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Newsletter of the New Mexico Archeological Council
PO Box 25691
Albuquerque NM 87125

2013-2

Paleoindian Archaeology in New Mexico

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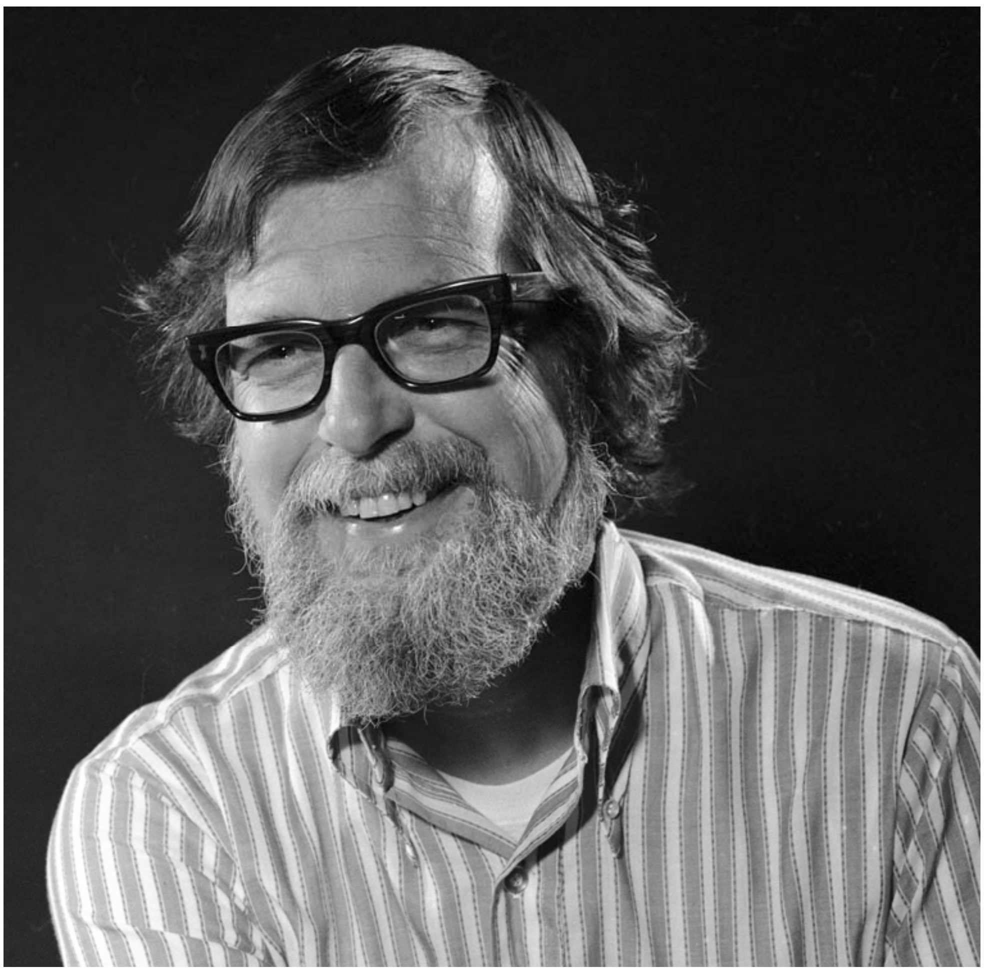
IN MEMORIUM

PATRICK CULBERT



(courtesy of the Arizona State Museum)

INTRODUCTION

Hopefully when you think of archaeology in New Mexico, you think of sites like Blackwater Draw and Folsom. That is, sites that changed our perspective of North American archaeology and the arrival of the first inhabitants onto this continent. Much has changed since then. There has been sporadic studies involving Paleoindian research in the Southwest, but it seems like most of the focus has been on the nearby Great Plains. Although there has been continuing work at Blackwater Draw, most research has focused on the Folsom in the Rio Grande valley, including the work of Amick, Huckell, Jodry, Judge and LeTourneau. It's nice to see a resurgence in Paleoindian research across the state that involves revisiting old sites and exploring new ones. My own research has studied the relationship between Late Paleoindian and Early Archaic projectile point design and hunting tactics in the northern Rio Grande. That is, Late Paleoindian hunters emphasized the importance of penetration efficiency and intercept hunting at close quarters; whereas, Early Archaic hunters emphasized durability and the encounter hunting of game with the increased likelihood of target misses (see Bousman and Vierra's [2012] edited volume). Although not included in this collection of NewsMac papers, Meltzer's recent work at the Folsom site provides some new perspectives. The suggestion that the site is the result of a logistically organized hunting party that simply encountered this small herd is a welcome addition. Amick's research has emphasized the differences between residentially mobile Folsom groups residing in the Basin and Range, vs. those on the southern Plains who may have been more logistically organized. Certainly Kornfeld's research has tried to de-emphasize the importance of large game to the exclusion of other species on the Plains. The real question is what was the nature of Clovis, Folsom and Late Paleoindian foragers residing across the environmentally diverse Southwest, and how have studies of the southern Great Plains affected our view of them? For example, why is there so much Folsom in the southern Tularosa Basin, and yet so little Clovis? The Southwest was probably more of a mosaic than we realize, with Paleoindian groups to the east and Paleoarchaic groups to the west. What does all this really mean in terms of Southwest Paleoindian archaeology?

Bradley Vierra, Editor
Statistical Research Inc.

PS. Huckell and Holliday have a nice article on Clovis in the new issue of American Antiquity.

CURRENT RESEARCH AND INVESTIGATIONS AT BLACKWATER DRAW, NM

David Kilby and George Crawford
Eastern New Mexico University

Blackwater Draw Locality 1, a.k.a. the Clovis site, is widely recognized as one of the most significant archaeological sites in North America. Toward the end of the last ice age, about 13,500 years ago, pioneering groups of hunter-gatherers encountered an oasis at Blackwater Draw – a spring-fed pond frequented by herds of Pleistocene fauna, including mammoth and bison. The Blackwater Draw (BWD) site (actually a series of sites) was a recurring hunting ground and camp area throughout the Late Pleistocene and much of the Holocene. In 1932 archaeologists and local volunteers confirmed the association of stone and bone tools with a number of mammoth skeletons, and identified the Clovis culture (Cotter 1937). Although artifacts had been collected from the site for years, it was discoveries of distinctive spear points and mammoth remains during gravel mining operations after 1932 that led to BWD becoming the type site for the Clovis cultural complex. In addition to the discovery and definition of Clovis, the stratified deposits at BWD confirmed the historic 1927 discoveries at Folsom, NM.

Archaeological investigations at BWD over the last 80 years have revealed an extensive stratigraphic record that established a sequence of archaeological cultures (Hester 1972; Stanford et al. 1982; Boldurian and Cotter 1999; Haynes and Warnica 2012), including Clovis, Folsom, Agate Basin, Plainview, Angostura, and Cody (the latter four were originally named the "Portales Complex," and are referred to here as Late Paleoindian) as well as Archaic and later

Prehistoric cultures, and provided a chronological ordering for the earliest archaeological cultures on the Southern Plains and the Southwest. Located between the towns of Clovis and Portales on the Llano Estacado of eastern New Mexico, BWD is owned by the state of New Mexico and managed by Eastern New Mexico University. Despite years of destructive gravel mining, intact deposits remain preserved at the site and it remains central to active research being carried out by a number of institutions. Here we will focus on describing four avenues of continuing research at BWD being carried out by ENMU.

Isequilla's Pit

The ENMU Archaeological Field school was conducted in an area of the South Bank known as "Isequilla's Pit" during the summers of 2009 and 2010 (Crawford and Kilby 2010), and will be again in 2013. Technically, the work constitutes a resumption of excavation in that area, as Alberto Isequilla abruptly abandoned his fieldwork in 1969, leaving behind an open excavation pit and a paucity of field records. The Isequilla excavation was never fully backfilled, and was recognizable as a depression filled with slumped and windblown sediments. Although records and photographs indicate that Isequilla's excavation efforts exposed at least the uppermost Paleoindian-aged stratum at the site, the Carbonaceous Silt (a.k.a. Unit E), little was known of the extent of excavations or the nature of what was encountered, and Isequilla's 1967-1969 fieldwork remained a poorly known episode in the history of research at the Blackwater Draw site.

The results of the 2009 excavation include the successful relocation and mapping of Alberto Isequilla's 1967-1969 excavation grid, the excavation of Unit E (Carbonaceous silt/Late Paleoindian) and Unit D (Diatomite/Folsom) sediments in 12 1x1 m excavation units, and the recovery and preliminary analysis of over 400 faunal specimens and lithic artifacts. In addition, a number of historic artifacts connect specific excavation features to photographs from the original excavation. In 2010 we continued excavation of seven 1x1 m excavation units in Unit E and Unit D sediments, resulting in the recovery and analysis of over 100 additional faunal specimens. The results indicate that these faunal remains most likely represent a continuation of the Late Paleoindian bison "bone beds" observed in other excavations of the South Bank (Crawford and Kilby 2010). Masters Thesis research constituting a zooarchaeological analysis of these remains and relating them to previous excavations is nearing completion by Stacey Bennett of ENMU (Bennett 2011). The 2013 field work will be focused upon expanding, mapping, and sampling the stratigraphic profile along the northeast wall of the pit.

Locality X

Locality X is an artifact scatter located a few hundred meters to the southeast of the gravel pit located during a joint survey effort between the New Mexico State Land Office and the ENMU 2009 Archaeological Field School. Due to its uncertain cultural and temporal affiliation, the area was temporarily dubbed "Locality X," a name which seems to have stuck. Locality X appears to represent a camp adjacent to the Pleistocene springs and pond at BWD proper. On the surface this activity area consisted of roughly 50 pieces of lithic debitage found in anthills and eroding from the head of a shallow swale. While the lithic technology and raw materials from the site compare well with nearby Paleoindian assemblages, its affiliation was unclear.

In 2010 we excavated a 1x3 m trench as well as five 1x1 m test units in order to determine the age and integrity of the site. We recovered over 1,000 small lithic artifacts from throughout a thick eolian sand deposit overlying an eroded Pleistocene stratum. Coring in the swale by Vance Holliday revealed that the swale itself represents a relatively recent deflation basin as opposed to a springhead or playa. However, an organic-rich stratum identified in the easternmost test unit may represent a marsh or cienega adjacent to the site. A Desert side-notched projectile point, metate fragment, and an underlying radiocarbon date of 1920±30 years BP indicate that this locality represents a Late Prehistoric occupation of the Blackwater Draw site. Masters Thesis research by Laura Hronec of ENMU is focused on elucidating the eolian geoarchaeology of this locality (Hronec 2012), which represents the only known discrete Late Prehistoric campsite at BWD.

The Folsom Block

The Folsom wedge is a ca. 2x1x0.5 m block of sediments from the Folsom stratum of the North Bank collected by George Agogino. The block was jacketed with plaster and salvaged from a collapsing exposure at the site in the 1960's in order to avoid imminent destruction by gravel mining (Stevens 1973). Although its exact provenience was not plotted, photos of the block in situ give us a good indication as to its approximate origin.

Over the course of two semesters, ENMU students in an Advanced Geoarchaeology class have been carefully investigating the contents of the Folsom block. We established a protected working environment and field laboratory in a Weatherport® and have opened and undertaken controlled excavation the sediment block. We are collecting and analyzing sediment samples in order to describe the stratigraphic, environmental, and archaeological record it contains.

Through our ongoing investigations we have established that the block was salvaged after May 16, 1963 (the most recent date observed on newspapers underlying the plaster), and contains a dense concentration of Pleistocene bison bones in a silt loam matrix (Figure 1). Underlying the bone-rich stratum is a series of laminated paludal strata dated to 11,095±35 B.P. which in return overlie Unit C (Clovis-age) alluvial sands.

Figure 1. Current research at Blackwater Draw. Clockwise from upper left: Stratigraphic profile in Isequilla's pit showing sequence from Unit G (Middle Archaic) at top to Unit C (Clovis) at base; Excavating Late Prehistoric eolian deposits at Locality X; Arroyo profile at Frost Arroyo north of BWD; Students working on the Folsom Block.

Paleoenvironmental Research

In 2012 the first author received a NM EPSCoR grant to undertake research on prehistoric climate change at BWD and the surrounding region, while providing interdisciplinary research opportunities for undergraduate students at ENMU (Kilby 2012; Kilby et al. 2013). In combination with Frost Arroyo, a newly discovered pluvial feature exposed by the erosion of a 4 meter deep arroyo located approximately 90 km (57 miles) north of BWD, the localities described above provide a nearly continuous record going back over 15,000 years. Pollen, phytolith, diatom, ostracod, mollusk, and stable carbon isotope data, as well as dates and stratigraphy, are being compiled to paint a picture of successive environmental change, the broad brushstrokes of which are already becoming clear.

The lowest levels at Frost Arroyo reflect the time period between the last glacial maximum and about 13,000 years ago, when spruce, pine, and fir were regionally abundant and a slightly saline marsh existed locally. Precipitation was winter-dominant. By around 13,000 years ago standing water continued to exist at Frost Arroyo, while running water deposited sands at Isequilla's Pit and in the North Bank (as indicated in the Folsom Block). Summers were increasingly dry and surface water may have been intermittent. Both the Folsom Block and Isequilla's pit indicate a return to cool, moist conditions and a large body of standing water at Blackwater Draw around 12,000 years ago – a period corresponding to the Younger Dryas interval. Episodic shifts in diatom species indicate pulses of freshwater discharge into the lake, perhaps representing seasonal increases in spring discharge (Palacios-Fest 2012). Isotope data from teeth support this overall trend, with the tooth from the Clovis sands reflecting predominately cool (C3) grazing under seasonally variable conditions, while the Folsom-age teeth reflect a shift to wetter conditions but more warm season grasses (C4). Pollen and phytolith results from the Folsom Block indicate an ecological community strikingly similar to wetland environments currently found in Minnesota (Cummings and Yost 2012). All localities reflect abrupt changes after 10,000 years ago. Increasingly saline and increasingly sparse surface water corresponds to an increase in xeric vegetation on the landscape. Evergreen pollen dropped precipitously and micro-faunal species diversity declined. Locality X and the uppermost strata of Isequilla's pit, though relatively wetter spots on the landscape at the time, reflect the semi-arid ecological communities of the present. Sediment data from all localities reflect an increase in erosion and landscape instability with increasing temperature and aridity. Current research is focused upon synthesizing these results to create a more detailed series of paleoenvironmental reconstructions corresponding to the record of human activity at BWD, and to providing a case study of human responses to abrupt climate change that is relevant to contemporary climate change issues.

Much of the long history of archaeological investigations at BWD remains relatively poorly reported, and there is a current emphasis on bringing past projects to light. In addition to ENMU projects that are moving forward with unfinished work at Isequilla's Pit and the Folsom Block, Vance Haynes and Jim Warnica have recently synthesized F. Earl Green's critical 1960's work in the North Pit, along with field notes and correspondence, in a single monograph (Haynes and Warnica 2012). However, not all work at BWD is focused on the past. Considerable research potential remains at BWD, and new discoveries such as Locality X, along with new research in the better known localities continue to add to our understanding of this perennially important site.

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RECENT RESEARCH AT THE MOCKINGBIRD GAP CLOVIS SITE

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Vance Holliday
University of Arizona

Some 40 km southeast of Socorro lies the Mockingbird Gap site, one of the largest yet most poorly known Clovis sites in the western United States. It was discovered approximately 50 years ago by the late Dr. Robert Weber, who pursued surface collection of diagnostic artifacts and detailed mapping of the site. His determined and conscientious work over six decades demonstrated that the site extended for some 800 m along Chupadera Draw in the northern Jornada del Muerto basin. A small portion of the site was excavated between 1966 and 1968 by an Eastern New Mexico University field school, under the direction of George Agogino and Bob Weber; little was published on their work (Weber 1997; Weber and Agogino 1997).

In 2004, we became interested in the site and visited it with Bob. From that visit, it was clear to us that a program of mapping and limited augering and testing of the site area, coupled with core sampling of the Chupadera Draw floodplain, might produce valuable data on Clovis use of the northern Jornada as well as a record of paleoenvironmental conditions before, during, and after Clovis occupation. In the summers of 2005 and 2006 we conducted preliminary evaluation of the site, particularly focusing on the geoarchaeological record in the area excavated by ENMU near the southern end of the site and an area at the northeastern end of it. Six test units 1-m-wide were used to straighten the eroded walls of the major ENMU investigation area; this provided a fresh exposure of the sediments in the area and permitted recovery of small samples of artifacts. Although we recovered abundant biface reduction debitage, the deposits from which they came were determined to have been affected by one or more episodes of erosion and later Archaic and ceramic period re-occupation. Thus, research potential here was limited.

To the north, augering and test pitting in 2006 led to the discovery of what appeared to be a largely intact locus of Clovis occupation in the northeastern part of the site (Figure 1). This area lay to the northeast of the prominent ridge on which the ENMU excavation area was located, and to the south and east of an extensive area of blowouts from which Weber had collected numerous Clovis artifacts. The auger testing revealed two discrete eolian deposits, the lower of which showed well-developed Btb (argillic) and Bkyb horizons of probable Pleistocene age. It was erosionally truncated, and overlain by a younger sand with a Bw horizon. Test pits yielded occasional artifacts, and two units close to one another produced significant quantities, including a Clovis point basal fragment.

In 2007, the UNM Southwestern Summer Archaeological field school focused on sampling this new area. Locus 1214, as it was designated (Huckell et al. 2007), was explored with 16 1 m by 1 m units, which indicated that the locus covered a small area of approximately 10 m by 19 m (Figure 2). From these units we recovered nearly 1000 flaked stone artifacts, including two Clovis point basal fragments, four biface fragments, nine small flake tools, five gravers, four utilized flakes, and 956 pieces of debitage. Nearly 60 percent of the artifacts were recovered from the Btb horizon developed on the older sand deposit; the remainder were in either the Bw developed on the younger sand or a distinctive gley horizon separating the younger sand from the Pleistocene argillic horizon. The younger sand ranged from as little as 5 cm thick near the north end of the locus to as much as 25 cm thick at its southern end. A variety of lithic raw materials was represented in the assemblage, including such nonlocal types as Chuska (or Narbona or Washington Pass) chert (some 400 km to the northwest of the site), China/Correo chert (some 200 km to the northwest), and two flakes of Grants Ridge obsidian (some 190 km northwest). Nearly half of the lithic material was derived from one or more sources of silicified rhyolite (“Socorro jasper”) that can be found west of the Rio Grande River some 50 or more km from the site. These data suggest that the group occupying Locus 1214 had travelled to the south and east from the Chuska Mountains, passing north of the Zuni Mountains, southwest of Mt. Taylor, and then southeastward past Cebolleta Mesa, the Plains of San Agustin, and then across the Rio Grande into the northern Jornada Basin.

Also recovered from the locus were small pieces of tooth enamel morphologically and metrically consistent with bison, and a few small, highly weathered large mammal bone splinters. We suspect that Locus 1214 represents a short-term processing camp occupied by a small group after a successful bison kill.

Geoarchaeological coring was used to assess the stratigraphic integrity of the site and gain clues to the paleoenvironmental conditions during the Clovis occupation (Holliday et al. 2009). Coring in Chupadera Draw revealed ~11 meters of fill spanning the past ~11,000 ^{14}C years. The stratified deposits provide evidence of flowing and standing water on the floor of the draw during Clovis times, a likely inducement to settlement. The floor of Chupadera Draw was ~9 to 10 meters below the modern surface of the draw, which is also roughly the surface of the Clovis occupation. Thus, the draw was roughly 9 to 10 meters below the site. The coring also showed that the wall of the draw between the site and the draw floor was nearly vertical. Clovis and later Paleoindian archaeology is likely preserved in the fill of the draw, but deeply buried (e.g., the recovery of a bead in a core at 9.20m below surface, reported by Holliday and Killick, 2013).

Together, these new data indicate that Mockingbird Gap was a huge site to which Clovis groups returned episodically. The overall distribution of artifact clusters within it suggests organization of the site into localized short-term camps, each of which may be the product of occupation by one small social unit. Whether these loci are temporally discrete or represent coeval aggregations of two or more smaller social units is, at this point, unclear. The presence of an apparently reliable water source and marsh along Chupadera Draw was certainly a major attraction, and it appears that, at least at Locus 1214, bison were the principal focus of hunting. The Mockingbird Gap site and Chupadera Draw clearly contain critical archaeological, geological, and paleoenvironmental data that we plan to explore in the coming years.

Figure 1. Holliday and Hill recovering core samples from the floodplain of Chupadero Wash.
In the Background is the ridge along which the Clovis occupation was distributed.

Figure 2. The UNM field school students excavating at Locus 1214 (north)

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NEW FINDS AT THE WATER CANYON PALEOINDIAN SITE (LA 134764)

Robert Dello-Russo
Office of Archaeological Studies

This article summarizes the field work efforts at the Water Canyon Paleoindian site in west-central New Mexico from September 5 to September 16, 2012. It follows on the heels of a previous NewsMac article (2011-1) about the results of research at the site and in the laboratory between 2008 and 2011. Personnel in 2012 included the author, as principal investigator, Dr. Russell Greaves as field director, Dr. Vance Holliday as geoarchaeologist, and Susan Smith as paleo-palynologist, together with a dedicated cadre of volunteers and students. Volunteers included Dr. Jesse Ballenger, Matt Barbour, Tom Ireland, Sheila Martin, Tim Maxwell, Beth Parisi, Steve Post, and Judi Powell, and students included Leslie Aragon, Eric Heffter, Jennifer Kielhofer, Chris Merriman, Jill Onken, and Andy Richard. George Cline from the Energetic Materials Research and Testing Center ran the backhoe. Visitors to the site included Gary Grief, Dr. C. Vance Haynes, and Martha and Roland Mace.

Summary of 2012 Field Work

In all, 242 new field samples were collected, including 42 lithics (none diagnostic); 56 bison bone elements, fragments, or tooth enamel; 9 ochre samples; 54 bulk sediment flotation samples; 11 pollen samples; 14 bulk sediment C-14 samples; 39 charcoal C-14 samples; 10 OSL samples; and 7 possible fire-cracked rock elements. These samples were recovered from 5 hand-excavated units in Locus 1, including Units 1-6, 1-10, 1-14, 1-15, and 1-17. Pollen and C-14 samples were collected from the north wall of Unit 1-9. Previously excavated backhoe trenches BHT-4, BHT-5 and BHT-6 were re-opened for the collection of the OSL samples, and an additional 8 mechanical sediment cores (12-01 through 12-08) were completed, sampled and described. Analytical efforts are now underway at the Center for New Mexico Archaeology in Santa Fe.

Notable Findings

In hand-excavated Unit 1-6, excavations proceeded down to a grid elevation of about 47.10 m, which corresponds to the level in the adjacent arroyo at which a Clovis-age sediment sample was recovered in 2008. A lens of densely carbonized sediment (charcoal?) was encountered at this level in Unit 1-6 and sampled.

Another noteworthy development during the 2012 field season was the discovery of adult bison bones in Locus 1, mostly along the south side of the excavation block (Figure 1). The distribution of bones encountered in this area was both horizontally and vertically dense, and many elements were more complete than those encountered in 2010 (which had been dated to ca. 9300 cal yr BP). Some bones still required plaster jacketing prior to their recovery. The comparative metrics for an adult bison metacarpal recovered from Unit 1-15 demonstrate that the adult (and, thus, most likely the adjacent juvenile) are actually the *Bison antiquus* species, rather than the *Bison occidentalis* species as previously thought. Some of the adult bones exhibited green-bone fractures, suggesting breakage by humans.

Mechanical core nos. 12-06 and 12-08 revealed additional deeply buried bone in black mat sediments at depths of 3.55 and 3.57 m, respectively, below the surface (bgs) in Locus 1. The sediments surrounding the bone previously discovered in 2010 dated to ca. 11,100 cal yr BP and suggest the possible presence of a second, older Paleoindian component at the site. The 2012 cores with bone enabled us to expand the horizontal size of the previously discovered buried bone bed to the north and the east. Based on the results of these new cores, we know that the bone bed extends, at a minimum, over an area measuring 9.92 square meters, or 106.78 square feet. It is likely that this buried bone bed covers a larger area.

After two significant thunderstorms, when both major drainages at the site ran (not seen before at this site), the black mat deposit was exposed in a cut-bank of the larger wash at the east side of Locus 1. We recovered pollen and dateable bulk sediment samples from that exposure. This exposure of the black mat occurs at the same grid elevations as that portion of the black mat where buried bone was encountered with the mechanical core, about 30 m to the west. In addition, the thunderstorm also caused sheet wash run-off across the site which, in the process, exposed additional surface artifacts. The nicest surprise is this regard was the discovery of the missing parallel-sided, concave base to a previously collected Late Paleoindian projectile point blade mid-section. As it turns out, the two artifacts were only about 6 horizontal meters apart.

Proposed Additional Work at the Buried Bone Bed

We had originally thought that the use of ground penetrating radar (GPR) would allow us to delineate the full horizontal extent of the buried bone bed remotely and without excavation. However, after conversations with several individuals familiar with the use of GPR on buried bison bone beds (Stephen Devore, NPS; Dave Reynolds, DRGS; and Maxine McBrinn, MIAC), it seems that the Water Canyon bone bed is buried too deeply (ca. 3.5 – 3.7 m bgs) and the overburden is not fine-grained enough for the GPR technology to be a definite success. Given its low potential for success and our limited funding, we chose to forgo the GPR approach.

We also considered the possibility of using the mechanical coring rig to further delineate the horizontal extent of the buried bone bed. Our reluctance to do this derived from the fact that each core that penetrates the bone bed lowers the deposit's integrity. Neither GPR nor mechanical coring can inform us about the species of animal represented; provide us with dateable bone samples; or allow us to assess – through the presence of artifacts or cut marks – whether humans were associated with the deposit or not. Accordingly, we are planning to use a backhoe / front-end loader to remove the overburden above the bone bed, ideally during the Spring of 2013.

Acknowledgments

The 2012 research efforts at Water Canyon have been underwritten by the Argonaut Archaeological Research Fund; the Museum of New Mexico – Office of Archaeological Studies; the Energetic Materials Research and Testing Center; the Museum of New Mexico Foundation – Friends of Archaeology; and several private donations.

Figure 1. Adult *Bison antiquus* bones in Locus 1, Water Canyon Paleoindian Site.

RECENT PALEOINDIAN STUDIES AT SPACEPORT AMERICA

James Moore
Office of Archaeological Studies

During 2010-2011, the Office of Archaeological Studies examined 14 sites at Spaceport America about 30 miles east of Truth or Consequences, four of which contain Paleoindian remains. This work was sponsored by the New Mexico Spaceport Authority in coordination with the Federal Aviation Administration. Paleoindian artifacts were found at two sites during surveys conducted by Human Systems Research (HSR 1997) and Zia Engineering & Environmental Consultants (Quaranta and Gibbs 2008). HSR found a Clovis point base, fragments of six Folsom points, and Paleoindian scrapers at LA 111429, a large multicomponent site that also contains Archaic, Formative, and early Historic remains. LA 111432 was also recorded by HSR who found the base of an Eden-like point there, suggesting a late Paleoindian date. Zia recorded the other two sites, though no Paleoindian materials were reported. LA 155963 is the largest site examined at the Spaceport, and was described as containing Late Archaic and Mesilla phase Jornada Mogollon components. OAS found three Folsom point fragments, two late Paleoindian point fragments, and two spurred end scrapers at this site, indicating multiple Paleoindian components. LA 155968 was described as a prehistoric artifact scatter with features during survey. During a later visit to stake a road corridor a Folsom point fragment was found, suggesting a Paleoindian component. A geomorphological study was conducted in conjunction with this study, providing an environmental context. Unfortunately, no faunal materials or intact features were found in association with these components.

Three locales at LA 111429 that contain Paleoindian materials were partly excavated. This site, which covers 18.07 ha, is located on and adjacent to a low sand ridge just east of Jornada Draw. The sand ridge comprises the east-central part of the site and few features and artifacts are visible on the surface in that area. The northern, western, and southern flanks of the site are deflated, exposing literally thousands of artifacts. The densest scatters occur along the west flank. Definition of the three Paleoindian locales was based on the presence of spurred end scrapers, a high percentage of heat-treated materials, and evidence for large biface reduction. These areas were badly deflated and artifacts were observed eroding from a thin layer of sediment that remains as occasional islands on which considerably fewer artifacts are visible. Next to the densest scatter of materials in the north-central part of the site was an uneroded expanse of the same sediment that was hoped to contain buried artifacts.

The geomorphological study showed that the layer of sediment from which Paleoindian artifacts are eroding is widespread through the Spaceport area and formed between the Paleoindian and Middle Archaic periods. The Paleoindian materials are eroding from the lower part of this unit, demonstrating their antiquity. A Folsom date for these materials is likely as suggested by the number of Folsom points found at the site and the similarity of these remains to other Folsom components that were investigated (Figure 1). Excavation in the Folsom locales recovered 903 chipped stone artifacts, which are dominated by various cherts (95%) of which 40% are heat-treated. Biface flakes comprise 16% of the flakes. Besides projectile points and spurred end scrapers, tools include utilized debitage, other types of scrapers, and biface fragments.

LA 111432 covers 1.75 ha and is on a flat mesquite and creosote dominated plain half a kilometer west of Jornada Draw; 141 chipped stone artifacts were collected or analyzed in the field. Cherts dominate this assemblage (58%), and metaquartzite is also common (39%). Besides the Eden-like point collected during survey (HSR 1997), the only other formal tools are two spurred end scrapers. Biface flakes comprise 9% of the flakes, and 19% of the cherts are heat-treated. The geomorphological study concluded that a Pleistocene age piedmont alluvium is exposed on the surface. Though artifacts were moderately common in the upper 5–10 cm of fill, they probably reached those depths through bioturbation. Associated cultural deposits have been eroded away and artifacts are vertically and possibly horizontally displaced.

LA 155963 covers 53.32 ha and sits on a hill with a gentle southerly slope and a more rapid drop off at the north end. A locale at the north end that contains a Folsom component was selected for excavation. Three Folsom point fragments were found in this area, though none were directly associated with the excavated areas. This area overlooks a shallow valley formed by Aleman Draw, and has an extensive view in all directions. The surface fill is a pebbly, silty sediment overlying materials deposited during the Pleistocene. The geomorphological study indicates that these sediments are the same geological unit that contains the Folsom component at LA 111429. A similar Folsom date is consistent with the occurrence of artifacts near the base of the sediment layer. Excavation recovered 554 chipped stone artifacts in addition to those collected from the surface in the northern part of the site (12). Cherts dominate this assemblage (95%), of which 35% are heat-treated. Biface flakes comprise 20% of the flakes. Besides the three Folsom point fragments, associated formal tools include 3 end scrapers, 3 spurred end scrapers, 1 side scraper, 6 bifaces, and a gouge (Figure 1).

The last Paleoindian component is at LA 155968, a site that covers 1.19 ha and is on a fairly level plain dominated by mesquite and creosote bushes. Besides a Folsom component, this site contains a Mesilla phase roasting pit and scatter of associated artifacts, and a single Historic strike-a-light flint was also found. Some mixture of materials from these three components is likely. Though no soil pit was excavated at this site, the geomorphological study showed that the surface is mantled by a thin layer of the same sediment that contains the other Folsom components, under which is Pleistocene alluvium. A total of 396 chipped stone artifacts were assigned to the Folsom component. Cherts dominate this assemblage (93%), of which 71% are heat-treated. In addition to the Folsom point, other formal tools include 5 spurred end scrapers, 2 side scrapers, 5 bifaces, a drill, a graver, and a Midland point base.

Each Folsom component occurs near the base of a wide-spread layer of cover sediment deposited between about 15,000 and 5,000 years ago, as determined by optical stimulated luminescence (OSL) dating. This sediment mantles the eroded surface of a piedmont alluvium that is at least 40,000 years old. Where the cover sediment is eroded, Paleoindian and later artifacts lie directly upon the ancient piedmont alluvium. This is the case with at LA 111432, which is completely deflated. Deflation is also a problem with the Folsom components, but in each case enough of the cover sediment remains in areas adjacent to deflated zones to suggest that some horizontal integrity remains. The most extensive Folsom component is at LA 111429, where the cover sediment disappears under a mantle of later sands. Excavation near later features 50 m or so from one of the Paleoindian areas at LA 111429 encountered the cover sediment just above the piedmont alluvium, and in one excavation area two pieces of the same Folsom base were recovered. Thus, much of the Folsom horizon at this site remains buried and available for further study.

A different situation pertains at LA 155963 and LA 155968. In both of these cases the remaining layer of cover sediment is thin—about 4–12 cm thick at LA 155963 and 11–17cm thick at LA 155968. In contrast, the undeflated cover sediment at LA 111429 is about 30 cm thick. Thus, only the lower half or less of this layer remains at the other two sites. All three of these sites have good research potential, though bone and other perishable materials are not preserved. Fire-cracked rock is mixed with the chipped stone artifacts at all three sites. Whether this indicates the early use of roasting pits and other types of thermal features that became common during the Archaic and later periods or is evidence of mixing with later materials through bioturbation is uncertain, but it is an interesting facet of these sites.

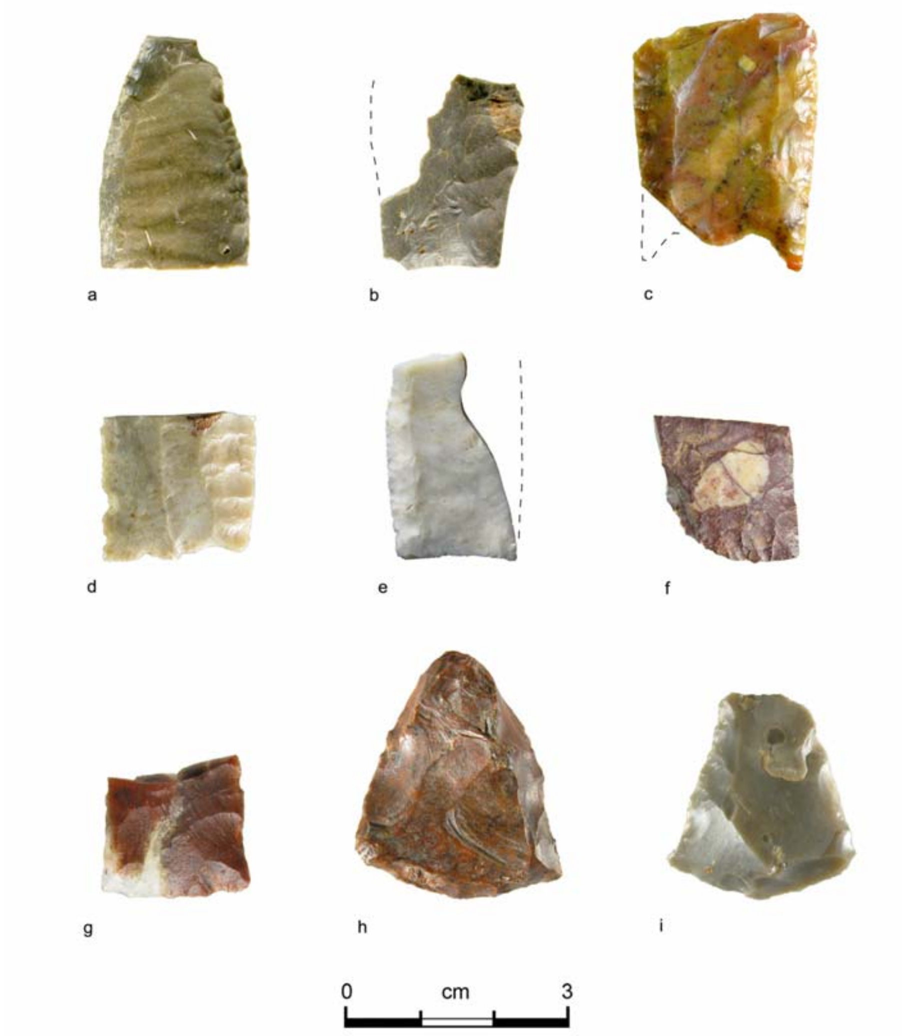

Figure 1. Paleoindian artifacts from Spaceport America: a. Folsom point fragment from LA 111429, b. Paleoindian point fragment from LA 111429, c-e. Folsom point fragments from LA 155963, f-g. Paleoindian point fragments from LA 155963, h-i. spurred end scrapers from LA 155963.

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INTERPRETING THE PALEOINDIAN SIGNATURE OF SOUTHEAST NEW MEXICO: EXAMINING PROJECTILE POINT DISTRIBUTIONS FROM THE SOUTHERN TULAROSA BASIN TO THE PECOS RIVER VALLEY

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Since the 1940s, New Mexico has benefitted from a number of regional studies focused on examining Paleoindian occupations throughout the state (Amick 1994; Beckett 1983; Carmichael 1986; Howard 1935; Hurt and McKnight 1949; Judge 1973; Sebastian and Larralde 1989; Wessel et al. 1997). Despite these contributions, the character of the Paleoindian period in southeast New Mexico remains poorly understood. Taking advantage of existing and emerging regional data sets derived from federal, state, and private collections, this preliminary study offers direction towards improving the regional signature through patterns in projectile point distribution and by proxy, a collective view on early land use across Eddy, Doña Ana, Lea, and Otero Counties, New Mexico, and by extension, the far northern reaches of the Hueco Bolson in El Paso County, Texas (Figure 1).

While fundamental in design, this distribution analysis borrowed heavily from concepts presented in Amick and Lukowski (2006), Anderson and Gillam (2000), Carmichael (1986), Meltzer (1986), and Wessel et al. (1997), with a first order inquiry presenting a comprehensive view of sites with possible Paleoindian components and/or singular isolated finds across the study area. A total of 263 Paleoindian projectile points were provided a UTM point provenience and plotted on an aerial map of the region. Of the five counties included in this preliminary study, Otero (n=142/53.99%) accounts for over half the projectile points. Adjacent counties Eddy (n=47/17.87%) and Lea (n=45/17.11%) parallel each other in current point density. Doña Ana and El Paso County made up 4.94 percent (n=13) and 6.08 percent (n=16) of the total assemblage, respectively. Recognizing sampling bias, all three of these counties reflect rigorous survey efforts that have intensified over the last decade in the southern portion of the state.

The point assemblage was seriated by style, resulting in 12 type categories: Agate Basin, Angostura, Clovis, Eden, Firstview, Folsom/Midland, Milnesand, Plainview, Scottsbluff, Indeterminate Late Paleoindian, and Indeterminate Paleoindian (Figure 2). The combined type category of Folsom-Midland clearly stands out making up 44.48 percent (n=117) of the point assemblage, the majority (n=73) of these recovered from Otero County, New Mexico. Clovis points, several of which have not been verified, consists of 8.36 percent (n=22) of the assemblage. Plainview points are relatively evenly spread across the five counties (n=23/8.74 percent). Remaining diagnostic point types (Agate Basin, Angostura, Eden, Milnesand, Scottsbluff etc.) collectively made up 15.96 percent (n=42) of the total assemblage. Indeterminate Paleoindian types also occur in elevated frequencies (n=59/22.43 percent).

Within the Tularosa Basin, distribution patterns reveal occupational aggregation associated with small pluvial lakes and playas that form west of the Hueco Mountain alluvial fans and spread across the basin (Johnson 1997) (Figure 3). While the timing and duration of ponding events is unclear, the human exploitation directly linked to these micro-habitats is intriguing and in part reinforced by the distribution data (Abbott et al. 2009; Condon and Smith 2012).

Clovis occupations, which tend to be defined as isolated finds occur rarely within the region, are identified in general proximity to pluvial Lake Alvarado west of the Hueco Mountains. The Krone Clovis point and a Clovis base from LA 123394 were recovered on ridges overlooking this Pleistocene lake (Krone 1976; Camarena-Garcès et al. 2011). Middle and Late Paleoindian clustering is tentatively linked to remnant Pleistocene Lakes Alvarado and Faultline. More random associations are noted adjacent to pluvial playas near Anthony Gap and the southern margins of Pleistocene Lake Otero and Pleistocene/early Holocene Lake Davis and Old Coe Lake. The majority of these locales contain few projectile points, tentatively supporting a mobility strategy that is diverse in nature and minimally oriented towards bison hunting (Amick 1994). This interpretation is presently supported by paleoenviromental reconstruction efforts that indicate a cooler, wetter Pleistocene to Holocene transition, followed by increasingly xeric conditions (Hall 2005; Abbott et al. 2009). One local exception is the Fillmore Pass site (LA 1613), a mixed occupation residential locale with a substantial Folsom component on the far southern margin of the Organ Mountains in Doña Ana County (Carmichael 1986; Sechrist and Ruth 1997). Additional Folsom sites in Otero County include Lone Butte, Three Buttes, Moody Tanks, and Tres Hermanos, all containing significant numbers of points, point fragments, and preforms (Amick 1994, 2002).

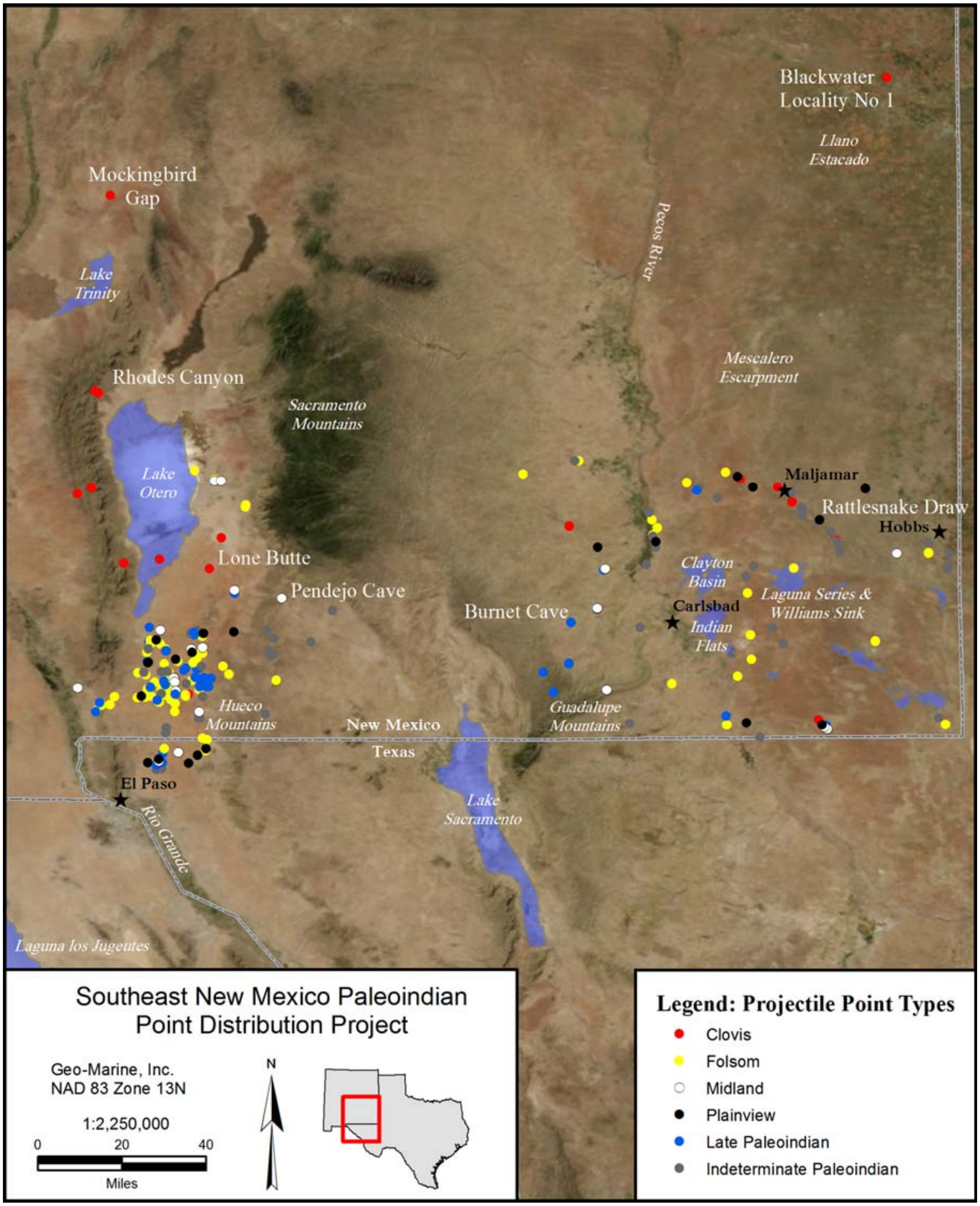

Figure 1. Distribution of Paleoindian points within Eddy, Doña Ana, Lea, and Otero Counties New Mexico and northern El Paso County, Texas.

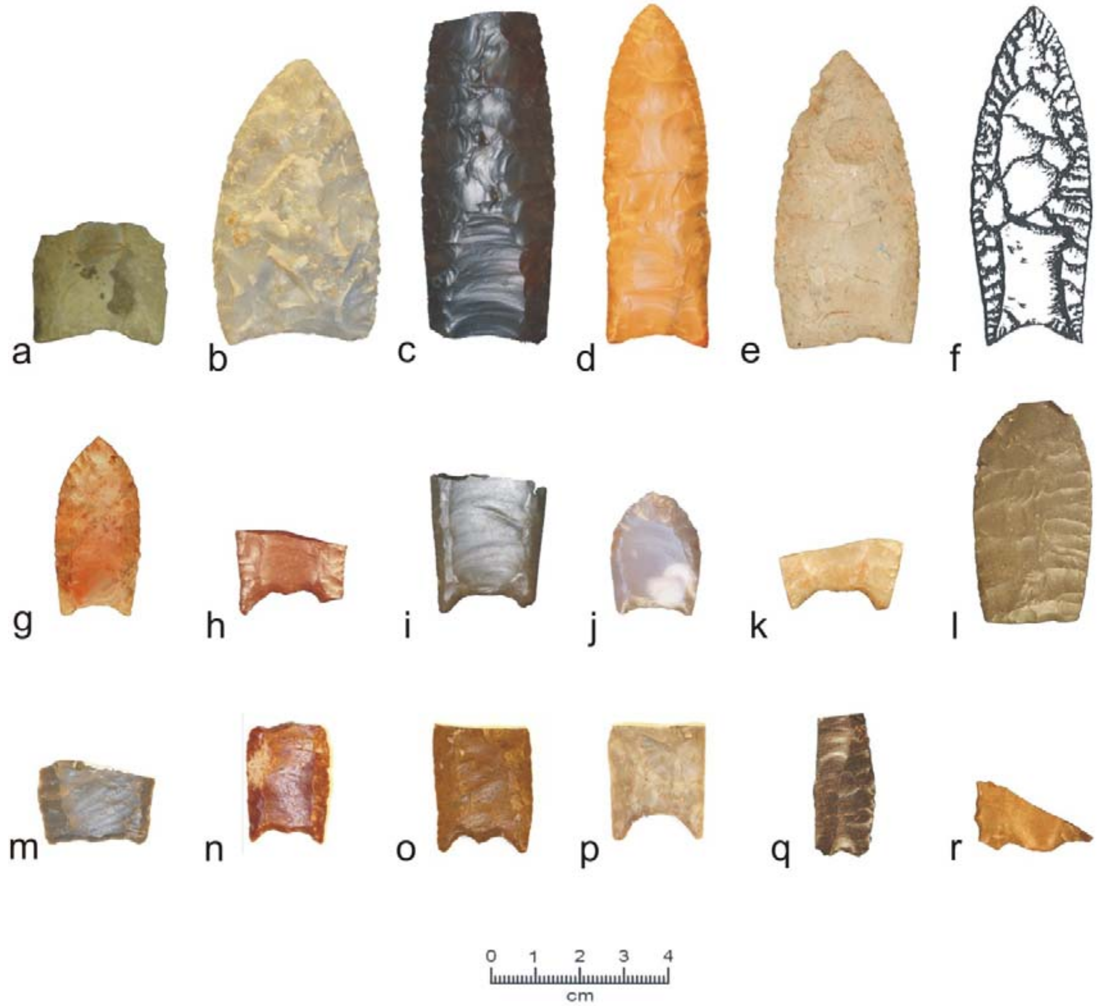

Figure 2. Row 1: Clovis: a) LA 123394 Otero County, NM; b) LA 72202 Doña Ana County, NM; c) NM/TX state line, Lea County, NM; d) Crooks Clovis, Lea County, NM; e) The Lusk Ranch Site, Eddy County, NM, f) Krone Clovis, Otero County, NM; Row 2: Folsom: g) Otero County (Lone Butte Site); h) LA 165710 Lea County, NM, i) Isolate Dona Ana County, NM; j) LA 44150 Eddy County, NM; k) LA 72394 Eddy County I) LA 97788 Otero County, NM (Plainview)*;* Row 3: Folsom: m-r recovered from the Fillmore Pass site (FB 1613), Doña Ana County, NM

In far southeast New Mexico, the distribution data reveals aggregation along the western margin of the Llano Estacado, and clustering along the Pecos River valley/ eastern Guadalupe Mountain slopes (Figure 4). Clovis finds, while rare, seemingly fall in proximity to pluvial water sources that take the form of playas, saline sinks, and catch-basin depressions/tributaries fed by seasonal springs or seeps emanating from the escarpment. Not surprisingly, the distribution of Clovis-related sites/isolates is generally dispersed along the western edge of the Llano Estacado. Clovis points have been linked to the Lusk Ranch site (plus Folsom-Midland) and the Taylor Peak site (plus Folsom-Midland), while the Crooks Clovis was recovered near the Paduca Breaks formation north of the Texas border.

Sites in southern Lea County also show evidence for possible Clovis though late Paleoindian occupations Condon and Smith 2012; Smith 1966). Folsom-Midland spatial arrangements are more widely dispersed, again suggestive of a high mobility strategy that unlike the Tularosa Basin is probably associated with bison hunting. Folsom through late Paleoindian occupations are supported at Rattlesnake Draw, the Laguna Plata region, and possibly at the Boot Hill site; all are adjacent to the Mescalero Escarpment. The Winkler-1 site in far southeast Lea County has also produced both Folsom and Midland style projectile points (Blaine 1968; Holliday 1997). Although more prevalent than Clovis, Folsom-Midland points also demonstrate a pattern of isolated finds, associated with seasonal playas, or sinks, as well as along localized ridges bordering terrestrial depressions. For example, Folsom-Midland points are documented at San Simon Sink, Williams Sink, Quajada Ridge, Clayton Basin, and Rustler Bluff southeast of Big Sinks, Lea County.

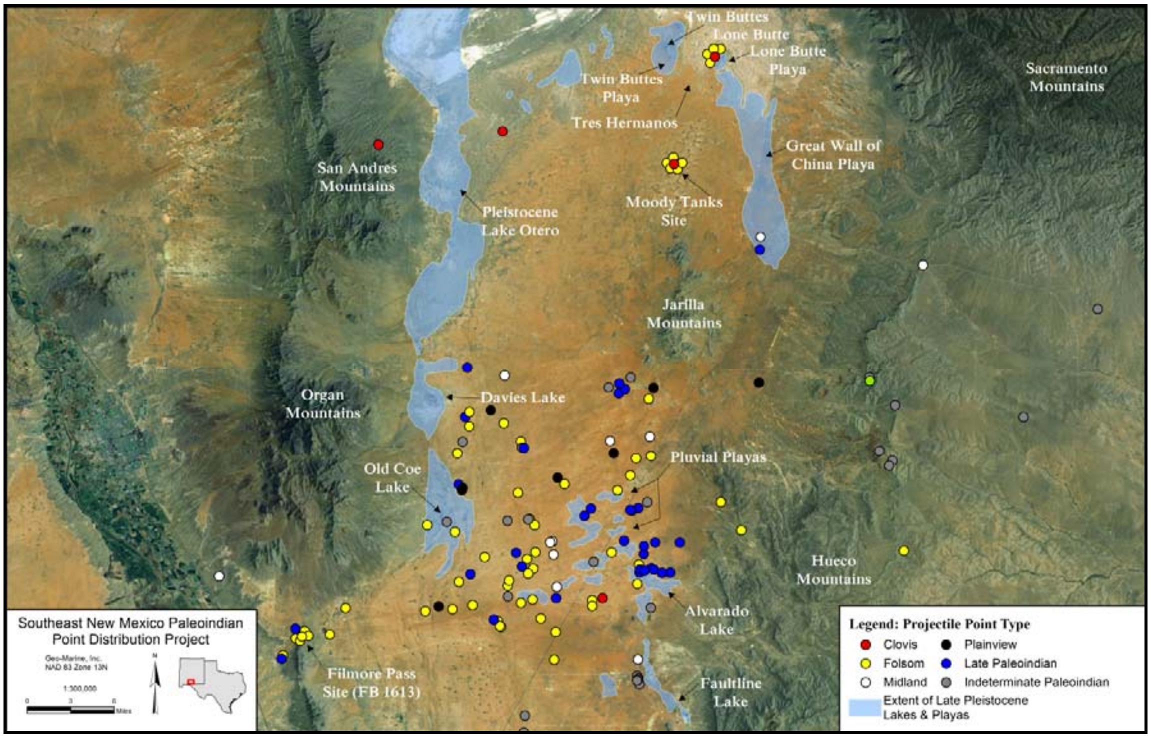

Figure 3. Distribution of Paleoindian points within the Tularosa Basin (modified from Johnson 1997).

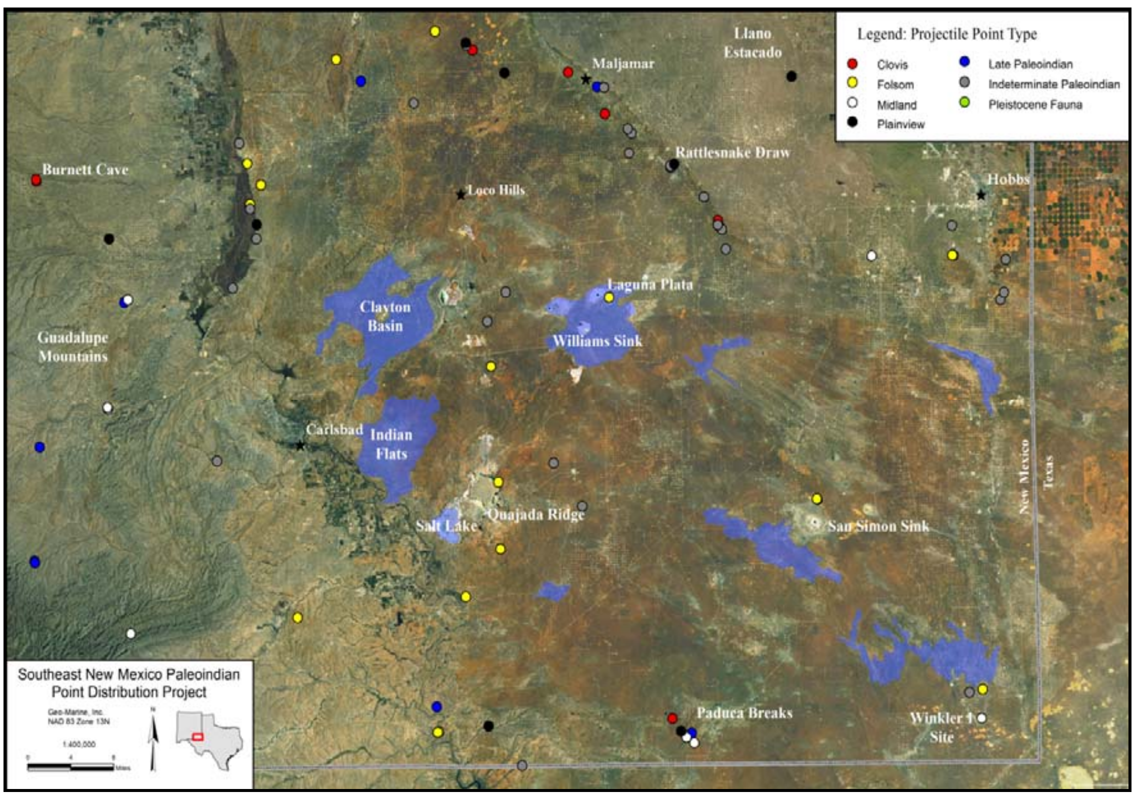

Figure 4. Distribution of Paleoindian points in Eddy and Lea Counties, New Mexico.

Immediately south of the New Mexico/Texas border in the Monahans Dunes region adjacent to the Llano Estacado, the Shifting Sands site (41WK21) produced a large number of Folsom and Midland projectile points and preforms (Rose 2011). Paleoindian points that fall into the indeterminate category cluster along the escarpment margin and may yield more definitive temporal assignments over time. These aggregations suggest a possible post-Folsom exploitation of grassland extensions and again, expansive bison movement off the Southern High Plains during the early Holocene period.

The Pecos River valley, and in particular the Middle Seven Rivers and Rocky Arroyo confluences display Folsom, Plainview, and sites with indeterminate affiliations components, and isolates. These areas reflect the intersection of the Guadalupe escarpment and Pecos River interface, and in much the same manner as the Mescalero Escarpment and the Pecos River Valley, represent the merging of multiple ecozones and diverse habitats (Katz and Katz 1994; Dick-Peddie 1993).

The distributions patterns presented in this study augment previous findings for the southern Tularosa Basin and reveal new patterns for the Pecos River Valley and escarpment margin. Not unexpectedly, Paleoindian sites and isolated projectile points tend to correlate with closed-basin landforms and tributaries associated with paleo-lake features, playas, and escarpment drainages (Condon and Smith 2012; Holliday in press). Noted paleo-lake features in New Mexico include the Jornada del Muerto, Estancia Basin, and the Plains of Augustin, while the Tularosa Basin and northern Hueco Bolson figure prominently in this current study (Allen 2005; Hawley 1993; Hill and Holliday 2011; Holliday in press; Judge 1973).

Refinement of the geochronologic data indicate that many of these lakes were at their maximum elevation during or just after the last glacial maximum with water levels falling by the time of Clovis occupation (~11,500 rcy BP; ~13,400 cal BP) (Holliday in press). Despite this drop in water level, it is suspected that at least some basins held significant amounts of water when Paleoindians arrived, while other basin may have diminished into smaller playas retaining only shallow marsh or wetland environments (Allen 2005; Allen and Anderson 2000; Anderson et al. 2002; Ballenger et al. 2011; Condon and Smith 2012; Hill and Holliday 2011; Holliday in press; Langford 2003; Wilkins and Currey 1997). The rise and fall of these paleo-lakes and subsequent wetlands and playas clearly had an effect on the regional distribution of Paleoindian sites, but little systematic work has focused on this aspect of landuse in the region.

Regionally, Paleoindian sites/isolates are identified around or above higher shorelines associated with paleo-lakes with fewer sites located in the lower basins, as noted by Wessel et al. (1997) for the upper Tularosa Basin. However, early sites may well have existed at lower elevations, perhaps along the water's edge, but through time have been lost to deflation or perhaps buried by eolian sediments (Langford 2003). In areas in which wind erosion is less a factor, such as the Plains of San Agustin, sites are found lower on the basin floor on and adjacent to terminal Pleistocene shorelines, well below the older shoreline highstands (Holliday in press). Distributions for the southern Tularosa Basin seem to follow this pattern aggregating in the low-lying margins of pluvial lakes Alvarado and Faultline, and just outside the southeastern extent of Lake Otero. Within the karst topography of far southeast New Mexico, sites tend to aggregate off the escarpment edge, along drainages, and in proximity to playas and saline sinks (Condon and Smith 2012).

Judge (1973) proposed a model of Paleoindian site distributions around the small playa depression of the West Mesa of the Albuquerque Basin that was used as a test model by Wessel et al. (1997) for Paleoindian sites and paleo-lakes in the upper Tularosa Basin. The West Mesa analysis showed that Clovis represented the lightest local expression and Folsom the heaviest, and that Folsom aggregated in proximity to the small playas while subsequent occupations were more widely dispersed (Judge 1973). This pattern was interpreted to reflect relatively wet conditions during the Folsom occupation (with no indication of Clovis environments), which made the playas particularly attractive micro-habitats. Increased aridity possibly heightened post-Folsom dispersion across the landscape as playas and wetlands desiccated and became less attractive resources (Holliday in press)

Wessel et al. (1997) observed a pattern in the northern Tularosa Basin that is repeated in the southern extent of the basin and again in far southeast New Mexico revealing one of the more striking aspects of this distribution summary: the scarcity of Clovis points/sites in comparison to Folsom or other post-Clovis point/sites in the region. These later sites may point toward adaptive strategies designed to maximize resources in both lacustrine and montane environments, as the former disappeared.

In a similar fashion to the West Mesa, few Clovis sites were identified in either the upper and lower Tularosa Basin or in far southeast New Mexico, so no pattern is clearly discernable. But this characteristic of rare, widely scattered Clovis sites in a variety of settings seems to be a more common occurrence as evidenced on the Plains of San Agustin, in Trans-Pecos Texas, and across northern Chihuahua (Holliday in press). In contrast, higher concentrations of Folsom sites are distributed across southeast New Mexico. This pattern may suggest that in regions east of the Sierra Madre the relatively limited number of Clovis foragers were using an array of resources across the landscape, followed by more intense focus on lakes, playas, and drainage-ways by the more numerous Folsom and late Paleoindian foragers (Holliday in press). For perspective, relatively high concentrations of Clovis artifacts and sites are known west of the Sierra Madre in southeast Arizona and northern Chihuahua. Folsom sites are essentially unknown (Holliday in press).

In conclusion, the current study exposed the relationships between early human activity, hydrology, and landform as equally complex and spatially difficult to interpret. To begin to remedy some of these gaps we will continue to compile data on sites in the key basins and landforms in southeast New Mexico with a focus on frequency and location of Paleoindian points and potential Clovis, Folsom-Midland, and late Paleoindian sites. Future research will attempt to further quantify the Paleoindian presence in the region and narrow the search for additional areas for study and evaluation.

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LATE PALEOINDIAN PROJECTILE POINT TYPOLOGY: A CONSIDERATION OF THE FIRSTVIEW AND CODY COMPLEXES IN EASTERN NEW MEXICO AND BEYOND

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My Ph.D. dissertation research is an examination of morphological variability among projectile points from the Late Paleoindian Cody Complex dated to 9400-8300 B.P. Relevant literature describes several cultural historical “types” of projectile points that are associated with the Cody Complex. Projectile points that Wheat classified as belonging to the San Jon, Firstview, and Kersey types of the Firstview Complex on the Southern Plains (Figure 1 and 2) cannot be differentiated from the Eden and Scottsbluff types of the Cody Complex found on the Northern Plains. Both Cody and Firstview complexes include diamond-shaped and lenticular projectile points. Most points in both Complexes have ground stems to facilitate hafting. A comparison of metric dimensions indicates that blade width, blade thickness, and stem thickness are not statistically significant (Table 1). Stem width is the only statistically significant variable for both diamond-shaped and lenticular points. Firstview and Cody Complex points can only be distinguished by differences in the amount of shoulder indentation, less for the Firstview and Kersey types and greater for Eden and Scottsbluff projectile points (Muniz 2005:116-117).

My research agrees with Bradley (1991:390-391) and Muniz (2005:116-117) that Firstview Complex projectile points have the same technological attributes as Cody Complex projectile points. My analysis shows that the variation inherent in Firstview Complex projectile points ranges along the traditionally-accepted continuum of variation defined by the Eden and Scottsbluff types (Wormington 1957:136.). Therefore, all Late Paleoindian lanceolate square-based projectile points, dated from about 9400 to 8300 B.P. (Holiday et al. 1999), should be classified in the Cody Complex, as it has temporal priority in taxonomic terms. The San Jon, Firstview, and Kersey types of the Firstview complex should become a historical footnote to Paleoindian systematics.

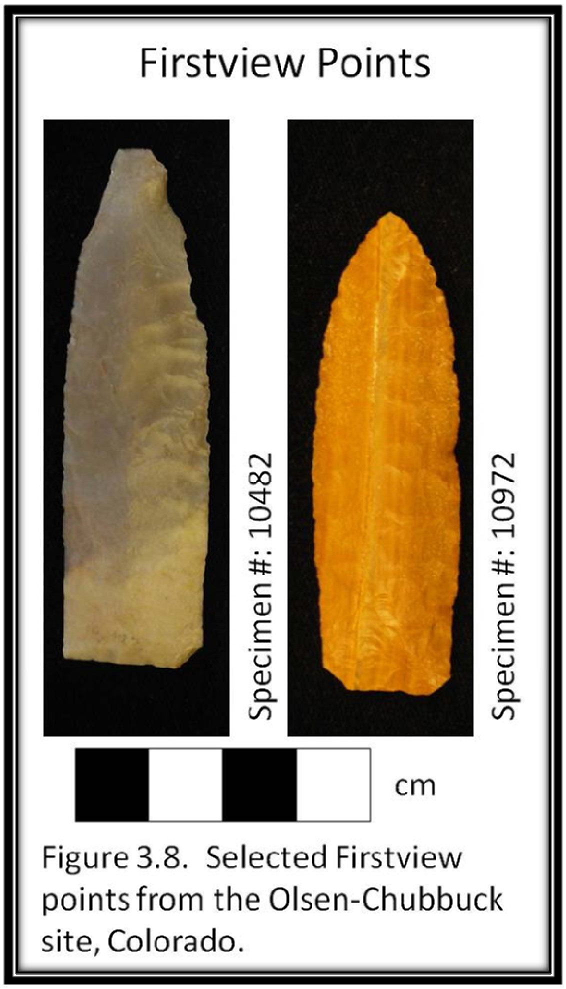

Figure 1. Firstview Points

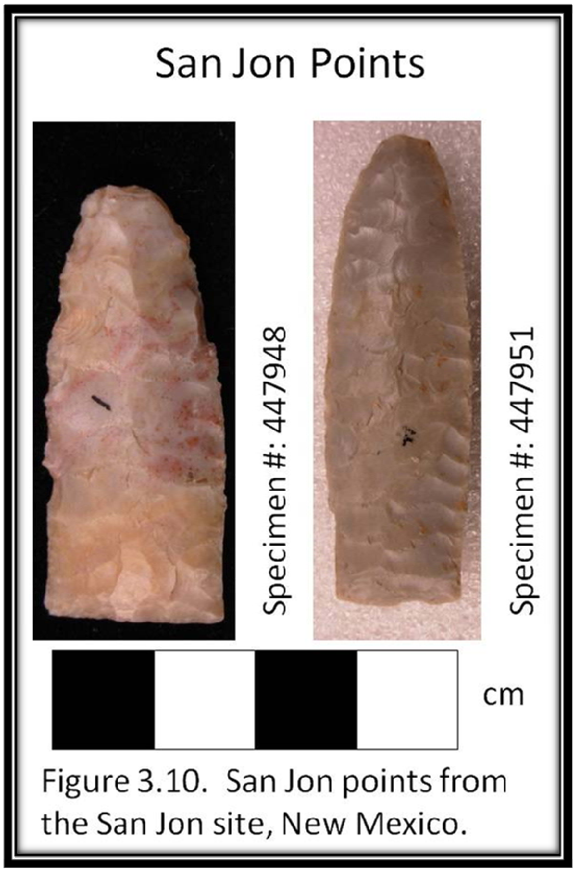

Figure 2. San Jon Points

Table 1. Projectile Point Metric Dimensions

cross section	variable	type	N	mean mm	variance	P(T<=t) two-tail
diamond	blade width	Cody	94	19.05	7.23	0.87
		Firstview	29	18.95	12.29	
	blade thickness	Cody	94	6.79	0.57	0.06
		Firstview	29	6.46	1.03	
	ratio blade width/thickness	Cody	94	2.82	0.13	0.1
		Firstview	29	2.95	0.23	
	stem length	Cody	92	14.17	10.12	0.26
		Firstview	29	14.98	15.42	
	stem width	Cody	92	17.06	6.05	0.01
		Firstview	29	18.53	6.18	
	stem thickness	Cody	92	5.44	0.63	0.3
		Firstview	29	5.64	1.06	
	ratio stem width/thickness	Cody	92	3.17	0.23	0.09
		Firstview	29	3.34	0.23	
lenticular	blade width	Cody	62	21.77	19.17	0.68
		Firstview	29	21.35	23.07	
	blade thickness	Cody	62	5.91	1.29	0.59
		Firstview	29	6.06	1.86	
	ratio blade width/thickness	Cody	62	3.79	1.14	0.29
		Firstview	29	3.56	0.36	
	stem length	Cody	61	13.57	14.22	0.04
		Firstview	30	14.49		

stem width	Cody	62	18.08	6.93	0.009
	Firstview	30	19.96	15.31	
stem thickness	Cody	62	5.14	0.73	0.7
	Firstview	30	5.22	1.06	
ratio stem width/thickness	Cody	62	3.58	0.43	0.05
	Firstview	30	3.89	0.5	

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