

A View From the Lake

The Dolores Archaeological Program in the McPhee Reservoir Area, SW Colorado

In 1997, I cruised McPhee Reservoir in a boat, trying to recognize the locations of archeological sites excavated during the Dolores Archaeological Program between 1978 and 1983. It was only with great difficulty that I could relate what I was seeing to the familiar geography of the fieldwork days. Although the filling of the lake has obscured the actual sites, the passage of time makes it easier to gain a perspective on the program's contributions.

The Dolores Archaeological Program (DAP) was one of the largest archeological projects ever carried out in the U.S. and was accomplished in several phases. I will focus on the work done to mitigate the effects of the reservoir and dam construction proper, the DAP. In the following article, Warren Hurley discusses later work associated with constructing the water delivery system.

There were over 1,600 sites, most of them prehistoric, in the Reservoir Project area; 101 sites were tested or partially excavated with 41 receiving more than one crew week of fieldwork. The contributions of DAP included an excellent public museum and federal collections repository at the Anasazi Heritage Center near Dolores, Colorado; a large DAP computer database, accessible at the Heritage Center; training many young archeologists who continue to work as professionals; lessons in the effective organization of large-scale, multi-disciplinary projects; and a number of substantive and methodological contributions to American archeology. I will focus on this last point and ask to what extent the work of the DAP has improved our understanding of southwestern archeology and has increased the power and efficiency of archeological methods.

The underlying premise of the mitigation of adverse effects through "data recovery" is that information gained through study of the archeo-

logical record can compensate, in some ways, for the loss of the physical record itself. Therefore, the expenditure of public funds on these projects can be justified only if they result in an increase in knowledge about the past. The development by such projects of more powerful and efficient methods for learning about the past is another way they can meet their obligations to society. I believe the DAP meets these two standards pretty well; below, I'll review what I think are its most important substantive and methodological contributions.

Principal Archeological Contributions **Understanding Puebloan Culture, AD 600-900**

Although the lands in and around McPhee Reservoir have sites of many periods, the bulk of the archeological record resulted from intensive use of the area by Mesa Verde Puebloans between about AD 600 and 900, the late Basketmaker III and Pueblo I periods. This period has consistently been interpreted as fitting a model of gradual, progressive change from the late centuries BC to about AD 1300. In this view, early groups were small, scattered, and nomadic. As they gradually added new traits such as farming, pottery, and masonry architecture, their communities became progressively larger, more aggregated, more permanent and more like historic period Pueblos. The DAP pretty conclusively blew this model away and helped loosen the grip of similar implicit gradualist models on interpretation of the archeological record elsewhere in the Southwest.

To make a complex story simple, the Dolores area was settled in the AD 600s by farmers living in dispersed single-family homesteads, each including a large pitstructure with outlying above- and below-ground storage structures and other features. Population size and density increased in the late 700s, declined somewhat in the early 800s, and then rose very rapidly, almost

certainly due to immigration, in the middle AD 800s. A number of very large villages formed between about AD 850 and 880. McPhee Village, the largest, probably had 150 to 200 households (600-1000 people). Population declined precipitously after AD 880, and by AD 900, the reservoir area was nearly or completely unoccupied.

Recognition of this population "boom and bust" cycle raised the obvious question of where the settlers came from and where they went. This stimulated a much broader view of settlement and population dynamics in the Four Corners area among both DAP archeologists and colleagues elsewhere in the Southwest. More recent work has documented numerous large but short-lived villages in the Four Corners area between AD 750 and 900. Not all were contemporaneous, suggesting that some communities either moved more or less intact, or that their inhabitants dispersed and joined existing or newly-forming villages. Large-scale community mobility may have been associated with a farming pattern that resulted in fairly rapid resource depletion, in the context of relatively low regional population density that permitted communities easy access to new lands.

The de-population of the Dolores Valley in the late AD 800s was part of a larger movement out of the northern Four Corners area, probably into the San Juan (geologic) basin of northwestern New Mexico. There, the emigrants may have contributed to the emergence of the early Chacoan center.

Reconstruction of Past Environmental Conditions

Ken Petersen and colleagues in environmental archeology did a masterful job of developing a model of past climactic change and relating it to agricultural conditions in the reservoir area. The model showed generally good agreement with the main contours of project area population and settlement. In particular, the eighth and ninth centuries showed declines in annual precipitation that would have made the high elevation Dolores Valley attractive for farmers, relative to other parts of the northern Southwest. Severe drought in the very late AD 800s and early 900s, coupled with probable short growing seasons in the early 900s, may have contributed to the abandonment or near- abandonment of the reservoir area.

Understanding Processes of Socio-cultural Change

The DAP provided an opportunity for an intensive, multi-disciplinary investigation of pre-historic social and economic change over a relatively short time in a small region. DAP studies showed that population increase in the AD 800s was associated with settlement aggregation, greater formalization of settlement layouts, intensification of farming, anthropogenic impacts on the local environment, elaboration of ritual features and architecture, and some degree of concentration of social power, though not of the sort that was clearly expressed by individual display of status markers. This research remains one of the best-documented case studies of the interaction of demographic, social, and environmental variables in American archeology.

The DAP also challenged prevailing (1970s) models of organizational change that relied on processes operating largely *in situ* within relatively small regions (such as a river valley or mesa). The DAP explicitly attempted to relate changes in the project area to those occurring in the broader Four Corners area, and to consider inter-regional differences in environmental, social and economic "push" and "pull" factors that may have influenced population movement and socio-cultural change.

Development of Archeological Methods

Several methodological contributions stand out. One was the use of archeobotanical samples to document changing patterns of firewood and construction timber consumption as population size and density increased, and as households aggregated into villages. These studies suggest that in the AD 800s, the large Dolores area population had begun to impact the local environment by depleting certain wood resources.

The DAP also contributed to the application of computer simulations to archeological problems. A simulation of population growth through time on a modeled landscape showed that as population rose, household agricultural and foraging catchments increasingly overlapped. One likely response would be for people to move away from fields into villages, where ritual and political measures to resolve resource conflicts could be maintained. In the simulation, the timing of a significant overlap in household catchments coincided well with the archeologically-observed timing of population aggregation into villages and evidence of intensified ritual activity.

DAP researchers did pioneering work in “accumulations research,” i.e., the rates at which various kinds of materials are deposited in the archeological record to form assemblages. They used accumulation rates to estimate length of site occupation, and the developed methods for “unmixing” assemblages formed during more than one period.

The DAP labs also contributed methodological improvements. The ceramics analysis program developed methods for refining stylistic chronologies, interpreting vessel use, and determining whether pottery production was at the household or specialist level. Studies of inter-regional pottery exchange attempted to distinguish changes in trade ware occurrence that were due to population decline in the production areas from those reflecting shifts in trading relationships.

The lithic artifact analysis program developed lithic artifact profiles for assemblages, based on raw materials and broad “morpho-use” tool classes. These profiles proved useful in large-scale comparisons across both inter- and intra-site contexts. A multivariate analysis of projectile point form permitted comparisons between statistical and intuitive point typologies. The large sample of excavated contexts supported an analysis of change in tool kits across the transition from a dispersed to an aggregated settlement pattern.

Data Comparability and Quality Control

The DAP was able to tackle large-scale problems in processual archeology because a serious commitment was made to obtaining comparable, high-quality data sets. This was not easy, because up to 10 excavation crews were in the field at the same time, and the central laboratory operated for several years, with changes in key personnel. Several steps were taken to ensure data comparability and quality

First, a sample of sites was subjected to probabilistic sampling by standard-sized excavation pits. The “probability sample” permitted the estimation of quantities and rates of deposition of various kinds of artifacts and ecological samples for various periods. Second, much effort was invested in developing and implementing standardized field forms. Third, DAP lab personnel rigorously checked field and lab records before they were entered into the computer database. Finally, a comprehensive computer database was developed, despite the relative primitiveness of the hardware and software available at the time.

A recent Colorado Historical Society grant has funded conversion of the database to a contemporary format, so it can continue to support new research.

Conclusion: Dissemination of Results

I conclude by returning to the question I started with—to what extent did the public funds spent on the DAP result in an increase in knowledge about the American past and an improvement in our ability to learn about the past through the practice of archeology? I think I have made a case that the DAP made important contributions of both sorts. To fully answer the question, however, we must also consider how effectively knowledge about these contributions has been disseminated. No matter how good the research has been, if scholars and ultimately the general public never learn about the results, the social benefit of the project remains unfulfilled.

First, by creating the Anasazi Heritage Center, the DAP ensured that information was made directly available to the public—not only about the project itself, but about the archeology of the Four Corners area. The Center continues to develop new exhibits and public programs.

Second, the 13 weighty DAP technical reports were produced in a timely manner and were distributed to a number of university libraries, as well as to state and federal agencies. Over 200 other technical reports were given more limited distribution.

Third, a number of theses, dissertations, journal articles, and book chapters have been based on DAP studies and data, many of them undertaken independent of DAP funding.

Despite these efforts to disseminate project results, I continue to be surprised at how long it has taken for some of the principal DAP findings to become incorporated into the general southwestern archeological literature. I don't think that there is any evil conspiracy afoot here. It is just that even accomplished scholars quail at the thought of having to read lengthy technical reports about a project outside their own research area in order to learn the main results of the work. I am not saying that technical reports of this sort should not be published; on the contrary, detailed documentation is absolutely essential to fulfilling a project's obligations to science and ultimately to the public. These basic reports will continue to be valuable reference works far into the future.

However, the peer-reviewed journal articles and book chapters based on DAP data but often not directly supported by the project have been much more effective than the technical reports in widely disseminating the DAP's principal substantive and methodological contributions. These publications are short and are published in journals and books circulated at a broad regional or national level.

In retrospect, I wish that some of the DAP fieldwork, analysis, or technical reporting had been cut back just a bit so that key project staff members could have been funded to produce a series of peer-reviewed journal articles or one or two books for submission to a major academic or trade press. Such works would have been addressed to archeologists, but would also have made the project findings more quickly accessible to a variety of public interpretive specialists as well (e.g., journalists, free-lance writers, K-12 teachers, museum exhibitors, video producers, etc.). In other words, dissemination of the project's most important contributions to knowledge would have relied on the standard, existing system of journals and presses that scholars, educators, media specialists, and the public depend on when they want to learn about what is happening in archeology.

In summary, the DAP has made and continues to make a significant contribution to our understanding of what happened in the past in the northern Southwest and to our ability to do better archeology in the future. The large investment of public funds in this project has paid off in many ways, including the direct provision of interpretive materials to the public through the Anasazi Heritage Center, the prompt publication of detailed technical reports, and the continued availability of collections, records, and a large database to support additional research. Dissemination of the principal project results might have been improved if one or more compact book-length syntheses or a series of journal articles, or both, had been produced by the project at its conclusion.

Further Background

Breternitz, David A., Christine K. Robinson, and G. Timothy Gross (compilers), *Dolores Archaeological Program: Final Synthetic Report*. USDI Bureau of Reclamation, Engineering and Research Center, Denver. 1986.

William D. Lipe is Chair, Department of Anthropology, Washington State University, Spokane, Washington, and Research Associate, Crow Canyon Archaeological Center, Cortez, Colorado.

Great Cut Dike in the Dolores Project, Colorado. High altitude downstream view shows finished dike embankment with left and right weighted zones and riprap center. Intake channel is in the foreground with Canal Outlet Works control and gate structures behind it. Pumping plant excavation is underway in center of photo. Photo courtesy J. Fleetman, Bureau of Reclamation.

