

Status of Project, July 5, 2007

Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU) RM-CESU Cooperative Agreement Number: H1200040001

TITLE OF PROJECT: Developing Education Resources, “Views of the National Parks,” phase 6, modification of UCOD-06/21/22/24/33, J2370041435

Background

“... the National Park Service embrace[s] its mission, as educator, to become a more significant part of America’s educational system by providing formal and informal programs for students and learners of all ages inside and outside park boundaries.”
— National Park System Advisory Board, “Rethinking the National Parks for the 21st Century”

The National Park System is a magnificent outdoor classroom for teaching and inspiring students. Exploring the many parks in the system is like taking a visual trip through a library of books on the natural and cultural worlds. Coastal processes and mountain-building, volcanic landforms and fossil remains of times past, ecological science and nutrient cycling, nightsky and daytime viewsheds, invasive species and cultural connections among peoples and to the land. All of these topics may be explored in our national parks – and to that end the National Park Service (NPS) has initiated an interactive, multimedia education system named “Views of the National Parks.” Its purpose is explained on the opening screen:

“Welcome to Views of the National Parks. The United States’ national park system is a magnificent quilt work of people and places stitched seamlessly in the fabric of the American experience. Come, explore this mosaic where the natural world and our cultural heritage are deeply intertwined. Investigate natural wonders and the powerful forces that sculpt them. Discover how the natural landscape has shaped - and been shaped by - the American people. Recognize the uniqueness and diversity of our many cultures and celebrate the threads that join us all as Americans. Connect with the stories of your national parks, and “Experience your America.”

Views Architecture

Views of the National Parks (Views) consists of two complementary components: virtual experiences and knowledge centers. Virtual experiences provide multimedia gateways to park-based educational experiences. They help park interpreters and education specialists reach a greater number of people, including park visitors that do not have time to take a ranger-led tour, students in classrooms (local and distant), handicapped visitors who cannot reach remote park sites, or members of the public unable to visit the park. Virtual experiences also allow interpreters and educational specialists to re-create historical, natural, and cultural landscapes. The ability to experience vanished landscapes will provide a new understanding of the past and of the processes that created the landscapes we see today. Knowledge centers present general information and principles on a variety of natural resource themes. They provide the basic knowledge required to better understand and appreciate the natural processes that have created our national parks. Knowledge centers provide a means of connecting national parks that share natural resource themes and also to provide linkages to citizens across the country, whether they live in an urban or rural environment. People will protect what they understand. It is the responsibility of the

NPS to help all its citizens understand the natural and cultural resources in our parks so they can become responsible stewards of our all planet's resources.

Creative Approach

Views has been a successful project because it has attracted a cadre of very dedicated and talented individuals and because the "creative process" is based on eight important principles which have led to quality products.

- 1) Fully involve park staff or subject matter experts throughout the entire process.

From the initial conceptual design to the final published product, park staff and/or subject matter experts play a central role in all aspects of module construction. These people know the information and the best ways to present that information. Since each set of experts takes a different approach, each new module is fresh and exciting. This approach also builds "buy-in," which ensures the completed product will be used. This process also fosters communication and cooperation among staff from WASO, parks, regions, universities and other partners.

- 2) Present accurate and timely information

All information presented in Views is collected, synthesized, and reviewed by park and/or subject matter experts. The success of this approach may be seen at the "Best of Science Websites" created by WGBH Educational Television and the DLESE (Digital Library for Earth Science Education) website. Currently, six earth science-based Views modules have been selected for inclusion by these websites. The Wilderness module was cited as a "quality wilderness education website" in a 2005 article on wilderness education in the International Journal of Wilderness (G. Hansen and T. Carlson, 2005).

- 3) Integrate natural resources and cultural resources

Natural and cultural resources are often intimately intertwined. One influences the other and the story of that interaction is fascinating. The NPS is America's Storyteller – it is our responsibility to fully engage our visitors in the rich fabric that is woven from both the warp and the woof – the natural and cultural resources – of our country.

- 4) Present information from multicultural perspectives

As America's Storytellers, it is our responsibility to present information from multiple cultural perspectives. While it is important to know the scientific facts concerning a particular species of plant, it is equally important to know how different peoples incorporated that plant into their culture. If we listen to each other's stories, we will better understand each other, which will enrich us all.

- 5) Provide well-designed and easily accessible educational resources

The future of our parks depends upon the willingness of the public to protect these special places. People will protect what they understand. By providing Views with a solid educational foundation, including information on all relevant national teaching standards, we will facilitate its incorporation into school curricula and park-based

presentations. Learning about these places will bring appreciation of the park system and acceptance of the responsibility to protect these special places.

6) Use modern techniques to inspire and teach

We live in Multimedia Times. Messages are short, concise, and simultaneously stimulate many of our senses. The Views Project must accept the challenge to capture the interest of a public expecting exciting multimedia. Modern technology should be used effectively - as both an educational and inspirational tool.

7) Integrate science and the arts

Views seeks to engage both the “right brain” and the “left brain.” Science, math, and the scientific method are important parts of our world. But so are poetry, song, music, and literature. Our parks have always been a source of inspiration for great artists and writers and for the general public. We should celebrate this aspect of our parks by fostering an appreciation for the creative influence of our national parks.

8) Provide the opportunity for personal connections to park resources

Even our smallest parks offer a cacophony of sights, sounds, smells, and ideas. Which ones are the most important? The ones which touch you as an individual. The ones which somehow forge a bridge between your experiences and the wonders that park have to offer. Once forged, that special connection will endure. Views must provide the raw materials as well as the opportunity to build those bridges.

Module Production

Production of a Views module is a team effort and requires a variety of skills. Typically, a new module is suggested by a domain expert or park staff person. If approved, the Views staff, subject or park experts, and appropriate NPS/university partners develop an outline that presents the information in an organized format. From this outline, a “script” is written that will provide the on-screen text. The script is prepared by either a contract technical writer or park staff. Following review, revision, and final script approval, domain experts and Views staff identify complimentary images and multimedia resources. Depending upon the script, Views modules have employed: panoramas (up to 360 degrees and full overhead coverage), interactive diagrams, digital movies, soundscapes, 3-D images (using red-blue glasses), etc. Emphasis is on the effective use of these techniques. If necessary (and funds available), a Views team will visit the subject park and obtain the imagery and multimedia. As the multimedia assets are collected and prepared, a module interface is developed that is attractive, yet functional, and maintains the overall “look-and-feel” of the Views system. Each module is designed and assembled to meet the specific needs of the park or subject matter, but also must meet standard design requirements to ensure a seamless blend with all existing Views modules. Once the interface is approved, the module is populated with text (from the script) and multimedia/imagery. The completed module is then reviewed to ensure all design elements, text, and multimedia are correct and working properly. If a professional educator is available, the module is given to him/her for preparation of complimentary lesson plans. At the current time, the target audience for Views is the general public and middle school-age students. The final step is to add the module to the Views website and Views DVD.

Involvement with the University of Colorado at Denver School of Education and Human Development

In 2005, faculty and students from the University of Colorado at Denver (UC-D) began to work cooperatively with NPS personnel on the Views project. The modules built for this project use multimedia techniques to present high quality science and cultural resource information to the public and school children. To make these modules more effective, the NPS has partnered with the University of Colorado-Denver so as to utilize their education expertise for the preparation of lesson plans, educational curriculum guides, references to national teaching standards, etc. In order to provide a balanced learning opportunity for their students, UC-D has also drawn on NPS expertise to teach their students how to capture multimedia assets in the field and how to assemble the final modules using computer-based graphics programs.

UC-D faculty, staff, and/or students have worked with NPS staff to provide computer and educational expertise for selected Views. This work has involved several critical areas in Views module development, including 1) module design and asset collection, 2) graphic design and assembly, and 3) development of supporting educational materials.

Module Development by UC-D Staff

Two modules have been completed by UC-D staff: “Petroglyphs (PETR) National Monument Volcanism” case study and the “Sonoran Desert” ecosystem module. A third module, “Geology of Grand Canyon NP” is currently under development. Two additional modules, Guadalupe Mountains NP (GUMO) Permian Reef Trail and Palo Alto Battlefield NHS (PAAL) are under development. UC-D staff has assisted in their development, although the lead developer is an NPS employee. Work has been initiated on the Chesapeake Bay module, focusing on local resources and issues, but also containing information applicable to the entire NPS System, especially in the areas of ecosystem science and conservation. For the modules listed above, the UC-D researchers worked with NPS WASO, park, and regional staff to develop a module outline, prepare a list of required multimedia assets, design the module interface, and/or prepare a module script. UC-D staff assembled the needed assets and then populated the module with appropriate text, multimedia assets, and graphics. The UC-D researchers linked all multimedia and text to appropriate locations within the module and ensured seamless integration with the existing Views system. The PETR case study included an activity where the user tried to understand the symbolism in ancient Native American rock art. The Sonoran Desert module was very complex in the area of multimedia. The multimedia assets in this module included: an introductory movie, taped interviews, 360 degree panoramas, virtual walks, and numerous complex visual graphics. The interface was designed to complement the colors and symbolism of the desert.

Educational Resources Developed by UC-D Staff

To meet the education-based goals, a UC-D educator wrote educational curriculum guides to compliment two existing Views modules. Currently, she has completed 1-week, 2-week, and comprehensive educational curriculum guides for “Caves and Karst”

and has almost completed 1-week and 2-week educational curriculum guides for “Glaciers.” These guides are available from within the Views website or the current Views DVD. The guides may be used on-line or printed from .PDF files. After developing a comprehensive curriculum guide for “Caves and Karst,” it was mutually decided that guides this large would not be produced for future modules. The Cave and Karst curriculum guide was reviewed by Ron Kerbo, the NPS Cave and Karst National Coordinator at the time (he has since retired). The WASO-Geologic Resources Division also provided a second reviewer (temporary staff person who had experience in caves/karst) for the module. All review comments were incorporated into the final drafts. For the “Glaciers” curriculum guides, a number of qualified USGS reviewers have been identified. Based on their availability to review the curriculum guide, two glacier experts will be sent the draft guide in late summer 2007. In addition, one of the Glaciers activities involves comparing paired Landsat images of Bear Glacier at Kenai Fjords (KEFJ) NP. This activity has been reviewed by our partners at NASA Landsat and a staff person at KEFJ has been designated as a “local” reviewer.

The Educational Specialist provided support in areas other than preparation of curriculum guides. She participated in a number of presentations, including: National Park Week 2006 (Trailblazer Elementary School, Highlands Ranch, CO) and a 4-hour presentation to education graduate students at the University of Colorado-Denver. At the National Science Teachers Association Annual Conference (2007), the Educational Specialist represented the Views project in a joint National Park Service/National Park Foundation exhibition hall booth. The Education Specialist has produced a PowerPoint presentation on educational resources in Views, a “Jeopardy-type” game for Views presentations, and a number of handouts. Lastly, she has served as an information source for the Project Manager, providing educational expertise for various planning activities. All educational tasks were mutually decided by NPS and UC-D, and coordinated by Dr. Mike Marlow (UC-D).

Status of Deliverables

Sonoran Desert Knowledge Center – Complete. Includes basic scientific information on the Sonoran Desert (flora, fauna, paleo-astronomy, climatology, etc.) as well as multicultural viewpoints of the desert (Mexican resource managers from El Pinacate y Gran Desierto del Altar Biosphere Reserve [Sonora, Mexico], member of the Hia-Ced O’odham people, a bilingual ethnobotany trail, and a bilingual curriculum on desert). The module has many interviews, panoramas, videos, and interactive graphics. Featured parks include: CAGR, MOCA, ORPI, SAGU, TONT, TUMA, and TUZI. Related to this work, the IMR Chief of Interpretation asked for a project proposal on “Issues at Border Parks,” which would include a Views module, to be submitted as a “Signature Project” for the NPS Centennial Celebration (it was submitted by ORPI and CORO).

Petroglyph NM Volcanism Case Study – Complete. Overview of volcanic processes at PETR, local rocks, the importance of volcanic features to Native Americans, and an interactive rock art feature. This case study was created in partnership with PETR. Staff from PETR presented the module (and the rest of Views) at the 2006 New Mexico State Fair.

“Caves and Karst” educational curriculum guide – Complete. This set of documents includes a comprehensive, 1-week, and 2-week curriculum guide. Each is available as a printed version,

PDF file, or on internet. These guides were demonstrated to teachers at the 2007 National Science Teachers Association Conference. The guides include a number of exercises that use IMR parks as examples or are applicable for IMR parks. Each exercise in this related to national teaching standards. It includes case studies on CAVE and TICA. These guides were written by UCD staff with help from Views personnel on the graphics.

“Glaciers” educational curriculum guide -- Almost Complete. 1-week and 2-week curriculum guides have been produced and are ready for final technical review (by USGS scientists). They will be available in hardcopy, PDF, or on internet. An early version of the curriculum guides were shown at NSTA, where we obtained feedback from educators. The guides include a number of exercises applicable for IMR parks. Each exercise is related to national teaching standards. These guides were written by UCD staff with help from Views personnel on the graphics. The guides include a lesson plan developed in partnership with NASA Landsat (Anita Davis) which uses dot grids to “measure” glacial retreat at KEFJ.

Translation of the Views Wilderness Knowledge Center to Spanish. The translation is complete (over 100 pages of text) and approximately half of the English text has been replaced with Spanish text (by Carhart personnel). Although this work did not directly involve UC-D staff, it was facilitated by the partnership that has evolved among the Views Project, IMR, and UC-D. The Spanish Colonial Research Center (SCRC)(Albuquerque, NM) and the Arthur Carhart National Wilderness Training Center provided the expertise and funding to translate the Wilderness module into Spanish. Needing a reviewer, Bruce Nash contacted Bill Gwaltney at the IMR, who suggested Ms. Susan Boyle (NPS retired, Ft Collins). Susan provided review comments, which were incorporated by the SCRC. A number of IMR parks are included in this module, including case studies at ROMO and ORPI. The lesson plan included in this module (but not translated to Spanish) was written by a UC-D graduate student.

PAAL (Palo Alto Battlefield NHS) – PAAL staff contracted with a university to produce a website featuring ecosystems and flora/fauna of PAAL. After seeing the Views program, PAAL asked the Views team to work with their contractor to ensure the website had a Views “look-and-feel.” When the final product was delivered to PAAL, they asked us to rework the website, creating a tighter connection to Views. Upon review of the product, we suggested some reworking of the script (= on-screen text) and replacing the many copyrighted images with public domain images. The park staff agreed with these suggestions and has worked with the Views team to implement them. To date, the module interface has been re-designed (approved by park staff), the script rewritten, and we are working with PAAL staff to replace the last of the copyrighted images. This work has been done primarily by NPS Views staff; however UC-D staff has participated.

GUMO (Guadalupe Mountains NP) – The script for this module was written by park staff and reviewed by the Views contract writer/editor and GRD staff. The module interface was designed by Views staff and approved by the park. We are currently working with the park to finalize the on-screen text and locate the last needed imagery. The Views project shipped an iPod to GUMO to enable them to produce some interviews for inclusion in the module. The final product will be a virtual trail through the Permian Reef formation with some additional material on key individual(s) in park history.

GRCA (Grand Canyon NP) Geology – GRCA staff wanted a Views module on GRCA geology, but the Views team was unable to meet the park’s desired delivery date. Therefore, the park started production on their own, with the intent of using the Views “look-and-feel,” so eventually

the module could be moved into the Views program. The park produced a website which included much of the planned information and turned this website over to the Views team in May 2007. At that time a UC-D graphics specialist was put in charge of the module and she began working with GRCA staff to produce a GRCA Geology module for Views. To date, much of the needed imagery has been collected by the park and the script is being reorganized for the Views format. The script was reviewed for technical content by a panel of geologists familiar with Grand Canyon geology. The interface designed by the park staff will probably be slightly modified to fit Views design guidelines. By mutual agreement, the planned multimedia assets will need to wait until additional funding can be located.

Geologic Time Knowledge Center – This ambitious module has been underdevelopment for a number of years. The script will be complete by the end of July 2007. Staff from IMR has played an important role in this project from its beginning. IMR Interpretation staff wants to use this module (and other Views modules) as a framework to provide region-wide (and possibly service-wide) geologic information and competency certifications. In December 2006, the Denver Museum of Nature and Science joined this project. Kirk Johnson, Vice President of Research & Collections, Chief Curator, and Curator of Paleontology, reviewed the entire Geologic Time and Paleontology scripts. He has also offered Museum assistance in collecting imagery, multimedia, etc. Many IMR parks are included as case studies in this module.

Paleontology Knowledge Center -- This module has been developed alongside the module on Geologic Time. All of the comments for Geologic Time module are applicable for the Paleontology module.

Ancestral Puebloans and Their Ties to the Land – This module has widespread support, but few financial resources. A number of IMR parks and the Views team have committed to producing a module on the Ancestral Puebloans and their ties to the land. The module will look at the connections between the people and the land and how each has influenced the other. The module will consist of many interviews so the story is told by the descendents of the Puebloans. An outline for the module was written that will provide guidance on what subject matter to include in the module. During the summer of 2006, BAND, PETR, and PECO hired a teacher-ranger-teacher to work with park staff and collect information and multimedia for use in the planned module. The Chief of Interpretation from BAND is working with UC-D (Dr. Mike Marlow) to hire UC-D students (= teachers) to work in the park. Parks that have expressed interest in the project are: AZRU, BAND, CHCU, ELMA, ELMO, MEVE, PECO, and PETR. The IMR Chief of Interpretation asked for a project proposal to be submitted as a “Signature Project” for the NPS Centennial Celebration (it was submitted by BAND).

Benefits for UC-D

Three employees/students (Kristen Lucke, Erika Matteo, Maureen Craig) have been hired by funds provided from the Views Project. These individuals have received salary, but also professional experience working on a multidisciplinary project, training in the areas of multimedia, graphics, interacting with WASO/region/park staff, and working as a member of a large team.

In addition to the staff mentioned above, other UC-D students have participated in meetings and workshops, where NPS staff has provided training, equipment, etc. For example, the NPS conducted a multimedia training session for about 20 UC-D students/staff prior to their 2006 trip to Hawai'i Volcanoes National Park.

Bruce Nash (and Judy Geniac, WASO-GRD) represented the NPS at the kick-off meeting of CASMIC (Center for Applied Science and Mathematics for Innovation and Competitiveness) on the UC-D campus.

Bruce Nash participated in a focus group composed of environmental educators to provide the School of Education and Human Development with information and suggestions for the proposed Informal Education concentration at UC-D.

Bruce Nash participated on a School of Education and Human Development faculty search committee. A portion of the interview process included a discussion of how the candidate would add to the existing NPS/University of Colorado-Denver partnership. One of the three candidates was hired by the university and will arrive in August 2007.

Bruce Nash participated in a UC-D “science and math concentration” doctoral laboratory meeting. As a result of this meeting, a number of joint NPS-UC-D proposals were developed for NSTA 2008 and other professional meetings. UC-D students and staff will plan and present work with NPS Views staff.

Bruce Nash provided input and review on a proposal submitted to the International Polar Year Project. If funded, NPS will partner and provide information and imagery on extreme environments found within NPS units (to be compared with Antarctica and Mars).

Bruce Nash provided input and review on a proposal submitted to the National Endowment for the Humanities. This proposal was not funded; however it is being revised and will be resubmitted. If funded, the project will include investigating how cultures represented within NPS units have made science a part of their culture.

Bruce Nash and other NPS personnel (WASO and IMR) met with UC-D to discuss joint programs focusing on culturally responsible curricula and work UC-D can do (under contract with IMR) to improve diversity objectives of IMR (which could be expanded to national). Funding and future work is being discussed between representatives from IMR and UC-D.

Bruce Nash served as an initial liaison between IMR Interpretation and UC-D on the Teacher-Ranger-Teacher Project. This stand-alone project, funded through the RM-CESU, is providing educational expertise to the IMR.

Bruce Nash and Kristen Lucke (UC-D) designed and presented a 4-hour workshop for a UC-D graduate-level course for science teachers. Bruce and Kristen presented Views, showed how parks use data to make decisions, and how teachers can use park data in Views for classroom exercises.

Availability

“Views of the National Parks” may be accessed at the Views website:

<http://www2.nature.nps.gov/views/>

The entire program is also available on DVD and selected modules on CD.

Additional Information

Fact sheets for most Views modules are available on-line in the “Help and Information Center” in the Views Visitor Center (<http://www2.nature.nps.gov/views/>). These 1-page (2-sided) color handouts provide information on the key features within each module.

Additional information may also be obtained by contacting

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Literature Cited

Hansen, G., and Carlson, T. 2005. Wilderness education: The ultimate commitment to quality wilderness stewardship. *International Journal of Wilderness* 11(1):21-25, 34.

Status of “Views of the National Parks” modules, July 2007

Name of Module ¹	Status	Educational Resources	Included in WGBH Website ²	Included in DLESE Website ³	Comments
VE – Grand Canyon Wildlife	Complete	Yes			Includes original songs
VE – Florissant Fossil Beds NM	Complete	Yes	Yes		
VE – Pu’uhonua o Honaunau NHP	Complete				
VE – Fort Bowie NHS	Complete				Small module
VE – Geology of the National Mall	Multimedia To Be Added				
VE – Timpanogos Cave NM	Complete		Yes		
VE – Grand Canyon-Parashant NM	Complete				
VE – Petersburg NM	Complete				
VE – Tonto NM	Complete				
VE – Whiskeytown NRA	Complete				
KC – Cave and Karst	Complete	Yes	Yes	Yes	
KC - Wilderness	Complete	Yes			With USDA-FS, USFWS, BLM, USGS-BRD, NPS, Carhart National Wilderness Training Center, etc.
KC – Coastal Geology	Complete	Yes	Yes	Yes	Update requested by Rebecca Beavers
KC – Invasive Species	Complete				Enhancements planned
KC - Glaciers	Complete	Yes	Yes	Yes	
KC – Volcanism	Complete	Yes	Yes	Yes	
KC – The Scientific Method	Complete				
KC – The Milankovitch Cycles	Complete		Yes		
KC – The Hydrologic Cycle	Complete				
VE – Geology of Devils Tower NM	Complete				
KC – The Sonoran Desert	Complete	Yes			With University of Arizona and USGS-BRD. Includes Native American and Mexican perspectives.
KC – Chesapeake Bay	Under Development	Planned			With Chesapeake Bay Program Office
VE – Palo Alto Battlefield NHS	Under Development				
VE – Fort Sumter NM/Charles Pickney NHS	On Hold Pending Funds				With James Madison University. Includes section on Gullah-Geechee culture and slave perspective
VE – Badlands NP	Completed				

VE – Petroglyphs NM Case Study	Completed				Developed for Volcanism KC. Demonstrated at New Mexico State Fair 2006
VE – Guadalupe Mountains NP Permian Reef Trail	Under Development				
KC – Principles of Ecology	Under Development				With University of Arizona, USGS-BRD, and James Madison University
KC – Paleontology	Under Development				With Denver Museum of Nature & Science. Script is complete
KC – Geologic Time	Under Development				With Denver Museum of Nature & Science. Script is complete
VE – Grand Canyon Geology	Under Development				Includes animated Grand Canyon fly-through developed with NASA Mission Mars, Landsat Program, and GRCA.
KC – The Ancestral Puebloans and Their Ties to the Land	Planned				Some data collection has occurred. At least 6 NPS units and IMR would participate
KC – Plate Tectonics	Planned				Possibly with Dr. Bob Lillie, Oregon State University, IMR
KC – Earth Materials	Planned				Possibly with Dr. Bob Lillie, Oregon State University, IMR
KC – Surface Processes	Planned				Possibly with Dr. Bob Lillie, Oregon State University, IMR
KC -- Snow Sampling/Analysis	Planned				With USGS-WRD and Kathy Tonnessen, IMR RM-CESU.
KC – Soils	Planned				Partner with I & M Program/Pete Biggam
KC – Exploration	Planned				

¹VE = Virtual Experience, KC = Knowledge Center

²WGBH Educational Television (Boston, MA) has a National Science Foundation grant to create a website that provides teachers with suggestions for the best science websites on the Internet. At the present time they are adding sites dealing with the Earth sciences. Future additions will include the biological sciences.

³ The Digital Library for Earth System Education (DLESE) is a collaborative effort to provide support and leadership in addressing the national reform agenda for science education, scientific literacy, and scientific discovery.

