Advances in Rock Art Field Assessment

Casey D. Allen[1], Austen K. Cutrell[1], Niccole V. Cerveny[2], and Jay Theurer[3]

[1]University of Colorado, Denver, Department of Geography and Environmental Sciences; [2]Mesa Community College, Department of Geography, Mesa, Arizona; [3]Petrified Forest National Park, Arizona.

Most integrative approaches to rock art management necessitate far greater financing and specialty skills than land managers have at their disposal. The rock art stability index (RASI, Dorn et al. 2008) remedies this drawback for cultural heritage resource managers by offering an accessible technique to assess a rock art panel's stability. Unlike other rock art assessment methods (cf. Fitzner 2002; Viles et al. 1997), RASI was created as a non-invasive, cost-effective field assessment technique focusing on approximately three-dozen easily identifiable rock weathering forms (or the breaking-down of rock in place) brought on by different geological processes. By combining these key factors, RASI offers an efficient method to help researchers establish the condition of a rock art panel (Cerveny 2005; Dorn et al. 2008). While still scientifically rigorous enough to yield valid scientific results, RASI also remains available to the amateur student of weathering (Dorn et al. 2008), and has also been shown to be a replicable tool for rock art assessment (cf. Cerveny 2005; Cerveny et al. 2006; Dorn et al. 2008), as well as helping people connect science and art in a field setting (Allen and Lukinbeal 2010). Helping to establish a sense of the most endangered rock art panels, RASI permits rapid evaluation of panels, allowing users to categorize, sketch, and assign a "score" to each panel, noting inherent weaknesses based on weathering phenomena that can be immediately analyzed by a cultural resource or land manager (Figure 1).

To illustrate RASI in action and demonstrate the effect it can have on rock art panels, sites, researchers, and volunteers, this essay uses anecdotal examples from our current study areas at Petrified Forest National Park to express how RASI functions as a field method. The first anecdote demonstrates how student researchers involved with RASI continue to take the initiative regarding rock art management, while the two following it express how RASI can have an immediate impact for cultural resource managers. Then, before a quick conclusion on how RASI entwines cultural appreciation and science, we briefly discuss the potential for adding cutting-edge technology to RASI, enhancing the overall examination and management of rock art.

The Dog Panel

In the summer of 2009, our National Science Foundation(NSF)-funded RASI project brought us to a site in the central portion of the Petrified Forest National Park. A rock art panel containing three canine glyphs had completely detached along the bedding plane of the sandstone bedrock (Figure 2). Student researcher Janica Webster completed a RASI analysis, and determined a raw score of 62 for the panel.

Figure 1. Student RASI recorders in the Petrified Forest National Park analyze damage to a rock art panel impacted by the natural weathering process of case hardening (photograph by Niccole V. Cerveny).

Figure 2. Student researcher Janica Webster evaluating detached rock art panel positioned to erode down a steep, bentonite clay slope (photograph by Niccole V. Cerveny).

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Figure 3. Loss of rock due to fractures independent of the sandstone bedding plane cut across the sun motif on this rock art panel in Petrified Forest National Park (photograph by Niccole V. Cerveny).

Figure 4. This image has many glyphs, but also much weathering. Trained RASI researchers can distinguish between natural weathering forms and processes—such as flaking, lithobiont pitting, and weathering rind flaking—and anthropogenically carved images (photograph by Casey D. Allen).

Raw scores over 60 indicate that the stability of the rock art panel is in severe danger. Due to the precarious position of the stone slab on the steep slope, the student researcher decided to take matters into her own hands by using her academic skills to petition the National Park Service (NPS) for its entry into the museum collection, rather than lose the panel and its cultural context to the erosion of the underlying bentonite clay. Although NPS initially declined the petition, the student researcher was authorized to periodically reassess it, and update the site managers on the condition of the rock and slope. On each visit to the park, this student always makes it a point to reassess this panel, keeping close tabs on it, and reporting even the slightest change in its position. Overall, this student gained experience in NPS policy, communication skills, and environmental analysis. She also decided to major in Physical Geography, and is now pursuing her bachelor's degree at Arizona State University.

Immediate Impacts

Although not on a steep slope, the second panel highlighted is of an apparent sun motif (Figure 3). The loss of this element is due to fracturing of the rock across the sandstone bedding planes, and lack of support at the edge of the rock due to undercutting. This panel earned a raw RASI score of 26, a stability status of good. The core of the rock is very stable, yet an entire glyph has been lost on its edge. Noting this overall condition is part of the RASI assessment, and seeing the researcher's analysis, a site manager might choose to increase the weight of a RASI variable (or two) so that the overall RASI score better reflects the impending loss of the resource. RASI scores can also provide important baseline data to site managers for better site recording and resource allocation decisions.

Over the summer 2010, student researchers trained in RASI canvassed large areas of petroglyphs, both concentrated and dispersed. This necessitated hiking to backcountry sites not normally available to the general public. Student researchers worked alongside NPS archaeologists, paleontologists, historians, and non-NPS scientists conducting research in the park. The focus was two-fold: identify panels based on previous maps, and assess panel stability via RASI. Locations were logged with precision via global positioning system (GPS) units and collated with NPS archaeologists' in-the-field maps. As an aside, this served as a great learning experience for student researchers on the importance of keeping good records, as previous maps were over two-decades old and often contained unclear data regarding panel location and glyph description. For example, where previous researchers with no apparent experience in weathering science sometimes mistook common weathering forms for glyphs, student researchers trained in RASI readily identified these and made the necessary corrections (Figure 4). This type of in-depth scientific analysis is of great help to NPS historians and archaeologists, giving them not only a more scientific assessment of their petroglyph sites, but also a more accurate recording of the panel content.

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RASI 2.0: Integrating GPS for In-the-Field Analysis

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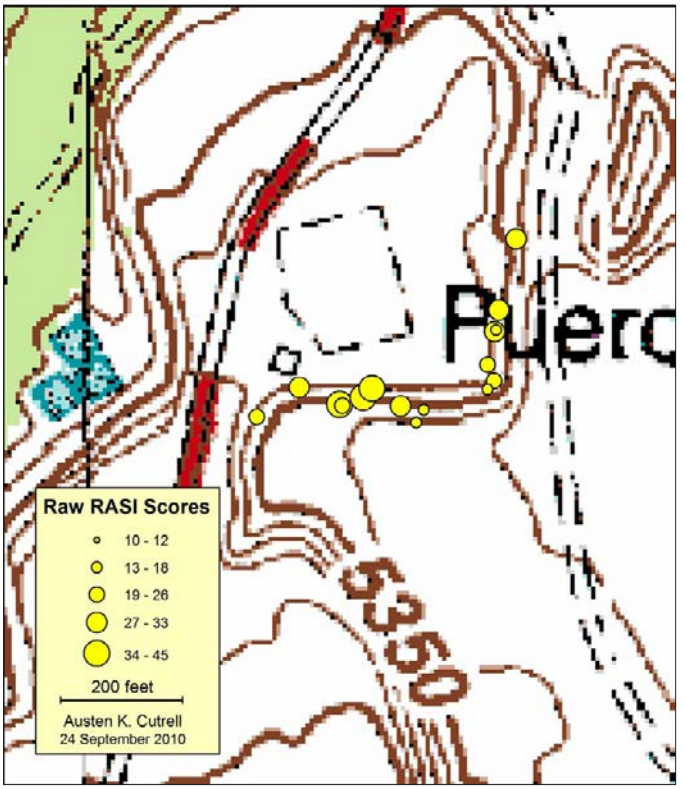

Figure 5. An example of a quick visual analysis using raw RASI scores for 16 separate panels at a public overlook in Petrified Forest National Park. The larger the circle, the less stable and more endangered a panel is. This map was created in less than 10 minutes after scoring the panels. While not especially cartographically appealing, this demonstrates the powerful and rapid analyses that RASI 2.0 can offer cultural resource and land managers. Within minutes of assessing a site, those areas and panels most in danger can be visually displayed (map by Austen K. Cutrell).

Using a software program called ArcMap, a RASI-specific attribute table was created and then customized with drop-down menus using an extension of the software called ArcPad Studio Builder. These resultant forms were then field-tested by researchers conducting fieldwork at Petrified Forest National Park (November 2009 and June-July 2010) using handheld GPS units (Trimble Juno SB) running the ArcPad program. After initial refining of the attribute table while in the field, this effort's outcome demonstrates the potential power for cultural resource managers and/or volunteers from diverse backgrounds to complete RASI in a 21st-century manner, providing the end-user with standardized data that permits quick and efficient decision-making—even on the spot in the field!—regarding rock art management (Figure 5). As a bonus, specific processes are being developed and tested to link an image taken by the in-GPS camera (if the unit has such a device) to an exact location, while also linking the image to the specific, completed RASI assessment.

Integrating Cultural Studies

Another interesting activity throughout the summer was interaction with members of the local Hopi Tribe. Several times throughout the summer, Hopi tribal members visited field sites where student researchers were performing RASI. After explaining the concept of RASI to them, the tribal members treated participants to their view of the rock art, and sometimes to their view of specific glyphs. Student researchers found this interaction to be one of the highlights of this summer experience. Perhaps due to their enthusiasm and willingness to learn, the student group was invited to attend a sacred Native American solstice event at Zuni Pueblo. While this event is open to the public, it is not well-advertised. Yet because of RASI's proactive nature, researchers were able to partake in this particularly culturally rich experience. And this incident, perhaps more than any other, highlights the connection RASI has not only with geology and weathering science, but also cultural and human perspectives as well. After being trained in RASI, volunteers become more aware of how science can inform cultural resource management agendas, while at the same time learning that their service can have great impact on a culture.

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Mojave Workshop Features New Research

Amy J. Gilreath

For the last 15 years, a group of some 30 Mojave Desert rock art aficionados have come together for a weekend in January, to give year-in-review presentations of their work completed and in progress. Like a good *vin ordinaire,* participants are a balanced blend of rock-art specialists (a second-career calling for many) and archaeologists. The venue is typically rustic, with camping and dorm-like accommodations in the middle of the Mojave Desert, usually at one of the various little gems in the National Park Service's Mojave Preserve.

The Mojave Rock Art Workshop (MORAW) is a progeny of Don Christensen, who, over the years, has coached a number of individuals in documenting rock art. As testimony to a good coach, a number of them now regularly set out on their own, giving over weekends, vacations, and other free time to advance what we know of this region's rock art. Some give their attention to disciplined, detailed recordation of sites in need; others embark on discovery or re-discovery expeditions, checking on the condition of sites known only by vague rumor or one-page records and notes in agencies' and archaeology information centers' files. Each individual's motivation is different, but what they have in common is an interest in the diversity of rock art in the region and respect for one another's contributions.

This year's meeting was held at Zzyzx, a short distance from Baker, California on January 16–17, 2011. The agenda for the weekend included a series of individual talks, followed by a handful of round-table workshops on issues of interest. Of the thirteen presentations, five reported on individual projects within the Mojave Desert and adjacent southern Great Basin.

John Bretney discussed University of California-Los Angeles' Cotsen Institute of Archaeology's rock art recordation work at Little Lake, California. His presentation focused on Atlatl Cliff, one of nine rock art loci nestled between Fossil Falls and the lake, itself (and a site visited by some ARARA field trippers at the Bakersfield meeting). He announced that the synthetic report of their decade-long project is currently in lay-out. *Captured Visions,* by Jo Anne Van Tilburg (Director), Gordon Hull, and John C. Bretney, should be available by mid-year. Doug Brotherton, the graphics artist handling lay-out, was also present, confirmed the announcement, and anchored a Sunday-morning workshop on Photoshop Layers.

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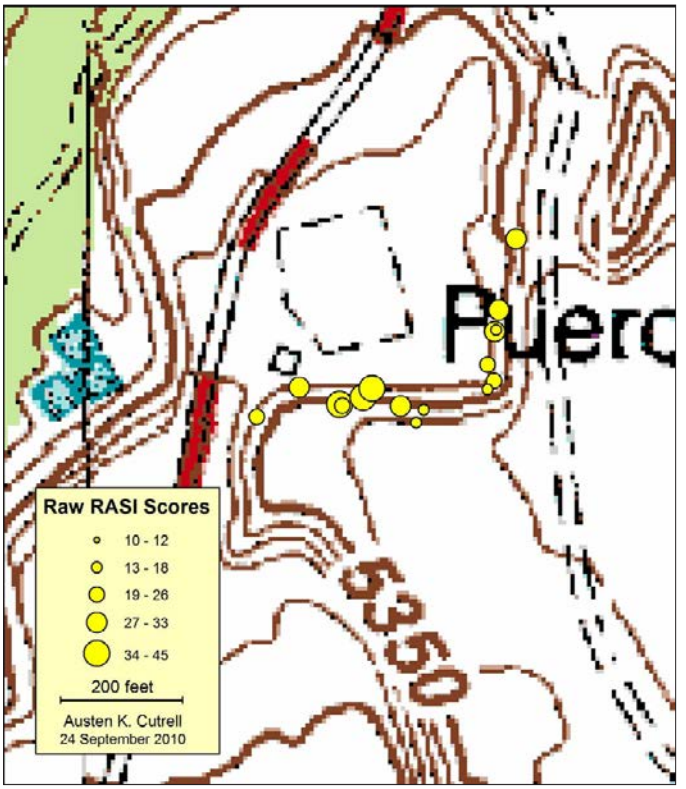

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