**Convergence at Poverty Point: A revised chronology of the Late Archaic Lower Mississippi Valley**

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**Radiocarbon dating methods**

There are 32 14C samples from the Jaketown site (Table S1). Ford and colleagues collected the first 14C samples in the early 1950s (Ford *et al*. 1955: 154; Ford & Webb 1956: 121). They processed five 14C samples, three on unidentified (UID) composite charcoal, one on unspecified shell and one on unspecified bone. All five measurements came from Late Archaic period contexts. The range of these samples spans 3820–1830 cal yr BP.

In 2001, Saunders and Allen (2003) processed three 14C samples from three soil cores near the excavations of Ford and colleagues and from similar stratigraphic contexts. Their goal was to test the accuracy of the Ford and colleagues’ dates. Two of their dates were on UID charcoal, and the third was from organically enriched sediments. The range of these samples spans 4230–3230 cal yr BP.

In 2004, Saunders and Jones (2004: 67–70) collected a core from Mound C, a large platform mound. They dated a piece of cane charcoal from the core that returned a date of 730–565 cal yr BP (95.4% probability) and surmised the mound was constructed during the Mississippian period.

We collected the remaining 23 14C samples from 2007 to 2020. Arco, a former graduate student at Washington University in St. Louis, processed 13 14C samples during 2007–2009, all on UID wood charcoal. Since 2018, the authors have processed 10 14C samples and prioritized short-lived species for dating instead of wood charcoal. At Jaketown, we have collected carbon samples from obvious cultural features such as middens, pits, combustion features and at important stratigraphic interfaces such as initial mound fill deposits and mound surfaces. We also collected many carbon samples from paleoethnobotanical flotation samples. No carbon samples were collected during the 2020 field season. We have processed nine 14C samples from short-lived species, five from charred seeds (*Diospyros virginiana*), four from charred nutshell (*Carya*), and one on residue adhering to the interior of a soapstone sherd.

**Chronological modelling methods**

Chronological modelling was done by author Grooms. The model was created using the OxCal 4.4 software (Ramsey 2009a), and the 14C measurements were calibrated using the IntCal20 calibration curve (Reimer *et al*. 2020). All carbon samples used in the model are from the terrestrial carbon reservoir. There are five iterations of the model (models A–E). We present the results of model E in the paper. Model E is a sequential phase model with four phases of site use (Ramsey 2009a). The CQL code for Model E is provided at the end of this document.

**Model iterations**

**Model A** is a sequential multiphase model that consists of three phases and uses 27 of the 32 14C samples. We omitted all five of the Ford and colleagues’ dates. The model will not run with these dates included because they are so erroneous that the model returns an error message (null distribution). When Ford and colleagues’ dates are included in the appropriate phase (initial phase) based on their stratigraphic provenience, they are much younger than the other dates in the same phase as well as those in the subsequent intensive and earthwork construction phases. Because the phases are within a sequence, this incongruity causes the model to fail. A more detailed description of other technical issues with the Ford and colleagues’ dates is provided in the omission section. This model lumps all dates from the point bar together into a single phase (initial occupation). The initial occupation in this model begins at *c*. 6000 cal yr BP. Such an early start date is the result of including sample 25 which dates to 6190–5940 (95.4% probability). It is unlikely that a continuous phase of occupation lasted three millennia, so for Model B we divided the dates among two phases, the initial and intensive phases. Splitting the dates between two phases is consistent with the archaeological evidence for more intensive occupation on the bank of Wasp Lake and the thick middens repurposed as mound fill.

**Model B** is a sequential multiphase model that consists of four phases and uses 27 of the 32 14C samples. Model B is the same as Model A, except it has four instead of three phases. In Model A, dates from the point bar were lumped together into a single phase (initial occupation). In Model B, they are split into two phases (initial occupation and intensive occupation phases) based on stratigraphic context and age. Like Model A, this model fails to pass the Agreement Index of 60 due to UID wood charcoal samples with poor agreement indices (samples 10, 12, and 21). Because the three problematic dates in Model B are on UID wood charcoal samples we began to consider utilising a Charcoal Outlier model. However, first, we ran a General Outlier model in the next iteration (Model C).

**Model C** has the same structure as Model B except it includes a General Outlier model. The outlier results show that samples 12 and 25 are strong outliers at 5/50 and 5/85, respectively. Sample 8 is a slight outlier (5/14) and is on a short-lived material (charred seed; *Diospyros virginiana*).

**Model D** has the same structure as Models B and C but includes Charcoal and General Outlier models. There are no outliers detected in this iteration.

**Model E** has the same structure as Models B–D and includes Charcoal and General Outlier models. It comprises 26 of the 32 available 14C samples; it does not include the five Ford and colleagues samples or sample 25. Sample 8 is a possible outlier (5/22) in this iteration. We chose to keep sample 8 in the model, and our reasons for doing so are provided in the next section. After working through the various iterations of the model, Model E is the best fit between the statistical outlier detection methods and the archaeological knowledge we bring to bear on the context of the samples.

**Outlier detection methods**

We have 27 AMS dates processed by Saunders and Allen, Saunders and Jones, Arco, and us. The dates are on different materials and were processed at different labs. Consequently, there is potential for outliers. Additionally, our team dated more short-lived species than past analysts, so there is potential for offsets. The charcoal outlier results for Model E indicate there is an offset, -64-1 (68%) and -155-3 (95%), showing the potential for the old wood effect on the UID wood charcoal samples. In OxCal, models are assessed by using either the Agreement Index method or the outlier detection methods outlined by Ramsey (2009b). We opted to use General and Charcoal outlier models. 1 in 20 dates are outliers of some kind, so for the General Outlier model, we began by defining the prior odds of any sample being an outlier at 5 per cent. Once the model is completed, dates with a posterior outlier value higher than 5 per cent should be analysed closer and considered for omission. All wood charcoal samples are expected to be outliers because they date earlier than the archaeological context in which they are found. Therefore, when using a Charcoal Outlier model, we gave each UID charcoal sample a prior outlier probability of 100 per cent (Bronk Ramsey 2009b: 1028). When using the outlier models described by Christen (1994) and Bronk Ramsey (2009b: 1024), the Agreement Index is no longer the standard for identifying outliers, and the outlier model results should be consulted. In the case of our primary model, Model E, the Agreement Index is irrelevant, although it still surpasses the required 60 per cent threshold.

**Reasoning for omissions**

We omitted six 14C measurements from Model E, one AMS date (sample 25), and all five of the Ford and colleagues’ radiometric dates (samples 27, 28, 29, 30, and 32). Ford and colleagues sent samples to three different radiocarbon laboratories, none of which exist today. The provenience for these samples is poor, and the three UID charcoal samples are composite samples rather than single-entity samples. Composite samples are a conglomerate of many different and potentially unrelated bits of charred material (Bayliss 2015: 688). In all cases, the laboratories involved used standards and procedures that are unacceptable today. Hamilton and Krus (2018: 12) argue against rejecting legacy dates based solely on large error ranges. They advise that in cases where legacy dates are questionable due to poor provenience, for example, analysts should cross-check them by re-dating the original materials or by dating contemporaneous material. We cannot re-date the original materials, but Saunders and Allen (2003) re-dated similar archaeological contexts with the explicit goal of testing the accuracy of the Ford and colleagues' dates. Their four 14C dates produced an earlier and tighter age span (4230–3230 vs. 3820–1830 cal yr BP). Furthermore, all dates gathered since the Ford and colleagues’ dates (n=27) produce a similar age span as Saunders and Allen’s assays and form a coherent dataset demonstrating that the legacy dates are erroneous. Consequently, these samples are not useful and were omitted from our model.

Sample 25 came from stratum 2 in Trench 1 and returned a date of 6190–5940 cal yr BP (95.4% probability). We processed a second carbon sample, sample 31, from stratum 2 to test the accuracy of such an early date. Sample 31 returned a date of 3450–3350 cal yr BP (95.4% probability). The *c*. 3400 cal yr BP date is consistent with our 14C database and leads us to suspect that the *c*. 6000 cal yr BP date is dating the paleosol, a buried A horizon formed on the point bar and below the anthropogenic sediments. Therefore, sample 25 does not date the event in question, the initial occupation of the point bar, but likely dates the formation of the buried A horizon.

Sample 8 is the oldest date from the pit beneath Mound A, and in Model E it has a 5/22 outlier value. The point at which we begin to remove dates has an element of subjectivity, and we are confident in the archaeological context of this sample. 5/22 is a relatively low outlier value, and based on what we know about the context, we decided to leave the date. Christen (1994: 499, tab. 3) rejected two samples with >40 per cent values but left the two with 24 per cent and 25 per cent values. Furthermore, even if we omitted sample 8, the pit context still dates to *c*. 4000 cal yr BP based on sample 7 from the same feature, and the basal midden on the bank of Wasp Lake dates to 4145–3870 cal yr BP (95.4% probability). Therefore, if we were to err on the side of caution and omit sample 8, we are still confident that the initial occupation of Jaketown was underway by *c*. 4000 cal yr BP.

**Notes on certain sample contexts and decisions made**

It is important that analysts provide insights into decisions they made while constructing chronological models. Here we describe challenging decisions regarding the placement of samples that required a combination of subjectivity and archaeological contextual knowledge. The reason for our placement of most samples in their respective phases is sufficiently evident from the information provided in Table S1. Below is a discussion of specific samples and contexts we feel need to be discussed in more detail than the table allows.

*The point bar*

The basal sandy point bar at Jaketown is a time-transgressive paleosurface. It supported both the initial and intensive occupations, so it is difficult to discern which phase some dates belong to based solely on their occurrence on the point bar. For this reason, it is necessary to split some dates into different phases even though they come from the same surface. For example, samples 22 and 23 come from a midden on top of the point bar, but sample 23 is older than sample 22. Sample 23 dates to 4225–3700 ca yrl BP (95.4% probability), while sample 22 dates to 3690–3465 cal yr BP (95.4% probability). Furthermore, sample 23 is from organic sediments, which means there is a higher potential for contamination from younger carbon sources such as rootlets and humic acids (Saunders & Allen 2003: 161–162). Consequently, sample 23 may be even older than the AMS measurement. Such temporal differences between samples from the point bar mean they are unlikely the result of one continuous occupation. Therefore, we divided some dates among the initial and intensive phases based on age. In Model A, we tested if lumping all the point bar dates into a single phase produced an appreciably different chronology compared to the iterations that split those dates into two phases (initial and intensive) and it did not.

*The Mound A area*

Saunders and Allen’s samples 20 and 22 come from similar contexts east of Mound A, but they are difficult to place in the model because they are from cores, and the area has not been excavated. We placed sample 22 in the intensive phase, and sample 20 in the earthwork phase based on the stratigraphic details Saunders and Allen provide (2003: 160–163), as well as their ages. We removed these dates altogether to test how much they impacted Model E, and their exclusion had virtually no effect. We feel it is best to include as many available dates as possible.

Sample 22 came from a midden east of Mound A (Saunders & Allen 2003: 161, fig. 6). Sample 22 is from midden (1.68‒1.80 metres below surface (mbs)) on top of the point bar and from a similar depth and context as our lowest stratum in Trench 1 (stratum 2; 1.7 mbs). Therefore, we interpret sample 22 as coming from the same midden represented by our Trench 1 stratum 2, only further east towards Wasp Lake. The stratigraphic context, along with the date 3690–3465 cal yr BP (95.4% probability), supports its placement in the intensive phase.

*Mound X contexts*

Sample 16 is from core 38c at 3.75 mbs near unit J103. During our reexcavation of J103, we encountered the point bar at approximately 3.6 mbs. We interpret sample 16 as coming from within the point bar while it was still forming. The sample is from a context stratigraphically deeper than stratum 2 beneath Mound X, and indeed, sample 16 returned a date earlier than the dates from stratum 2 above it. For these reasons, as well as the age of the sample, we placed sample 16 in the initial phase.

Sample 18 is from core 38f at 2.18 mbs, near the middle of stratum 4 (midden-fill) in Mound X. We know this midden was mined from an existing occupation area and used as mound fill. This date supports that interpretation since it is older than the dates from stratum 2 beneath the mound (4065–3720 cal yr BP (95.4% probability)).

Sample 15 is from stratum 4 in Mound X and was processed from residue adhering to the interior of a soapstone vessel sherd. Sample 15 is older (3565–3395 cal yr BP (95.4% probability)) than the sub-mound dates from stratum 2, thus supporting our interpretation that stratum 4 is redeposited midden that formed during the intensive phase and was gathered and used as mound fill during the earthwork construction phase.

Sample 13 is a charred nutshell (*Carya*) collected via flotation and comes from an *in-situ* PPO concentration in stratum 2 beneath Mound X. Stratum 2 represents the feasting event documented under the first obvious mound fill deposit, stratum 3. Its age (3455–3370 cal yr BP (95.4% probability)) overlaps with dates from the surface of Mound X (3580–3395 cal yr BP (95.4% probability)). For these reasons, we have interpreted the feasting event as part of the mound building process and included dates associated with stratum 2 in the Earthwork Construction phase.

*Trench 1 contexts*

Sample 24 is from stratum 4 in Trench 1 and dates to 3450–3370 cal yr BP (95.4% probability), which is slightly older than the beginning of the earthwork construction phase. The intensive and earthwork construction phases probably blurred into each other rather than representing two distinct occupations separated by any appreciable time. However, based on the age and the fact that there is no mound over it, we included this context in the intensive phase.

Sample 31 is from stratum 2 and dates to 3450–3350 cal yr BP (95.4% probability). This date overlaps with the sample 24 date from stratum 4. Therefore, it is plausible that the intervening stratum was deposited quickly (stratum 3 in Figure 6). Whether stratum 3 is an anthropogenic or alluvial deposit is difficult to discern. The stratum was deposited quickly, and it was present only in sections of our Trench 1 re-excavation. One would expect the stratum to be more spatially contiguous if it were an alluvial deposit. However, the depositional history of Jaketown is highly complex. It is the result of millennia of both anthropogenic and alluvial deposition, so more excavation in the Trench 1 area is needed, along with laboratory analyses to clarify the nature of stratum 3.



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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample ID & Lab No.  | Method | Provenience | Context | Material | 13c/12c ratio | Con. 14C age (yr BP) | 2σ (cal yr BP) | Probability under distribution (%) | 2σ date range (yr BP) | Source |
| 24.OS-159306  | AMS | Trench 1 N Profile | stratum 4  | nut shell (*Carya*) | n/a | 3190±20 | 3450–3370 | 95.4 | 3450–3370 | Ward *et al*. 2021 |
| 31.OS-160358 | AMS | Trench 1 N Profile | stratum 2  | nut shell (*Carya*) | n/a | 3160±20 | 3450–3350 | 95.4 | 3450–3350 | Ward *et al*. 2021 |
| 25.OS-159311 | AMS | Trench 1 N Profile | stratum 2/1  | nut shell (*Carya*) | n/a | 5290±35 | 6190–5985 5970–5940 | 89.3/6.2 | 6190–5940 | Ward *et al*. 2021 |
| 1.B-252853 | AMS | J100 S Profile (MD-A) | EW midden, above crevasse deposit | UID wood charcoal | -24.5 ‰ | 2440±50 | 2710–2625 2620–2350  | 22.3/73.2 | 2710–2350 | Kidder *et al*. 2018 |
| 2.B-253789  | AMS | J100 S Profile (MD-A) | Below crevasse deposit; upper PP midden on top of md construction fill | UID wood charcoal | n/a | 3120±40 | 3445–3420 3410–3220 | 4.3/91.1 | 3445–3220 | Kidder *et al*. 2018 |
| 3.UGA-38993 | AMS | J100 E Profile (MD-A) | stratum 4; upper PP surface below crevasse | Seed (*Diospyros virginiana*) | -25.94 ‰ | 3110±20 | 3385–3320 3305–3245 | 55.6/39.8 | 3385–3245 | Ward *et al*. 2021 |
| 4.B-252854 | AMS | J100 S Profile (MD-A) | Stratum 2 | UID wood charcoal | -26.5 ‰ | 3220±40 | 3560–3530 3495–3360 | 3.1/92.3 | 3560–3360 | Kidder *et al*. 2018 |
| 5.UGA-38992 | AMS | J100 E Profile (MD-A) | Stratum 2 | Seed (*Diospyros virginiana*) | ̥-25.48 | 3150±20 | 3445–3420 3415–3335 3285–3270 | 11.2/81.3/2.9 | 3445–3270 | Ward *et al*. 2021 |
| 6.UGA-38991 | AMS | J100 E Profile (MD-A) | Stratum 2 | Seed (*Diospyros virginiana*) | -25.33 | 3150±20 | 3445–3420 3415–3335 3285–3270 | 11.2/81.3/2.9 | 3445–3270 | Ward *et al*. 2021 |
| 7.B-253774 | AMS | J100 N Profile (MD-A) | Pit beneath MD-A; assoc. with PPO  | UID wood charcoal | -27.0 ‰ | 3660±40 | 4145–4125 4095–3870 | 1.9/93.5 | 4145–3870 | Kidder *et al*. 2018 |
| 8.UGA-41847 | AMS | J100 N Profile (MD-A) | Pit beneath MD-A; assoc. with PPO  | Seed (*Diospyros virginiana*) | -23.39 ‰ | 3910±70 | 4525–4145 4115–4100 | 94.9/0.6 | 4525–4100 | Ward *et al*. 2021 |
| 9.B-263583 | AMS | J102 E-F1RC-1 (MD-A) | Early woodland tetrahedron-filled pit excavated into upper surface of crevasse deposit | UID wood charcoal | -27.0 ‰ | 2570±40 | 2760–2685 2645–2610 2600–2495 | 56.1/10.6/28.8 | 2760–2495 | Kidder *et al*. 2018 |
| 10.B-263420 | AMS | J103 E Profile (MD-X) | Stratum 6 | UID wood charcoal | -23.7 ‰ | 3280±40 | 3580–3395 | 95.4 | 3580–3395 | Kidder *et al*. 2018 |
| 11.B-263421 | AMS | J103 E-PRC-9 (MD-X) | Stratum 2 | UID wood charcoal | -27.1 ‰ | 3220±40 | 3560–3530 3495–3360 | 3.1/92.3 | 3560–3360 | Kidder *et al*. 2018 |
| 12.B-264059 | AMS | J103 W-PRC-1 (MD-X) | Stratum 2 | UID wood charcoal | -23.3 ‰ | 3340±40 | 3690–3660 3645–3465 | 6.2/89.3 | 3690–3465 | Kidder *et al*. 2018 |
| 13.UGA-41848 | AMS | J103 (MD-X) | Stratum 2; FS#43 from PPO concentration | nutshell (*Carya)* | -24.05 ‰ | 3200±25 | 3455–3370 | 95.4 | 3455–3370 | Ward *et al*. 2021 |
| 14.OS-151671 | AMS | J103 (MD-X) | Stratum 2  | Seed (*Diospyros virginiana*) | n/a | 3170±20 | 3450–3360 | 95.4 | 3450–3360 | Ward *et al*. 2021 |
| 15.B-555137 | AMS | J103 (MD-X) | Stratum 4, midden-fill | soapstone sherd residue | -25.2 ‰ | 3260±30 | 3565–3440 3435–3395 | 81.6/13.8 | 3565–3395 | Ward *et al*. 2021 |
| 16.AA-83901 | AMS | Core 38C (MD-X) | Between Mounds B & C; near J103 excavation area | UID wood charcoal | -26.4 ‰ | 3416±64 | 3835–3485 | 95.4 | 3835–3485 | Kidder *et al*. 2018 |
| 17.AA-83903 | AMS | Core 38I (MD-X) | Below crevasse deposit; upper surface of mound | UID wood charcoal | -26.8 ‰ | 3201±39 | 3485–3350 | 95.4 | 3485–3350 | Kidder *et al*. 2018 |
| 18.AA-83902 | AMS | Core 38F (MD-X ) | Upper part of stratum 4 (midden-fill) | UID wood charcoal | -25.3 ‰ | 3585±40 | 4065–4045 3990–3820 3795–3765 3755–3720 | 1.4/85.3/5.2/3.6 | 4065–3720 | Kidder *et al*. 2018 |
| 19.B-236318 | AMS | Core 24 (MD A area) | Strat. 5, 4Ab; below crevasse deposit; upper surface of mound | UID wood charcoal | -25.9 ‰ | 3170±40 | 3465–3330 3290–3260 | 90.1/5.4 | 3465–3260 | Kidder *et al*. 2018 |
| 20.B-156646 | AMS | Core 2 (MD A area); 3A3b (2.64‒2.75 mbs) | From middle of basal PP midden near MD-A area; E of J100 & J101/J102; near Core 24 | UID wood charcoal | n/a | 3150±50 | 3460–3235 | 95.4 | 3460–3235 | Saunders & Allen 2003 |
| 21.B-235218 | AMS | Core 24 (MD A area; 3.12 mbs)  | Strat 21, 14Ab4/15Ab, 33.1 amsl; basal PP midden | UID wood charcoal | -27.3 ‰ | 3260±40 | 3570–3390 | 95.4 | 3570–3390 | Kidder *et al*. 2018 |
| 22.B-157421 | AMS | Core 3 (MD A area; 3A1b, 1.68‒1.80 mbs)  | From upper portion of basal PP midden; E of Trench 1 and J101/J102 | UID wood charcoal | n/a | 3350±40 | 3690–3655 3650–3465 | 9.4/86 | 3690–3465 | Saunders & Allen 2003 |
| 23.B-154428 | Radiometric |  Core 1 (T1 area; 2A3b 1.60‒1.80 mbs) | From middle of basal PP midden in T1/Mound A area | organic sediment | n/a | 3630±80 | 4225–4205 4155–3810 3805–3715 3710–3700 | 0.7/85.6/8.8/0.3 | 4225–3700 | Saunders & Allen 2003 |
| 26.UGA-14091 | AMS | Core 1 (Mound C) | MD C 2.2-2.4 mbs, Ab1, surface, stage I mound | cane charcoal | n/a | 740±40 | 730–645 585–565 | 91.0/4.4 | 730–565 | Saunders & Jones 2004: 67–70 |
| 27.M-216 | Radiometric | Trench 5 square 0-2, stratum 2 level  | "Charcoal from Poverty Point cultural deposits." | charcoal | n/a | 2830±300 | 3820–3795 3725–2300 2230–2180 | 0.3/94.5/0.7 | 3820–2180 | Ford & Webb 1956: 121 |
| 28.L-114 | Radiometric | Mound A | West end of Trench 5, stratum 2 above sand bar  | charcoal | n/a | 2350±80 | 2710–2295 2265–2150 | 81.2/14.3 | 2710–2150 | Ford & Webb 1956: 121 |
| 32.L-115 | Radiometric | Mound A | West end of Trench 5, stratum 2 above sand bar  |   | n/a | ± |   |   |   | Ford & Webb 1956: 121 |
| 29.O-41 | Radiometric | Unknown | "Shell from Poverty Point cultural deposits." | shell | n/a | 2560±100 | 2850–2810 2800–2355 | 3.3/92.1 | 2850–2355 | Ford & Webb 1956: 121 |
| 30.O-46 | Radiometric | Unknown | "Bone from Poverty Point cultural deposits." | bone | n/a | 2150±110 | 2360–1830 | 95.4 | 2360–1830 | Ford & Webb 1956: 121 |



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| --- | --- | --- | --- |
| Name | Unmodelled (BP) | Modelled (BP) | Indices: Amodel 79.3 Aoverall 79.9 |
|  | from | to | % | from | to | % | m | from | to | % | from | to | % | m | A | P | C |
| R\_Date 26. UGA-14091 | 720 | 655 | 68 | 730 | 565 | 95 | 680 | 720 | 655 | 68 | 735 | 565 | 95 | 680 | 101.6 | 97 | 99.9 |
| Boundary End 4 |  |  |  |  |  |  |  | 2665 | 2385 | 68 | 2705 | 2100 | 95 | 2490 |  |  | 99.2 |
| R\_Date 1. B-252853 | 2695 | 2360 | 68 | 2710 | 2350 | 95 | 2510 | 2695 | 2505 | 68 | 2710 | 2355 | 95 | 2585 | 94.3 |  | 99.9 |
| R\_Date 9. B-263583 | 2755 | 2540 | 68 | 2760 | 2495 | 95 | 2710 | 2735 | 2510 | 68 | 2745 | 2435 | 95 | 2620 | 97.7 |  | 99.9 |
| Phase Post Flood Occupation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Boundary Start 4 |  |  |  |  |  |  |  | 2865 | 2535 | 68 | 3245 | 2455 | 95 | 2725 |  |  | 99.8 |
| Boundary End 3 |  |  |  |  |  |  |  | 3380 | 3350 | 68 | 3390 | 3325 | 95 | 3365 |  |  | 99.9 |
| R\_Date 13. UGA-41848 | 3450 | 3390 | 68 | 3455 | 3370 | 95 | 3415 | 3390 | 3370 | 68 | 3410 | 3360 | 95 | 3380 | 62.6 | 97 | 100 |
| R\_Date 2. B-253789  | 3390 | 3255 | 68 | 3445 | 3220 | 95 | 3340 | 3390 | 3360 | 68 | 3405 | 3340 | 95 | 3375 | 73.5 |  | 100 |
| R\_Date 3. UGA-38993 | 3370 | 3265 | 68 | 3385 | 3245 | 95 | 3335 | 3385 | 3360 | 68 | 3395 | 3345 | 95 | 3370 | 73.9 | 96 | 100 |
| R\_Date 10. B-263420 | 3560 | 3450 | 68 | 3580 | 3395 | 95 | 3500 | 3395 | 3365 | 68 | 3415 | 3350 | 95 | 3380 | 83.4 |  | 100 |
| R\_Date 17. AA-83903 | 3455 | 3385 | 68 | 3485 | 3350 | 95 | 3420 | 3390 | 3360 | 68 | 3410 | 3345 | 95 | 3375 | 111 |  | 100 |
| R\_Date 19. B-236318 | 3450 | 3360 | 68 | 3465 | 3260 | 95 | 3395 | 3390 | 3360 | 68 | 3410 | 3345 | 95 | 3375 | 117.9 |  | 100 |
| R\_Date 14. OS-151671 | 3445 | 3370 | 68 | 3450 | 3360 | 95 | 3395 | 3390 | 3365 | 68 | 3405 | 3360 | 95 | 3380 | 118.1 | 98 | 100 |
| R\_Date 4. B-252854 | 3460 | 3390 | 68 | 3560 | 3360 | 95 | 3430 | 3390 | 3360 | 68 | 3410 | 3345 | 95 | 3375 | 110.9 |  | 100 |
| R\_Date 5. UGA-38992 | 3400 | 3355 | 68 | 3445 | 3270 | 95 | 3375 | 3390 | 3365 | 68 | 3400 | 3355 | 95 | 3375 | 138.5 | 98 | 100 |
| R\_Date 6. UGA-38991 | 3400 | 3355 | 68 | 3445 | 3270 | 95 | 3375 | 3390 | 3365 | 68 | 3400 | 3355 | 95 | 3375 | 138.5 | 98 | 100 |
| R\_Date 20. B-156646 | 3450 | 3270 | 68 | 3460 | 3235 | 95 | 3370 | 3390 | 3360 | 68 | 3405 | 3340 | 95 | 3375 | 119.5 |  | 100 |
| R\_Date 21. B-235218 | 3560 | 3405 | 68 | 3570 | 3390 | 95 | 3475 | 3395 | 3365 | 68 | 3410 | 3350 | 95 | 3380 | 92.3 |  | 100 |
| R\_Date 11. B-263421 | 3460 | 3390 | 68 | 3560 | 3360 | 95 | 3430 | 3390 | 3360 | 68 | 3410 | 3345 | 95 | 3375 | 110.9 |  | 100 |
| R\_Date 12. B-264059 | 3620 | 3485 | 68 | 3690 | 3465 | 95 | 3560 | 3395 | 3365 | 68 | 3415 | 3350 | 95 | 3380 | 92.9 |  | 100 |
| Phase Earthwork Construction |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Boundary Start 3 |  |  |  |  |  |  |  | 3405 | 3375 | 68 | 3425 | 3365 | 95 | 3390 |  |  | 99.9 |
| Boundary End 2 |  |  |  |  |  |  |  | 3440 | 3400 | 68 | 3445 | 3380 | 95 | 3415 |  |  | 100 |
| R\_Date 24. OS-159306 | 3450 | 3385 | 68 | 3450 | 3370 | 95 | 3410 | 3450 | 3420 | 68 | 3455 | 3395 | 95 | 3435 | 108.4 | 97 | 100 |
| R\_Date 31. OS-160358 | 3440 | 3360 | 68 | 3450 | 3350 | 95 | 3385 | 3450 | 3420 | 68 | 3450 | 3385 | 95 | 3435 | 62.7 | 97 | 100 |
| R\_Date 15. B-555137 | 3550 | 3405 | 68 | 3565 | 3395 | 95 | 3470 | 3475 | 3410 | 68 | 3500 | 3390 | 95 | 3450 | 96.8 | 97 | 100 |
| R\_Date 22. B-157421 | 3640 | 3490 | 68 | 3690 | 3465 | 95 | 3575 | 3475 | 3415 | 68 | 3530 | 3390 | 95 | 3445 | 94.5 |  | 100 |
| Phase Intensive Occupation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Boundary Start 2 |  |  |  |  |  |  |  | 3505 | 3425 | 68 | 3585 | 3395 | 95 | 3470 |  |  | 99.9 |
| Boundary End 1 |  |  |  |  |  |  |  | 3755 | 3535 | 68 | 3820 | 3460 | 95 | 3645 |  |  | 99.9 |
| R\_Date 23. B-154428 | 4085 | 3840 | 68 | 4225 | 3700 | 95 | 3950 | 4080 | 3830 | 68 | 4150 | 3720 | 95 | 3930 | 102.8 | 97 | 99.8 |
| R\_Date 18. AA-83902 | 3965 | 3835 | 68 | 4065 | 3720 | 95 | 3890 | 3925 | 3780 | 68 | 3975 | 3670 | 95 | 3845 | 102.5 |  | 99.9 |
| R\_Date 16. AA-83901 | 3820 | 3565 | 68 | 3835 | 3485 | 95 | 3665 | 3820 | 3650 | 68 | 3875 | 3545 | 95 | 3735 | 84.6 |  | 99.9 |
| R\_Date 8. UGA-41847 | 4425 | 4185 | 68 | 4525 | 4100 | 95 | 4335 | 4345 | 3985 | 68 | 4425 | 3730 | 95 | 4170 | 55.8 | 78 | 99.6 |
| R\_Date 7. B-253774 | 4085 | 3905 | 68 | 4145 | 3870 | 95 | 3985 | 4040 | 3850 | 68 | 4080 | 3750 | 95 | 3925 | 99.1 |  | 99.8 |
| Phase Initial Occupation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Boundary Start 1 |  |  |  |  |  |  |  | 4445 | 4010 | 68 | 4590 | 3785 | 95 | 4235 |  |  | 98.5 |
| Sequence |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| U(0,4) | 3.99E-17 | 4 | 68 | 3.99E-17 | 4 | 95 | 2 | 5.38E-17 | 3.136 | 68 | 5.38E-17 | 3.724 | 95 | 2.012 | 100 |  | 99.2 |
| T(5) | -1.14 | 1.14 | 68 | -2.65 | 2.65 | 95 | 2.05E-12 |  |  |  |  |  |  | -0.33 |  |  | 96.5 |
| Outlier\_Model General |  |  |  |  |  |  |  | -565 | 60 | 68 | -715 | 125 | 95 | -10 |  |  | 99.8 |
| U(0,3) | 2.21E-17 | 3 | 68 | 2.21E-17 | 3 | 95 | 1.515 | 1.536 | 1.857 | 68 | 1.32 | 2.052 | 95 | 1.692 | 100 |  | 99.7 |
| Exp(1,-10,0) | -1.24 | -0.05 | 68 | -3.19 | -0.05 | 95 | -0.74 |  |  |  |  |  |  | -0.75 |  |  | 100 |
| Outlier\_Model Charcoal |  |  |  |  |  |  |  | -65 | 0 | 68 | -160 | 5 | 95 | -35 |  |  | 100 |

**MODEL E**

Plot()

 {

 Outlier\_Model("Charcoal",Exp(1,-10,0),U(0,3),"t");

 Outlier\_Model("General",T(5),U(0,4),"t");

 Sequence()

 {

 Boundary("Start 1");

 Phase("Initial Occupation")

 {

 R\_Date("7. B-253774", 3660, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("8. UGA-41847", 3910, 70)

 {

 Outlier("General", 0.05);

 };

 R\_Date("16. AA-83901", 3416, 64)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("18. AA-83902", 3585, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("23. B-154428", 3630, 80)

 {

 Outlier("General", 0.05);

 };

 };

 Boundary("End 1");

 Boundary("Start 2");

 Phase("Intensive Occupation")

 {

 R\_Date("22. B-157421", 3350, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("15. B-555137", 3260, 30)

 {

 Outlier("General", 0.05);

 };

 R\_Date("31. OS-160358", 3160, 20)

 {

 Outlier("General", 0.05);

 };

 R\_Date("24. OS-159306", 3190, 20)

 {

 Outlier("General", 0.05);

 };

 };

 Boundary("End 2");

 Boundary("Start 3");

 Phase("Earthwork Construction")

 {

 R\_Date("12. B-264059", 3340, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("11. B-263421", 3220, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("21. B-235218", 3260, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("20. B-156646", 3150, 50)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("6. UGA-38991", 3150, 20)

 {

 Outlier("General", 0.05);

 };

 R\_Date("5. UGA-38992", 3150, 20)

 {

 Outlier("General", 0.05);

 };

 R\_Date("4. B-252854", 3220, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("14. OS-151671", 3170, 20)

 {

 Outlier("General", 0.05);

 };

 R\_Date("19. B-236318", 3170, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("17. AA-83903", 3201, 39)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("10. B-263420", 3280, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("3. UGA-38993", 3110, 20)

 {

 Outlier("General", 0.05);

 };

 R\_Date("2. B-253789 ", 3120, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("13. UGA-41848", 3200, 25)

 {

 Outlier("General", 0.05);

 };

 };

 Boundary("End 3");

 Boundary("Start 4");

 Phase("Post Flood Occupation")

 {

 R\_Date("9. B-263583", 2570, 40)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("1. B-252853", 2440, 50)

 {

 Outlier("Charcoal", 1);

 };

 };

 Boundary("End 4");

 R\_Date("26. UGA-14091", 740, 40)

 {

 Outlier("General", 0.05);

 };

 };

 };

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