QUEST
Summative Evaluation
Final Report

Submitted by

Rockman et al
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Final Report

Submitted to:
KQED/QUEST

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Introduction

QUEST is a unique cross-platform science journalism collaborative that creates and distributes content for radio, television, interactive, and education audiences. The project collaborative comprises six leading public media providers representing markets across the country: KQED (San Francisco), Nebraska Educational Television (NET) and Radio, UNC-TV (North Carolina), WVIZ/*ideastream* (Cleveland), Wisconsin Public TV (WPT) and Radio, and KCTS (Seattle). QUEST is built on the success of the local, cross-editorial QUEST model, in which professionals from multiple disciplines--radio, television, web, and especially education--collaborate to distribute high-quality content to general and underserved audiences.

The QUEST project began more than six years ago at KQED-TV as an experiment in multimedia science journalism and education designed to deliver content and foster engagement using a range of media formats and presentation styles. In April 2011 KQED/QUEST received funding from the Corporation of Public Broadcasting (CPB) and the National Science Foundation (NSF) to support work with partner PBS media stations across the country to train producers on its multimedia science-reporting model. The grant also enabled pilot productions of science and environment stories on television, radio and the web while highlighting local science stories of interest for each partner's community.

In 2013, QUEST received an additional $2.5 million from NSF to build upon their previous work to create a two-year collaborative national multimedia science reporting initiative. The primary goal of this collaborative was to foster widespread STEM literacy for general audiences and support formal and informal education outcomes in the sciences. In expanding the project, QUEST also sought to produce a lasting impact on the field of informal STEM learning though the design and distribution a scalable 21st-century multimedia production model that was increasingly public in nature, encouraged new engagement methods for collaborations and community participation, and more closely integrated production of science content to educational assets tied to Common Core and Next Generation Science Standards.

During 2013-14, QUEST partners created content on the theme of "Science of Sustainability." Primary project deliverables included 18 television segments; 6 half-hour television programs; 20 radio reports; 18 "web extras" (slide shows, maps, etc.); 12 web-based videos; 144 blog posts; 18 education *explainers*; 5 educator trainings; and a comprehensive distribution and social media campaign. All efforts were supported locally by a series of community partners, including zoos, museums, aquariums, research centers, and individual consultants.

QUEST content covered a variety of topics dealing with science and environmental sustainability. Some of the major story topics included water, food, energy, biodiversity, human health, and the wilderness and natural resources. Local

science and educational organizations including museums, zoos, aquariums, and higher education institutions contributed content or expert commentary.

QUEST project management operated at a number of different levels. The QUEST Central Office staff in San Francisco consisted of an executive producer, managing editor and lead coordinating producer responsible for coordinating cross-station efforts—including guiding efficiencies in science reporting, production and education efforts; anticipating content sharing opportunities; ensuring a rich mix of coverage in science and environmental topic areas; promoting content for national distribution opportunities; and ensuring compliance to shared editorial and technical guidelines.

Each partner station's activities were guided by an onsite coordinating producer, whose responsibilities included working with local and affiliate station content staff to provide regional editorial and production oversight, collaborating with local educational specialists on program design, engaging and recruiting local informal science and education community partners, and communicating those efforts with the central office staff.

Broad strategic, staffing and resource oversight was conducted by the project's Leadership Team, which consisted of senior management from each of the participating stations. The Leadership Team participated in weekly calls with the project's executive producer to discuss strategic, funding, staffing and other issues impacting the collaborative.

Education specialists at each participating station administered QUEST education materials development and training activities. Responsibilities included collaborating with coordinating producers on educational program content, assuring that program content aligned with state and national science standards, developing web-based education *explainer* pieces for the web, and developing and managing QUEST training workshops with local teachers and administrators. The educational specialists also held joint weekly conference calls to discuss these and other issues.

After conducting extensive focus group sessions at five of the six participating QUEST stations during the project's formative period in 2013, project researchers from Rockman et al (REA) had a rich foundation of baseline data from representative audience members, community partners, educators and project staff providing feedback and insight on a wide range of topics. It is worth noting that the 2013 focus groups served a double purpose by also helping to inform participating stations' to design targeted programs and activities for their local audiences. Some important themes and topics discussed during these focus groups included:

- Critical local and global science and sustainability issues (audience, community partners, educators)
- Expectations for types of and topics for QUEST program content (audience, community partners, educators)

- Preferences for media viewing and presentation/production methods for science news and information (audience, educators)
- Role and impact of community partners (formal/informal science and education organizations) in delivering science education (partners)
- Role of public media in delivering and supporting science education in the schools (audience, community partners, educators, staff)
- Areas for potential collaboration (and related opportunities and barriers) between QUEST stations and community partners (community partners, staff)
- Issues surrounding implementation and sustainability of the QUEST model at participating stations (staff)
- Issues involving production, distribution and funding of QUEST amongst the collaborative (staff)

Methods

Methods designed to conduct the QUEST summative evaluation included a combination of surveys, interviews and focus groups with individuals and organizations that participated in the 2013 formative evaluation study and subsequent production activities in 2013-2014. These included audience members from each of the six participating stations, each station's QUEST project staff, members of the project's Leadership Team, Central Office and representative local community partners.

Representative survey items, and focus group and interview protocols were developed by REA in collaboration with QUEST project staff. All focus groups and on site and phone interviews were digitally recorded for transcription purposes only. No names of individuals or organizations are identified in this report.

Audience members

REA staff contacted individuals who were participants in the 2013 QUEST formative evaluation focus groups to participate in the 2014 summative evaluation study. The purpose of reconvening these groups was to build on the data collected during the project's formative evaluation and to assess to what degree participant expectations for QUEST content and presentation were met, as well as to explore participant reactions to QUEST programming and outreach activities produced since the project launch in October 2013. The 2013 focus groups included viewers from five of the project's six participating stations. Fifteen focus groups were conducted in total.

Summative evaluation for these QUEST audiences was conducted via online surveys. A total of 115 individuals completed the surveys across five participating station sites. Survey items were broad, but linked to the interests and direction of each of the regional hubs. In addition to answering specific questions about the series, participating viewers were asked explore the QUEST website, and to view

and listen to samples of QUEST programming. These included two web-based video programs (one from their local station, and one from another participating station), a radio/podcast segment from Cleveland's *ideastream*, as well as accompanying written articles for both the web videos and podcast. Participants were also asked to explore the project's three social media sites (Facebook, Twitter and Google +). Programs and written material selected for review reflected a diversity of sustainability topics, presentation methods and geographic representation.

The online survey also explored participant reactions to various topics including:

- Whether QUEST program content and presentation methods met/did not meet participant expectations as expressed during formative evaluation
- The level of interest and engagement in other participating stations' local QUEST programming
- Whether QUEST programming raised level of awareness and interest in broader STEM and sustainability issues

Project staff

Researchers conducted in-person and phone interviews with QUEST staff from the project's Central Office in San Francisco, the project's Leadership Team and each of the six participating local stations. Those interviewed were identified in collaboration with staff from the project's participating stations. Interviewees included individuals involved with QUEST project management, production, education, marketing, programming, promotion, and community outreach/partnering activities.

Topics covered during these interviews included:

- Project management issues (e.g. setting project goals and objectives, determining content focus areas, producing cross-platform, project expansion)
- Project roles and responsibilities
- Challenges and issues implementing or adapting the QUEST model within each station (e.g. support from other staff, alignment with station organizational structure)
- Funding
- Impact of the QUEST project on cross-platform production and distribution methods and inter/intra station collaboration
- Alignment of content creation/production and education
- Impact on the quality/quantity of science programming at the local and national level
- Challenges and issues in working with community partners
- Impact of QUEST model on other station projects
- Benefits and challenges of working in a collaborative
- Individual professional development and advancement

- Lessons learned
- Opportunities and challenges going forward

Community partners

Members of the community partner (e.g. local formal/information education and science organizations) focus groups participating in the 2013 formative study were reconvened, or individual partner organization representatives were interviewed by phone.

Topics discussed during these focus groups and interviews included:

- Benefits/challenges in working with participating QUEST stations and community partners
- Changes in partner perception of working with public media and changes in QUEST station perceptions of working with community partners
- Different models of QUEST community partnerships and collaboration
- Ways QUEST collaboration impacted community partner education/science programming and activities
- Ways collaboration with community partners influenced QUEST stations
- Challenges and opportunities going forward

Executive Summary

QUEST staff and community partners

Adapting the QUEST model

There was consensus across the collaborative that QUEST changed the perception of the traditional role of a media organization, and what these organizations can bring to a partnership. Stations appreciated that QUEST provided an opportunity to experiment with a new way of linking content and education across multiple platforms. Stations also looked to QUEST as a viable model in transitioning from being less platform-driven to becoming more content and audience-driven.

QUEST was programmatically powerful not only in delivering content across different platforms, but also in developing programming to appeal to the points of view of diverse audiences across those platforms. Some stations, however, struggled with adopting and implementing the QUEST model due to internal personnel issues, basically not having individuals with the right skills and mindset necessary to work in a collaborative fashion.

Impact on Science Reporting

The QUEST project had a positive impact on the quantity and quality of science programming at a majority of the participating stations. Many interviewees commented that the multiplatform elements of QUEST allowed for greater reach and breadth of science content to different audiences. QUEST helped energize staff across distribution platforms (TV, radio, web) platforms to think more about science reporting. Those who already had an interest in pursuing science 'got more interested.'

QUEST coordinating producers credited QUEST with strengthening their narrative voice in telling science stories, and with providing opportunities for learning innovative production and graphic techniques to more effectively communicate complex scientific ideas to diverse audiences.

Impact on community partnerships

Stations experienced mixed success both identifying and working with community partners on QUEST. Those stations with existing community partnerships found it easier to expand these relationships to include QUEST activities than stations having to develop partnerships from scratch.

Despite some difficulties a number of stations developed mutually beneficial and creative partnerships with local community organizations. In some instances, serving as a QUEST partner validated an organization's work, provided greater visibility and awareness of their science programs to the local community, and offered new individual and collective learning opportunities for program development and dissemination.

Impact on education

Each QUEST station approached the role and purpose of education differently, frustrating attempts by the collaborative to achieve a common vision of how education should fit into the QUEST model. Similar to the difficulty experienced when asked to recruit community partners, many of the project's coordinating producers had little experience with or desire to work with educators on their productions.

Despite the inter and intra station level divides over the QUEST education development process and deliverables, individual stations created some unique and varied educational media as well as QUEST training workshops for teachers and school administrators, to improve science teaching and learning in the classroom.

As the project progressed QUEST education specialists noticed an improvement in production quality and breadth of science content coverage. They felt that the

process was becoming more iterative, with enhanced opportunities to share best practices.

Building and sustaining a collaborative

Participating station executives concurred that, for QUEST to be sustainable, it had to grow from the appearance of being a collaborative focused on generating deliverables, to a more engaged and active initiative influencing the adoption and expansion of each station's science reporting capacity. In its last year, there is evidence to suggest that QUEST was slowly heading in that direction. With a production and distribution system already in place, many of the participating stations were already in the process of taking more control over shaping and editing their own science content.

The QUEST approach also provided partner stations the tools to begin building their own science capacity through introduction of new collaborative work processes, personal and organizational skill building, capital improvements, and identification of strategies for introducing new educational and outreach opportunities. One of the difficulties, however, in obtaining long-term buy-in from QUEST partners was the lack of a coherent long term and sustainable funding plan.

QUEST Audience Reactions

QUEST website

Survey respondents rated the QUEST website site design, navigation, ease of use, and graphics and other visuals as very *good or excellent.* A number of respondents commented on the excellent quality of the site's still and video imagery, while others were particularly impressed with the breadth of environmental topics and links to other science resources.

Other general comments about the QUEST website focused on the lack of a comprehensive description of sustainability. Some respondents felt that because sustainability meant different things to different people, it was imperative to include some kind of larger organizational and conceptual framework connecting the site's many media and text-based elements.

Locally produced QUEST videos

90% of survey respondents believed that their station's locally produced and locally focused QUEST videos was both well executed and engaging. A majority of respondents in each survey region rated the production quality, presentation of content, narration, and visuals of these QUEST videos as *Good to Excellent*, while the vast majority (92%) rated the use of content experts as *Very Good to Excellent*.

An average of 85% of respondents stated they were interested in learning more about a specific sustainability topic as a result of viewing locally produced QUEST videos. An equally high percentage (80%) claimed they learned something new about a sustainability topic affecting their region, and that these programs would definitely be of interest to other viewers around the country. 92%% of respondents also believed that their station's locally produced QUEST video was something they would have expected to see in a series about science and sustainability.

Accompanying articles

About two-thirds of the respondents reported that written articles accompanying QUEST videos expanded their understanding of the content. Respondents commented that accompanying articles both contextualized and personalized environmental topics, while enriching viewing and learning experiences. A number of respondents felt some accompanying articles were too long, redundant (to the video), and did not provide balanced points of view.

Non-local video: Battling the Bloom

Respondents from across the national survey sample gave this video program produced by *ideastream* positive ratings (*Good* to *Excellent*) in terms of production quality, presentation of content, narration, use of content experts, and visuals and other graphics (mean range of 4.4- 4.6 in all categories). A majority of respondents (90%) found the video to be interesting and engaging, with the same percentage stating they learned something new about water quality. Over three quarters of respondents said they were motivated to learn more about algae blooms and water quality issues.

Nearly three quarters of respondents felt the video content was relevant to sustainability issue in their geographic region, with all respondents reporting they would be interested in viewing similar programs about sustainability issues occurring elsewhere in the United States.

QUEST podcast: From Cheese to Energy

The majority of listeners (64%) commented that the podcast format of this program, produced by WPT, made for more compelling storytelling and all agreed the topic was relevant to the concept of sustainability. Most (91%) reported that listening to this podcast made them want to learn more about ways of turning waste into energy. Respondents strongly agreed that the program's topic was important, and had relevance for audiences outside the state of Wisconsin, the site for the story. The program inspired a number of respondents to think about the impacts of energy runoff in industries other than dairy, as well as suggesting ideas for producing other podcasts on similar topics.

QUEST social media

As a method to obtain further information on the program content, a majority of respondents preferred QUEST's Facebook site, to that of Twitter, and Google +. About 10% across the survey stated they had no desire at all to use any of the three social media sites for additional information on QUEST. Those who preferred QUEST's Facebook site were particularly drawn to the striking still images that were posted from QUEST programming, as well the opportunity to actively engage with other users about environmental issues.

A majority of respondents commented that participation in a community of like-minded users via social media encouraged them to learn more about the environment and motivated them to think about adapting pro-environmental behaviors. Many commented that after having seen QUEST on Twitter, they were hoping to add it to their personal news feeds. Eight in ten respondents believed QUEST's social media sites had value because they helped to create a global awareness of science and sustainability issues.

Meeting expectations

96% of all respondents stated that QUEST programming and materials met or exceeded their expectations for a series on science and sustainability. Respondents commented positively about the professionalism of the productions, the diversity of topics and presentation styles, the functional and navigational 'ease' of the website, and the quality and breadth of the accompanying articles and resources.

Respondents were particularly impressed with the series' solution-oriented approach to addressing environmental issues, the emphasis on storytelling to communicate information, and the series' multi-platform approach to outreach and audience engagement. Many respondents commented how QUEST programming encouraged them to learn more about sustainability in general, and more specifically about environmental issues in their region. A good number of respondents were pleasantly surprised at learning something new about sustainability and the environment.

Summary of Findings

QUEST project staff and partners

Adapting the QUEST model

Despite varying levels of success in adapting the QUEST model at each of the participating stations, there was a consensus across the collaborative that QUEST changed the perception of the traditional role of a media organization, and what

these organizations can bring to a partnership. While some of the stations had had experiences working with local or regional collaboratives, most agreed that QUEST's focus on cross-platform long-term story development through collaboration was a very different experience for their organizations. The QUEST model challenged traditional vertically oriented and isolated production and distribution processes.

Interviewees recognized that QUEST was in many ways still a pilot project. While ostensibly focusing on the improvement of science literacy, there was an appreciation among the station staff that the project provided an opportunity to experiment with new ways of producing that linked content and education across multiple platforms. Station executives commented that this approach helped staff to better understand that their audiences used all of these different platforms to different degrees, and that audience needs and expectations differed across those platforms.

Stations looked to QUEST as a viable model of how to transition from being platform-driven to becoming more of a content and audience-driven organization. QUEST was programmatically powerful, not only by delivering across different platforms, but also developing programming that appeals to the points of view of diverse audience across those various platforms. Stations began to integrate segments or components of long form TV pieces onto the web and social media.

Three participating stations, UNC-TV, KCTS, and *ideastream* were particularly intrigued with the QUEST model from the outset. It served as a powerful motivation for their involvement in the project, and many elements of the model are still being felt. UNC-TV staff commented that they were becoming more comfortable with a QUEST-style workflow, and the ability to simultaneously work both internally and externally.

We got involved with QUEST because we wanted to work with KQED and see how they had developed this multimedia content production model and if we could apply that model in some way here at UNC-TV. I think it gave us another way to think of working collaboratively. As in any organizations, there are silos, and we've been working to beat them down. Have we succeeded 100%? No, but we're working on it. It was clear that at KQED, people started talking to each other in different ways, and we wanted that to happen here. – UNC staff member

UNC-TV has also adapted the QUEST model for two of their internal productions, *Science Now* and *North Carolina Now*. Both programs are cross-platform, and *Science Now* has closely integrated education into front-end content development, as well as leveraged social media platforms to push content and aid in promotion. *Science Now* is the only UNC-TV production that has a blog. Adopting the QUEST model has helped UNC-TV with its own strategic planning process as well. Station leadership is currently looking at how UNC needs to be positioned for the future—a

future that might include use of new technologies, cross-functional teams, greater collaboration, and a move away from a TV-only focus.

At *ideastream* in Cleveland, the QUEST model aligned well with the station's approach to content development and complemented their overall strategic direction. *Ideastream* staff was particularly impressed with the way the QUEST model positioned community engagement around multiple media, and build science programming that is topically and educationally relevant to local audiences.

Ideatream staff commented that QUEST gave the station the ability to do science stories that have a 'long tail' that can be referenced at a later time to provide context to issues that are newsworthy and relevant. As a result of their involvement with QUEST, station staff is now vetting production and placement of stories based on their fit with a specific platform. (e.g., Would this be a good radio piece or is it a visual piece more appropriate for TV, or is it better on the web?)

KCTS management was looking for a way to better organize around content. The station was historically too siloed, with staff from different departments rarely working collaboratively across projects. Through numerous staff interviews at KCTS there is evidence to suggest that the QUEST model was having a positive impact on inter and intra station relationships and providing KCTS staff with a different kind of operational framework:

In a traditional framework, you'd say, "Well, we really can't move on these other pieces until we know what's happening here." We tend to be very sequential preachers, right? I think that Quest was really good at helping us to hold multiple evolving entities at the same time. - KCTS staff member

For a time, applying the QUEST model internally provided the KCTS team across the board integration with other departments. Staff from marketing, interactive media, community relations and education operated in synch with QUEST program development and dissemination. Working in this fashion pushed KCTS staff across departments to think more about multi-platform approaches, and improved their skills for conceptualizing and implementing a project in different ways. KCTS staff commented that the QUEST model disrupted a whole system of how television and media content are created.

While some participating stations found QUEST's cross-platform approach appealing, other stations had more difficulty implementing the model. Much of this difficulty stemmed from internal organizational or management structures that made certain elements of QUEST's collaborative design problematic to implement. Production, education and other functional services for statewide systems (university licenses) such as WPT were physically separated in different buildings (some miles apart), making day-day collaboration and project alignment particularly challenging.

At WPT, the TV, education and radio departments operate essentially as separate organizations, reporting to separate leadership. There was no single person representing all three units who could effectively champion the project on behalf of all of WPT. Due to their physical and functional separation, there was not a strong culture of collaboration within these WPT service units on cross-platform projects. While at times difficult to implement, however, working with the QUEST model did provide some WPT staff opportunities and exposure to different people and skills that they might not have otherwise had.

I do think there was a positive impact (from QUEST) because of people getting to know each other better and people who hadn't worked closely together just building more of a relationship, even between radio and TV, and TV and education. I don't think that should be underestimated. – WPT staff member

Other stations struggled with QUEST model adoption and implementation due to internal personnel issues, in effect not having individuals with the right skill sets and attitude necessary to work in a collaborative fashion. Many career TV and radio producers within the public media system have a history and expectation of independence in managing their work. Functioning in an environment where some content and production decisions were determined from outside their organization met with some resistance. In addition, having to factor in the requirements of producing for multiple platforms, in addition to thinking about education, was also difficult for some of the project's senior TV and radio producers.

Impact on science reporting

The QUEST project had a positive impact on the quantity and quality of science programming at a majority of the participating stations. For most stations, science reporting was never a priority before QUEST, and even for those stations that had some or a strong history of science programming, QUEST's innovative production and/or storytelling methods for communicating science content had an appreciable impact on their approach to science going forward.

Many interviewees commented that QUEST's multiplatform approach allowed for greater reach and breadth of science content designed for different audiences (e.g., more than a six part TV series might have). Stations could communicate science stories without the need of a camera or crew. Content could be developed using a phone and computer (e.g. blog entries). The cross-platform process also gave stations the ability to take other stories that reporters, not working on QUEST, had done, repurpose them as online articles, and share them with a broader audience.

Another sentiment shared across many of the stations was that QUEST kept the focus on science journalism on a more regular basis, in contrast to producing big 'pop out' documentaries that would take years to fund and develop. The project helped energize staff within TV and digital media to think more about science

reporting and those who already had an interest in pursuing science 'got more interested.'

Before QUEST, UNC-TV had a very small footprint in science news and reporting. UNC-TV was able to leverage their involvement in QUEST, in part, to secure funding from GlaxoSmithKline, a large North Carolina-based pharmaceutical company, to produce a weekly series called *Science Now*, which focuses exclusively on North Carolina science issues. The combination of QUEST and *Science Now* also raised UNC-TV's prestige and visibility within the their local science community, which includes prominent universities and corporations within Research Triangle Park. UNC-TV recently received additional funding to continue *Science Now* for a second season, as well as a grant from the Water Resource Research Institute to product a digital media segment on water issues (stemming, in part, from a QUEST education *explainer* piece on surface water issues).

QUEST was a steppingstone to our project, North Carolina Science Now, which is extraordinary. If we had not had QUEST, we would not have had that foundation with which to go to GlaxoSmithKline and say: look, this is what we have been doing and we'd like to do it specifically for North Carolina. They saw the value in it – UNC-TV staff member

As a result, UNC-TV has been able to make science a real thrust for their original programming, especially important in a state where science and education have a rich tradition.

At *ideastream*, the collaboration on QUEST instilled a new commitment to the value of science coverage, in particular, the richness of the stories that can come out of taking a 'deep dive' into the science world. *Ideastream* staff felt that QUEST helped them move away from a traditional 'he-said, she-said' approach to science journalism and concentrate more on in-depth science storytelling.

I think science is considered to be a dry, brainy thing and I think that there was a real nice ability of the QUEST project to respect and reveal the science and at the same time create good storytelling. That's powerful when it works well. The instructional design care was more intentional and less derivative and I think that makes it have a powerful impact as well. – ideastream staff member

The quality and attention to local science issues reporting at *ideastream* has improved as a result of working on QUEST.

Our coverage of Lake Erie, and the Toledo water crisis with the algae has gotten measurably better from the QUEST project. The story I had done on that previously was on radio. We also did a story on television. These stories were shared like mad on social media during this recent news event because they explained the science in an in-depth, easy and accessible way in terms that people just getting onto the story weren't able to do. – ideastream staff member

Ideastream staff credit QUEST with providing a structure for staff to become more knowledgeable and appreciative of environmental issues immediately affecting their region such as Lake Erie algae, fracking, green infrastructure, and storm water management. QUEST also had a strong influence on the station's decision to include science as part of a newly formed Health, Science and Education Unit.

At KCTS, QUEST provided an opportunity for production staff to dig deeper into science content with their community organizations. Staff spoke of having a greater appreciation of the importance of collective or collaborative storytelling in science. Whereas before, producers might approach science content as primarily technical, through QUEST, they now saw their role as helping those in the science community tell their stories.

I now see my role more as a media partner, someone who has the tools to tell the story, and but not the expertise to tell the story. In this case, I realized, oh, I didn't need to know everything, I need to be talking to the people who know everything.
— KCTS staff member

For a time, KCTS' involvement with QUEST allowed the station to broaden their science portfolio, which included the idea of key station staff to collapse QUEST and another local science collaboration series, into a totally dedicated science-reporting unit. The concept of this dedicated science unit was being actively considered up until the recent change in station management.

At KQED, QUEST heightened and accelerated the prioritization of science reporting. QUEST is now a part of the station's newly formed Science Unit, which is the largest dedicated science-reporting unit west of the Mississippi.

A majority of the QUEST coordinating producers credited the QUEST experience with strengthening their narrative voice in telling science stories. They also credited QUEST with providing opportunities for learning innovative production and graphic techniques to more effectively communicate complex scientific ideas to diverse audiences. By producing in different regions and with greater depth at each region, and by focusing on science and sustainability, stations could prioritize and sustain science programming at their stations

In January 2014, the project's Coordinating Producers met face-to-face in San Francisco. The purpose was to share ideas and experiences and brainstorm how to improve program presentation and project communication. Many of the coordinating producers pointed to that meeting as a tipping point in collectively raising the quality of the project's science programming across all platforms.

The producers spoke of how working on QUEST changed their attitudes about science reporting, inspiring them to look more closely at the people and passions behind the science. The cross-platform process also helped to place a premium on

broadening and deepening science content not strictly directed for TV broadcast alone. Producers began thinking more creatively and boldly about developing different types of visuals for their programs.
I think it's been inspiring to try to tease out the human element in science and find a way to do that as much as you can. It's been a fun exploration. – QUEST Coordinating Producer

Impact on community partnerships

Participating stations had mixed success both identifying and working with community partners on QUEST. Stations with pre-existing community partners found it much easier to expand these relationships to include QUEST activities, than those stations having to form these partnerships from scratch.

Many station staff members noted that QUEST should have provided more training on how to facilitate project partnerships. Interviewees pointed out that it was unreasonable to expect stations to form and sustain project partnerships over a few months, given the fact that it took KQED at least 2-3 years to formalize their relationships with partners in the Bay Area. Most stations did not have project staff dedicated to facilitating community partnerships similar to KQED. At some stations partner cultivation happened in marketing or promotions departments, which engendered more of a financial than content-focused relationship with outside organizations.

For many of the coordinating producers (whose responsibility it was to facilitate these relationships), finding potential community partners was not a skill set they were familiar with or found to their liking. This responsibility often had a negative impact on what limited time (and budget) they had for production responsibilities and periodically created a kind of internal conflict of interest with their primary role as series producers.

It (partner solicitation) kind of put me in an awkward role because I was producing and editing for the content as well as coordinating and supposed to be sourcing partners. To me that is a real mixture of roles and in a way I was uncomfortable with. Speaking with somebody as a source from a journalistic standpoint is a very different conversation than going to someone as a partnership call. – QUEST Coordinating Producer

For some of the larger station systems, facilitating partnerships was difficult because it meant scaling the effort to a statewide area, as opposed to the major market stations where proximity to local partners was not an issue. Bringing partners together, separated by hundreds of miles, was logistically complex. It was unclear to many in project leadership exactly how to articulate what QUEST could bring to potential partners. Stations were looking for a clearer definition of partner roles and responsibilities. The concept of partnering with community organizations

was unfamiliar terrain to some stations, and often made for a difficult and unfamiliar transition.

We're very standalone. If we can't control something, I think that we have an expectation of control that sometimes has to be tempered in a partnership. — QUEST staff member

Some stations felt it was disingenuous to solicit partners for story ideas, knowing that the central vetting process often limited how many of these ideas would come to fruition. It was suggested that, in order to develop and sustain these relationships, it might be necessary to more formally put some of the content creation responsibilities in the hands of informal and formal educators, even if resulting story ideas might not meet the exact criteria of the QUEST's Central Office.

Despite these and other difficulties, there were, however, some good examples at participating stations of how to effect productive partnerships with community organizations. At KCTS, QUEST's Coordinating Producer worked closely with a local Seattle informal education consortium called WISE (Washington Informal Science Education Consortium) to introduce and expand the station's role with community partners. KCTS served as the media partner for WISE. WISE members included prominent Seattle informal science and education institutions such as the Burke Museum, the Seattle Zoo, the Seattle Aquarium and the Pacific Science Center.

KCTS' Coordinating Producer credited QUEST for opening up new, innovative, and mutually beneficial relationships with Seattle's science and education community.

The (QUEST) model was coming alive. I could really see it. I could see how it was happening. I was really using the San Francisco materials about in working with partners. It was starting to become tangible, the power of really reaching outside of the building walls to work with community partners. Opportunities were popping up, and even joint fundraising opportunities as well. – KCTS staff member

In collaboration with Seattle's Woodland Zoo, KCTS produced a video piece on wolves and their impact on the region's local ecosystem. This program aligned with a professional development workshop administered by the Zoo, where that program and other QUEST videos were screened. The program provided an excellent platform for the Zoo's Senior Conservationist to discuss the issue of wolves and conservation. The Zoo also offered to show QUEST videos onsite at their facility. KCTS also collaborated with other WISE partners, such as the Seattle Aquarium to deliver professional development workshops on science and sustainability.

Individual organizational members of WISE cited various benefits for partnering with KCTS/QUEST. The project provided:

- Opportunities and context to jointly work together on environmental outreach education projects,
- Wider exposure to science and environmental topics that member organizations were discussing with their audiences,
- Broader outreach to a general public audience through multiple communications platforms,
- Opportunities for telling stories about science in new and compelling ways, and
- Integrated (specialist lecture combined with QUEST video/web resources) onsite teacher education workshops that made it easier for teachers to use and align science material in their classrooms.

Some WISE members commented that the relationship with KCTS/QUEST was just starting to hit its stride, and had the project been continued, expansion and deepening of individual and collective collaborative opportunities would most likely have occurred. It was also pointed that the topic of sustainability, while important to local audiences, was a bit too narrow, and had the focus of the series been broadened to more general science topics as was planned, the quality of project partnerships, and the programs produced, would have been strengthened.

If the science topics been broader it would have given us even more localization and allowed us to be uniquely in touch with what does Seattle stand for. We (Seattle) have high tech, aviation, as well as an environmental and biotech focus. It would have been great to look at all four of those areas through that one lens. – WISE partner

All of the KCTS partners interviewed credited KCTS/QUEST's coordinating producer for effectively exploring and implementing ways for creating partnerships that provided value to both their audiences and their institutions.

WPT created a project advisory group with local community partners to help staff members frame proposed stories and provide feedback for education activities. QUEST provided an opportunity for WPT to work with their community partners in a unique and different manner. Participating community partners included the Aldo Leopold Nature Center, the Nelson Institute, and the Wisconsin Academy of Science Arts and Letters.

WPT's QUEST partners felt that the QUEST concept was extremely valuable and complemented each organization's onsite and community outreach programs.

I thought the (QUEST) idea was great and really overlapped with what we're doing as far as reaching multiple audiences with multiple forms of media. I liked the idea of having a web component because I think that's how a lot of people consume

their media these days. It's also a great way to feature partners and things going on in the community and the region. – WPT/QUEST partner

WPT/QUEST partners helped to identify material for the QUEST website, developed blog articles, and provided insight on how QUEST material could be better aligned to Common Core and NGSS standards. Partner representatives praised WPT staff for creating an atmosphere for open and genuinely collaborative discussion. Partners spoke of being treated as active and productive participants.

Serving as QUEST partners validated each organization's work, provided greater visibility and awareness of their individual programs to the local community, and offered new individual and collective learning opportunities for program development and dissemination. Partners looked to WPT for suggestions on how to better develop their science and environmental programming.

WPT/QUEST partners spoke of the importance of synergy between their organizations and public media for providing more exposure of informal science to diverse local audiences. They looked to WPT for ways to integrate more media into their programming to attract and retain local interest in their activities. They praised WPT/QUEST for making science more accessible, shareable and contextually relevant.

QUEST's cross-platform approach appealed to one WPT partner as a way to help audiences bring meaning, depth and capacity to expand awareness and make decisions about complex multi-layered science and environmental topics such as water.

How do we integrate Wisconsin's water policy, ground and surface water, as issues to mesh together? Then how do we help people understand how essential fresh water is to the Wisconsin economy? Then how do we have a conversation about the ethical issues around water, who gets it, who doesn't, and who decides? Projects like QUEST can provide just this kind of platform for educating and stimulating audiences to confront these kinds of issues on many different levels. – WPT/QUEST partner

For WPT, QUEST served as a springboard for deepening and broadening relationships with local partners around formal and informal science. WPT was in discussions with the Aldo Leopold Nature Center (ALNC) to replace the Wisconsin Media Lab as the project's formal education partner, had the project been continued. WPT and the ALNC also expressed interested in jointly developing a proposal to create a Wisconsin-based version of NSF's *Science on a Sphere* program.

Ideastream staff reached out to community organizations to develop blog articles on topics of local interest, including an article on forest farming with the Holden Arboretum, and one on the local water and algae crisis by a local Cleveland non-

profit organization, Drink Local, Drink Tap. Representatives from both these organizations felt projects such as QUEST could augment local community dialogue and education about important science and environmental issues, and provide audiences a broader perspective of these issues through incorporation of QUEST programs from other areas of the country.

To have programs like QUEST help us communicate all of this really cerebral information to the masses is so valuable. We have grants and funding for a lot of research and education programs with organizations like NSF but their (QUEST's) ability to communicate complicated concepts and environmental sciences to the masses is so very important. – i*deastream*/QUEST partner

Ideastream education staff discovered that QUEST programs could serve as valuable enhancements to the professional development (PD) services they provided to teachers and principals from schools in northeastern Ohio, through the regional Science and Math Achievement Required for Tomorrow (SMART) consortium. *Ideastream's* PD and coaching focused on science and math.

QUEST staff participated in SMART consortium meetings and conducted PD for school superintendents, curriculum specialists and central office staff. *Ideastream* staff showed QUEST media materials, demonstrated the QUEST website, and discussed how QUEST materials could be used in the classroom to enhance existing science curriculum.

Response to these presentations was very positive and has spawned new partnering opportunities. *Ideastream* staff is currently in discussions with one local school district to secure funding for students to develop their own multimedia science projects modeled on QUEST. They are also consulting with other local districts on similar types of training for students.

Ideastream staff credited QUEST with improving relationships with school districts and for infusing new ideas about science and science instruction to teachers, students and administrators.

I think it (QUEST) raised the awareness of all the educators that we've worked with. We've acquainted 50 superintendents, so that's 50 school districts in northeastern Ohio with the work that we're doing. It also made them think differently about how science could be taught. *– ideastream* staff

Impact on education

One of the project's most ambitious, challenging, and sometimes divisive elements was the effort to align education more overtly with the science content development process. Each QUEST station approached the role and purpose of educational services differently, frustrating attempts by the collaborative to achieve a common vision of how education fit into the QUEST model. Despite having a working group

of educators from each of the participating stations responsible for setting and implementing educational goals and objectives, there was often confusion about the nature of project deliverables, and very little synergy with the project's other cross-station teams (e.g., Coordinating Producers) as well as within the stations themselves.

Similar to the difficulty experienced when asked to recruit community partners, many of the project's coordinating producers had little experience with or desire to work with educators on their productions. For many, educational material was usually developed after a production was completed, treated more as ancillary material than central to the core themes of a particular story. Having to collaborate directly with educators from the start challenged the producers' sense of autonomy and control over their work.

We always think about education, but we may think about it a little bit differently than other people because we think about story first. If you look at the stories that we told, we try to build them around a person as much as possible, regardless of what we're supposed to do. – QUEST coordinating producer

Both coordinating producers and project educators complained that they were never clear who the intended audience was. Were they targeting educational material for middle school, high school or lifelong learners? Project educators, in particular, felt that education was treated as a kind of afterthought or stepchild. They wondered that, if linking production and education was a priority goal of the project, why were there never any joint meetings between their group and the coordinating producers?

This disconnection was compounded by the fact that each station's production unit had different types of relationships with their education team. UNC-TV had no formal education function to speak of, WPT had very little history working with their education unit (Wisconsin Media Lab) which was housed in a separate building miles from their offices. KCTS worked primarily with an outside education consultant. KQED had a fairly robust education unit that aligned well with their production teams and community outreach staff.

In addition to distribution of STEM reporting and educational media across a full range of platforms, QUEST project educators were charged with creating a complementary set of online educational resources called *explainers*. *Explainers* are collections of original media, animations, and interactives combined with standards-aligned curriculum assets on specific STEM topics. These media-rich educational learning resources offered an alternative to traditional STEM text-based tools (see next page for some specific examples). They are distributed through the QUEST network to local and regional audiences and more broadly through PBS LearningMedia and iTunes U.

Throughout the early stage of development, QUEST project educators were unclear how the *explainer* pieces were meant to function in conjunction with other QUEST cross-platform content (TV, web, radio). A number of QUEST education staff felt they were provided little guidance on how teachers and students should be expected to use this material in the classroom. They felt too much time was spent discussing and debating the concept of *explainer*s, than actually doing the work. They wished that there had been less of a focus on 'making pitches' and more time spent reviewing each other's material, testing approaches, and sharing ideas. One educator suggested it would have been more efficient to schedule education meetings to align with production review milestones, when certain activities were ready to review and critique

As a result, each coordinating producer and project educator formed different ideas of what an *explainer* should be, and how media should fit. What transpired was an assortment of approaches to the QUEST education component, based on skills and experiences of each of the station's individual project teams. One station created an interactive component that incorporated learning into the design of each segment, another produced short videos that teachers could play and discuss, and yet another prioritized making vocabulary games that were geared to younger audiences.

Some station staff commented that, while the process may have been difficult at times, *explainer*s were different than the kinds of educational media they usually produced, and

…maybe it added some different perspective. I think what it did do was give us an additional focus on some very specific science content and that's a good thing. It has introduced a more solid sense that we ought to do more science reporting, and as a result of that, other kinds of educational things. – QUEST educator

Education specialists concurred that as the project progressed they noticed an improvement in production quality and breadth of science content coverage. They felt that the process was becoming more iterative, with enhanced opportunities to share best practices.

Despite the inter and intra station level divides over the QUEST education development process and resulting deliverables, individual stations created some unique and varied educational elements and activities to improve science teaching and learning in the classroom.

Some specific examples of locally developed *explainers* included:

WPT/WML: A classroom game in which students decide the best location to start a community garden. The game references the WPT/QUEST Will Allen segment on urban gardening. Students have to weigh various environmental, financial and social factors in making their decision.

UNC-TV: Through a partnership with the Stroud Water Research Center, a multi-part web *explainer* piece on surface water and water quality. One component, called 'A Watershed Moment,' is a web-based hydrologic model using real time GIS data and a professional grade model to illustrate the impact of current land use on local hydrology. It allows users to change local conditions to see how best management practices decrease runoff.
KCTS – With assistance from the Seattle Aquarium, produced a series of *explainer*s on ocean acidification. These included a game to introduce and test related vocabulary, and an interactive map illustrating the build up of carbon dioxide in the oceans from 1880 projected through 2010.
NET – A four-part education program on Ground Water, including a primer on aquifers, an animation on groundwater buildup, and a groundwater term game.
KQED – A series of *explainer* animations on earthquakes including seismic waves, a comparison of energy levels generated by earthquakes, and locating the epicenter.

Some QUEST educational products were designed and developed in collaboration with new or existing local community partner organizations. This process helped to facilitate and expand these relationships.

WPT/WML included local teachers and administrators as active participants in the development process, soliciting their opinions on possible topics, and beta testing material with them to ensure both content and instructional validity. As previously mentioned, *ideastream* is working with local school districts to produce QUEST-like multimedia with students. One of KCTS' teacher workshops was held in a rural coastal location outside of Seattle with teachers who normally do not have access to quality science materials.

Stations such as KQED, *ideastream*, KCTS, and UNC-TV incorporated the *explainer* pieces as part of educator workshops designed to introduce local teachers and administrators to QUEST, and as part of an overall goal to improve science teaching in the classroom. Feedback from teachers attending these workshops was extremely positive with many participants planning to use QUEST materials in their classrooms. Some educators suggested there should have been more training for stations on how to design these kinds of workshops for teachers, especially given the heavy dose of media concentration.

Introducing an educational focus and process through QUEST has had an impact on stations in ways beyond development of educational materials. Several station executives believed that, even with the inconsistencies and frustrations with the process, introducing the education component helped to break down some of the longstanding barriers between production and education. As a result, those stations are now exploring ways to more actively incorporate education into their program development and outreach activities.

Due, in part, to their experience with QUEST, WPT is planning to hire their first fulltime Educational Specialist. WPT has several general audience projects that would benefit or already benefit from a formal K-12 education component. Once this specialist is hired, WPT plans to more actively partner with both formal and informal educational organizations such as the Wisconsin Department of Public Instruction (DPI), WML, and the Aldo Leopold Nature Center.

UNC-TV is formally integrating the education and production functions as part of its recently launched *Science Now* series. UNC-TVs onsite Educational Specialist (hired in part through QUEST funding, and now a full-time employee) is working directly with the series producer to ensure that video and web segments are educationally sound and align to Common Core and NGSS standards. This process has helped the educator develop a greater understanding and appreciation of production values, and the producer appreciate the importance of educational alignment with content. The process has engendered a new and different kind of partnership that the station hopes to replicate with other of their local productions.

He (the producer) picks the stories and tells me after. I can refer stories to him but he's the reporter, and I've actually come to appreciate the value of that, because he has a nose for what's hot. My approach as an educator is to say we have these standards to meet, let's go find a story, and his is to find a story. I have come to think that that is an interesting model, and I like it. – UNC-TV Education Specialist

I*deastream*, in addition to working more proactively with local area schools on QUEST-like cross-platform science projects, has begun to explore the possibility of producing programs that simultaneously have both general audience and school use. They have noticed that area educators have a keen interest in science stories that have a local relevancy.

At QUEST education workshops conducted by each of the stations, participating teachers and partner organizations (who assisted in developing or delivering workshops) were enthusiastic about the use of QUEST material in the classroom. Teachers were shown examples of QUEST programming (many tailored to the a content area of particular interest to the audience, such as water issues, etc.), given a demonstration of the QUEST website, and informed of related science resources.

QUEST presenters, generally the Education Specialists, showed attendees how QUEST and other related material could be integrated into lesson plans, as well as how these same sources could be used to support national and state course standards. Partner community organizations often contributed staff to provide professional expertise and contextualization of the science and environmental content to history, tradition and issues of local concern. Teacher participants and representatives from partner organization concurred that these types of education workshops are fundamental to sustaining and expanding the mission of public broadcasting's role and outreach into the community.

Although the tools and needs of the broadcasting community and the educational community have changed somewhat over time, I think that the fundamental relationship and the needs for both sides remain there. — UNC-TV/QUEST partner

Building and sustaining collaboration

What you could have done differently tends to be the new agenda and you take those lessons forward. We very much have to be learning organizations and not just produce and kill projects. – QUEST station executive

It is clear from the QUEST example that building and sustaining multi-stakeholder collaborations are both art and science. Frameworks, principles, processes, roles and responsibilities are important considerations. Sustainable collaborations don't just happen. They are complex systems that involve planning, iteration, continuous assessment, and relationship building.

The nature of multi-stakeholder collaborations, like QUEST, is changing. Today's collaborations are more relational than transactional. In the past, relational partnerships were approached in an informal and organic manner. But today collaborations like QUEST are aimed at making big, disruptive system shifts, impacting all stakeholders at different levels and frequencies. These processes take time, energy and resources, requiring commitment, patience and flexibility from all involved.

QUEST's operational goals were ambitious: to design a science unit of replicable scale, capable of creating multiple media science content to improve the science literacy of regional audiences and students in the classroom, influence and activate relationships between public media and local science and educational organizations, and challenge the traditional paradigm of how science media content is produced and disseminated.

KQED's own experience in designing and refining QUEST took years and numerous iterations with staff, partners, educators and viewers before becoming a model that could potentially be scaled by other public media stations across the country. Participating station executives concurred that for QUEST to be sustainable it had to grow from a perception of being a collaborative only focused on generating deliverables to something about growing and nurturing science capacity at stations. There is evidence to support that the QUEST collaborative was slowly heading in that direction.

With a production and distribution system already in place, many of the participating stations were in the process of taking more control over shaping and editing their own science content. The QUEST Central Office was also making plans to scale back the amount of central editorial control, flatten the model, and hand more responsibility over to the individual stations. Going forward, partner

stations would be encouraged to reach out to other stations in their region for content and editorial assistance.

Interviewees across participating stations commented that they were beginning to envision and actually plan for ways to expand and build science capacity within their own organizations. Some stations were starting to shift their thinking from focusing on science output to broader organizational science outcomes, a mindset more in line with initiating an internal capacity building process. The QUEST experience has provided partner stations the seeds to begin to build their own science capacity through introduction of new collaborative work processes, personal and organizational skill building, capital improvements, and identification of strategies for introducing new educational and outreach opportunities.

The QUEST team was reasonably successful in designing ways to collaborate and maximize resources in a way that made sense to the regional communities and at the same time to a more national audience. For many of those interviewed, that exercise alone was something that was worth replicating on a smaller scale at their participating stations.

As was noted earlier, UNC-TV has already begun to boost their organizational science capacity with the launch of *Science Now*. They have retained their QUEST education specialist as a full time employee for continued work on *Science Now*, and their QUEST coordinating producer for work on *North Carolina Now*, which will include more of a cross-platform approach adopted from QUEST. *North Carolina Now* and other UNC-TV series will also benefit from use of a DSLR camera kit, purchased with QUEST funds for producing web videos.

Addressing their continued science capacity building processes a UNC-TV station executive commented:

We had already determined we wanted the ability to have a full time educator working on science regardless of whether QUEST was going on – UNC-TV staff

QUEST's coordinating producer at *ideastream* has begun work in a similar capacity as part of their newly formed Health, Science and Education Unit. Previous to QUEST, the position of Coordinating Producer did not exist at *ideastream*. This new organizational focus on science headed up by a Coordinating Producer, were both due in large part to their involvement with QUEST.

This project (QUEST) helped inform our own strategic plan. We've made the decision to build out a Health, Science and Education unit and we have a campaign going right now where the goal is to double our investment in content in education. So, yes, it's both part of our strategic plan and part of the way we're organizing our content management. – ideastream staff member

Ideastream staff is also building organizational capacity by leveraging the many personal and professional skills and knowledge that their staff attained through QUEST activities. The Coordinating Producer for *ideastream's* new Health, Science and Education unit is planning to use her newly acquired cross-platform development skills to enhance the quality and breadth of new programming. One former *ideastream* QUEST staff person, who learned to use WordPress as part of her project responsibilities, is now using that skill to build websites for other station programs. She has also grown as a manager.

I feel like I've learned so much. I've learned how to write a blog post and work with infographics. That's not something I had done before. I had only done graphics for TV, WordPress, and Aspera. Working across stations and with others' here, I've also learned how to collaborative with people more effectively. – ideastream staff member

The enthusiasm for pursuing science reporting outside of QUEST was articulated across *ideastream* staff:

The COO really sees the value in both the QUEST brand and the value of science literacy in our community and the role that we can play as the media in that science literacy puzzle, equation. Science is not off the table at the station even though the funding is off the table from NSF. That's very encouraging and I'm not sure that would have been the case had we not done this QUEST project. – ideastream staff member

Despite internal difficulties at their station, interviewees at NET acknowledged that QUEST has helped to plant the seeds for improvement and innovation in a variety of different areas. Station executives believe that for them the QUEST project was at a pivotal tipping point, and had the project continued, the next year's activities would have been instrumental in more broadly embedding cross-platform collaborative processes at the station, leading to more expansive and general coverage of local science topics. They also believe that the overall project structure would have had to change, giving more autonomy and control to the individual stations.

We're moving and we're shifting some of our internal investments around and focusing more on science, which has generated interest and expertise as a result. I wanted QUEST to be a catalyst. I wanted it (QUEST) to help us think through these larger organizational issues and help us think of capacity building as more than growing for the sake of growing in size but in terms of reinvesting and redeploying. Yes, it's actually had that effect – QUEST/NET station executive

One of the difficulties in obtaining long-term buy-in from QUEST partners was the lack of a coherent long term funding plan. Fundraising can be a challenge for multi-stakeholder groups. Given the lengthy gap between submitting proposals and actually receiving funds, there is pressure to begin fundraising as soon as possible.

However, this requires decisions—not only about the exact nature and costs of the group's work program but also about the donors to approach, where to hold funds and who will be responsible for financial accounting. All of these issues take time to resolve. Furthermore, locating an acceptable funder or series of funders that are willing to take the risk of funding an innovative and unusual project is not easy.

The pressure to focus on work and editorial processes and completing the project's numerous deliverables distracted from any urgency to concentrate on fundraising at the outset. There was no one with deep development experience directing the fundraising effort on behalf of the entire project. Individual station development representatives complained that it was difficult approaching local funders to support a project that was managed by a station outside of their region. Many found the QUEST concept difficult for local funders to grasp. Local funders were also wary to support a project that was being sustained only by a single government agency. Stations were counting on continued funding from NSF. When that didn't happen, the collaborative had no alternative funding options to fall back on.

Interviewees also felt that project leadership could have done more to promote and facilitate buy-in and ownership of QUEST at each of the participating stations. There was a strong sentiment that QUEST had become too much of a middle managers project, and that for the project to become more 'embedded' at each of the stations required more CEO level involvement. In particular, many believed funding conversations should have more directly involved individuals at the corporate level.

Station executives commented that much of the information they received about QUEST was anecdotal. Many felt more regular reporting on the status of project deliverables and the impact of any internal issues (e.g. staff, resources) on production activities would have been helpful to them. Several wondered why QUEST activities were not more actively promoted in the local press, or throughout the broader public media science and education communities. With the focus on production, coordinating producers commented that they had neither the time nor expertise to lead activities tied to impact in the community, regular press coverage, and penetration in local area markets. QUEST promotion and marketing was uneven amongst participating stations.

It was also suggested that project processes and communication depended too heavily on virtual or online methods. Station staff believed that more face-face meetings between working groups or occasional visits by QUEST Central Office staff would have helped to generate enthusiasm, trust, and improve problem solving across each of the stations. As an example, coordinating producers concurred that their face to face meeting was a key turning point for developing a more coherent collective voice, and reinforcing project ownership and identity.
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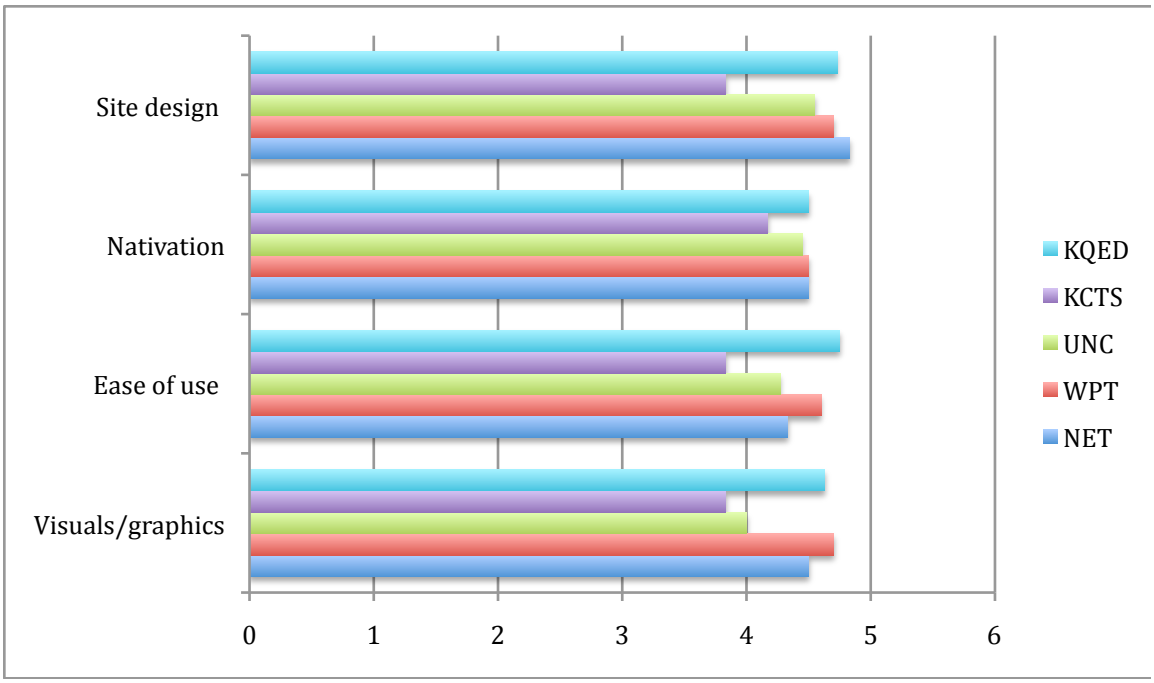
QUEST audience members

QUEST website

Survey participants were asked to explore the QUEST website and rate its elements on a scale of 1 to 5 (1 = very poor, 5 = very good). The elements they were asked to consider were: site design, navigation, ease of use, and graphics and other visuals. Respondents most often rated these elements between *Good and Very Good* with median scores for each falling between 4.50 – 4.75. Average ratings from KQED respondents were the highest, with those from KCTS being the lowest.



A number of respondents commented on the excellent quality of the site's still and video imagery, while others were particularly impressed with the breadth of environmental topics and links to other science resources.

Other comments about the QUEST website focused primarily on the lack of a comprehensive description of sustainability. Some respondents felt that because sustainability means different things to different people, it was imperative to include some kind of larger organizational and conceptual framework connecting the site's many media and text-based materials.

I think the opening page should say exactly what the vision of the organization is. It is unclear WHY it is important to bring forward these various sustainability topics.

The purpose of the site is sustainability. It is not stated or inferred anywhere on the site. It's just a collection of stories. The 'About' page doesn't even sustainability.

You have a wonderful, fun and educational website with links to some great information. As you know, your audience ranges from adults with PhDs to young children... in other words people who have vast global knowledge to those who cannot spell sustainability. I think you must define sustainability on the home page. It would be wonderful to see links to your advanced reporting, photojournalism and statistics. I strongly believe it would become even more of a place where academics do hardcore research.

Feedback on locally produced video

Audience survey participants were asked to view a QUEST video produced by their local station on the web, and rate it in terms of production quality, presentation of content, narration, use of content experts and visuals and other graphics. The rating scale was from 1 – 5 (1 = poor, 5 = excellent).

UNC-TV:

Bike to the Future:

Description: This video explores development of the ELF, a solar and pedal powered vehicle bridging the gap between bicycles and cars.

All viewers found the *Bike to the Future* video interesting and engaging. While two respondents were neutral regarding whether that wanted to learn more about the topic after watching the video, the other 82% were interested in learning more. As a result of watching the video, 73% learned something they did not know about a local approach to improving the environment.

In terms of length, 73% of viewers felt it was appropriate, while one viewer felt it was too long. The same percentage (73%) indicated they would recommend the video to a friend and 82% felt the video presented an important sustainability for their region. Most of the viewers (73%) felt the video would be appropriate for school-age audiences, and the vast majority (82%) said this is the type of video they would expect to see from a series on sustainability and the environment. All viewers felt this topic would be of interest to viewers in other parts of the country, though fewer (73%) thought the video was well balanced and presented a variety of perspectives.

Additional audience comments regarding the program were very positive. Suggestions for improvement focused on balancing perspective, increasing diversity, including humor, and adding more visuals.

There was only one person interviewed that opposed it, and he seemed to be biased. It would be nice to have unbiased points of view.

The video was very good. My only issue was that the owner of the bicycle shop was very negative and his statements didn't add much value.

I think if you want to truly engage our country you need to include non-white people in your presentation materials...it would also make it more interesting and engaging

Add some humor, but overall, the clip already has a lighthearted and pleasant feeling.

The initial visuals without narration left me a bit confused... it was also way too long... perhaps half the amount of time for the intro! The photojournalist needed freedom to create more compelling footage/b-roll. Let him/her take visual risks. Having led visual teams for over two decades I would suggest more visual variety (much higher, lower views) would greatly enhance the report.

Accompanying article: *Bike to the Future*

On a scale from 1 – 5 (1 = strongly agree, 5 = strongly disagree) audience members were asked to comment on a number of elements relating to the text material accompanying the *Bike to the Future* web video.

While only 64% of the respondents reported that the accompanying article expanded their understanding of the topic of sustainable product design, all found the links to be useful and relevant and 73% that questions covered were those they would ask.

The written material provided a greater context to the story according to 82% of the respondents. Readers were divided about the inclusion of an interview, with 27% reporting the video alone was satisfactory and 45% disagreeing. While some viewers found the written material to be redundant with the video, they acknowledged that different people learn in different ways. Others found the written material provided additional information or an overview of the video, allowing viewers to decide whether they wanted to watch it.

Additional viewer comments about the written material were mixed:

I always appreciate seeing written material to accompany a video. Many of the interesting headlines I click on from news sites and social media have ONLY a video, which I find frustrating. I don't necessarily want to see those videos. I want to first skim the written content in order to decide whether I want to watch the videos. You guys got it right!

The article was a nice, brief overview. Good compliment to the story. Well done.

Your average reader would be interested in comparing environmental footprints of a bike, ELF, average car, SUV and minivan. A more expanded graphic (breakdown) of the information used to generate the $9000 annual car cost would also have been terrific.

WPT:
Growing Power

Description: This video introduces viewers to former pro-basketball player and MacArthur 'Genius' award winner Will Allen, and explores the Milwaukee farm where he successfully cultivates food, including fish, to feed thousands of residents.

All viewers found the *Growing Power* video to be interesting and engaging. While one respondent was neutral regarding whether that wanted to learn more about the topic after watching the video, the other 89% were interested in learning more. As a result of watching the video, 67%% learned something they did not know about Wisconsin and sustainability. All viewers felt the program was long enough, almost all (90%) indicated they would recommend the video to a friend, and all felt the video presented an important sustainability for their region.

Most of the viewers (78%) felt the video would be appropriate for school-age audiences, and all said this is the type of video they would expect to see from a series on sustainability and the environment. All viewers also felt this topic would be of interest to viewers in other parts of the country, and most (78%) thought the video was well balanced and presented a variety of perspectives.

Additional comments were very positive. Some had heard of the Will Allen story, and thought the video did a good job of complementing what they already knew. Others enjoyed the program's storytelling approach, the music, and program length. There were also suggestions of other related topics that could be covered.

I was already pretty familiar with Growing Power and Will Allen, but it is still a fascinating story. The video did a good job of giving enough detail to be educational and wasn't too long.

I liked the video a lot. It had a good mix of information about his business and his personal story, which humanized it and made it easy to connect. It was longer than I would normally sit through for a video on a website though. I usually like to watch videos that are only like 4 min long. Once I got started, I really enjoyed it though.

I really enjoyed Will and narration was a good speed to comprehend and keep up with. Also music was used appropriately and sparingly so it did not drown out speaking.

I think they could have included information regarding any difference of food quality, quantity, nutrition, etc., when looking at food grown in an environment such as the urban center shown in the video vs. the conventional method. Are there any health risks or benefits from the food grown at this urban center?

Questions I want answered: How big of an impact does this urban farm have on the overall availability of food for this area? How economical is this operation?

Accompanying article: *Growing Power*

Most respondents (89%) reported that the accompanying article expanded their understanding of food sourcing and urban farming, and 78% found the links to be useful and relevant. Only 44% said that questions covered were those they would ask. Fewer, 33%, said the written material provided a greater context to the story. Respondents were divided regarding the inclusion of written content with half agreeing the video alone was satisfactory and the other half reporting the written content enhanced the video.

The few additional comments regarding the accompanying article were divided. Two respondents had issues with the language, tone, and content focus of the article, while another thought the written material enhanced the viewing experience.

I thought the accompanying article was a miss. I would have liked to have seen more focus on the actual topic and impact on the community, and less on the founder's background and bio. I typically prefer to read articles rather than watching videos, and would have missed out of the meat of the content if I had done so. The meat (or in this case, veggies) should be presented in the article such that the key points aren't missed if the video is skipped.

I didn't like the written material. I thought the choice of words of "zealous, gospel, foodies and wannabees" in this section were demeaning.

It (accompanying article) complimented the video well. I was glad it was somewhat different from the video. It's also nice to have a video and some written material. When I enter a website, I usually skim the text before watching the video, so it is valuable to have both.

NET
Beyond Plain Sight

Description: This program explores photographer Mike Forsberg's unexpected imagery of the Great Plains and shows how he is using time-lapse cameras to reveal unprecedented views of how watersheds work.

All respondents rated the production quality, presentation of content, narration, and visuals and other graphic as *Good to Excellent*. While the vast majority rated the

use of content experts as *Very Good to Excellent*, one viewer rated use of content experts as *Fair*.

All respondents found the video interesting and engaging. 83% of respondents were interested in learning more about the topic. As a result of watching the video, 83% learned something they did not know about the Great Plains and environmental sustainability.

Almost all (92%) of the respondents felt the program's length was appropriate, and 75% indicated they would recommend the video to a friend, and all felt the video presented an important sustainability topic for their region. Most of the respondents (75%) felt the video would be appropriate for school-age audiences, and 92% said this is the type of video they would expect to see from a series on sustainability and the environment.

While three-quarters of the respondents felt this topic would be of interest to viewers in other parts of the country, fewer (58%) thought the video was well balanced and presented a variety of perspectives.

Many respondents were particularly struck by the program's visuals, others' commented about learning something new about the region's environment, while others' spoke about the program's message and presentation needing more balance.

The stunning visuals that hooked me during the introduction emphasized the focus of the video. There is a personal connection, just last week my students and I were at Mahoney State Park and saw the time-lapse camera. Now we know about the project it is recording!

I am a native Nebraskan though I've lived in other states for one-third of my life. I didn't know that the Platte River Basin takes up most of Nebraska, nor about the great numbers of migratory birds. I only knew of the Sandhill Cranes. This video influences one to learn more!

I think the imagery and content of this video was quite striking. The science was well placed and useful without alienating the audience.

I am sure there are other segments that present views of non-scientists (farmers, water utility companies, etc.), but if there are NOT other video segments, which provide a richer, broader, and deeper view, there SHOULD be!

Accompanying article: *Beyond Plain Sight*

Only 67% of the respondents said the written material expanded their understanding of wilderness preservation; more found the links to be useful and relevant. Two thirds of respondents also reported that the questions covered in the

article were those they would ask and that the written material provided a greater context to the story.

Respondents commented very positively about the accompanying article, stating the material personalized the content, and enriched their viewing and learning experiences.

I appreciate the extra information and believe it helps the viewer to conduct further personal research on the topic. I wish more stories in regular media would provide this sort of accompanying material.

I love the interviews! Real people talking about subjects they are passionate about gives any piece more depth.

Love the links for additional information- TRL cam is awesome!

KCTS
Wolves and the Ecology of Fear

Description: The return of wolves to Washington State for the first time in almost 80 years could have a profound impact on plant and animal life. In this video, experts from the University of Washington and the Woodland Park Zoo explore how apex predators diversify ecosystems.

All respondents rated the video's production quality, presentation of content, and narration as *Good* to *Excellent*. While the vast majority rated the use of content experts and visuals and other graphics as *Good* to *Excellent*, one viewer rated both as *Fair.*

Most of the viewers (82%) found the Wolves video interesting and engaging, with the same percentage stating they were interested in learning more about wilderness preservation. As a result of watching the video, 92% learned something they did not know about their region's ecosystem.

Seven in ten indicated they would recommend the video to a friend while 82% felt the video covered an important sustainability topic for their region.

Most of the viewers (71%) felt the video would be appropriate for school-age audiences, and the same number said this is the type of video they would expect to see from a series on sustainability and the environment.

Almost 3/4 of the respondents (71%) felt this topic would be of interest to viewers in other parts of the country, though fewer (49%) thought the video was well balanced and presented a variety of perspectives.

A number of respondents felt the programs' pacing was slow and meandering, and that the presentation perspective was slightly unbalanced.

I found the subject matter almost intriguing, but it took far too long to get to the point. I had to draw the conclusions myself regarding the Aspen trees, so the whole "impact factor" of the video wasn't present. It just sort of moved along, like someone walking down a country road.

There was only one expert and a grad student, and while the expert did present the opposing point of view, he was of course biased. Other individuals offering other points of view would have better supported this.

Accompanying article*:*
Wolves and the Ecology of Fear

Only 43% of the respondents reported the written material expanded their understanding of the topic of sustainable product design, but they were more positive about the usefulness and relevance of the links: 43% said that questions covered were those they would ask and the same number said the written material provided a greater context to the story. Respondents were divided regarding the inclusion of an interview, with 43% reporting the video alone was satisfactory and 43% disagreeing. While some viewers found the written material complemented the video, others thought it was too long or more biased than the video.

Respondents commented that the article was too long, that the content needed more elaboration, and that not there was enough diversity of opinion from key stakeholders.

It was not clear in the article what was fact and what was opinion - there needed to have been better separation. A better approach would have been to include fact punctuated by opinion/comment/observation, and substantiated. Overall, the article was far, far too long.

There should be better explanation of several stakeholders' points, concerns, perspectives and solutions. This should include both existing conflicts and cooperative efforts for managing wildlife.

KQED
Largest Solar Plant in the World Goes Through Last Test Before Opening

Description: Engineers at the Ivanpah solar farm, 40 miles south of Las Vegas, test the plant's water boilers as a last major step before opening.

All respondents rated the production quality and narrations as *Good to Excellent*. Most viewers (93%) found the Solar video interesting and engaging. Nearly as many

(86%), were interested in learning more about solar energy. As a result of watching the video, 79% learned something they did not know about California and solar energy.

Most (64%) thought the video was an appropriate length, 86% indicated they would recommend the video to a friend, and all but one felt the video presented an important sustainability for their region. Most of the viewers (79%) felt the video would be appropriate for school age audiences, and 93% said this was the type of video they would expect to see from a series on sustainability and the environment.

Almost all (93%) felt this topic would be of interest to viewers in other parts of the country, and most (86%) thought the video was well balanced and presented a variety of perspectives.

Respondents commented positively on the program's balanced perspective, and to the excitement of learning something new about the environment.

I like that this wasn't just a "pitch" for solar, but also included wildlife experts illustrating the potential harm to the environment. This showed a balanced perspective.

I thought it was really good! I had no idea that existed in the Mohave Desert! I am kind of irritated at myself for not knowing! Glad I know now!

Accompanying article:
Largest Solar Farm

Most respondents (79%) reported that the written material expanded their understanding of wilderness preservation, 86% the links to be useful and relevant, 64% reported that questions covered were those they would ask, and 64% also said the written material provided a greater context to the story. Respondents felt the inclusion of written content was beneficial with only 36% agreeing the video alone was satisfactory.

Non-local video: Battling the Bloom

All survey participants were asked to view a QUEST video program from outside their local region. The program selected was *Battling the Bloom*, produced by *ideastream*. The program focused on Lake Erie, and the threat to drinking water, habitat and fish life caused by the rising number of toxic algae blooms. Survey questions for *Battling the Bloom* were identical to those used for surveys to assess other stations locally produced QUEST video programs.

Collective responses

Respondents from across our national survey sample gave the program positive ratings (*Good* to *Excellent*) in terms of production quality, presentation of content,

narration, use of content experts, and visuals and other graphics (mean range of 4.4- 4.6 in all categories). These mean ranges are consistent with positive ratings respondents gave to the same categories for each of their respective local video programs.

Of the respondents across the survey sample, 90% found the video to be interesting and engaging, and 80% were motivated to learn more about algae blooms and water quality issues. Nine out of ten stated they learned something new about water quality and the same percentage would recommend the video to a friend. Three-quarters felt the video content was relevant to sustainability issues in their geographic location.

Close to 90% of respondents indicated the video was an appropriate length and nearly all respondents (95%) agreed it was the kind of video they would expect to be included in a series on sustainability and the environment, and 75% felt it would be appropriate for school age audiences.

All respondents from across the survey sample reported they would be interested in viewing similar programs about sustainability issues elsewhere in the United States.

Respondent comments from across the survey groups were predominantly positive about this program. Respondents were particularly impressed with the production quality, historical and personal contextualization of the content, balance of presentation, diversity of perspectives, its strong connection to the issue of environmental sustainability, and use with school audiences.

The text gave the facts, an overview and links, which would work well with text reading in middle school. The video showed the facts with a human perspective and a sense of place. – KCTS respondent

Great video! It makes me think of how I can make small changes to impact my own neighborhood. There is a pond in my neighborhood park that has a huge algae problem. I should limit the fertilizer applied to my lawn. – KCTS respondent

The video had excellent production and education value. This truly demonstrated the definition and importance of sustainability. While I realize that not all environmental problems have an easy solution, this video highlighted what needs to be done to identify the actual problem and offer legitimate solution that are amiable to several interested parties. I appreciate the optimism that is tempered with strong doses of reality. – NET respondent

Balances different points of view! Kudos! – NET respondent

Great photo research! Nice job of bringing in the metropolitan viewpoint. Would have liked to hear the mayor of Cleveland's point of view on the overflow. I like the

artistic vision of making reporting seem like a 1920-40 newsreel but as a viewer I would wonder how old the facts and figures are. – UNC-TV respondent

The program didn't talk about what they do with the runoff results from the machine that measures runoff at the edge of the crops. What do they adjust afterwards? How do they correct the problem? – UNC-TV respondent

I liked the old footage at the beginning. The interviews were informative. I like the drama built into the story showing us the progress and then the algae problem. The use of satellite images is also cool. The graphics around 3 min look great for kids. It was nice to see the farmer's side of the story juxtaposed with the researchers. – WPT respondent

I would like to have seen more about the vanguard systems that were placed next to the roads to collect the phosphorous from the urban areas. I liked how the perspective of the farmer was added to show that there are needs and desires to improve the situation on their end as well – WPT respondent

An excellent video. I wish they had QUEST when I was in school!! I could definitely see this being used in conjunction with a science curriculum and being shown in the classroom to inspire discussion. – KQED respondent

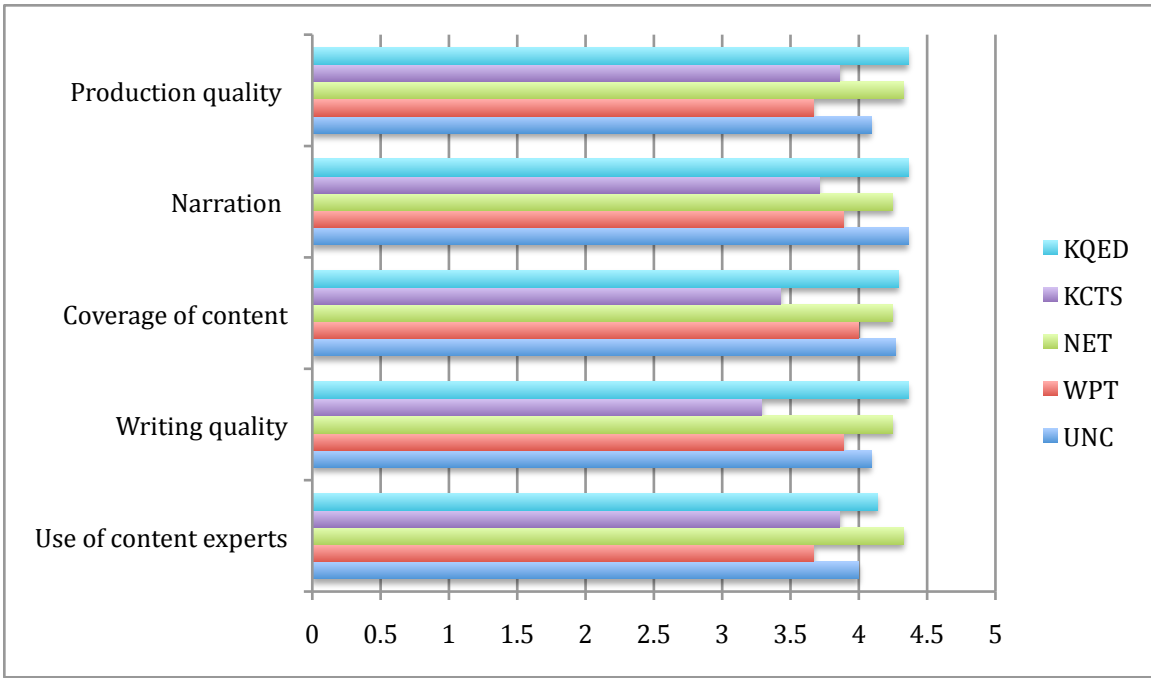
Interesting and very informative about water quality issues that I was not aware of. – KQED respondent

Close to 85% of all survey respondents felt the accompanying article to *Battling the Bloom* enhanced their understanding of the subject, 89% of total respondents found that the written material provided greater context to the story and 70% reported that the embedded links were useful and relevant. But not all felt that way:

This material was very dull, if you want to engage people in reading you need to make it more vibrant and engaging, otherwise its a bunch of gloomy dull facts and the only people who will be interested are the scientists who study it. It needs to engage your typical person, so that they can see how it relates to their life.

QUEST podcast: From Cheese to Energy

All survey respondents were asked to listen to the QUEST audio podcast, *From Cheese to Energy.* The program, produced by QUEST Wisconsin, describes how a large cheese producer in western Wisconsin is turning its wastewater into energy.



Respondents were overwhelmingly positive about the audio program with all rating it as *Good to Excellent* (4 = good, 5 = excellent) in terms of narration, coverage of content, writing quality, and use of content experts.

For 82% of all respondents, the program was interesting and engaging and 91% liked the narrator's style. The majority of respondents (64%) tended to agree the radio format made for more compelling storytelling and all agreed the topic was relevant to the concept of sustainability. Most (91%) reported that listening to the story made them want to learn more about ways of turning waste into energy and the same number found the length appropriate for maintaining their interest. Roughly half of the listeners (55%) prefer listening to audio stories about sustainability and the environment.

Most respondents (89%) said they would recommend the story to a friend and 83% agreed this is the kind of story they would expect to find in a series about sustainability and the environment. Most felt it was appropriate for a general (national) audience, with only 21% reporting it was too specific to Wisconsin.

Specific comments about the podcast were generally positive. Respondents from across the country strongly agreed that the program's topic was important, and had relevance for audiences outside the state of Wisconsin. Many commented that the program inspired to them think about the impacts of energy runoff in industries other than dairy, as well as ideas for future stories on similar topics.

There were some criticisms about the narrator's lack of pacing, and suggestions that the topic could have been covered more comprehensively as a short video program.

The topic got me to think about by-products, like milky water from cheese, that I wasn't aware of. It's not just an issue for a cheese making state, but there would be by products to manufacturing anything. – NET respondent

I think stories like this are useful for the public and help to show ways that modern processing can control environmental waste with positive results. I am curious what else is done with the solid waste after the energy (methane) is recovered. It could be useful to address further items like this in future stories. – NET respondent

Very interesting and I really enjoyed it, but I wish it had been a video. I would have been really interested to see the actual plants/ tanks etc. I'm not from Wisconsin and I didn't know cheese makers had this issue, but I have heard about it with Greek yogurt makers and as someone who enjoys both yogurt and cheese I think it would be an interesting topic for everyone in the US. – KQED respondent

I think just listening is a very hard way to learn content. The material is pretty complex and I don't think students would understand it. It was also hard for me to hold my attention. – KQED respondent

This is an important topic around the country. I now live in Washington and there are at least 7 biodigestors operating at dairies in Western Washington. This is a good example of sustainable systems. – KCTS respondent

The primary way I learn as an adult learn is not through listening. Therefore I struggled to keep up with the program. I found myself going ahead and reading while the narrator was talking many times. He seemed on a mission to just get through it, and that's what I ended up doing - bracing myself to just get through it, following his lead. – KCTS respondent

The subject should be of interest to anyone regardless of geographic location since we all have waste problems, which can be solved in creative ways. – UNC-TV respondent

This podcast was very well done. It was informative, took an issue that I never even thought about, broke it down, explained it and offered a viable solution that is good for the environment. Nice job! – UNC-TV respondent

I like the length. I think it's a great example of using waste in a sustainable way that is applicable in other regions. – WPT respondent

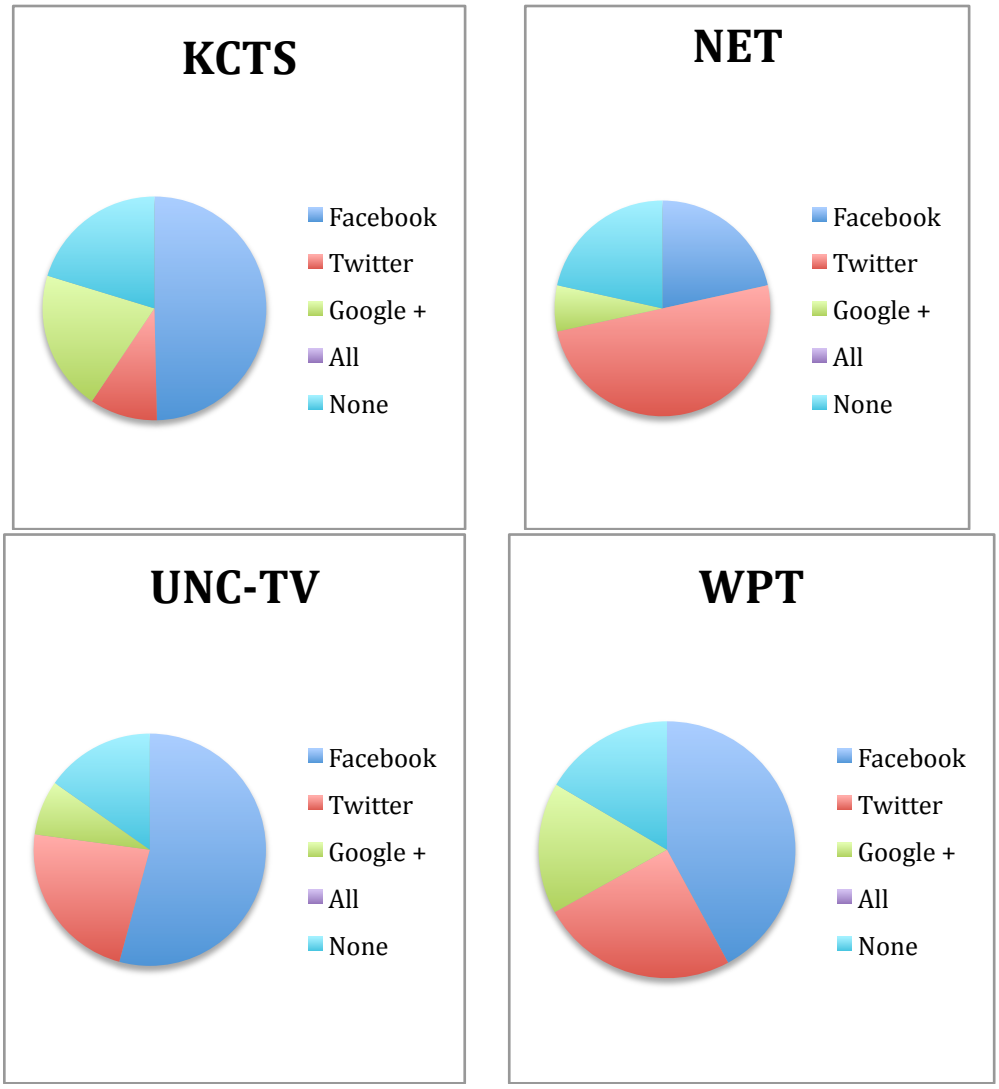
The narration was a little soft and a little too sing-songy to hold my attention as well as the others. Maybe it's too complicated a story for radio. – WPT respondent

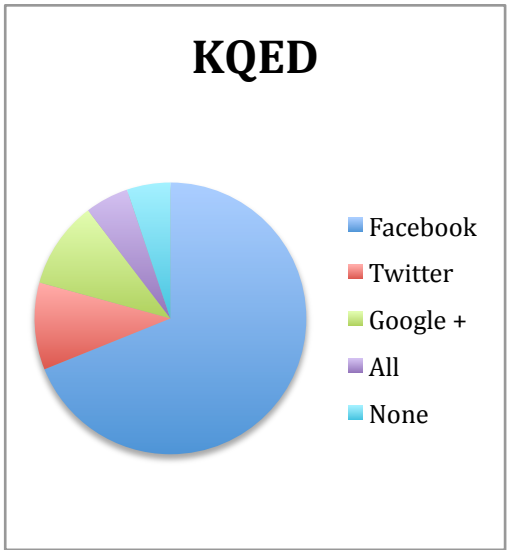
QUEST social media

Survey participants were asked to explore QUEST's three primary social media sites, Facebook, Twitter and Google +. We asked participants *which of the QUEST social media sites they would be more inclined to use and why?*

Not surprisingly, a majority of respondents (60%) preferred Facebook, 21% preferred Twitter, and 8% preferred Google +. 11% stated they had no desire at all to use any of the three social media sites for additional information on QUEST.

In terms of individual station trends, KQED respondents overwhelming preferred Facebook, while more than half of NET respondents preferred Twitter. KCTS and NET respondents had the highest percentage of those not interested in any of the QUEST social media sites.





Those who preferred Facebook were particularly drawn to the striking still images that were posted from QUEST programming, as well as the opportunity to actively engage with other users about environmental issues. Many commented that participation in a community of like-minded users spurred them to learn more about the environment and motivated them to think about adapting pro-environmental behaviors. Some respondents suggested QUEST should put a greater emphasis on posting still imagery as part of their Facebook presence.

Twitter users appeared to prefer a QUEST presence that would allow them to link quickly and seamlessly to programs or articles on sustainability and the environment. They weren't as concerned with imagery on the page itself, as with QUEST headlines serving as a kind of aggregator to other stories on environmental issues. Many commented that after having seen QUEST on Twitter, they were hoping to add it to their personal news feeds.

Several respondents commented that QUEST social media sites should be leveraged as a resource for complementing K-12 science and environmental education. They pointed out that younger audiences were naturally drawn to social media platforms for news and communication, and that using social media in this manner was a natural extension of QUEST's multi-platform approach. Many self-identified educators commented that they already used QUEST in this manner.

Across each of the five survey sites, there were a consistent number of individuals who claimed no interest at all in engaging with QUEST via social media. Reasons included not enough time to access social media, a fatigue with social media in general, or a preference for web only content. Some preferred the design and media 'richness' of the QUEST website over social media and found it had more informational depth. A few respondents stated that they equated social media more with communication than education.

If I were seeking out this kind of information, I might be more inclined to use social media. But actually I think I'd expect to find more useful information on the website itself than on Twitter or Facebook. – KCTS respondent

The Facebook site was compelling. The titles all vied for my attention, and were presented in such a way as to afford me a mini-crisis over which to follow first. I chose the prominent California Drought GIFs and was amazed. Second was Twitter, though I lost interest when scrolling down and encountering larger typeface files. – KCTS respondent

I really enjoyed the Twitter page because the headline writing was far more compelling than the Facebook or G+ crowd. I would highly suggest forming an Instagram page because your youngest viewers are not on FB or G+. It's nice to have immediate links to stories that do not require a lot of hopping around. Would have liked to see a picture attached to the "These photographs will make you see the Great Plains in a whole new light" Twitter post. Strong photos would elevate your stories and multimedia. – UNC-TV respondent

My generation finds social media to be an easier outlet to keep up with things going on around us and in different parts of the world. – UNC-TV respondent

Posts on QUEST's Facebook page had a great conversational tone. The posts gave me just enough to be interested in clicking the link to learn more. Also there was great visual content (really apparent on Google+), it was very easy to scroll through, stop at an intriguing picture and get a little more information about it to decide if I want more. – WPT respondent

I thought it was interesting to read the Facebook comments and it would be a good way to get science news by linking to the selected articles. I would probably be more likely to see this on Facebook than to go to the QUEST site on my own. – WPT respondent

My main social media site is Twitter, and I like what I saw from the QUEST tweets. Links to good stories and information, great photos, regular updates. I'm your newest follower. - NET respondent

I like Twitter because the description is short and there is usually a link, so if it is something that interests me I can click on the link and watch a video, look at a picture or read an article. Twitter is also where I get 50% of my news, so I would enjoy QUEST and sustainability issues being in my feed. – NET respondent

I noticed on the home QUEST page under education there was a question posed and a Twitter conversation about it which I read part of. It was nice to read people's thoughts on the topic via Twitter. – KQED respondent

Passing on this sustainable education is important. Creating greater awareness through social media will take us to the next level – KQED respondent

Why QUEST social media sites add value

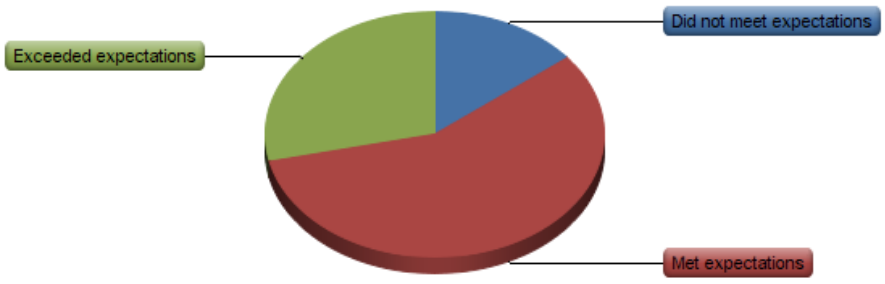
We asked participants to select from a list of statements describing why QUEST's various social media sites had value.

79% - They create a global awareness of science and sustainability
75% - They keep me up to date on important science and sustainability issues.
68% - They expand on topics and ideas introduced in QUEST programming
49% - They provide opportunities for dialogue with others
41% - You can communicate with experts from many different fields of science
1% - They provide no added value

Meeting expectations

After sampling a variety of QUEST video, text and audio material, and exploring the QUEST web and social media sites, we asked survey participants *to what degree did QUEST meet their expectations for delivering a multi-platform series on science and sustainability?*

KCTS respondents



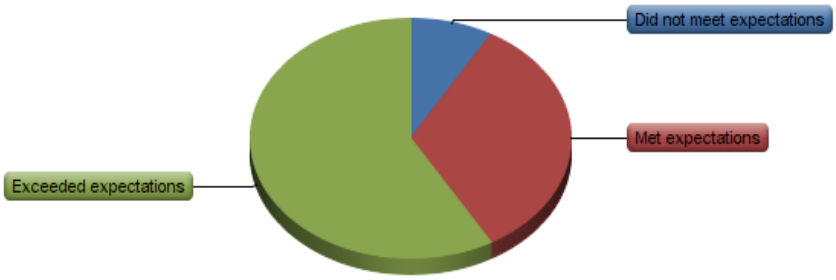
Most KCTS respondents (86%) reported that QUEST material met or exceeded expectations. Those who stated that QUEST exceeded expectations were impressed with the series' multi-platform (video, audio, text and still) presentation, and how this approach helped to address a diversity of learning styles and preferences. Others commented on the quality of the website, videos and supporting articles and documentation, in particular the contextualization of science material.

I thought the videos were well done-short and comprehensive. I liked the written document that followed that supported the video with a bit more detail

I liked the website and the videos. They were easily digestible stories. Many of the stories related to places I've lived and visited which always makes relating to the topic easier.

One respondent who reported the materials did not meet his or her expectations said it was not clear the content was better than that found on other sites.

NET Respondents



Most participants reported the QUEST programming and material met their expectations with 58% reporting that it exceeded expectations. Those who stated that QUEST exceeded their expectations commented on the series' production quality, the breadth and diversity of topics, visual imagery, the diversity of local stories and locations, how the storytelling approach helped to personalize issues, the quality of supporting material and documentation, interest in learning more about environmental topics, and the ability to tailor material for both personal and educational use.

When I participated in the focus group, I did not fully comprehend the geographic scope (6 broadcasters from across the US). Super! I have every intention of skimming through the website with my "teacher eyes" and I will use clips and content for my classes.

It is one thing to say you want to produce exciting, relevant stories that address an issue. However, to produce timely, interesting stories with fantastic visuals and supporting links... I am very impressed!

QUEST covers all the bases. It is a quality production of videos and audio casts, with topics relate directly to sustainability and science and topics that you never thought about. I appreciated that it covers sustainability and science stories from across all parts of the country, and all modes of social media are also covered. I'm

impressed that programs can be used in the classroom and/or for personal interests.

I think the production value and scientific content was better than I expected. I was worried about losing the potential audience by being too technical or discussing only worrisome aspects of environmental impacts due to agriculture practices and energy use. Instead, much of the series focuses on successes and plans for improving problems the have been identified in these areas. While we face many serious problems in our environment today, I believe we can make more progress attracting all people to sustainability causes through positive messages that also clearly demonstrate needs rather than a message of condemnation. I respect what has been done and hope this mission and area continues.

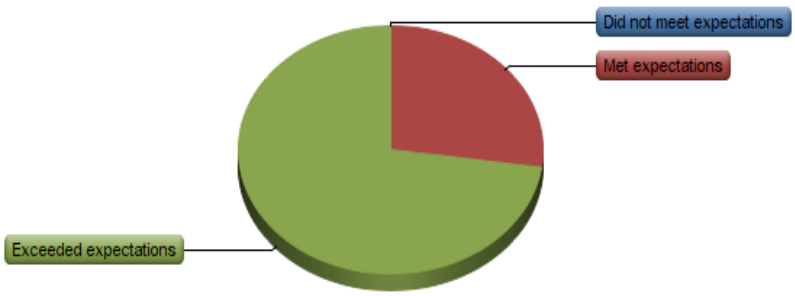
I really enjoyed the diversity and basic depth of topics. I didn't feel overwhelmed, but was left desiring more detail information or knowledge.

Other comments reflected a desire for strictly local content, a continued emphasis on a multi-platform approach, and the need for more balance and diversity in representative views about the environment.

I really enjoyed the water video and about the topography of Nebraska. I think as long as the content is relevant to the geographic area people live in, and videos are included along with narration and text, those hold my interest a lot better.

I was hoping for a more rounded truthful approach with multiple views presented.

UNC-TV respondents



All participants reported the QUEST programming and material met their expectations with 73% reporting that it exceeded expectations. Respondents commented about the professionalism of the productions, the diversity of topics and presentation styles, the functional and navigational 'ease' of the website, the

programs' solution-oriented approach to environmental issues, the quality and breadth of the accompanying articles and resources, and how QUEST programs encouraged them to learn more about environmental issues.

Covers a multitude of topics, presented in a very appealing and educational manner, not too statistical. Lots of eye opening topics, wonderful graphics and narratives. I found this site extremely interesting, informative and understandable. I have put it into my favorites and will keep coming back.

The material presented was very professional, informative and innovative. The interviews were well done and the subject experts were carefully chosen. The articles were also very interesting. Who knew you could build a house with mushrooms? I also liked that the subjects were very oriented towards improving communities.

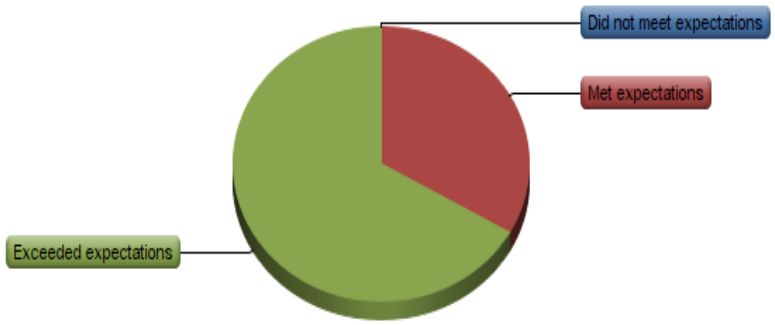
I expected it to be a television series but it's much more comprehensive than that.

It was organized, and was energizing. It had many interesting stories in many different publication forms. It is easy enough to navigate for people of all ages.

One respondent commented on the importance of customizing each of QUEST's social media sites to the need of their respective audiences.

Each social media site has a vastly different audience comprising a large segment of your audience. You need to focus on how each one is different and make adjustments. (For example the FB and G+ are almost exactly the same).

WPT respondents



All WPT participants reported the QUEST programming and material met their expectations with 67% reporting that it exceeded expectations. Respondents were impressed with the production quality of video and audio programs, the breadth

and depth of subject matter, the series' positive solution-oriented presentation, and the professionalism of the site design and layout.

It combined interesting and important topics and hopefully will build positive momentum for sustainability issues. It may be preaching to the choir but would also be a good introduction for others.

There is an abundance of material and a huge variety of subjects that go beyond the standard of what you normally hear.

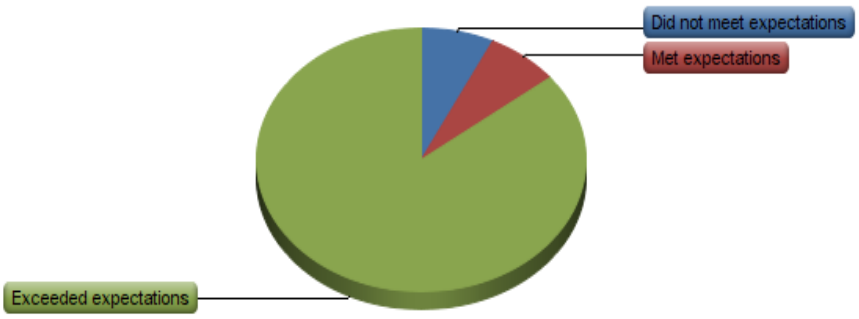
The series had greater depth and more topics than I had thought about.

The videos were the best. I was impressed with the range of topics. It was easy to see how you could spend time on the site browsing the topics.

Other respondents argued for a broadening of viewpoints on environmental issues covered by QUEST.

I would like to have seen more from a big picture standpoint. For example, what is the status of our sustainability when it comes to water? My assumption is there are many varying viewpoints on this. I'd like to hear all of them. This then provides a framework for the rest of the videos and articles.

KQED respondents



Almost all KQED respondents (93%) reported the QUEST programming and material met their expectations, with 86% reporting that it exceeded expectations. Respondents commented positively on the professionalism of the presentation, the excellence of the production quality, the breadth and depth of subject matter, the balanced perspective of experts, the visuals, and the excitement and surprise of learning something new about sustainability and the environment.

The articles were more relevant and more pertinent and - some could even say controversial - I than I thought they would be which really impressed me. There was not a hint of bias. These are just factual issues. Production was excellent, choice of stories and material was great; I genuinely enjoyed each piece, super interesting.

The topics were professionally covered. Every time I thought they needed to have someone from a different perspective, soon after someone appeared. Examples include the farmer from the algae in Lake Erie and the woman talking about the desert tortoise in the solar energy program.

I thought the production value and overall quality of the videos were outstanding and the actual topics covered were really interesting. This summer I drove from LA to Las Vegas and noticed the solar panels, and was wondering what those were. Now I know. And knowing is half the battle!

I guess I expected nothing less, but I feel like QUEST is about to take topics that don't necessarily sound very interesting and can make them very interesting and more importantly applicable to all (even WI cheese). They are able to make topics that are sometimes dry really interesting and applicable to today.

The topics were interesting, and very well done; great use of experts, video, audio. In total QUEST it was interesting and informative for the layperson.

Recommend to a friend

We asked participants to rate on a scale of 0 -10 (with 10 being most likely) how likely they were to recommend QUEST to a friend. A majority of respondents would recommend QUEST to a friend with 85% respondents rating their willingness to recommend it at a seven out of ten or better.

Conclusion

QUEST was a complex, multilayered collaborative, designed to support informal science education and transform traditional notions of science journalism. While it is easy to extol the virtues of this model, it has not been easy to implement. Its major components—production across multiple media platforms, development of science content for regional audiences, collaboration with local and regional formal and informal science and education organizations to disseminate content—have at times proved challenging, in large part because traditional media organizations and television and radio producers work independently of one another, under different timelines, budgets and work processes. Moreover, the work of a station's education and interactive staff typically are often separate and begins *after* media pieces have been finished and made ready for broadcast.

The move toward an integrated, cross-platform production team focusing on science education requires station staff to adopt new roles and identities as informal science educators in essence to undergo a shift in cultural norms. Aligning QUEST with the varied and often competing missions of local science and education organizations has required a similar shift away from traditional walled relationships with these types of organizations.

Finding the best ways to adapt the multilayered model to each station's existing structures, resources, barriers and missions would clearly take time. Changes at KQED-QUEST did not take place overnight, and second-generation stations were experiencing the same fits and starts. Still, as has been documented in this report that positive changes were happening, and the model—and the partner stations' ability to adapt it—were starting to mature. Best practices across the collaborative were beginning to emerge. Plans were in place to reduce administrative control from the project's Central Office, and provide more editorial autonomy to the participating stations. An additional four stations had agreed in principle to join the collaborative, which would have given QUEST a true national presence.

Given the enormous time and investment to design, implement and expand the QUEST concept, it is unfortunate that the project was unable to continue. Clearly, the inability of project leadership and station partners to develop a sustainable funding strategy was a significant factor in the project's demise. However, we believe, that despite this systems failure, had this summative data been available to reviewers as part of QUEST's 2014 proposal submission to NSF, the funding outcome may have been different.

Station executives and project staff believed QUEST was at a critical juncture, and had additional funding been in place to support it, many stations would have been in a position to independently enrich and expand their science and environmental reporting capabilities. Stations such as UNC-TV and *ideastream* had already begun to create new production streams for developing science content, in large part as a result of their participation in QUEST.

Stations were also beginning to embrace QUEST's multi-platform production and information dissemination strategy for science and other content areas. With the acquisition of new digital skills, stations discovered they had a suite of assets—on air, online, mobile and social media—and newfound confidence to leverage those assets for greater community impact.

Local audience reaction to QUEST programming and material was generally positive. Respondent feedback across each of our participating sites concurred that the QUEST platform provided balanced, high-quality productions that increased awareness of important environmental issues, instilling a curiosity to learn more. Respondents enjoyed viewing and listening to QUEST science programming

from stations across the country. Many believed this approach was important for both contextualizing and connecting a diverse range of environmental issues.

Focus groups conducted during last year's formative evaluation set high standards and expectations for the proposed QUEST series. Based on their responses during the summative phase, these expectations were not only met, but for many, were exceeded.

Had funding been in place, QUEST, replete with bumps and bruises along the way, would have been that much closer to achieving its objectives for creating a dynamic, responsive multimedia platform for educating the public, and raising awareness of critical science and sustainability issues both locally and nationally. Though it may not have met all the goals it had set, QUEST has been successful in changing the way their public broadcasting partners produce and distribute science programming.