PIDBA (Paleoindian Database of the Americas)
Site and Artifact Distributions in Late Pleistocene North America

David G. Anderson-1, Stephen J. Yerka-1, Thaddeus G. Bissett-1, David Echeverry-1,
D. Shane Miller-2, Douglas A. Sain-1, Ashley M. Smallwood-3, and David K. Thulman-4

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**To explore the site, simply Google 'PIDBA'
… we have made a lot of changes recently!**

Abstract:
The Paleoindian Database of the Americas (PIDBA), available on-line at http://pidba.org compiles information from multiple sources to assist archaeologists in their research. PIDBA contains locational data, attribute, and image data on over 30,000 projectile points, blades, blade cores, and other artifact categories, together with distribution maps, radiocarbon dates, links to other online sources, and bibliographic references. Zooarchaeological and bioarchaeological categories are currently under development. PIDBA highlights an important and positive aspect of Paleoindian archaeology, namely the sharing of primary data. and presented to users of PIDBA.org. PIDBA contains attribute data of Paleoindian points, maps of geographic distribution, radiocarbon dates, and images of artifacts. This presentation unveils the new design and features of PIDBA, to illustrate the information that is accessible at the site, and how the website is becoming more accessible to researchers.

PIDBA: An Introduction

The compilation and dissemination of primary data from multiple sources and across large areas in electronic form is one of the major challenges facing the archaeological profession in the twenty-first century. The Paleoindian Database of the Americas (PIDBA) at http://pidba.utk.edu is one such database (Figure 1), another is the Digital Index of North American Archaeology at http://ux.opencontext.org/blog/archaeology-site-data/ dedicated to linking site file data over large areas for research and resource management purposes (Figure 2). To learn more about these projects, simply Google 'PIDBA' or 'DINAA'.

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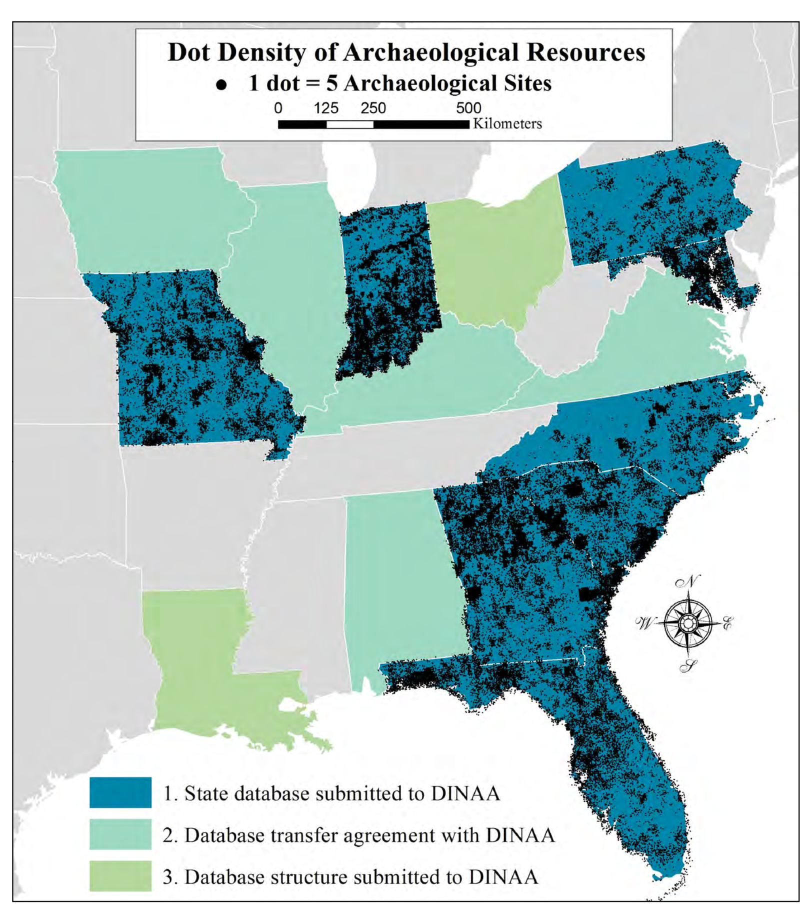

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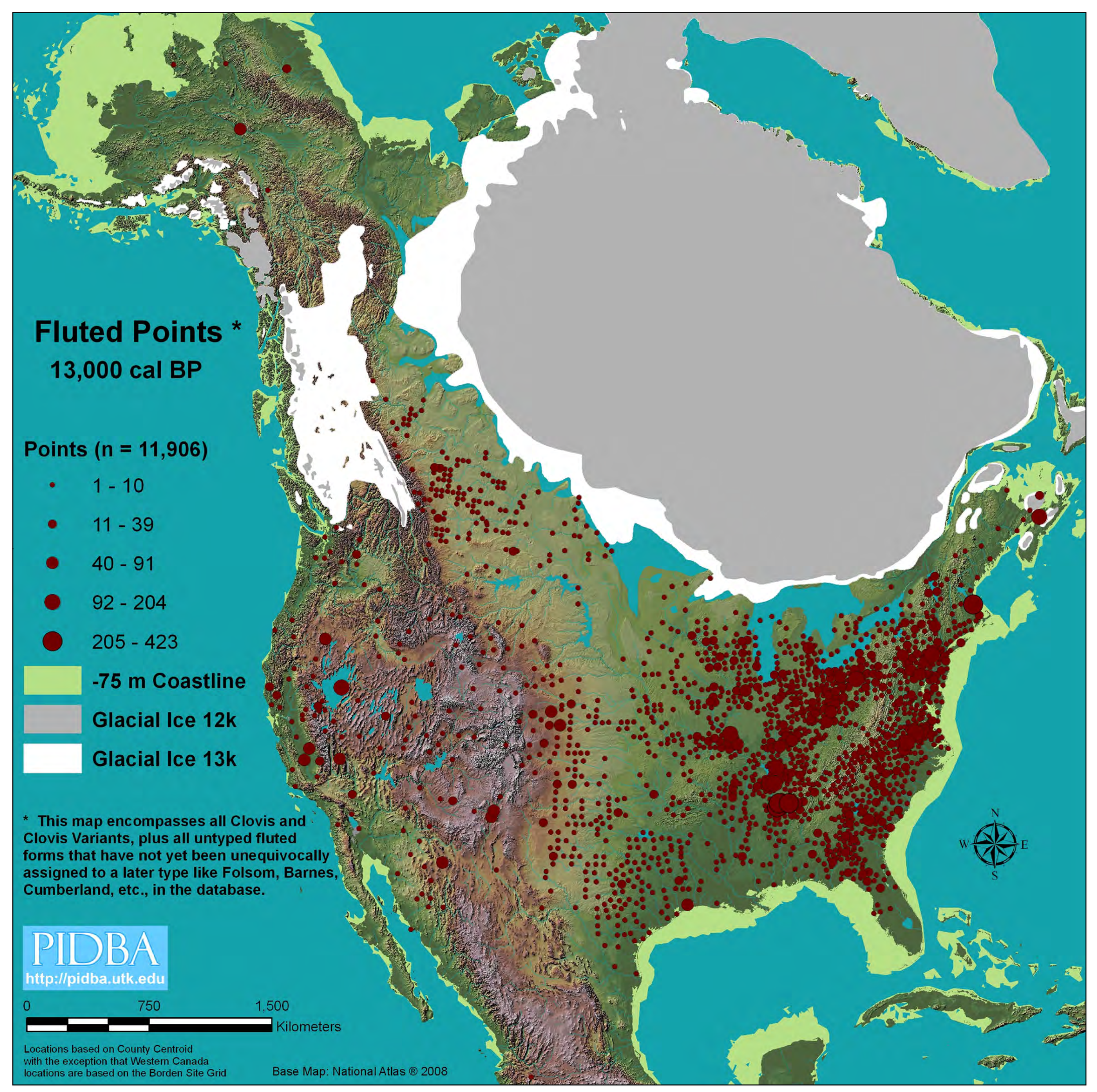
Mapping Clovis and Untyped Fluted Points

When Clovis and untyped 'fluted forms' are plotted, point concentrations and low density areas are evident (Figure 3). A light scattering of fluted points is evident just about everywhere south of the ice sheets, with denser concentrations restricted to areas around quarries, along or near major rivers, and at major ecotones, particularly in Eastern North America. Some areas were clearly favored, while others were apparently avoided



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Data exists for only a few post-Clovis types, such as Folsom, Suwannee-Simpson, and Cumberland (Figure 4). Cumberland points, most common in the Midsouth, when combined with Redstone, Barnes, and other full fluted or deeply indented based forms, appear to comprise a post-Clovis horizon over much of Eastern North America, comparable to Folsom in the west. Gaps in coverage remain to be filled in and the dating of these forms needs to be confirmed.

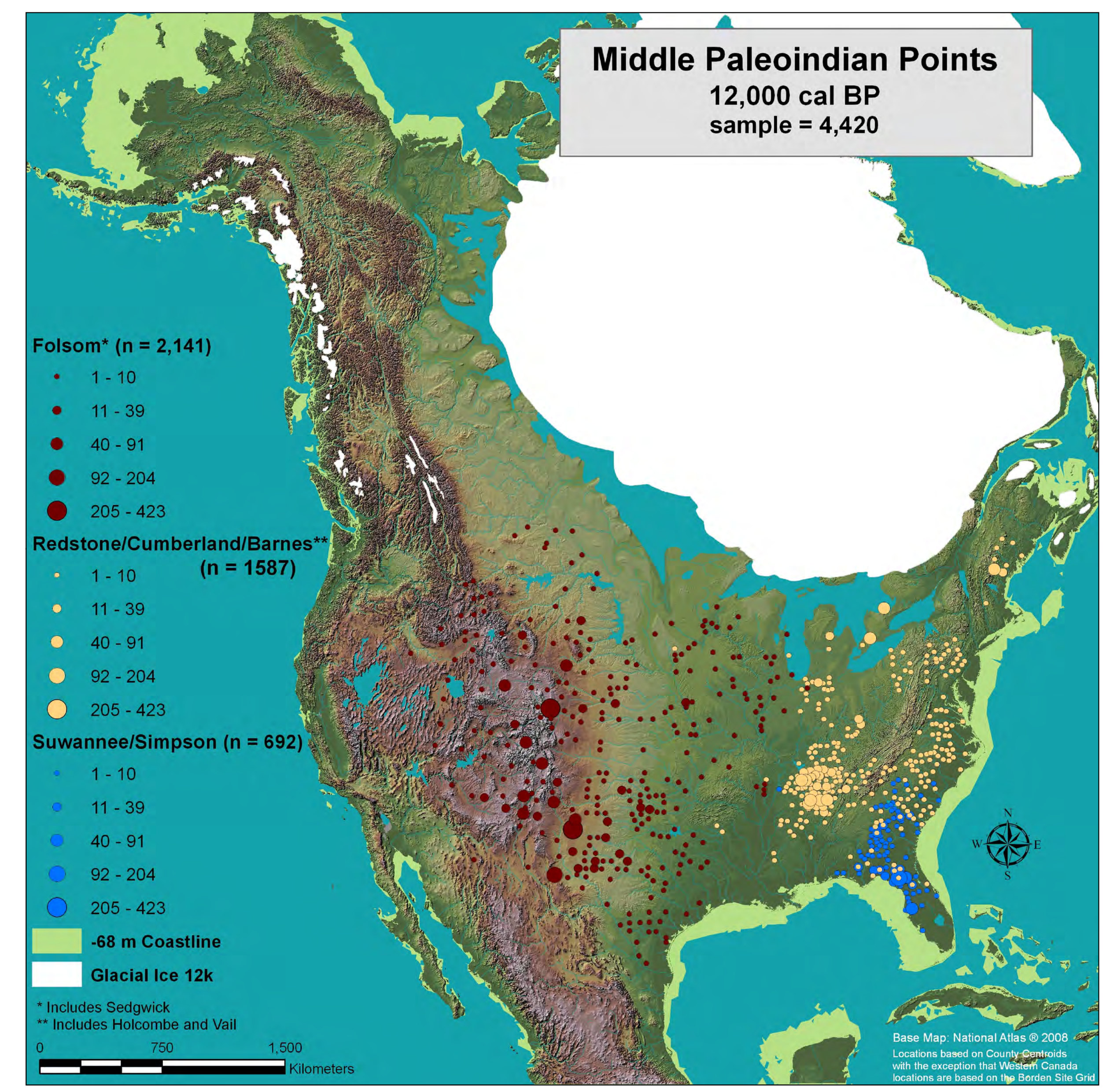
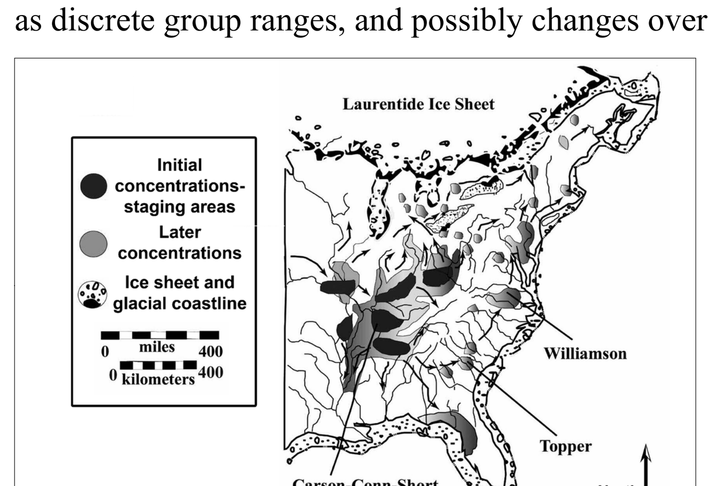


Figure 4 Presumed Post-Clovis, initial Middle Paleoindian Projectile Point Types: Folsom, Redstone/Cumberland/Barnes/Holcombe/Vail, and Suwannee/Simpson forms. The distribution of Folsom and the Eastern forms show remarkably little overlap.

Using PIDBA Data to Develop Paleoindian Settlement Models

PIDBA has been used to develop and test settlement models, such as the 'staging area' model developed by Anderson and tested and refined by Miller and Smallwood (Anderson 1990a, 1990b; Miller 2011, Smallwood 2012). Thulman (2006, 2009) identified distinctive clusters of Clovis and immediate post-Clovis points in different portions of north-central Florida interpreted as discrete group ranges, and possibly changes over time. All of the data used in these studies has been posted on or came from PIDBA.



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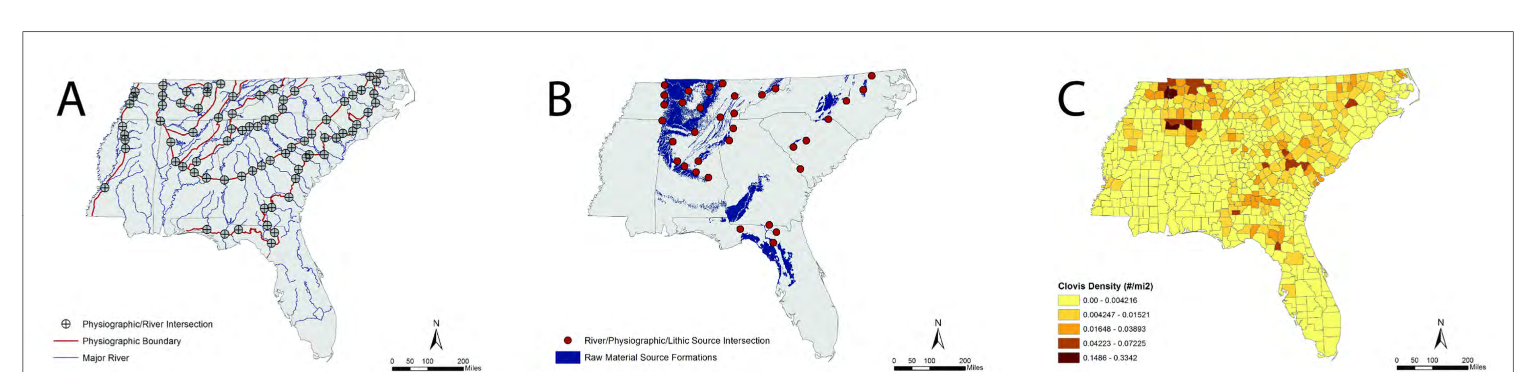

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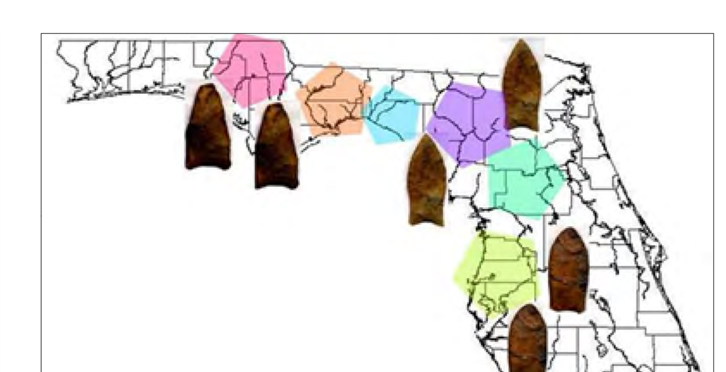

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Exploring Colonization Routes: The Baja California/Colorado River Model

PIDBA data has also been used to explore possibly colonization routes into the Americas (Anderson and Gillam 2000; Anderson 2013). The Colorado River and Sonora may have been routes into the interior, based in part on the large numbers of fluted points in Sonora (Sanchez 2010). Eastern North America, with its remarkable fluted point tradition, may have thus been initially settled from the southwest or south.

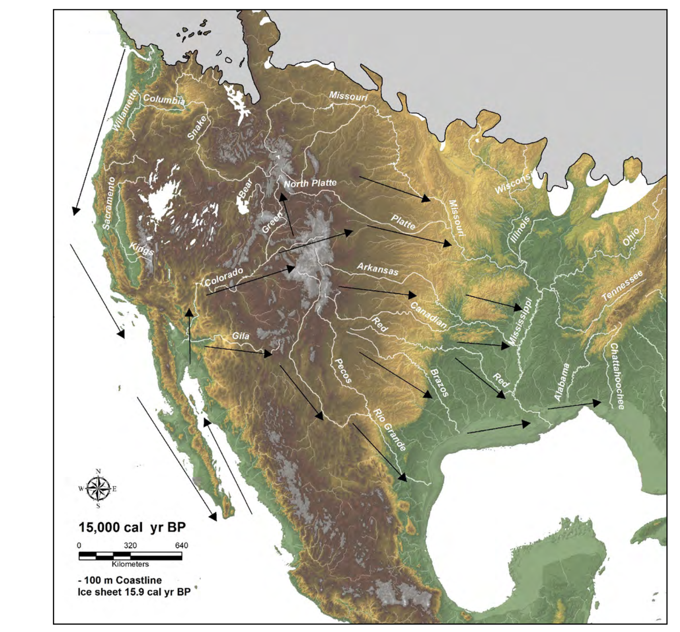

Figure 8. The Baja/Colorado River Settlement Model: Possible movement pathways into the interior of North America from the Colorado River and its tributaries (Anderson 2013).

Exploring Colonization Routes: The Role of Sea-Level Change

Sea level change in the Late Pleistocene would have profoundly impacted human settlement and colonization routes. The amount of land exposed or submerged over time on the continental shelf in the vicinity of the southeastern United States was calculated from ca. 20,000 to 10,000 years ago based on sea level reconstructions (Balsillie and Donoghue 2004a:Appendix II; 2009) (Table 1, Figures 10 and 11). There were periods when the seaward margin of the Coastal Plain was fairly stable, and other times when it was changing rapidly. Rapid sea level rise is indicated coincident with Meltwater Pulse 1A (MWP-1A), and during the Younger Dryas and initial Holocene, when Meltwater Pulse 1B (MWP-1B) occurred.

While the average annual rise in sea-level was greatest during the MWP-IA interval, the area submerged or exposed on the Coastal Plain, both overall and per year, was much greater during portions of the Younger Dryas and afterwards. The Younger Dryas/initial Holocene in the vicinity of the southeastern United States was characterized by the most pronounced changes in the amount of area of the Coastal Plain submerged or exposed than any time during the Late Pleistocene, greatly exceeding the changes that took place during MWP-1A.

The analysis shows that the amount of sea level rise or fall cannot accurately predict the amount of land submerged or exposed. For much of the period during and prior to Clovis, the coastal margin would have been an unpredict¬able environment. The Younger Dryas and immediately afterward may have been a very difficult time for people living near the coast in the southeastern Coastal Plain. Changes in settlement reported early in the Younger Dryas, notably apparent declines in numbers of diagnostic projectile points across the region as well as possible decreases in group annual ranges, may be related to these changes in sea-level. These apparent changes in population and settlement are most pronounced in the coastal areas of the southeast, furthermore, and less pronounced in the interior, in the Midsouth (Miller and Gingerich 2013a, b).

Cal Yr BP	Sea Level (m AMSL)*	Total area (km²) exposed (0 mAMSL baseline)	Interval (years)	Δ sea level during interval (m)	Avg. sea level rise per year (cm)	Total area lost (-) / gained (+) during interval (km²)	Avg area lost per year (km²)	Percent of entire Coastal Plain lost (-) / gained (+) during interval**
20,218	-121.0	536,192	-	-	-	-	-	-
19,139	-112.6	528,111	1079	8.4	0.78	-8081	-7.49	-0.48%
18,053	-112.8	528,111	1086	-0.1	-0.01	0	0.00	0.00%
16,692	-101.1	519,636	1361	11.7	0.86	-8475	-6.23	-0.50%
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14,308	-92.9	511,582	866	5.5	0.64	-5380	-6.21	-0.32%
14,044	-80.0	496,470	264	12.9	4.89	-15112	-57.24	-0.89%
13,928	-73.0	485,150	116	7.0	6.03	-11320	-97.59	-0.67%
13,499	-71.9	483,075	429	1.1	0.26	-2075	-4.84	-0.12%
13,276	-69.1	478,813	223	2.8	1.26	-4262	-19.11	-0.25%
13,013	-65.0	468,963	263	4.1	1.56	-9850	-37.45	-0.58%
12,933	-67.6	474,218	80	-2.6	-3.25	5255	65.69	0.31%
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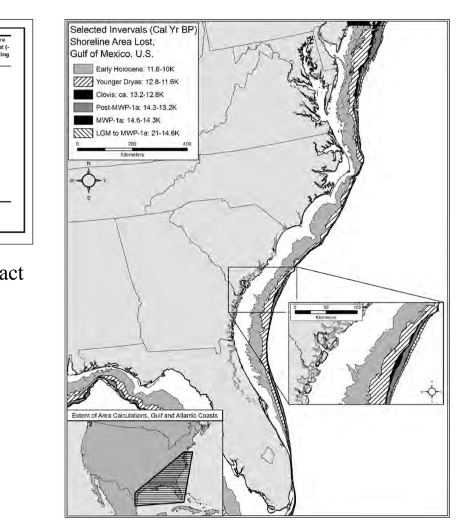

Figure 10. Study area boundaries and shorelines at selected intervals along the Atlantic Coast, 20-10k cal yr BP based on sea level data from Balsillie and Donoghue 2004: Appendix II, as presented in Table 1.

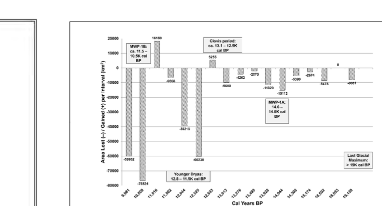

Figure 11. Area of the Coastal Plain lost or gained in the study area in square kilometers during specified intervals from ca. 20–10 cal yr BP (based on the data in Table 1, derived from sea level values in Balsillie and Donoghue 2004:Appendix II).

Evidence for Range Extent and Possible Contraction Over Time

Lithic raw materials were used over areas up to several hundred kilometers in extent when Clovis points were being manufactured (Figure 12). In contrast, raw material occurrence appears to be more geographically restricted on presumably immediate post-Clovis (Figure 13). A contraction in group ranges may have been occurring. A similar pattern is indicated by the more geographically restricted occurrence of post-Clovis projectile point forms like the Cumberland or Suwannee-Simpson types compared to Clovis.

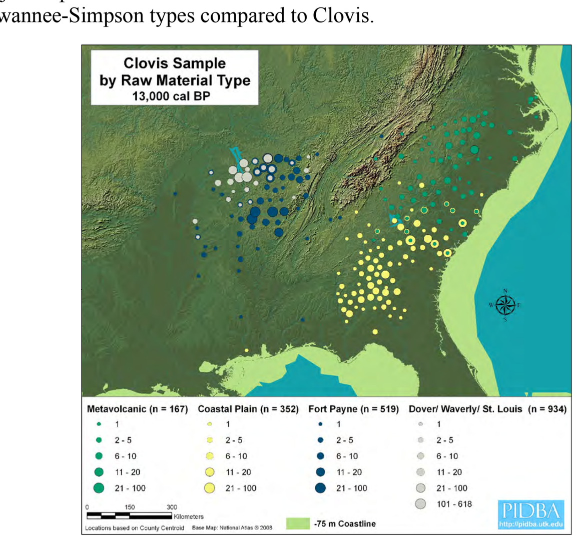

Figure 12. Clovis point incidence on four major lithic raw material categories in the lower Southeast. Most materials are found over areas several hundred kilometers in extent.

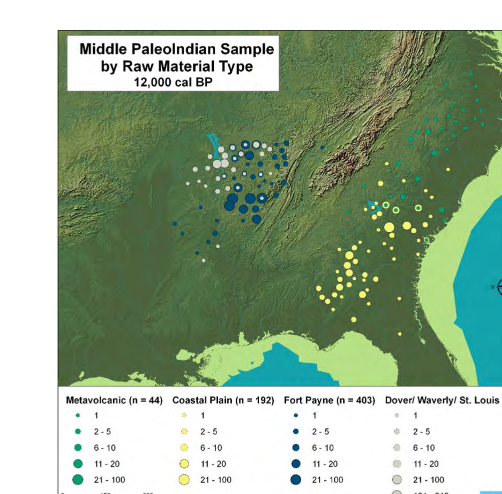

Figure 13. Cumberland, Redstone, and related 'full-fluted' point incidence on four major lithic raw material categories in the lower Southeast. Most materials occur over smaller areas than during preceding Clovis times.

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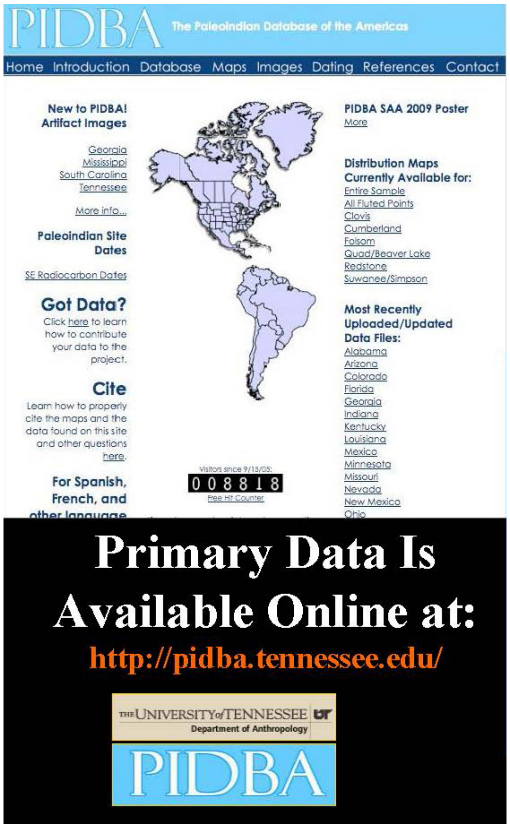

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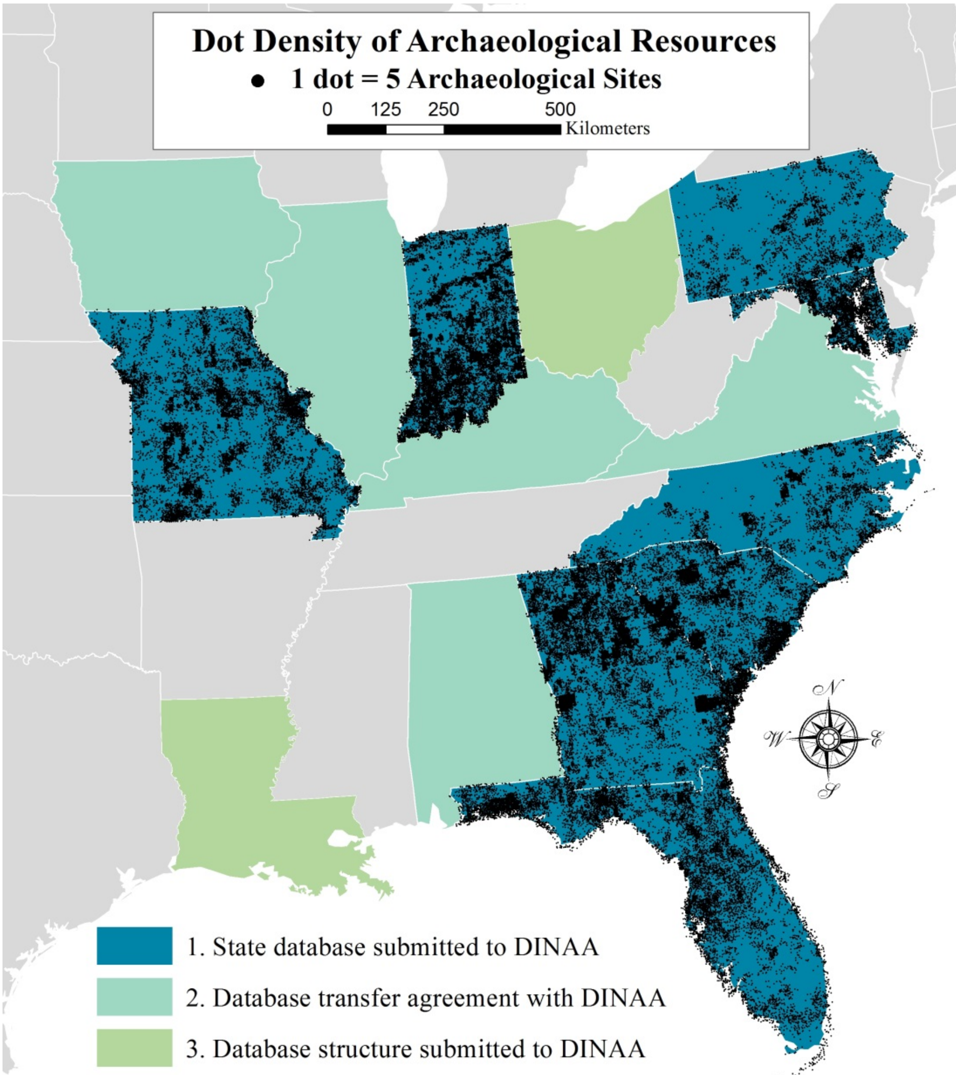

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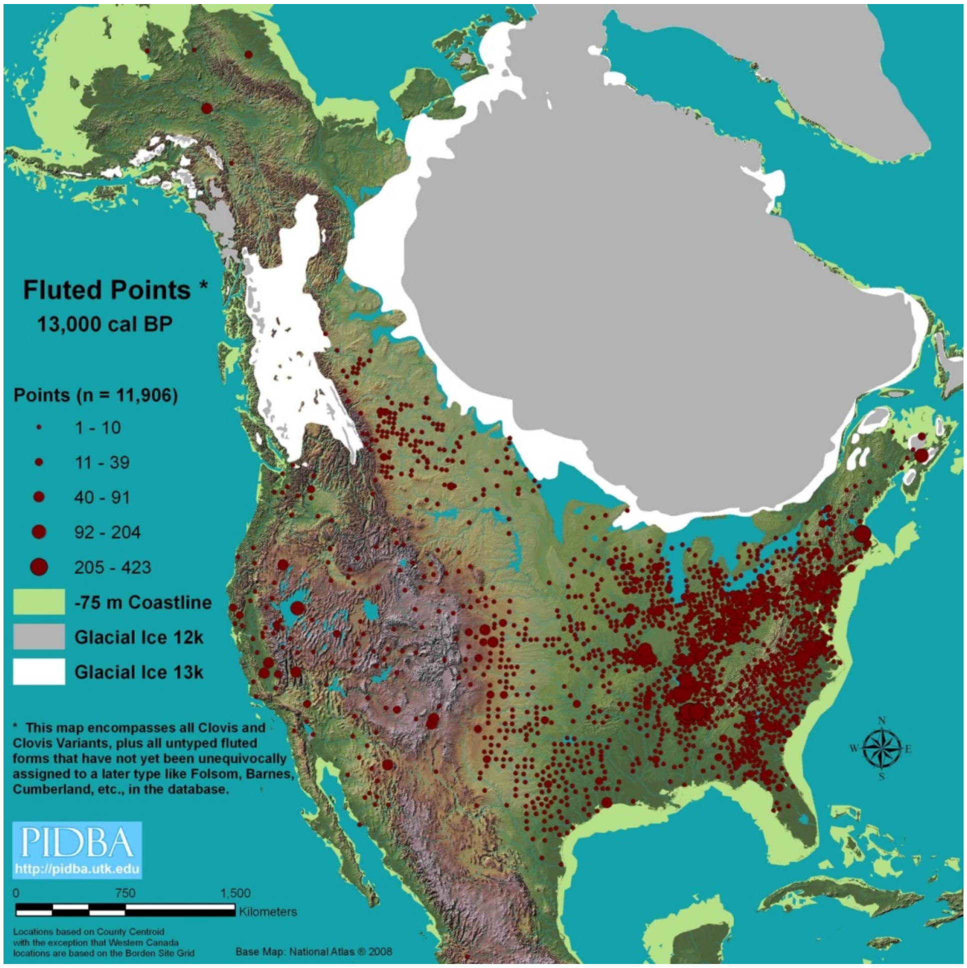

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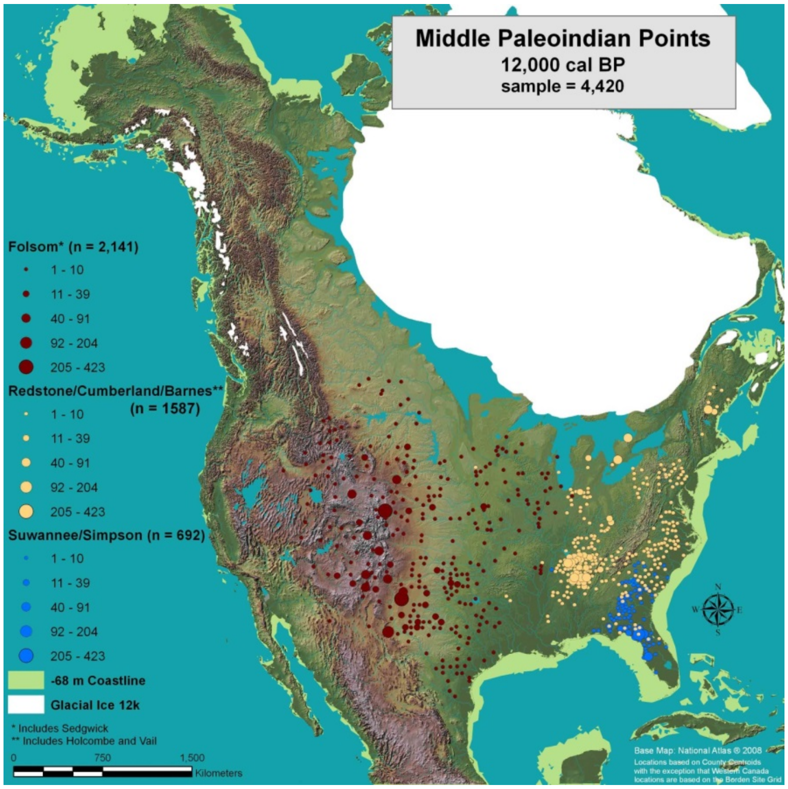
Reasonably complete samples only exist for a few post-Clovis types, such as Folsom, Suwannee-Simpson, and Cumberland (Figure 4). Cumberland points, most common in the Midsouth, when combined with Redstone, Barnes, and other full fluted or deeply indented based forms, appear to comprise a post-Clovis horizon over much of Eastern North America, although major gaps in coverage remain to be filled in, and the dating of these forms needs to be confirmed.



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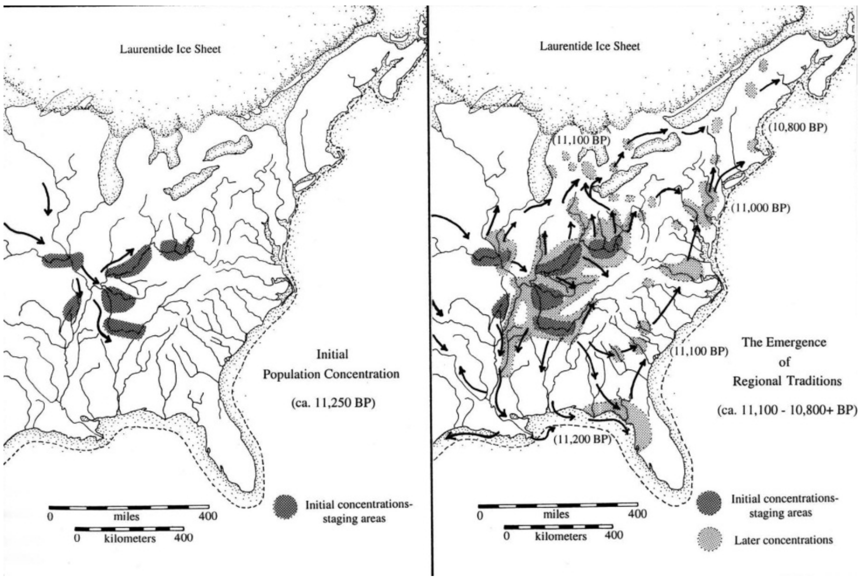

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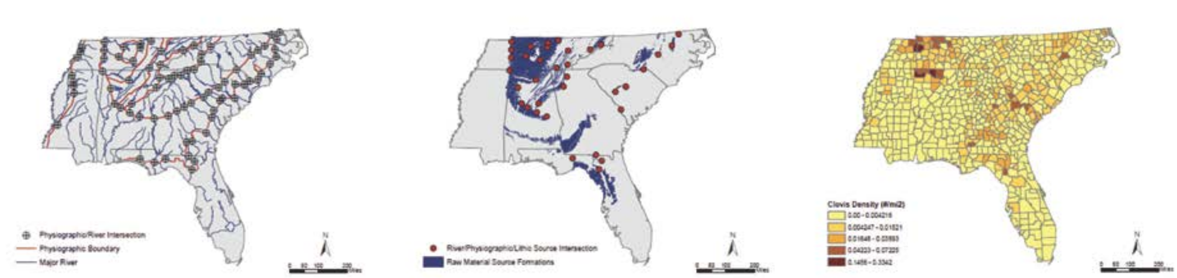

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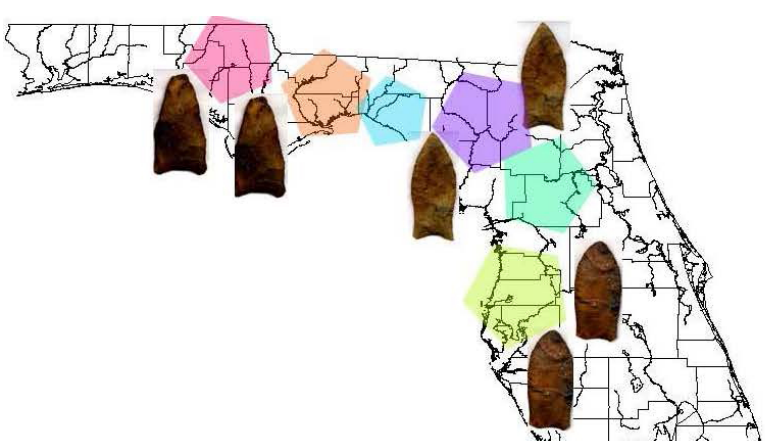

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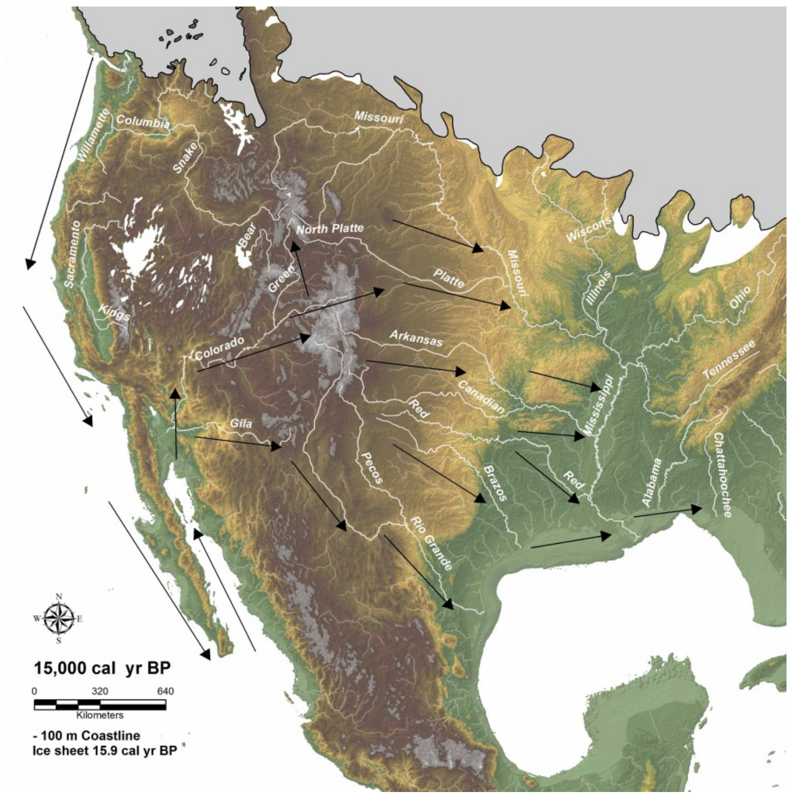

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Exploring Colonization Routes: The Role of Sea-Level Change

What was the impact of sea level change in the Late Pleistocene on human settlement? Several of us explored this question, in a paper published in the conference volume (Anderson et al. 2013).

The amount of land exposed or submerged over time on the continental shelf in the vicinity of the southeastern United States was calculated from ca. 20,000 to 10,000 years ago based on sea level reconstructions (Balsillie and Donoghue 2004a:Appendix II, 2009) (Table 1, Figures 10 and 11). First, there were periods when the seaward margin of the Coastal Plain was fairly stable, and other times when it was changing rapidly. As expected, rapid sea level rise is indicated from ca. 14,308 to 13,928 cal yr BP, roughly coincident with Meltwater Pulse 1A (MWP-1A), and afterwards, during the Younger Dryas and initial Holocene, from ca. 12,933 to 9,981 cal yr BP, during which Meltwater Pulse 1B (MWP-1B) occurred. The data show that while the average annual rise in sea-level was greatest during the MWP-IA interval, the area submerged or exposed on the Coastal Plain, both overall and per year, was much greater during portions of the Younger Dryas and afterwards. The Younger Dryas/initial Holocene in the vicinity of the southeastern United States, in fact, these data demonstrate, was characterized by the most pronounced changes in the amount of area of the Coastal Plain submerged or exposed than any time during the Late Pleistocene, greatly exceeding the changes that took place during MWP-1A. The analysis shows that the amount of sea level rise or fall cannot accurately predict the amount of land submerged or exposed. The Younger Dryas and immediately afterward may have been a very difficult time for people living near the coast in the southeastern Coastal Plain. Changes in settlement reported early in the Younger Dryas—notably apparent declines in numbers of diagnostic projectile points across the region as well as possible decreases in group annual ranges, may be related to these changes in sea-level.

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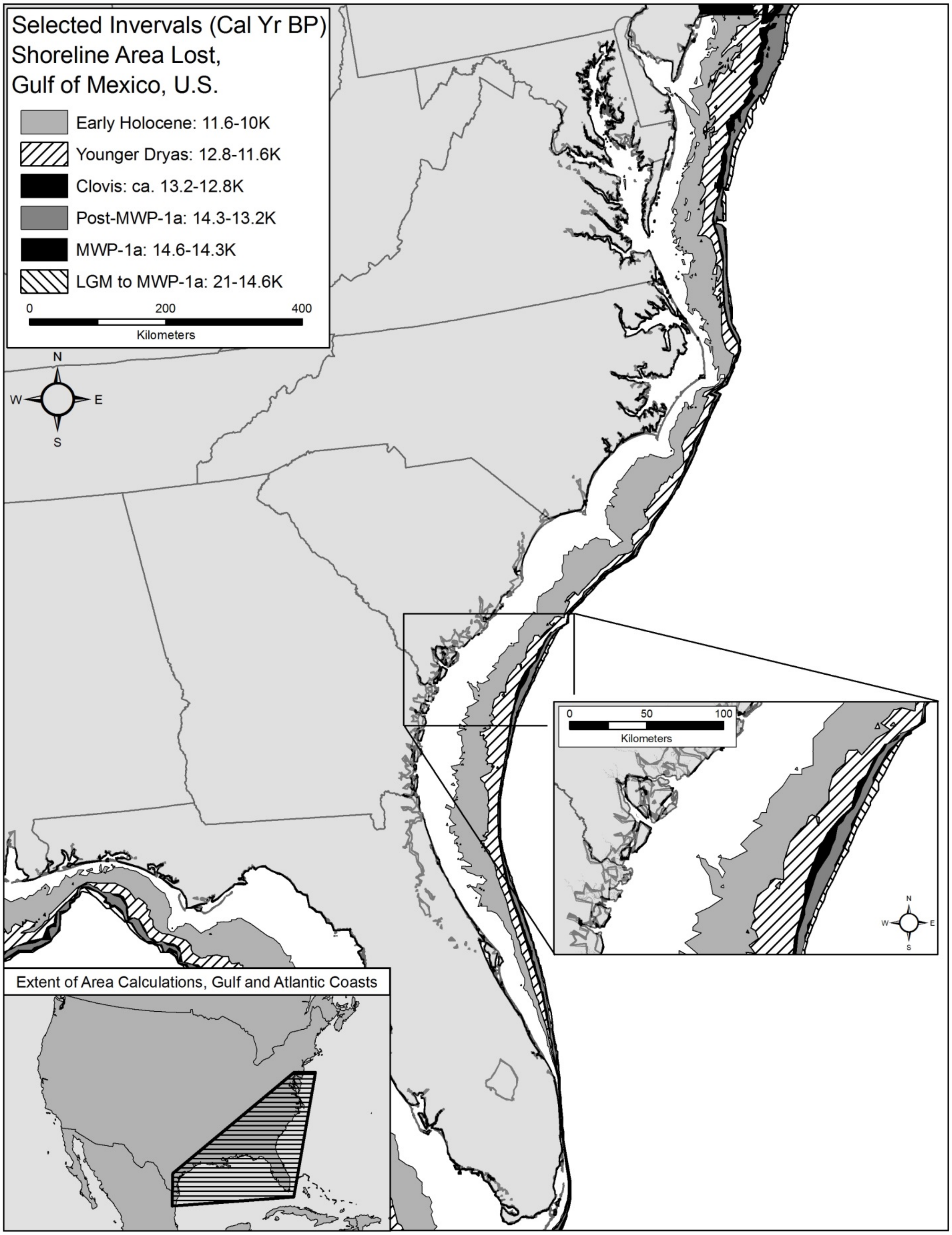


Selected Invervals (Cal Yr BP)
Shoreline Area Lost,
Gulf of Mexico, U.S.
Early Holocene: 11.6-10K
Younger Dryas: 12.8-11.6K
Clovis: ca. 13.2-12.8K
Post-MWP-1a: 14.3-13.2K
MWP-1a: 14.6-14.3K
LGM to MWP-1a: 21-14.6K
0
200
400
Kilometers
N
W
E
S
0
50
100
Kilometers
Extent of Area Calculations, Gulf and Atlantic Coasts

Figure 10. Study area boundaries and shorelines at selected intervals along the Atlantic Coast, 20-10k cal yr BP based on sea level data from Balsillie and Donoghue 2004: Appendix II, as presented in Table 1.

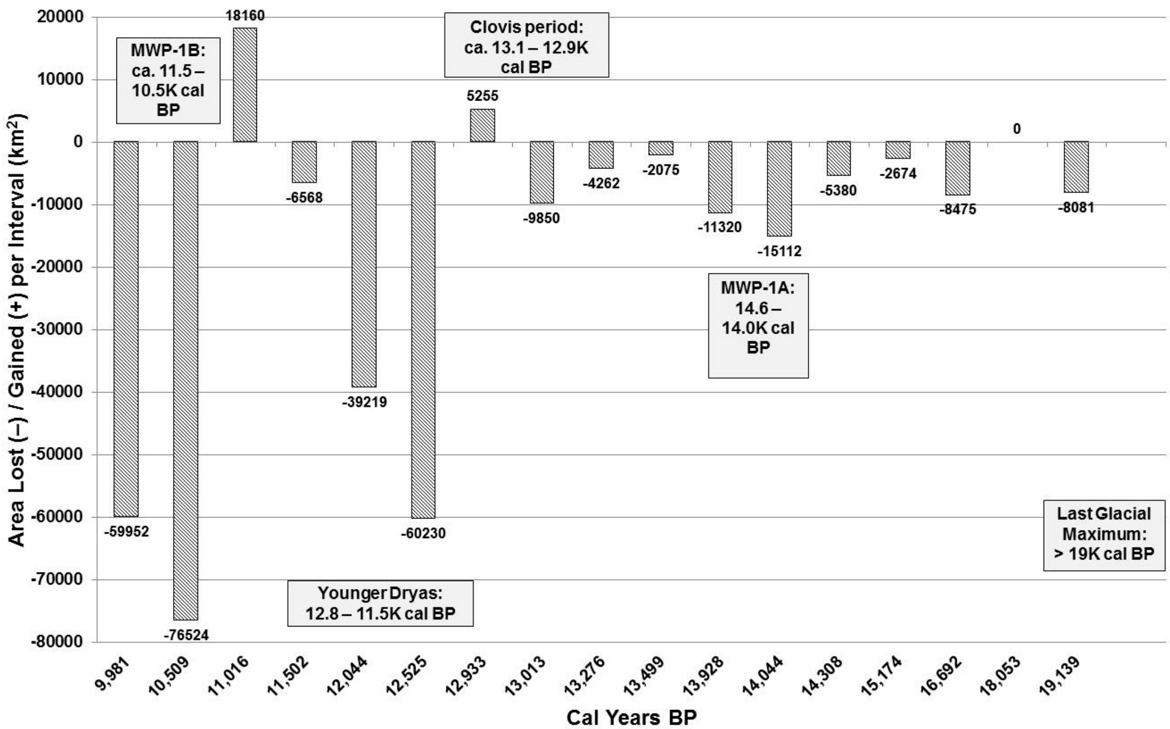


Figure 11. Area of the Coastal Plain lost or gained in the study area in square kilometers during specified intervals from ca. 20–10 cal yr BP (based on the data in Table 1, derived from sea level values in Balsillie and Donoghue 2004:Appendix II).

Enhancing Accessibility: PIDBA Images

For several years images of Paleoindian artifacts have been available on PIDBA. For most datasets all the artifact images are displayed at once (Figures 12, 13). Clicking on individual artifacts gives access to a high resolution picture.

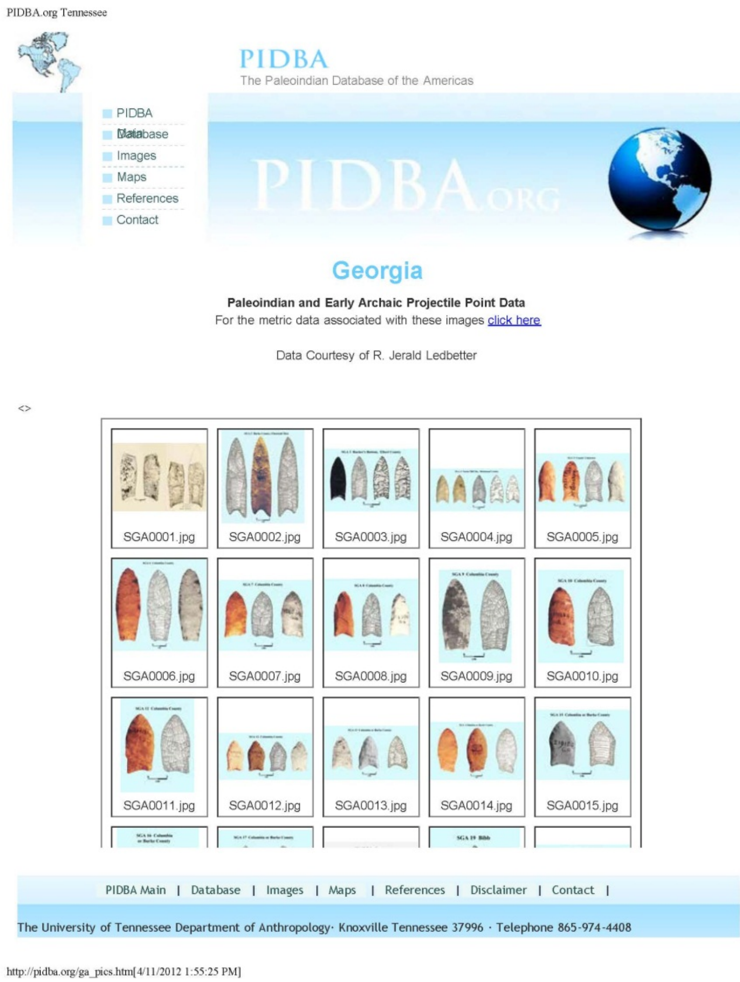


Figure 12. Georgia Artifacts in PIDBA, Viewed All at Once (Images and data courtesy R. Jerald Ledbetter).

Figure 13. Florida Artifacts in PIDBA, Viewed All at Once (Images and data courtesy David Thulman)

Evidence for Range Extent and Possible Contraction Over Time

Lithic raw materials were used over areas up to several hundred kilometers in extent when Clovis points were being manufactured (Figure 14). In contrast, raw material occurrence appears to be more geographically restricted on presumably immediate post-Clovis (Figure 15). 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 much 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.

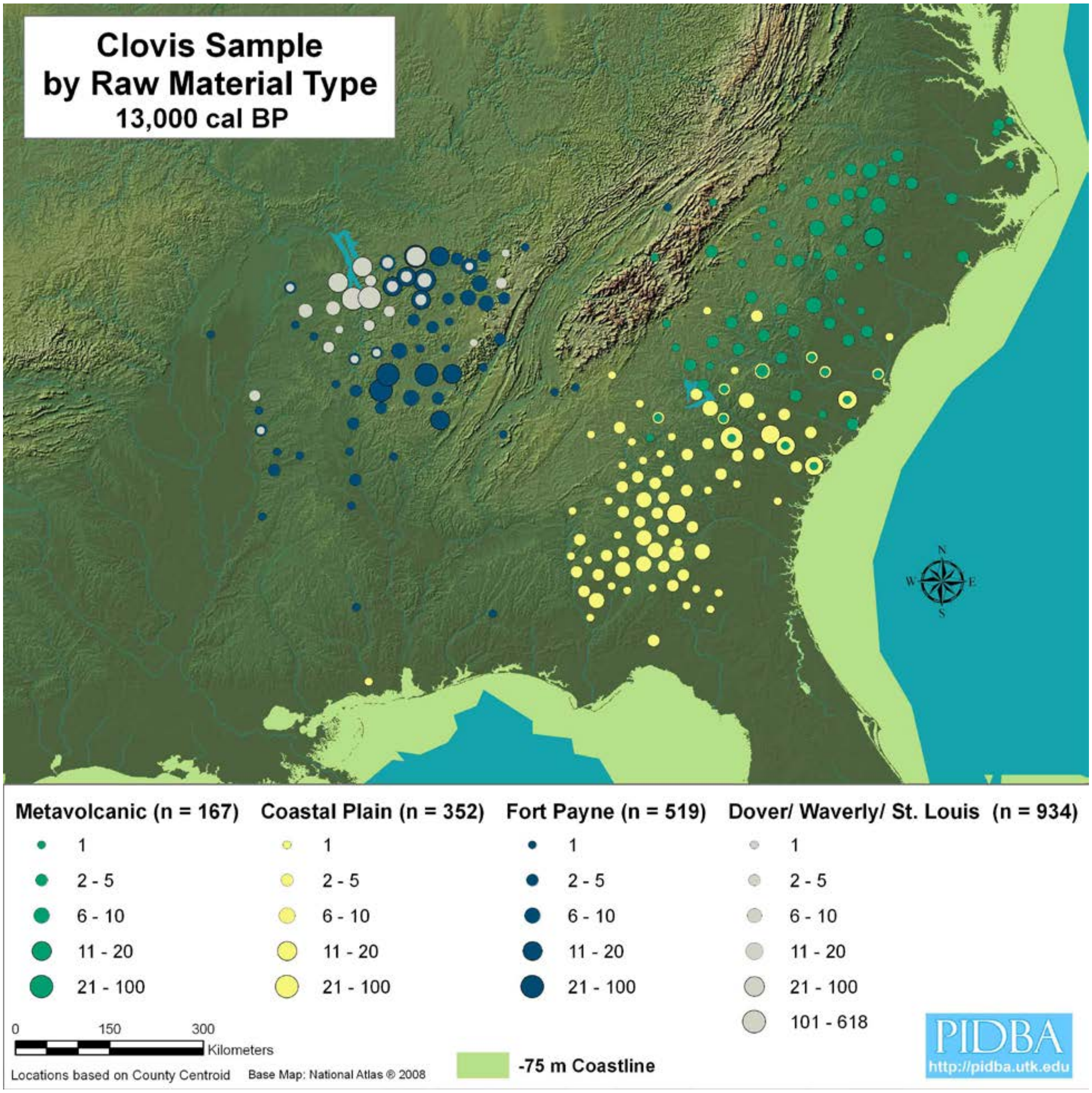


Figure 14. Clovis point incidence on four major lithic raw material categories in the lower Southeast. Most materials are found over areas several hundred kilometers in extent.

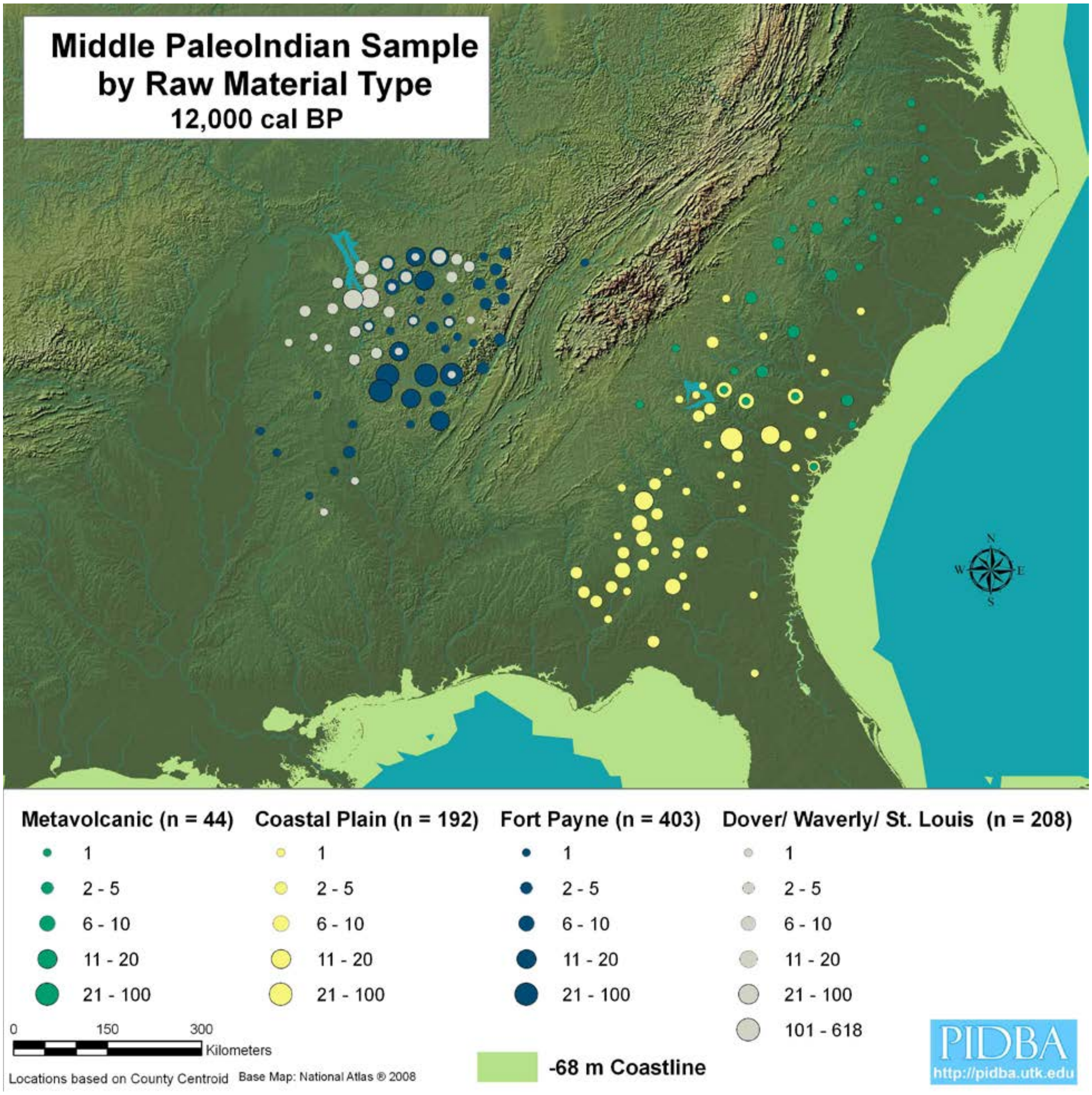


Figure 15. Cumberland, Redstone, and related 'full-fluted' point incidence on four major lithic raw material categories in the lower Southeast. Most materials occur over areas that are smaller than those observed during preceding Clovis times.

Evidence for a Post-Clovis Decline in Population?

Tallying the diagnostic projectile point sample from PIDBA suggests that in the Southeast a significant decline occurs between Clovis and presumably immediate post-Clovis full fluted forms (Figure 16). The data suggest a population rebound occurred later in the Paleoindian era from the full fluted to unfluted and then to Dalton forms. The increase may be far more pronounced then indicated since Dalton points are only systematically recorded in a very few states.

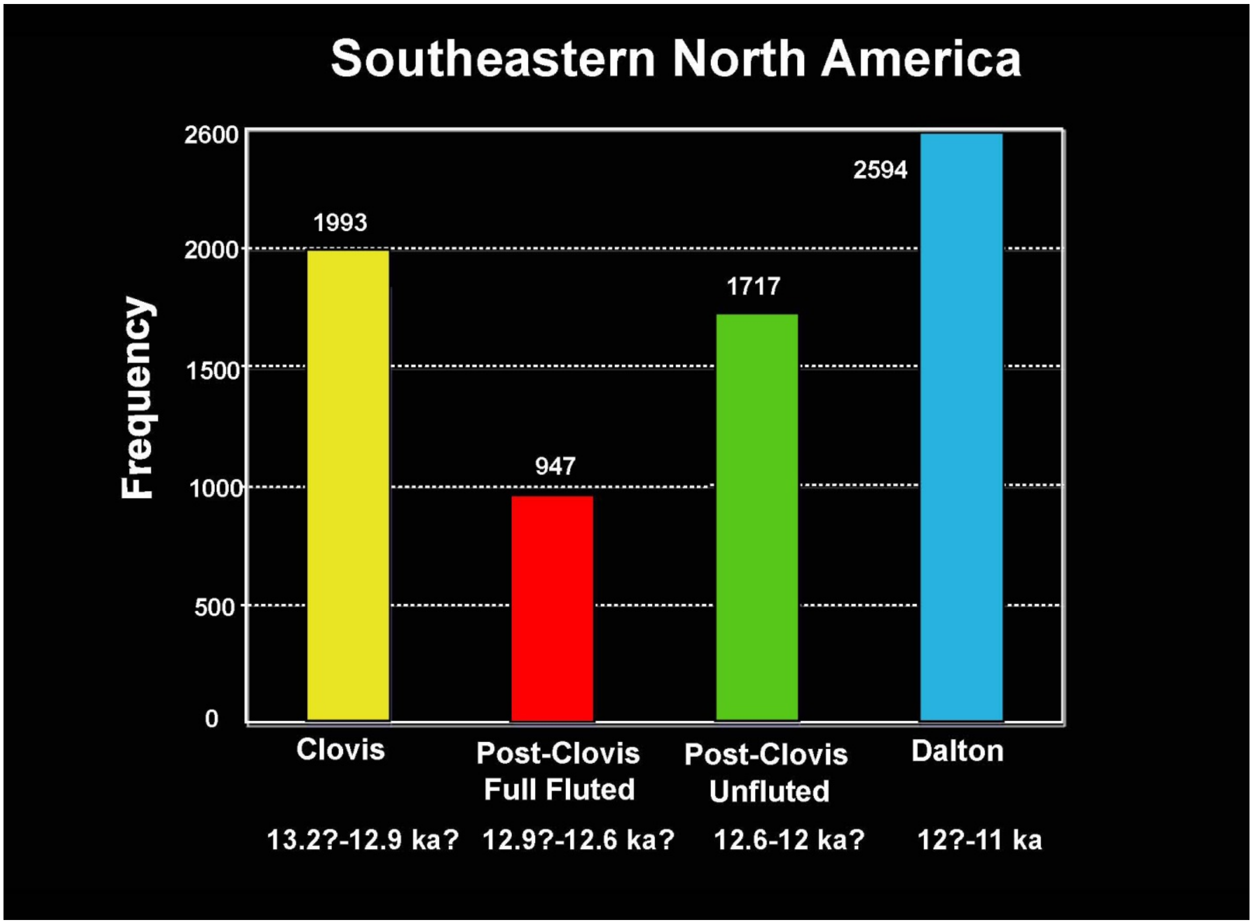


Figure 16. Possible population or settlement trends in the Southeastern United States indicated by numbers of projectile points in the PIDBA dataset.

Find Out More About PIDBA!

Additional details on PIDBA may be found in a recent article in *Archaeology of Eastern North America*, copies of which are available on request, or from the Eastern States Archaeological Federation (Anderson et al. 2010).

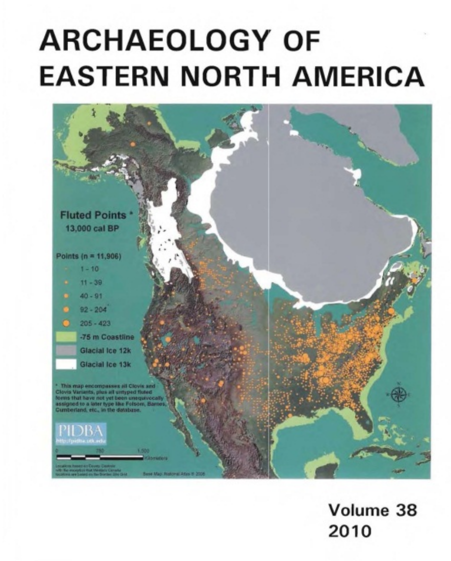


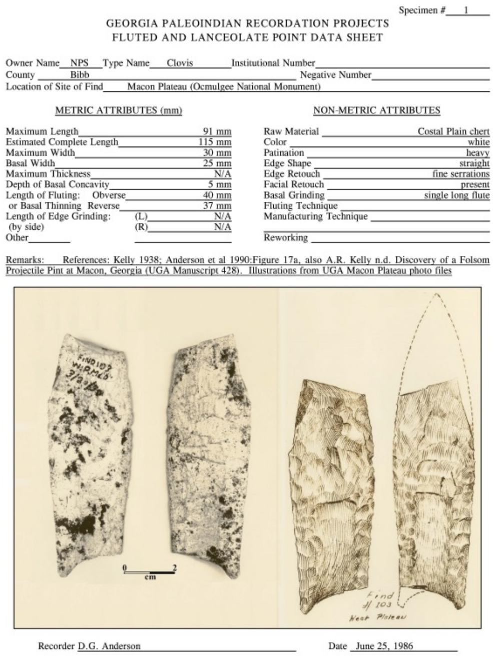
Figure 17. PIDBA has been described in detail in *Archaeology of Eastern North America* (Anderson et al. 2010).

Problems of Representativeness

Complicating analyses are problems of sample bias and representativeness, which is influenced by factors such as the extent of prior collection and recording activity, the extent of agricultural or other land clearing, and many other factors (Shott 2002, Prasciunas 2008, Miller and Smallwood 2009). Also, while fluted projectile point forms are widely reported, later Paleoindian and Early Archaic types are unevenly reported or ignored altogether. It is hoped as more people contribute data these problems will diminish over time.

Start Collecting Data!

We encourage colleagues to start compiling data in those areas where recording projects have not been initiated. The Georgia Paleoindian Recording Project offers a good example of how to proceed (Figures 18, 19)(Anderson et al 1990, Ledbetter et al 2008).



Specimen # 1

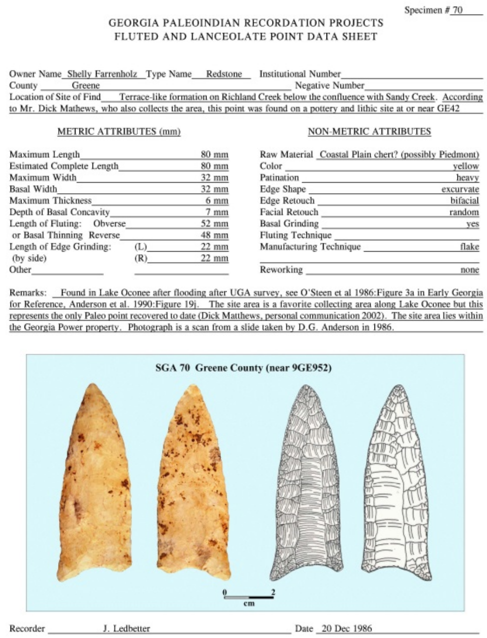
GEORGIA PALEOINDIAN RECORDATION PROJECTS
FLUTED AND LANCEOLATE POINT DATA SHEET

Owner Name NPS Type Name Clovis Institutional Number
County Bibb Negative Number
Location of Site of Find Macon Plateau (Ocmulgee National Monument)

METRIC ATTRIBUTES (mm)		NON-METRIC ATTRIBUTES	
Maximum Length	91 mm	Raw Material	Costal Plain chert
Estimated Complete Length	115 mm	Color	white
Maximum Width	30 mm	Patination	heavy
Basal Width	25 mm	Edge Shape	straight
Maximum Thickness	N/A	Edge Retouch	fine serrations
Depth of Basal Concavity	5 mm	Facial Retouch	present
Length of Fluting: Obverse	40 mm	Basal Grinding	single long flute
or Basal Thinning Reverse	37 mm	Fluting Technique	
Length of Edge Grinding: (L)	N/A	Manufacturing Technique	
(by side) (R)	N/A		
Other		Reworking	

Remarks: References: Kelly 1938; Anderson et al 1990:Figure 17a, also A.R. Kelly n.d. Discovery of a Folsom Projectile Pint at Macon, Georgia (UGA Manuscript 428). Illustrations from UGA Macon Plateau photo files

Recorder D.G. Anderson Date June 25, 1986



Specimen # 70

GEORGIA PALEOINDIAN RECORDATION PROJECTS
FLUTED AND LANCEOLATE POINT DATA SHEET

Owner Name Shelly Farrenholz Type Name Redstone Institutional Number
County Greene Negative Number
Location of Site of Find Terrace-like formation on Richland Creek below the confluence with Sandy Creek. According to Mr. Dick Mathews, who also collects the area, this point was found on a pottery and lithic site at or near GE42

METRIC ATTRIBUTES (mm)		NON-METRIC ATTRIBUTES	
Maximum Length	80 mm	Raw Material	Coastal Plain chert? (possibly Piedmont)
Estimated Complete Length	80 mm	Color	yellow
Maximum Width	32 mm	Patination	heavy
Basal Width	32 mm	Edge Shape	excurvate
Maximum Thickness	6 mm	Edge Retouch	bifacial
Depth of Basal Concavity	7 mm	Facial Retouch	random
Length of Fluting: Obverse	52 mm	Basal Grinding	yes
or Basal Thinning Reverse	48 mm	Fluting Technique	
Length of Edge Grinding: (L)	22 mm	Manufacturing Technique	flake
(by side) (R)	22 mm		
Other		Reworking	none

Remarks: Found in Lake Oconee after flooding after UGA survey, see O'Steen et al 1986:Figure 3a in Early Georgia for Reference, Anderson et al. 1990:Figure 19j. The site area is a favorite collecting area along Lake Oconee but this represents the only Paleo point recovered to date (Dick Matthews, personal communication 2002). The site area lies within the Georgia Power property. Photograph is a scan from a slide taken by D.G. Anderson in 1986.

Recorder J. Ledbetter Date 20 Dec 1986

Figures 18, 19. Examples of artifact data recording from Georgia. Over 2000 such forms have been produced in the past 23 years. Images courtesy of R. Jerald Ledbetter.

Conclusions

We encourage our colleagues to contribute to this effort by submitting information in hard copy or electronic form. All data and contributors will be fully referenced and acknowledged. We thank all those who have contributed data!

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