A Cluster Evaluation of the Process and Impacts of the Joint Fire Science Program Regional Consortia: Initial Survey and Webmetrics Report 2010-2011

Lorie Sicafuse, Loretta Singletary, and William Evans
University of Nevada Cooperative Extension
University of Nevada, Reno

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Introduction

During the past several decades, there has been an increasing emphasis on accountability for federally funded programming. 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 evaluation of the Joint Fire Science Program (JFSP) regional consortia employs a mixed-method cluster design, guided by logic modeling, to assess the processes and outcomes of consortia activities. As each consortium is diverse and in varying stages of development, the present evaluation focuses on the aggregate level data 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 Consortia Best Practices toward reaching consortia goals.

The national cluster evaluation of the JFSP is comprised of four components: A web-based survey targeting fire managers/practitioners, fire researchers/scientists, and members of the general public; a webmetrics piece involving the collection and analysis of both quantitative and qualitative data regarding the individual consortia websites; development and distribution of an evaluation resource guide intended to help consortia build capacity to conduct individualized evaluations; and interviews conducted with consortia PIs aimed at understanding the successes and challenges encountered in efforts towards increasing the accessibility and applicability of fire science information. As PI interviews will not be conducted until Spring 2012, the current report focuses on the findings from the initial phases of the online survey and webmetrics components of the JFSP consortia evaluation.

Many consortia are in the beginning phases of program development and implementation. Thus, current results are primarily intended to provide a baseline assessment that will be compared with results from the second phase of this evaluation (to be conducted in 2012). During the following months and throughout 2012, consortia will have increased opportunities to reach their target audiences through educational activities and other interventions; they also may be continually improving and expanding their websites. Results from Phase two of the evaluation when considered in conjunction with the initial findings presented here should prove especially valuable in assessing the impacts of consortia programming. More specifically, such comparisons will help illuminate the short-term (e.g., changes in awareness, knowledge, skills, motivations) and medium-term (e.g., changes in decision-making and behaviors) outcomes resulting from consortia outreach and educational activities. Yet, the initial results of the JFSP consortia evaluation do carry additional implications beyond establishing a solid baseline for future assessment. Most notably, these results may be used to better understand and target fire science information needs, identify emergent gaps and successes in consortia programming, and help consortia focus their efforts on the most conducive means of enhancing fire science delivery.

This report begins with an overview of the online survey component of the JFSP consortia evaluation, which primarily focused on respondents' perceptions and behaviors regarding fire science information accessibility and applicability. Survey data were collected from three main target audiences: Consumers of fire science information (i.e., fire managers/practitioners), Producers of fire science information (i.e., fire researchers/scientists) and the General Public (i.e., community members and landowners). As each group of respondents completed a different version of the online survey, results are presented separately for Consumers, Producers, and the General Public. Implications of these findings are discussed with respect to both the primary identification of survey respondents and the relationships between the perspectives of participants from different samples (e.g., the relationships between Consumer and Producer responses). Ratings of the accessibility and applicability of fire science information were relatively high among both Consumer and General Public samples. Further, fire science information Consumers and Producers appeared to have favorable perceptions of one another and were motivated to collaborate on research projects; Producers in particular expressed a willingness to study applied problems and to directly address Consumers' problems and concerns. Yet, initial online survey results also highlight a general need to increase the frequency and accessibility of more interactive fire-science learning opportunities among Consumers and the General Public. In addition, results indicated some continuing difficulty with accessing relevant fire science information in one convenient place. Accordingly, consortia may wish to focus their efforts on synthesizing fire science information and providing "one-stop shopping" for website users.

Next, this report summarizes results obtained from the webmetrics component of the JFSP consortia evaluation. Both quantitative and qualitative findings are presented and discussed. Many consortia have only recently launched their individual websites and begun collecting quantitative user data via analytics packages. Thus, these findings should again be considered as preliminary and a means of providing an initial understanding of consortia sites rather than as an indicator of consortia performance. Initial quantitative webmetrics findings suggest that consortia are effectively recruiting and retaining website users, and that website features and content are currently addressing the needs of several visitors. Qualitative data collected from consortia PIs and Coordinators reveal consistencies in website purposes and target audiences, though considerable diversity is noted in reported means of website maintenance. A comparison of website features indicates that most consortia have incorporated elements conducive to providing "one-stop shopping" for users and are striving to keep visitors informed of upcoming educational opportunities and other fire science-related events. Most consortia, however, reported that their websites did not yet include interactive features such as a communication forum or a "Help Desk/Ask an Expert" component allowing fire managers/practitioners to submit questions to fire researchers/scientists. Implementation of such interactive website components may be critical in facilitating communication and collaboration among fire science information Producers and Consumers, and ultimately in enhancing fire science delivery.

Again, the initial findings presented here are intended to provide the JFSP Board and regional consortia with a basic understanding of the perceptions and experiences of fire science

information Consumers, Producers, and the General Public with regard to the accessibility and applicability of fire science information. A coherent picture of consortia progress toward their shared goals and a more valid assessment of the outcomes of consortia activities in terms of the Logic Model will emerge following analysis of data obtained from the secondary phase of this national cluster evaluation (to be implemented in 2012). Yet, we hope that these initial findings will prove valuable to the JFSP Board in ascertaining general attitudes and behaviors regarding fire science information accessibility and applicability, fire science information needs, and preliminary consortia successes and challenges encountered in striving toward their ultimate goal of enhancing fire science delivery.

Online Survey Component

The JFSP consortia are unique entities in several respects. They encompass different geographic regions, each featuring a distinct ecology, demography, and political boundary. Resources, regional needs and issues, communication styles, and relationships among fire science professionals and organizations also vary among consortia. Yet, the JFSP consortia 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 purpose of the online survey is to assess progress toward these and other shared goals, as well as the effectiveness of common consortia strategies aimed at facilitating goal attainment. Again, as consortia are diverse and in various stages of development, the online survey is intended as an aggregate assessment.

There are two "phases" of the online survey component of the JFSP consortia Evaluation. Phase one comprises the initial survey development, distribution, data collection, and analysis. The current report only details the execution and results of Phase one, which was completed in June 2011. Findings from this initial wave of survey distribution may be used to provide a "baseline" assessment of consortia progress toward their shared goals, better understand participants' needs and challenges in accessing and applying fire science information, and identify strengths and gaps in consortia programming. The existing online survey will be modified according to preliminary results and lessons learned prior to its redistribution in Phase two, occurring in 2012. Results from this second wave of survey distribution can be used to identify changes and improvements in fire science delivery as a result of consortia interventions and activities. Overall, survey findings will inform the JFSP Board and consortia of advancements, strengths, challenges, and Best Practices in improving fire science delivery at the National Level.

Survey Development, Design, and Target Audience

The majority of consortia goals as proposed to the JFSP Board are targeted towards increasing the accessibility and applicability of fire science research results and tools among fire managers/practitioners. As producers of fire science information, fire scientists/researchers play a critical role in facilitating consortia progress towards these goals, and their work should be similarly strengthened by consortia activities. For instance, consortia may foster communication between researchers and practitioners in providing more collaborative learning opportunities, develop interactive websites allowing scientists to share their current research projects and findings, and otherwise encourage researchers/scientists to study local problems relevant to managers/practitioners. Perceptions of both fire managers/practitioners and fire researchers/scientists are essential in obtaining a more comprehensive understanding of

consortia strengths and challenges in improving fire science delivery. In addition, some consortia also aim to enhance the accessibility and applicability of fire science research results and tools among the general public. Community members in this target audience vary in terms of their knowledge and experience with fire science information (e.g., this audience may be comprised of certified prescribed burn managers, large and small landowners, stakeholders, average homeowners and renters); however, their career does not focus on fire management or research.

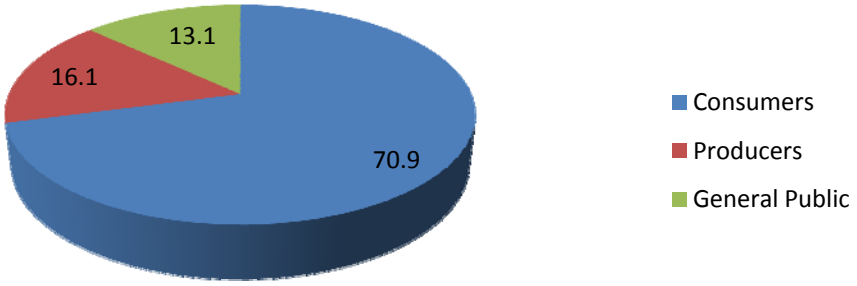
Three frames of the online survey were developed in order to capture the perspectives and experiences of these distinct audiences. The first targets *Consumers* of fire science information, or fire managers/practitioners, whereas the second targets *Producers* of fire science information, or fire researchers/scientists. The third frame is intended for members of the general public- essentially all other respondents who may be exposed to consortia outreach or educational activities but do not identify as fire science professionals. When possible, items in the Consumer and Producer survey were constructed to be complimentary or parallel. For instance, both of these groups answered corresponding items about their experiences with one another (e.g., "I would like to work/continue working jointly with Managers/Scientists on research projects," "Scientists/Managers value my knowledge and experience"). Consumers and Producers also responded to several identical items regarding their experiences with their regional consortium and their consortium's website. 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 participants and methodology, this section presents specific results for each frame separately. It concludes with a discussion of the similarities and differences between perspectives and experiences across survey frames, and highlights implications of these initial findings.

Those directly involved in program development and management often best understand their evaluation needs. Consequently, the online survey development was a collaborative process between the external evaluation team, consortia PIs and Coordinators, and other key JFSP personnel. The evaluation team sent an initial draft of the survey to the consortia for review during August 2010. Numerous subsequent drafts of the survey were developed, circulated, and revised based on consortia comments and recommendations. The final survey version, drafted in February 2011, represents an integration of input from each consortium.

Participants

A total of **1253** individuals accessed the online survey and agreed to participate, and **1041** (83.1%) of these participants completed the entire survey. Among those who began the survey, 70.9% (n = 873) identified themselves as Consumers of fire science information, 16.1% (n = 198) identified themselves as Producers of fire science information, and 13.1% (n = 161) identified themselves as the General Public/Community members (see Figure 1).

Figure 1. Primary Identification of Survey Respondents



All consortia were well-represented in the online survey. Table 1 displays the frequencies of Consumer and Producer survey respondents from each consortium. It should be noted that the frequency of responses for consortia are dependent on a variety of factors, including consortia/region size, consortia phase of development, existing contacts/relationships within consortia, differences in consortia resources and funding, and other regional differences (such as the occurrence of "fire season" or other busy times).

Table 1. Number of Respondents to Consumer and Producer Surveys by Consortia*

Consortium	Consumer *N*	Producer *N*	Total *N*
Alaska	31	14	**45**
Appalachians	43	25	**68**
California	85	29	**114**
Great Basin	48	15	**63**
Lake States	87	24	**111**
Southeast	293	56	**349**
Southern Rockies	101	17	**118**
Southwest	51	27	**78**
National Level	9	18	**27**
Unsure	2	0	**2**

Note: These figures only reflect the number of Consumer and Producer survey participants who completed the entire survey and explicitly identified their region via a multiple choice survey item. "Total *N*" refers to the sum of Consumer and Producer respondents who identified with each consortium. Participants who identified with an "other" region are not included in this table. General Public survey frame respondents were asked to identify their state of residence rather than their region/consortium and are not included in the Total *N* as displayed in this table.

Nearly three-quarters (74.3%) of the 1041 individuals who completed the online survey were male. Mean age of participants was 47.5 years. Respondents were overwhelmingly Caucasian (90.9%) followed by "Other" (3.0%); American Indian (1.8%); Hispanic/Latino (1.7%); Multi-

Ethnic (1.5%); Black (.7%); and Asian/Pacific Islander (.3%). Other participant demographics (e.g., education, affiliation, role) will be reported as they pertain to participants completing each survey frame.

Method

Due to the varying stages of development across consortia (i.e., with respect to funding, resources, organizational relationships and website development), survey administration was "staggered" across a five-month period. That is, each consortium launched the online survey at the time they deemed most appropriate. Initial recruitment of survey participants across consortia spanned from February 2011 – June 2011, and the online survey was closed to further participants in July 2011.

Each consortium created a "contact list" with potential participants' names and email addresses for the purposes of recruitment. These lists were developed through compiling existing listservs, contacts from prior needs assessments, and registrants at websites and various educational activities. Contacts also were obtained through local and federal organizations that provided the names and addresses of their members and employees. To reach as many potential participants as possible, a "snowball" sampling strategy was used. That is, existing contacts and all others invited to participate were encouraged to forward the survey invitation to any other qualified or interested participants.

Participant recruitment followed the Dillman (2010) method, and consisted of three stages. Upon launching the survey, consortia forwarded an initial invitation to participate to all individuals included in their contact lists. This initial invitation informed participants of the purpose and content of the survey, and included a link to the online survey which was posted on SurveyMonkey. Two weeks after the initial invitation was sent, consortia distributed a follow-up email to their contacts reminding them of the opportunity to participate in the survey. A final reminder was sent two weeks after the follow-up email, which again described the purpose and content of the survey in more detail, thanked those who had already participated, and encouraged those who had not yet visited the online survey to do so. Each recruitment email also included critical participant information as required by the University of Nevada, Reno Institutional Review Board, such as details regarding privacy and means of reporting questions and concerns.

Participants accessed the survey via the link included in all recruitment emails. Upon entering SurveyMonkey, 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 initial responses, participants then 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, debriefed, and immediately redirected to the JFSP website home page.

Initial Findings: Consumer Survey Frame

Consumers were by far the most represented group of online survey participants. Nearly three quarters (70.8%, *N* = 873) of total survey respondents primarily 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 was the most extensive of the three frames. Consumers were asked to respond to a variety of multiple-choice items, including those about their experiences with fire science information and information producers; opinions and experiences regarding educational activities within their region, their regional consortium, their consortium's website, and common communication sources of fire science information; and perceptions of obstacles to accessing and applying fire science information. As with the other survey frames, items included in the Consumer survey 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 (75.2%) and Caucasian (90.1%). Other reported ethnicities included "Other" (3.5%); American Indian (1.8%); Hispanic/Latino (1.5%); Multi-Ethnic (1.5%); Black (.9%); Asian/Pacific Islander (.4%); and Alaskan Native (.3%). The mean age of Consumer survey respondents was 46.3 years.

Figure 2. Educational Background of Consumer Survey Respondents

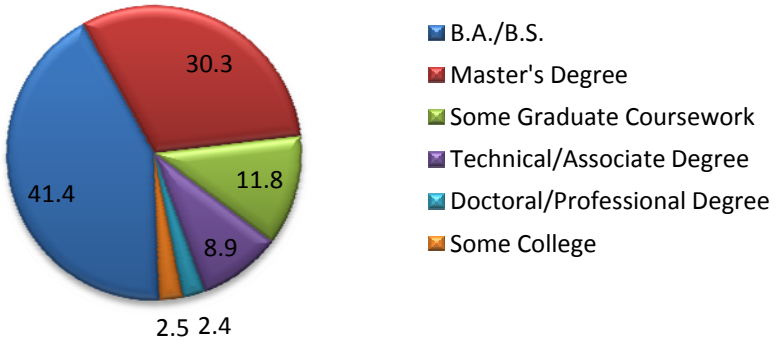


Figure 3. Primary Role of Consumer Survey Respondents

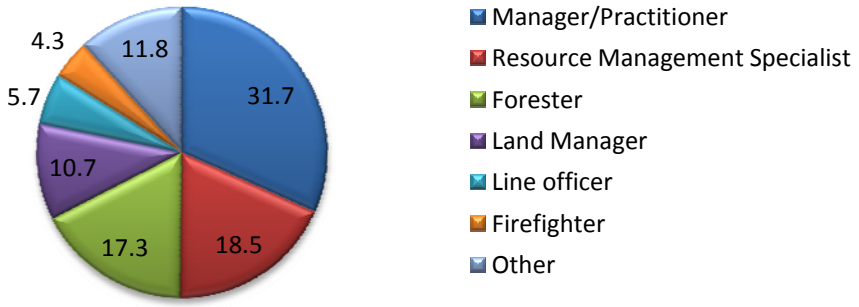
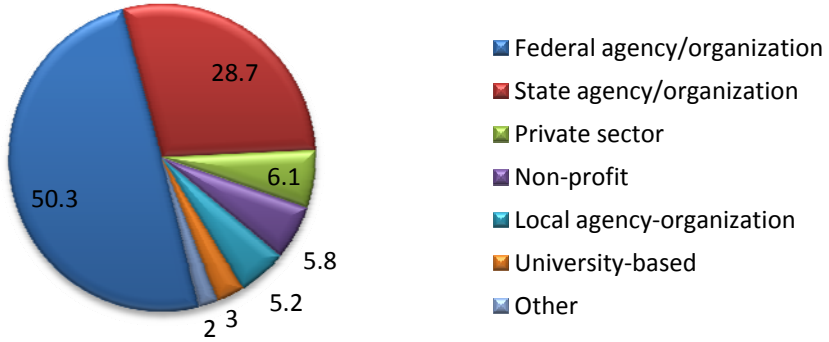


Figure 4. Affiliation of Consumer Survey Respondents



Consumer respondents were experienced and well-educated. Average reported length of time working as a fire practitioner/manager was 18.90 years, and the majority had earned a Bachelor's or advanced degree (See Figure 2). Nearly one-third of respondents (31.7%) described themselves as fire managers/practitioners; other reported roles included Resource Management Specialist (18.5%); Forester (17.3%) and Land Manager (10.4%; see Figure 3). Over half of Consumer respondents were affiliated with federal organizations (50.3%), followed by state agencies/organizations (28.7%); private sector organizations (6.1%); and non-profit organizations (5.6%; see Figure 4).

Experiences with Fire Science Information and Producers

The first section of the Consumer survey instructed participants to indicate their level of agreement with 15 statements targeting their perceptions and experiences concerning fire science information and fire science information 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, several consortia noted 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. Such changes and improvements should become more apparent following the second wave of survey distribution, when comparative analyses will be conducted using first and second wave online survey data.

Responses to all 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. It is interesting to note that the majority of respondents agreed that fire science information should be shared more frequently within their organization. This result has both positive and negative connotations. On the one hand, it suggests that managers/practitioners are highly interested in receiving/sharing current fire science information; on the other, it suggests that the level of sharing of fire science information within organizations is inadequate in meeting Consumers' needs. Consumers 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 initial result suggests that some consumers may have difficulty adapting fire science research results and tools for their own use. In addition, perhaps increased efforts can be made to present current fire science information as a means of addressing regional issues/problems.

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

Item	Mean (SD)
Fire science information should be shared more frequently within my agency/organization	**4.05** (.74)
Using fire science information enhances my effectiveness on the job	**4.03** (.68)
I trust fire science research findings	**3.77** (.67)
I often draw on fire science research when making work-related decisions	**3.63** (.83)
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)
Fire science information is easy to find	**3.37** (.83)
Fire science information is easy to understand	**3.30** (.81)
Fire science information is easy to apply to my specific problems	**3.13** (.87)

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 also fell at the positive end of the scale (with the exception of the negatively framed items), suggesting that Consumers have relatively favorable options of fire science information producers and their work. In particular, Consumers seemed eager to collaborate with fire researchers/scientists on research projects. With respect to the "negatively framed" items, Consumers moderately disagreed that fire researchers/scientists were unwilling to study local problems and that they rarely provided information pertinent to their current management issues.

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

Item	Mean (SD)
I would like to work/continue working jointly with fire scientists/researchers on research projects	**3.90** (.75)
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	**3.39** (.70)
Fire science researchers/scientists value my knowledge and experience as a field professional	**3.37** (.81)
Fire science researchers/scientists are easy to approach	**3.36** (.75)
I have worked jointly with fire science researchers/scientists on research projects	**3.09** (1.13)
Fire science researchers/scientists are reluctant to study problems and issues suggested by local managers/practitioners*	**2.75** (.80)
Fire science researchers/scientists rarely provide information that helps me address the management problems I face*	**2.62** (.87)

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

Consumer Experiences with Regional Fire Science Activities

Next, respondents were asked to indicate their level of agreement with a series of five statements regarding the effects of fire science-related activities within their region. Responses occurred on a 5 point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree. Such fire-science activities are most likely the product of consortia programming. Some participants, however, were unaware of the existence of their regional consortium; thus, these items were phrased at a more general level.

Table 4 displays the mean responses to items targeting Consumers' general beliefs about regional fire science-related activities. Though all responses fell at the positive end of the scale, there was an inclination towards neutrality. This may be because some of these items assess more medium-term outcomes (i.e., changes in policy and practice), which only may emerge several years after a program or intervention has been implemented. It should be noted that

participants were most inclined to agree with the statement that "A consortium is needed to help coordinate sharing of fire science information in my region."

Table 4. Consumer Opinions and Experiences Regarding Regional Fire Science-Related Activities

Item	Mean (SD)
During the last year, my agency/organization has effectively collaborated with other agencies/organizations to access fire science information	**3.44** (.88)
During the last year, educational activities within my region have helped me to connect with researchers/scientists whose work is of interest to me	**3.23** (.94)
During the last year, fire science-related activities within my region have helped facilitate changes in fire management and/or policy	**3.17** (.82)
During the last year, fire science-related activities within my region have made it easier for my agency/organization to accomplish its goals	**3.14** (.83)

Consortium-Specific Items

Due to the varying developmental stages of the consortia, it was expected that several participants 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 first asked whether they were aware of a fire science and delivery Consortium supported by the Joint Fire Science Program in their region. The majority of respondents were indeed aware of their regional consortium (67.8%) and were subsequently asked to respond to five items regarding their opinions and experiences about their consortium. The remaining 32.3% of participants indicated that they were unaware of their regional consortium skipped these items and continued on to the next portion of the survey.

Responses to consortium-specific items 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, with some trending toward neutrality or uncertainty (e.g., *The Consortium has helped improve fire management policy in my region*). Again, this may be attributed to the time it takes for more medium-term outcomes to emerge. In addition, some participants may have been aware of their regional consortium but relatively unfamiliar with consortium efforts and their outcomes. As most participants agreed that they would recommend consortium involvement to their co-workers, we expect to observe increases in knowledge about the regional consortia and their activities during the next year.

Table 5. Consumer Opinions and Experiences Regarding their Regional Consortium

Item	Mean (SD)
The Consortium has helped improve the accessibility of fire science information	**3.63** (.74)
The Consortium has helped improve communication among fire managers/practitioners and fire researchers/scientists in my region	**3.51** (.77)
The Consortium has helped improve the use and application of fire science in my region	**3.47** (.74)
The Consortium has helped improve policy regarding fire management in my region	**3.02** (.73)

Website-Specific Items

The establishment of individual websites is perhaps the most critical element of consortia efforts to enhance fire science delivery. Many consortia envisioned these websites as a "one-stop-shop" whereby users could access a wide variety of fire science information in one convenient place. Individual websites also may serve as a primary means of informing users of educational opportunities and other fire science activities within their region. To the extent that websites incorporate interactive components (e.g., communication forums, features allowing managers/practitioners to submit questions to researchers/scientists), they may also help foster relationships between fire science information Consumers and Producers.

The purposes and initial impacts of the consortia websites will be further discussed in the section focusing on the Webmetrics component of the JFSP Consortia Evaluation. Considering the importance of these websites in facilitating consortia progress toward their goals, we sought to obtain an initial understanding of Consumers' experiences and opinions regarding their consortium's website via the online survey. Consumers were first asked if they had visited their consortium's website; almost half (48.4%) indicated that they had. Though this figure may initially seem low, it is important to note that some consortia had not yet launched their websites at the time of survey distribution, and most existing sites had been recently implemented. Those indicating that they had visited their consortium's site were directed to a series of six survey items regarding their experiences; those who had not visited their consortium's site (51.6% of Consumers) skipped these items and were electronically re-directed to the next portion of the survey.

Table 6 presents mean Consumer responses to website-specific items, which were measured using a 5 point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree. Though most respondents were likely not yet frequent visitors to their consortium's site, results suggest that users were satisfied with site content and features. Consumers were most inclined to agree that their consortium's website provided information that was current and up-to-date and offered a wide variety of fire science information. Though mean responses to website-specific items all fell at the positive end of the scale, these initial results suggest that consortia may

wish to focus on implementing interactive website components and on general organization of fire science information within their sites.

Table 6. Consumer Opinions and Experiences Regarding their Consortium's Website

Item	Mean (SD)
My Consortium's website provides information that is current and up-to-date	**3.75** (.58)
My Consortium's website provides a wide variety of fire science information	**3.71** (.65)
My Consortium's website is user-friendly	**3.67** (.61)
My Consortium's website provides practical information I can use in my job	**3.59** (.72)
My Consortium's website provides a forum where I can share information or ask questions	**3.48** (.67)
My Consortium's website organizes the information I need in one convenient place	**3.44** (.74)

Experiences with Fire Science Information Communication Sources

In their initial proposals to the JFSP Board, the consortia identified numerous strategies for disseminating current and practical fire science information to Consumers. All consortia planned to develop web-based sources of fire science information, and the majority aimed to synthesize fire science information via newsletters, fact sheets, and brochures. In addition, many consortia outlined plans to increase the number of interactive and hands-on learning opportunities available to consumers (e.g., workshops, conferences, field demonstrations) as a means of enhancing both the applicability of fire science information and the relationships between consumers and producers. Accordingly, this section in 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 participants accessed information via these sources. It should be noted that responses to these survey items were more variable than those to other survey items, as indicated by larger standard deviations. This may be partially attributable to differences in learning opportunities extended to consumers, varying levels of exposure to communication sources, and individual learning preferences.

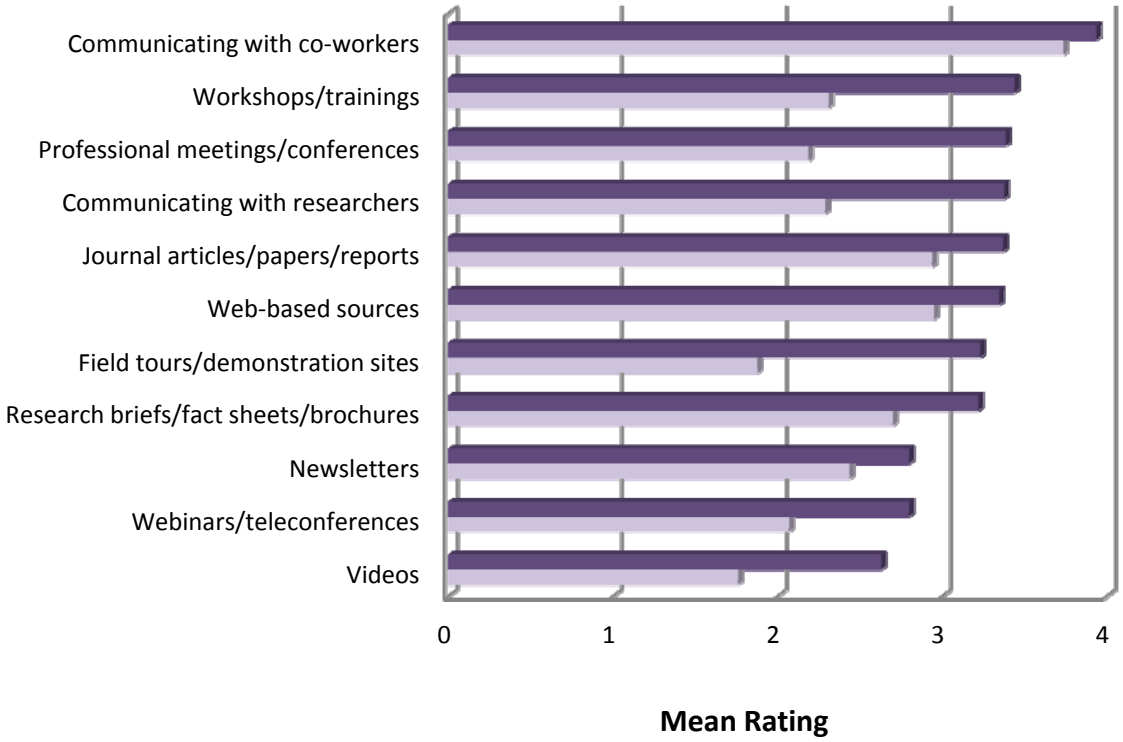
Table 7. Mean Ratings of Fire Science Information Communication Sources: Frequency of Access and Perceived Usefulness

Communication Source	Often Accessed Mean (SD)	Usefulness Mean (SD)*
Communicating with co-workers	**3.74** (1.15)	**3.94** (.94)
Web-based sources	**2.95** (1.10)	**3.35** (1.02)
Journal articles, papers, or professional reports	**2.94** (1.08)	**3.37** (1.01)
Research briefs, fact sheets, brochures	**2.70** (.91)	**3.22** (.94)
Newsletters	**2.44** (.99)	**2.80** (.98)
Workshops or trainings	**2.31** (1.03)	**3.44** (1.21)
Communicating with researchers/scientists	**2.29** (1.01)	**3.38** (1.19)
Professional meetings/conferences	**2.19** (.97)	**3.39** (1.19)
Webinars/teleconferences	**2.07** (1.09)	**2.80** (1.23)
Field tours/demonstration sites	**1.88** (.94)	**3.23** (1.42)
Videos	**1.76** (.88)	**2.63** (1.18)

***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 participants provided usefulness ratings. *N*s for usefulness ratings ranged from 506 (*Webinars/teleconferences*) to 639 (*Research briefs, fact sheets, brochures*).

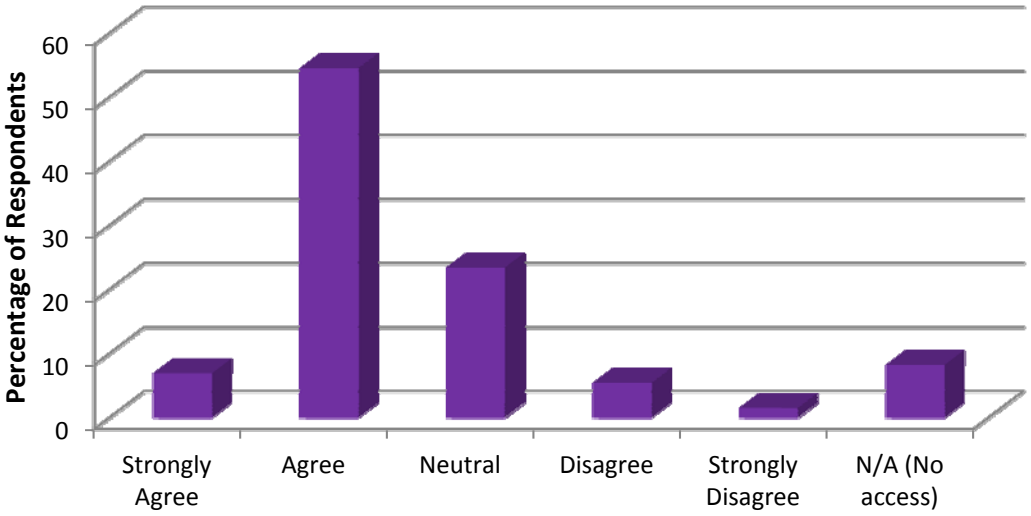
Communicating with co-workers was the top-rated communication source, both with respect to the frequency with which information from this source was accessed and the perceived usefulness of the information obtained from this source. These results suggest that Consumers strongly prefer more hands-on, interactive learning opportunities (as *Communicating with co-workers/researchers/scientists*, *Workshops/trainings*, and *Professional meetings/conferences* were the communication sources rated as most useful). Yet, as Figure 5 illustrates, ratings of the usefulness of common sources of fire science information did not always cohere with the frequency with which these sources were accessed. For instance, *Workshops/trainings* and *Professional meetings/conferences* were rated among the top three most useful communication sources, but the majority of consumers said that they only accessed information through these sources on an occasional basis. Due to time constraints and resource availability, Consumers will naturally have fewer opportunities to engage in many of these interactive learning activities than in more independent activities (e.g. accessing fire science information via journal articles and web-based sources). These initial findings do suggest, however, that consortia may wish to concentrate their efforts on extending interactive learning opportunities to Consumers.

Figure 5. Fire Science Information Commincation Sources: Mean Ratings of Usefulness and Frequency of Access



In line with the consortia's focus on disseminating the most current fire science information via the internet, participants were asked to indicate their level of agreement with one additional statement at the end of this section: "The fire science information I have received from web-based sources is current and up to date." Over half of participants agreed or strongly agreed with this statement (64.1%; 23.4% were uncertain or neutral; 5.4% disagreed; 1.5% strongly disagreed; and 8.2% indicated that they had not accessed fire science information from web-based sources; see Figure 6).

Figure 6. Currency of Web-based Communication Sources



The fire science information I have received from web-based sources is current and up-to-date

Consumer Perceptions of Obstacles to Accessing and Applying Fire Science Information

In the final section of the Consumer survey, participants 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 were included to help illuminate general strengths and gaps in consortia programming; future analyses of the results from Phase two of the online survey can be used to determine if such gaps are being addressed effectively.

Table 8 displays Consumers' mean responses to items assessing their perceptions of obstacles to accessing and applying fire science information in their region. Consumers were slightly inclined to agree that they faced all of these obstacles in accessing relevant information with the exception of *There is too much fire science information to digest/integrate*. Perceptions of obstacles were not extreme, and these initial results do not indicate any strong deficiencies in consortia programming. Yet, these findings highlight existing Consumer needs and support current consortia efforts in synthesizing and communicating fire science information. *Fire science information is not available in one convenient place* was the top-rated obstacle, suggesting that the consortia's focus on developing "one-stop shopping" websites is well-placed. These findings also suggest that consortia should aim to facilitate inter- and intra-organizational relationships and communication within their region, in addition to promoting communication among Consumer and Producer groups.

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

Obstacle	Mean (SD)
Fire science information is not available in one convenient place.	**3.43** (.82)
Lack of communication *between* agencies and organizations in my region decreases the accessibility of fire science information	**3.38** (.96)
Lack of communication *within* agencies and organizations in my region decreases the accessibility of fire science information	**3.26** (.95)
I have few opportunities to communicate with fire science researchers/scientists	**3.23** (1.02)
There is too much fire science information available to digest/integrate	**2.91** (.95)

Initial Findings: Producer Survey Frame

A total of **198** participants (16.1% of the entire sample) self-identified as fire science researchers/scientists, and were thus directed to the Producer survey frame. 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 a bit shorter than the Consumer frame, primarily targeting Producers' perspectives and behaviors regarding the dissemination of fire science research results as well as their attitudes towards Consumers.

Producer Demographics

Most Producer respondents were male (71.2%) and Caucasian (90.4%). Other reported ethnicities of respondents included Hispanic/Latino (3.0%); American Indian (2.4%); Multi-Ethnic (1.8%) and "Other" (1.8%). The mean age of Producers was 48.18 years, and they had worked as researchers/scientists for an average of 17.84 years.

All participants completing the Producer survey had earned a college degree. Over half (64.6%) held a Doctoral degree; roughly one-quarter (25.1%) held a Master's degree; 5.7% completed some graduate coursework, and 4.6% had earned their B.A./B.S. but did not pursue graduate studies (See Figure 7). Though most Producers strictly identified themselves as fire science researcher/scientists (74.3%), some were student scientists/researchers (9.9%), and a few identified with more specialized roles (e.g., Resource Management/Specialist, 2.9%; Weather, 2.9%; see Figure 8). A University-based affiliation was most common (46.0%), followed by Federal agency/organization (42.6%); Non-profit (7.4%); Private sector (2.3%); State agency/organization (1.1%); and Other affiliation (0.6%; see Figure 9).

Figure 7. Educational Background of Producer Survey Respondents

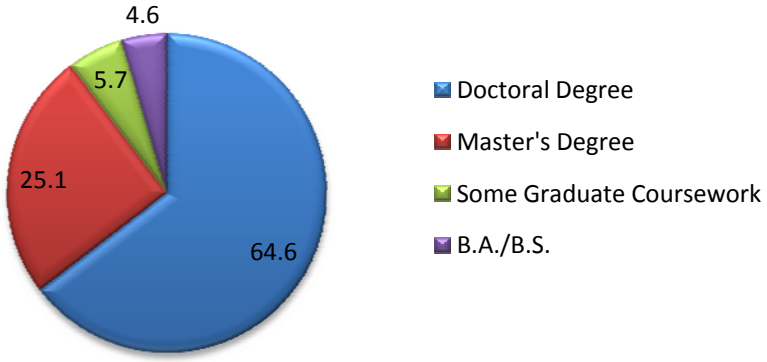


Figure 8. Primary Role of Producer Survey Respondents

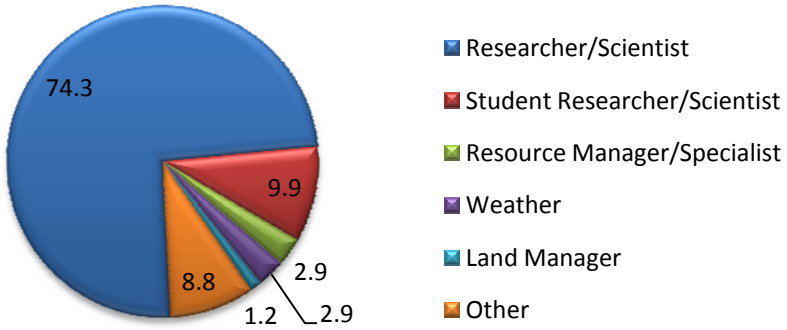
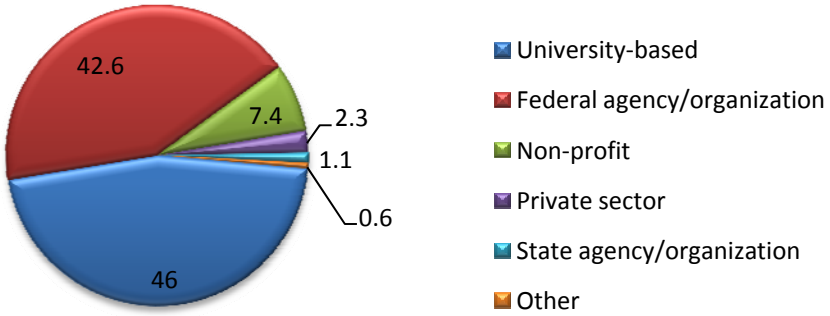


Figure 9. Affiliation of Producer Survey Respondents



Producer Experiences with Fire Science Information and Consumers

After agreeing to participate in the survey, Producers were asked to complete a series of 12 items concerning their "experiences with fire science information and consumers of fire science information." Responses occurred on a 5 point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree. Several of these items were complimentary 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; both Consumers and Producers were asked about their desire to work with one another on research projects). Items in the Producer frame, however, were more focused on their willingness to research applied problems and to communicate findings to Consumer audiences. 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 items targeting their experiences with fire science information consumers and their attitudes and practices regarding the study of applied issues are displayed in Table 9. These initial results are quite favorable considering consortia goals of improving the applicability of fire science information as well as the relationships between Consumers and Producers. The majority of Producer respondents agreed or strongly agreed that they would like to work directly with fire managers/practitioners and that they focused their research efforts on solving on more applied and local problems relevant to Consumers. Further, Producers expressed positive perceptions of Consumers. Most believed that fire managers/practitioners valued their knowledge and experience as fire researchers/scientists, and that interacting with Consumers enhanced their effectiveness on the job. No major inconsistencies were noted between Producer and Consumer responses to related items in this section (e.g., those assessing perceptions of one another and willingness to work together), though Producer responses were a bit more positive overall than were Consumer responses.

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	**4.58** (.58)
I make an effort to present information to managers/practitioners in a way that is easy to understand	**4.57** (.62)
I would like to work/continue working jointly with managers/practitioners on research projects	**4.54** (.56)
I am willing to work directly with managers/practitioners to address their questions about fire science research or how to apply fire science research at their job	**4.50** (.55)
Interacting with managers/practitioners enhances my effectiveness on the job	**4.43** (.68)
I consider myself approachable to managers/practitioners	**4.36** (.62)
I have worked jointly with managers/practitioners on research projects	**4.27** (.78)
Managers/practitioners value my knowledge and experience as a fire scientist	**3.88** (.73)
I often present or publish fire science information for manager/practitioner audiences	**3.74** (.96)
I believe that managers/practitioners trust fire science research findings	**3.61** (.70)
I am sometimes hesitant to study problems and issues suggested by local managers/practitioners*	**2.20** (.89)
I prefer that my research be focused on theoretical issues, rather than on applied management problems*	**2.07** (.85)

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

Producer Experiences with Regional Fire Science Activities

Producers were next asked to respond to five items concerning their experiences with regional fire science-related activities, which were identical to those included in the corresponding Consumer survey frame section with one exception (*During the last year, educational activities within my region have helped me to connect with managers and on-the-ground fire personnel whose work is of interest to me*). As in the Consumer frame, these items primarily targeted opinions and experiences concerning *consortia-sponsored* activities, but the consortia were not explicitly mentioned due to some participants' lack of familiarity with these partnerships and their programming. Again, responses occurred on a 5 point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree.

Like Consumers' responses, all Producer mean responses to these items fell at the positive end of the scale (see Table 10). Producers were most inclined to agree that "A consortium is needed

to help coordinate sharing of fire science information in my region." As expected, more neutral (but still positively-skewed) opinions emerged on items targeting more long-term outcomes related to policy and practice.

Table 10. Producer Opinions and Experiences Regarding Regional Fire Science-Related Activities

Item	Mean (SD)
A consortium is needed to help coordinate sharing of fire science information in my region	**4.03** (.85)
During the last year, my agency/organization has effectively collaborated with other agencies/organizations to access fire science information	**3.88** (.77)
During the last year, educational activities within my region have helped me to connect with managers and on-the-ground fire personnel whose work is of interest to me	**3.60** (.89)
During the last year, fire science-related activities within my region have helped facilitate changes in fire management and/or policy	**3.47** (.81)
During the last year, fire science-related activities within my region have made it easier for my agency/organization to accomplish its goals	**3.39** (.73)

Consortium-Specific Items

As with Consumer participants, 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, Producer respondents were first asked if they were aware of a fire science and delivery consortium supported by the JFSP in their region (prior to participating in the survey). Over three-quarters (80.7%) of Producers indicated that they were aware of their regional consortium. These participants were then asked to respond to five questions regarding their opinions and experiences regarding their consortium, while the remaining 19.3% of respondents skipped these items and were electronically re-directed to the next portion of the survey.

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. Again, mean responses were relatively positive and similar to those obtained from Consumer participants (see Table 11). The majority of Producers agreed that they would recommend consortium involvement to their co-workers, but were a bit less certain regarding the effects of their consortium's activities on regional fire management policy.

Table 11. Producer Opinions and Experiences Regarding their Regional Consortium

Item	Mean (SD)
I would recommend Consortium involvement to my co-workers	**4.03** (.78)
The Consortium has helped improve communication among fire managers/practitioners and fire researchers/scientists in my region	**3.63** (.77)
The Consortium has helped improve the accessibility of fire science information	**3.62** (.78)
The Consortium has helped improve the use and application of fire science in my region	**3.39** (.73)
The Consortium has helped improve policy regarding fire management in my region	**3.08** (.63)

Website-Specific Items

All 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 consortia websites may provide more efficient means for Producers to share information regarding their current research projects and to solicit feedback. Including a "Help Desk/Ask an Expert" component can facilitate the application of Producers' knowledge and expertise to Consumer problems.

Over half (58.6%) of Producers indicated that they had visited their consortium's website, and subsequently responded to six 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*). These items were intended to provide an initial understanding of Producers' perceptions of website organization, content, and features.

Producers' mean responses to website-specific items are displayed in Table 12. Most Producers agreed with Consumers that their consortium's site was user friendly and provided a wide variety of fire science information. Though many Producers indicated that their consortium's website included interactive components, others were unsure of the existence of a "Help Desk/Ask an Expert" component and further opportunities for information sharing. Implementing and advertising such interactive website features may substantially further consortia progress toward enhancing fire science information accessibility and applicability.

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

Item	Mean (SD)
My Consortium's website is user-friendly	**3.73** (.67)
My Consortium's website provides a wide variety of fire science information	**3.71** (.81)
My Consortium's website organizes fire science information and other useful tools in one convenient place	**3.53** (.85)
My Consortium's website helps keep me informed of current research findings	**3.52** (.82)
My Consortium's website provides a way for me to share my research products or fire science delivery activities	**3.52** (.75)
My Consortium's website provides a forum where I can share information or ask questions	**3.47** (.78)

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 were intended to highlight initial gaps and strengths in consortia performance related to the overarching objective of improving fire science delivery. Current results can be compared with results from Phase 2 of the online survey distribution to determine whether strengths are being maintained and/or enhanced and gaps are being addressed.

Producers responded to these items using a 5 point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree. Most 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). Importantly, both Producers and Consumers identified the same three top obstacles to the dissemination (accessibility) and applicability of fire science information: Lack of availability of fire science information in one convenient place, lack of communication *between* agencies/organizations, and lack of communication *within* agencies/organizations. It is interesting to note that most Producers did not implicate lack of opportunities to communicate with mangers/practitioners as an obstacle to fire science information dissemination and application. As Consumers were a bit more inclined to cite limited communication opportunities as an obstacle, consortia may strive to inform this population of such 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)
Fire science information is not available in one convenient place.	**3.60** (.86)
Lack of communication *between* agencies and organizations in my region decreases the accessibility of fire science information	**3.41** (.91)
Lack of communication *within* agencies and organizations in my region decreases the accessibility of fire science information	**3.30** (.89)
Fire scientists/researchers have few opportunities to communicate with managers/practitioners	**2.86** (1.05)
Managers/practitioners seem unreceptive or disinterested in current fire science research and information	**2.47** (.91)

Initial Findings: General Public Survey Frame

The General Public survey frame was intended for all other targets of consortia efforts and activities who were not primarily employed in fire management or research-related fields. This audience is highly diverse, including typical homeowners, large and small private landowners, business owners, elected officials/decision makers, and otherwise interested community members. Some participants had substantial knowledge of fire management issues and frequently made decisions based on fire science information, whereas others were much less familiar with fire science research results and tools.

Only a few consortia have specific plans to increase fire science information accessibility and applicability among the general public. Consequently, the General Public survey is the smallest of the three frames, both in number of participants **(*N* = 161)** and in scope. It 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.

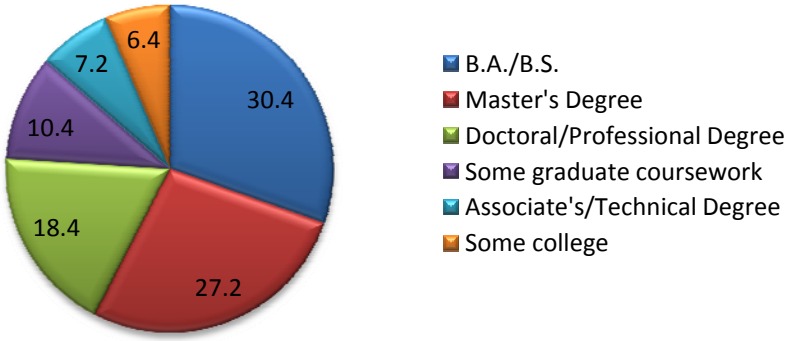
Some consortia are likely in the beginning phases of designing and implementing activities targeting the general public. The more general items included in this frame can help consortia build their understanding of community members' fire science information needs and preferences.

General Public Demographics

Nearly three-quarters (73.8%) of General Public respondents were male. The vast majority were Caucasian (95.0%), followed by "Other" (1.7%); Black (.8%); Hispanic/Latino (.8%); American Indian (.8%); and Multi-Ethnic (.8%). The mean age of participants was 55.1 years. Educational background was reported as follows: B.A./B.S. (30.4%); Master's Degree (27.2%); Doctoral or

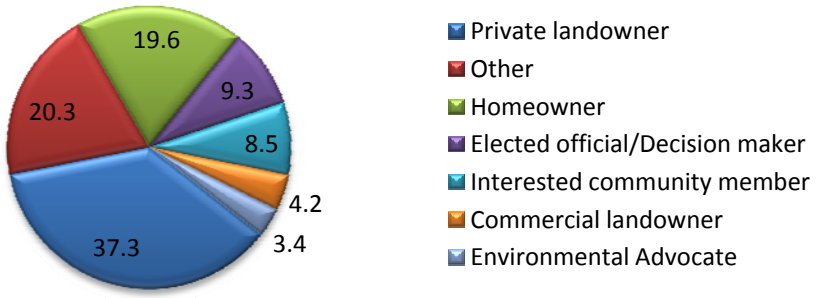
Professional Degree (18.4%); Some graduate coursework (10.4%); Technical/Associate Degree (7.2%); Some college (6.4%; see Figure 10).

Figure 10. Educational Background of General Public Survey Respondents



General Public respondents were not asked to identify their region/consortium, but rather their state of residence. They most commonly resided in Colorado (20.0%); North Carolina (19.2%); Florida (10.4%); California (9.6%); South Carolina (5.6%); Alabama (4.0%); Texas (4.0%); and Wisconsin (4.0%). The remaining 19.4% of participants were from various other states (e.g., Michigan, Mississippi, Nevada, Virginia) with typically only one or two individuals representing each state. These respondents were, however, asked to select response from a series of options that best described their "situation" or role. These responses demonstrate the diverse nature of the General Public survey sample (see Figure 11). Over one-third (37.3%) of respondents identified themselves as large or small private landowners , 16.9% identified themselves as homeowners, 9.3% were elected officials/decision makers, and 8.5% said that they were "interested community members." Twenty percent of General Public respondents did not explicitly identify with any of these categories and selected the "Other" option. When asked to elaborate on their "Other" role, some participants provided more detailed descriptions of existing response categories (e.g., Rancher, State Representative). Yet, many others provided role descriptions indicative of a substantial background in fire management/science which was at times career-oriented (e.g., "Federal Land Manager," "Wildlife Biologist," "Forester"). The Consumer survey may have been more appropriate for such experienced participants, though they identified themselves as members of the general public (and not currently employed as a fire manager/technical specialist or a fire researcher/scientist).

Figure 11. Primary Role of General Public Survey Respondents



General Public Experiences with Fire Science Information

General Public participants were first asked to respond to a series of 13 items concerning their experience 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 appearing in the Consumer survey frame such that they assessed the ease of accessing and understanding fire science information. Whereas many of the Consumer items referenced work-related practices, 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.

Mean responses to the first series of items included in the General Public frame are displayed in Table 14. Taken together, these initial findings not only suggest that community members have positive perceptions of fire science information, but also regularly share and apply this information. Level of interest in learning more about fire science/management issues was high, and the majority of respondents indicated that they planned to use what they've learned about fire science to protect their home/land/community. Most participants also agreed that they had changed at least one of their behaviors as a result of what they had learned about fire science.

Though mean responses still fell at the positive end of the scale, General Public participants were least likely to endorse the statement, "Fire science information is easy to find." Thus, consortia may make efforts to highlight fire science information sources and convenient means of accessing these sources (e.g., via the internet) throughout their outreach/educational activities targeting the general public. Increased accessibility of fire science information among the General Public should translate into increased applicability and positive behavioral changes, which can be ascertained using data collected from Phase 2 of the online survey.

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	**4.09** (.75)
I plan to use what I've learned about fire science to protect my home/land/community	**4.05** (.81)
I have shared or discussed information that I have learned about fire science with others	**4.01** (.89)
Overall, the fire science information available to me has been useful	**3.98** (.61)
The fire science information I have received seems trustworthy and credible	**3.98** (.62)
Fire science information is relevant to my needs	**3.88** (.77)
I am concerned about fire danger in my community	**3.79** (1.15)
I have changed one or more of my behaviors as a result of what I have learned about fire science	**3.74** (.87)
My awareness of fire science/fire management issues has increased during the past year	**3.74** (.99)
I am concerned about the effects of fire on my environment	**3.69** (1.17)
Educational materials about fire science (e.g., fact sheets, videos, web-based) are easy to understand	**3.64** (.77)
Fire science information is easy to find	**3.33** (.87)
I'm unsure of where to go or who to contact if I have questions about fire science or fire management issues	**2.37** (1.01)

***Note**: The last item in this table is negatively framed. As all responses occurred on a 1 (Strongly Agree) to 5 (Strongly Disagree) 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 7 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 12.[1] The General Public rated *Communicating with fire management/extension professionals* as the most useful source of fire science information, followed by *Group instruction, classes, or demonstrations*. Thus, like Consumers, it appears that the General Public respondents prefer more interactive learning opportunities. Though many General Public respondents also rated more independently accessed communication sources as useful (i.e., *internet, research briefs/fact sheets/brochures*), few reported accessing useful fire science information via *television/radio* or *videos*.

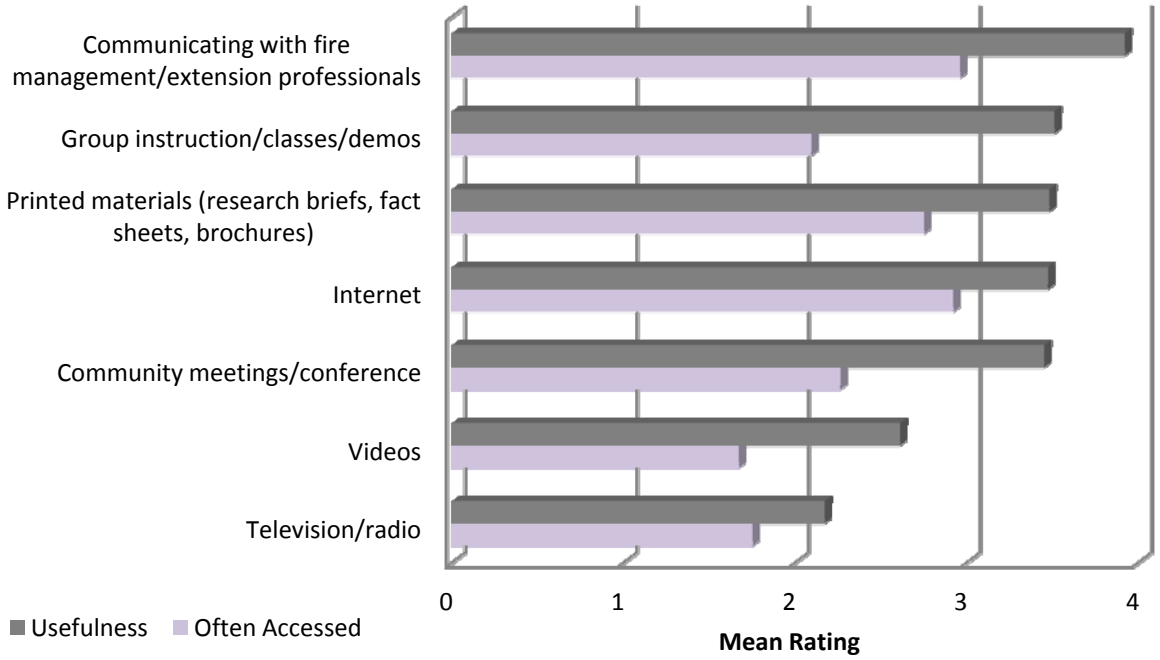
Table 15. General Public Mean Ratings of Fire Science Information Communication Sources: Frequency of Access and Perceived Usefulness

Communication Source	Often Accessed Mean (SD)	Usefulness Mean (SD)*
Communicating with fire management/extension professionals	**2.96** (1.04)	**3.92** (1.44)
Internet	**2.92** (1.14)	**3.47** (1.00)
Printed materials such as research briefs, fact sheets, and/or brochures	**2.75** (.97)	**3.48** (.96)
Community meetings or conferences	**2.26** (.99)	**3.45** (1.27)
Group instruction/classes/demonstrations	**2.09** (1.06)	**3.51** (1.33)
Television/radio	**1.75** (.88)	**2.17** (1.01)
Videos	**1.67** (.82)	**2.17** (1.01)

Note: Because some General Public respondents had little or no experience with some of these fire science information sources (i.e., had never accessed during the past year), not all participants provided usefulness ratings. *N*s for usefulness ratings ranged from 89 (*Videos*) to 128 (*Printed materials such as research briefs, fact sheets, brochures*).

[1] 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 7 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.

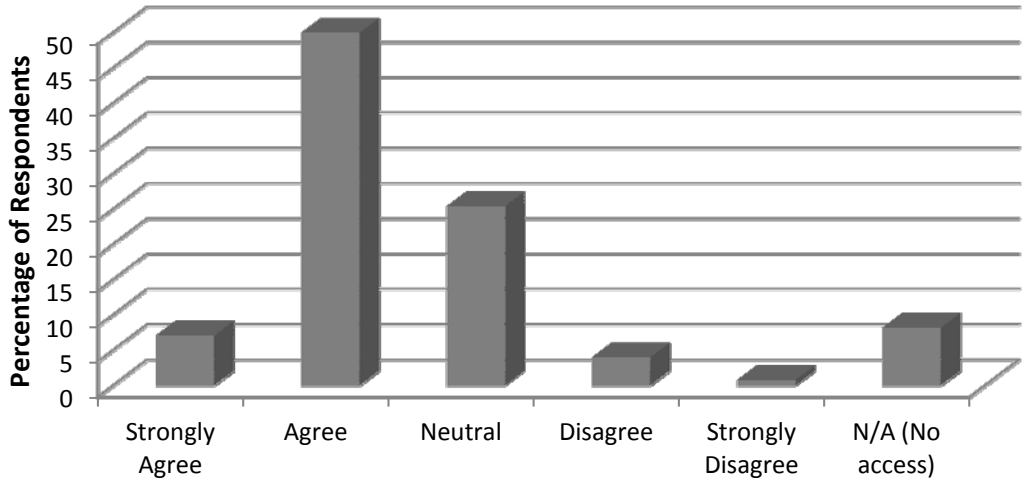
Figure 12. Fire Science Information Commincation Sources: General Public Mean Ratings of Usefulness and Frequency of Access



Overall, the General Public accessed fire science information less frequently than did Consumers. This is to be expected, as General Public respondents were not primarily employed in fire science/management-related fields. The finding that the top rated source of fire science information (*Communicating with fire management/extension professionals*) was also the most frequently accessed is particularly encouraging, and indicates that consortia targeting the General Public should aim to maintain and enhance such communication via outreach and educational activities (e.g., community meetings, interactive websites). The internet was the second most frequently accessed source among the General Public, though information obtained from this source only was rated as moderately useful. Thus, interested consortia may make increased efforts to advertise their websites to the General Public and to ensure that their sites include information that is relevant to this population.

Finally, General Public respondents were asked if the fire science information they received from web-based sources was current and up-to-date. Over half (57.1%) of participants agreed with this statement, 25.4% were uncertain or neutral, 4.0% disagreed, and .8% strongly disagreed that the information they received from web-based sources was current and up-to-date. A substantial proportion of General Public respondents (12.7%) indicated that they had not accessed fire science information from web-based sources, which further suggests that consortia targeting this population should aim to advertise their websites and ensure that they are easily navigated by more inexperienced users.

Figure 13. General Public Perceptions of Currency of Web-based Communication Sources



The fire science information I have received from web-based sources is current and up-to-date

Online Survey Component: Summary and Implications

The JFSP Consortia were critical in ensuring the success of the first wave of the online survey component. Because of their efforts, we obtained responses from over 1200 participants representing all of the regional consortia. These responses have helped establish a solid baseline for future assessment of consortia progress toward their shared goals. Initial survey results are encouraging, suggesting that respondents from all three target groups have had relatively positive experiences with fire science information with respect to its accessibility and applicability. Further, respondents indicated that their motivations, decisions, and behaviors often were influenced by what they have learned about fire science.

> *"I really appreciate the efforts of the Joint Fire Science Program. I look forward to benefitting from more information that their program will help disseminate."*
>
> -General Public Survey Respondent

Though positive, the first phase of online survey responses still were quite variable across measures and illuminated potential areas of focus for consortia striving to reach their objectives. Consortia are in varying stages of development, and are continually designing and implementing outreach/educational activities. In providing a foundation for understanding

individuals' experiences and opinions concerning fire science information, these initial results may help consortia tailor their efforts to address specific challenges and needs. Results from Phase 2 of the online survey (scheduled to be implemented in 2012) can help determine whether such needs and challenges are being effectively addressed. Comparisons across these two phases will further illuminate the impacts of the consortia websites and other recently implemented activities on desired outcomes.

Again, it is important to recognize that the consortia are diverse, with specific regional issues and problems. As a result, each may experience different successes and challenges, and implement a variety of outreach/educational activities designed to enhance fire science delivery among their regional population. Findings from this aggregate evaluation, however, indicate that two broader consortia efforts may be particularly conducive to achieving shared goals. First, they suggest that consortia efforts in developing comprehensive, "one-stop shopping" websites are well-placed, and that consortia may further promote communication among Consumers and Producers by implementing interactive website features. Second, they suggest that improving the availability/accessibility of more interactive learning opportunities (e.g., professional conferences/meetings, workshops/field demonstrations, community meetings, group instruction/classes) may substantially facilitate consortia progress toward their goals of increasing fire science information knowledge and utilization among both Consumer and General Public populations.

> *"It is difficult to find one-stop shopping to get up to speed on current fire science information or even management tools that are being used by other fire practitioners. Having a website that is easily searchable will help to alleviate that concern."*
>
> -Consumer Survey Participant

In comparing responses to the Consumer and Producer survey frames, it emerged that both samples rated, "Fire science information is not available in one convenient place" as the top obstacle to the accessibility/dissemination and application of fire science research results and tools. Though responses regarding the accessibility and applicability of fire science information were relatively positive across all survey frames, it is important to note that nearly half of Consumer and General Public respondents expressed neutrality (or explicit disagreement) towards the statement that "Fire science information is easy to find." As described in their proposals to the JFSP Board, consortia are actively taking steps to synthesize and disseminate fire science information that is relevant to these populations, most often through their individual websites or concise publications such as fact sheets and newsletters. These initial findings not only support current consortia efforts, but also suggest that an increased concentration on disseminating practical fire science information via conveniently accessed communication sources (e.g., websites) will significantly further consortia progress toward their goals. Importantly, consortia websites should be user-friendly so that these diverse populations (e.g., fire science practitioners with varying roles, stakeholders/decision makers, interested community members) can easily access information applicable to their specific issues.

"An important consortia function is to summarize and synthesize current and past research into easily accessible research briefs. Not only do many practitioners not have time to review scientific literature, but many practitioners in my agency do not even have access to the literature because many departments have dropped journal subscriptions due to tight budgets."

-Consumer Survey Participant

Both Consumers and General Public respondents seemed to prefer hands-on, interactive learning activities. Information obtained from interactive communication sources (e.g., communicating with co-workers, scientists, fire management professionals; professional meetings/conferences; workshops/trainings, group classes/demonstrations) was rated as more useful than that acquired from more passive sources (e.g., newsletters, videos). The most useful communication sources of fire science information, however, were not always among the most frequently accessed. Respondents frequently learned about fire science from co-workers or (in the General Public sample) from fire management/extension professionals. Participation in scheduled activities such as professional meetings/conferences, workshops, and group classes/demonstrations was less common. Many consortia are likely in the process of developing and implementing additional interactive learning endeavors for Consumers and the General Public, as this was a recurring theme articulated in their proposals to the JFSP Board. It should be noted that increasing work responsibilities and time/scheduling constraints also may inhibit participation in more interactive learning opportunities. This may be particularly true for Consumers (fire managers/practitioners). There are likely many barriers to participation in interactive learning opportunities (e.g., limited funding, resources, and other regional issues), some of which the consortia may not be able to fully address. Yet, to the extent possible, present results suggest that consortia should aim to increase both the availability and accessibility of such opportunities.

"I am glad that the consortium is available- it has streamlined the availability of information"

-Consumer Survey Participant

All consortia have emphasized the importance of fostering positive relationships between Consumers and Producers of fire science information in reaching their overarching goal of enhancing fire science delivery. More frequent communication between fire managers/practitioners and researchers/scientists should substantially increase the accessibility of fire science information. Further, such communication may assist Producers in targeting their research towards relevant applied problems and enhance Consumers' likelihood of applying current fire science research results and tools. Findings from Phase one of the online survey are encouraging in these respects, suggesting that fire science information Producers and Consumers have relatively positive perceptions of one another. These favorable attitudes seemed to positively affect motivations as well; the majority of Producers and Consumers agreed or strongly agreed that they would like to collaborate on research projects,

and Producers expressed a strong willingness to work directly with Consumers in addressing applied issues.

> *"As a fire scientist, I would benefit from more opportunities to work with managers in order to get a better understanding of what their information needs are."*
>
> -Producer Survey Participant

Though both Consumer and Producer respondents expressed respect for one another, some Consumers were uncertain about the approachability of Producers and Producers' willingness to address their questions, concerns, and local issues. It is possible that many Consumers may be unaware of Producers' motivations to study applied management problems and to work directly with fire managers/practitioners. If possible, such willingness should be communicated via various consortia outreach/educational efforts. Activities promoting interaction between Consumers and Producers (e.g., professional meetings/conferences, interactive web features) should be particularly helpful in fostering more trusting and collaborative relationships between these two groups.

> *"Face-to-face communication with researchers/scientists and site visits are the best way for both groups to better understand what challenges we will be faced with now and in the future."*
>
> -Consumer Survey Respondent

JFSP Consortia Webmetrics Component

In their proposals to the JFSP Board, all consortia highlighted the importance of developing, implementing, and expanding their individual websites in enhancing fire science delivery. The consortia websites are a primary (perhaps *the* primary) means of increasing fire science information accessibility and applicability among Consumer, Producer, and General Public populations. These websites serve multiple purposes: They can provide "one-stop shopping" for users (frequently Consumers) who need to access a variety of practical fire science information in one convenient place; keep Producers informed of the most current research findings and provide a forum for sharing current research endeavors and results; engage the General Public in fire prevention and management issues; facilitate communication between Consumers, Producers, and the General Public through interactive features; and notify users of funding and learning opportunities. These websites will likely impact a wide range of audiences, and significant resources are expended on their development and maintenance. Thus, one of the four components of the national cluster evaluation of the JFSP consortia specifically focuses on consortia websites.

The webmetrics component of the current evaluation includes both quantitative and qualitative assessments, developed and implemented by the evaluation team and subcontractors Sarah Trainor (Alaska) and Toddi Steelman (Southern Fire Exchange). The quantitative piece involves

collection and analysis of common "web analytics" or indicators regarding website users and utilization. The qualitative piece focuses on the design and features of consortia websites, and aims to enhance the understanding of website function and operations. Most consortia have only recently launched their individual websites and embedded analytics packages in order to collect user data. Thus, initial quantitative and qualitative results only are intended to be used as a baseline for further webmetrics assessments. Upon collecting future data, the evaluation team can conduct comparisons and trend analyses with the intent of 1) Identifying website user needs; 2) Assessing basic impacts of consortia websites regarding the dissemination of fire science research results and tools; 3) Illuminating Best Practices and features of effective consortia websites; 4) Addressing any challenges to the successful dissemination of current, practical, and synthesized information via consortia websites.

Quantitative Webmetrics Component

The evaluation team, along with subcontractors Sarah Trainor and Toddi Steelman, requested that the individual consortia collect and report numerous quantitative indicators regarding their individual website users and patterns of utilization. Such indicators include total number of website visits, data regarding unique (first-time) visitors and visitor loyalty, means of accessing the consortia websites (e.g., traffic sources, search engine keywords), top website content, and "bounce rates." At the time of initial webmetrics data collection, however, many consortia had only recently implemented an analytics package designed to track these indicators. Further, consortia did not receive instructions regarding the specific web analytics to track and report until August 2011. As a result, the data collected and reported here for Phase one of the webmetrics evaluation component are limited.[2] At present, we have obtained preliminary quantitative data from seven consortia, and some data fields are not yet complete for many of the responding consortia. These missing data issues are largely attributable to the recent development and implementation of the webmetrics component of the JFSP evaluation, rather than individual consortia failure to collect and report web analytics.

The evaluation team and webmetrics subcontractors have since established explicit guidelines for collecting and reporting quantitative webmetrics data. All requested quantitative data from consortia websites will be collected monthly and reported to the evaluation team and subcontractors quarterly. These complete data reports submitted on a routine basis will allow us to analyze trends in website user data as well as to conduct comparative statistical analyses, with results providing more insight into the consortia websites' impact on fire science delivery.

Launch dates for consortia websites ranged from April 2009 to August 2011. The majority of Consortia reporting quantitative data indicated that they had embedded their analytics package during the spring of 2011. Only quantitative webmetrics data from June and July of 2011 are

[2] Data regarding some quantitative web analytic indicators were collected but not reported here, such as the average time users spent viewing specific page. This is due to missing data issues (as consortia were only recently informed of the indicators to track and report) as well as the lack of relevance of these initial findings in ascertaining current consortia strengths, challenges, and progress toward their goals. Results pertaining to all qualitative webmetrics indicators will be thoroughly reported and discussed in the next report submitted to the JFSP Board.

reported here, as consortia were most likely to have collected data from these months. Again, future analyses and reports will be more thorough, including data for all quantitative indicators collected from September 2011 and beyond.

Basic Website User Data

Basic quantitative website user data requested from consortia included the total number of visitors to each site per month, the number of "unique" visitors to each site per month, and website "bounce rates." 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, 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. "Bounce rate" indicates the percentage of website visitors who left the site upon accessing the home page (i.e., did not further explore the website). Higher bounce rates may indicate that website content and features are irrelevant 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.

Table 16 displays the number of total website visits, unique visitors, and percentage of "bounce rates" reported by the seven responding JFSP consortia for June and July 2011; aggregate means of these results appear in the last row of the table. Total number of website visits varied dramatically across consortia, ranging from 98-22752 visits for June and from 87-2183 visits for July.[3] Similarly, the number of unique visitors to consortia websites ranged from 63-803 for June and from 56-788 for July. Bounce rates across consortia ranged from 20.7% to 69.7% for June and from 20.0% to 55.73% for July. It should be noted that bounce rates for each consortia are within the acceptable range. Further, these results indicate that the consortia have been successful in recruiting new users, as evidenced by the number of "unique" visitors.

Discrepancies in number of total website visits and unique visitors are likely not related to current consortia efforts and programming. Rather, they may be attributable to consortia size (with respect to both geographic region and population) and developmental differences among consortia (with respect to funding, resources, and time of website and analytics implementation). These frequencies also are influenced by numerous external factors, such as the occurrence of "fire season." Slight monthly increases or decreases in basic website user indicators likely correspond to local issues and activities. More long-term analyses (i.e., those

[3] To date, only two consortia have activated "filters" excluding user data from individuals who routinely access the websites for maintenance and review purposes (e.g., consortia PIs, Coordinators, or Webmasters). Thus, figures regarding frequency of visits may be slightly inflated for some consortia.

which will continue throughout the next several months and into 2012) are better suited to ascertaining the impacts of the consortia websites. Present results are only intended to establish a baseline for future comparisons and trend analyses involving basic website user data.

Table 16. Consortia Website Total Visits, Unique Visitors, and Bounce Rates for June and July 2011.

	Total Visits		Unique Visitors		Bounce Rate	
Consortium	June Visits	July Visits	June Visitors	July Visitors	June Rate	July Rate
Alaska	212	189	91	69	41.0%	45.5%
Appalachians	22752	21873	803	788	N/A	N/A
California*	314	327	191	204	33.3%	41.6%
Great Basin	1893	543	280	77	20.7%	20.0%
Lake States	98	87	63	56	52.0%	55.2%
Southern Fire Exchange	341	300	207	229	69.7%	55.6%
Southern Rockies	230	131	111	72	52.2%	55.73%
Aggregate Mean	**3691.4**	**3350.3**	**249.4**	**213.6**	**44.8%**	**45.7%**

***Note**: June results for the California Consortium only include data collected from 6/15/2011 – 6/30/2011.

Data also were collected to obtain a preliminary 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 indicates that users are engaged and satisfied with website content; in essence, visitor loyalty is a measure of user retention.

Four consortia reported data regarding visitor loyalty for the months of June (see Table 17) and July (see Table 18). Though many users only accessed their consortium's website once, results also indicate substantial user loyalty across consortia. During the month of June, the number of individuals who had visited their consortium's website between 2 and 8 times during the month of June ranged from 24 – 84 with a mean of 59.3 users; the number of individuals who had visited their consortium's site between 9 and 25 times ranged from 21 – 57, with a mean of 33.0 users. Though overall numbers of repeat visitors to consortia websites decreased during July, results continue to suggest that the sites are retaining users and addressing their fire science information needs.

Table 17. Visitor Loyalty: Repeat Visitors to Consortia Websites and Frequency of Visits in June 2011

	Frequency of Visits					
Consortium	**1**	**2 – 8**	**9 – 25**	**26 – 50**	**51 – 100**	**101 +**
Alaska	83	24	33	7	8	30
California*	191	84	21	18	0	0
Southern Fire Exchange	169	84	57	11	30	2
Southern Rockies	108	45	41	23	3	10
Aggregate Mean	**137.8**	**59.3**	**33.0**	**14.8**	**10.3**	**10.5**

Note: Results for the California Consortium only include data collected from 6/15/2011 – 6/30/2011.

Table 18. Visitor Loyalty: Repeat Visitors to Consortia Websites and Frequency of Visits in July 2011

	Frequency of Visits					
Consortium	**1**	**2 – 8**	**9 – 25**	**26 – 50**	**51 – 100**	**101 +**
Alaska	58	38	35	24	16	18
California	176	82	25	7	37	0
Southern Fire Exchange	162	62	44	19	26	0
Southern Rockies	57	36	8	13	11	6
Aggregate Mean	**113.3**	**54.5**	**28.0**	**15.8**	**22.5**	**6.0**

Note: June results for the California Consortium only include data collected from 6/15/2011 – 6/30/2011.

Website Access

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 specific keywords use in searches resulting in consortium website visits.

"Traffic sources" refers to the specific websites 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 20 displays the top three traffic sources for six reporting consortia during the months of June and July. Results indicate that most users accessed their consortium's website directly (i.e., without any outside referrals). Google also was a popular means of locating and accessing websites. Finally, several users were referred to their consortium's site through the JFSP home page (firescience.gov).

Table 20. Top Consortia Website Traffic Sources for June and July 2011.

	# 1 Source		# 2 Source		#3 Source	
Consortium	**June**	**July**	**June**	**July**	**June**	**July**
Alaska	Google	Google	Direct	Direct	Frames Home	AFSC Fire Sci. Blog
Appalachians	Google	Google	Firescience.gov	Firescience.gov	So. Fire Exchange	Mir74.ru
California*	Direct	CFSC email list	Google	Direct	Firescience.gov	Direct
Great Basin	Direct	Direct	Firescience.gov	Firescience.gov	So. Fire Exchange	Procyone.com
Southern Fire Exchange	Direct	Direct	Firescience.gov	ncsu.edu	Firescience.gov	ncsu.edu
Southern Rockies	Direct	Direct	Google	Google	Firescience.gov	Forestguild.com

***Note**: June results for the California Consortium only include data collected from 6/15/2011 – 6/30/2011.

Top "keywords" refer to the most common words and phrases entered into search engines that result in consortium website visits. Visitors accessing their consortium's website via search engines most commonly entered the name of their regional consortium, followed by general searches for "Fire Science Consortium" or "JFSP Consortium." Less frequently, individuals' searches for specific consortia personnel (e.g., "Jen Northway") or learning opportunities (e.g., "Circuitscape Tutorial") led them to their consortium's website.

The popularity of Google as a referral source is promising, as this suggests that many potential users are quickly informed of their consortium's site via this prominent search engine. Further, it appears that the JFSP home page has successfully linked many users to consortium websites that can provide them with region-specific fire science information and updates on local events. Though preliminary, these findings do indicate an opportunity for consortia to recruit website users via additional electronic sources. Most visitors accessed their consortium's website directly, or searched for these sites using keywords implicating awareness of their regional consortium. To the extent possible, consortia may aim to further advertise their sites and establish linkages with other fire science and management-related sites.

Top Website Content

To help illuminate the website content most relevant to users, consortia were asked to identify their top most frequently viewed pages. Five consortia had collected and subsequently reported data regarding their top content for June and July of 2011 (see Table 21). As these initial results illustrate, the most popular website content will differ according to the specific features of consortia websites and the needs of regional users. Predictably, users most

frequently visited their consortium website's home page, but other page views appeared to be contingent on the offerings of individual websites, and perhaps upon website design.

Table 21 is intended to illustrate the variability in top content across consortia websites. It is expected that more concrete implications will emerge as data are collected from all consortia in the following months and continuing throughout 2012. These future results may assist consortia in tailoring their website content to regional user needs, as well as in including content relevant to broader audiences.

Table 21. Top Consortia Website Content for June and July 2011.

	# 1 Page		# 2 Page		#3 Page	
Consortium	**June**	**July**	**June**	**July**	**June**	**July**
Alaska	Home	Home	AK Fire Portal	AK Fire Portal	Boreal History Home	Boreal History Home
California*	Home	Home	Webinar Registration	Blog	Blog	Citations
Great Basin	Home	Home	Webcasts and Workshops	Webcasts and Workshops	Blog	Events
Southern Fire Exchange	Index	Index	N/A	Products	N/A	Product Development
Southern Rockies	Home	Home	Documents	Documents	About	About

***Note**: June results for the California Consortium only include data collected from 6/15/2011 – 6/30/2011.

Qualitative Webmetrics Component

The qualitative webmetrics component focuses on describing the consortia websites in an effort to enhance the understanding of their operation, organization, design, and content. At this phase in the evaluation, such information can be used to help determine whether website features cohere with consortia objectives and the needs of the websites' target audiences. Similarly, qualitative findings may help consortia with websites in varying stages of development to identify areas for potential improvement and to focus their efforts on including or expanding site elements most conducive to goal progress.

The qualitative component also is intended to compliment the quantitative webmetrics component. As web analytics data collection and reporting becomes more consistent across consortia during the upcoming months, relationships between quantitative and qualitative findings may emerge that have implications for consortia website Best Practices. Consideration of quantitative trend analyses in conjunction with qualitative indicators may prove particularly valuable in illuminating the features of successful websites. Such analyses will be conducted in

2012 after sufficient time has elapsed to establish trends in website utilization and visitor behavior.

Qualitative data regarding consortia websites were collected using an online survey completed by consortia PIs or Coordinators. A representative from each of the eight consortia responded to the survey, which was disseminated via email in August 2011. The survey requested basic information about the operation, maintenance, and features of the consortia sites; respondents also were asked to identify their website's primary purpose and target audience. Consortia will be asked to complete the survey again during 2012 in order to ascertain changes occurring as a result of continual website development and expansion efforts.

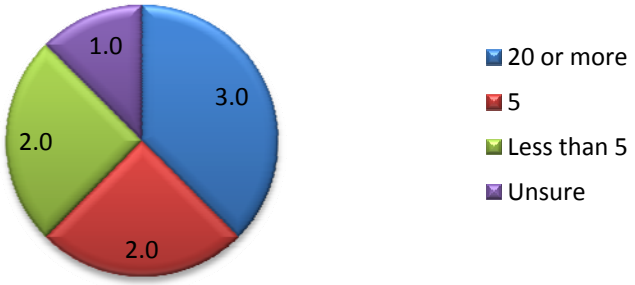
Website Maintenance and Operation

Consortia representatives responded to some basic questions regarding the operation and maintenance of their websites. Though two consortia have hosted individual websites since 2009, the majority did not launch their sites until late 2010 (3 consortia) or during the spring and summer months of 2011 (3 consortia). Two consortia reported that they had embedded an analytics package for the purposes of collecting web shortly following inception of their site (in 2009 and 2010), but the majority of consortia (5) embedded analytics during the spring of 2011. At the time of survey distribution, one consortium had not yet embedded a web analytics package.

Two consortia reported using the FRAMES platform, and an additional two used self-designed platforms. Other sites were hosted by Universities or regional organizations, "Sqaurespace," and "Dream Host." Some consortia will likely adopt alternative platforms in the future due to the limited features of FRAMES and other hosts.

The majority of consortia (7) had a designated individual in charge of their website, and 6 consortia reported contracting outside assistance to help maintain their sites. Websites were primarily maintained by consortium Coordinators (3 consortia) followed by part-time Webmasters (2 consortia). The remaining consortia maintained their websites through the efforts of the consortium PI, FRAMES, and "consortium partners." Average hours per week spent on website maintenance as reported by consortia are depicted in Figure 14. Three consortia reported spending 20 hours or more per week on website maintenance; two reported spending an average of 5 hours per week on website maintenance, and an additional two said that fewer than 5 hours per week were dedicated to maintaining their websites. One consortia representative was uncertain as to the average number of hours per week spent on website maintenance.

Figure 14. Average Number of Hours Spent per Week on Website Maintenance as Reported by JFSP Consortia



Website Purpose and Features

Consortia representatives were asked to select the response best representing the primary purpose of their website from a variety of response options. Consistent with many of the funding proposals submitted to the JFSP Board, six consortia indicated that their websites' primary purpose was to "Provide online one-stop shopping whereby users can access a wide variety of fire science information regarding fire science research results, tools, and learning opportunities." The remaining two consortia identified "Providing users with region-specific fire science information that is most relevant to their local problems" as the primary purpose of their websites. Consortia representatives also were invited to elaborate on any other purposes of their consortium's website; those responding to this open-ended survey item most commonly cited "Facilitating communication/collaboration among fire science professionals (e.g., managers, scientists) in my region" as a key objective of their site.

All respondents identified fire managers/practitioners as the primary target audience for their website and specified that their sites also were intended for fire researchers/scientists. Some consortia also reported targeting private landowners (3 consortia), stakeholders/decision-makers (2 consortia) commercial landowners (one consortium) and general community members/homeowners (one consortium).

Obtaining a basic understanding of the features included in consortia websites was the one of the key objectives of this initital phase of the qualitative webmetrics component of the JFSP consortia evaluation. To this end, consortia representatives were presented with a list of features associated with attainment of shared consortia goals and asked to indicate whether their consortium's website currently included each feature. These responses are displayed in Table 22.

Table 22. Current Features of Consortia Websites

Website Features	Number of Consortia Including Feature
Summaries of fire science information (e.g., fact sheets, summaries of workshops and/or other educational activities, lists of publications)	**8**
"About" section providing basic information about the consortium	**8**
Calendar and/or information about upcoming events	**8**
Information or announcements about workshops	**8**
Information or announcements about podcasts/webinars	**7**
Information/reports on fire science in the news	**7**
"What's new" section	**7**
A list of and/or links to key consortia contacts	**7**
Downloadable newsletter	**6**
Literature libraries	**6**
Information or announcements about funding opportunities	**5**
Information or announcements about online courses	**4**
Interactive map	**4**
Links to social media (e.g., to Facebook, Twitter, YouTube)	**3**
Communication forum	**3**
Help desk/ask and expert component (allowing users to submit questions for researchers/scientists)	**3**
Blog	**3**

Results indicate that consortia are making consistent efforts to distribute synthesized fire science information and inform visitors of upcoming consortia events and educational opportunities. In addition, most or all of these websites highlight current applications of fire science information and include features aimed at increasing visitor awareness of their regional consortium and its activities. The majority of consortia representatives, however, reported that their website did not include more interactive features such as a communication forum or a "help desk/ask an expert" component that may be critical in promoting communication and collaboration between fire science information Producers and Consumers. Consortia should strongly consider implementing and expanding these more interactive features in order to improve the quality of relationships among fire science professionals and to achieve their overarching objective of enhancing fire science delivery.

Webmetrics Component: Future Directions

It should be emphasized that these initial results only are intended to provide a baseline assessment which will be used as a starting point for comparisons with web analytics collected in the following months and throughout 2012. Presently, all consortia have been provided instructions with regard to quantitative webmetrics data collection and reporting. These

additional data will permit a more valid and thorough analysis of consortia website impacts which will be presented in the second annual evaluation report submitted to the JFSP Board. Further, quantitative data will be used to conduct trend analyses, which will be considered along with qualitative data in the development of Best Practices for consortia websites. Such data can help identify the features of the most successful consortia websites and provide suggestions and recommendations that will further consortia progress toward their ultimate goal of enhancing fire science delivery. Though preliminary, current findings are encouraging as they suggest that the consortia sites are successfully recruiting and retaining users and that the sites are incorporating many features consistent with enhancing fire science information accessibility and applicability. Present (primarily qualitative) findings highlight some potential areas for improvement. Most notably, consortia may wish to focus their efforts on incorporating and expanding interactive website features that facilitate communication and collaboration among fire science information Consumers and Producers. Further, some consortia may consider replacing their existing website platforms (i.e., FRAMES) with those allowing more flexibility in website content/design and that are more conducive to tracking user data.

Finally, consortia should strongly consider conducting independent evaluations of their websites. Only two consortia indicated that they had made efforts to evaluate their websites. One of these efforts assessed visitors' opinions about two specific website features (which were largely positive), and the other was conducted prior to website implementation in order to identify site features that would be most helpful to potential visitors. Relatively simple individual site evaluations can provide consortia with critical information regarding their visitors' needs and the extent to which their sites meet these needs. Further, consortia may solicit valuable user feedback regarding website design, organization, content, and features. This may be accomplished via "pop up" online surveys presented to visitors or via other relatively convenient electronic methods.