THE DOLORES ARCHAEOLOGICAL PROGRAM: IN MEMORIAM

David A. Breternitz

The Dolores Archaeological Project (DAP) encompassed a contract period from June 1978 through December 1985. Although investigations both preceded and postdated the contract period, the accomplishments, failures, positive and negative aspects of DAP, and certain comparisons with another major cultural-resource-mitigation project offer historical, methodological, and academic lessons that are instructive, particularly for future, long-term, federally (or nonfederally) financed cultural-resource-mitigation endeavors.

El Programa Arqueológico “Dolores” (DAP) comprendió un período de contrato de junio de 1978 a diciembre de 1985. Aunque las investigaciones precedieron y siguieron al periodo del contrato, las conclusiones, fracasos, aspectos positivos y negativos del programa y ciertas comparaciones con otro importante proyecto relacionado con la mitigación de recursos culturales ofrecen lecciones históricas, metodológicas y académicas que son instructivas, particularmente para futuros esfuerzos vinculados con la mitigación de recursos culturales, financiados o no federalmente y realizados a largo plazo.

The Dolores Project Cultural Resources Mitigation Program (Dolores Archaeological Program or DAP) began officially on June 6, 1978, with the signing of Bureau of Reclamation (BRec) contract 8-07-40-S0562, issued to the University of Colorado (CU), Boulder. David A. Breternitz was senior principal investigator, and Washington State University (WSU) was named the primary subcontractor. The program was at one time facetiously called “second only to Aswan,” but in reality DAP was the largest cultural-resources-mitigation contract issued to a single prime contractor by a single federal agency. During the tenure of the contract, which ended on December 31, 1985, a total of $9,990,562 was billed by the University of Colorado, an amount .094 of one percent under budget.

The final project publication distributed by the BRec has an issue date of October 1988. The vast data bank accumulated, analyzed, and reported during the seven years, six months, and 25 days of DAP is available for current and future researchers at the Anasazi Heritage Center (AHC); papers, theses, and dissertations continue to be produced using DAP data.

The passage of more than seven calendar years since the termination of the DAP contract should be sufficient to permit a dispassionate evaluation of DAP and to provide an opportunity to examine some of the positive, negative, comparative, and thought-provoking aspects of a truly unique chapter in American archaeology.

The DAP activities discussed below concern themselves solely with the contract period noted above; precontract site reconnaissances and the ongoing mitigation activities for the Dolores Project water-distribution system (conducted by a different contractor) are not discussed (see Figure 1).

The Dolores Archaeological Program: Final Synthetic Report (Breternitz et al. 1986) summarizes all activities conducted and the results produced during the contract period and provides most of the baseline information alluded to in this paper. The report is now out-of-print and is available only through the National Technical Information System (NTIS).

The report documents the statements made in this paper and presents the factual and philosophical guidelines of DAP. The report also includes abstracts of excavated sites, a guide for researchers to materials not published or distributed by BRec (including an annotated bibliography), a listing of all 286 DAP technical reports, a complete publication bibliography, a manuscript bibliography, a listing of papers presented and other publications bibliography, and a thesis and dissertation bibliography.

The goals of the DAP, and program design, implementation, and operation are presented in

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Figure 1. Map showing the location of the Dolores Archaeological Program study area in relation to the Four Corners region of the United States.

Breternitz et al. (1986) and in the *Dolores Archaeological Program: Synthetic Report 1978–1981* (1984). However, two aspects of DAP require emphasis. First, the organization of DAP (see Breternitz et al. 1986:7–9; Dolores Archaeological Program 1984:4–5) created a set of checks and balances through the senior principal investigator, the coprincipal investigators, the senior staff, and BRec personnel that was flexible enough to respond to long-range goals and short-term crises. Secondly, I believe that the University of Colorado was awarded the DAP contract partly on the strength of our willingness to operate as a year-round field project and not as a seasonal, university campus-based operation.

**PLUSES, MINUSES, AND LESSONS LEARNED**

The size of the DAP program, its tenure of over seven years, and the number of people who were involved created a multifaceted operation with decision making necessary at all levels. Actions, directives, policies, and ideas were generated by both DAP and BRec personnel, and the outcomes of these activities produced results that were primarily positive, but which also had some negative manifestations.

**Project Pluses**

Positive aspects of DAP far outweigh the negative. The brief citations below are not in order of importance because every positive feature contributes to a successful project.

*Publications.* Fieldwork ceased following the 1983 field season to allow adequate time for analysis and write-up prior to termination of the contract. The BRec distributed all of the DAP material it was obligated to publish, consisting of 13 volumes (16 separately bound books). Although 1,000 to 1,500 copies of each volume were printed, some volumes are already out of print; all DAP published volumes are available through NTIS.

*Data Availability.* The Anasazi Heritage Center, Dolores, Colorado, was constructed to present
the results of DAP to the public and to house the research notes and collections for further study and interpretation. All field notes, photographs, analysis data, rough drafts, final drafts, and computer records compiled during the course of DAP are housed at the AHS, as well as theses, dissertations, and articles resulting from the project. These materials are being used at a growing pace as researchers become aware of the availability of this vast body of controlled data; the data file is also available on disk through the Museum of New Mexico. An example of the postcontract use of DAP data is Schlanger and Wilshusen (1990) who document that the Dolores area was abandoned four times between A.D. 600 and 910.

The DAP was one of the projects that helped make the transition in thinking from doing “salvage archaeology” to “data recovery” in the management of archaeological resources. As noted in the example above, the detailed, controlled, and available body of data accumulated by DAP has enabled researchers to fine-tune important local and regional interpretations, many of which have been unquestioned for at least the past 60 years.

The Four-Percent Solution. When reconnaissance surveys of the project area were initiated in 1972 there were only two archaeological sites documented and on record. Eventually 1,626 sites were located within the project area. As DAP progressed the extent of the cultural resources present made it obvious that the obligatory one percent of construction costs available for cultural resources mitigation was insufficient. Public Law 96-301 [94 Statute 832] was passed in the summer of 1980 authorizing the Bureau of Reclamation to increase spending from one to four percent of the total Dolores Project construction costs to mitigate the adverse effects on cultural resources in the project area (Breternitz et al. 1986:3). The additional funding made available by P.L. 96-301 enabled the BRec to construct the Anasazi Heritage Center (operated by the Bureau of Land Management [BLM]), to support the archaeological staff and activities at the Dolores Project’s Office in Cortez, to print and distribute 13 report volumes, and to fund the cultural-resources-mitigation activities, including those that have been conducted by a different contractor on the Dolores Project Distribution system. P.L. 96-301 was quickly followed by amendments to the National Historic Preservation Act of 1974 allowing the one-percent limitation to be waived in unusual circumstances.

On-site Computerization. When the magnitude of data generated by the DAP and transmitted to the BRec’s mainframe computer in Denver was realized (at one time the DAP was using 25 percent of its total capacity), an on-site microcomputer was installed. This equipment allowed quicker access, more accurate inputing of data, on-site programming, and reliability checks to be made by four full-time computer persons.

Supporting Studies. The BRec was not authorized to fund “research” under terms of a cultural-resources-mitigation contract, but the BRec and DAP personnel agreed that some basic research was necessary for adequate completion of descriptive and synthetic reports. Issuance of one complete volume of supporting studies and supporting studies reports in other volumes enabled DAP to present vital ancillary research results that otherwise would have been buried in project archives or published in numerous, dispersed journals and magazines. In particular, paleoenvironmental, magnetometer, ceramic, and lithic papers have been made available as supporting studies.

Personnel Continuity. At the end of the DAP contract, all task specialists (those persons most involved in report production and final publication obligations) had been year-round, on-site employees for at least four years; some had been continuously employed by DAP since 1978. This continuity of personnel enabled a higher level of energy and productivity than most long-term projects allow.

Full Site Equivalent and Track Concepts. These quantitative and evaluative concepts enabled the DAP to deal with the value of cultural resources and not with the elusive concept of “site.” A full site equivalent (FSE) for any identified archaeological entity is determined by estimating the number of crew weeks needed to fully investigate that identified unit by a 10-person crew (one crew chief, one assistant crew chief, eight field workers), each putting in a 40-hour week of field effort. Tracks designate the intensity of data recovery, from controlled surface collection and documentation to total excavation of an identified archaeological entity. These concepts are discussed more fully in Breternitz et al. (1986:17-18).

Subcontractors. Numerous subcontractors were engaged during the course of DAP (see Breternitz
et al. 1986:9–15). The primary subcontractor was Washington State University. This association existed for the entire contract period and provided expertise, personnel, and participation that exceeded expectations.

**Bureau of Reclamation Personnel.** Within the limits of their familiarity with cultural-resources-mitigation projects and agency directives, the on-project BRec personnel were understanding and supportive and served as a comforting buffer with the higher echelons of the federal bureaucracy.1

**Anasazi Outreach.** In cooperation with the BLM, local and regional public-school agencies, and volunteers, a series of instructive materials and programs were developed for use in area elementary schools. Kits were created for hands-on experience, and teachers were provided with further instruction and syllabus-like information. This program has been continued for southwest Colorado schools, particularly through the Anasazi Heritage Center.

**Negative Aspects**

Again, the following situations associated with DAP are not listed in any order of importance, and they should be evaluated not only for their individual impact on DAP but how they affected other project operations.

**Premature Initiation of Fieldwork and Inadequacy of the Data Base.** Fieldwork was begun six days after signing the contract, and actual excavation was begun seven days later on a site that had not been recorded on a site survey form. No laboratory processing was conducted until after more than three months of fieldwork. In fact, no laboratory facility and no laboratory supervisor were in place until the end of the first field season. The site inventory of the reservoir takeline was not completed until the summer of 1981, four years into the project.

The unknown data base and inadequate processing facilities caused logistic, programming, and theoretical difficulties that have been ignored by critics of the accomplishments of DAP. The survival of and recovery from these negative situations constitutes one of the more positive accomplishments of DAP personnel.

**Mitigation, Not Research.** That the BRec was not authorized to fund research under the constraints of a cultural-resources-mitigation contract constituted more of an apparent obstacle than a real one. The negative response to this situation by some DAP personnel was overcome eventually through the realization that data acquired during the course of DAP activities could be used to provide documentation for those activities and for reporting the results of those activities as supporting studies, theses, and journal articles.

**Communication.** Operating a field project some 644 km away from the parent institution, which is established to serve on-campus, academic units, produced myriad problems, and because of these we probably “got away” with procedures that were efficient but would not have been tolerated at the university.

Because the administrative organization for the university and the BRec did not always coincide, inappropriate contact between the two administrative units often caused problems. Several months of miscommunication made operations difficult for all parties until the BRec’s Upper Colorado Regional Office realized that no one on the CU campus was responsible for the day-to-day activities of the DAP, and that the BRec had to deal directly with the senior principal investigator. With time the poor communication situation was corrected, but not before BRec shocked DAP personnel with a list of items that the BRec considered to be areas of concern. At a meeting in Salt Lake City attended by the senior principal investigator and the program administrative assistant, a 13-point agenda was discussed, though a copy of the agenda was not provided to the DAP either prior to the meeting, at the meeting, or later. The agenda contained some well-thought-out, some picky, some impossible, and some realistic items. Although each item was responded to in time, the manner of their presentation created concern for many of the on-site personnel who had to formulate specific responses and who regarded the “list” as a negative reflection on their personal abilities and activities. The interim synthetic report (Dolores Archaeological Program 1984) was a direct outgrowth of the 13-point agenda.

**How Much Is Enough?** Using the FSE concept for investigations conducted by the DAP on
cultural resources within the McPhee Reservoir pool area, it was determined that of a total of 4,582 FSE’s only eight percent were adequately investigated (Breternitz et al. 1986:45). Using the “site concept,” BRec personnel determined that 33 percent of the cultural resources were mitigated (King 1984:5). Regardless of how these contradictory figures are interpreted, if we use DAP figures we can extrapolate that to investigate all 4,582 FSE’s in the pool area would have cost $125,000,000. I believe that this figure would have produced negative responses from the taxing public, regardless of the quality of the cultural resources that were not investigated and that no longer exist.

Site Catchment. In the late 1970s, site-catchment studies were one of the fashionable research topics being pursued, particularly by students exploring the possibilities of computer graphics. The BRec specifically encouraged DAP to conduct site-catchment investigations, and considerable time and money were devoted to this activity. As it turned out, the geographical and cultural situations at the Dolores Project were not conducive to site-catchment studies, as they were being investigated and interpreted at that time. After an inordinate amount of time and effort was devoted to site-catchment studies, they were found to be misleading. DAP site-catchment investigations eventually were modified, and in the long run valuable results were obtained, primarily through the efforts of individuals who did this research on their own initiative. But, on the whole, site-catchment studies at the DAP were conducted at a low cost-effective level, and this aspect of DAP provides a caution regarding overenthusiastic fads in both research archaeology and contract work.

Historical Studies. Historical studies were mandated under terms of the project contract. Some unfortunate choices were made regarding initial participants, and internal DAP adjustments were just getting the DAP historical studies in order when that aspect of the contract was voided. Unfortunately, some historical data accumulated by the DAP became dispersed and have not become a part of the archived information housed at the Anasazi Heritage Center, e.g., oral history of the project area, which the BRec specifically requested not become part of the DAP archived records. I believe this decision by the BRec relates to the view that oral histories were research that could be collected at a later date and were therefore not an authorized mitigation activity.

Postcontract Publications. None of the DAP publications issued by the BRec that were not already in press by December 31, 1985, were proofread or galley proofed by any CU or WSU personnel. My offer to proofread all planned DAP publications and create indexes for each volume without cost to the BRec was not accepted, for reasons that are still unclear. The three volumes that had been proofread prior to the termination of the DAP contract were not examined at page-proof stage, and on the basis of galley-proof errors, errata sheets were compiled that were then distributed by the BRec. The indexes for the later issued volumes tended to become very generic after DAP personnel were no longer involved in any aspect of publication production or distribution.

Lessons Learned

Additional aspects of the DAP that contributed to the overall success of the endeavor deserve mention.

Hiring and Firing Flexibility. Because of the uniqueness of DAP within the overall structure of the University of Colorado, in particular our physical detachment from normal campus administrative accountability, we were less constrained concerning personnel actions. If we had not had the hiring flexibility permitted by our unique situation we could not have acquired the services of many of the qualified persons who contributed so much to the success of the project. By the same token, our internal ability to release people also contributed to overall efficiency and productivity.

Sheltered Workshop Persons. A prevailing problem existed in obtaining persons to perform the necessary, but routine and tedious, laboratory functions, e.g., washing and cleaning field specimens such as potsherds and lithics. Qualified persons, i.e., persons with Bachelor’s degrees in anthropology, generally considered themselves above performing these tasks and consequently were a continuing source of discontent and sloppy work. Toward the end of the project we acquired the part-time services of local, handicapped persons from the Cortez Sheltered Workshop. These people were wonderful to work with and highly productive. They were enthusiastic, happy to be part of a mainstream activity, and extremely careful workers. Everyone involved with the Sheltered Workshop
benefited; and, it is worthwhile to note that the Crow Canyon Archaeological Center currently uses Sheltered Workshop persons with continued success.

**DAP VS. BLACK MESA ARCHAEOLOGICAL PROJECT**

DAP and the Black Mesa Archaeological Project (BMAP) each operated under its own set of circumstances, and a brief comparison can only emphasize this situation (see Gumerman [1984] and Powell et al. [1983] for the BMAP and Breternitz et al. [1986] for the DAP). However, it is germane to compare a few of the major characteristics of BMAP and the DAP, as follows.

1. **Sponsor:** The DAP was federally funded, by the BRec, and the contract was issued to a single prime contractor, the University of Colorado. The BMAP contract was between private industry (Peabody Coal) and a series of academic institutions (Prescott College, Fort Lewis College, and Southern Illinois University).

2. **Investigation Schedule:** The DAP field operations were coordinated with project construction and the BMAP operations were dictated by coal-recovery schedules.

3. **Longevity:** The DAP contract covered seven and one-half years from start to end (June 6, 1978–December 31, 1985), and the BMAP field operations alone covered a period of 17 years (1967–1983).

4. **Analysis and Write-Up:** With the exception of minor, specialized subcontracts, all DAP analysis and write-up was done on-site, on a year-round basis, by the supervisory personnel responsible for field recovery or analysis. All 286 technical reports produced by DAP were submitted in final draft to the BRec by the final day of the contract.

The BMAP conducted field processing during the excavation season, and then materials were shipped off to the participating institutions or to subcontractors; final synthetic reports eventually were contracted to specialists who were not necessarily involved with data collection.

5. **Curation:** All the project records and materials acquired by DAP are housed at the AHC and are available to qualified researchers. The public exhibition room at the Center displays a sample of the materials recovered by the DAP, and the entire exhibit is keyed to the DAP and local prehistory. BMAP collections are housed at Southern Illinois University, Carbondale.

6. **Publications:** All planned DAP publications to be issued by the BRec have been distributed, as of October 1988 (see above regarding DAP publications). The final synthetic reports to emanate from the BMAP are in press at this time, but have not yet been issued.

Neither the DAP nor the BMAP can be used as the model for future, large, long-term, mitigation projects, in this country or elsewhere. Both projects were successful in their own ways; they employed or were controlled by differing procedures and administrative constraints. The important point is that both projects achieved their major goals and that future, large projects will be evaluated on the strengths of their particular and unique circumstances, the personnel involved, and the sponsor.

**AFTERTHOUGHTS**

I believe that even our greatest critics must now admit that DAP was a worthwhile project as judged by the recovery of cultural-resources data against the cost. The data were well controlled, described in detail, and made accessible in perpetuity. Success was primarily the product of loyal, highly intelligent, energetic personnel who performed the field, laboratory, analytical, and writing tasks with skill and good cheer!

Many local people have asked me if I thought DAP was “worth it” and “what was the most interesting thing you found?” To the first question, I respond with an unqualified “yes” and elaborate by citing the positive aspects of the project noted earlier in this paper. To the second question I routinely cite two examples that have not been sufficiently emphasized in the published reports.

The site called Singing Shelter contained the largest special use/ceremonial structure excavated and reported in the northern Anasazi area (Nelson and Kane 1986). This Pueblo I period Great Kiva was constructed partially within the shelter of a large overhang and upon excavation proved to be 33 m in diameter. The uniqueness of this huge intercommunity structure went unacknowledged in a recent review (Smiley 1989:663–664).
Secondly, I point out that we did not dig too much and that one pithouse does not look like every other pithouse. McPhee Pueblo (5MT4475) and Grass Mesa Village (5MT0023) are approximately 6.5 km apart; both are situated near the main Dolores River channel. Both sites developed, flourished, and subsequently declined during the local Pueblo I period (A.D. 850–975). However, when climatic and social conditions deteriorated to the extent that neither site area could support the existing population, they chose different adjustments to permit cultural continuity. At McPhee Pueblo emigration was practiced—a portion of the population moved out in order that the remaining population could continue to exist on the smaller available agricultural land base. At Grass Mesa Village permanent occupation of the site was terminated and it was only occupied seasonally during the summer. The lesson to be learned as we construct elaborate regional patterns is that we cannot overgeneralize from one or two cases to the development, coexistence, and later history of a larger cultural and geographic entity. There are five or six Pueblo I period villages in the DAP area that were insufficiently investigated to assume that the divergent actions seen at McPhee Pueblo and at Grass Mesa Village were typical.

George Gumerman (personal communication 1990) has made some appropriate comments that summarize the DAP as well as contract archaeology in general: “One of the beauties of contract archaeology is that for once we are beginning to see the incredible variability in the archaeological record. If anything crushed the idea of a ‘type’ site, it is the variation we have found in contract archaeology.”

The major point is that because of the variables, every project has to be evaluated on its own merits.

Acknowledgments. More than 540 persons participated in the DAP; each made contributions that enabled the DAP to meet contract and professional obligations. The role of Ward F. Weakly has never been adequately acknowledged; the dedication in Breternitz et al. (1986:ii) bears repeating: “Dedicated to Ward F. Weakly (1938–1985) who, as Senior Bureau Archeologist (1974–1981) and Preservation Officer (1981–1985) for the Bureau of Reclamation, was instrumental in initiating the Dolores Project Cultural Resources Mitigation Program and who was an inspiration to us throughout the tenure of the program.”

George J. Gumerman kindly commented on a preliminary draft of this manuscript. The peer reviewers of the original manuscript provided uncommonly thoughtful and helpful comments. Mercedes Tasende-Grabowski prepared the Spanish abstract.

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1 One of the peer reviewers was obviously a former DAP employee who suggested that a paragraph be added under the negative aspects of the program to describe the difficulty in coping with BRec “oversight” personnel who were marginally qualified and therefore not credible. I have to acknowledge that his/her opinion was shared by many DAP personnel, but had we been dealing with more credible BRec personnel it would have been difficult to more or less ignore certain oversight directives when there was conflict regarding procedures, priorities, techniques, and reporting.

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MISSISSIPPIAN PERIOD STATUS DIFFERENTIATION THROUGH TEXTILE ANALYSIS: A CADDIOAN EXAMPLE

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Specific attributes were recorded for 119 textiles recovered from burial contexts from Craig Mound at the Spiro site and eight southern Ozark bluff shelters. Textile attributes that varied according to status designations of the burial contexts were identified using the following three avenues of investigation. The textiles were rated using an ordinal index of production complexity, and more complex textiles were found to be associated with burial contexts of presumed higher status. Use of a series of contingency tables identified edge finishes, color, patterning, design motif, fiber, and scale as attributes that are individually associated with status differences. When selected attributes were considered together using a classification and pattern-recognition program, color description, scale, fiber, and number of yarn components were identified as the best predictors of status association.

Se registraron atributos específicos para 119 textiles recuperados en contextos funerarios de Craig Mound, en el sitio de Spiro, y de ocho abrigos en el Ozark bluff sur. Para identificar aquellos atributos de los textiles que varían de acuerdo al status de los contextos mortuorios se emplearon tres avenidas de investigación. Los textiles fueron clasificados de acuerdo a un índice ordinal de complejidad en su producción, descubriéndose que textiles más complejos se encuentran asociados con entierros de mayor status. Se utilizaron tablas de contingencia para identificar la terminación de bordes, los colores, los patrones, el diseño de motivos, la fibra y la escala como atributos individualmente asociados con diferencias de status. Al considerar conjuntos de atributos mediante un programa de clasificación y reconocimiento de patrones, se determinó que la descripción del color, la escala, la fibra y el número de hilos son los mejores predictores del status asociado.

The number of scientific studies of prehistoric textile remains from eastern North America has increased in recent years. However, in contrast to areas such as the American Southwest and Peru, where textile remains are relatively more common, a dearth of actual textiles are preserved in the archaeological record of this area. The scarcity of organic textile remains from the southeastern United States emphasizes the importance of detailed analyses and cultural interpretations of the existing textiles. However, the data base can be expanded and the interpretations broadened by studying additional forms of textile evidence. These include textile impressions in pottery or other previously plastic surfaces, two- and three-dimensional representations of textiles in various art forms, tools used for textile production, and early historic accounts describing indigenous textile use and manufacture.

Impressions of textiles in the southeastern United States have been documented from as early as the eighth and ninth millennia B.C.; however, the oldest-known assemblage of pliable textiles in

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