Central Ohio Archaeological Digitization Survey: Preliminary Report

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The Central Ohio Archaeological Digitization Survey (COADS) is a collaborative research project between Ball State University, the University of Akron, and over a dozen private collectors from Ohio to Colorado funded by the National Science Foundation (BCS #1723879 and BCS #1723877). COADS' three primary goals are to 1) investigate patterns of land use and technology over long expanses of past time in central Ohio (see Nolan 2014), and 2) to leverage the large, if selective, datasets of private collectors for analytical purposes (characterizing point types using geometric morphometrics methods and modeling the transitions between types). Finally, COADS is also designed to serve as a model of productive collaboration between archaeologists and responsible collectors that, among other things, will greatly increase relevant sample sizes (Pitblado and Shott 2015; Shott 2008; 2015). The goal of this paper is to summarize the initial results of collaboration with local collectors, who own the majority of projectile points across the Midwest (Shott 2017), and general patterns interpreted from one of the largest amassed projectile point databases in the world.

The primary data collected was gathered using local knowledge. Collectors that had projectile points and other temporally diagnostic artifacts from Fairfield, Fayette, Franklin, Hocking, Licking, Madison, Pickaway, and Ross counties of central Ohio were contacted and their collections and local knowledge documented (**Figure 1**). Collectors were contacted using snowball sampling. In all, collections from 13 living collectors, and 19 inherited collections were documented, that encompass 17,169 artifacts (Table 1). The artifacts are grouped by collection locations as "sites" defined by the collector, usually a bounded farm field, though ranging in accuracy from piece-plotted with UTM coordinates for each artifact to county level context. The artifacts are associated with a total of 490 collector defined sites. Some collectors occasionally recorded subsites, usually particularly dense areas of concentrations of certain types or ages of artifacts; a total of 122 subsite areas were defined by the collectors for artifacts documented by COADS (Figure 1).

Table 1 shows the distribution of artifacts recorded by county and number of collections analyzed. Most artifacts came from one collector, Gary Argabright (N = 11,981), who also owned several inherited collections.

Materials and Methods

COADS focused primarily on temporally diagnostic projectile points. Of the 17,169 artifacts examined, 12,101 could be confidently identified as a diagnostic projectile point, bladelet, or blade-core. The remaining 5,068 artifacts were either not identifiable to a specific diagnostic point cluster, or were not a projectile point (preforms, flake tools, drills, etc.).

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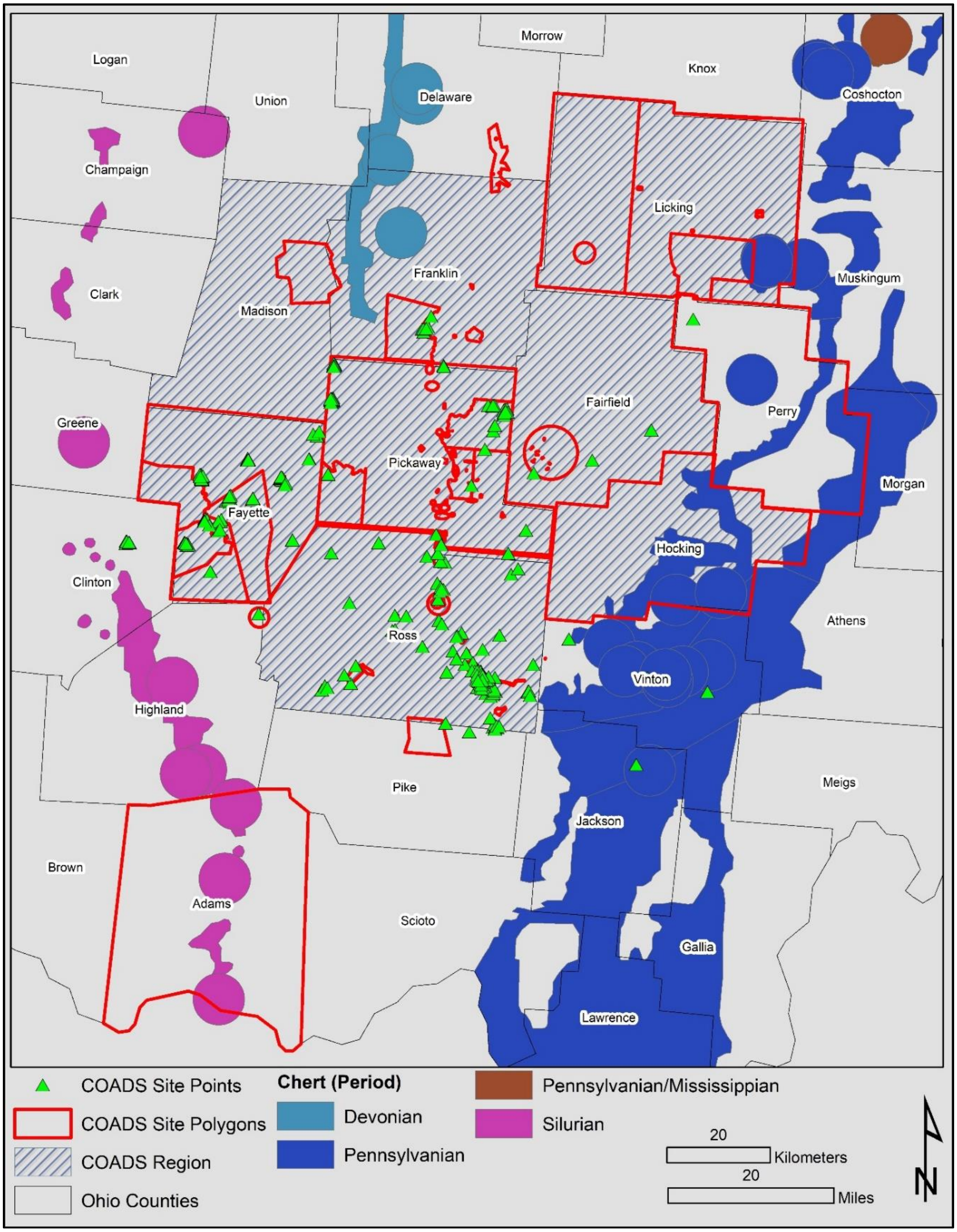

Figure 1. Location of COADS recorded sites and bedrock chert sources (chert sources from Lutz and Nolan 2020 after Foradas 2003 and Kagelmacher 2001).

Table 1: Artifacts and collections by county.

County	Living Collectors	Inherited Collections	Artifacts
Clinton	1	0	6
Delaware	2	0	737
Fairfield	2	1	115
Fayette	2	2	608
Franklin	2	2	360
Hocking	0	1	1
Licking	5	3	1,464
Madison	1	0	1
Perry	1	0	1
Pickaway	9	3	1,722
Pike	1	0	4
Ross	4	7	11,982
Unknown	1	0	168
Total	**13**	**19**	**17,169**

Diagnostic projectile point types were grouped into "clusters" by morphological and temporal similarity. Initial type assignments were made using Justice (1989) (Table 2); however, Justice's "clusters" were not used for this study. Instead, COADS "clusters," or groupings of diagnostic types were created. In most cases, the COADS cluster is named after the most ubiquitous type in the cluster or given a new name that encapsulates the entire cluster by shape (such as "triangle" or "bifurcate"). Any clusters that appear in Table 2 which are not described below contain only one type for which the cluster is named.

Triangles consist of Levanna, Madison, Fort Ancient, and Cahokia. Jack's Reef Corner Notched (JRCN) includes the eponymous type and Raccoon Side Notched. Lowe includes Lowe, Chesser, Steuben, and Baker's Creek. Besides the type itself, "Adena" includes Robinson, and Dickson. "Kramer" includes most Late Archaic to Early Woodland stemmed points including Genesee Stemmed, Saratoga Stemmed, Savannah River Stemmed, Karnak Stemmed, and Cresap. "Snook Kill" includes, White River, Morrow Mountain, and Pickwick. "Bottleneck" includes, Table Rock, Durst, Ace of Spades, Susquehanna Broad, Ashtabula, and Perkiomen broad. "Merom" includes Trimble. "Godar" includes Big Sandy, Otter Creek, and Raddatz. "Stanly Stemmed" includes Kanawha Stemmed. "Bifurcate" includes St. Albans, LeCroy, and MacCorkle. "Kirk" includes Kirk Stemmed, Serrated, and Corner Notched, as well as Palmer and Charleston Corner Notched. "Dovetail" includes the eponymous type and St. Charles. "Thebes" include Thebes and Lost Lake. "Paleo" includes fluted and unfluted lances (e.g., Clovis). One projectile point "type", Brewerton, was omitted. The Brewerton types (Ritchie 1971) are highly variable, and so morphologically diverse that their identification during the project was never made with confidence.

Table 2. Diagnostic Clusters. Top ranked (by frequency) source highlighted grey for types with 30+ cases.

Type	VP	UM	DE	Other	Total	Percent*	Time Period
Paleo	39	**52**	8	9	108	1.39	Paleoindian
Dalton/Hi-Lo	2	2	3	0	7	0.09	Early Archaic
Dovetail	**84**	43	21	21	169	2.17	Early Archaic
Hardaway	2	2	2	0	6	0.08	Early Archaic
Hardin barbed	3	5	2	0	10	0.13	Early Archaic
Kessel	5	10	5	3	23	0.30	Early Archaic
Kirk	289	**302**	183	115	889	11.43	Early Archaic
Thebes	**78**	45	32	22	177	2.27	Early Archaic
Bifurcate	**112**	87	61	30	290	3.73	Early/Middle Archaic
Godar	56	**88**	66	35	245	3.15	Middle Archaic
Stanly Stemmed	**39**	18	24	16	97	1.25	Middle Archaic
Bottleneck	53	**58**	52	21	184	2.36	Late Archaic
Brewerton	124	122	**123**	92	461	5.92	Late Archaic
Kramer	101	108	**123**	77	409	5.26	Late Archaic
Lamoka	**41**	34	30	**37**	127	1.63	Late Archaic
Matanzas	50	37	**67**	41	195	2.51	Late Archaic
Meadowood	5	10	8	2	25	0.32	Late Archaic
Merom	**63**	22	13	16	114	1.47	Late Archaic
Normanskill	**13**	9	11	7	40	0.51	Late Archaic
Snook Kill	5	8	**13**	12	38	0.49	Late Archaic
Turkey Tail	2	1	2	0	5	0.06	Late Archaic
TA barbed	15	15	15	6	51	0.66	Late Archaic/Early Woodland
Adena	283	299	**334**	187	1103	14.18	Early Woodland
Adena Cache Blade	**32**	26	15	**10**	83	1.07	Early Woodland
Blade-Core	**338**	8	14	29	389		Middle Woodland
Bladelet	**3400**	110	72	349	3931		Middle Woodland
Hopewell Cache Blade	**61**	17	12	7	97	1.25	Middle Woodland
Snyders	**283**	132	98	77	590	7.58	Middle Woodland
Lowe	**172**	119	110	56	457	5.87	Middle/Late Woodland
JRCN	51	84	**150**	37	322	4.14	Late Woodland
Triangle	152	247	**889**	155	1443	18.55	Late Prehistoric
Scallorn	7	3	3	3	16	0.21	Late Prehistoric
Total	5960	2123	2561	1472	12101	**100%**	

* excluding Hopewell blade industry

Results and Preliminary Analysis

Table 2 presents summary attributes for COADS recorded projectile points by type cluster. Projectile points, bifaces, or artifacts related to Hopewell blade production constitute 94.6 percent of the artifacts documented by COADS. However, 29.5 percent (*n*=5,068) of the documented artifacts could not be assigned to defined diagnostic artifact clusters. Middle Woodland diagnostics make up the largest percentage of the sample at 45.1 percent. Hopewell bladelets and cores constitute nearly 1 in 4 of all artifacts identified (22.9%). To facilitate discussion of projectile points, Hopewell blade industry products are omitted from the remaining frequency discussion and Table 2 proportion calculations.

Points of the Triangle cluster were the most frequently recorded diagnostic projectile points, followed by Adena, Kirk, Snyders, and Brewerton. These clusters compose over half of the sample (57.65%). In contrast, points diagnostic of the Paleoindian period makes up approximately one percent of the diagnostic points recorded.

Several attributes were collected in the field or from 2D/3D models of the artifacts in the lab. These included raw material, maximum thickness, weight, blade and stem length, number of flake scars on left and right side of the blade, and tip angle. Linear dimensions, scar counts and tip angle register pattern and degree of reduction after original production. Because COADS in part investigates rates of curation by point type, these variables were necessary to measure that quantity.

Raw material was identified using 25x magnification, a comparative chert collection, and relevant resources (e.g., Kagelmacher 2001). Table 2 contains frequencies of raw materials Vanport (VP), Upper Mercer (UM), Delaware (DE), and Other chert types. The first three chert sources subsume most chert types of the database; the “Other” category encompasses unknown, local, and exotic sources. Exotic sources (e.g., Burlington, Knife River, Knox, Obsidian, and Wyandotte) account for less than three percent of the entire dataset (N = 496). Most “Other” cherts include Paoli, Jeffersonville, Kanawha, Cedarville-Guelph, Brassfield, Brush Creek, Fort Payne, Pipe Creek, Onondaga, Plum Run, Rhyolite, Laurel, and unknown sources.

There are a few clear “preferences” when we consider the large deviations in materials by frequency. The most obvious that other archaeologists have anecdotally observed is the shift in preference from the Middle Woodland to the Late Woodland and Late Prehistoric. Triangular points and preforms, and Jack’s Reef Corner Notched points are predominately made from DE. This follows a long-standing preference during the Early and Middle Woodland for VP (Mullet 2009). Late Archaic projectiles were relatively equally represented in VP, UM, and DE but not in other chert sources. Middle Archaic clusters were mostly made of UM and DE over FR. Early Archaic types, particularly Dovetail and Thebes, indicate a preference for VP. There were numerous clusters with sample sizes too small to make meaningful interpretations. Paleoindian fluted and unfluted lances indicate a preference for UM (see Mullet 2009).

Turning to overall projectile point production, there are a few broad temporal trends (Figure 2). The general pattern is rising production (though slight) of projectile points through

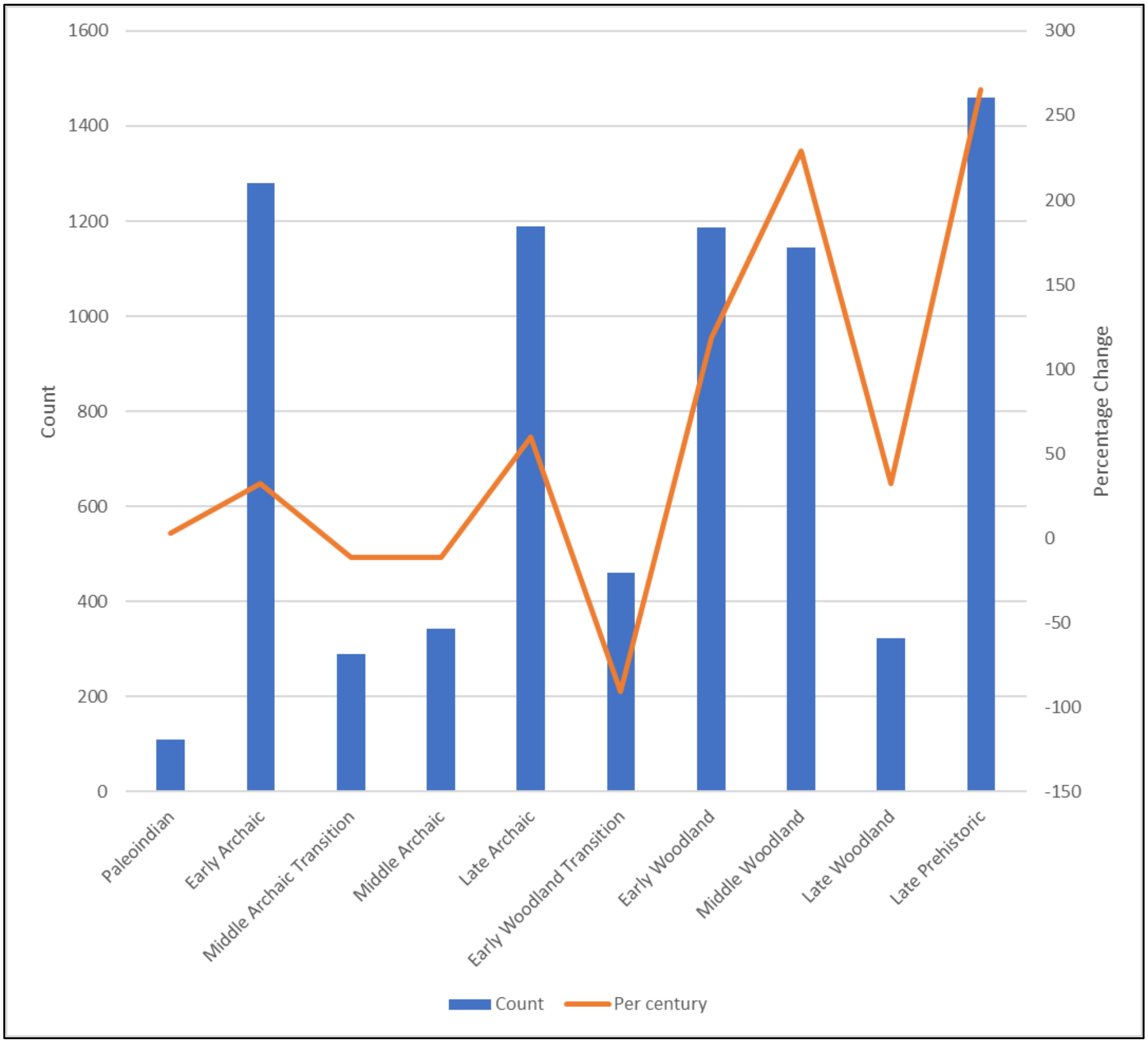

Figure 2. Frequency of Diagnostic Artifacts by Period and Counts per Century by Period, excluding Hopewell Bladelets and Blade-cores.

time, with significant drop-offs in the Middle Archaic and Late Woodland periods. There are several factors that may be causing these dips in frequencies at these times, but discussion of these is beyond the scope of this brief paper (see Shott 2020).

Conclusion

Through the collaboration and support of private collectors, COADS has accumulated one of the largest projectile point databases in North America. These data begin to fill information gaps that professional surveys have missed (Nolan et al. 2018). While this paper briefly discusses general patterns and preliminary results of the project, there is still much more research awaiting the COADS database. The kinds of data collected by COADS can address questions related to the "theory of the point" (Shott 2020). These include questions about "the dimensions that characterize points and reveal their design, to their use, to the contribution of that use to larger synchronic cultural units and practices, and finally to inherently historical traditions of manufacture and use" (Shott 2020:246). Questions of these kind require "big data" (see VanValkenburg and Dufton 2020). COADS has demonstrated, through collaboration with private collectors, that "big data" are out there, if we are willing to talk to people.

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