

Making Science Relevant for Parks and People

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HOW HAVE INVENTORY AND MONITORING (I&M) NETWORKS HELPED TO INCREASE SCIENCE literacy and enhance public participation in resource preservation in parks? Panel members framed challenges and highlighted successes in science communication between the Heartland I&M Network (Heartland Network) and its member parks and partners. The panel provided specific examples of interpreting science in predominantly cultural parks. These projects facilitated interdivisional collaboration, and emphasized the role of science in park management, within the context of each park's primary interpretive themes. Making scientific information relevant to park visitors and stakeholders developed the public's connection to park resources. Connecting inventory and monitoring results to place, park resources, and visitor experience helped managers attain the goals of their individual parks and the National Park Service (NPS).

The NPS needs to engage the public in the process of defining the relevance of its resources and stories. Despite our policies and plans, we alone (the NPS) cannot determine what is relevant about our parks. The NPS needs to engage society in determining what is interesting and relevant within each park. To do that, the NPS must be willing to change in order to meet the pub-

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lic's interest and understanding. This is particularly true in science communication, when the public has a poor understanding of the scientific process and results.

For example, people's belief in the existence of climate change has shifted over time. The public wants proof that climate change exists before engaging the problem. The majority of people now believe that climate change does exist, but they are unwilling to pay tax money, or change their lifestyles to correct it, because they do not perceive it as a problem. Scientists must help the public understand how science works in order to give the public the proof they need to engage the problem on a personal level.

Parks can plant the seeds of how science works in order to inform the public, and engage their interest. One way to do this is to tie the science and issues to a place. This plays directly into interpretation in the parks. People agree that a site is worth saving, but their reasons for saving it may be diverse. Therefore, the personal relevance of that resource or issue varies, depending on the individual's perspective and values. Yet, it is necessary to make the resource issue relevant before the public will engage in change. Tanaka Shozo, a Japanese conservationist said, "The care of rivers is not a question of rivers, but of the human heart." The public must care about the resource before it can care for the resource.

The Heartland Network convened a communication work group to guide communication activities, and evaluate progress in effective science communication. The work group consisted of Heartland Network staff, the regional chief of interpretation, and park resource and interpretation managers. The original Heartland Network Communication Plan 2006 focused on products for the public, but the work group changed the focus to improving science communication between the Heartland Network and its member parks. It accomplished this in several ways:

1. Resource briefs, one-page report summaries, sent to resource management and interpretation, tell what, where, why, when, and how of monitoring, and provide several encapsulated results from the particular report.
2. The newsletter, *The Weather Vane*, creates general awareness of Heartland Network program activities and Science in Parks, giving the program a sense of place by relating the program to park resource issues.
3. A website appeals to various audiences, but places a priority on interpretation by linking park Nature and Science pages to the Heartland Network site, connecting the program to a place and a resource issue; the Heartland Network site contains reports, protocols, and interpretation products for park staff and the public to download (<http://science.nature.nps.gov/im/units/htln/aboutus.cfm>).
4. Scientific auditing, and sharing of best practices in interpretation, improve the quality of park programs; Heartland Network park interpreters use a SharePoint site for discussion and for sharing materials, and they participate in Heartland Network biennial meetings to learn about the monitoring programs and accomplishments.
5. Programs presented by Heartland Network staff for park staff and the public provide opportunities for face-to-face encounters between scientists and all park staff.

These communication efforts, together with building cross-training opportunities and sharing student-interns across park divisions, strengthened the partnership between the Heartland Network and park staff. This resulted in successful communication of scientific information to a variety of park audiences. Examples highlighted in this session included the Junior Ranger, Kids in Parks, and Distance Learning Programs, that had been augmented with updated scientific information. Additionally, highly skilled Citizen Science volunteers, trained in using Heartland Network survey protocols, contributed to scientific databases for the parks, while they became

envoys between their park and the public. The data became part of interpretive materials for park visitors, such as wildflower and bird checklists. Interpreters worked with resource managers to create other interpretive products from sound, scientific information, such as the “Eco-box,” an audio wayside exhibit that utilizes a variety of science-based messages to inform visitors of current issues and potential threats to natural resources.

Scientists and interpreters become most effective when working together to use good science to support the interpretation program. Scientists provide quality information, and interpreters encourage visitors to use this new information to shape their core beliefs about a resource issue. This change in core paradigm brings the visitor to caring about the resource.

Partnerships outside of the NPS have contributed to connecting resource issues to a place, and to nurturing the caring about and for park resources. The Heartland Network collaborated with Erica Cox and Dr. Janice Greene, of Missouri State University (MSU), to hold a teacher workshop. Participants, including local middle school and high school science teachers, network scientists, and park staff, were challenged to incorporate actual Heartland Network data and real world management questions into lesson plans. The example from the workshop focused on a high school lesson, *To Burn or Not to Burn*. Theresa Johnson, science teacher at Miller High School created this lesson. The town of Miller is located on the edge of the western Missouri prairie. Johnson worked closely with Diane Eilenstein, Park Ranger at George Washington Carver National Monument (GWCNM). The lesson began with a discussion of George Washington Carver’s boyhood, his passion for exploring nature, and what Diamond, Missouri, may have looked like when Carver was a boy. Cox served as editor for the project and worked with all groups. Sherry Leis, Fire Ecologist with the Heartland Network, provided technical information about prairie management techniques, and developed graphics for the lesson.

The lesson contained two parts. First, an in-class lesson on prairie and prairie management, has high school biology students interpret data and maps of burn units from the park. The follow-up lesson, a field trip to GWCA, involves students in reviewing an inventory of prairie species within the burn areas as designated on maps that they had previously used. Eilenstein has purchased materials to be used in an adaptation of the lesson planned for this summer with the Junior Ranger program. It is anticipated that small revisions may be necessary, following trials of the lesson with students and groups.

Science interpretation in cultural and historical parks can address global challenges by connecting the science and issue to a place. Just as we connect the story of slavery to a Civil War site, we can connect science issues to that same site. For example, interpreters tell the story of how slavery was justified by slave owners 150 years ago, because it improved the owner’s life and society found it acceptable. Similarly, we justify our carbon footprint today, because things that contribute to our footprint improve our lives. Furthermore, elements of society use the public’s lack of science literacy to tell us that society accepts a large carbon footprint as inevitable. We can make people aware of their lifestyle choices with interpretive exercises that ask questions, such as, “what was George Washington Carver’s boyhood carbon footprint?” and “how does that compare to an average youth’s carbon footprint today?”

The Heartland Network supports the parks, enhancing decision-making and interpretation. The parks are a portal to the public for science literacy and an example for implementing best management practices. It starts with the high quality information from science that is processed through good science communication practices for use in park resource management and interpretation. We need to meet the audience where it is in understanding the issues. In evaluating the effectiveness of our communication, we must engage the visitor by listening to the values that the visitor brings with them and the meanings that they take away with them. We must instill the awe of the place and the resource in the visitors so that they care about the resource. We cannot

achieve that awe if the visitor is merely the recipient of facts. Science alone is not enough to carry the day. However, interaction between quality scientific information and the interpreters' abilities to make that information relevant to the public affects caring for the park resources.

The late David Larsen, NPS Interpretation and Education Training Manager, Harpers Ferry Center, Harpers Ferry, West Virginia, was to have presented in this session. The panel organizers wish to acknowledge his contributions to the panel, and dedicated this session to his memory.