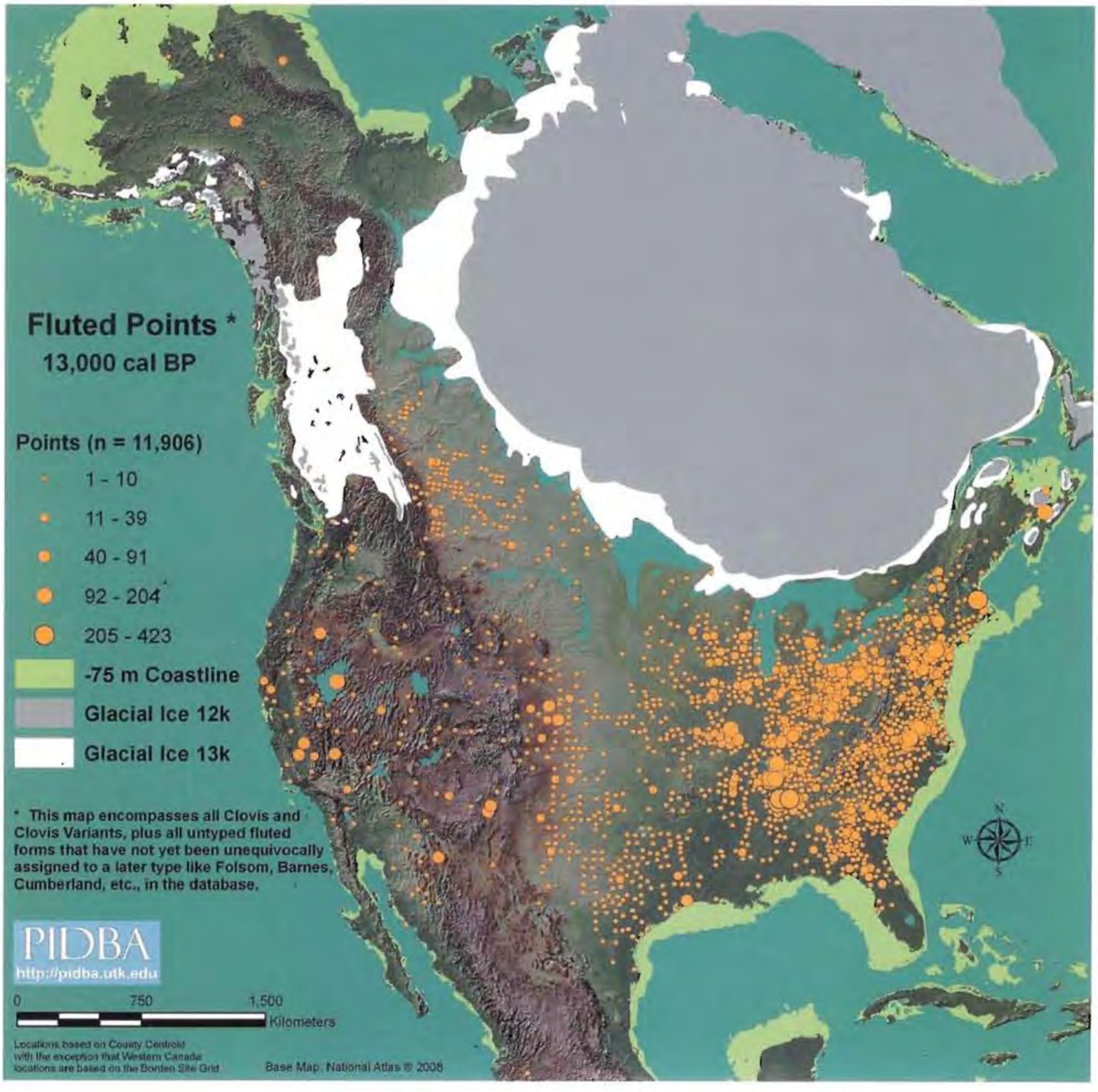
ARCHAEOLOGY OF EASTERN NORTH AMERICA



Volume 38
2010

PIDBA (PALEOINDIAN DATABASE OF THE AMERICAS) 2010: CURRENT STATUS AND FINDINGS

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The compilation and dissemination of primary data from multiple sources and across large areas is one of the major challenges facing the archaeological profession in the twenty-first century. The Paleoindian Database of the Americas (PIDBA), available on-line at http://pidba.utk.edu, integrates database and GIS technology to make available locational data on nearly 30,000 projectile points, attribute data on over 15,000 artifacts, and image data on ca. 7,500 points from across North America. These data can be used to explore patterns of land and lithic raw material use and demographic trends within the Paleoindian period. Equally important, PIDBA serves as a model for collaborative interaction between professional and avocational archaeological communities across the Americas. PIDBA grows through the voluntary collection and compilation of primary data, and the website provides instructions on how to record and submit this information. Recent additions to PIDBA include radiometric and bibliographic databases, color artifact photographs, and artifact distribution maps that include accurate glacial, periglacial and pluvial lake, and shoreline/sea-level boundaries. Ongoing activity is directed to finding and adding in new information and compiling the attribute data from multiple sources into a single comprehensive database. All those interested in participating in the project are welcome and encouraged to do so.

This paper documents recent efforts to systematically collect and share information about Paleoindian sites and artifacts by members of the professional and avocational archaeological community in the Americas. For the past two decades locational, attribute, and image data on Paleoindian materials have been collected and compiled into what is now called the Paleoindian Database of the Americas, or PIDBA, with updates on the state of the database issued periodically in journals like this one (Anderson 1990a; 1991; Anderson and Faught 1998, 2000; Anderson et al. 2005; Faught et al. 1994). The data have been available upon request since the initiation of the project, first through floppy disks, then CDs, and for the past decade online [http://pidba.utk.edu]. The project involves multiple collaborators from across the Americas, with mechanisms in place to ensure it continues beyond the lifetime of individual researchers. New data are continually being added, and we encourage colleagues to contribute to this effort by submitting information in hard copy and electronic form. All data and contributors are referenced and acknowledged in the data files and on the public website.

The Paleoindian period that PIDBA seeks to document refers to occupations predating 10,000 ^{14}C yr BP, or ca. 11,450 cal yr BP, during the Pleistocene epoch.[1] Projects recording information about Paleoindian sites and artifacts have a long history in American archaeology, and many are currently underway in states, provinces, and parishes in the US, Canada, and Mexico, and in portions of Central and South America. This information, although currently incomplete and distributed in a range of formats and outlets can, we believe, be made available in a single readily accessible source useful to exploring early human occupations in the Americas. PIDBA demonstrates the feasibility of large scale, multi-collaborator and multi-institutional data compilation, standardization, analysis, and presentation. Conducting such projects is a challenge as well as an opportunity facing the archaeological profession in the twenty-first century (e.g., Banks et al. 2006; Conolly and Lane 2006; Gillam 2009; Kintigh 2006; Snow et al. 2006).

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There are a number of reasons why data compilation efforts like PIDBA are important.[2] First, they take information that is widely and unevenly distributed and compile it into a single source readily accessible to scholars and laypeople alike, with an internet connection the only requirement for access. Recording projects like PIDBA thus help foster an ethos of data sharing and interaction among professional archaeologists and with the interested general public. Calls for the development of a culture of openness, transparency, and responsible data management are becoming widespread as increasing numbers of scholars recognize that the pre- and post-publication sharing of primary data is essential if science is to flourish and knowledge to grow (*Nature* 2009:145; Toronto International Data Release Workshop 2009; Schofield et al. 2009). Second, standardized and accessible databases allow for the evaluation and replication of research, an essential aspect of science. When data repositories are available for inspection and use by all interested parties, arguments based on authority unsupported by primary evidence become increasingly untenable. Third, employing standardized databases can help make results from different projects more directly comparable. Finally, developing standardized data sets can save time, money, effort and brain power, all of which are finite resources. Re-inventing the wheel is all too common in archaeology, where scholars may address the same questions and collect the same kind of data time and time again. For example, archaeologists have been producing maps showing the distribution of fluted points in North America since the 1930s (e.g., Cotter 1937[2007]; Mason 1962; Williams and Stoltman 1965), but only in recent decades have they done so employing standardized and readily accessible artifact datasets (Anderson 1990a, Anderson and Faught 2000; Brennan 1982). The benefits of focusing limited archaeological resources on compiling and sharing information, or on intuitive rather than quantitative analyses when the latter are an option, are obvious.

PIDBA: THE STATE OF THE DATABASE 2010

As of January 2010, locational data are posted online for 29,393 projectile points from Canada, the United States, and Mexico, together with attribute/measurement data for 15,254 artifacts, and digital images of some 7,500 artifacts (Figure 1, Table 1). While most of the artifacts documented in PIDBA at present are projectile points, data on other aspects of Paleoindian site assemblages are now being added, including information about other tool forms, associated radiocarbon dates, and relevant bibliographic references. These data provide an increasingly robust sample for scholars interested in exploring a variety of research questions, including those related to the distribution and morphological variability in early artifacts and assemblages in the Americas, changes in demography and mobility in the early populations leaving these remains behind, determining the ecological associations of early sites, and where and how distinctive subregional cultural traditions emerged over the course of the Paleoindian period. The PIDBA web site also has compilations of radiocarbon dates and bibliographic references relevant to Paleoindian research[3] as well as numerous links to other web sites. The data posted on PIDBA in electronic form and the hard copy files we receive from researchers contributing information serve as a backup repository for information in state or province level data collection projects. New data are being added to PIDBA all the time. These data have been submitted directly to PIDBA or have been entered from published sources. The project is an entirely voluntary effort, with much of the actual database development accomplished by undergraduate and graduate students at a number of universities, including Arizona, Tennessee, Texas A&M, and Wyoming. To date some 75 professional or avocational archaeologists have provided data directly to PIDBA, and information from dozens of other published and unpublished sources has been typed or scanned into digital format by the authors and innumerable other volunteers when it was not already available electronically. Private individuals, many avocational archaeologists, have made impressive contributions to this effort, and in some local surveys have collected much of the primary information. When data are posted on PIDBA, it is always with the permission of the original authors or researchers, if the latter are living, and with respect for copyright. While PIDBA's coverage is nowhere near as complete as what we know or believe to be potentially available, a vast amount of information has already been compiled and is available for use in research and public education.

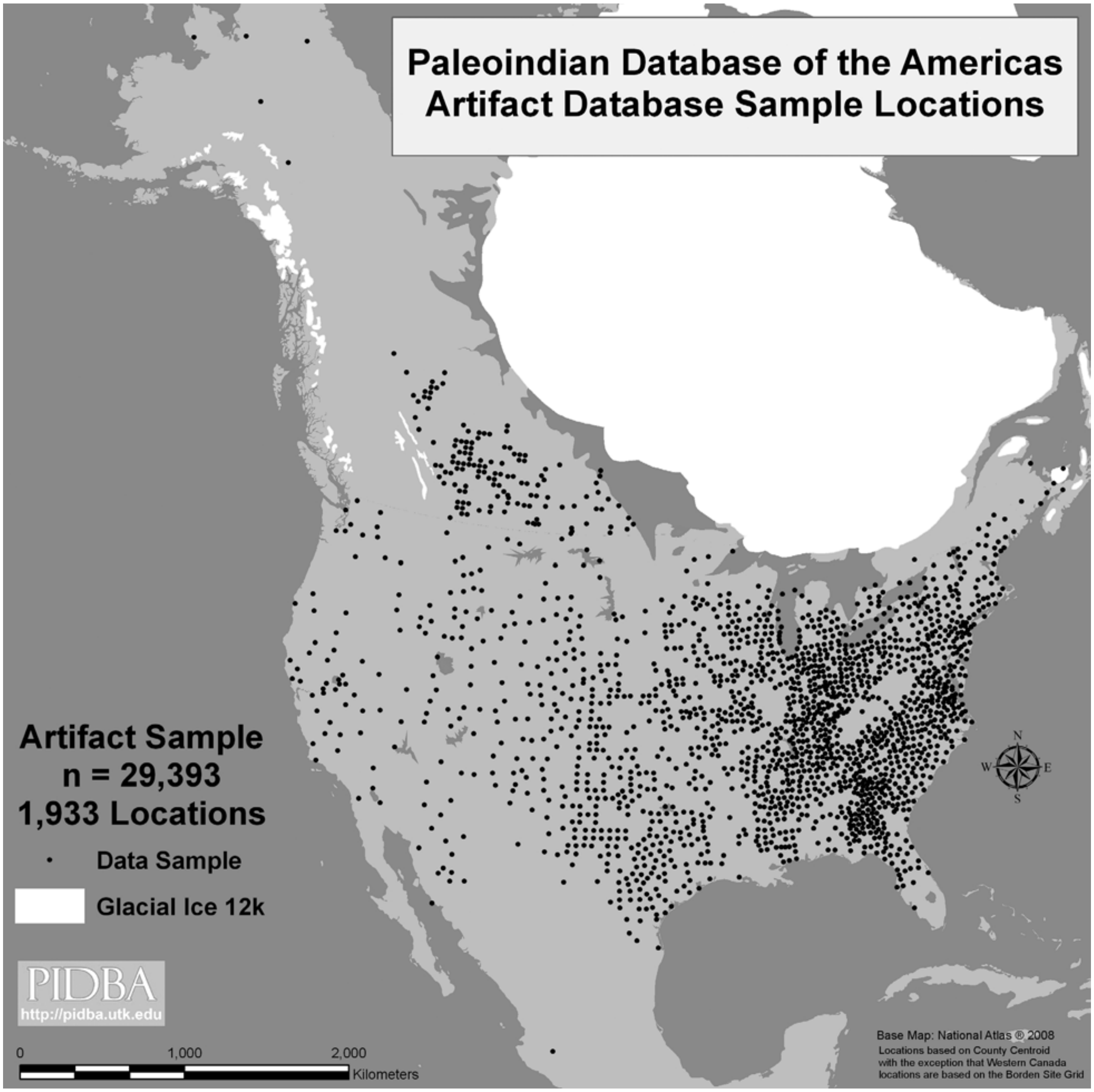

Figure 1. Sample Locations (N=29,393 Paleoindian and Early Archaic projectile points). Data are recorded by county, parish, or other political unit, with the estimated geographic centers for each unit used in Mexico, the United States, and eastern Canada. In western Canada Borden grid cell centers are used. Coordinate data are posted online with the artifact data for each county.

Developing PIDBA is a challenging, albeit rewarding endeavor for a number of reasons. Until recently, primary locational and descriptive information about Paleoindian artifacts and assemblages has been difficult to obtain in many parts of the Americas. This may seem surprising, because 'fluted point' or Paleoindian artifact recording projects have been underway in some areas for decades, with hundreds or thousands of individual artifacts recorded. Most of the data in Table 1 and posted online, in fact, comes from such projects. Unfortunately, with rare exception these efforts are typically limited in extent or duration, lasting for few years or decades at most, and ceasing when the people leading the project move on to other things or die

Table 1. The PIDBA Sample as of January 2010

State or Province	SAMPLE (N)	FLUTED	VARIETIES	CLOVIS	Artifacts with Attribute Data Posted on Line*
Alaska	69	69	0	0	0
Alabama	1871	1147	724	398	1125
Arizona	135	101	34	0	22
Arkansas	155	112	43	97	647
California	301	301	0	0	14
Colorado	626	211	415	207	0
Connecticut	58	58	0	0	0
Deleware	48	42	6	22	51
Washington, DC	3	3	0	0	0
Florida**	660	163	497	159	136
Georgia**	1594	380	1214	345	1650
Idaho	34	12	22	0	30
Illinois	403	378	25	220	0
Indiana	726	534	192	39	235
Iowa	191	149	42	63	105
Kansas	104	70	34	67	12
Kentucky	363	267	96	5	0
Louisiana	20	20	0	0	68
Maine	140	6	134	0	42
Maryland	94	91	3	19	32
Massachusetts	427	427	0	0	32
Michigan	192	167	25	26	26
Minnesota	61	41	20	0	48
Mississippi**	1871	105	1766	81	1672
Missouri	412	297	115	4	121
Montana	64	23	41	0	60
Nebraska	144	85	59	82	0
Nevada	172	172	0	145	142
New Hampshire	12	10	2	0	0
New Jersey	262	262	0	0	0
New Mexico	1025	123	902	0	1053
New York	290	290	0	0	13
North Carolina	2524	448	2076	174	253
North Dakota	20	9	11	8	0
Ohio	1108	1089	19	1	34
Oklahoma	240	108	132	108	83
Oregon	57	57	0	57	95
Pennsylvania**	934	766	168	416	872
Rhode Island	4	4	0	0	0
South Carolina**	5812	313	5499	214	469
South Dakota	75	3	72	0	0
Tennessee**	2737	667	2070	671	4376
Texas	1027	453	574	532	72
Utah	58	33	25	33	98
Vermont	33	33	0	0	33
Virginia	868	819	49	0	1008
Washington	36	36	0	0	0
West Virginia	28	28	0	1	0

Wisconsin	332	321	11	189	240
Wyoming	240	44	196	43	0
CANADA					
"ALB, BC, SAS, MAN"	279	279	0	0	78
Ontario	213	49	164	0	190
New Brunswick	5	5	0	0	0
Nova Scotia	141	141	0	0	17
Prince Edward Is.	25	25	0	0	0
Quebec	3	3	0	0	0
Saskatchewan	42	32	10	5	0
MEXICO	25	25	0	0	0
TOTAL	22393	(11096)	(17487)	4431	15254

SAMPLE Total number of reported Paleoindian and Early Archaic Projectile Points in the sample.
CLOVIS Total number of reported Clovis Projectile Points.
FLUTED Clovis Points and Untyped Fluted Points
VARIETIES Total number of reported named point types and varieties excluding Clovis and Clovis Variant Forms
* Not all measured artifacts are in the locational sample. AR, MT NM totals include non-point data.
** Image data are posted online, taken from recording forms

without designating successors to carry on the work. Much of the primary image and attribute data collected in these surveys, furthermore, is only rarely published in its entirety or readily available on request – often because only one copy of the files exists – although most information, particularly from the longer lasting projects, are carefully maintained in curatorial repositories and have been the subject of at least occasional summary papers or monographs. In many cases obtaining the primary data requires appreciable effort and expense, including travel to curatorial facilities and copying fees, and time devoted to scanning and data entry.

Paleoindian recording projects with a record of thorough and continual publication with updates released every few years are the ideal, but such projects are, unfortunately, extremely rare. Virginia and Texas are two states where an exemplary record of continued collection and publication of primary data exists going back several decades, but they are unique in this regard (e.g., Bever and Meltzer 2007; Hranicky 2008; McCary 1984; Meltzer 1986, Meltzer and Bever 1995). More commonly, a stand-alone paper or monograph appears, summarizing what is known in a particular area at the time of release (e.g., Anderson et al. 1990; Huckell 1982; Loring 1989; Mason 1958; Ritchie 1957); only infrequently have updates followed, even if data have continued to be compiled. Fogelman and Lantz's (2006, 2009a, 2009b) recent monograph length, lavishly illustrated publications on Pennsylvania Paleoindian projectile points, with hundreds of color images and tables presenting qualitative and quantitative attribute data for each artifact, serve as a model of reporting that hopefully others will emulate. Fogelman and Lantz also generously made all of their image and attribute data files available to PIDBA in electronic format and allowed us to post them. Given the incomplete record of publication and short duration of many recording projects, making primary information available on line via PIDBA also helps to ensure that the data from these surveys are known and used beyond their immediate area.

Even finding and compiling primary data that has been published can be daunting. While numerous Paleoindian sites have been subject to surface collection or excavation, much of the primary data, if reported at all, is likely to be located in book chapters, journal articles, cultural resource management (CRM) reports, or unpublished master's theses and doctoral dissertations.[4] We rely on our colleagues to tell us about these sources, since finding all of them is beyond the capability of any one person, especially since new data are emerging all the time. Detailed locational, measurement, and photographic data for much of the Paleoindian material that has been found in the Americas are thus either scattered in a wide array of publications or, for the vast majority of the Paleoindian material found to date, our work indicates, remains unrecorded or unpublished. Artifact recording projects are thus essential to the success of PIDBA, and we try to encourage them whenever possible. If you know about data that should be on PIDBA, furthermore, we want to hear about it, since it is quite possible we missed it.

Some primary information, unfortunately, is tightly held by individuals who are reluctant to publish or share it and who may or may not have made provisions for its curation in perpetuity, with the result that potentially useful data may be lost upon their death. While this is not very common (most of our colleagues have been extremely generous in sharing their data) there are exceptions.[5] We also try to encourage avocational archaeologists to make provisions to donate their collections and records to curatorial facilities, museums, or research institutions, especially when they have a large and well documented collection that would be useful to research and public education on a number of fronts (e.g., Pike et al. 2006). The PIDBA project thus has as a primary mission: the encouragement of an ethos of data publication, sharing, and open access among professionals and avocationals to help us work cooperatively and more efficiently to better understand the early human occupation of the Americas.

Our work with PIDBA to date has shown that when primary attribute, image, and locational data are compiled, and available for inspection, it can educate us about what has been found and can be examined to help us learn new and previously unrecognized things about the past. Some fluted, lanceolate, and notched Paleoindian projectile point forms, for example, appear to be diagnostic indicators of spatially or temporally restricted occupations. Information about their occurrence is thus one way that we can recognize where the people who made them were living on the landscape and, by association with other artifacts, what they may have been doing. The absence of early projectile point types, in contrast, may indicate geographic areas that were not heavily utilized or that are in need of further investigation. By recording detailed descriptive information about projectile points or other artifacts, furthermore, it should be possible to document temporally or behaviorally significant morphological variation within these forms, something not well understood anywhere in the Americas at present (e.g., Buchanan and Collard 2007; Meltzer 1984, 2009:283-286; Morrow and Morrow 1999; O'Brien et al. 2001).[6] Other positive research accomplishments that have been or can be obtained from PIDBA are discussed in the pages that follow.

THE VALUE OF PALEOINDIAN DATA RECORDING PROJECTS

Compiling primary data on Paleoindian materials is not a new idea in American archaeology, although until recently the samples gathered and employed in analyses have typically been quite small or focused on count instead of attribute data. Early syntheses attempting to delimit where sites and artifacts occurred were for the most part unsystematic and impressionistic but still made a number of important observations. Fluted points were observed to be present across much of unglaciated North America, for example, with dense concentrations in some areas, typically along major river systems, and comparatively few artifacts in others, and it was observed that appreciable morphological variability was present among these artifacts (e.g., Cotter 1937[2007]; Mason 1962; Prufer 1960; Sellards 1952; Williams and Stoltman 1965; Wormington 1957). In the early 1980s, the first large scale systematic data collection effort involving Paleoindian data took place when Louis Brennan and members of the Eastern States Archaeological Federation gathered count data on 5,820 Paleoindian projectile points (mostly fluted points) from 17 states and two Canadian provinces located primarily along the Atlantic seaboard. This information was published in the 1982 issue of *Archaeology of Eastern North America*. In the mid-1980s, David Meltzer (1984, 1988) examined morphological variability in fluted point forms across North America using a sample of 1,039 points.[7] His work resolved a number of stylistic classes, some of which conform to known types, and in some cases with fairly restricted spatial distributions. The point sample Meltzer used remains the largest employed to date in such analyses in the Americas.

In the late 1980s and early 1990s one of us (Anderson 1990a, 1990b, 1991) began compiling fluted point locational and attribute data from across eastern North America. The 'North American Paleoindian Database' project, as it was initially designated, expanded markedly in the ensuing two decades, and PIDBA now encompasses all of the Americas and involves many scholars (e.g., Anderson and Faught 1998, 2000; Anderson et al. 2005, 2009; Faught et al. 1994). Maps displaying the location of projectile points by specific type were originally produced by hand shading county areas, then using contouring programs like Surfer, and now using a GIS interface. The occurrence of specific artifact categories can be shown in relation to ice sheet, periglacial and pluvial lakes, and shorelines at different points in time during the late Pleistocene, and these distributions can be evaluated in terms of a number of environmental variables such as elevation, hydrology, and reconstructed paleovegetation (Banks et al. 2006; Dyke 2004; Gilliam 2009, Gillam et al. 2006, 2007). The GIS-linked locational dataset also allows researchers to examine the distribution of artifacts at varying scales of resolution. Currently, the locational data available for mapping purposes is based on county, parish, or other political unit centroids in the United States, Mexico, and portions of Canada (Figure 1). In some areas of western Canada, the centroids of Borden recording grid cells are employed.

Unfortunately, archaeological sites may be subject to looting and collections to theft or vandalism. While more specific locational data are available for much of the material that has been compiled, and a site database is currently under development, this information is not posted on the web, primarily to ensure that site locations remain secure. For the same reason, curation (i.e., artifact ownership) information posted online is restricted to materials in public repositories. A substantial amount of the Paleoindian archaeological record in many parts of the Americas resides in private collections, and while the names and addresses of the individuals who own these materials are recorded, they are not made publically available.

While PIDBA originated in an effort to map the occurrence of fluted points over large areas and examine morphological and temporal variation within these forms, the utility of these data for addressing a range of research topics was soon apparent (Anderson 1990a, 1990b). The initial distribution map of Clovis and presumably related fluted points from eastern North American assemblages, with concentrations in some parts of the region, for example, was used to suggest a model of Clovis settlement in and expansion from resource rich 'staging' areas, a 'place-oriented' perspective that remains in sharp contrast to 'technology-oriented' models that see Clovis peoples as moving widely over the landscape, rarely settling anywhere for very long (cf., Anderson 1990b with Gardner 1977, 1989, and Kelly and Todd 1988). The irregular distribution of fluted points (Figure 2, color plate), if not due to sampling bias (something that increasingly seems unlikely as the dataset grows larger), further suggests that these people were "keying-in" some areas and avoiding others. In particular, major river systems, boundaries between major environmental zones or macroecotones, and the occurrence of high quality knappable stone appeared to have been particularly important in shaping early settlement (e.g., Anderson 1990b; Dincauze 1993a; Gardner 1977; Goodyear 1979; Miller and Smallwood 2009). While some of these inferences had been noted by earlier generations of researchers, the patterns were usually impressionistic in nature and based on the characteristics of one or a few key sites, rather than over a regional scale and extensive data sample. Distributional maps of specific artifact categories developed from PIDBA, furthermore, are far more accurate and useful than earlier efforts, which typically consisted of lines drawn around or shading placed over areas impressionistically perceived to represent the distribution of the category (e.g., Anderson 1990b:170; Cotter 1937[2007:34]; Dincauze 1993b:282; Justice 1987; Williams and Stoltman 1965:677)(Figure 3, color plate).

Compilations of measurement data from and digital images of individual artifacts, like locational data, also have great value in Paleoindian research. We have a long way to go before we recognize, much less understand, the range of variability within major Paleoindian artifact categories, so the compilation and analysis of primary data is essential if we are to effectively explore this variation. Evaluating typological designations with attribute data and over large samples is particularly critical. Paleoindian projectile points are typically classified using a plethora of stylistic and technological variants or type names, many of which are restricted to small areas or regions, or else are classified so generally (i.e., as 'Clovis' or 'fluted') or differently from region to region that potentially meaningful variability within these categories likely goes unrecognized (e.g., Bell 1958, 1960; Cambron and Hulse 1964; Hranicky 2007; Justice 1987; Perino 1985, 1991, 2002; Turner and Hester 1993).[8] Ideally, specific artifact categories found and dated in secure contexts should form the basis for classificatory analyses (e.g., Buchannan and Collard 2007; Buchannan and Hamilton 2009). Appreciable variability is commonly observed even within tightly dated Paleoindian assemblages or presumably well known types (e.g., Clovis, Folsom), however, and vast quantities of presumably Paleoindian archaeological material has been found in temporally more ambiguous surface or mixed excavation contexts that may only approximately resemble known types.

Several important studies have attempted to explore morphological variation in Paleoindian projectile points employing data from over a large area (e.g., Buchannan and Hamilton 2009; Meltzer 1984; Morrow and Morrow 1999), but such analyses are decidedly uncommon. Having detailed attribute and image data from as large and as well documented a sample as possible is absolutely critical to the success of such efforts. Recording projects need to be maintained where present and initiated where none currently exist, and the data that is collected needs to be shared. Fortunately, new Paleoindian recording projects are being initiated all the time or older projects re-invigorated, most recently in Montana, Missouri, New York, and Uruguay (e.g., Anderson and Knudson 2009; Lothrop 2009; Martens and Lopinot 2009; Suárez and Gillam 2008).

SOURCES OF BIAS IN PIDBA

Complicating analyses with PIDBA data are problems of sample bias and representativeness, which is influenced by the amount of prior survey, collection and recording activity that has occurred in a given area; the extent of agricultural or other land clearing; current and past ground cover and erosional conditions; local and regional population density; the numbers of local collectors; and many other factors (e.g., Bever and Meltzer 2007; Buchanan 2003; Labelle 2005:72-90; Lepper 1983, 1985; Loebel 2005:65-69; Meltzer 1986, 2009; Meltzer and Bever 1995; 1995; Miller and Smallwood 2009; Prasciunas 2008; Schaefer 2005; Seeman and Prufer 1982, 1984; Shott 2002, 2004). There is little consensus among these studies, many of which have made use of PIDBA, however, about the kinds of bias and their impact or importance, save for general agreement that (1) sources of bias must always be acknowledged and as much as possible controlled for; (2) a great deal more primary data collection is needed to achieve such control; and (3) until we know what sources of bias are present, we must proceed cautiously in drawing inferences from the existing samples. While something of a "cottage industry" has emerged evaluating PIDBA, nothing better has been proposed to take its place, and most scholars recognize that the project has utility. Most of these studies, furthermore, besides helping us recognize and control for possible sources of bias, have had the additional benefit of generating large amounts of new primary data that have helped PIDBA continue to grow.

Recent analyses using PIDBA to evaluate records and collection management practices offer a promising way of overcoming some of the biases in the dataset. A comparison of PIDBA artifact and site file data from five states in the Southeast, for example, demonstrated that there are sometimes major differences in where Paleoindian *artifacts* have been documented in recording projects and where Paleoindian *sites or components* have been reported in official archaeological site files (O'Donoughue 2007; a similar pattern was also noted in Texas by Bever and Meltzer, 2007:76-78). That is, many locations where fluted and other Paleoindian points have been found during artifact recording projects have not been reported as possible archaeological sites or isolated finds to the appropriate state or province site files. This is probably because most avocationals don't create and file site forms for the areas they collect. Likewise, artifacts from known Paleoindian sites are sometimes overlooked in recording projects, perhaps because the sites were identified during CRM projects where only limited numbers of reports were produced. Analyses using PIDBA are thus useful in documenting the kinds of data we may be either missing in our artifact recording projects, or that may be over or under-represented in our site files.

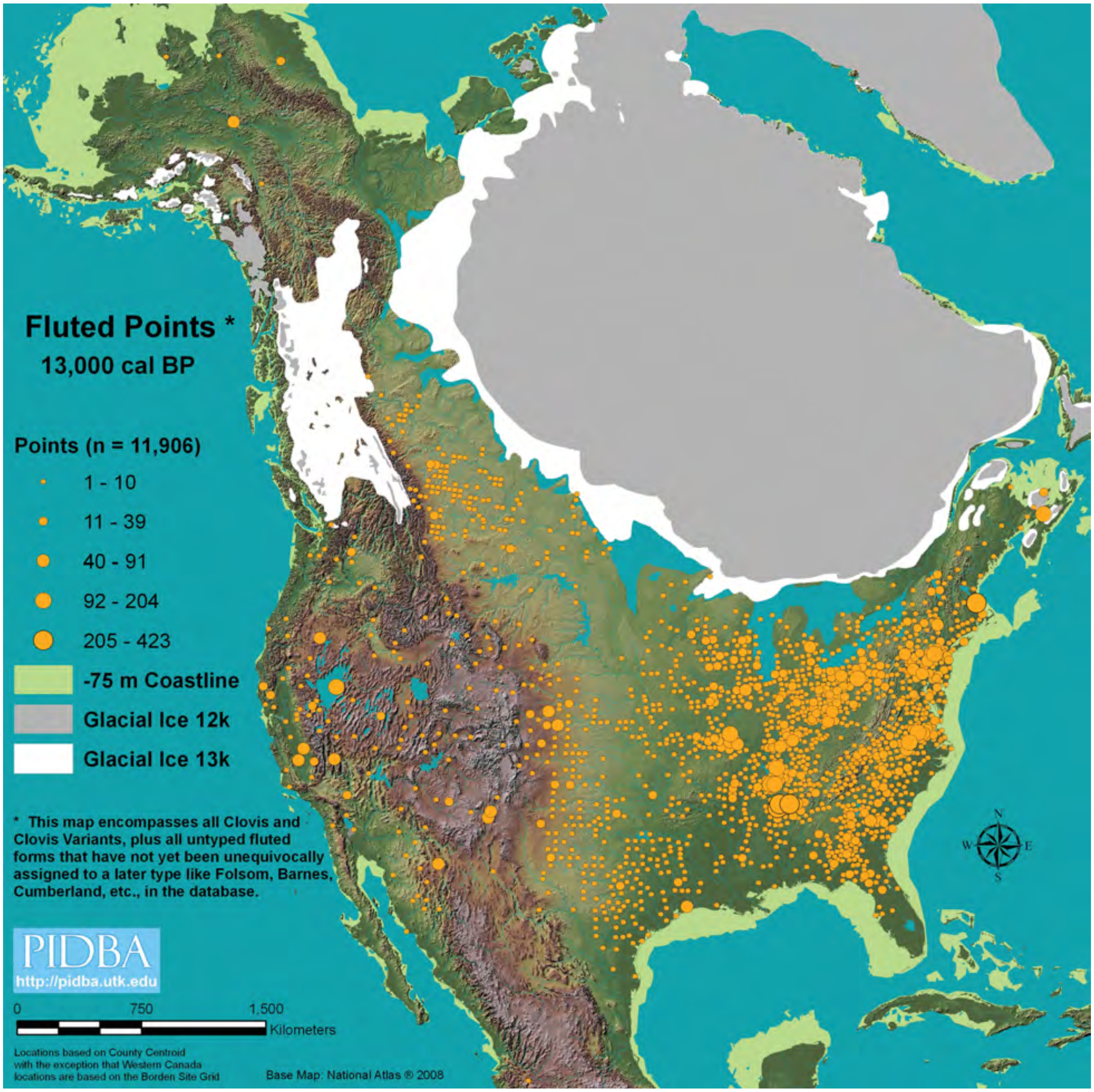

Figure 2. All reported Clovis and Clovis Variants, plus points designated as 'fluted' in Paleoindian artifact recording projects but not yet assigned to a specific type in PIDBA.

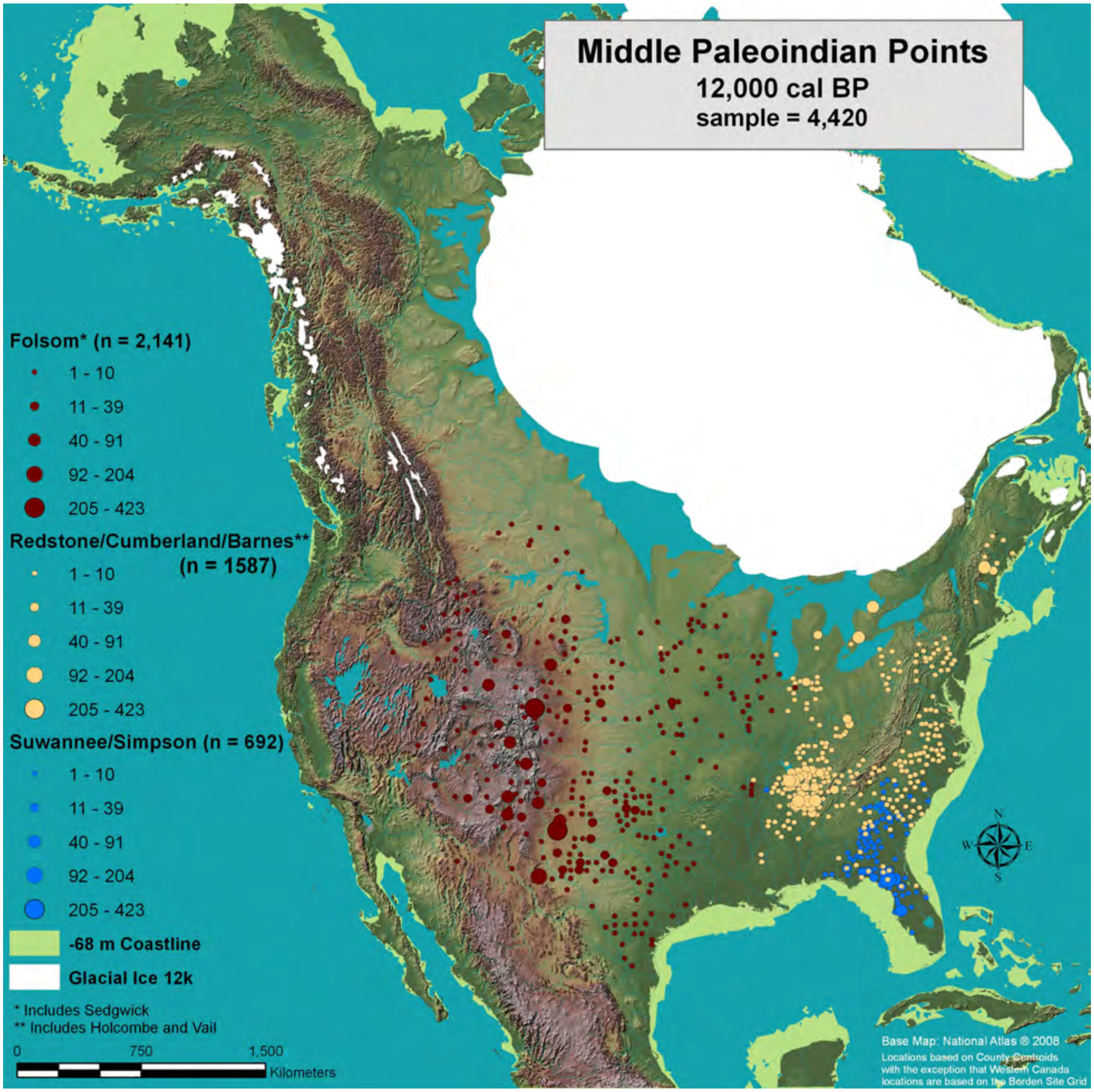

Figure 3. Presumed Post-Clovis, Paleoindian Projectile Point Types: Folsom, Redstone/Cumberland/Barnes/Holcombe/Vail, and Suwannee/Simpson forms. Distributional maps like these are far more useful than more traditional, impressionistic or qualitative efforts to delimit, through lines or shading, where on the landscape specific artifact categories occur. Areas of incomplete coverage in PIDBA, where typological subdivision of general 'fluted' or 'Paleoindian' point categories has yet to occur, particularly in the Midwest and Northeast, are clearly delimited by vacant areas corresponding to state or province outlines.

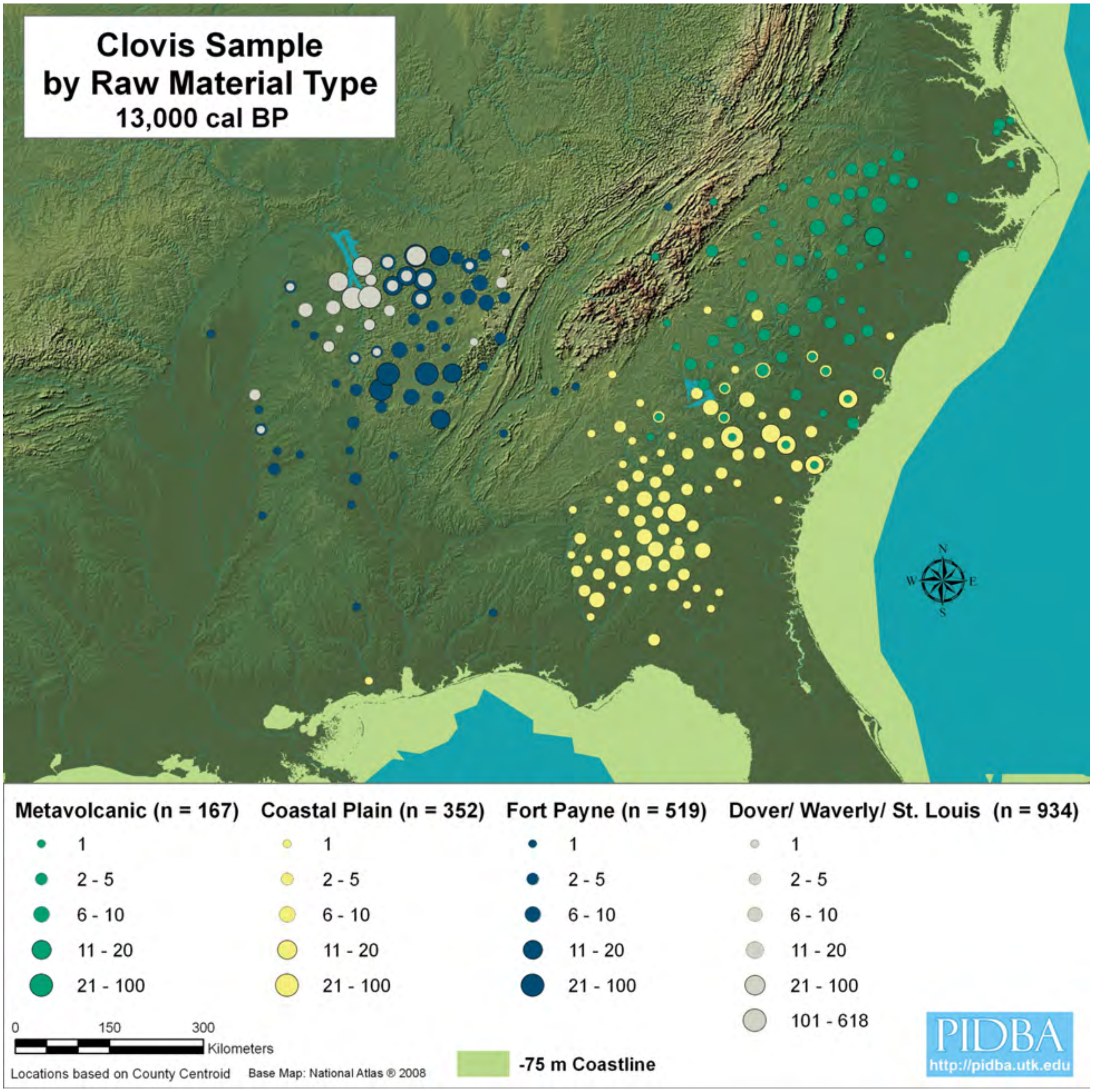

Figure 4. Clovis point incidence on four major lithic raw material categories in the lower Southeast. Most materials are found over areas several hundred kilometers in extent.

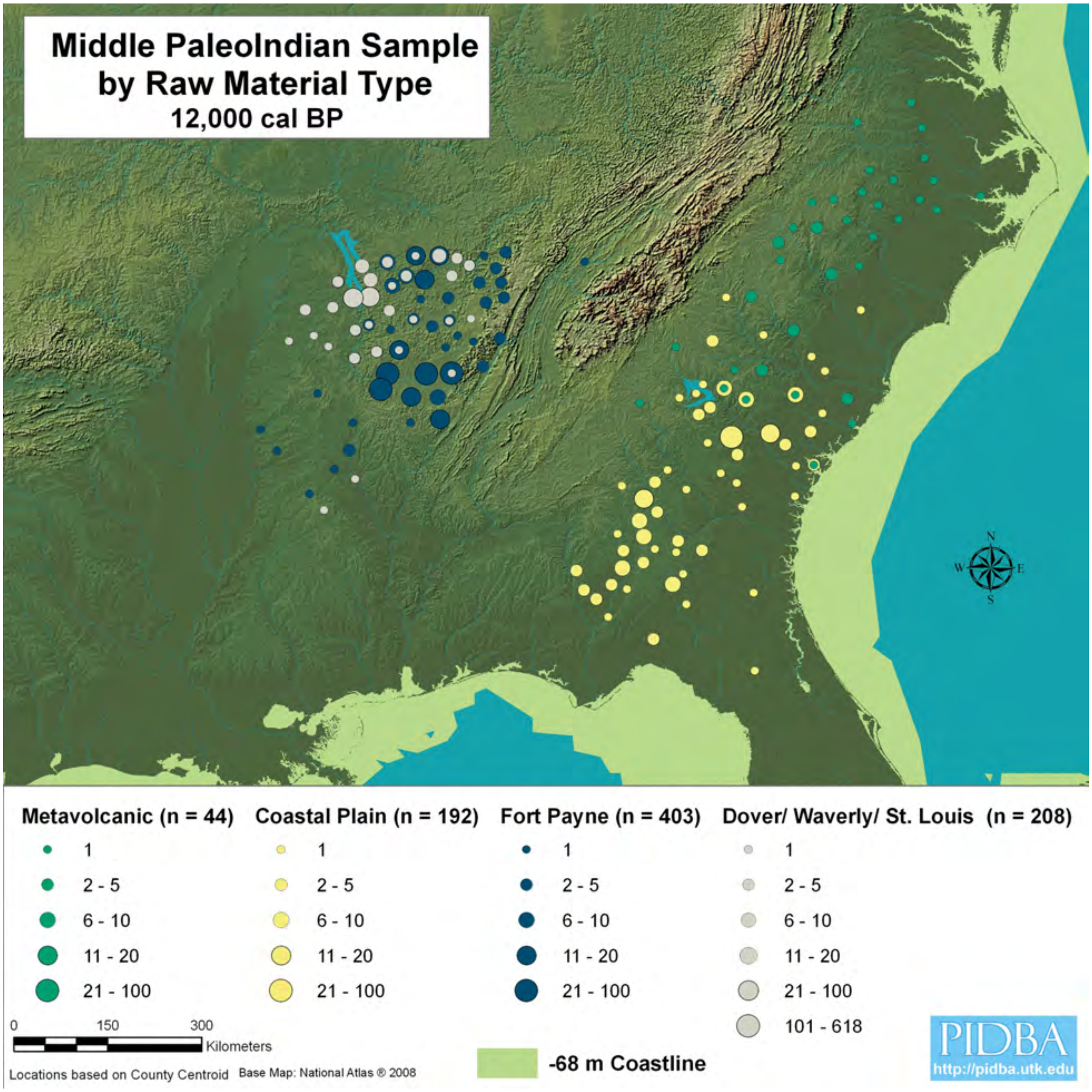

Figure 5. Cumberland, Redstone, and related 'Full-Fluted' horizon point incidence on four major lithic raw material categories in the lower Southeast. Most materials occur over areas that are smaller than those observed during preceding Clovis times.

Perhaps the greatest deficiency in many Paleoindian artifact recording projects, including PIDBA, is that they have tended to focus on projectile points, and only on specific point forms at that, such as fluted or lanceolate types. While fluted projectile point forms appear to be universally reported, unfluted lanceolate or notched types of presumed or known Paleoindian age are unevenly reported or ignored altogether in some surveys. In some cases this is because there are so many of these artifacts that recording them can appear seemingly impossible or far too labor intensive. It should be noted, though, that the point surveys in Georgia, Mississippi, and Tennessee record all identifiable Paleoindian points from Clovis through Dalton (Ledbetter et al. 2008; McGahey 2004; John Broster: personal communication 2009). Other artifacts from Paleoindian assemblages, such as blades and blade cores, scrapers, bone tools, debitage, or paleosubsistence data are only rarely compiled. Few of these artifact categories can be unambiguously classified as Paleoindian in age, however, unless they are found in secure context. Just as PIDBA expanded its geographic focus from the lower 48 states to across the Americas over the past decade, we have also begun recording a much broader array of information in recent years, a trend that should continue, and that we hope will encourage others to do so. To succeed in this assemblage diversification, however, people must continue to contribute information to PIDBA, and ideally in electronic format, since our resources are limited when it comes to data scanning and entry (although we have volunteers able to enter data if necessary).

Another source of bias is that Paleoindian artifact classification is not very standardized across North America and, hence, within PIDBA. The use of terms such as ‘Clovis’ or ‘fluted points’ in current surveys is very uneven, for example.[9] Few Clovis points have been typed as such in the northern part of the continent, where most are instead described as ‘fluted’ or using other type names such as Barnes, Debert, Gainey, Holcombe, etc. It is probable that as analysis proceeds, many of the ‘fluted’ points currently reported in the upper Midwest, the Northeast, western Canada and Alaska, and possibly in California and the Great Basin, will be recognized and classified as post-Clovis in age. It is thus critical that when people type points, they should provide their criteria for doing so, or at least make available image and attribute data for these artifacts, so other researchers can evaluate their classifications.

Finally, there are some biases in the occurrence of artifacts in existing distribution maps produced using PIDBA. As more and more data are added to PIDBA, new artifact occurrences and even concentrations are emerging, with fluted points occurring in areas where few or none were previously reported (e.g., Labelle 2005; Loebel 2005:65-69). Fluted points appear to occur in many parts of North America in at least low incidence away from areas covered by ice sheets or pluvial or periglacial lakes. Major point concentrations recognized since the earliest studies seem to be holding up, however, such as those recognized in the Midsouth, the lower Midwest, or in portions of the Atlantic Coastal Plain (c.f., Anderson 1990:170 with Figure 2 herein). The densest concentrations of points still tend to be found around quarries, along or near major rivers or former shorelines, or at major ecotones (Anderson 1990b; Miller and Smallwood 2009).

PALEOINDIAN ARTIFACT HORIZONS: DIACHRONIC AND DISTRIBUTIONAL ANALYSES

PIDBA has proven useful in documenting where, at a regional or continental scale, Paleoindian artifacts occur on the landscape, and at what incidence. This kind of information can be employed to examine aspects of Paleoindian settlement, range mobility, and demography. At least some types of Paleoindian projectile points across North America appear to occur within broad, presumably contemporaneous horizons, facilitating diachronic analyses. The earliest that is currently widely accepted is the ‘*Clovis horizon*’ which is characterized by classic Clovis points, which typically have flat to weakly indented bases and fluting only part way up the blade. These points are dated to ca. 11,050 and 10,800 ^{14}C yr BP or 13,050 to 12,900 cal yr BP (Waters and Stafford 2007). As noted they are actually quite variable in form, although distinct subregional variants like those observed in ensuing horizons have yet to be recognized. The Clovis horizon is thought to have been replaced in many parts of North America during the early part of the Younger Dryas from ca. 12,800 to 12,500 cal yr BP by a '*Full-Fluted horizon*' characterized by points with deeply indented bases and lengthy flutes, including the Redstone, Gainey, Barnes, Cumberland, and Folsom types. Acceptance of such a horizon is not universal, because some of the constituent types are poorly dated or have not been found in good stratigraphic context (e.g., Holliday and Meltzer 2010).[10] These 'Full-Fluted' forms in turn are thought to have been replaced by an *Unfluted horizon*, which in the Plains included lanceolates like Agate Basin, Goshen, Hell Gap, Midland, and Plainview types, some of which may have been contemporaneous with Folsom or even Clovis. In the Southeast this Unfluted horizon is characterized by a number of eared or waisted forms, including the Beaver Lake, Quad, and Suwannee-Simpson types, and, presumably slightly later in time, notched and beveled Dalton points. As in the Plains, some of these Unfluted horizon types are poorly dated and have only rarely been found in good stratigraphic context, and some may be coeval with earlier fluted forms. In the Northeast and the upper Midwest, interestingly, fluting continued quite late, well after it had apparently disappeared elsewhere, although later in the Paleoindian period a number of unfluted forms also appear (Ellis and Deller 1988, 1990, 1997; Bradley et al 2008).

Because the stratigraphic placement and dating of many post-Clovis Paleoindian point forms in the Americas is not well established, great care must be taken in interpreting the results of analyses based on these horizons. Except in the case of Folsom, found stratigraphically above Clovis at sites like Blackwater Draw (Boldurian and Cotter 1999), for example, the dating of Full-Fluted forms like Redstone and Cumberland as post-Clovis in age is made primarily on stylistic and technological grounds. Because the fluting on Eastern forms like Barnes, Cumberland, and Redstone extends up much of the blade, and is thus similar to the fluting observed on Folsom points, these types are assumed to belong to a roughly contemporaneous horizon. The flutes on all of these Full-Fluted types are assumed to have been struck by indirect percussion or pressue, what Goodyear (2006:210, 2010) has called 'instrument assisted' fluting. Even though the precise dating and cultural associations of these three successive Paleoindian horizons is incomplete, and some overlap between them clearly occurred, the general sequence is accepted in many areas (e.g., Anderson et al. 1996; Bradley et al. 2008, Frison 1991; Meltzer 2009:284-285).

While it is possible to produce maps for every Paleoindian artifact category coded in PIDBA, reasonably broad geographic coverage exists for only a few of them, such as the Folsom and Clovis/fluted types, which are ubiquitously reported when encountered across the continent (Figures 2 and 3). Even the Clovis category is a bit questionable, though, since in some surveys a generic 'fluted' category is employed that sometimes includes known later fluted types. Wherever possible we have attempted to remove these later types from the 'fluted' and Clovis categories currently reported in PIDBA, but this has been only unevenly accomplished or reported for parts of the country, particularly in portions of the Northeast and Midwest, where many of the fluted points reported likely post-date Clovis (Figure 2). The distributions of post-Clovis Paleoindian point forms, particularly those that aren't fluted, are likewise not very well documented outside of the Southeast at present. For types that are common in the Southeast yet occur fairly widely beyond this region (i.e., Beaver Lake, Cumberland, and Quad), the distributions produced from PIDBA can only be considered sound in those states where they have been systematically recorded (e.g., Figure 3).[11] PIDBA is clearly a work in progress, which is why we actively seek out data, and welcome contributions and constructive criticism.

The information in PIDBA indicates that a post-Clovis 'Full-Fluted' horizon apparently occurs over much of North America, encompassing Folsom points in the west and a number of distinct types in the east, including Barnes, Cumberland, Redstone, and other full fluted or deeply indented based forms (Figure 3). In Florida, while 'full-fluted' horizon points are rare, Suwannee-Simpson unfluted types are fairly common, and may be contemporaneous tool forms; while poorly dated at present, Suwannee-Simpson points have been found stratigraphically below terminal Paleoindian side notched points at several sites (Daniel and Wisenbaker 1987; Dunbar and Hemmings 2004; Dunbar 2006) (Figure 3). Interestingly, late Paleoindian Dalton points are also uncommon in Florida, although this inference is impressionistic, because these points are not systematically recorded in that or indeed in many states. As indicated on Figure 3, Suwannee-Simpson points, once thought to occur almost exclusively in Florida, are now known from Georgia and the Carolinas, where they overlap in occurrence with full-fluted forms.

Unlike the Clovis horizon, morphologically distinctive local projectile point forms are clearly present within the posited 'full fluted' horizon, such as the Folsom, Cumberland, and Barnes types. These may represent the material manifestations of differing cultures or adaptations. The distribution of Folsom points does not overlap much with either Barnes or Cumberland points, for example. The former are rare east of the Mississippi River, especially beyond the Illinois-Indiana border (Munson 1990), while Barnes types tend to occur more commonly in the Midwest and Cumberland points in the Midsouth. These spatial and stylistic distributions, if real and not an artifact of sampling bias or regional classification systems, may be related to increasing population isolation, or perhaps to subsistence differences, with adaptations to the west primarily focused on Plains resources such as bison, and adaptations in the east directed to northern and southern species like caribou and white tailed deer, respectively (e.g., Ellis and Deller 1988; Meltzer 1988).

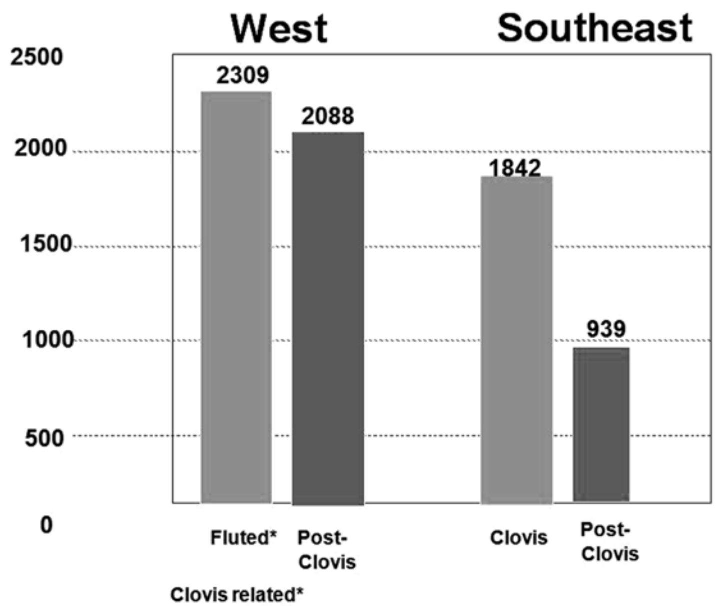

Figure 6. Incidence of fluted, presumed Clovis era points and 'full fluted' presumed immediate post-Clovis forms in the southeastern and western United States in the PIDBA dataset.

In the lower Southeast, morphological variation in Paleoindian points has been carefully evaluated, with 'fluted' and post-fluted points described using a number of well established taxa. Clovis points are found over much of the region, with a high incidence in the Tennessee and Cumberland drainages and along the Atlantic seaboard, and far fewer in the Gulf Coastal Plain. Lithic raw materials were used over areas up to several hundred kilometers in extent when Clovis points were being manufactured (Figure 4, color plate). In contrast, raw material occurrence appears to be more geographically restricted on presumably immediate post-Clovis forms (Figure 5, color plate). A contraction in group ranges may have been occurring, or perhaps in the area over which regular interaction occurred. This pattern is matched in the more geographically restricted occurrence of post-Clovis projectile point forms like the Cumberland or Suwannee-Simpson types which, unlike Clovis, are found in greatest incidence within areas no more than a few hundred kilometers in extent. It is probably not coincidental that this apparent contraction in group range occurs about the same time as the onset and early centuries of the Younger Dryas cold reversal, after ca. 12,850 cal yr BP.

A significant decline occurs in the number of post-Clovis full fluted points compared to presumably preceding Clovis points in PIDBA, at least in the southeastern United States (Figure 6). This may correspond to a decline in population, or perhaps a reorganization in settlement or technology, although such inferences must be carefully evaluated and tested. In the western United States, in contrast, evidence for a decrease in point incidence is minimal for Clovis and Folsom, although we do not yet know how long each point type was in use in the region (see also Holiday and Meltzer 2010; Labelle 2005). A steady pattern of increase in numbers of projectile points is observed in the Southeast from full-fluted to unfluted to Dalton forms (Figure 7), suggesting a population rebound may have occurred following an initial decline after Clovis (see also Goodyear 2006:102; McAvoy 1992:160-163). This increase may be far more pronounced then indicated by the data available at present, since Dalton points are only systematically recorded in a very few southern states. In a similar pattern, radiocarbon dates from southeastern Paleoindian and Early Archaic assemblages falling into the immediate post-Clovis era are uncommon. In a sample of 126 dates from the Southeast and

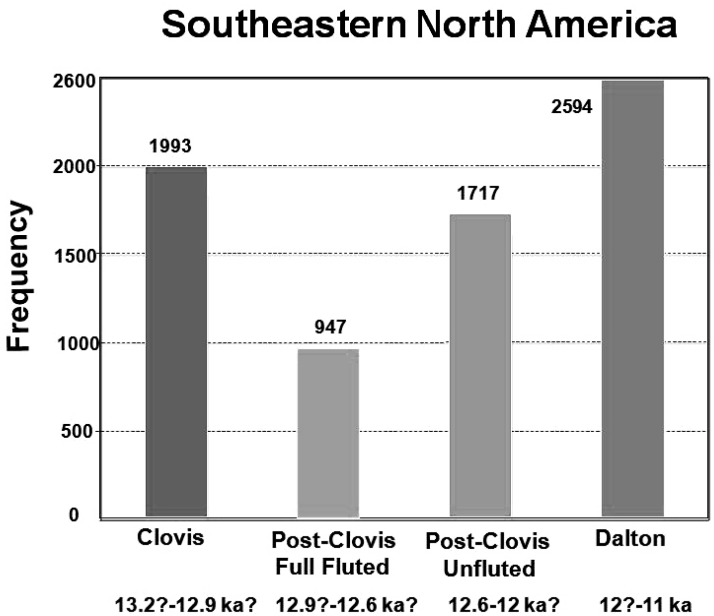

Figure 7. Possible population or settlement trends in the southeastern United States indicated by numbers of projectile points by major horizon or category in the PIDBA dataset.

adjoining areas that fall between 9,100 and 12,800 ^{14}C yr BP (Seibert 2004), only a handful fall between 10,900 and 10,570 ^{14}C yr BP or between ca. 12,850 and 12,600 cal yr BP, and all of these are at the recent end of this range, between 10,570 and 10,710 ^{14}C yr BP.

HOW TO START SYSTEMATICALLY RECORDING INFORMATION

Critical to the success of PIDBA, and to exploring early human occupations in the Americas, is having as many projects in place as possible recording information, in the form of measurements and digital photographs, as well as locational data, about the sites and assemblages of the earliest peoples. Some states, provinces, and regions in the Americas have Paleoindian period data recording projects in place, others do not. Where this is not being accomplished, we believe it should be, and offer our suggestions on how to proceed. Information about projectile points, the most common artifact documented, is typically collected using a standardized form (Figure 8), which ensures that information is consistently recorded, allowing for analyses of materials from over large areas. Templates for recording forms are also included on the PIDBA web site, where we have them for specific projects, as well as descriptions of the attributes and how to measure them. While the attributes recorded vary somewhat from project to project, there is a high degree of overlap, given general agreement among most Paleoindian researchers about what data should be collected. Additional attributes or forms for other categories of data can be added as necessary, depending on local circumstances and research emphases.

Ideally, not only fluted points like Clovis, Folsom, or Cumberland should be recorded, but also unfluted early points like Agate Basin, Angostura, Dalton, Goshen, Hell Gap, Plainview, Scottsbluff, Suwannee, Simpson, and so on. Increasingly, surveys that originally only recorded fluted or Clovis points are now documenting a range of point forms, as the value of the surveys becomes better understood, and as more people contribute data. Information on raw material type should also be recorded for each artifact, if it all possible, that ideally includes the name of the geologic formation it is derived from. Complete, broken, and reworked points should all be recorded. PIDBA also posts data about other kinds of Paleoindian artifacts, such as blades and blade cores, scrapers, performs, debitage, paleosubsistence remains, and so on. While no recording project that we are aware of systematically documents information about Paleoindian assemblage contents, we believe that is a logical next step to undertake, and are encouraging it by posting essentially any and all site assemblage information we receive from colleagues.

The kinds of specific attributes and measurements recorded for projectile points are given in Figures 8 and 9, adopted from a survey underway for about a decade now in Missouri, and recently also established in Montana (Anderson and O'Brien 1998, Anderson and Knudson 2009; Martens and Lopinot 2009). Recording projects like these are easy to get started (e.g., Carter et al. 1998) Given a little dedication and perseverance, it is surprising how quickly a great deal of information can be compiled. In several states in eastern North

Specimen #_______ Suggested Type Name________________

Paleoindian Point Data Form

Owner:___________________________ Address:____
Phone:_________________________ Email: _________________________
Public Access Constraints: ____

Recorder's Name and Address:____
Address: _________________________________Phone: _______________Email: _____________
Image Number or Identification:____
Location of Find:__________________________ Location Ownership: _______________________
Nearest Water Source:______________________ River Drainage:____________________________
Slope of Find Location:____________________ Method of Recovery:________________________
References:______________________________ USGS quad sheet: __________________________

Attributes

Measurements (English or metric)
Max. Width: ___________________________
Basal Width: ___________________________
Length of Basal Grinding: ________________
Width at end of Basal Grinding: ____________
Length (Actual): ________________________
Length (Complete): ______________________
Max. Thickness: ________________________
Depth of Basal Concavity: ________________
Obverse face–
Basal Thinning/Flute #1 L ______W _________
Basal Thinning/Flute #2 L ______W _________
Basal Thinning/Flute #3 L ______W _________
Basal Thinning/Flute #4 L ______W _________
Reverse face–
Basal Thinning/Flute #1 L ______W _________
Basal Thinning/Flute #2 L ______W _________
Basal Thinning/Flute #3 L ______W _________
Basal/Thinning/Flute #4 L ______W _________

General Attributes
Material: _______________________________
Color: _________________________________
Patination: ______________________________
Edge Shape: _____________________________
Edge Retouch: ___________________________
Basal Grinding: __________________________
Thinning/Fluting Technique: _______________
Manufacturing Notes: ____
Reworking Notes: ____
Special Attributes: ____

|___________|___________|
0 1 2 inches

SKETCH POINT ABOVE

Attached Sketches/Tracings/Digital Images/Photocopies of Point: ___________ pages

Figure 8. Paleoindian Projectile Point Recording Form (adapted from Anderson and O'Brien 1998:6; Anderson and Knudson 2009; Martens and Lopinot 2009:9).

America, including Alabama, Florida, Georgia, Pennsylvania, and Tennessee, for example, data on over a thousand Paleoindian points has been recorded, offering good examples of how to proceed (Table 1).[12]

Contributors should be encouraged to fill out the forms to the best of their ability. *The most critical information to collect are digital color photographs of the front and back of the artifact, and a side view if possible taken by mounting the artifact on a lump of clay. These photographs should always be taken with scale, ideally a metric rule delimiting cm and mm.* Equally important is determining, as best possible, the location where the artifact was found. In many cases only general locational data may be available, but even this is important to note, since a few miles is unlikely to matter much in distributional or morphological analyses with materials from over a large area.

Contributors should also not be overly concerned if some of the information on the form is left blank or if any drawings included are fairly crude. Just knowing an artifact exists is the first step, and after that getting complete information about it is typically just a matter of time. A good way to draw stone tools is to photocopy each side, and then trace the flake scars from the copy. Even an outline, with the photocopies attached, is sufficient to begin the documentation of these artifacts. Once basic descriptive and locational information about a point exists, sooner or later the artifact can be photographed to scientific standards. With digital cameras, fortunately, this task has become far simpler, and less expensive, than it was even a decade or two ago, when film was the only medium employed.

Recording the current owner's name, or the collection repository where the material is stored is extremely important, but all too often these change over time. Fortunately, good digital photographs of chipped stone tools are very much like fingerprints, making it possible to recognize artifacts reported previously, as has sometimes happened in surveys in the east that have been underway for decades. Since data are contributed voluntarily, while specific site locations and the owners of private collections should be recorded, they should not be made public, to protect both from unwanted attention.

Attribute data should be compiled to the best of a person's ability. Locations where measurements are to be taken are illustrated in Figure 9. Measurements should be taken to the nearest millimeter using calipers if at all possible. Questions about the non-metric attributes (i.e., raw material, color, presence or absence of basal grinding, etc.) should be answered to the best of a person's ability. Once basic information about these artifacts is recorded, it should be possible to go back and collect more detailed data about them in the future. Any information that can be gathered and shared is important. Once a project gets underway, ideally there will be several people recording these artifacts. Typically those running the survey will either try to visit the owner and record the artifacts, or else encourage people to bring their artifacts to meetings, county fairs, or archaeological conferences where they can be recorded, often as part of formal 'artifact identification' booths or projects. Additional details on how to record data and submit information are found on the website.

CONCLUSION

We have tried to show why the collection of primary data on the earliest occupations in the Americas is important, and some of the things that can be accomplished with such data. PIDBA relies on voluntary contributions of data and of work from interested professional and avocational archaeologists, including a good many undergraduate and graduate students. All of the participants in the project are characterized by a willingness to collect and share data, and are committed to transparency in research. The cooperation that we have obtained to date is truly impressive, and serves as a model of collegial interaction. We encourage colleagues to start compiling data in those areas where recording projects have not been initiated, to continue them where they are, and to help us grow the database by sending us primary information, references, and commentary about how we can do things better. If your data isn't in PIDBA, send it to us, and we will add it in as quickly as we can.

Paleoindian Point Recording Attribute Key

For the following fields, record the following information:

Location of Find—Locate as exactly as possible, using legal description and/or UTM designation. Surface-collected points should be located to within 1/4 mile of actual location. Archaeologically-recovered points should be located within site both horizontally and to depth below surface, with publication references, and artifact disposition.

Nearest Water Source—Name the nearest water source and distance to that source.

River Drainage—Name the larger river drainage system where the site is located

Slope of Find Location—Describe which way the slope of the find location faces

Method of Recovery—Examples include "Surface collected in plowed field, Surface collected on eroded bank, Shovel-test recovery, Archaeological excavation."

Material—Record raw material, preferably with a bedrock locality or even quarry.

Color—Give Munsell® Soil Color Chart hue, value, and chroma where possible.

Patination—Note whether the point is patinated or not. If there is evidence of post-discovery chipping, attempt to gauge thickness of patination.

Edge Shape—Note the shape of the working edges of the point (for example: straight/excurvate/ incurvate)

Edge Retouch—Describe the reworking of the point's edges. Note pressure flaking/resharpening.

Lateral and Proximal Edge Basal Grinding—Note presence/absence, describe as "heavy or light."

Basal Thinning or Fluting Techniques——Describe any special basal thinning or fluting features. For example, note if thinning or flute scars do not terminate near the end of the point, if most of the fluting scar has been removed by subsequent flaking.

Reworking Notes—Describe any evidence of the artifact's reshaping that might have affected the point's use.

Special Attributes—Describe any special attributes of interest (e.g., burn pot lidding, shaft mastic adhering, association with animal bones).

Other Notes

Figure 9. Instructions for Completing the Data Form (adapted from Anderson and O'Brien 1998:6; Anderson and Knudson 2009; Martens and Lopinot 2009:9).

END NOTES

1 Assemblages considered Paleoindian in character have been dated later than this in some areas and are included in PIDBA when information about them has been provided by local specialists.

2 This section on the potential of PIDBA in the rapidly burgeoning field of informatics was markedly improved by comments from Marcus Hamilton, to whom the authors are deeply grateful.

3 The posted radiocarbon database has over 800 determinations, all from North America, while the downloadable bibliography has ca. 3000 entries broadly concerned with the Paleoindian period from across the Americas. In addition to site reports and assemblage analyses, related references include studies of late Pleistocene and early Holocene floral and faunal resources, paleoclimate, lithic outcrops and chemical sourcing of materials, material culture and technology, chronology, geoarchaeology, mobility and landscapes, and general hunter-gatherer studies. While the focus is currently on sites and studies in Canada and the lower 48 states, we plan to eventually incorporate as many relevant references as possible from Alaska and Central and South America as well. As with all other aspects of PIDBA, we encourage contributions and will happily include any reference that can be obtained in printed form.

4 This problem is exacerbated by the tendency of some researchers to present research results in brief articles, in outlets like *Current Research in the Pleistocene* (an excellent journal, but not the place for effective documentation of any but the smallest of assemblages) rather than write more lengthy papers or the site reports, monographs, or books that are the expected product of major field or analysis projects. Fortunately, the Paleoindian archaeological record and total body of literature is small compared to what is potentially available for most later periods, making the goals we have set for PIDBA, we believe, both achievable and manageable. The lessons learned in creating and maintaining PIDBA, we also believe, should prove invaluable in efforts to establish more massive data compilation efforts (e.g., Kintigh 2006).

5 Some researchers are reluctant to part with data until they have completed publishing on it, or provide only summary measures in their reports (i.e., means, standard deviations), rather than attributes for individual artifacts. For a long term project like PIDBA, with intellectual heirs designated in descendant generations (i.e., the younger authors of this paper), we try to be as patient as possible in obtaining primary data. If a decade or more goes by without primary information forthcoming in spite of repeated requests, however, we typically ask the individual in question, with all due respect, if he or she has made provisions in their will to ensure that their collections or analysis records will be curated upon their death. Given the increasingly widespread acceptance of an ethos of responsible data management in Paleoindian research, and indeed in archaeological research in general, the need for such tactics should lessen.

6 At present analyses employing large site or artifact samples are still infrequent in Paleoindian archaeology, and when they occur the data are used primarily for mapping purposes, as herein. While a number of innovative analyses of morphological variability in Paleoindian assemblages have occurred in recent years, these are typically conducted with small and arguably nonrepresentative assemblages. Thus, Morrow and Morrow's (1999) analysis of fluted point morphology across the Americas, documenting some patterns that we believe will stand the test of time, and employing innovative recording and measurement procedures, made use of a sample of 449 points from North America, and 92 points from all of Latin America. Areas where hundreds if not thousands of points exist were minimally sampled in this study, or not sampled at all, including most of the southeastern United States and Texas. An even smaller sample, 232 points, characterizes Buchanan and Hamilton's (2009) recent analysis of fluted point variability across North America. Their sample included only six points from the entire southeastern United States, all from Virginia, and included no artifacts from the lower Midwest, including the states of Illinois, Indiana, Ohio, and Kentucky. Over 5,000 fluted points are reported from these areas in PIDBA (Table 1). While all of these studies reached seemingly important conclusions about the nature of morphological variability in fluted point assemblages, analyses using larger and more representative samples should prove even more rewarding, and in any event will be needed for verification purposes.

7 David Meltzer graciously provided the primary datasheets for many of these artifacts upon request in January 1992, and this information is available on PIDBA.

8 Many more projectile point identification guides, or 'point books' as they are sometimes called, exist than are cited here. They have been produced in many states and regions, by both professional and avocational archaeologists, sometimes in combination. While these documents vary appreciably in technical detail, quality of illustrations, and overall utility, they are perhaps the most widely read and used archaeological products of our profession, at least among the general public.

9 One thing is clear in the examination of large samples of artifacts from across North America, and that is that there is a lot of variation in what is called 'Clovis' (or indeed most point types), which is why the typological data in PIDBA should be considered somewhat suspect. It is, however, the best we have, and relies on the abilities of local authorities, typically those recording Paleoindian artifacts in their respective states and provinces.

10 The concept of a 'full-fluted horizon' following Clovis derives in part from observations on the way Redstone points were produced by Goodyear (2006), and the recognition that well dated post-Clovis Folsom points appear to have been made using a similar instrument assisted flaking technique (see also Beck and Jones 2007:40, 2010:95-98). A few scholars have suggested that some 'full-fluted' forms, such as Redstone or Cumberland, may actually be contemporaneous with or predate Clovis (e.g., Gramly 2004; O'Brien et al. 2001), although this is a distinctly minority viewpoint. Another criticism is that some of the constituent point forms making up the horizon are not well dated, particularly in the southeast (Holliday and Meltzer 2010). Finally, in some parts of the country, notably in the Great Basin, Intermountain West, and the Pacific Northwest, post-Clovis full-fluted forms are rare or non-existent, and other stemmed on unfluted point forms appear to have been present (Beck and Jones 20100; Graf and Schmitt 2007; Madson 2007:13-14).

11 All fluted points, including forms such as Clovis, Folsom, Cumberland, and Redstone have been systematically recorded in Paleoindian projectile point surveys, at least in the Southeast, for many years now. How they have been typed is another matter, although PIDBA team members have worked with local artifact recording project directors to standardize classification within the region. A classic example concerns the Redstone category, which were described as 'fluted' or 'Clovis' points until quite recently in all but a few states like Alabama and adjoining areas, where the type was originally defined. Thanks to research and reclassification efforts by Goodyear (2006), we now we know that the Redstone type occurs more widely, in the Midsouth and along the Atlantic slope from northern Florida to Virginia. Likewise, Cumberland-like points found in the Midwest are sometimes classified using a generic 'fluted' category, or are described using other type names, such as Barnes or Northumberland (e.g., Fogelman and Lantz 2006; Gramly 2006). Complicating matters even further, non-fluted presumed post-Clovis point types, such as Beaver-Lake, Dalton, Quad, and various other unfluted lanceolate forms, are not systematically recorded in most Paleoindian artifact recording projects outside of the Southeast. Indeed, even within the Southeast, only in the states of Georgia, Mississippi, and Tennessee has there been a systematic attempt to document later Paleoindian Dalton forms, and only in Mississippi have all presumed post-Dalton early side and corner notched points been recorded. Much data remains to be recorded and entered into PIDBA!

12 We also maintain scanned copies of the thousands of compiled artifact recording forms (many of which are now being compiled and submitted in digital format). Because these forms contain sensitive location and ownership data they are not posted even though we have the capability of doing so.

ACKNOWLEDGMENTS

The color maps used in this article were created using a GIS interface with topographic relief data in the public domain from the National Atlas of the United States, March 5, 2003, http://nationalatlas.gov/. The specific map data layer employed is the Color North America Shaded Relief - 1 Kilometer Resolution. This map is available at http://nationalatlas.gov/mld/shdrlfi.html.

The development of PIDBA has been a cooperative effort between many people, and we thank all those who have participated to date. They include Daniel S. Amick, Derek T. Anderson, Tony Baker, Tyler Bastian, Richard A. Boisvert, Jonathan E. Bowen, James W. Bradley, Mark J. Brooks, David S. Brose, John B. Broster, Dillan Carr; Tommy Charles, Mark Cole, I. Randolph Daniel, Leslie B. Davis, R. P. Stephen Davis, B. D. Dillon, James S. Dunbar, Chris

Ellis, Jon Erlandson, Meten Eren, Michael K. Faught, James P. Fenton, Gary Fogelman, Eugene Futato, William M. Gardner, J. Christopher Gillam, Jason Gillespie, Arleen Garcia-Herbst, Albert C. Goodyear III, R. Michael Gramly, Robert S. Grumet, Lisa Haney, Gary Haynes, Daniel K. Higginbottom, Jack L. Hofman, John D. Holland, Steve Holen, Mary Hopkins, Wm Jack Hranicky, Charles Hubbert, Bruce B. Huckell, Jack Ives, Erik Johanson, Michael F. Johnson, Scott Jones, Richard Kilborn, Howard King, Van King, Cynthia Klink, Ruthann Knudson, Brad Koldehoff, Jose Luis Lanata, R. Jerald Ledbetter, Bradley T. Lepper, Phil LeTourneau, Tom Loebel, Neal Lopinot, Martin Magne, Eliza Martin, Sam McGahey, Katherine McMillan, David J. Meltzer, Juliet E. Morrow, Toby Morrow, Dan F. Morse, Patrick Munson, Mark Norton, Jason M. O'Donoughue, Lisa D. O'Steen, Rodney Peck, Mary M. Prasciunas, Olaf Prufer, Philip "Duke" Rivet, Ashley Smallwood, Arthur E. Spiess, Eugene Stewart, Fern Swenson, Kenneth B. Tankersley, Amanda Taylor, David Thulman, Gene L. Titmus, William Topping, Sam Wills, Andy White, Robert G. Whitlam, Ellis Whitt, James C. Woods, Henry T. Wright, and Bryan Wygal. We apologize for anyone we have missed. Finally, we thank Ruthann Knudson, Neal Lopinot, Richard Martens, and Michael O'Brien for permission to use a slightly revised version of the Missouri and Montana recording forms and attribute keys herein. Finally, Marcus Hamilton, David J. Meltzer, and two anonymous reviewers provided comments that greatly improved the overall manuscript. We welcome and encourage data contributions, as well as references to published information and links to relevant web sites. We are particularly looking for colleagues in Latin America to help compile data from that region.

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ARCHAEOLOGY OF EASTERN NORTH AMERICA

The preceding article was subjected to formal peer review prior to publication.

ARCHAEOLOGY OF EASTERN NORTH AMERICA
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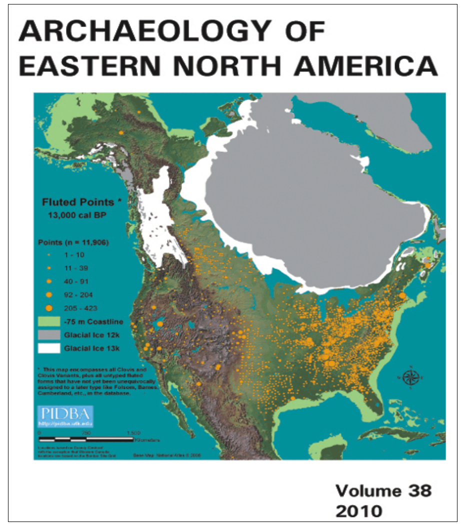

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