The Spatiotemporal Distribution and Characteristics of Folsom Projectile Points in Texas

by

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ABSTRACT

Over three hundred Folsom points have been recovered from eighty-six localities in Texas. Statistical analysis of the distribution of Folsom points and the localities from which they came shows that the documented patterning reflects the differential intensity of archaeological investigations across the state and does not as yet reflect regional Folsom settlement patterns. Acceptable radiocarbon ages from Texas Folsom sites fall between 11,000 and 10,000 B.P. Metric attributes of Texas Folsom points compare favorably with the dimensions of Folsom points found in nearby states.

INTRODUCTION

The first study describing the distribution of the Folsom occupation in Texas was undertaken by Fischel in 1939. He documented 22 Folsom and "Folsom-like" points from five Texas counties. A later study by Hester (1967) recorded the distribution of over seventy Folsom points from fifteen counties. This paper provides an expanded summary of the geographic distribution of Folsom culture sites and diagnostic projectile points in Texas. This distribution is described, statistically analyzed, and compared to factors which may account for the observed patterning. Additional information is provided on the temporal context and metric attributes of Folsom projectile points.

METHODOLOGY

The data for this study were primarily collected by compiling spatial, temporal, and typological information from published sources. Additional data on undocumented Folsom points and sites were gathered from professional and avocational archaeologists. Questionnaires requesting information about Folsom points and sites were sent to twenty-one archaeologists and sixteen archaeological societies, and appeared in several local and regional newsletters. In this way, 329 Folsom points from 86 localities in 57 counties were documented. Localities are defined here to include three types of field situations: (1) sites where Folsom assemblages (projectile points and other artifacts) have been documented; (2) sites where Folsom artifacts of uncertain relationship have been found within a limited area; and (3) Folsom projectile points which were found alone or at multicomponent sites. These types of sites are grouped together in this discussion because, while it was possible to determine what type of site a number of the Folsom points are from, in most cases it was impossible to make this determination based on the information available to us. The literature search provided information on 296 of the Folsom points reported here, while the questionnaires produced data on 33 previously undocumented points.

Only definite Folsom points are reported in this study. Folsom preforms (points in preliminary stages of manufacture) are not used. Likewise, basally thinned Plainview points, another type of Paleoindian projectile point common to Texas, are not included in our sample.

GEOGRAPHIC DISTRIBUTION OF FOLSOM BY REGION

Folsom points and sites are found throughout Texas (Figs. 1 and 2, Table 1). For this discussion and to facilitate comparisons to the distribution of Clovis projectile points documented by Meltzer (1985, 1986), Folsom culture

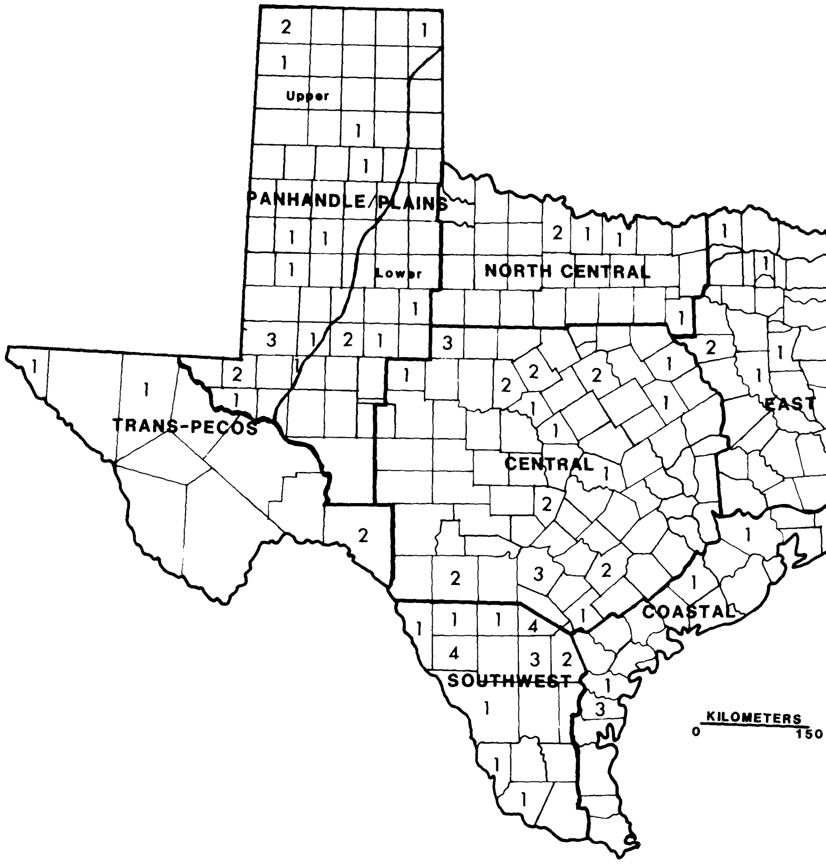

Figure 1. Distribution of Folsom points in Texas.

remains will be discussed within the geographic regions defined in the Handbook of Texas Archaeology (Suhm et al. 1954).

One hundred and twenty-four Folsom points from 21 localities (more than one-third of the points from Texas) are from the Panhandle/Plains region. This region is subdivided into the High Plains and Lower Plains. Ninety-two of the 124 Folsom projectile points are from the High Plains, or "Llano Estacado." Representative sites in the High Plains include: (1) the kill site in Lipscomb County, where 18 Folsom points were associated with the remains of *Bison antiquus* (Suhm et al. 1954; Reading 1960; Judge 1974); (2) the Lake Theo kill site in Briscoe County, where 13 fluted Folsom points were recovered from surface and subsurface contexts (Harrison and Smith 1975; Harrison and Killen 1978; B. Harrison, pers. comm. 1988); (3) the Lubbock Lake Site, Lubbock County, where five points were found with extinct bison and five more were found out of context (Green 1962; Kelley 1974; Wheat 1974; Holliday et al. 1983; Johnson et al. 1982; Johnson and Holliday 1984, 1986, 1987); (4) the Scharbauer site in Midland County, which yielded seven Folsom points and eight preforms (Wendorf et al. 1955); and (5) the Shifting Sands site in Winkler County, where 19 Folsom points were found in association with hundreds of Folsom and Midland-age tools (Amick et al. 1989). Hofman (1986) reports nine points from the Dalhart region (Hartley County).

In contrast, fewer Folsom points are known from the Lower Plains. In Fisher County, 25 points and 89 preforms were collected from the Adair-Steadman site (Tunnel 1977, pers. comm. 1988). In addition, at least six points were dis-

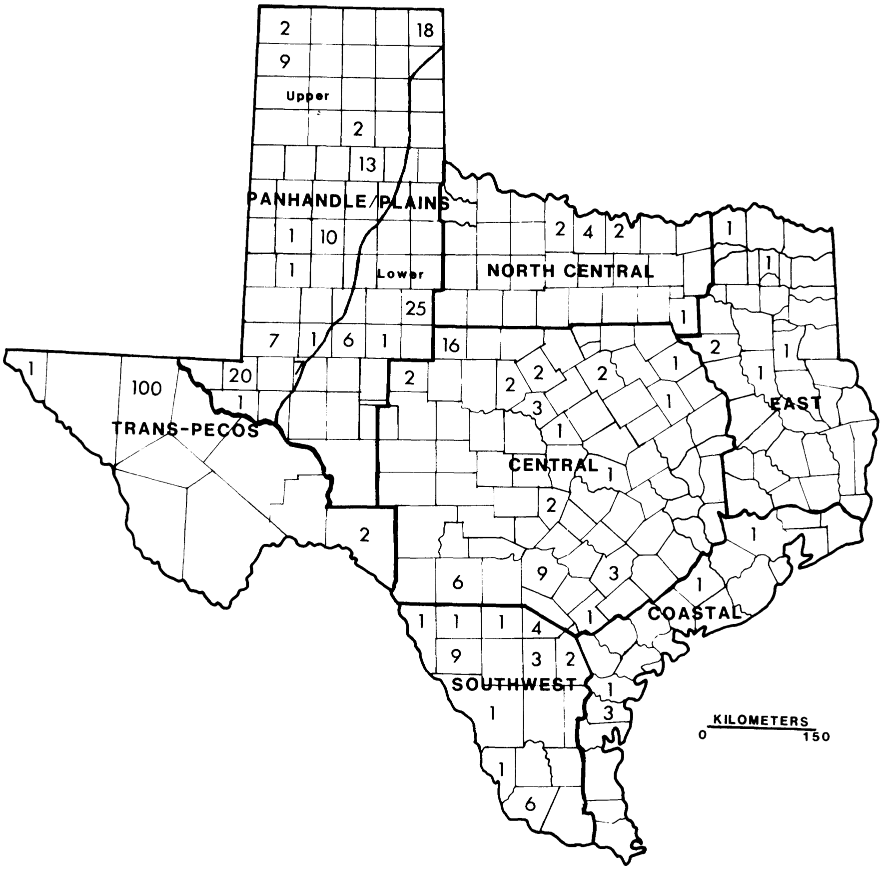

Figure 2. Distribution of Folsom localities in Texas.

covered in nearby Howard County, at two separate surface sites eight miles apart (J. Wilkinson, pers. comm. 1988) and a single point was found at Lone Wolf Creek in Mitchell County (Story 1981).

Although few Folsom sites have been discovered in the Trans-Pecos region of Texas, one of these sites has yielded an abundance of points. Boisvert (1983) reports on a site in Culberson County at which over 100 Folsom points were found. This site, known as the Chispa Creek site near Van Horn, was investigated by Joe Ben Wheat (1971) in the late 1950s, but little is known about it. Other sites in the region occur near El Paso, where a single point was discovered in association with other Paleoindian points (Brook 1979), and in Val Verde County at Bonfire Shelter and Hinds Cave, where single Folsom points were found in deeply-buried contexts (Dibble and Lorraine 1968; Turpin 1987).

Fifty-two Folsom points were recovered from 25 localities in central Texas. Most of these localities produced only a few points. A notable exception is the site of 41BX52 in Bexar County, where seven fluted Folsom points and six preforms were excavated by Henderson (1980). Two other localities in Bexar County produced single Folsom points (Hester 1977; Hester et al. 1978). Ray and others discovered 16 points at three sites in Taylor County (Ray 1929, 1930, 1934, 1937; Fischel 1939). Five points from Uvalde County were found in the backdirt left by looters at Kincaid Rockshelter (Suhm 1958). These points appear to have come from the lower component of the shelter. Another point from Uvalde County was a solitary surface find (Fischel 1939).

Table 1. Texas Folsom Points and Localities per County

County	Number of Points	Number of Localities	Site Names	References
Andrews	7	3	--	Fritz, 1940; Hester 1967
Armstrong	2+	1+	--	Hughes 1978
Atascosa	4	4	Goose Creek	Chandler pers. comm. 1988, 1989
Bexar	9	3	41BX52, 41BX229	Hester 1977, 1978; Henderson 1980
Blanco	2+	2+	--	Hester 1967
Bosque	2	2	Horn Shelter	Moore and Bradle 1986
Brisco	13	1	Lake Theo	Harrison and Smith 1975; Harrison and Killen 1978
Brown	2	2	--	Eubank 1976
Cherokee	1	1	Davis Site	Krieger 1951; Griffin and Yarnell 1963
Clay	2	2	--	Witte 1935; Fischel 1941
Coke	2	1	--	Ray 1948
Comanche	2	2	--	Runkles 1936
Cooke	2	1	41CO10	Jensen 1968
Culberson	100	1	Chispa Creek	Boisvert 1983 Wheat 1971
Dallam	2	2	--	Fischel 1939
Dimmit	10	4+	41DM3; Carrizo Creek	Hester 1968, 1974
El Paso	1	1	--	Brook 1979
Fisher	25	1	Adair-Steadman	Tunnell 1977, pers. comm. 1988
Frio	1+	1+	--	Hester 1968
Gonzales	3	2	41GV1	Hester 1974
Harris	1	1	41HR624	Patterson et al. n.d.
Hartley*	9	1+	--	Hofman 1986
Henderson	1	1	Cedar Creek Cope Sand Pit	Story 1965, pers. comm. 1988
Hockley	1	1	--	Hester 1967
Howard	6	2	Wilkinson Ranch	Wilkinson, pers. comm. 1988
Karnes	1	1	--	Hester 1974
Kaufman	1	1	41KF47	Story 1988
Lamar	1	1	--	Story 1988
Lampasas	1	1	LS-1	Field 1956
Limestone	1	1	Lake Limestone	Story 1988
Lipscomb	18	1	--	Reading 1960; Judge 1974
Live Oak	2	2	Choke Canyon	House 1974; Stewart 1988
Lubbock	10	1	--	Green 1962; Holliday and Johnson 1987
Martin	1	1	--	Hester 1967
Maverick	1	1	41MC364	Hester 1968
McMullen	3	3	--	Cooper 1973; Kelly 1983; Chandler, pers. comm. 1989
Midland	7	1	Scharbauer	Wendorf et al. 1955
Mills	3	1	--	Ray 1934
Mitchell	1	1	--	Fischel 1939
Montague	4	1	--	Witte 1942
Navarro	1	1	--	Bryan 1937
Nueces	3	3	--	Hester 1973; Chandler 1983
Rusk	1	1	--	Hester 1967
San Patricio	1	1	--	Gunter 1985
Starr	6	1+	--	Hester 1967
Taylor	16	3+	--	Ray 1930; Fischel 1939
Terry	1	1	--	Hester 1967
Titus	1	1	41TT60	Story 1988
Uvalde	6	2	Kincaid Shelter	Fischel 1939; Suhm 1954

Table 1, continued.

County	Number of Points	Number of Localities	Site Names	References
Val Verde	2	2	Bonfire Shelter; Hinds Cave	Dibble and Lorraine 1967; Turpin 1987
Ward	1	1	--	Robbins pers. comm. 1988
Webb	1	1	Killiam Lake	Hester 1974
Wharton	1	1	41WH19	Patterson and Hudgins 1985
Williamson	1	1	--	Hester 1967
Winkler	20	2	41WK21	Fritz 1940; Amick et al. 1989
Zapata	1	1	--	Hester 1974
Zavala	1	1	--	Hester 1974
Total: 57 Counties	329	86		

+ Original source unclear. Presence of one or more Folsom points or sites; absolute number not reported.
* Exact county of origin unknown

Folsom culture remains are nearly absent from North-Central Texas. Only nine Folsom points from five localities are reported. Eight points are from three contiguous counties on the Oklahoma border and a single point came from the southeastern part of the region. In Clay County, two Folsom points were discovered on a terrace of the Red River near Henrietta, and four others were discovered in Montague County (Witte 1935, 1942). Jensen (1968) describes two Folsom points from Cooke County, in association with other Paleoindian points. A fragmentary Folsom point was recovered from site 41LT12 in Limestone County (Story 1988).

From Southwest Texas, 29 Folsom points were recorded. Most sites in this region are scattered surface localities. This characterizes Dimmit County especially, where nine points were recovered from a number of surface sites – most often on terraces overlooking creeks (Hester 1968, 1974, 1980, 1984). In Starr County, six points were reported by Hester (1967); Chandler (pers. comm. 1988 and 1989) has documented a total of four points for Atascosa County.

Six Folsom points are known from East Texas. Single points were recovered from Titus, Lamar, Cherokee, and Rusk Counties (Griffin and Yarnell 1963; Hester 1967; Story 1988) and two Folsom points were recovered from Henderson County (Story 1965, 1988). Most Folsom points recovered from this region are fragmentary, often consisting of basal or medial fragments. The Cherokee County point was recovered from a late prehistoric context dated to 680 ± 150 B.P. (C-153; Griffin and Yarnell 1963). This point was apparently curated by a later Indian group. The Folsom point from site 41HE61 in Henderson County (Story 1965) may be the solitary detritus of an early Folsom occupation.

A total of six Folsom points were found on or near the Texas Coast. All were surface finds, with the exception of a fragmentary point unearthed at site 41WH19 in Wharton County (Patterson and Hudgins 1985). Though this site is characterized by late prehistoric and Archaic cultural materials, the Folsom point was deeply buried and was in association with other Paleoindian artifacts. A single reworked point from San Patricio County was found on Padre Island. Because this point was found on a barrier island formed only four to five thousand years ago, it was apparently procured by a later group of people (Gunter 1985). Three additional surface finds are reported from Neuces County, near Corpus Christi (Hester 1970; Chandler et al. 1983). An additional find of a Folsom point with only a single flute removed is reported from the Cypress Creek site in Harris County (Patterson et al. n.d.).

STATISTICAL ANALYSIS AND INTERPRETATION OF FOLSOM SITE DISTRIBUTION

Statistical analysis of the data set was undertaken to determine if meaningful patterns of Folsom occupation could be identified. In this way, perhaps specific regions of Texas would stand out as areas favored by the Folsom people. To run our analyses we had a choice; either to use the distribution of Folsom points or Folsom localities. We decided not to run our statistics on the distribution of Folsom points because the results would have been highly skewed towards sites with large numbers of Folsom points (e.g., the Chispa Creek site near Van Horn), and thus would not reflect Folsom distribution. Instead, we decided to use the distribution of Folsom localities, even though this data set has limitations. It was thought that the distribution of localities where Folsom points had been found would more accurately represent the distribution of Folsom people.

One way to examine the distribution of the 86 Folsom localities identified in this study is to characterize their patterning in some way. Folsom localities could be regularly distributed over 86 counties (in this case a single locality would occur within each county) and the rest would contain no sites. Alternatively, the localities could cluster so that most of the localities were found in a few counties. Finally, the patterning could be random, which means only that the probability of a locality being in any given county is constant. Each county has an equal possibility of having one or more localities. Random in this case refers to the distribution of localities, not to whether or not we can explain the distribution. For example, the patterning of localities might be random if the geographic variability across the state was irrelevant to Folsom settlement patterns or if the locations of the known localities do not represent the actual distribution of Folsom sites. The distribution could also be random if localities always were situated near topographic features that were randomly distributed around the state. If the localities are randomly distributed, it means that the observed distribution of localities is not different from what we would get if we tossed 86 points onto a map of Texas.

If the distribution of known Folsom localities is random, we can approximate the expected locality distribution with a Poisson probability distribution. In computing the Poisson distribution we ignore where the counties are situated so that the test could indicate a random distribution even if all of the counties having more than one locality were located in a single geographic region of the state. However, examination of Figure 2 shows that this is not the case. Furthermore, we assume that the areas of the counties are effectively equal. Figure 2 shows that large counties do not always have more Folsom localities, but we will explore this assumption later. To compare the distribution of localities to a Poisson distribution we compute the number of counties that we would expect to have no localities, one locality, two localities, and so on, if the localities are randomly distributed. These expected numbers are then compared to the actual values using a Chi-square test. If the discrepancy between the expected and actual values is too large to have occurred by chance, the distribution is considered to be non- random. Since there are 254 Texas counties, a small discrepancy between the expected and the observed values will be sufficient to be judged significant.

The expected numbers of counties with a specific number of localities is given by the following equation for the Poisson distribution:

$$P(x) = \frac{e^{-\lambda} \lambda^{x}}{x!}$$

Where P(x) is the probability of x localities in a county,

$x = 1, 2, 3, \ldots,$
$e = 2.71828,$
$x! = x \cdot x\text{-}1 \cdot x\text{-}2 \cdot x\text{-}3 \ldots \cdot 1$, and
λ = total number of localities/number of counties

Table 2 shows the actual and expected number of localities per county. Although the actual and expected numbers are quite similar, the Chi-square test indicates that we would not expect even this small a discrepancy by chance as often as one time in one thousand ($p < .001$). Thus, the distribution of known Folsom localities is slightly clustered. Only a single county should have three or more localities, but in fact, seven counties do. The non-random distribution of localities could be a reflection of preferences on

Table 2. Distribution of Folsom Localities in Texas Fitted to the Poisson Distribution.

Localities/ County	Probability	Expected Localities	Observed Localities	Chi-Square
0	0.7128	181.0	197	1.4059
1	0.2413	61.3	37	9.6322
2	0.0409	10.4	13	0.6628
≥ 3	0.0050	1.3	7	25.6351
Total	1.0000	254.0	254	37.3360

the part of Folsom hunters for certain areas of the state. It could also represent a bias in our knowledge of the locations of these localities.

Since the size of Texas counties varies considerably, the 254 counties were divided into four equal groups: the smallest 25% (which had only 9 localities), the next smallest 25% (which had 18 localities), the next 25% (which had 19 localities), and the largest 25% (which had 40 localities). The Poisson distribution was computed for each and the Chi-square statistic was computed as well. Interestingly, only the largest group showed a clustered distribution. The other groups were random. Examination of the location of the large counties shows that they are in the Trans- Pecos (where there are few Folsom localities) and south Texas (where there are many localities).

To further examine the patterning of Folsom localities, we compared the distribution of Folsom localities to: (1) the distribution of Clovis localities as determined from the work of Meltzer (1986) and relevant sources he cites; (2) the current population of each county (Kingston 1990); (3) the area of each county (Kingston 1990); (4) the number of TAS members in each county (Meltzer 1986); and (5) the number of publications available for each county. The number of publications is simply the number of entries in the county index of "The Microfilm Archive of Texas Archaeology" (Simons 1983). It contains cultural resources reports through the early 1980s and articles from the *Bulletin of the Texas Archeological Society.* While it is not complete, it provides an indication of which counties have more published reports. Because the distributions of some of the variables are skewed, a nonparametric measure of correlation, called Kendall's Tau-B (Blalock 1979: 436-439; SAS, Inst. 1990: 215), was computed for all of the variables. We also computed the correlations by including only the 57 counties which have at least one Folsom locality. This is reasonable, since the absence of a locality may indicate that little effort has been made in the county to locate Folsom localities, or it may mean that none are present. Table 3 summarizes both sets of correlation coefficients for each pair of variables.

All of the correlations are quite low, but eight are significant (at the $p < .05$ level). The distribution of Folsom localities is significantly correlated with the distribution of Clovis localities. The correlations between Folsom localities and population and TAS membership are not significant, but the correlations with area and publications are significant. Although they are statistically significant, the correlations are small. If we exclude the counties which do not have any Folsom localities, these correlations are of the same magnitude or larger, but the correlations with area and publications are no longer significant. This is because the sample size is much smaller ($N = 57$ instead of 254). The Kendall's Tau-B statistic gives a measure of how well we can predict which of two counties has more Folsom localities. If we simply guess, we would be wrong half the time (50%). If we predict that whichever counties have more Clovis points should have more Folsom localities, we would be wrong only 36% of the time. If we predict that the larger or better published county should have more Folsom localities, we would be wrong 42% and 44% of the time, respectively. The number of Clovis points is significantly correlated with population and TAS membership, but again the correlations are very small. These correlations decrease

Table 3. Kendall's Tau-B Rank Correlations (Correlation and Significance Level).

	Folsom Localities	Clovis Localities	Population (1980)	TAS Members	Area (Sq mi)
All Counties (254)					
Clovis Localities	0.28525 *				
	0.0001				
Population	0.07668	0.14363 *			
	0.1251	0.0033			
TAS Members	0.07712	0.17634 *	0.48346		
	0.1639	0.0011	0.0000		
Area (Sq mi)	0.15888 *	0.08908	-0.02898	0.02870	
	0.0015	0.0690	0.4919	0.5389	
Publications	0.11998 *	0.09835	0.32674 *	0.23632 *	0.01913
	0.0213	0.0537	0.0001	0.0001	0.6632
Counties with at Least One Folsom Locality (57)					
Clovis Localities	0.35629 *				
	0.0025				
Population	0.01122	0.08253			
	0.9154	0.4162			
TAS Members	-0.07289	0.02572	0.52557 *		
	0.5246	0.8152	0.0001		
Area (Sq mi)	0.18247	0.05980	0.03139	0.00707	
	0.0846	0.5565	0.7307	0.9429	
Publications	0.14072	0.09352	0.38727 *	0.27152 *	0.13926
	0.1949	0.3701	0.0001	0.0074	0.1371

* Correlation is significant at $p < .05$.
Note: Publications is the number of publications listed for a county in Simons 1983.

when the counties without Folsom localities are excluded. Not too surprisingly, population, TAS members, and publications are significantly correlated with one another. The correlation analysis suggests that at least part of the distribution of Folsom localities relates to county size and the intensity of investigations as measured by the number of publications, but the best way to predict Folsom localities is to know the number of Clovis points in a county.

Finally, we can examine the distribution of Folsom localities in terms of their geographic distribution. Table 4 shows the number of localities by geographic regions as defined by Suhm et al. (1954). The area of each region can be used to predict the number of localities which should be in the region if the localities are distributed in proportion to the region's area. The Chi-square value is significant ($p < .001$) which indicates that localities tend to be clustered in southwest Texas, the High Plains, and Central Texas. More than twice as many localities are reported in southwest Texas as we would expect to find by chance alone. If we ignore southwest Texas, there is no significant difference between the number of localities expected and the number actually observed. The results support the correlation analysis and suggest that the large number of Folsom localities in southwest Texas may be partly attributable to active investigations in the area by the Center for Archaeological Research at the University of Texas at San Antonio and the Southern Texas Archaeological Association. Consequently, the present distribution of Folsom localities does not provide insights into regional Folsom settlement patterns. Unfortunately, this will have to wait for a larger data set.

TEMPORAL CONTEXT OF FOLSOM POINTS

Twenty-eight radiocarbon ages associated with Folsom points are documented here for five Texas sites. These ages are from a variety of or-

Table 4. Distribution of Folsom Localities in Texas by Regions.

Region	No. of Localities	Area (Sq mi)	Probability	Expected Localities	Chi-Square
High Plains	17	41,965	0.1601	13.8	0.7420
Lower Plains	4	23,423	0.0894	7.7	1.7779
Central	25	67,235	0.2565	22.1	0.3805
East	6	26,765	0.1021	8.8	0.8909
Coastal	6	21,527	0.0821	7.1	0.1704
Southwest	19	21,683	0.0827	8.1	19.9451
North Central	5	24,719	0.0943	8.1	19.9451
Trans-Pecos	4	34,797	0.1328	11.4	4.8035
Total	86	262,114	1.0000	86.1	29,8967

ganic materials (Table 5). Many fall within the 11,000-10,000 B.P. range reported for the Folsom Culture (Frison 1978); however, some of the radiocarbon ages fall outside this range.

What had long been considered the first radiocarbon age on the Folsom culture was obtained at the Lubbock Lake site (Green 1962). In 1950, burned bone from what was believed to be the Folsom component yielded an age of 9883 ± 350 B.P. (C-558). However, Johnson and Holliday (1986) have since demonstrated that this radiocarbon date was obtained on material from the overlying Plainview level. Nine radiocarbon dates have since been obtained from the Folsom level (Stratum 2ALB2) at the Lubbock Lake site. The most reliable was a charcoal age of 10,540 ± 100 B.P. (SMU-547) obtained from that level. Many of the other dates from humates and bulk samples of the diatomite yielded similar results, although some of the younger ages are not considered accurate (Holliday et al. 1983, 1985; Johnson, pers. comm. 1988).

At the Lake Theo site in Briscoe County, two bones from the Folsom level yielded ages of 8010 ± 100 B.P. (TX-2880) and 9360 ± 170 B.P. (TX- 2879; Harrison and Killen 1978). These data are considered inaccurate by Johnson, Holliday, and Neck (1982), especially considering that the humates from overlying units yielded ages 9950 ± 110 B.P. (SMU-866) and 9420 ± 85 B.P. (SMU-856). Therefore, the Folsom level is undated, but older than the overlying ages.

Three charcoal samples from the level thought to be associated with the five Folsom points found in looters' backdirt at Kincaid Shel-

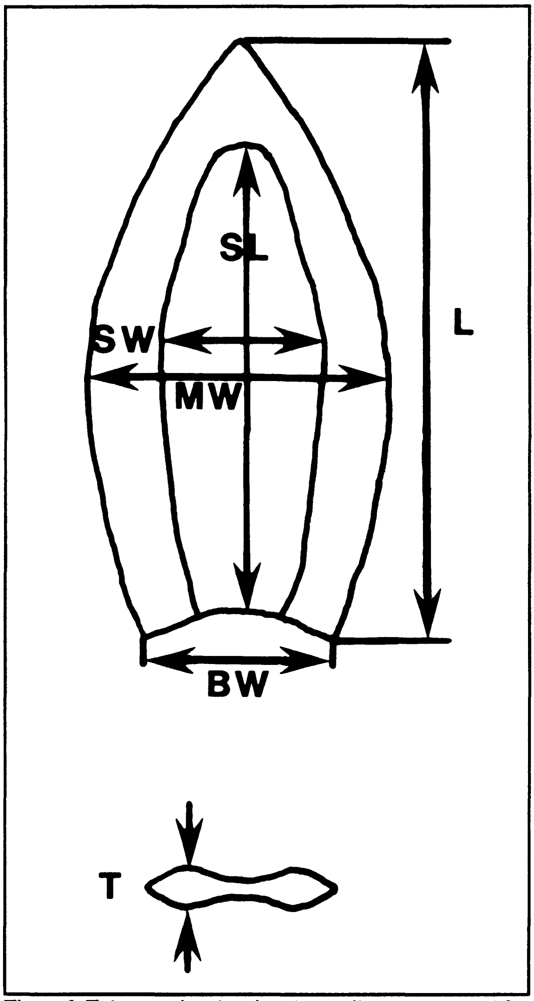

Figure 3. Folsom point showing the attributes measured for this study: L = Length; BW = Basal Width; MW = Maximum Width; T = Thickness; SL = Scar Length; and SW = Scar Width (after Wilmsen and Roberts 1978).

Table 5. Radiocarbon Dates from Texas Folsom Localities

Site	County	Date (Yr B.P.)	Material Dated	Lab No.	References	Remarks
Lake Theo	Brisco	9950±110	Humates	SMU-866	Johnson et al. 1982	Overlies Folsom level
		9420±85	Humates	SMU-856		
		9360±170	Bone	TX-2879	Harrison & Killen 1978	Folsom Horizon
		8010±100	Bone	TX-2880		Folsom Horizon
Lubbock Lake	Lubbock	7840±170	Diatomite	SMU-247	Holliday et al. 1983	Stratum 2ALB2
		10060±170	Humic Acid	SMU-251		Stratum 2ALB2
		10360±80	Humin	SI-3200		Stratum 2ABL2
		10540±100	Charcoal	SMU-547		Stratum 2ABL2
		9040±90	Humin	SI-4592	Holliday et al. 1985	Stratum 2ABL2
		9720±80	Humic Acid	SMU-975		Stratum 2ABL2
		10090_100	Humic Acid	SMU-1144		Stratum 2ABL2
		10160±80	Humic Acid	SMU-846		Stratum 2ABL2
		10195±165	Humin	SI-4976		Stratum 2ABL2
Kincaid	Uvalde	10025±85	Charcoal	TX-17	Haynes 1967	From Assumed Folsom Level points found in backdirt)
		10065±185	Charcoal	TX-19		
		10365±110	Charcoal	TX-20		
Bonfire	Val Verde	9920±150	Charcoal	TX-657	Dibble 1970	Bone Bed 2
		10100±300	Charcoal	TX-658		
		10230±160	Charcoal	TX-153	Dibble & Lorraine 1968	Bone Bed 2
		8380±180	Bone	TX-118	Tamers & Pearson 1965	Bone Bed 2
		7470±160	Bone	TX-230-A		
		7110±160	Bone	TX-230-B		
		9120±200	Bone	TX-231-A		
		7230±160	Bone	TX-231-B		
		9210±200	Bone	TX-231-C		
		9080±210	Bone	TX-232-A		
		7230±380	Bone	TX-232-B		
41WH19	Wharton	9920±530	Charcoal	AA-298	Patterson & Hudgins 1985	Associated with Other Paleoindian Artifacts

ter in Uvalde County have yielded ages of 10,025±185 B.P. (TX-17), 10,065±185 B.P. (TX-19), and 10,365±110 B.P. (TX-20; Haynes 1967). At nearby Bonfire shelter in Val Verde County, the trio of radiocarbon ages for charcoal from the Folsom bone bed fall comfortably into the Folsom age range: 9920±150 B.P. (TX-657), 10,100±300 B.P. (TX- 658), and 10,230±160 B.P. (TX-153). Eight bone samples from the Folsom level yielded anomolously young ages ranging from 7110±160 B.P. (TX-230-B) to 9210±200 B.P. (TX-231-C) and are not considered to be accurate (Tamers and Pearson 1965; Dibble and Lorraine 1968). In Wharton County, charcoal from the layer that contained a single broken Folsom point yielded an age of 9920±530 B.P. (AA-298; Patterson and Hudgins 1985).

POINT DIMENSIONS AND CHARACTERISTICS

Metric data on the morphological attributes of 65 Texas Folsom points were collected. This constitutes only 19.8% of the total sample, because metric attributes were not available for many specimens. The set of attributes was compiled by: (1) directly measuring specimens; (2) measuring the attributes of points from photographs and drawings, if scales were provided (where only one face of a point was illustrated, certain dimensions were unmeasurable); and (3) collecting measurements

Table 6. Folsom Point Dimensions (in mm).

County	L	MW	BW	T	SL1	SL2	SW1	SW2	Material	Reference
Atascosa										
1. #1	31	18.8	18.3	3.5	28.5	28.5	7	14	Brown Flint	Chandler 1988, 1989
2. #2	39	20	–	4.2	29	32	–	–	Tan Chert	
3. #3	54.8	17.5	16.5	4.8	–	–	–	–	Tan Agate	
Bexar										
4.	34	19	–	4	–	–	9.9	11.1	Brown Chert	Hester 1967
Briscoe										
5. A917–26	32.1	22	–	4.1	–	–	–	–	Edwards Flint	Harrison & Smith 1975
6. A917–40	29.5	18.4	18	3.2	26.8	19.3	11.4	10.8	Alibates Flint	
7. A917–79	46.5	20.5	19.2	4.5	36.2	15.8	10.9	11.9	Edwards Flint	
8. A917–103	47	26	–	3.9	–	–	–	–	Edwards Flint	
9. A917–114	35.7	20.6	18.2	3.5	16.2	24.2	9.2	9.7	Edwards Flint	Harrison & Killen 1978
10. A917–115	–	–	–	3.4	–	–	–	–	Tecovas Jasper	
11. A917–160	–	20	–	3.8	–	–	–	–	Edwards Flint	
12. A917–382	–	19.8	–	5.1	–	–	–	–	Chalcedony	
13. T1	–	–	21.3	45	–	–	17.3	17.5	Edwards Flint	
Cooke										
14. #1	34.9	18	18.3	5.7	–	–	–	–	Gray Chert	Jensen 1968
15. #2	31.5	18	16	3.4	–	–	–	–	White Chert	
Dimmit										
16. 41DM3 #1	36	22	17.5	–	22.8	–	16	–	–––	Hester 1968, 1974
17. 41DM3 #2	37.5	19	17.5	–	16.2	–	14.9	–	–––	
18. Carrizo	–	–	–	–	–	–	12	–	Brown Flint	
19. #4	33	23	21.3	–	23	–	17.8	–	White Flint	
20. #5	40	18	16.8	4.0	27.5	–	12.2	–	Pink Flint	
21. #6	38.5	21.5	18.2	–	37.9	–	14	–	–––	
22. #7	–	23.4	–	–	–	–	13	9.8	–––	
23. #8	–	16.9	–	–	–	–	9.1	9.0	–––	
24. #9	–	26	–	–	–	–	11.7	18.2	–––	
El Paso										
25.	37	20	18	4.0	–	–	11	–	Gray Chert	Brook 1979
Gonzales										
26. #1	39	18.2	15.6	–	25.6	27.3	13	13	–––	Hester 1974
27. #2	33.1	15.6	13	–	28.6	23	9.8	9.1	–––	
28. #3	–	–	20.1	–	–	–	–	–	–––	
Henderson										
29.	–	20	–	–	–	–	–	–	–––	
Howard										
30.	–	19.1	16	16	–	–	12.7	12.7	Tan Flint	Hester 1974
Karnes										
31.	39	24.7	15.6	–	30.1	–	11.7	–	–––	Hester 1974
Live Oak										
32. #1	51	24	20	2	16	22	14	17	Gueydan Chert	House 1974
33. #2	28.6	21.5	21.5	1.3	13	15.9	9.5	12.7	Pink Agate	Stewart 1988
Lubbock										
34. TTU-4036136	74	26	20	5	51.3	55.3	13.8	16.3	Edwards Chert	Johnson & Holliday 1987
35. TMM-89222	49.3	21.4	15.4	–	13.8	–	10.7	–	Edwards Chert	

Table 6, continued.

County	L	MW	BW	T	SL1	SL2	SW1	SW2	Material	Reference
36. TMM-8923	28.1	17.5	15.1	2.8	14.4	–	8.3	–	Edwards Chert	
37. TMM-8924	26.3	8.3	–	3.5	–	–	–	–	Edwards Chert	
38. TMM-89270	–	24.8	–	3.6	–	–	–	–	Edwards Chert	
39. TMM-89271	30.7	18.9	17.8	3.5	20.6	17.8	9.6	11.7	Edwards Chert	
40. TMM-89276	37.4	20.6	15.1	4.2	17.8	24.6	11.7	9.6	Edwards Chert	
41. TMM-89277	22.4	19.5	–	3.2	–	–	–	–	Edwards Chert	
42. TTI-A1	31.3	19	17.3	3.2	20.8	24.1	10.7	10.7	Edwards Chert	
Maverick										
43.	40	16	16.7	4	27.4	–	12	–	Cream Flint	Hester 1968
McMullen										
44. #1	–	32	18	–	–	–	8	12	Pearly Chert	Cooper 1973
45. #2	–	–	19	3	–	–	11	11	Milky Agate	Kelly 1983
46. #3	37	19.6	16.5	4.5	–	–	–	–	Tan Chert	Chandler, pers. comm. 1989
Midland										
47. Art. #16	–	20.1	17.8	3.6	–	–	–	–	Yellow Flint	Wendorf et al. 1955
48. #17	–	–	17.7	2	–	–	–	–	Gray Flint	
49. #18	–	17.8	15.5	3.6	–	–	–	–	Gray Flint	
50. #55	35.6	20.3	17.3	4.8	–	–	12.5	–	Gray Flint	
51. #74	48.3	22.9	20.3	4.8	–	–	–	–	Gray Flint	
Nueces										
52. #1	31	21.5	20	–	17	19	11	10	Maroon Chert	Hester 1970
53. #2	–	24.4	21.5	4.7	–	–	14	13	Tan Flint	Chandler et al. 1983
San Patricio										
54. #1	22.4	18.5	17.2	3.6	15	–	10.5	–	White Quartz	Gunter 1985
Taylor										
55. #1	63.9	29.3	21.6	–	48.5	–	12.3	–	– – –	Ray 1970
56. #2	–	–	–	–	–	–	12.3	–	– – –	
57. #3	–	34.6	30	–	50	–	16.9	–	– – –	
58. #4	–	27.5	27	–	–	–	13.9	–	– – –	
Val Verde										
59. Hinds Cave	–	20.7	18.4	–	–	15	12.7	–	– – –	Turpin 1987
60. Bonfire Shelter	42	22	18	5	–	–	13	11	– – –	Dibble & Lorraine 1968
Ward										
61.	31.8	22.2	20.6	4	20.8	–	11.1	–	Edwards Flint	Robbins, pers. comm. 1988
Webb										
62.	44.2	–	–	–	–	–	–	–	– – –	Hester 1974
Wharton										
63.	48.4	–	–	4	26	–	–	–	– – –	Patterson & Hudgins 1985
Zapata										
64.	–	–	22.8	–	–	–	15	15	– – –	Hester 1974
Zavala										
65.	40.3	22.1	21.5	–	36.4	29.9	11.1	13.6	– – –	Hester 1974
AVERAGES	37.6	22.4	18.6	3.75	26.9	26.8	12.2	12.4		

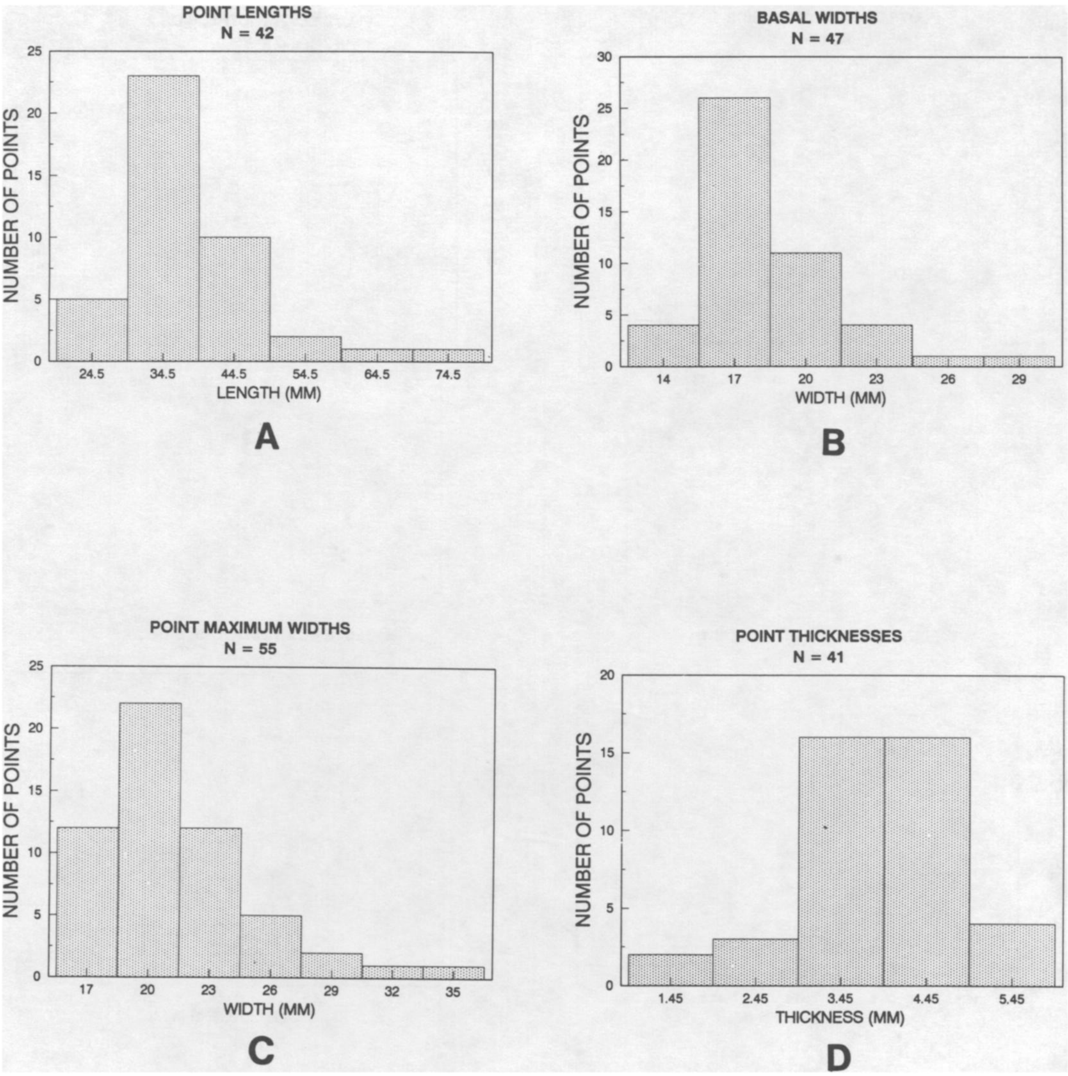

Figure 4. Folsom point attributes: A) Length; B) Basal Width; C) Maximum Width; D) Maximum Thickness.

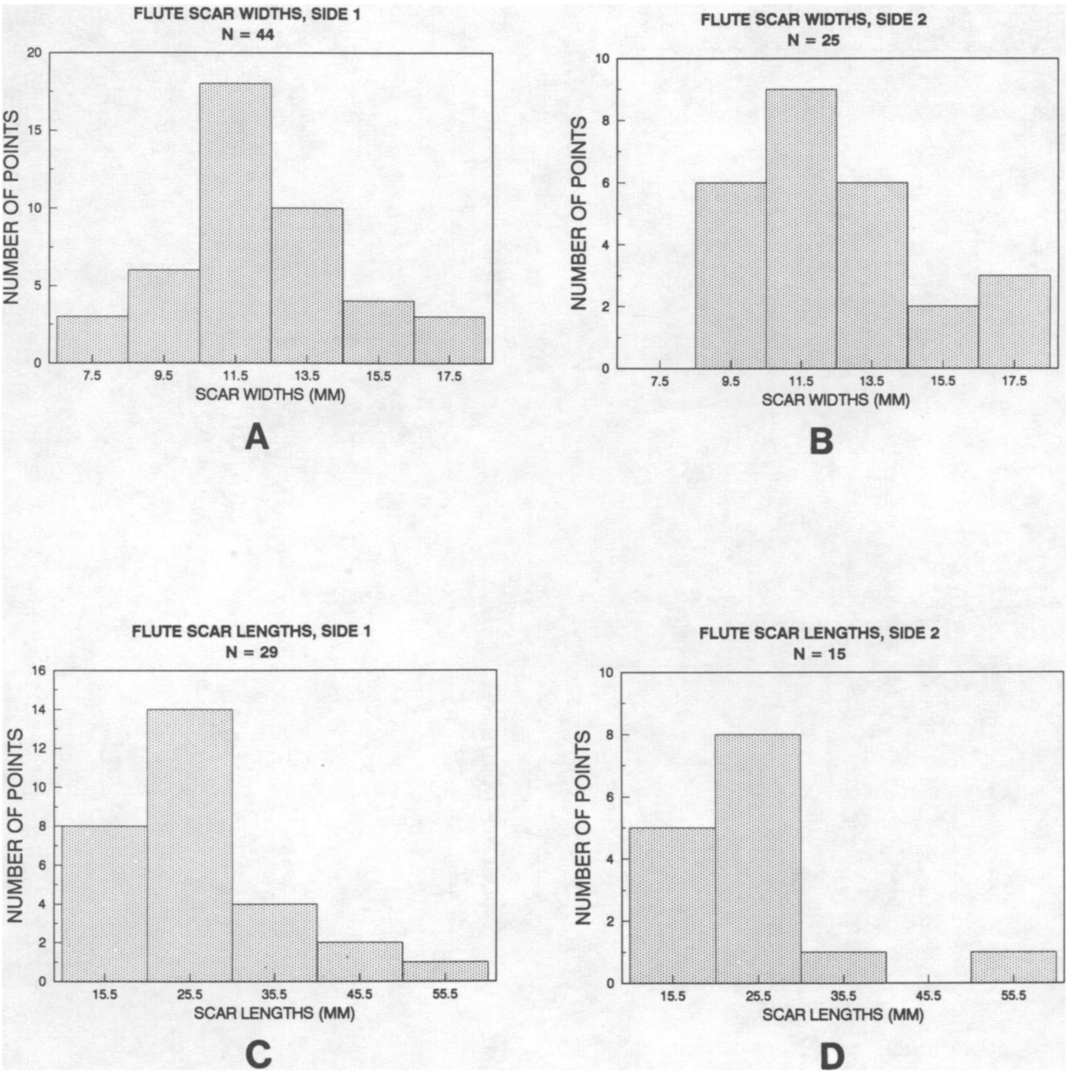

Figure 5. Folsom point flute scar attributes: A) Scar Widths, side 1; B) Scar Widths, side 2; C) Scar Lengths, side 1; D) Scar Lengths, side 2.

from data tables in reports. Furthermore, because many of the points were fragmentary, some dimensions (e.g., length and flute scar width) could not be measured. Consequently, point dimension data are incomplete.

The attributes described here follow those defined by Wilmsen and Roberts (1978; Figure 3). The attributes measured included: length (L); maximum width (MW); proximal or basal width (BM); maximum thickness (T); scar length (SL); and scar width (SW). Other data concerning edge grinding and material types as reported are also included (Table 6).

The lengths of 42 complete Folsom points average 37.6 mm. These points varied in length from 22.4 mm to 74 mm, but the majority are within a few millimeters of this average value. The average basal width (BW), determined from a sample of 47 points, is 18.6 mm. A sample of 55 points yielded an average maximum width of 22.4 mm. Maximum widths for Folsom points ranged from 15.6 mm to 34.6 mm, and the basal widths ranged from 13 mm to 30 mm (Fig. 4; Table 6).

Flute scars tend to extend over the entire length of the point. Scar length for the obverse and reverse sides of Texas Folsom points averaged 26.9 mm and 26.8 mm respectively. The largest set of scars measured 51.25 mm and 55.3 mm from end to end; the smallest, 13 mm and 15.9 mm. Scar width averages 12.2 mm and 12.4 mm for the obverse and reverse sides of Folsom points (Fig. 5, Table 6). Nearly all points were ground along their basal edges.

The points in the sample were crafted primarily from fine-grained lithic materials, particularly flints and cherts. Brown Edwards flint is the best-represented material type, although Alibates flint (Schaeffer 1958) and a number of local cherts, jaspers, and quartz in a variety of colors were also commonly used. Noteworthy examples of more exotic material types include a single small point made of a pinkish agatized wood (E. Stewart, pers. comm. 1988; Largent and Stewart 1989), as well as another chipped from a "milky" agate (Cooper 1973; Kelly 1983) and still another fashioned from a translucent, tan agatized wood (C. Chandler, pers. comm. 1989). A single point was knapped from chalcedony (Harrison and Killen 1978).

The dimensions and other attributes of Folsom points in Texas are strikingly uniform. Texas Folsom points are virtually identical to those from the Lindenmeier site in Colorado and points from sites in other Plains states (Wilmsen and Roberts 1978; Hofman 1986; Brown and Logan 1987). Points from the Lindenmeier site (Wilmsen and Roberts 1978), by comparison, average 35.02 mm in length (37.1 mm in Texas); 16.32 mm in basal width (18.7 mm in Texas); 18.66 mm in maximum width (22.6 mm in Texas); and 3.7 mm in thickness (3.69 mm in Texas). Flute scar measurements of Folsom points recorded for Lindenmeier average 28.47 mm in length (26.85 mm in Texas), and 12.12 mm in width (12.3 mm in Texas). These size differences, of 2-4 mm, are insignificant. The striking similarity between Folsom points in Texas and Colorado only illustrates the uniformity of Folsom lithic technology across the grasslands of late Pleistocene North America.

CONCLUSIONS

An extensive survey of the available literature, coupled with a program of correspondence with Texas archaeologists and archaeological societies, produced data on 329 Folsom Points from 57 Texas counties. The patternings of Folsom points and localities appears to reflect the intensity of archaeological activity in different parts of the state. Inferences concerning the behavioral patterning of the Folsom people will have to wait until more data are available.

In regards to temporal context, accurate radiocarbon ages from Folsom sites in Texas fall into the accepted age range of 10,000 to 11,000 B.P. Texas Folsom points were generally manufactured from fine-grained flint or chert. The metric attributes of Folsom points are similar throughout the state, falling within well defined ranges. Further, the dimensions of Texas Folsom points compare favorably with Folsom points from other states.

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