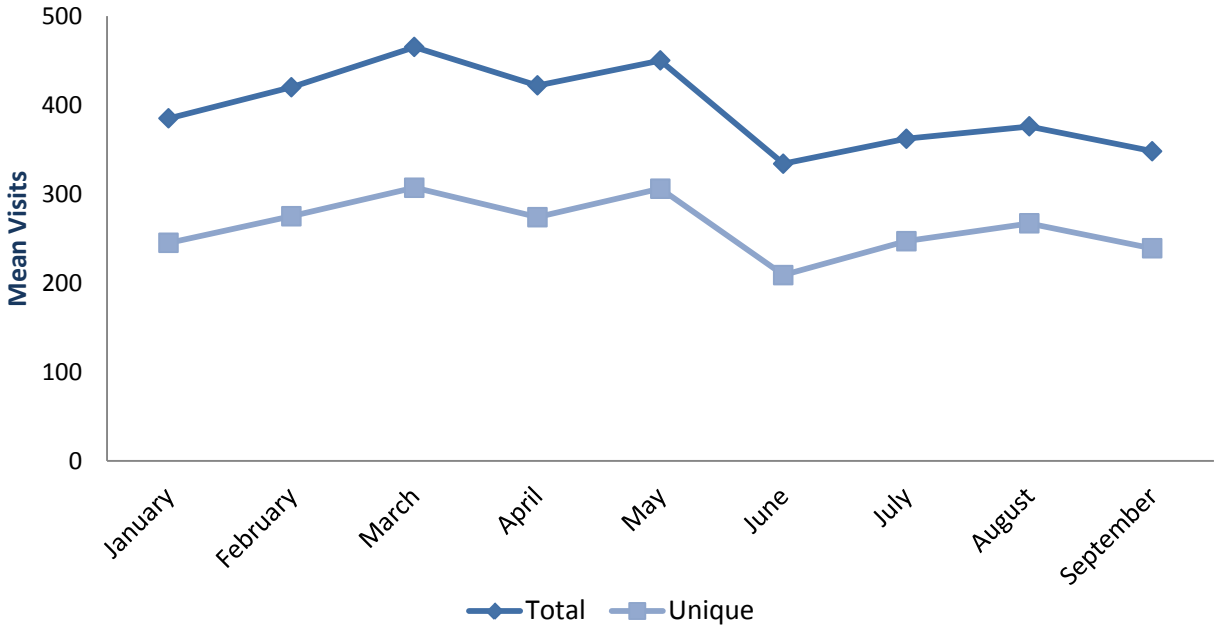
the consortium's site had intended to visit the overseas site. Thus, most data submitted from this consortium are significantly confounded. For instance, this consortium reported 20,000 plus monthly visits due to site address similarity, whereas all other consortia reported below 1,000 monthly visits. The consortium is aware of this issue and in the process of addressing it.

When appropriate, limited findings from Wave 2 and Wave 1 will be cited for comparative purposes. As with findings from the other national evaluation components, quantitative webmetrics results are presented at the aggregate level. Yet, the uniqueness of each consortium does have implications for website evaluation, which will be discussed further in the "Top Content" sub-section.

Basic Website User Data

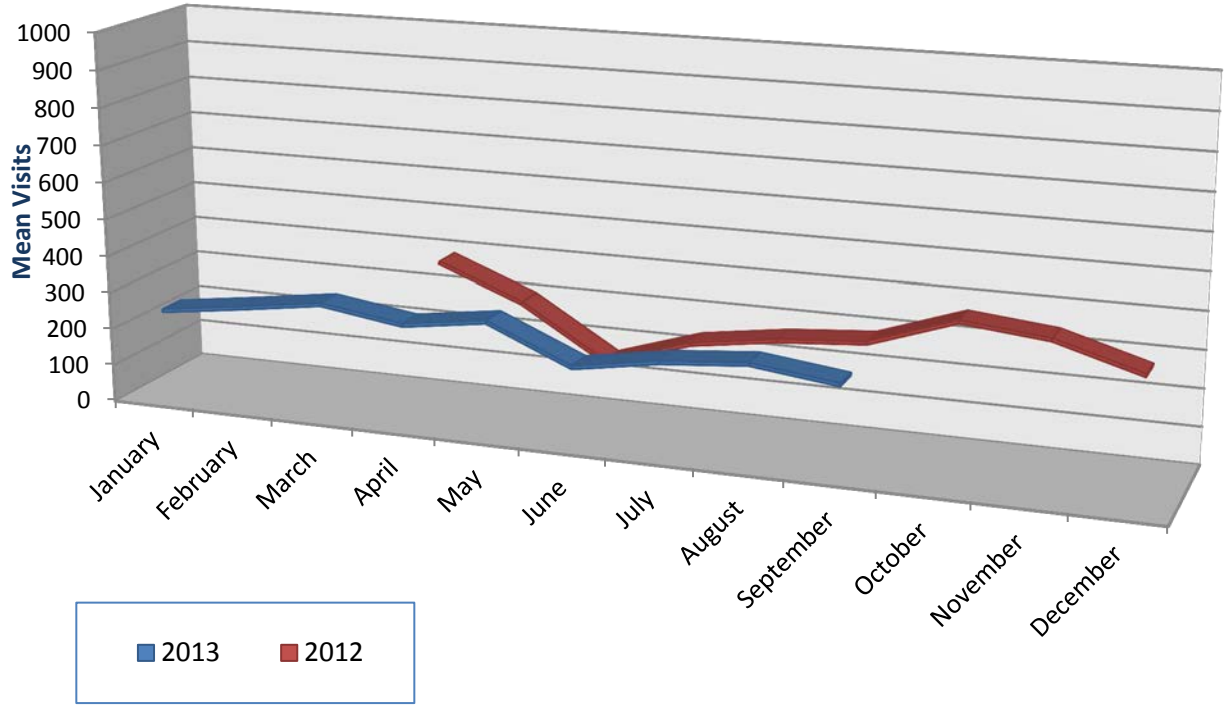
All consortia with established sites were asked to report the number of "total" and "unique" visits to their websites from January 2013 to September 2013. Total number of visits provides a raw count of instances in which the website was accessed during a one-month period, whereas the number of "unique" visitors provides a count of *unduplicated* visitors to the website. To illustrate this point, an individual visiting a consortium website five times during a particular month would be counted only once as a "unique" visitor, but all five website visits would be counted under "total" number of visits. Total number of visits indicates the general frequency with which the websites are being accessed, whereas the number of "unique" visitors indicates the extent to which the consortia websites are recruiting new users.

Figure 16. Mean Total and Unique Site Visits per Month 2013



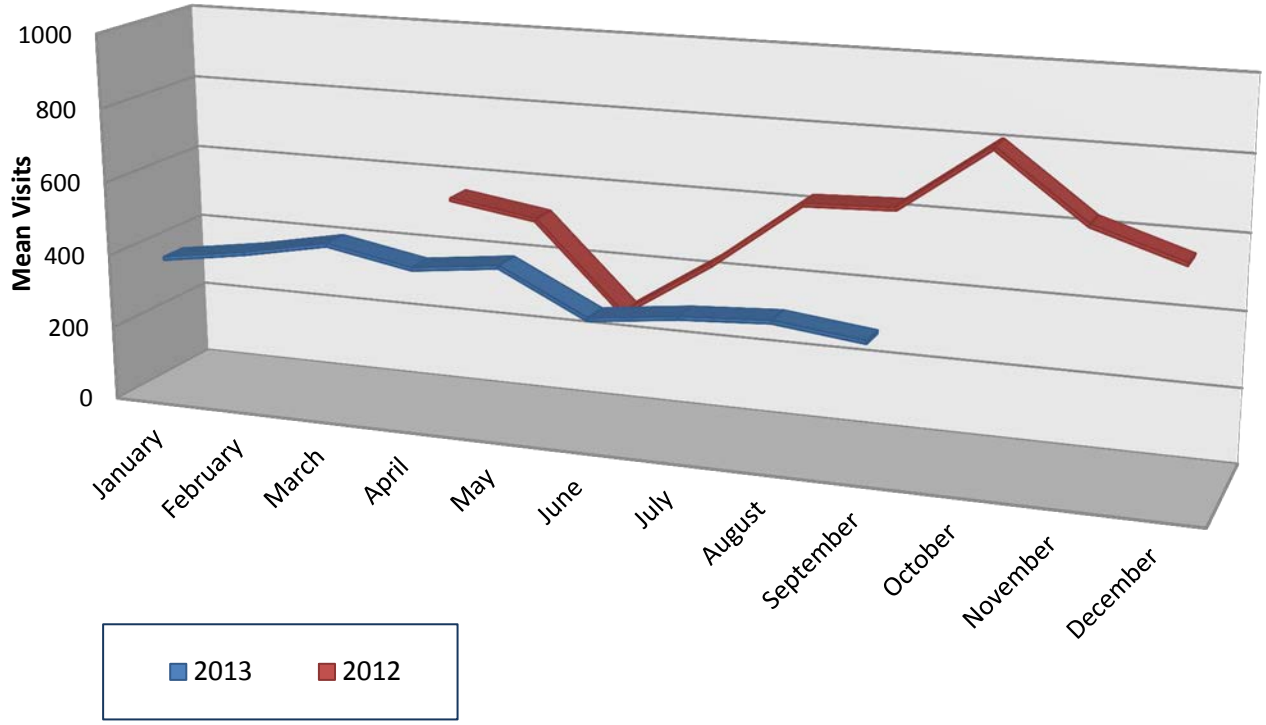
The mean total and unique visits to original consortia websites from January 2013 to September 2013 are depicted in Figure 16. Twelve consortia submitted data for all nine months and one consortium submitted data for seven months (omitting January and February). Similar to Wave 2, the data for total visitors and unique visitors in Wave 3 followed the same trends across the months (i.e., the data are parallel) with an expected greater number of total visitors than unique visitors. Standard deviations of the mean ranged from 252 to 404 for total visitors and 182 to 272 for unique visitors for all months. Although these ranges are quite large, this is expected considering consortia diversity in terms of site development and regional user needs.

Figure 17a. Average Mean Unique Site Visits: Wave 2 & Wave 3



When Wave 3 total and unique site visits are compared to total and unique site visits in Wave 2, a decrease in both types of website visits was noticeable (see Figure 17a and Figure 17b). The number of visitors across months stabilized in Wave 3, not showing substantial increases and decreases across months as demonstrated in Wave 2. Although visits decreased overall, a smaller number of users visited more consistently throughout the months.

Figure 17b. Average Mean Total Website Visists: Wave 2 & Wave 3



Consortia also were asked to report monthly "bounce rates," which indicate the percentage of website visitors who did not further explore the website site upon accessing the home page. Higher bounce rates may indicate that website content and features are not relevant to users or that the website design is confusing and difficult to navigate. As website layout and features differ among consortia, however, bounce rates may have varying implications. For instance, some Consumers may be searching for information located within their consortium's website homepage and subsequently exit the site; such instances would not be indicative of user dissatisfaction or of websites' failure to deliver relevant fire science information.

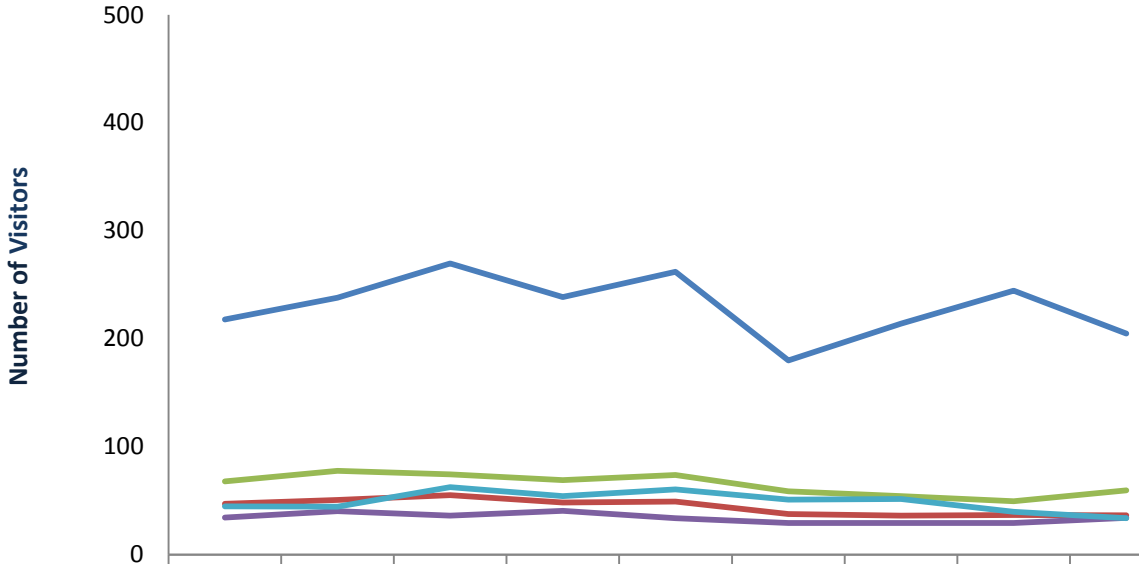
Wave 1 quantitative webmetrics results, aggregated across the months of May 2011-July 2011, revealed a mean bounce rate of **54.06%** (SD = 19.17) for responding consortia (n = 4). The comprehensive mean bounce rate for Wave 2 (aggregated across the months of August 2011-March 2012) was similar with five participating consortia (M = **55.31%**; SD = 7.94). The comprehensive mean bounce rate for Wave 3 (aggregated across the months of January 2013-September 2013) with data from twelve of the thirteen participating consortia was lower at **43.51%** (SD = 22.97). In addition, the average bounce rate steadily dropped within Wave 3 from January (47.7) to September (37.96). The drop in bounce rate may be due to less accidental traffic (i.e., people unintentionally entering the site), which is consistent with fewer visits overall. Additionally, a lowered bounce rate may indicate site improvements and/or increased familiarity over time has improved site navigation and utilization among users.

Visitor Loyalty

Data also were collected to obtain an understanding of visitor loyalty to the consortia websites. The extent of visitor loyalty is determined by the number of times that the same user accessed a website over a specified time period. High visitor loyalty (i.e., increased number of subsequent visits) indicates that users are engaged and satisfied with website content; in essence, visitor loyalty is a measure of user retention.

Eleven out of thirteen consortia provided complete data for visitor loyalty; one consortium was missing data for the month of January only and one consortium did not provide data for any month. Month by month means for January 2013-September 2013 of the number of individuals visiting consortia websites based on frequency of use is provided in table 18a. In addition, aggregate means and standard deviations for Waves 1, 2, and 3 are provided to highlight general trends (see Figure 18b).

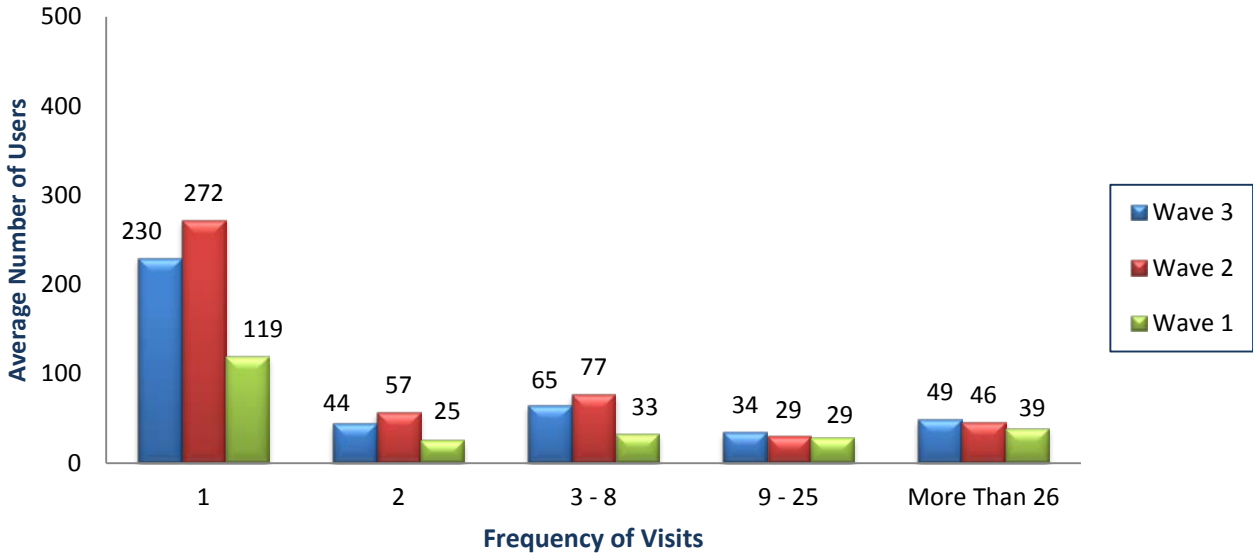
Figure 18a. Mean Frequency of Visits to Consorita Websites per User, 2013



	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
Visited Once	217.82	238.00	269.67	238.67	262.00	179.92	214.08	244.58	204.83
Visited Twice	47.09	50.82	55.17	48.33	49.25	37.83	36.25	36.92	36.50
Three to Eight Visits	67.82	77.82	74.42	69.00	73.75	58.75	54.42	49.42	59.58
Nine to Twenty-Five Visits	34.55	40.36	36.17	40.75	33.92	29.50	29.50	29.25	34.17
Twenty-Six or More Visits	44.91	44.36	62.50	54.33	60.50	51.08	51.58	39.75	33.83

As with previous waves, Wave 3 data indicated a large number of first time visitors, with a sharp decline for the number of reoccurring visits. Non-reoccurring visits could be due to an unintentional site visit, the user's need being satisfied by a single visit per month, or may indicate user dissatisfaction; unfortunately, the data do not indicate the reason for a single visit. However, among reoccurring visitors, three to eight visits was most common. In addition, website visits over nine times (i.e., the categories of nine to 25 and 26 or more) were greater than in the previous waves indicating increased use among regular users (see Figure 18b).

Figure 18b. Mean Frequency of Visits to Consortia Websites Across Waves



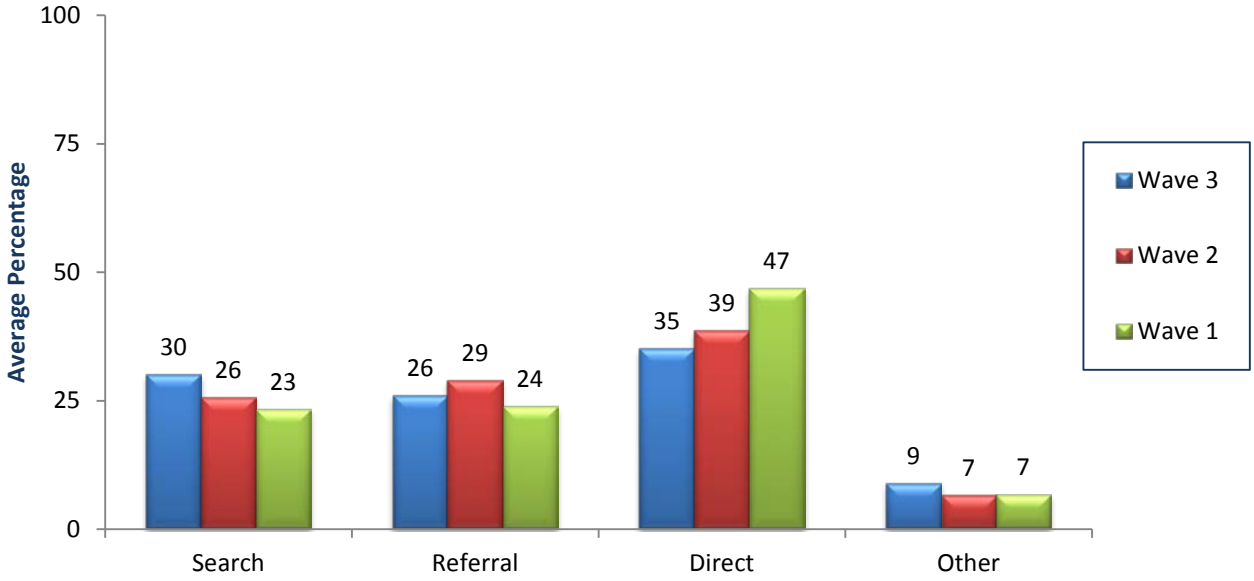
Traffic Sources

In order to provide "one stop shopping" and ultimately enhance fire science delivery, it is imperative that potential users are able to easily locate and access the JFSP consortia websites. To better understand the means whereby users encountered their consortium's websites, data were collected regarding the top website traffic sources and use of specific keywords in searches resulting in consortium website visits.

"Traffic sources" refers to the specific web-based mechanisms that subsequently directed visitors to the consortia websites. For instance, individuals may use a search engine such as Google to locate consortium sites, or they may access their individual consortium website via a link posted on other fire science websites. Table 19 displays the breakdown of frequencies for four general traffic sources that resulted in consortia site visits. "Search" refers to search engines, indicating the percentage of users that landed at a consortium website by entering a related term using Google, Yahoo, Bing, etc. "Referrals" encompass all other websites and domains (including emails) with a link that ultimately directed the user to the particular consortia site. "Direct" refers to the percentage of users who accessed a consortia site by

directly typing the site's address into their web browser (or accessed the site address via browser history). "Other/Campaigns" is a catch-all category which captures site arrivals from sources not otherwise specified (most commonly advertisements and mailchimp announcements). Ten consortia provided complete data for this section; one consortium provided no data and two consortia had missing data for the months of January and February.

Figure 19. Traffic Sources by Wave



Direct access continued to be the most common traffic source for Wave 3. It was expected that frequent users would access the consortia sites directly; however, the decrease in direct access over time indicates websites are being effectively promoted through other means. Indeed, increase in search engines as a traffic source indicates outreach to new users. The drop in referral sites, although slight, suggests consortia should continue to seek out partnering sites to raise awareness among the target population.

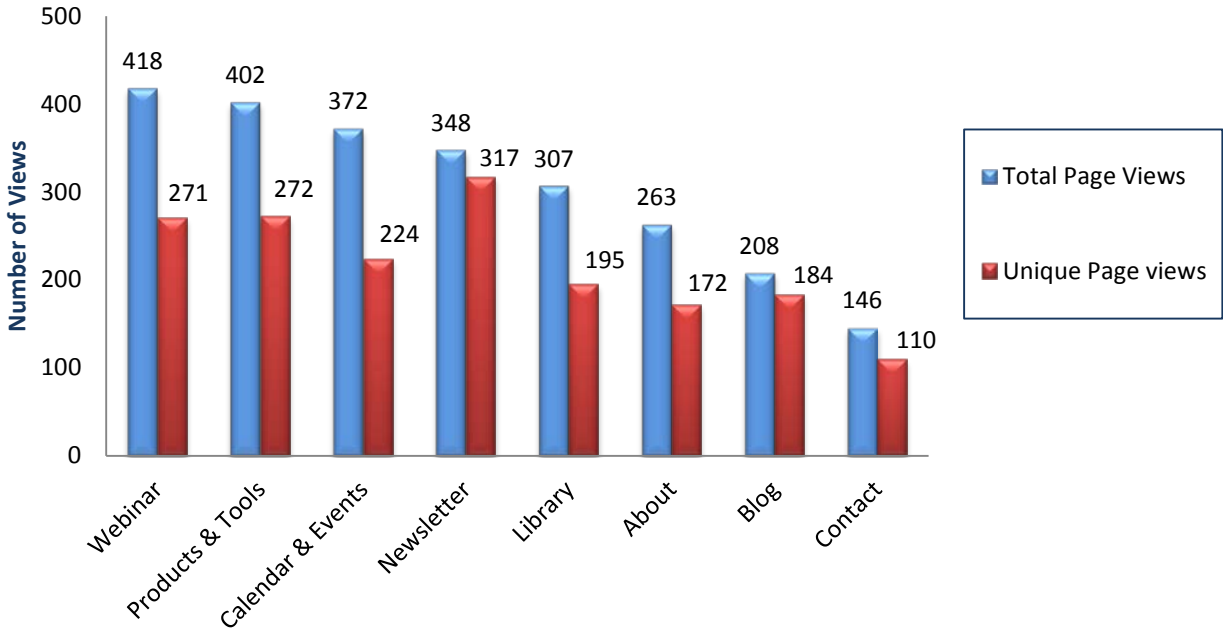
The JFSP consortia should continue to explore electronic source opportunities to recruit users. This may include establishing linkages with other fire science and management-related sites or environmental science sites more generally. In addition, further exploration of search engine properties and key search terms will help with site promotion. Social media may also be an ideal way to connect with both managers and the general public.

Consortia also were asked to indicate their top three *specific* traffic sources for each month. These data were entered as text (i.e., web addresses, phrases), so no numeric analyses were conducted in this category. A basic review of these data illuminates the most common types of general traffic sources used to access the sites. Similar to Wave 2, those ultimately arriving at a consortium's site using searches overwhelmingly used the Google search engine. The majority of referrals originated from the JFSP home site (firescience.gov) and FRAMES, though cross-consortia links and University based links also generated web traffic. Finally, links embedded in mailchimp announcements, listserv emails, and blogs often appeared among the top three specific traffic sources. New to Wave 3 was the mention of Facebook as a traffic source. It is expected that as consortia utilize social media outlets for promotion, social media sites will grow as a valuable traffic source.

Top Website Content

One objective of the quantitative webmetrics component was to examine the popularity of site content in order to assess the degree to which specific site features and content are meeting users' needs. This information may be used to inform further site development, modification, and expansion. Yet, there are several challenges in reliably identifying top site content at the aggregate level.

Figure 20a. Aggregated Total and Unique Page Views for Top Consortia Pages in Wave 3



Consortia may benefit from duplicating website organization from the most popular consortia websites. While specific content will differ, keeping a consistent organizational format will help users across regions naviagate all websites as well as ensure future comparisons that can highlight best practices.

When the quantitative webmetrics evaluation component was designed, it was anticipated that regional information would vary by site but that site configuration and page themes (e.g., blogs, calendar/events, and literature libraries) would remain similar. Specific challenges in assessing top site content were due to the differential configuration of site content, differences in site updating, and popularity of pages due to location within the site. For example, some sites had a single "Events" page for all upcoming activities, whereas others included separate pages for each event. In addition, some calendars were routinely updated whereas others were mostly blank. Finally, page/content popularity was sometimes simply due to placement within the site; some pages with potentially relevant information were accessed less frequently because they were embedded deep in the site and hidden.

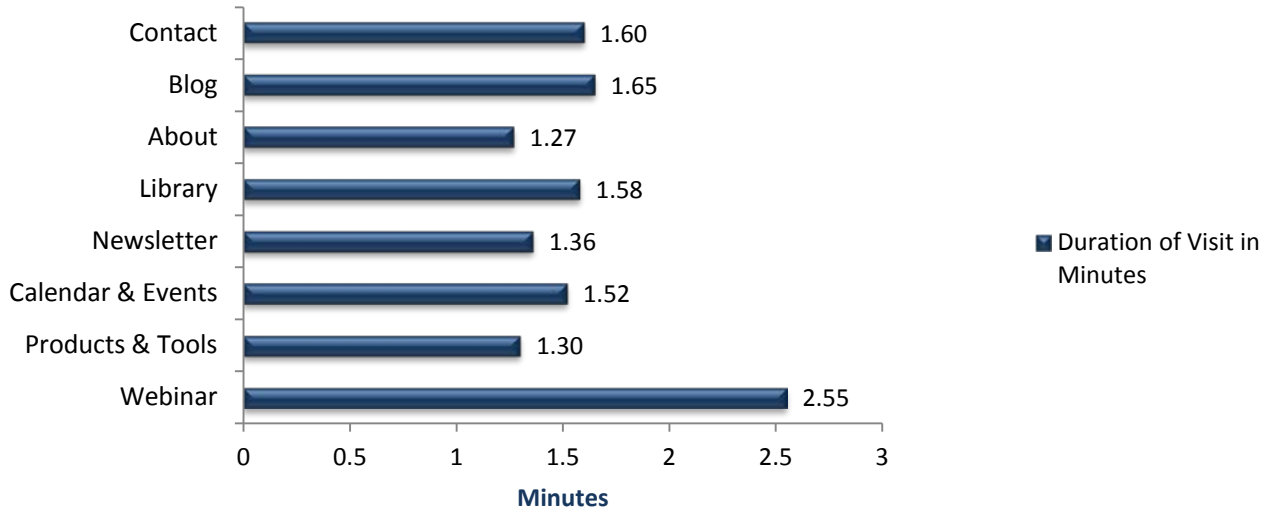
Despite these issues, we were able to identify some general themes related to the popularity of specific content across the sites of **thirteen** reporting JFSP consortia (see Figures 20a and 20b). Consortia reported an average of total page views, unique page views, and average duration of time spent on page for each page accessed during the reporting period (January 2013-September 2013). By consortium, each page was classified under a broad category (e.g., webinar, newsletter, consortia created products/tools, resource library, calendar/events, blog/ask an expert, about, and contact information). Next, total views, unique views, and duration spent on page were aggregated by category across consortia. "Total views" is the count of all page views while "unique views" only counts a user once regardless of multiple page re-visits. Distinguishing between the two is particularly important for these pages because a small subset of users may be utilizing specific pages multiple times. Duration of time spent on page indicates engagement. Determining which pages are attracting initial and returning users, as well as the length of time users spend on each page, can guide consortia in either altering websites to provide only the most engaging pages or improve important pages (i.e., pages with consortium priority information) with popular features included on more frequented pages.

Newsletters, webinars and **products/tools** attracted the most unique views, whereas webinars and product/tool pages had higher returning views. These data are promising as the original intent for consortia websites was to be a "one-stop shop" for access to fire science information. Average duration spent on these pages however, is somewhat low (less than two minutes for newsletters and products/tools; see Figure 20b). Each individual consortium should be looking at website page duration data and strategizing ways to increase engagement for these

important pages. Cross-consortia communication can facilitate borrowing of features or users can be asked directly about preferences.

The popularity of **calendar/events** pages varied across consortia, which is likely attributable to the actual content of these pages. Some consortia had more comprehensive "events" pages listing all upcoming learning and funding opportunities, whereas others had unique pages for different opportunities. Calendar/events pages are crucial for mobilizing the fire science community. Consortia should regularly update these pages as well as make sure they are easily accessible from the homepage.

Figure 20b. Average Duration in Minutes Spent on Top Website Pages



Similar to Wave 2, **literature libraries** did not attract users as expected. Both total and unique page views for literature libraries decreased from Wave 2 to Wave 3. The decrease in interest illuminates a need for strategies to further increase user engagement in these "one-stop-shops" that provide access to a wide variety of fire science information.

It is recommended that websites place priority information in easily accessible formats (i.e., bullet-point highlights or research syntheses) on webpages in addition to full length articles to help ensure information accessibility.

Further quantitative webmetrics data as well as regional-scale website evaluation data are needed to better understand the reasons underlying the popularity (or lack thereof) of specific site features. Part of the difficulty in determining best practices for websites is the different organization of each site. Though content should differ by region, having a similar format may help consortia benefit from their shared experiences and ensure that consortia website users navigate sites with greater ease.

Qualitative Webmetrics Component

The qualitative webmetrics component was designed to obtain a more comprehensive understanding of consortia websites' operation and intended purposes. In addition, the qualitative webmetrics component draws on the perspectives of those most responsible for the consortia websites to help identify Best Practices and shared challenges. The qualitative component also is intended to compliment the quantitative webmetrics component. As consistency in web analytics data collection and reporting across consortia continue to improve, qualitative findings may help provide additional context for quantitative findings and illuminate the *reasons* behind various aspects of website performance.

Qualitative data regarding consortia websites are collected annually using an online survey completed by consortia PIs and Coordinators, webmasters, or other key consortia personnel familiar with their consortium's website. Preliminary qualitative data pertaining to the original eight JFSP consortia websites are presented in the 2011 and 2012 Evaluation Reports.

Considerable modifications were made to the 2013 qualitative webmetrics survey to better understand consortia needs and experiences as they continue to grow. Most notably, we added a series of items focusing on consortia use of social media to promote fire science delivery. Qualitative survey results are first presented for the items pertaining to consortia websites, followed by those pertaining to consortia social media accounts. Each section summarizes findings related to maintenance and operation, purpose/target audiences, respondent perspectives, and evaluation activities and plans.

Consortia Websites

The current 2013 qualitative webmetrics data (Wave 3) are the first to include responses from all 14 JFSP consortia with established websites. Though all 14 consortia participated in the 2012 wave (Wave 2), several had not yet officially launched their websites and their responses were preliminary and focused on planning. The 2013 qualitative webmetrics data provided more comprehensive information regarding consortia sites' functioning and perspectives on consortia sites than in prior years. Although all JFSP consortia have successfully launched their sites, it still important to recognize that consortia sites are in varying developmental stages when interpreting the webmetrics results. Reported public launch dates for the consortia sites ranged from July 2009-January 2013. In addition, the consortia vary in terms of resources and personnel allocated to website development and maintenance.

An IT Subcommittee comprised of volunteers (consortia PIs, Co-Is, Webmasters) was formed in Spring 2013 and tasked with assessing needs and challenges pertaining to JFSP consortia websites. The JFSP IT Subcommittee conducted a survey during Summer 2013 to further explore these issues. The findings from this survey, which is distinct from the national evaluation efforts, have been distributed to the JFSP Board and all consortia to help inform the development and implementation of plans to further support the success of consortia websites. Some findings from the IT Subcommittee Survey, however, provide valuable insight into the current qualitative webmetrics assessment and are referenced when relevant in this section.

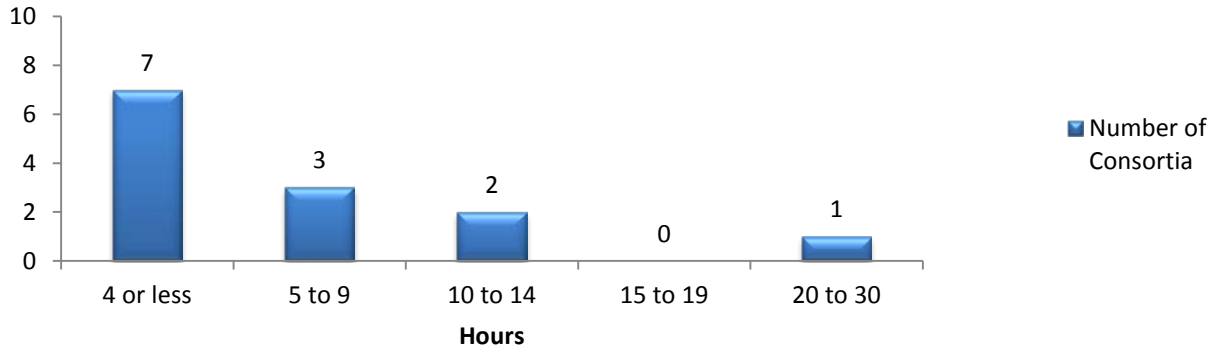
Website Operation and Maintenance

Consortia representatives were asked to respond to a series of questions regarding their website's platform, the time spent on maintaining and updating their site, and their knowledge regarding links to their site (via external websites).

The most common platform used to ground consortia websites was Squarespace (*n* = 4), followed by self-designed platforms (*n* = 3), Drupal (*n* = 2), FRAMES (*n* = 2) and Homestead (*n* = 2). Half (*n* = 7) of consortia representatives reported that their current platform "mostly" met their web design and analysis needs, **four** said their platform "completely" met their needs, and the remaining **three** said their platform "somewhat" met their needs. There were no notable relationships between type of platform used and the extent to which consortia representatives believed that their website design and analysis needs were being met.

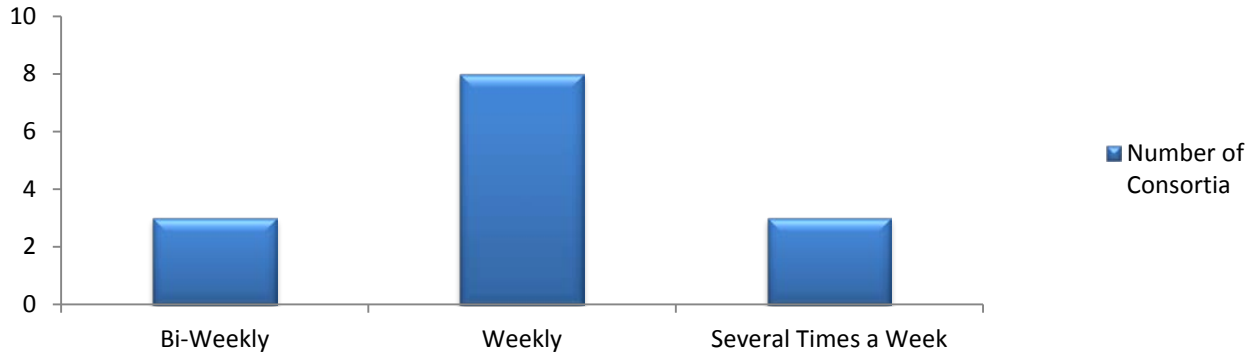
The amount of time spent on website maintenance varied across consortia (see Figure 21), but the ratios of time spent were similar to those obtained from Wave 2 of the qualitative webmetrics component (conducted in Summer 2012). That is, the reported time spent overall did not substantially increase or decrease from 2012 to 2013. Half (*n* = 7) of the consortia representatives reported spending an average of less than 5 hours per week on site maintenance, and **four** reported spending 5 to 10 hours. **Two** consortia representatives said that an average of 10 hours was spent per week, and **one** consortium representative indicated that between 20-30 hours per week were used to maintain their website.

Figure 21. Average Number of Hours Spent per Week on Website Maintenance



The reported frequency with which consortia sites were updated, however, increased from Wave 2 to Wave 3. Specifically, there was a substantial increase in the number of consortia representatives reporting that their sites were updated weekly (*n* = 8) as opposed to bi-weekly (*n* =3) or monthly (*n* = 0)[12] (see Figure 22). **Three** respondents reported that their consortium's site was updated several times per week. This increase in the frequency of updates is promising and aligns with consortia perspectives that continuing updates are critical to website success, as expressed in the 2013 qualitative interviews. Not surprisingly, consortia spending more time maintaining their sites also tended to report more frequent site updates.

Figure 22. Frequency of Website Updates



Consortia websites are essential in increasing *awareness* of the JFSP consortia presence, mission, and the extensive products and learning opportunities they provide. The "market" for consortia websites is not yet saturated, and employing strategies to attract new site users remains critical to promoting fire science delivery in a variety of target audiences. "Referrals," whereby access consortia websites through a link posted on another website, are one means of attracting new users. As indicated in the quantitative webmetrics analysis, a little more than one-quarter of individuals accessing consortia websites do so through links posted on other sites.

To help determine the extent to which consortia are promoting referral traffic, the qualitative webmetrics survey includes an item asking respondents to list the external sites that include links to their consortium's website. Only **four** respondents indicated that they were aware of any sites other than firescience.gov (the JFSP site) that included a link to their consortium's site. When asked to identify the sites, **three** of these respondents listed 1-2 sites, whereas the remaining respondent listed over ten sites that included links to their consortium. Common types of sites listed included forestguild.org, Prescribed Fire Council sites, and various sites for regional environmental research centers.

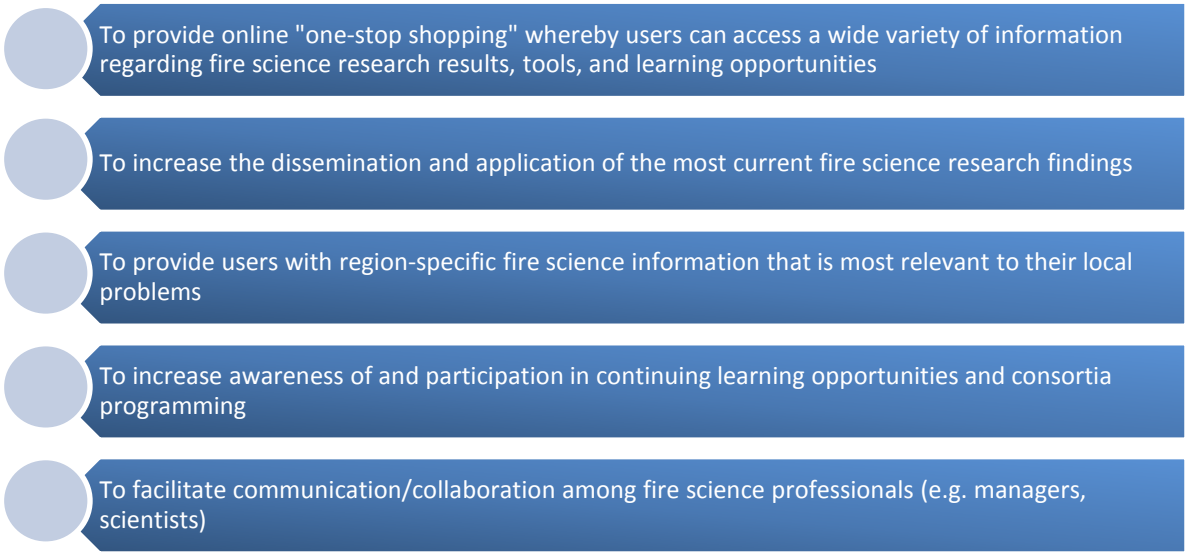
Considering the substantial amount of traffic arriving at consortia sites through referrals, the relatively low reported number of referral sites is surprising. Perhaps other external site linkages exist that consortia representatives were unaware of or the reported links have been

[12] In Wave 2 of the qualitative webmetrics component, three consortia representatives reported that their sites were updated on a monthly basis.

highly effective in drawing users to consortia sites. Regardless of the explanation, these data illuminate an opportunity for consortia to reach additional constituents by reaching out to other organizations and asking if these organizations would consider including consortia links in their sites. The JFSP consortia may reciprocate by including a link to the referral site in their own website if appropriate.

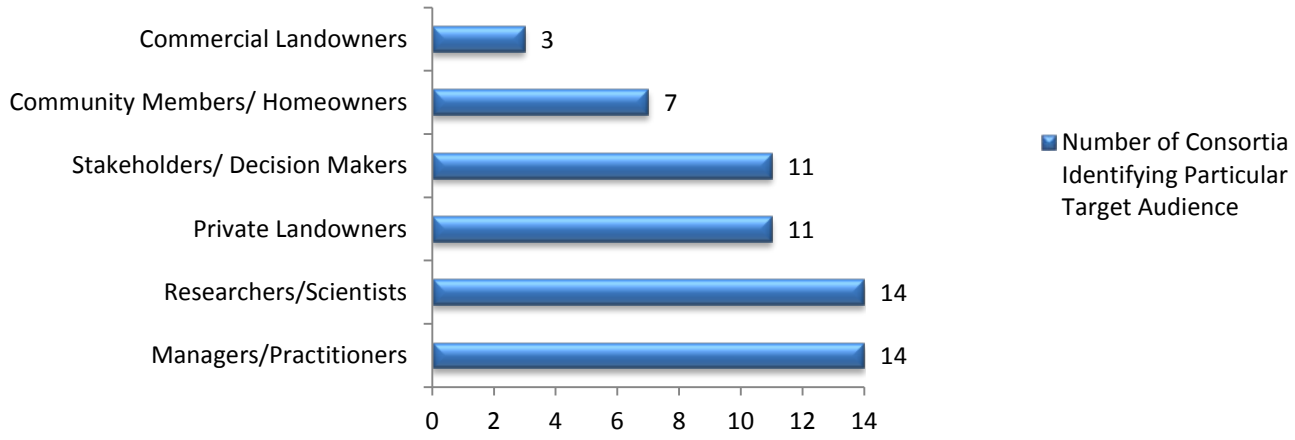
Website Purpose and Target Audience

Despite regional differences, representatives from all JFSP consortia agreed that their current or developing sites aim to serve the following purposes:



Representatives from all JFSP consortia with existing sites identified **fire managers/practitioners** or "Consumers" as the *primary* target audience for their website. Respondents were then asked to identify any other target audiences for their consortium's website. As shown in Figure 23, all respondents identified **fire researchers/scientists** as another target audience, but the extent to which additional target audiences of the websites were identified varied across consortia. It should be noted, however, that the majority of respondents (*n* = 11) indicated that that **private landowners** and **decision-makers/stakeholders** were a target audience, and half (*n* = 7) said that **community members/homeowners** were a target audience. Though the current qualitative webmetrics wave did not include a review of site features, it is important for consortia to consider the relevance of site content and site "user-friendliness" as they pertain to their individual target audiences.

Figure 23. Number of Consortia Identifying Target Audiences for Website



Respondents' Perspectives and Opinions

Exploring the opinions and experiences of those most involved in programming efforts is critical in ensuring the success of any large-scale evaluation, such as the external national evaluation of the JFSP consortia. To this end, the qualitative webmetrics survey included several items asking consortia representatives (presumably those most familiar with their consortium's site) for their perspectives on site content, website-related challenges, and the value of maintaining consortia sites. Most of these questions asked for open-ended or text responses.

First, respondents were asked to list the three features of their website that they felt were most critical in helping their consortium attain its goals. Across consortia, respondents most frequently identified the following features as the most critical:

- **Interactive Calendars and/or Events Pages** that inform users of upcoming consortia events and learning opportunities
- **Webinar Pages** that include information and online registration for upcoming webinars and/or allow access to archived webinars
- **Blogs** that give consortia the opportunity to quickly share the most recent fire science information and news and (for some websites) encourage site users to comment and interact.
- **Comprehensive fire science/management resource pages or searchable databases** that allow users to access a wide variety of fire science research articles, briefs, or fact sheets that is relevant to their regional needs.

This year's quantitative webmetrics analysis revealed that the pages the consortia perceive as most critical are also among the most popular among their users. Interactive calendars/events pages and webinar pages were among the top three most frequently viewed pages across consortia. Though blogs and resource pages/searchable databases also were popular with respect to other site pages (which can range from 10-25 plus), their popularity varied across sites and the average amount of time users spent on these pages was relatively low. Thus, consortia may wish to consider strategies to promote increased user activity (both in terms of access and time spent digesting material) on blogs and comprehensive resource pages. Allowing users to comment on blogs as some consortia do may help increase site visits and user engagement.

Next, respondents were asked to briefly describe the single biggest website-related challenge they have faced; this challenge could pertain to any aspect or developmental component of consortia sites. Overall, the two most frequently reported challenges were: 1) Improving website design and organization and 2) Continued maintenance of the sites and keeping sites updated with new and "fresh" information. These challenges were frequently reported in response to the JFSP IT Subcommittee survey as well. Findings of the Winter 2013 qualitative interviews (during which many participants indicated that they felt overwhelmed by the responsibilities of maintaining and updating their consortium's site), further indicate that the majority of consortia would benefit from additional, perhaps external, support and expertise to assist in maintaining and improving their websites. Many (but not all) respondents to the IT Subcommittee Survey agreed that collaborating and sharing website-related expertise with other consortia would be beneficial.

> *"Even though all consortia are unique – each share common goals and features, such as events, publications, JFSP funding projects/grants. Inter-consortia collaboration and projects are becoming more common, so sharing expertise can only be a benefit"*
>
> -JFSP IT Subcommittee Survey Respondent

Wave 3 of the quantitative webmetrics survey also included two Likert-scale type items concerning respondents' perceptions of the value of their websites. The first asked participants to rate the importance of their websites in achieving their consortium's goals. Responses occurred on a 9-point scale where 1 = not important, 5 = somewhat important, and 9 = very important. The mean response to this item was 8.43 with a relatively small standard deviation of .65, indicating consistency in participants' beliefs that their website is highly important to furthering consortia progress. The second item asked respondents to weigh the costs and benefits of their consortium's site using a 9-point scale where 1 = costs far outweigh the benefits, 5 = costs and benefits are equal, and 9 = benefits far outweigh the costs. Most

respondents believed that the benefits of their websites outweighed the costs (*M* = 7.86, *SD* = 1.35).

> *"The learning curve was worth it."*
>
> -Coordinator, commenting on costs and benefits of consortia websites

Website Evaluation Plans

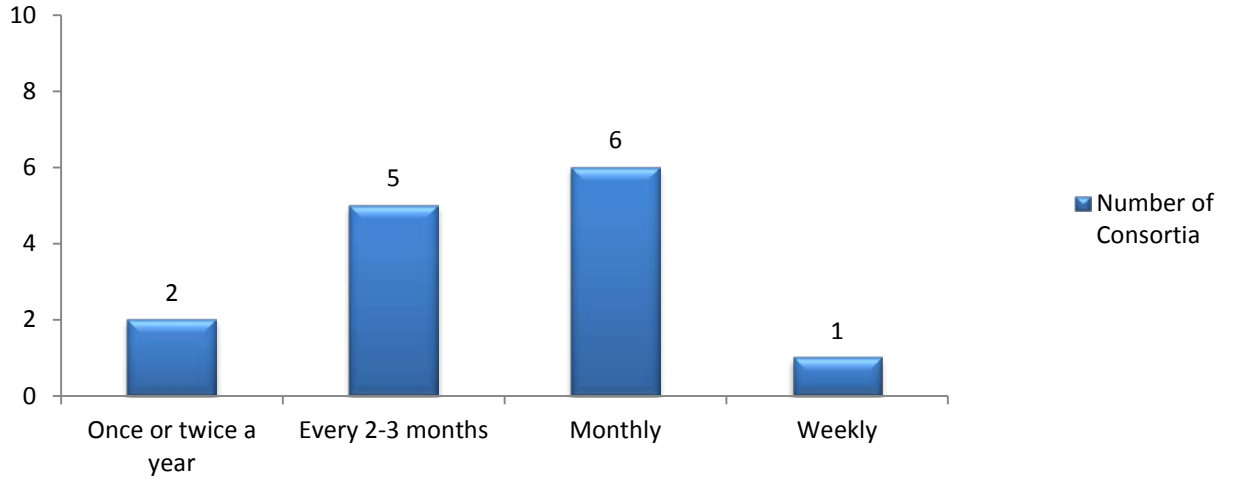
The current national evaluation examines JFSP consortia processes and impacts at the aggregate level. Each consortium, however, is responsible for evaluating their programming impacts at the regional level.[13] Consortia evaluations of their individual websites may provide valuable information that cannot be captured at the aggregate level. For instance, such findings can help "fill in the gaps" of the aggregate quantitative assessment by illuminating the reasons underlying the high or low popularity of specific pages and features. They can enhance the understanding of user needs, as well as website strengths and areas for improvement with respect to organization and content. Consortia wishing to evaluate their sites may do so through several different means, such as conducting focus groups, interviewing current and potential site users, and/or including a brief "pop-up" evaluation survey in their actual site.

Only **one** respondent said that their consortium had conducted a regional-scale evaluation of their website. This consortium included a brief evaluations survey for current and potential website users in a newsletter. **Eight** of the remaining 13 respondents said that their consortium had plans to conduct a regional-scale evaluation of their website in the future. When asked to briefly describe these plans, respondents mentioned administering short surveys (either paper surveys incorporated into another activity such as a workshop or online surveys), and conducting focus groups and interviews.

As part of the quantitative webmetrics component, all consortia are asked to submit monthly data collected by Google Analytics or a similar package to the national evaluation team every 6 months. Analytics packages facilitate the collection and reporting of quantitative website data on a monthly basis, but these monthly data are only submitted to the evaluation team bi-annually and are analyzed and reported at the aggregate level. Because the consortia are already collecting monthly quantitative web data, they are well positioned to use these metrics in guiding the improvement of their individual sites.

[13] The JFSP Consortia Evaluation Resource Guide (2011) provides tools and references to assist consortia in evaluating their regional educational and outreach activities. To request a copy of this guide, please email Lorie Sicafuse at lsicafuse@unr.edu.

Figure 24. How Often Consortia Review Website Data



Wave 3 of the quantitative webmetrics survey included two items to help understand how the consortia are using the data collected by their site analytics packages. First, respondents were asked how often they (or another individual working on their consortium's site) reviewed site-specific data. As shown in Figure 24, most respondents reported examining site-specific data monthly (*n* = 6) or every 2-3 months (*n* = 5). The extent to which these data are examined as part of independent regional website evaluation efforts, and as part of the national evaluation reporting requirements, is unknown. Second, respondents were asked to briefly describe how their consortium has used data collected by their website's analytics package. Several consortia representatives (*n* = 6) reported that these data were not currently being used or were only being used at a very basic level in assessing overall site visits and bounce rates. The most common uses of analytics data reported by the remaining **eight** respondents were to help identify the most popular site pages/content and to better understand website traffic sources. One respondent reported more in-depth analysis of analytics data to help understand how users navigate ("are moving through") their website and to determine how to best modify their site to accommodate users' browsers.

The availability of monthly quantitative data that is already being collected provides an opportunity for the consortia to better understand website users' behavior with their website in several aspects (e.g., page/content preferences, navigation, engagement). This information can be used to futher improve consortia websites. It is recommended that all JFSP consortia implement plans for regional-scale evaluations of their websites. Though concerns over constituent "survey fatigue" are warranted, such evalautions may be conducted using other methods (e.g., interviews, focus groups).

Social Media

The use of social media in promoting fire science delivery is relatively new to many consortia. In Spring 2013, the JFSP Board advanced two recommendations for consortia use of social media, aimed at further increasing *awareness*. The first recommendation was for all consortia to establish social media offerings, and the second was for consortia to establish a clear and consistent means of assessing and reporting the extent to which consortia social media accounts are reaching participants. Given these expectations and the likelihood that the number of social media users (including members of consortia target audiences) will continue to increase, this year's qualitative webmetrics survey was expanded to include items regarding consortia use of social media. These items aim to obtain a basic understanding of consortia efforts expended on social media accounts to date, social media target audiences, and consortia representatives' perspectives on the value of maintaining social media accounts.

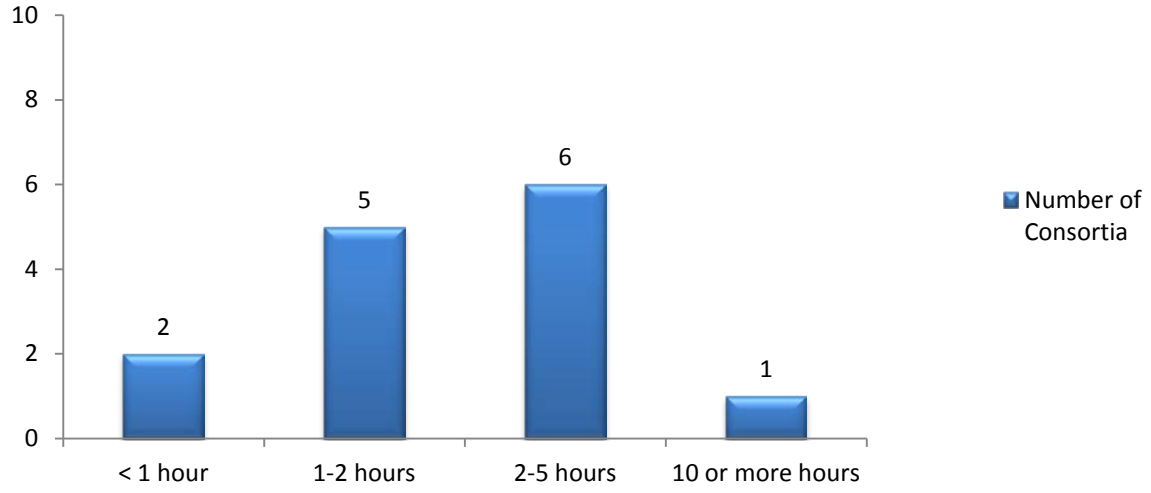
Operation of Consortia Social Media Accounts

The majority of respondents (*n* = 12) reported that their consortium had established a Twitter account, with an additional respondent reporting that their consortium was planning to establish a Twitter account in the near future. Over half (*n* = 8) reported that their consortium had an active Facebook account, with two additional respondents reporting that their consortium had plans to establish a Facebook account in the near future. **Two** respondents further indicated that their consortium had an active video social media site (i.e., YouTube and Vimeo accounts).

All respondents reported that the consortia Coordinator played a key role in establishing and maintaining their consortium's social media accounts. The majority (*n* = 10) said that the Coordinator was the primary and sole individual responsible for their consortium's social media accounts; the remaining **four** respondents indicated that the responsibility for the consortium's social media accounts was shared between the Coordinator and another individual (e.g., PI, contracted staff). Findings from the JFSP IT Subcommittee Survey and prior waves of the qualitative webmetrics survey indicate that Coordinators also are largely responsible for the consortia websites. Though consortia social media accounts are important in increasing constituent *awareness* and promoting fire science delivery, it is understandable that some Coordinators may feel overwhelmed by their growing IT responsibilities.

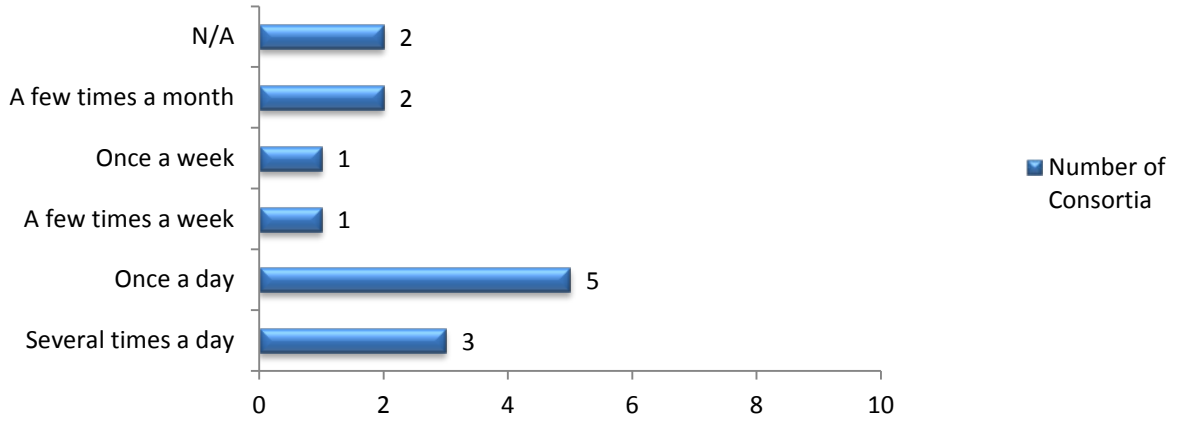
Almost half of respondents (*n* = 6) reported that they (or other consortia personnel) dedicated 2-5 hours per week to consortia social media accounts (see Figure 25). This is a substantial amount of time to dedicate to consortia social media accounts considering: 1) The relatively recent advancement of JFSP Board recommendations that all consortia establish social media accounts and 2) The time required to post, re-tweet, or otherwise update social media accounts. Over half of consortia representatives said that their consortium's social media account was updated on at least a daily basis, with **five** reporting that their account was updated once each day and **three** reporting that their account was updated several times per day (see Figure 26).

Figure 25. Time Spent a Week Posting on Social Media Site



Respondents also were asked if their consortium's social media accounts were integrated or linked to their website via a social media management tool such as HootSuite or another mechanism. Establishing such cross-linkages is important, as these linkages can help draw consortia social media followers to consortia websites and vice versa. For instance, consortia websites may incorporate their consortium's twitter feed, or the consortium's twitter feed may include links directing users to their website. Most respondents (*n* = 9) indicated that their consortia websites and social media accounts were linked in this manner, with **four** reporting that such links had not been established but that there were plans to do so in the near future.

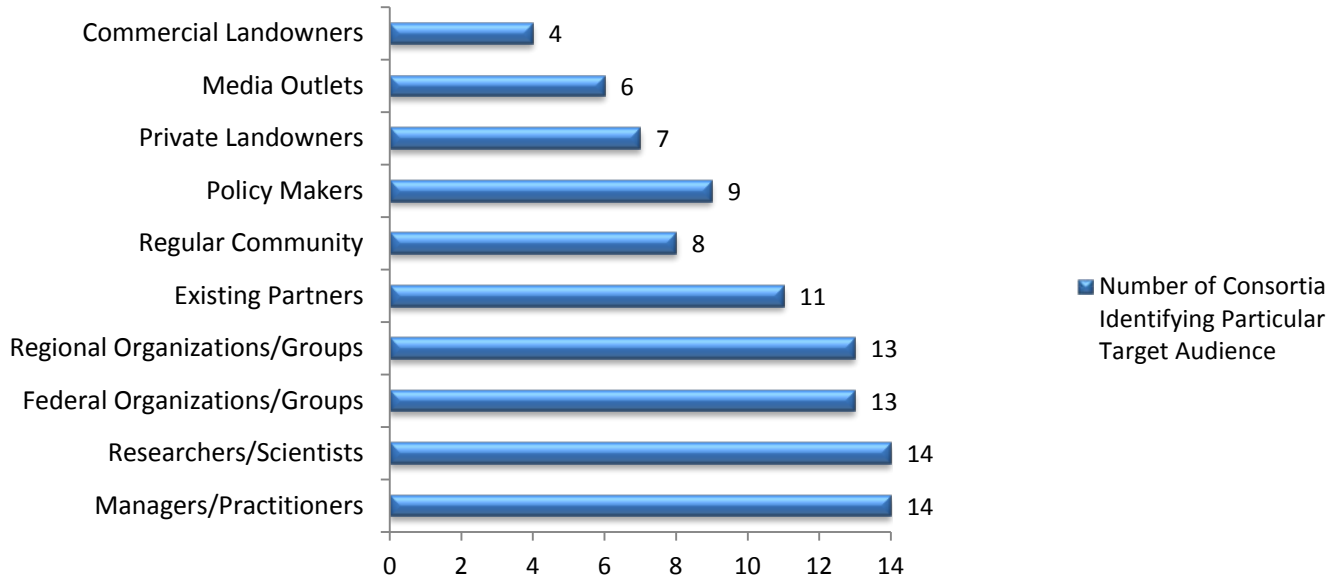
Figure 26. How Often Consortia Update Social Media Accounts



Social Media Target Audience

Respondents were asked to identify the target audiences of their consortium's social media accounts via an item with a "select all that apply" option including an "other" option allowing respondents to list any other target audiences not responses in the response options. Results suggest that consortia target audiences for their social media accounts are broader than the target audiences for their websites. All consortia representatives indicated that fire managers/practitioners and fire researchers/scientists were target audiences for their consortium's social media accounts (see Figure 27). **Thirteen** consortia representatives also identified federal and regional groups/organizations as target audiences. Half of respondents (*n* = 7) identified private landowners as a target audience. This is fewer than the number of respondent who identified private landowners as a target audience for their consortium's website (*n* = 11). Some consortia may be reluctant to include private landowners in their social media target audience due to the assumption that most private landowners are not active social media users. The validity of this assumption is unknown, but evidence suggests that many private landowners are active internet users. Thus, they could potentially be drawn to consortia social media accounts through linkages between these accounts and consortia websites, or through other means of marketing consortia social media accounts.

Figure 27. Number of Consortia Identifying Target Audiences for Social Media



Perspectives on the Value of Social Media

Consortia representatives were asked to respond to six items concerning their opinions about the importance and benefits of using three types of social media accounts to further consortium goals: Twitter, Facebook, and the JFSP Google Groups account. These items are similar to those assessing the perceived value of consortia websites as previously described. For each social media account, respondents were first asked to rate its importance to achieving consortium goals on a 9-point Likert scale where 1 = not important and 9 = very important. Next, respondents were asked to assess the costs and benefits of using each social media account on a 9-point Likert scale where 1 = costs far outweigh the benefits and 9 = benefits far outweigh the costs.

The 2013 qualitative interview findings revealed that consortia representatives' opinions regarding the value of maintaining social media accounts were quite variable. This variability is reflected in the qualitative webmetrics survey results as well. Mean item responses indicated that most consortia representatives felt that Twitter and Facebook accounts were somewhat, but not very important to meeting consortia goals (Twitter M = 6.43, SD = 2.00; Facebook M = 6.45, SD = 1.57). Cost/benefit analysis mean ratings of maintaining consortium Twitter and Facebook accounts were slightly higher (Twitter M = 7.08, SD = 1.85; Facebook M = 6.55, SD = 2.07). The standard deviations of response to all of these items were relatively high, again reflecting the variability in consortia representatives' perspectives on the value of these social media accounts. That is, some respondents had very positive perceptions of the value of social media in further consortia goals, some had rather negative perceptions, and others had mixed opinions.

The JFSP Google Group received slightly higher ratings than consortium Twitter and Facebook accounts in terms of its importance (M = 7.07, SD = 1.44) and its perceived costs versus its perceived benefits (M = 7.42, SD = 1.74). Given the extent of consortia programming, it is not expected that the JFSP Google Group would be considered highly critical to attaining consortia goals in comparison to other products and activities. Current findings indicate that most consortia representatives find the JFSP Google Group helpful, though there is considerable variability in ratings of the costs and benefits of the Google Group. This may be because some consortia personnel are unsure of how to participate in the Google Group. Ultimately, the JFSP Google Group provides a convenient opportunity for consortia to share experiences and learn from one another. Increased activity and participation in the Google Group should be conducive to consortia progress toward their shared goals.

Social Media Metrics: Collection and Analysis

Most consortia have only recently established social media accounts, and it is not expected that the consortia will have plans to evaluate the impacts of these accounts at this time. The JFSP Board has recommended, however, that all consortia develop and implement a means of tracking the extent to which consortia social media accounts are reaching targeted audiences. Further, new requirements outlined in the White House Digital Strategy mandate that federally funded programs collect and report data pertaining to their use of social media accounts. Thus,

two basic questions regarding the collection and analysis of quantitative social media data were included in the 2013 qualitative webmetrics survey. Respondents were first asked if their consortium was currently collecting quantitative data regarding their social media accounts. More than half (*n* = 8) of consortium representatives indicated that they were collecting such data. Respondents indicating that their consortium was collecting social media user data were further prompted to briefly describe how these data were being used. Consortia representatives most frequently reported using these data to better understand the interests of their social media followers and determine how to expand their "reach" on social media.

Webmetrics Component: Summary and Future Directions

The 2013 webmetrics data is the most comprehensive to date, with all consortia represented in the quantitative component and 13 consortia represented in the qualitative component. Though some comparisons were made between Wave 2 and Wave 3 data, Wave 3 data will largely comprise the baseline for future assessments. In addition, the Wave 3 webmetrics data can help illuminate the current functioning of consortia sites, common challenges encountered, and potential areas for improvement.

As mentioned throughout this report, all consortia are in different phases of development and this should be considered in interpreting all findings presented in this report. In particular, consortia diversity likely played a role in the decrease in aggregate consortia website visits from Wave 2 to Wave 3. Not only had six consortia recently launched their websites at the time of data collection, but the population covered by many of the newer consortia is less than that of some original consortia (e.g., California and Southeast regions vs. Northern Rockies and Pacific regions). Thus, this decrease should not be interpreted as a decrease in overall consortia website performance. Future comparisons using Wave 3 data as a baseline will provide a more valid assessment of the extent to which consortia are attracting and retaining users.

Despite regional differences, several common themes emerged across consortia. Though overall growth has slowed, user retention remains steady and has increased in some categories. Consortia are attracting new site users through multiple electronic routes, with an even distribution of traffic from search, referral, and direct sources. Few consortia respondents, however, were aware of other websites including links to their consortium's site. This presents an opportunity to increase website referral traffic and overall reach through partnering with other organizations and arranging cross-linkages (if appropriate) between sites. In addition, consortia should continue or perhaps increase efforts in marketing their websites. This is important not only for the recently launched sites, but also for the more established sites as they further broaden their target audience.

Participants in the 2013 qualitative interviews recognized that regularly providing new information and keeping sites "fresh" promotes return visits and user retention. Accordingly, consortia representatives reported updating their sites more frequently this year than in prior years. Yet, there were no changes in the reported amount of time spent on maintaining the sites per week. Many consortia also continue to face challenges related to website design,

organization, and maintenance. Considering the rapid growth of technology and the advancement of the White House Digital Strategy, it is likely that consortia responsibilities pertaining to their websites and social media accounts will only increase. It is critical that consortia implement strategies to manage these ongoing demands so that they do not detract from other consortia programming endeavors. Adopting a common website template with organizational and design features that have proven to be effective is one means of decreasing burdens on Coordinators and other consortia personnel who are understandably not experts in these areas. Budgeting for and contracting outside website assistance may further help consortia websites expand their reach while meeting current users' needs, as well as in adhering to the White House Digital Strategy Requirements. In addition, the consortia can seek guidance from one another and implement shared strategies for website success.

Current qualitative webmetrics findings reveal that few consortia have conduced regional-scale evaluations of their website, though many respondents described plans to do so in the future. Thoughtful but timely development and implementation of these planned evaluations may yield highly valuable information that can be used to further improve consortia websites. Findings from regional-scale evaluations may be particularly helpful at this time during which many consortia are aiming to expand the reach of their sites or considering changes in site content, organization, and design. Though survey fatigue is a real concern for many consortia, short "pop-up" evaluation surveys presented to site users as they browse online or surveys distributed to workshop/conference participants in person (as one consortia planned) may yield increased response rates. Regional-scale evaluations of consortia websites also may be conducted through constituent interviews or focus groups.

Though many consortia have only recently established social media accounts, it is important that they begin collecting and tracking simple metrics documenting consortia social media activity and user engagement as soon as possible (if these data are not already being collected). Tracking and reporting basic social media data (e.g., frequency of social media postings, number of subscribers, "followers," or "friends," number of "shares" or "retweets") is recommended by both the JFSP Board and in the White House Digital Strategy. Moreover, such data will help consortia increase social media following by posting information that is of interest and relevant to users.

References

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail, and mixed-mode surveys: The tailored design method.* New York: Wiley.

Sicafuse, L., Evans, W., & Singletary, L. (January 2013). *Joint Fire Science Program regional consortia 2012 evaluation report: A national cluster evaluation of consortia process and impacts.* [available from the authors]

Sicafuse, L., Evans, W., Singletary, L., & Maletsky, L. (July 2013). *Interviews with JFSP consortia leadership and staff.* [available from the authors]

Sicafuse, L., Singletary, L., & Evans, W. (January 2012). *A cluster evaluation of the process and impacts of the Joint Fire Science Program regional consortia: Initial survey and webmetrics report 2010-2011.* [available from the authors]

Singletary, L., Evans, W., & Sicafuse, L. (September 2011). *Evaluation resource guide for JFSP consortia.* [available from the authors]