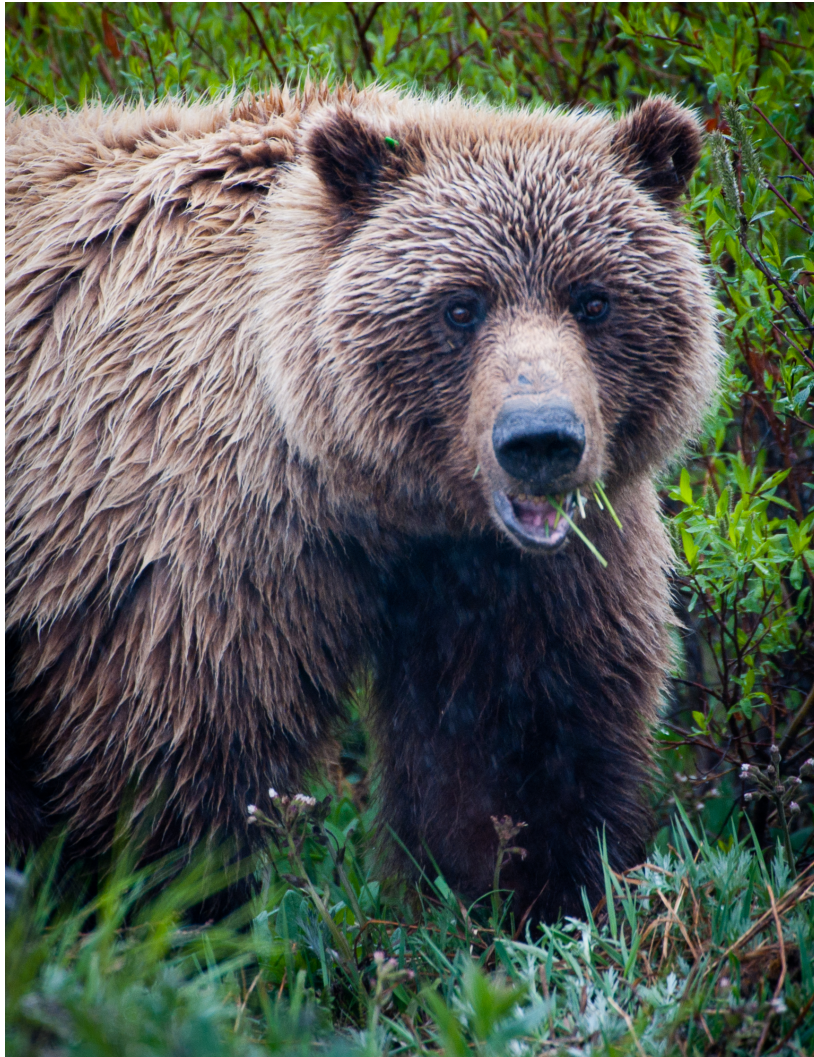


FRONTIER SCIENTISTS
SUMMATIVE EVALUATION REPORT

May 2012



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Please address all communication to Deborah Perry, DLPerry@selindaresearch.com

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Introduction

Overview of Project

Frontier Scientists (FS) is an NSF-funded University of Alaska - Fairbanks (UAF) and WonderVisions (WV) collaborative project whose mission is “to excite the general public about ongoing science in Alaska and the Arctic.” According to the project’s website, the target audience for *Frontier Scientists* includes “travelers, teachers, students, aspiring scientists, and anyone interested in [Alaska- and Arctic-focused] scientific discovery.” Consisting of a series of short video clips (vodcasts) delivered primarily via a website,¹ *Frontier Scientists* showcases scientists and their research that is being conducted in Alaska and the Arctic.

As part of the FS project, Selinda Research Associates (SRA) conducted an evaluation of the project’s vodcasts and website. This evaluation had two parts. The first phase consisted of reviews of prototype materials including draft video scripts and video rough cuts. Six evaluation briefs were produced and are available on the FS website.² Findings from this first phase of the evaluation played a major role in the ongoing development of the materials as findings were incorporated and recommendations implemented.

The second phase of the evaluation, the focus of this report, set out to examine the nature of the website user experience including the contributions of the website to viewers’ understanding about and appreciation for Alaska, the Arctic, and Arctic scientific research. Following is a brief description of the study, and a summary of the major findings from this second phase of the evaluation.

Description of the Website and Videos

The *Frontier Scientists* website covered a wide range of topics including: humanities, geology, biology, marine science, archaeology, ecology, chemistry, and more. At the time of this report, it included: (a) 53 video clips (vodcasts) showcasing scientists in the field talking about their research; (b) blog posts discussing the scientists and research featured in the vodcasts, many of them written by the scientists themselves; (c) narrative descriptions (with accompanying photos) of the scientific research featured in the vodcasts; (d) short bios about the featured scientists; and (e) a listing of recent Twitter posts about topics related to Arctic scientific research (see [Fig. 1](#)). There were also a *Frontier Scientists* Facebook page, Twitter feed, YouTube channel, and Flickr site, none of which were part of this evaluation study. As of the writing of this report, the website and all the additional online presences were still active and being used by the public.

The 53 video clips were the major focus of the website. They were located at the top of the homepage and also accessed from a number of other pages on the site. Organized into eleven “stacks,” they covered a range of topics including Alutiiq weavers, birds, climate change, volcanoes, petroglyphs, computational science, paleo-Eskimos, and grizzly bears. Each stack included from one to eight video clips ranging in length from less than two minutes to over 18 minutes. The stack of grizzly videos (a major focus of this evaluation study) consisted of seven active videos and one listed as “in production.” Titles included “Pat’s Big Bear,” “Backcountry Incidents,” “Denali’s Grizzly Population,” and “Grizzly Bears and People.” Clicking on the “Scientist on Call/ Ask Me!” large photo on the right side of the page took viewers to the “Contact Frontier Scientists” webpage. There they could post a question or leave a mes-

¹ www.frontierscientists.com

² www.frontierscientists.com/nsf-evaluation-worksheets/

sage. On the left side of the page, a large photograph of a snowy owl with “Share in My Alaska” was not an active link. “Follow Us!” beneath the photograph encouraged viewers to follow FS on Facebook, Twitter, and YouTube.



Fig. 1 - The *Frontier Scientists* website homepage on January 24, 2012.

Methods & Methodology

We used a naturalistic inquiry methodology (Lincoln & Guba, 1985) and a developmental evaluation framework (Patton, 2011). A naturalistic methodology examines naturally-occurring behavior and phenomena in natural settings. The goal of developmental evaluation is to gather information to guide the development of a product. To conduct this study, SRA researchers conducted (a) a hermeneutic circle critical review of the design and usability of the website, and (b) a series of depth interviews with respondents who watched one series of videos, a “stack” of seven grizzly vodcasts. The data collection and analysis are explained briefly below.

Evaluation Team

The evaluation team consisted of four SRA researcher associates with various backgrounds and experience in instructional design, website development and evaluation, educational technology, informal learning, exhibit design and development, and Alaska: Deborah Perry, Eric Gyllenhaal, Diane White, and Barb Becker. All four researchers participated in the website critical review and hermeneutic circle. Three of the four conducted depth interviews with respondents, and all four participated in all aspects of the data analysis. One researcher took the lead in writing the final report, with all four contributing to it, and all agree with the trustworthiness of the findings.

Critical Review

To conduct the critical review, a website usability heuristic was adapted from Jakob Nielsen.³ The critical review consisted of five rounds of a hermeneutic circle, conducted between November 9, 2011 and December 16, 2011. The hermeneutic circle began with one researcher using the heuristic to review the website and write comments and feedback based on their findings. The review was then passed to the next researcher who added their comments, noted where they agreed or disagreed with the previous reviewer, and expanded the discussion. The review was then passed to the next individual. This process continued until all four researchers had reviewed the document. The process culminated in a final “group debrief” session on December 15, 2011, where the four researchers discussed and reached consensus about the findings and recommendations. See [Appendix A](#) for a list of the technology used to review the website.

Depth Interviews

Whereas the critical review relied on SRA researchers’ backgrounds and experiences in website design, development, and evaluation, the depth interviews focused on the experiences of members of the target audience who were invited to view the stack of grizzly vodcasts and discuss their experiences (see [Appendix B](#)).

Using purposive sampling (Miles & Huberman, 1994), 25 respondents were selected to participate in this study. They ranged in age from 14 to approximately 65, and they were located in eight states: Oregon, Washington, Wisconsin, Colorado, Illinois, California, Michigan, and Texas (see [Appendix C](#)). Eight respondents had been to Alaska before, ten had never been, and one respondent did not indicate whether they had been. A total of 19 interviews were conducted (three of the interviews were with more than one respondent) for a total of approximately 46 hours of contact time. Interviews ranged from 18 minutes to 72 minutes in length and most were at least 45 minutes long. One respondent provided feedback via email instead of over the phone. All interviews took place from November 28, 2011 through December 20, 2011.

³ <http://www.useit.com/papers/heuristic/>

Depth interviews by definition are open-ended and conversational in nature, following the lead and interests of the respondent. While there are often predetermined questions, these questions are used only as a guide and may or may not be used depending on the nature of the particular interview. In this way issues can emerge that are not anticipated, enabling a rich understanding of the visitor's experience in their own words. In this study, an interview protocol was developed (see [Appendix D](#)), but it was only used to supplement the naturally-occurring conversation as it evolved between the researcher and the respondents. Not all questions were asked of all respondents, and many questions not on the protocol were also asked. All interviews were conversational.

Data Analysis

This study used a modified inductive constant comparison technique to compare each unit of data with all other units of data. With the critical review, data analysis was ongoing; the hermeneutic circle process enabled constant comparison as each successive reviewer compared their findings with all previous findings. At the end of the hermeneutic circle, on December 15, 2011, all members of the evaluation team discussed and came to consensus about the findings in a group debrief.

With the depth interviews, data analysis was also ongoing. Analysis began immediately after each interview. When the interview was completed, the researcher engaged in an individual debriefing process, usually taking at least twice as long as the interview. During each debrief session, the researcher fleshed out their notes, reflected on the findings, compared the findings from that interview to all previous interviews, and wrote a debrief document that was then shared with the other researchers. As part of this debriefing process, the interviewer also identified new questions to explore during the next interview.

After all data collection was completed, one researcher summarized the major findings from the depth interviews, critical review, and first group debrief, and then a second group debrief was conducted on January 4, 2012.

Reporting

It should be noted that, for the most part, the reader will not find percentages or other statistics in this report. We have found that the inclusion of statistics in a naturalistic report that relies primarily on purposive sampling can create a false impression of specificity or strength of finding. Instead, in accordance with standards for naturalistic inquiry, we use the adjectives "all," "most," "many," "some," "few," and "none" as a more accurate way to describe tendencies.

In reporting aggregate information such as interview data, we made the decision not to tabulate percentages of different kinds of responses offered by visitors. It is our view that once numerical ratings are assigned to judgmental data, there is a great tendency on the part of the reader to engage in hyperbole and misinterpretation. Rather, we have intentionally used adjectives such as "most," "many," "some," "few," or "none" to help portray aggregate tendencies. If we simply say visitors, then it implies that almost everyone was in agreement (Wolf & Tymitz, 1981).

SRA is committed to the use of non-sexist language whenever possible. In this report, we designated the gender of a person only when it seemed important either to the context, or when its inclusion would result in more interesting prose and it would not perpetuate a stereotype. Furthermore, we have chosen to replace the false generics "he" and "his," and the awkwardness of "he or she" and "his or hers," with "they" and "their." Grammarians may object to this obvious lack of agreement in number. Given the choice between (a) agreement in number, (b) agreement in gender, and (c) less awkward prose, we have opted for the latter two (Miller & Swift, 1980, p. 35-47).

Usually summative evaluation reports do not include extensive recommendations. One of the characteristics of this project is that recommendations have been incorporated throughout the development process. In this report, recommendations are included because the *Frontier Scientists* website and videos continue to evolve, and recommendations for improving the product were specifically requested.

Although this evaluation focused on two areas—the critical review of the website by the researchers, and interviews with respondents who viewed the stack of grizzly videos—the data for the study were integrated and presented as an aggregate of issues or topics rather than as different data sets. In other words, the reader won't find separate sections for the results of the website critical review, or what respondents thought was important. Rather, the data are presented as issues that emerged, regardless of whether they came from the website critical review or respondent interviews. Some findings emerged directly from interviews with respondents, others directly from the critical review, but most were a result of the integration of all the data.

Limitations

This report combines findings from the researchers' critical review and the depth interviews with members of the target audience who viewed a selected set (the grizzly stack) of vodcasts. Interview respondents were not asked to explore the entire website or to view additional vodcasts, although were encouraged to do so if they wanted to. Most respondents chose not to, focusing their attention on the seven grizzly videos. It should be noted that (a) the findings about the website design are based on limited user data (with the exception of users' experiences as they viewed the assigned videos), and (b) the findings about viewers' experiences with the videos are limited primarily to their experiences with the seven grizzly videos. Results may have been different if more videos had been viewed and/or respondents had freely explored the website.

Findings

Overall Website

The overall design of the website was aesthetically pleasing. The homepage and many of the subsequent pages made good use of color and images. The videos in general were well-received by most respondents with strong indications that viewers enjoyed the images, especially the spectacular scenery and shots of grizzly bears moving about. Most respondents indicated that watching the videos reminded them how much they wanted to go, or return, to Alaska.

All respondents we talked with indicated they took away some nuggets of new information, for example, that bears eat blueberries, how to avoid a grizzly attack, how bears are darted, etc. There were also strong indications that viewers appreciated the “accessibility” of the scientists, both in the way they were portrayed in the videos as real people doing real things, as well as having the *Scientist on Call* area on the home page (see [Fig. 1](#)), which helped viewers perceive them as approachable. Respondents indicated they appreciated that “it was all real,” that the people, bears, scenery, and science were not staged, or, as one respondent put it, “not Disney-fied.” They came away from watching the videos with the sense that the scientists were real and approachable people.

The topics presented were well-chosen and most were interesting to most viewers. The website and videos displayed well on all sorts of devices, including laptops, desktops, and mobile devices like iPads, iPhones, and Android smartphones.

Browsing and Selecting Vodcasts

The navigation for the videos consisted of: (a) the display of video stacks across the top of the homepage of the website, (b) the active stack in the middle, (c) the visible inactive stacks to either side of the active stack, (d) the small double-arrow stack browser directly below the active stack, and (e) the small double-arrow video browser on the top right corner of the active stack (see [Fig. 2](#)). Each video stack had a title, and when that stack moved into the active (center) position, additional information appeared including the title of the stack in the upper left, the title of the first video in the stack in the lower left, and the number of videos in the stack in the upper right. The data indicated that having the videos located at the top of the homepage and accompanied by the large play button in the middle, made the grizzly stack easy for respondents to find and use.

Browsing Among Stacks

Navigating between stacks, however, proved more difficult. There were two ways to navigate between stacks. One was to click on one of the stacks on either side of the active stack. The stack that was selected would then snap into the center position. However, when the selected stack moved into the center position, the image changed, and it was not readily apparent that the center video was the one that had just been selected. [Fig. 2](#) is an example of what the video section of the website looked like, with the stack of grizzly videos in the center and the *Climate Change Watch* videos to the immediate right. To make *Climate Change Watch* the active stack, the viewer would click on it, and that stack would move into the center position, with *Grizzlies* moving to the left. [Fig. 3](#) shows how the images changed when the stack was moved to/from the center position. This image change confused viewers, leading them to wonder where the video they clicked on went. *We recommend revising each stack so that when it moves into the active position, the “cover image” does not change.*

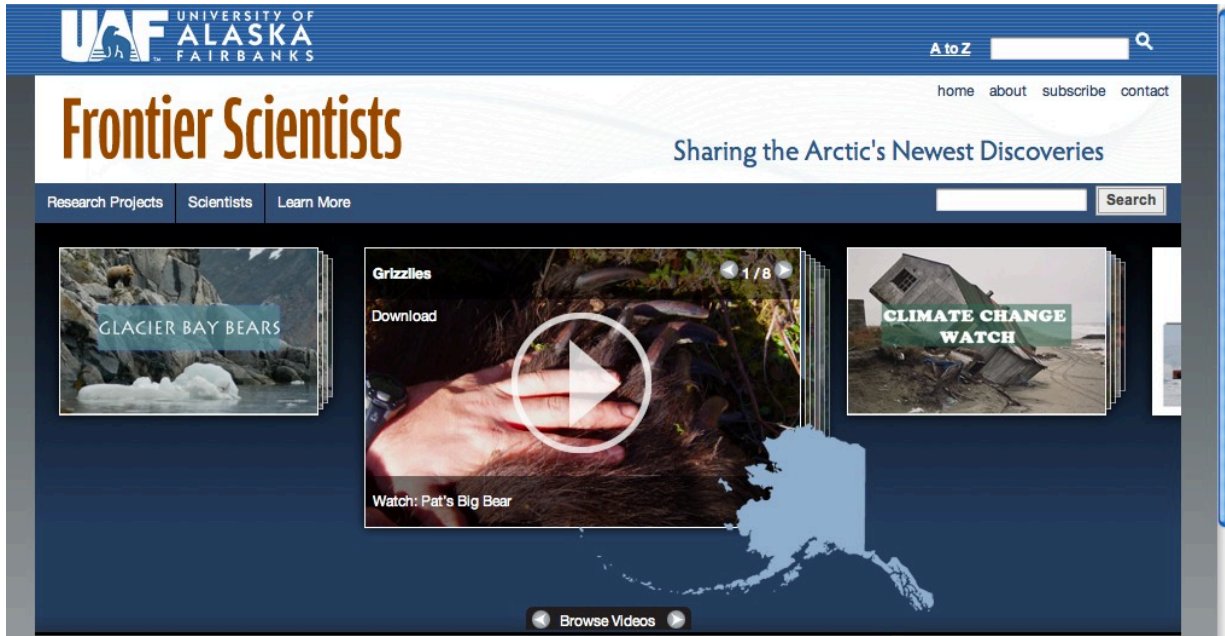


Fig. 2 - The top of the FS website homepage showing three of the video stacks, and a little bit of a fourth.

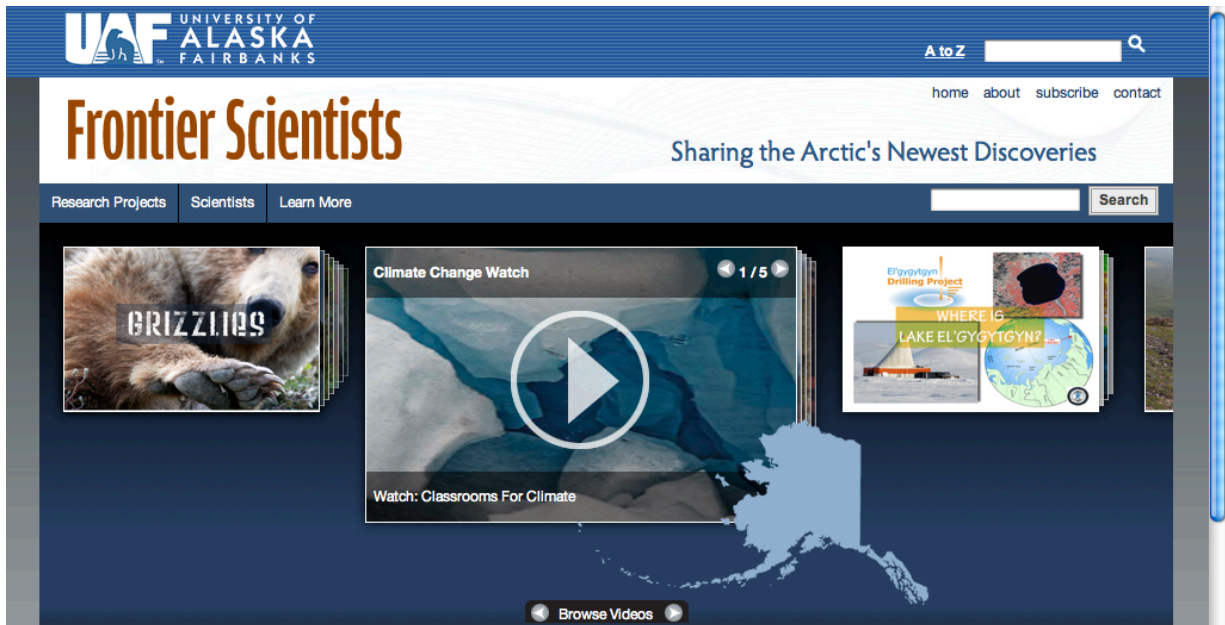


Fig. 3 - The top of the FS website homepage showing how it looked when viewers clicked on the *Climate Change Watch* stack.

The other mechanism for browsing among the stacks was to use the small stack browser and click on either of the arrows. Unfortunately, this browser often went unnoticed. *We recommend making the stack browser more noticeable, for example by enlarging it, or using a different, more intuitive navigational design.*⁴

One other limitation of the browsing mechanism was that the far right (partially obscured) stack did not allow viewers to click on it. This created frustration among some of our respondents. *We recommend allowing viewers to click on the far right, partially obscured stack to scroll through the stacks.*

Browsing Among Videos

The vodcasts on the website were set up so that once a viewer selected a stack, they were able to use the small stack browser in the upper right corner to scroll through the stack and select a video. However, the data indicated that some viewers will likely watch only the top video in the stack, not noticing the small browser in the upper right, and not realizing that there are many other videos on this topic. *We recommend making this browser more noticeable, for example by enlarging it.*

Most respondents viewed the stack of grizzly videos in order. We don't have clear evidence whether or not most viewers, outside of a test situation, will watch the videos in order from top to bottom. However, some of the data suggested that at least some viewers will skip around within and between stacks, watching individual videos in a haphazard order. *We recommend that each video is able to stand on its own, and that each includes a brief background and context for the research being conducted, even when this information is also presented in other videos in that stack.*

Selecting Videos to Watch

When choosing whether or not to view a particular video, respondents put a lot of value in both the title given to the video and the cover image. Some of the vodcast titles for the grizzly videos were revised immediately prior to the summative evaluation to make them more appealing to viewers. The data indicated, however, that many of the titles for the vodcasts in the grizzly stack were misleading; most respondents felt that the titles did not give them a clear indication of what the vodcast would contain. For example, the vodcast called "Grizzly Bears and People" (previously called "Preserving Bear and Visitor Experiences") turned out to be mostly about the bears themselves--their populations, diet and caching behaviors, life span, reference to ecosystem, etc. Many respondents were very interested in this information, but it wasn't clear from the title or the cover image that it was there. *We recommend reviewing each of the titles and cover images and making sure they accurately reflect the content of the vodcast.*

Another important criterion in selecting which videos to watch was the length of the vodcast. Unfortunately, this information did not appear until after the video was selected and started to play. Many respondents were frustrated by this and skipped a vodcast because they were concerned it would take too much time, or they aborted a viewing session after they started because they found out it would take longer than they wanted to spend. *We recommend placing the length of the vodcast on the cover image.*

Data also indicated that viewers were often turned off by long videos. There were strong indications that shorter vodcasts in general will be more appealing and more likely to be watched than longer ones. One way of shortening the vodcasts would be to limit each vodcast to one main idea. Because many of the vodcasts included multiple topics, some viewers missed topics that might have been interesting to them but were buried too deep in the video, and

⁴ One respondent suggested the following "intuitive" interface: When you run your cursor over the top of the stack, it could open up a bunch of pop-up mini-windows that have titles with a small picture or subtitle description.

others were overwhelmed by the number of topics presented in a single video and didn't finish watching it. *We recommend having shorter (2-4 minutes, maximum) vodcasts, each focused on one specific topic. For example, the "Great Grizzly Bear Q and A" could be made into a number of separate vodcasts, each one answering one question.*

Some respondents indicated a strong desire to see a listing of all the available videos in one location so they could see the scope of the FS offerings, and also make informed decisions about which videos to watch. Having such a list would enable any viewer to watch the videos in the order most interesting to them, rather than watching them in the order presented. *We recommend adding a page, organized by project, with the name of the vodcast, an image, and a one-sentence description. Link to this page from the Learn More tab (right under About).*

Using the Video Player

The big play button in the middle of the active stack made the videos easy to find and watch. There were three ways to watch the videos. The easiest and most obvious (and one chosen by most respondents) was to click on the large play button. When clicked, a small video player opened, superimposed on the grayed-out background of the website. (See Fig. 4)

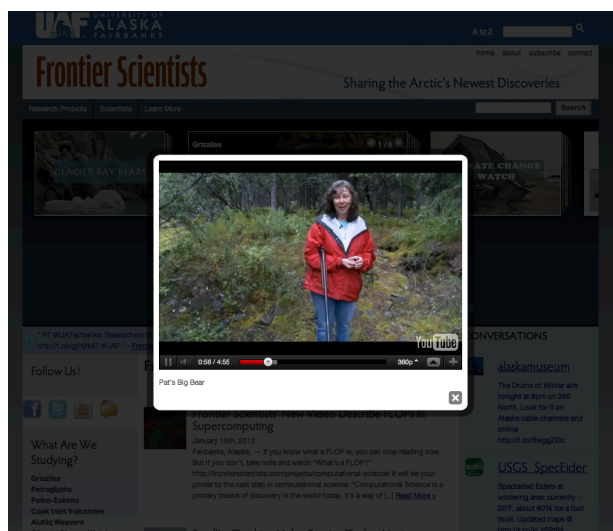


Fig. 4 - The video player opened in a small window superimposed on the FS website.

A second option was to click on the word *download* which was a choice on some, but not all, of the videos. This took the viewer to a large *amazonaws* web-viewing window. Because most respondents were hesitant to download, this option was rarely used. A third option, available once you started viewing the video using the FS video player, was to go to YouTube by clicking on the YouTube logo in the lower right corner of the viewing window, or by clicking anywhere on the FS video player.

While most respondents started by using the embedded video player, some became frustrated because they didn't have the option of expanding the image to full-screen view. Viewers knowledgeable about this technology often chose to watch the vodcast on YouTube, where they would have the option to view in full-screen mode. Some respondents did not realize that YouTube would give them the option to view full-screen, or they were hesitant to leave the FS website, in which case they remained frustrated by having to view it in the small video player window. *We recommend including an option to view full-screen using the embedded FS video player if possible.*

Another limitation of the embedded video player was that it did not give respondents the option to view the video at the lower 240p resolution. Again, this option was available when they went from the FS website to YouTube to watch the video. For those respondents with slower Internet connections, this often made the difference between them choosing to watch the vodcasts, or not, because buffering was taking too long. *We recommend including an option to view at 240p resolution using the embedded FS video player, if possible.*

The desire for these two options (full-screen viewing and lower resolution) led many respondents from the FS website to YouTube. However, when this happened they often did not return to *Frontier Scientists* because they either: (a) got distracted by all the non-FS videos YouTube displays (one respondent for example, got sidetracked by a “Mama Grizzly” video that turned out to be about Sarah Palin), or (b) couldn’t quickly figure out how to return. *We recommend adding a clear and well-marked link back to the FS website in the description under each FS video when in YouTube.*

Technical Quality of the Vodcasts

Most respondents appreciated the spectacular Alaska scenery and the images of bears moving about, and most enjoyed the accompanying music. Some respondents expressed frustration for what they perceived as uneven audio and visual quality. Some examples included uneven sound levels (for example, when Pat, the featured scientist, was alternating between whispering and talking in a normal voice), a presumably inserted image (see, for example, “Grizzly Bears and People” at 5:21 where one respondent remarked incredulously, “Photoshopped?!”), lengthy shots of Pat driving in a car, some music mismatched to the seriousness of the topic, the overuse of still rather than moving images, images of people when the narration was about bears, music starting and stopping abruptly, etc. *We recommend adjusting the variable sound levels, using fewer low-quality still images, re-examining the music choices, and replacing some of the footage of people with animal footage when talking about animals.*

Website Organization

Overall, the website had a straightforward underlying organization with an appropriate mix of items including the video clips, the list of research projects, the list of scientists, a blog, opportunities to ask scientists questions, related Twitter postings, etc. However, the data indicated that the underlying organization wasn’t obvious to viewers, and most respondents were confused about where and how to locate many items they wished to investigate. Following is an outline of the major issues respondents encountered (see [Fig. 1](#)).

- It was unclear to respondents that the section called *Frontier Updates* was actually a running blog, or that *Conversations* was a list of selected Twitter posts. *We recommend renaming these sections so their purpose and function is more clear, for example: Frontier Updates → Arctic Science Blog; Conversations → Related Twitter Posts.*
- Some respondents were confused because *Share in My Alaska* was not clickable, whereas *Ask Me!* was, and it was unclear how one was supposed to “share.” Facebook, Twitter, YouTube, and email icons were located directly beneath the *Share in My Alaska* area, causing some respondents to think that they could share this site with (for example) their Facebook friends. But clicking on the icon instead took them to the FS Facebook page where they could “Like” the site if they choose. The email icon was particularly confusing as clicking on it opened a blank email form with no address or link to share. *We recommend revising the website to allow users to easily share their personal Alaska and Arctic experiences as they would expect to.*
- Respondents were confused by the two separate search bars. They became frustrated when they inadvertently tried to use the UAF search bar to explore the FS website. *We strongly recommend removing the UAF search function.*

- The three organizing tabs located directly beneath the Frontier Scientists main heading and directly above the videos—*Research Projects*, *Scientists*, and *Learn More*—were useful when they were seen, but data indicated they likely will not be noticed by most viewers. *We recommend enlarging the three tabs so they are more noticeable.*
- When respondents clicked on the *Research Projects* tab, the list of items that came up were some of the same topics that were listed immediately under the *What Are We Studying?* heading, but some were different (see Fig. 5). *We recommend changing the What Are We Studying? heading to something like What Are We Blogging?.*

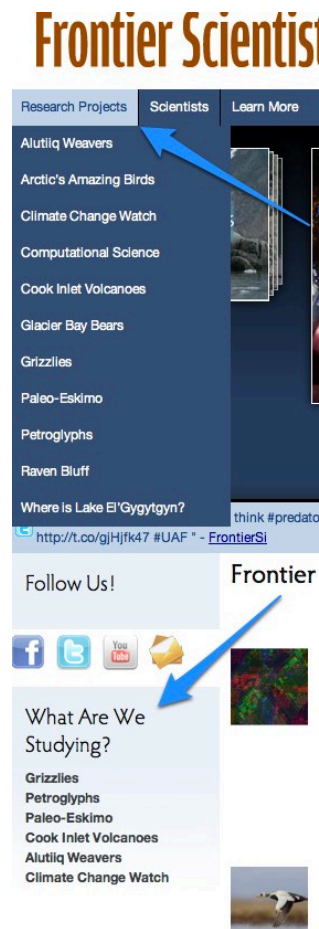


Fig. 5 - Viewers were confused when *Research Projects* and *What Are We Studying?* included similar-looking but different topics, and linked to similar-looking but different pages.

- Respondents became confused when they clicked on (for example) Alutliq Weavers under the *Research Projects* tab, but were taken to a different page when they clicked on the same term under the *What Are We Studying?* heading.

We recommend adding a heading to each page linked to under the What Are We Blogging? heading (for example, What We Are Blogging?....Alutiiq Weavers) to clearly differentiate it from the Research Projects pages.

- Respondents were confused when they clicked on the *Scientists* tab and only some of the scientists were listed. Only one of the eleven individuals listed under Alutiiq Weavers is included under the *Scientists* tab, even though each of the eleven has their own page. For example, if a viewer watched June Pardue and wanted to find out more about her, they would not be able to access her page in the same way they could access some of the other scientists. *We recommend including all the scientists under the Scientists tab. If there are too many, we recommend organizing them by project, similar to the way we recommend listing all the videos above (page 11, in the section: [Selecting Videos to Watch](#)).*
- The Twitter post in the blue bar immediately under the videos was misperceived as an error message by a few respondents, ignored by others, and confusing to still others because it was separated from the Twitter posts in the right-hand column. *We recommend moving this Twitter feed to join the other Twitter posts in the right-hand column.*
- The large institutional logos at the bottom of the page created confusion because they appeared to be clickable but were not, and their relationship to the project wasn't clear. Are these sponsors of the project? Funders? Places to go for more information? *We recommend making these logos smaller, and making them clickable. We also recommend including a brief statement about their relationship to the project, e.g., Frontier Scientists is funded by....., or Additional resources can be found at.....*

Context and the Big Picture

While most respondents enjoyed viewing the videos and using different aspects of the website, many of them expressed frustration because they were unable to figure out the big picture, especially who the Frontier Scientists were, why they made this website, and for whom. Some of them thought that there was a group of scientists, all affiliated with the University of Alaska - Fairbanks, and all contributing research to a larger initiative or project that they couldn't figure out. While the *About* page would be a logical place viewers might go to find this information, the data indicated that when they did, they became more confused, and even frustrated as the page didn't answer the big picture questions they had, or provide the orientation they were looking for. In addition, the overall design of this page--including varying font sizes and an inconsistent design style--contributed to feelings of frustration. *We recommend re-doing the About page, streamlining the design, and including a brief paragraph that explains what the FS project is, who the FS scientists are, a clearer description of the role of the educators, along with a description of the relationship between the scientists and the educators, and what visitors can expect to get out of the website.*

Some respondents expressed disappointment because the tag line on the homepage said *Sharing the Arctic's Newest Discoveries*, and yet much of the information in the stack of grizzly videos was not new to them. Based on the tag line, they were expecting to find out the results of ongoing scientific work. Other stacks such as the *Petroglyph* videos (for example, "This Sod House"), and the *Cook Inlet Volcanoes* videos (for example, "Mt. Augustine Breathes"), did a better job of showcasing scientific discoveries. The grizzly stack seemed to be more about how science was being done, for example, how a bear is darted, or how a scientist knows what a bear is eating, or how to avoid getting attacked by a grizzly. While interesting and useful information, respondents expressed a strong desire for more information about why the research was being done, what discoveries were being made, and why the findings were important. *We recommend adding to the existing grizzly videos more of the results of what Pat is finding out, why she is doing this work, and how/why it is important.*

Most respondents' experiences were limited by what they perceived as an overall lack of focus. Four questions in particular appeared to be the source of much of the confusion: Is FS about Alaska, or is it about the Arctic? Is this

website for tourists, or is it for scientists? Is the focus on new discoveries, or is it about interesting science-related stuff? Is it to help me plan my visit, or is it to teach me something I didn't know? *We recommend narrowing the focus of the website so that it can more clearly communicate the most important messages.*

Finally, while many respondents enjoyed the brief "Denali's Rainbow Portal," most respondents were confused by its inclusion in the grizzly stack, and there were clear indications that it contributed to the feelings about an overall lack of focus. *We recommend removing the Rainbow video from the grizzly stack. Consider creating a stack that consists of short, interesting video clips that are only moderately related to scientific research, perhaps called something like Cool Video Clips.*

The Audience

The FS website was designed with a general adult audience in mind, including "tourists" (as stated in the original proposal), and "travelers, teachers, students, aspiring scientists, and anyone interested in scientific discovery in one of the last great unexplored regions—the Alaskan arctic" (from the website).

The data from the critical review as well as the depth interviews indicated that the FS vodcasts will likely be successful with many general audience and tourist viewers. There were further indications it will likely work best for those viewers who (a) are interested in Alaska and/or the Arctic, (b) are interested in research and/or research findings, and (c) have a fairly good understanding of the geography of Alaska and the Arctic.

While FS will undoubtedly be appealing and useful for many different audiences, if the *target* audience is a general audience, it will be important that the FS website and videos address the needs of those who know less about Alaska and the Arctic and are less familiar with its geography, and those who are less able to immediately grasp the importance or significance of the research. For example, the data indicated that many tourist viewers will likely need additional information, such as more detail about where the research is taking place, whether or not they can go there, if there are tours they can join, and information about other tourist opportunities. They will also benefit from a deeper understanding of the overall context within which the research is taking place, including a better understanding of the geography (for example references to familiar place names, e.g. "Just two hours northwest of Fairbanks, but inaccessible to the general public....") and repeated messages about why this research might be important to them (e.g. "The radio collaring allows us to monitor the bear population so we can figure out how climate change is affecting where bears spend their time in Denali.") The data also indicated that general audiences will likely find shorter video clips (as recommended above in the section *Selecting Videos To Watch*) more appealing. *We recommend including additional geographical and contextual information, as well as compelling descriptions about why this research is important and relevant to the general tourist audience.*

Place-based Stories

A strength of the originally conceived *Frontier Scientists* project was a commitment to "place-based stories." Place-based stories can be especially powerful, and can help people connect to scientific findings in rich and meaningful ways. Most respondents in this study were interested in knowing about the places where the research was being conducted. Three primary strategies were employed to communicate place to viewers: mentioning the name of the research location, having beautiful video imagery of the setting, and indicating the location on a map. While these strategies were important and effective, many respondents expressed a desire for a richer, more intimate understanding of the location. *We recommend including strategies to more closely connect viewers with the research locations. This might include more context and place-based information, especially for viewers who are unfamiliar with Alaska and the Arctic.*

Conclusions

The *Frontier Scientists* website and videos are a valuable contribution to the current array of informal science education materials available to the public. The ability to get to know real scientists doing real work in the Arctic was a major strength of this project, and the data clearly indicated that the accessibility of the scientists--both technically as well as emotionally--was appreciated by viewers. While none of the respondents chose to ask a scientist a question, respondents found the scientists engaging, credible, and passionate. Having a conspicuous invitation to contact them located on the website homepage, coupled with brief bios, helped convey their accessibility.

The opportunity to learn about new research findings was another major strength of the *Frontier Scientists* project, whether these findings were recent--within the last few months or year--or whether they were simply new to most of the viewers (such as those findings showcased in "The Appearing and Disappearing Petroglyphs of Cape Alitak"). All respondents learned new things when they watched the videos, and appreciated the opportunity to learn more. The FS website and videos made an important contribution showcasing beautiful and authentic Arctic scenery, flora, and fauna. Seeing these images stirred in many respondents a desire to visit, or re-visit, the Arctic.

The evaluation identified some challenges that continue to face the *Frontier Scientists* project, the most significant being the overall diffuse nature of the website, including an ambiguous target audience, and an unclear overarching purpose. Both of these are fixable by sharpening the website's focus, and remaining true to a more finely honed mission and target audience (the "what" and "for whom"). This would include deciding that some topics, while interesting and appealing, are not really part of this particular project, or at least require some straightforward explanation that ties the topic into why and how this is important to the field of scientific research.

Other challenges that remain are primarily technical, and many of these website revisions have already been started. (Responding to evaluation findings has been an integral component of this proof-of-concept phase of the FS project, and continues during the writing of this report.) Making the video clips shorter and more focused, revising the titles of many video clips so they convey a more accurate depiction of what the video is about, replacing some of the still shots with moving images, fixing the variable audio quality, and refining the organization and user interface of the website, will all go a long way towards taking the project to the next level.

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Appendix A - Website Review Technology

The following set-ups were used to review the *Frontier Scientists* website:

Desktops:

Dell Inspiron 530 desktop with HP w2207h monitor with 22" diagonal screen. Web browser was Internet Explorer 9 via AT&T Yahoo Broadband.

iMac 11.2 computer with 21.5" screen. Web browser was Safari 5.1.2 via RCN high speed cable wireless internet.

Laptops:

Dell Vostro 1720 laptop (17" diagonal screen). Web browsers used included Internet Explorer 9 and Firefox 8.0, via Comcast internet via wireless connections.

HP Pavilion dm4-1160 laptop connected to a Samsung SyncMaster 2253w 22" diagonal monitor. Web browser was Google Chrome 15.0.874.121 m via Time Warner high speed cable wireless internet.

Mobile devices:

iPhone 3GS using Safari; Android phone, DroidX-2; iPad2 using Safari; and iPhone 4 using Safari.

Appendix B - Recruiting Templates

**DIG: Scientist in Alaska's Scenery
RECRUITING TEMPLATES
11/14/11**

Sample Phone Recruitment

Organization: XX
Name/Title: XX
Phone: XX
Email: XX
Date/Time: XX
Notes: XX

To get to the referred person:

Hi, my name is **YourName**. May I please speak with **(referred person)**.

With referred person:

Hi **(referred person)**. My name is **(YourName)** and **(referring person)** suggested I call you about the Alaska video project we're working on—(s)he thought you might be interested...maybe (s)he's already talked to you about it?

Well...I can tell you a bit more about it...is this a good time to talk for a few minutes?

If No:

Oh, I'm sorry...is there a better time that I could call you back? **(schedule a time)**

If Yes:

Basically, we're talking with folks who are interested in watching some short video clips--at their leisure--about Alaska's grizzly bears, and then giving us their opinion by answering a few questions. The reason for this is that the person who produced the clips is looking for feedback so the videos can be improved before they are finalized. The whole thing would probably take about an hour and a half of your time over the next couple of weeks.

Do you think this something you might be interested in?

If they have questions:

Answer specific questions **then ask again:**

Does this sound interesting to you?

Move to either "If No" or "If Yes" below.

If No:

I totally understand. Would you by chance know of anyone else that might be interested in helping out with this Alaska project? **(get name and phone/email)** Thank you so much...I appreciate your time.

1

If Yes:

Oh, that's great!

1. Well the way it will work is that you'll have a week or two to view a group of seven short videos. Then when you're finished, you'll have a short phone conversation with me.
2. The videos are all online, there's 7 of them...and most of them are pretty short, right around five minutes or so. And you can watch them in any order that you want and you don't have to watch them all at once...it's kind of whatever works best for you. (If they ask, all 7 videos total about an hour and don't have to be watched in one sitting)
3. Does this sound OK to you?

If No:

I totally understand. Would you by chance know of anyone else that might be interested in helping out with this Alaska project? (get name and phone/email) Thank you so much...I appreciate your time.

If Yes, continue below:

4. Great...I'll give you the website where you can find the videos...do you have pen? It's frontierscientists.com. There's actually a lot of stuff on the website so feel free to poke around on the site a bit, but the most important thing is to watch the 7 grizzly bear videos.
5. And again, you don't have to watch them all at once and feel free to watch the videos in any order that you want.
6. If you have any problems online at all, just give me call. And if you end up not watching all 7 of them, that's okay too; we'll still want to talk with you.
7. So, do you have any questions so far?
8. I guess the last thing...is that we should set up a time for me to call you back after you've seen the videos. It would be about a 15-20 minute call...I'd just like to get your opinion on a few things. When would be a good time for me to call you back? (make an appointment)
9. Now is this the best phone number for me to call? Confirm phone number
10. I know we've talked about a lot...if you do email, I can send you the website for the videos, some instructions, and my contact information...do you have an email you'd like me to use? Get email.
11. Thanks...I'll get that right off to you. I'm also happy to drop you an email or give you a call the day before our appointment just to confirm everything is still a go...would that be good for you?

If yes: confirm email or phone number to use

12. Before I let you go, do you have any last questions you'd like to ask of me?
13. Let me give you my name and contact information, just in case anything comes up...and I'll include them in the email I send you as well. (provide phone number [and time zone if needed] and email)
14. Thank you so much for your willingness to participate. I look forward to talking with you again on: (date of appointment)

1

Sample Email Recruitment

Hi XXX,

My name is YourName and (Referring Person) gave me your name as someone who might be interested in the Alaska video project I'm involved with.

The National Science Foundation has funded the development of a few short web videos on Alaska's grizzly bears that average about 5-7 minutes in length. I'm working with Selinda Research Associates to get some feedback on these videos before they're finalized. To that end, I'm looking for a few participants to watch the videos online at their leisure and then to share their opinions over the phone with me afterward. Would you or someone you know be interested in participating on this project?

I'm happy to fill you in on the details by email or phone (I'm located in the Eastern Time Zone). I look forward to hearing from you!

YourName

Research Associate
Selinda Research Associates, Inc.
phone: YourPhone
email: YourEmail

Selinda Research Associates, Inc.
801 South Plymouth Court, Suite 521
Chicago, IL 60605
phone: 312-986-1134
fax: 312-986-1213
www.selindaresearch.com

Appendix C - Sources of Data

recruit-ment #	contact time in minutes*	researcher	n	ages**	been to Alaska?
1	135	Diane	5	55, 55, 15, 15, 25	Y
4	195	Diane	1	30	N
6	120	Diane	1	60	N
8	105	Diane	1	50	Y
9	105	Diane	1	50	Y
11	105	Diane	1	25	N
12	150	Diane	1	25	N
13	65	Diane	1	25	?
14	150	Diane	2	26, 26	N
15	135	Diane	2	55, 55	N
16	60	Eric	1	14	N
17	90	Eric	1	19	Y
18	150	Eric	1	61	Y
19	150	Barbara	1	55	N
20	240	Barbara	1	29	N
21	210	Barbara	1	58	Y
24	195	Barbara	1	55	Y
25	195	Barbara	1	52	N
28	210	Barbara	1	65	Y
TOTALS	2,765		25		

* Contact time for this study was defined as the amount of time spent talking directly with respondents about their experience, and writing the individual debriefs. It did not include time spent during the recruiting process or group debriefing.

** All ages ending in 0 or 5 were estimated.

Appendix D - Interview Protocol

7. If you were watching with someone else, what do you think they found out that they didn't know before?
8. If you were going to explain to an 8 year old what these videos were about, how would you explain it?
9. After watching the videos, what unanswered questions did you have?
10. Rate this set of videos from 1-10 (1 is the worst and 10 is the best) compared to other videos you've seen.
Why did you give it this rating?

11. Did you explore any of the rest of the website? What areas? Did you post a comment, go to or like the Facebook Frontier Scientist page, follow Frontier Scientist on Twitter, etc.? Some folks we've talked with didn't. What prompted you to?
12. Now that you did this, do you think you'll come back to this website, or use it in the future? Why or why not?
13. What would you like to tell the producer of these videos?
14. Are there any topics about Alaska you'd like to see a bunch of video clips about?
15. Tell me a little more about yourself. Do you tend to use websites like this? Would you describe yourself as someone who finds out anything they can about Alaska? About ongoing scientific research? Are you someone who is always looking for stuff like this on the internet?
16. That's all the questions I have. Do you have any questions for me?

Thank you very much. The video producer has a small token of appreciation, a 2012 Alaska photo calendar we can mail to you, just to say thanks. Where would you like me to send it? (No, the address will not be used for any other purpose.)