

Final Report

DISSEMINATION AND EXPANSION OF THE SCIENCE IN OUR PARKS EDUCATIONAL PROGRAM, PRIMARILY ON THE NAVAJO AND HOPI RESERVATIONS

Cooperative Agreement No. CA 1200-99-009 Task Agreement No. NAU-40

Submitted by Joëlle Clark

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Project Description

Under the CESU Cooperative Agreement (CA) between the National Park Service (NPS) and Northern Arizona University (NAU), the Flagstaff Area National Monuments (NPS-FLAG) expanded a curriculum-based education program used in the national monuments. This collaboration was initiated in 1997 with the Science and Mathematics Learning Center (now the Center for Science Teaching and Learning – CSTL) through Cooperative Agreement No. 8048-8-0002, and resulted in the production of the *Science in Our Parks* curriculum now in use in the Flagstaff Area National Monuments. The *Science in Our Parks* format is based on national education standards and offers preparatory lessons, background information, and opportunities for students to conduct mini-research projects at one of the parks, and then report their findings to the NPS. A similar program, also developed by CSTL, is in place at Petrified Forest National Park (PEFO) and at Hubbell Trading Post (HUTR).

The intent of the expansion project for the *Science In Our Parks* program was the following:

- Provide Internet access to information about the program;
- Conduct a formative evaluation for the Science In Our Parks program;
- Provide enhanced interpretation for Hopi and Navajo school groups;
- Revise existing materials; and
- Provide alternative venues for teachers or other educator to learn about the program.

This report outlines the results and accomplishments of this agreement.

Project Results and Accomplishments

Internet Development:

Linda Neff, website designer for Northern Arizona University's Institute for Future Work Force Development, designed and produced a first draft of the *Science In Our Parks* website in the Spring 2003. These website pages have been subsequently re-drafted in response to changes in the National Park Service web presence and identity. The *Science In Our Parks* program is included as part of the NPS-FLG education section in their web pages. The figure below is the introductory web page for the program.

Figure 1: *Science In Our Parks* Introductory Webpage

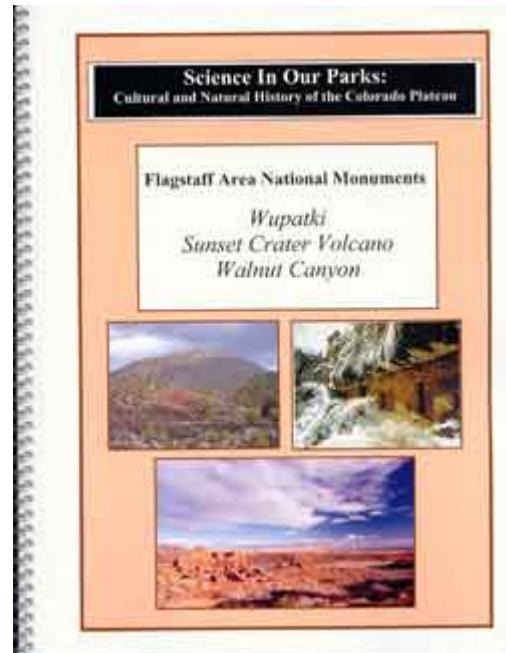
Curriculum Materials

Science in Our Parks

Science In Our Parks is a curriculum-based program for 4th through 6th grade teachers and their students. It is designed around issues common to the Colorado Plateau, using examples from Wupatki, Sunset Crater Volcano, and Walnut Canyon National Monuments. Students improve teamwork, reasoning, and critical thinking skills through classroom activities and field explorations in the monuments.

A handbook containing field explorations and pre- and post-visit materials is available for teachers planning visits to the Flagstaff Area National Monuments. [See a sample field exploration.](#) (pdf)

Please contact the [Interpretive Specialist](#) for additional details.



Formative Evaluation and Revision of the *Science In Our Parks* Program

Prior to the dissemination and expansion project, the primary form of dissemination for the program was through teacher workshops. With changes in education due to No Child Left Behind Act, many teachers were no longer able to attend these sessions and the program was experiencing low workshop enrollments. Thus, a formative evaluation with teachers and rangers who had previously used the program was conducted to gather information on the effectiveness and viability of the teacher workshops and to determine what changes needed to be made to the program in light of changes in academic standards. A program evaluation instrument (Appendix 1) was sent to 27 educators with a letter requesting assistance and explaining the rationale for the evaluation. Based on their responses, we included an alignment of the program with Arizona Academic standards, modified the pre and post visit activities, provided more detailed descriptions and directions for the field explorations, and reduced the number of field explorations. We also created a workshop video to explain the program so that attending a teacher workshop was no longer necessary.

Enhanced Navajo and Hopi Interpretation in the *Science In Our Parks* Program

Both Hopi and Navajo are culturally affiliated with the Flagstaff Area National Monuments (Wupatki, Sunset Crater Volcano, and Walnut Canyon), and their histories and traditions are an integral part of each park's purpose, significance, and interpretive themes. The project worked with six Navajo and Hopi educators to revise and evaluate the content included in the *Science In Our Parks* program. Each participating educator conducted pre-visit and post-visit activities with their students and brought their students to one of the three monuments for a field exploration (field investigation). The educators completed an extensive evaluation for the program, making recommendations to enhance cultural sensitivities, awareness, and interpretations as appropriate.

Several of these classes were videotaped on their field explorations by NAU's School of Communication to serve as recruitment and training videos for future classes.

Science In Our Parks Program Advertising

NAU School of Communications senior project students produced two videos for the *Science in Our Parks* education program. One video is designed to be promotional and can be used in a variety of venues including a streaming informational piece on the NPS-FLG website or used in local, regional, or state venues to disseminate information about the program. The second video was designed to be a professional development video. As such, it is more extensive than the promotional video providing detailed description of the program and its components.

A complete copy of the *Science In Our Parks* can be made available upon request to the Flagstaff Area National Monuments headquarters.

Appendix 1

Science In Our Parks Program Evaluation

Name _____ Grade: _____

School: _____

Contact Information: (Please give us the best way to contact you if we need to do any follow-up – mail, email, address (home or school), fax, or phone numbers): _____

The Science In Our Parks program utilizes interdisciplinary curricular materials, *Science In Our Parks: Cultural and Natural History of the Colorado Plateau*, as a framework to help educators design and implement scientific field investigations on national park service lands with their students. Through classroom activities and field explorations, students will develop an understanding of scientific inquiry, park management, and gain a sense of resource stewardship.

Science In Our Parks Intended Program Outcomes:

1. Provide professional development on the use and implementation of the curriculum materials and accompanying field explorations
2. Provide curriculum materials to help educators prepare students for their field explorations.
3. Build understanding of inquiry process through engaging students in on-site field explorations based on actual research topics, issues, and problems facing the Flagstaff Areas of the National Park Service.
4. Help students gain a sense of resource stewardship by completing a post-field project based on their data and learning from the field explorations.

Please reflect back over your experience and involvement in the Science In Our Parks program (at whatever level you participated) and let us know how well did the Institute helped you meet the intended outcomes? Please share your thoughts and any additional comments. We are currently revising the program and need your feedback.

As a thank you for your assistance, we will send you a gift from the Western National Parks Association upon receipt of your completed evaluation form. We hope that this gift will express our appreciation for the time and effort you are taking to help shape the future of this unique program.

Please mail or fax this evaluation to:

Joëlle Clark, Science and Mathematics Learning Center, Box 5697, Flagstaff, AZ 86011-5697.
Phone: (928) 523-8797. Fax: (928) 523-7953. Or email me and I will send you an electronic version of this evaluation for you to complete Joelle.Clark@nau.edu

Evaluation Questions

1. How well did the workshop you attended provide you with the knowledge and experience to use and implement the curriculum materials and field explorations?



1	2	3	4	5	6
Not Applicable	Little or No effect	Some effect but I am still unclear	I understand with some clarity	I understand pretty well	I have it! I can understand it and can explain it to others

Please comment on the workshop. We are considering some alternate professional development strategies and need to hear your perspective on how best to prepare educators and their students to participate in the field explorations.

2. Please rate the degree to which the written curriculum materials helped you prepare students for their field explorations.



1	2	3	4	5	6
Not Applicable	Little or No use of the materials	I chose to prepare the students in my own way.	I used one or more of the lessons.	I used most of the lessons and materials.	The materials were very helpful to me and my students/

Please tell us how we can improve upon or change the written curriculum materials in the binder provided to you. We are currently aligning the materials to Arizona Academic Standards and are considering some lesson revising.

3. How well did the field exploration build understanding of inquiry process?



1	2	3	4	5	6
Not Applicable	Little or No effect	My students were unclear about what they did.	My students understood most of the field exploration work	My students understood the field explorations pretty well	My students were thoroughly engaged in the process of collecting and interpreting their data.

Please share with us your thoughts and ideas about the field exploration in which your students participated. If your students did not participate in any field exploration, please let us know why or what we can do to help your students experience this field-based opportunity.

4. How well did the Science In Our parks experience help students gain a sense of resource stewardship?



1	2	3	4	5	6
Not Applicable	Little or No effect	My students are still unclear about resource stewardship.	My students understood resource stewardship somewhat.	My students understood resource stewardship pretty well	My students got it and demonstrated an understanding of resource stewardship.

Please share with us some of the post-visit projects your students created as a result of their field explorations. As an educator, what do you feel is the value of those post-visit projects? What recommendations do you have for this aspect of the program?

Please answer the following questions as completely as possible.

1. We are developing a website for the Science In Our Parks program. Do you have any suggestions for what you or your students would like to have included in the website?
 2. As mentioned previously, we are making revisions to the Science In Our Parks program. What specific suggestions do you have?
 3. Are there any ideas you have for different field explorations that could be considered for development? Which ones should we DEFINITELY keep?
 4. Please feel free to provide any additional comments, suggestions or recommendations.