Supplementary Materials for

The Initial Spread of Peaches across Eastern North America was Structured by Indigenous Communities and Ecologies

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The PDF file includes:

Supplementary Methods

Descriptions for all models are included below. All OxCal code for each model is included as Supplemental Code 1.

Primary Oconee Valley Model (Model A)

The primary model for the Oconee Valley uses a simple, single phase. For this primary model, all AMS dates made directly on peach pits in the Oconee Valley were grouped into a single phase and the start boundary for their adoption was modeled. The phase was modeled with trapezium boundaries. The start boundary models to *cal AD 1625-1640 (68% CI)* or *cal AD 1620-1645 (95% CI)* (Supplementary Figure 2).

Alternative Oconee Valley Model (Model B)

Model B (the alternative model to the primary Model A) includes more prior information. Instead of grouping all peach dates into a single phase for the region, individual site chronologies across the Oconee Valley were modeled (Models C-H below) that included both peach dates and dates on other materials. These dates were modeled using archaeological information like stratigraphy and contextual associations. Modeled peach dates from each individual site model were then saved as priors. All of these modeled peach dates, or priors were then included in an independent phase using the prior command. This is similar to the primary model (Model A), except the likelihoods included in the phase were not corrected radiocarbon ages, they were modeled priors extracted from individual site models. A start boundary was then modeled for this 'phase of priors' to determine an overall start boundary for peach introduction into the Oconee Valley. Modeled peach dates indicated in the code below must be saved as priors from the individual site models (Models C-H) before the code for Model B can be run. Three dates on peaches used in Model A were removed from Model B for consistently poor agreement. These are PSUAMS-12730 (9PM260), PSUAMS-12729 (9PM260), and PSUAMS-12723 (9BI1). The modeled end date derived from the Lindsey site model (Model H) was included for visualization purposes. The start boundary models to *cal AD 1635-1645 (68% CI)* or *cal AD 1630-1645 (95% CI)* (Supplementary Figure 3).

Model C (9MG28, Joe Bell)

For Joe Bell, 12 dates were incorporated into a site-wide model that included information on stratigraphy and contextual associations. Two large pieces of charcoal were used for wiggle-matching, in which multiple rings within each charcoal sample were dated and included in a D_Sequence to produce a high-resolution modeled age. These D_Sequences were incorporated into the overall modeled based on their contextual and stratigraphic locations. For each of the dates included in the D_Sequence, an SSimple Outlier model was applied. For each non-charcoal date (including peaches), a General Outlier model was applied. For each charcoal date not used for wiggle-matching, a Charcoal Outlier model was applied. Simple boundaries were used. The start boundary models to *cal AD 1630-1645 (68% CI)* or *cal AD 1520-1645 (95% CI)* (Supplementary Figure 4).

Model D (9BI1, Shinholser)

Two dates were included in a simple phase to refine their chronological ranges at Shinholser. While these do not provide a robust occupational span for the site itself, the information included in the model does refine the spans for each individual AMS date. This refinement is critical given the vagaries of the calibration curve during the 16th and 17th centuries. A General Outlier model was applied to both dates. Additionally, a date of 1565 (the founding of St. Augustine) was included as a *terminus post quem* for the site, given the materials excavated with ages known to post-date 1565. Simple boundaries were included. The start boundary models to *cal AD 1600-1650 (68% CI)* or *cal AD 1565-1650 (95% CI).* The individual dates, however, model to *cal AD 1640-1655 (68%)* and *cal AD 1645-1670 (68%)* (Supplementary Figure 5).

Model E (9GE958)

Two dates were included in a simple phase to refine their chronological ranges at 9GE958. While these do not provide a robust occupational span for the site itself, the information included in the model refines each individual AMS date. A General Outlier model was applied to both dates. Additionally, a date of 1565 (the founding of St. Augustine) was included as a *terminus post quem* for the site, given the materials excavated with ages known to post-date 1565. Simple boundaries were included. The start boundary models to *cal AD 1570-1635 (68% CI)* or *cal AD 1560-1640 (95% CI).* The individual dates, however, model to *cal AD 1650-1665 (68%)* and *cal AD 1625-1645 (68%)* (Supplementary Figure 6).
Model E (9GE958) OxCal Code

Model F (9PM260)

For 9PM260, four dates were incorporated into a site-wide model that included information on stratigraphy and contextual associations. One large piece of charcoal was used for wiggle-matching, in which multiple rings within the charcoal sample were dated and included in a D_Sequence to produce a high-resolution modeled age. The D_Sequence was incorporated into the overall model based on its contextual and stratigraphic locations. For each of the dates included in the D_Sequence, an SSimple Outlier model was applied. For each non-charcoal date (including peaches), a General Outlier model was applied. Simple boundaries were used. Additionally, a date of 1565 (the founding of St. Augustine) was included as a *terminus post quem* for the site, given the materials excavated with ages known to post-date 1565. The charcoal dated at the sites seems to have dated to a period later than the deposition of the peaches. Given the span of time between the peach deposition and the charcoal deposition, the priors were not particularly powerful in refining the peach dates. The individual peach dates, however, both model to *cal AD 1655-1800 (68%).* Each of these exhibit two main peaks in calibration: one peak at *cal AD 1655-1675* and one at *cal AD 1770-1800* (Fig. Supplementary Figure 7). Given the other archaeological materials excavated from the site, and expert analyses by the excavators, the first peak is likely representative of the age of the peach pits.

Model G (9MG231, Lindsey)

For Lindsey, 10 dates were incorporated into a site-wide model that included information on stratigraphy and contextual associations. Three large pieces of charcoal were used for wiggle-matching, in which multiple rings within each charcoal sample were dated and included in independent D_Sequence models to produce a high-resolution modeled age. These models are included below, before the code for the site-wide model. For these D_Sequences, An SSimple outlier model was applied to each R_Date from a single ring. The reason for this is the event to be dated in these cases is the life of the individual ring (a single year). As such, we have no reason to believe that the sample is older than the event we are trying to date (e.g., the ring itself). In addition to the two dates for each charcoal sample, a Date command was included as the last event in each sequence to account for some of the uncertainty in not having the outer ring. The resulting posterior distribution for the Date command was saved as a prior. These three priors (from each of the three charcoal samples, PM58, PM68, and F4L2) were then incorporated into the site-wide model, where a charcoal outlier model was applied to them. The other 4 dates included in the model are on maize (n=2), hickory nut, and walnut.

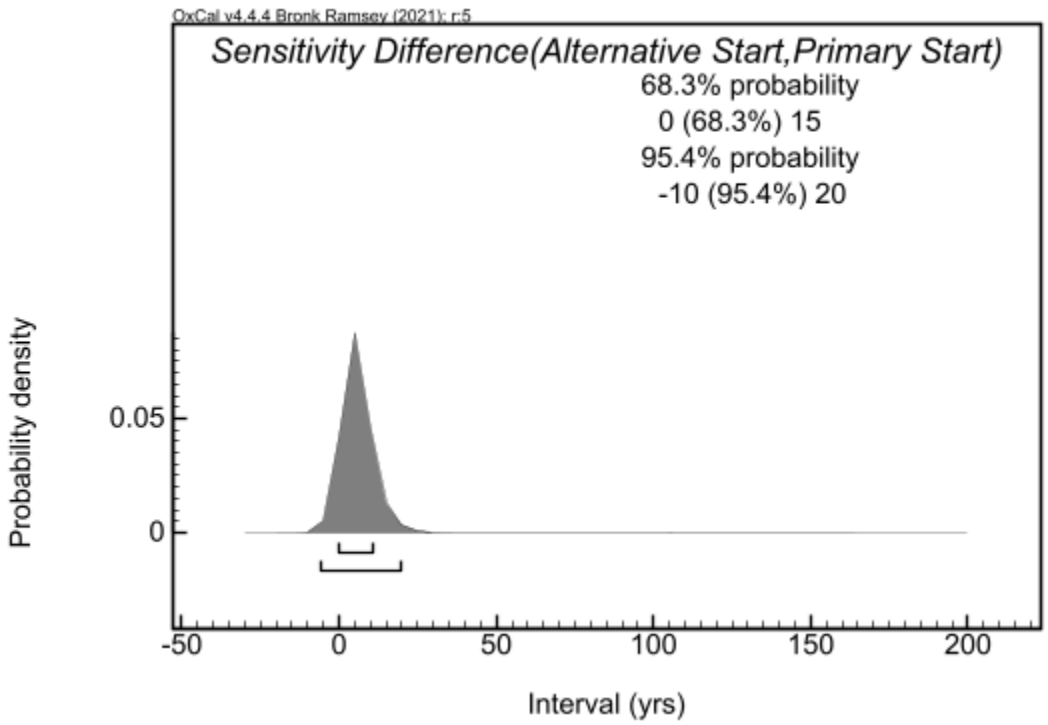
For each non-charcoal date in the site-wide model, a General Outlier model was applied. Simple boundaries were used. The start boundary models to *cal AD 1520-1550 (68% CI)* or *cal AD 1500-1645 (95% CI).* End boundaries modeled to *cal AD 1530-1570 (68% CI)* or *cal AD 1530-1680 (95% CI)* (Supplementary Figure 8).

Given the overlap between the start and end boundaries, the difference command was used to formally compare the two boundaries. The calculated difference at the 68% interval is between -30 and 5 years, while at the 95% interval the estimated difference could range between -165 and -105 (4.7%) or between -80 and 5 years (90.7%) (Supplementary Figure 9).

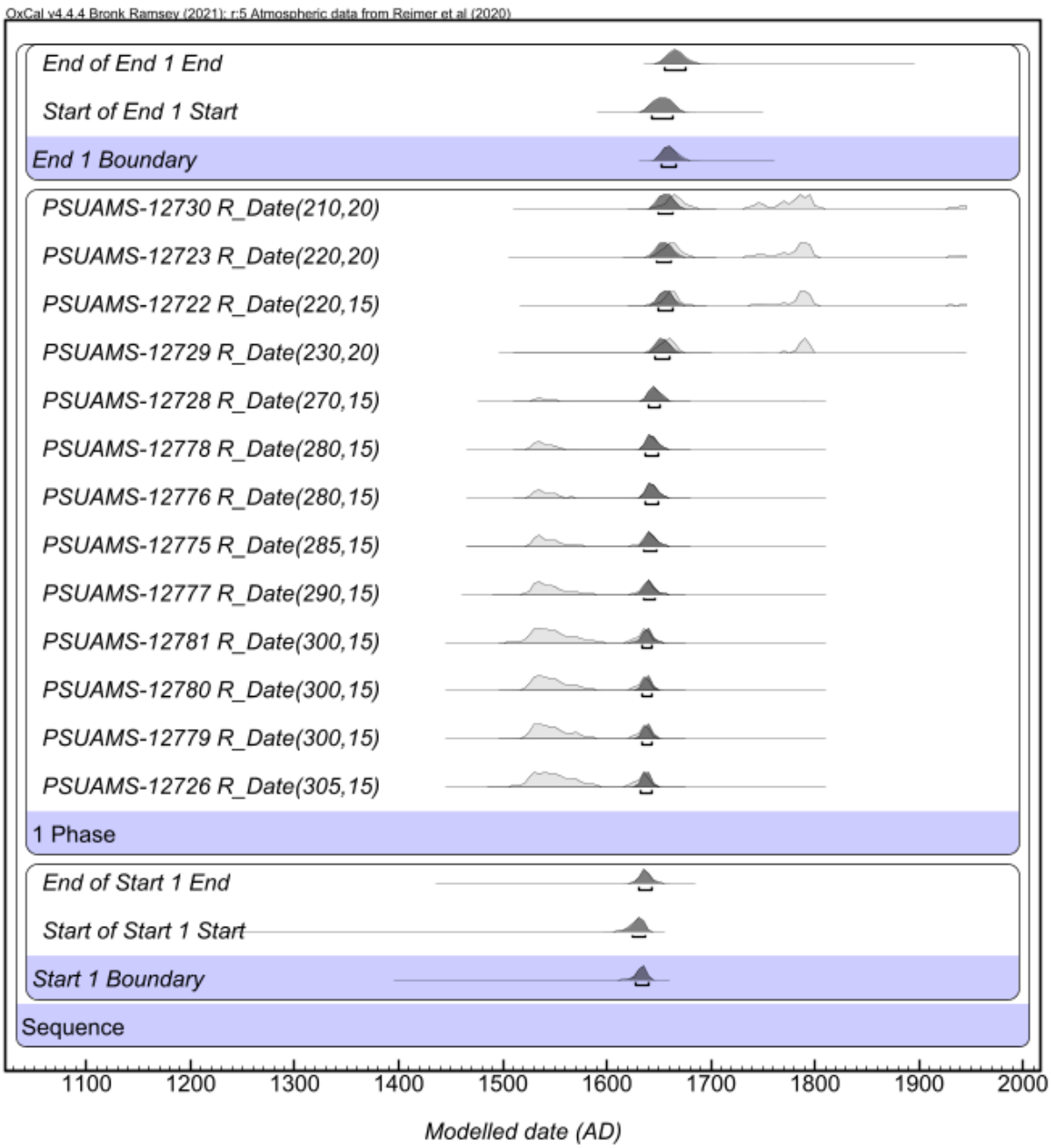
Model H (40WG20, Runion)

Ten dates were used in a model that included information on contextual associations. One large log was used for wiggle-matching to produce a high-resolution modeled age for the log. For each of the dates included in the D_Sequence, an SSimple Outlier model was applied. For each non-charcoal date, a General Outlier model was applied. For each charcoal date not used for wiggle-matching, a Charcoal Outlier model was applied. Simple boundaries were used. The start boundary models to *cal AD 1410-1495 (68% CI)* or *cal AD 1230-1620 (95% CI).* End boundaries modeled to *cal AD 1645-1760 (68% CI)* or *cal AD 1530-1935 (95% CI)* (Supplementary Figure 10).

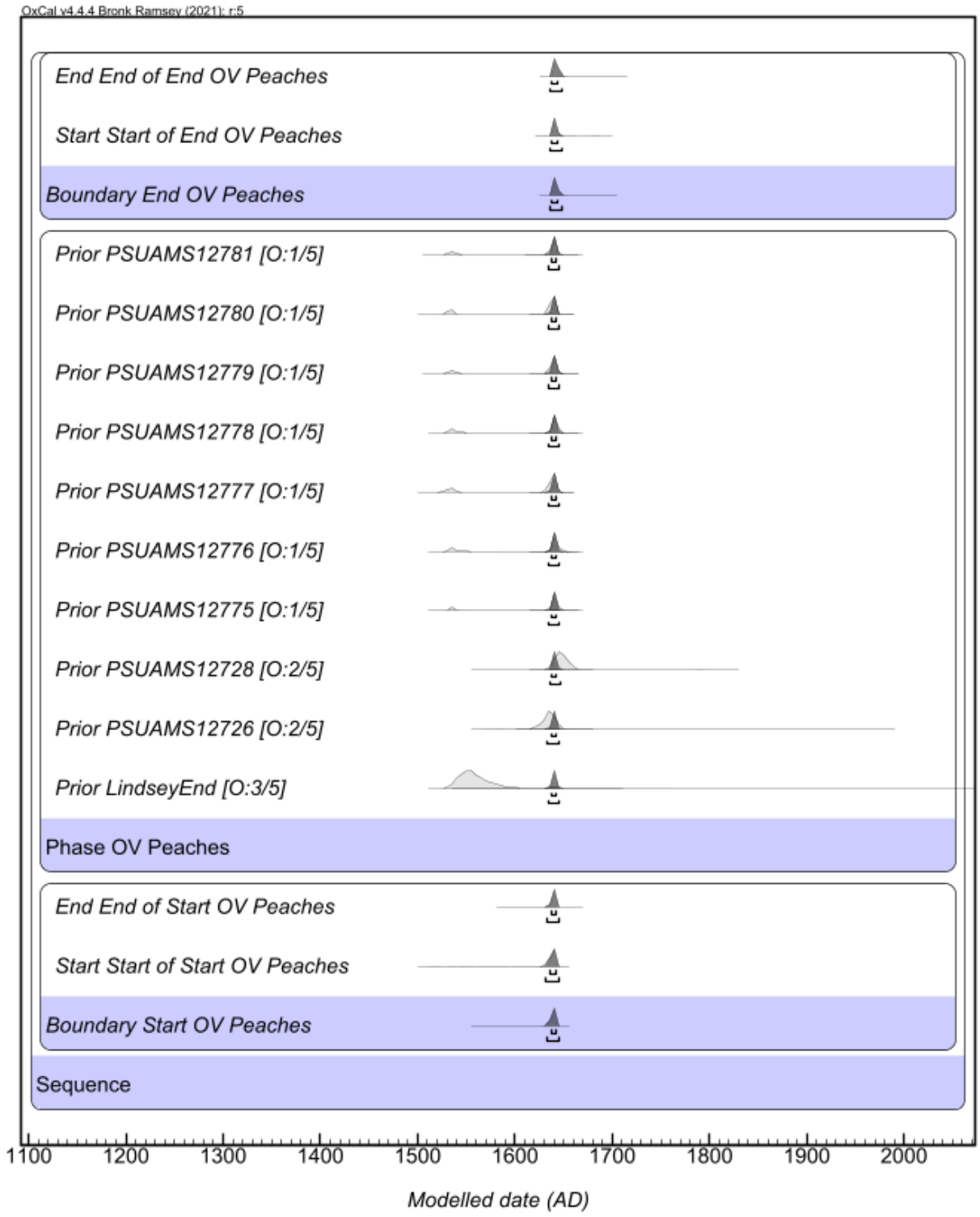
Supplementary Figures



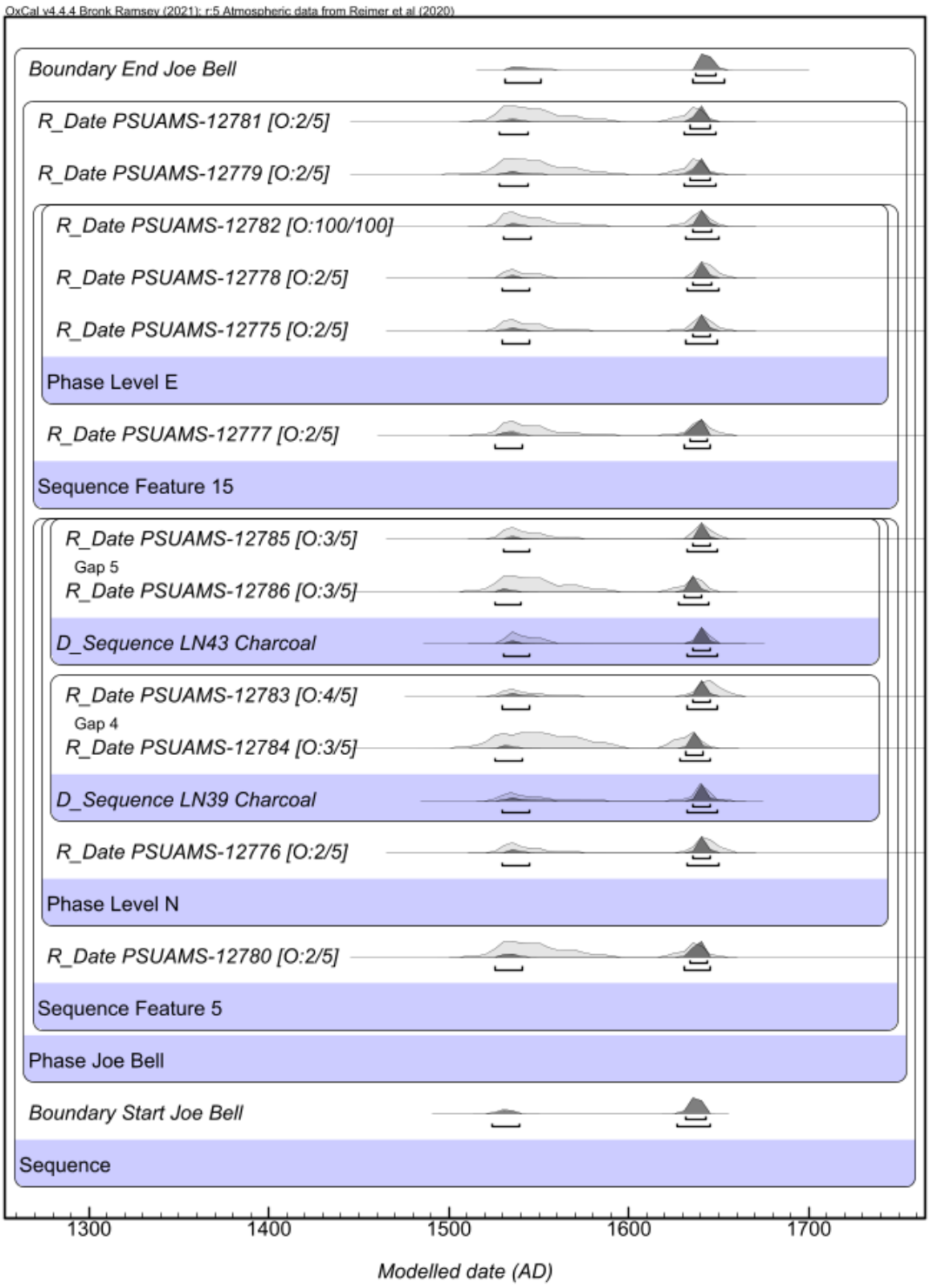
Supplementary Figure 1. Probability distribution for the difference between the primary model (Model A) and alternative model (Model B). OxCal code is included below as Model I.



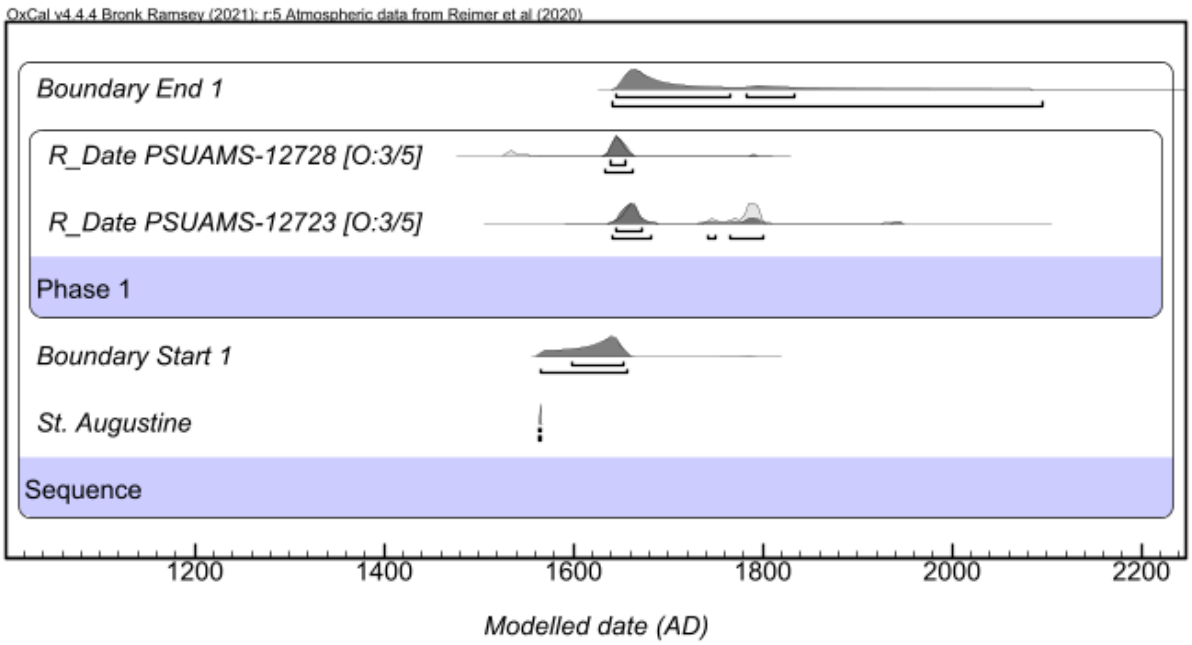
Supplementary Figure 2. Bayesian chronological Model A. The primary model for the introduction of peaches into the Oconee Valley in the interior of Georgia.



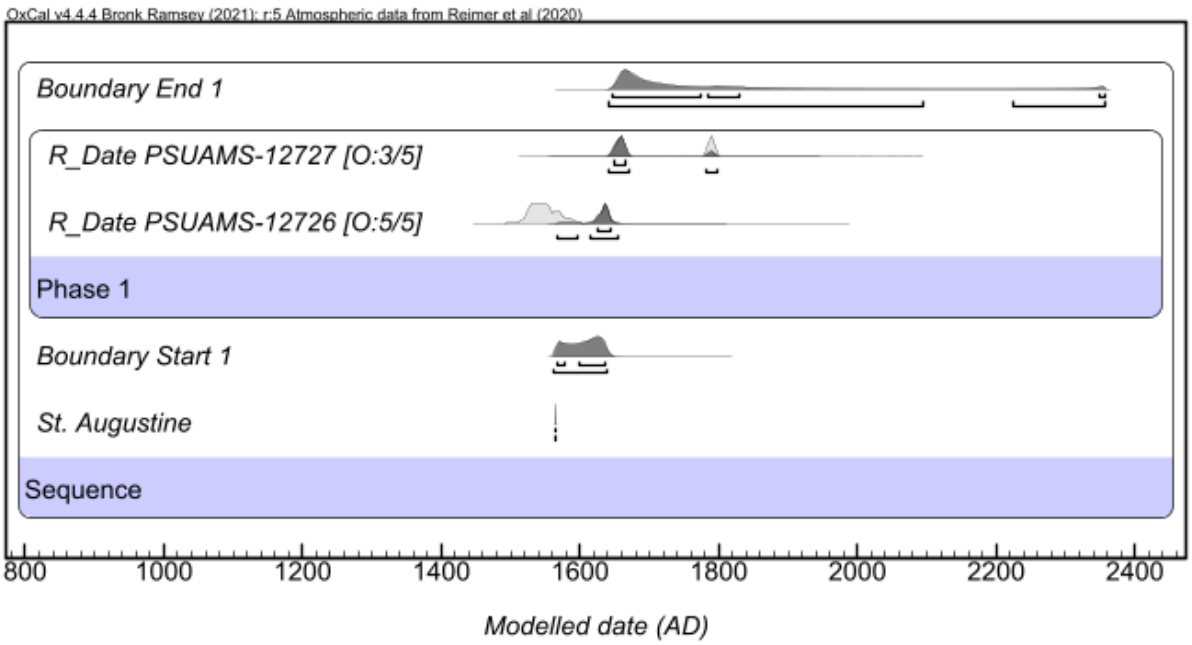
Supplementary Figure 3. Bayesian chronological Model B. An alternative model for the introduction of peaches into the Oconee Valley in the interior of Georgia.



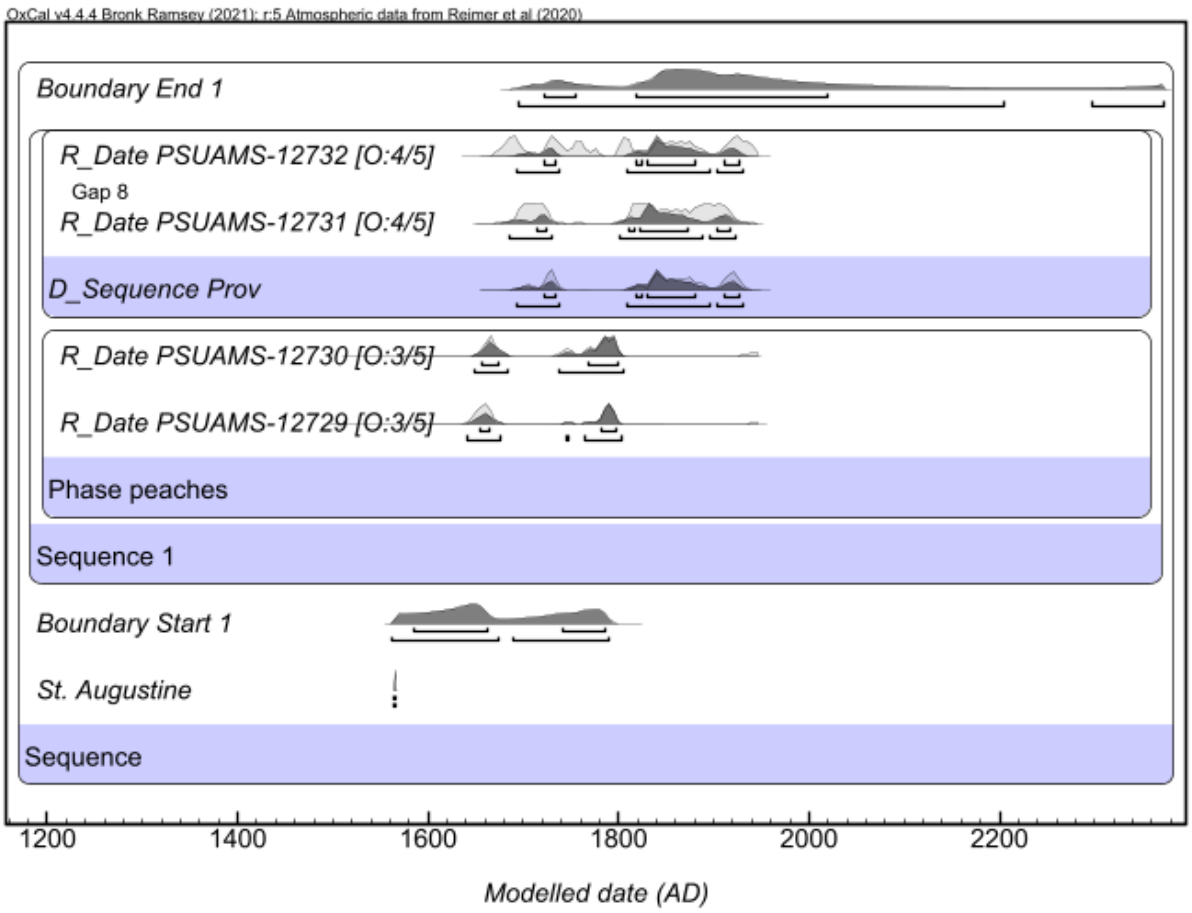
Supplementary Figure 4. Bayesian chronological Model C for the Joe Bell site (9MG28).



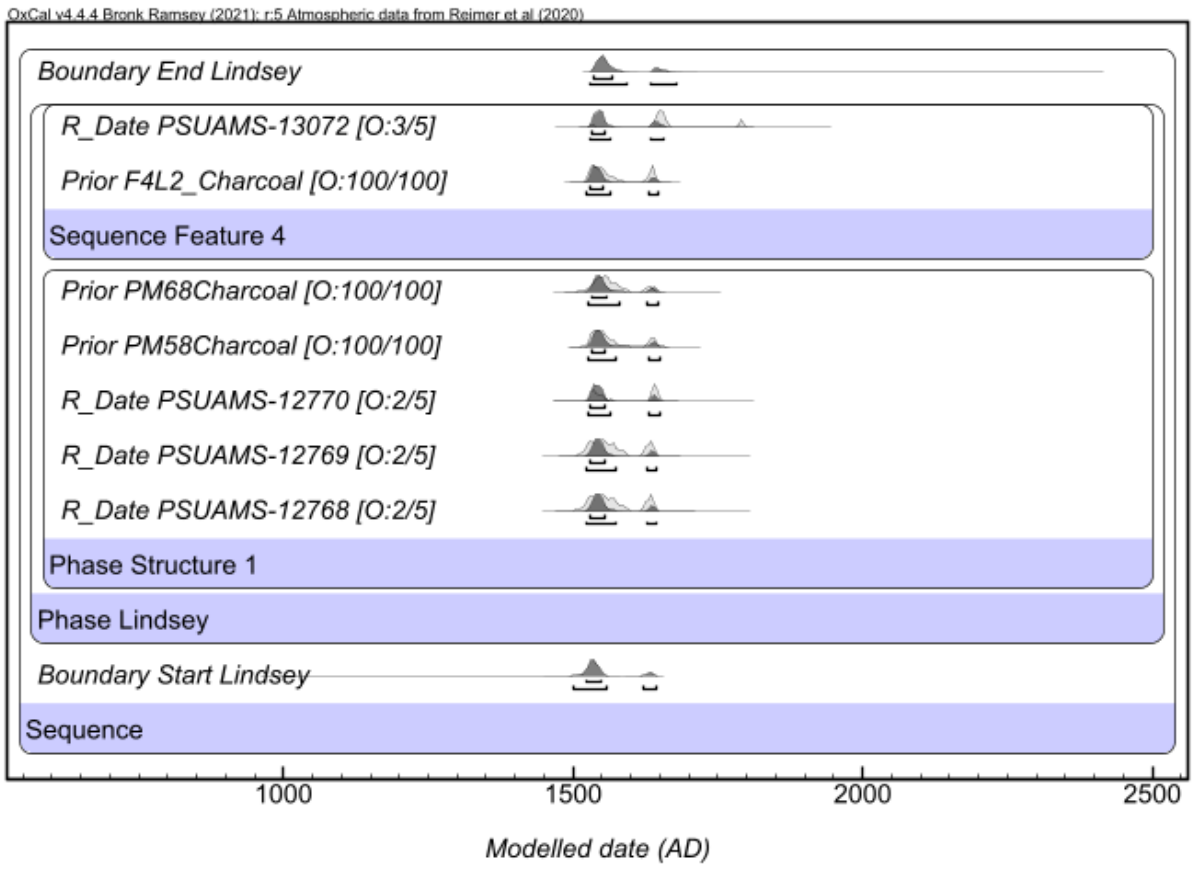
Supplementary Figure 5. Bayesian chronological Model D for the Shinholser site (9BI1).



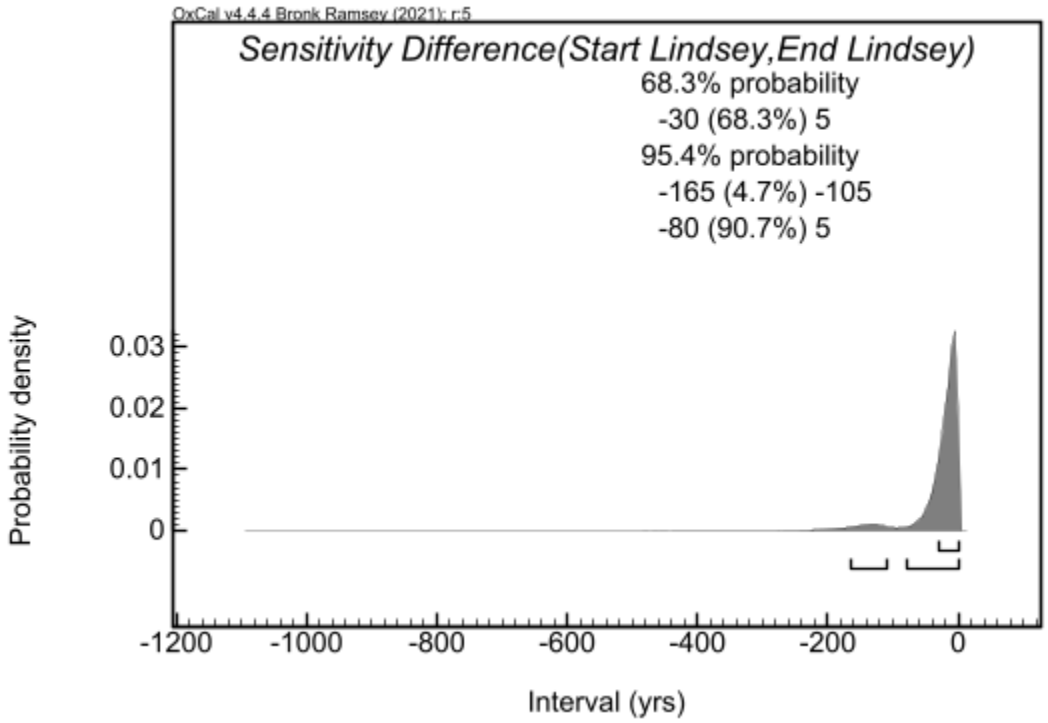
Supplementary Figure 6. Bayesian chronological Model E for 9GE958.



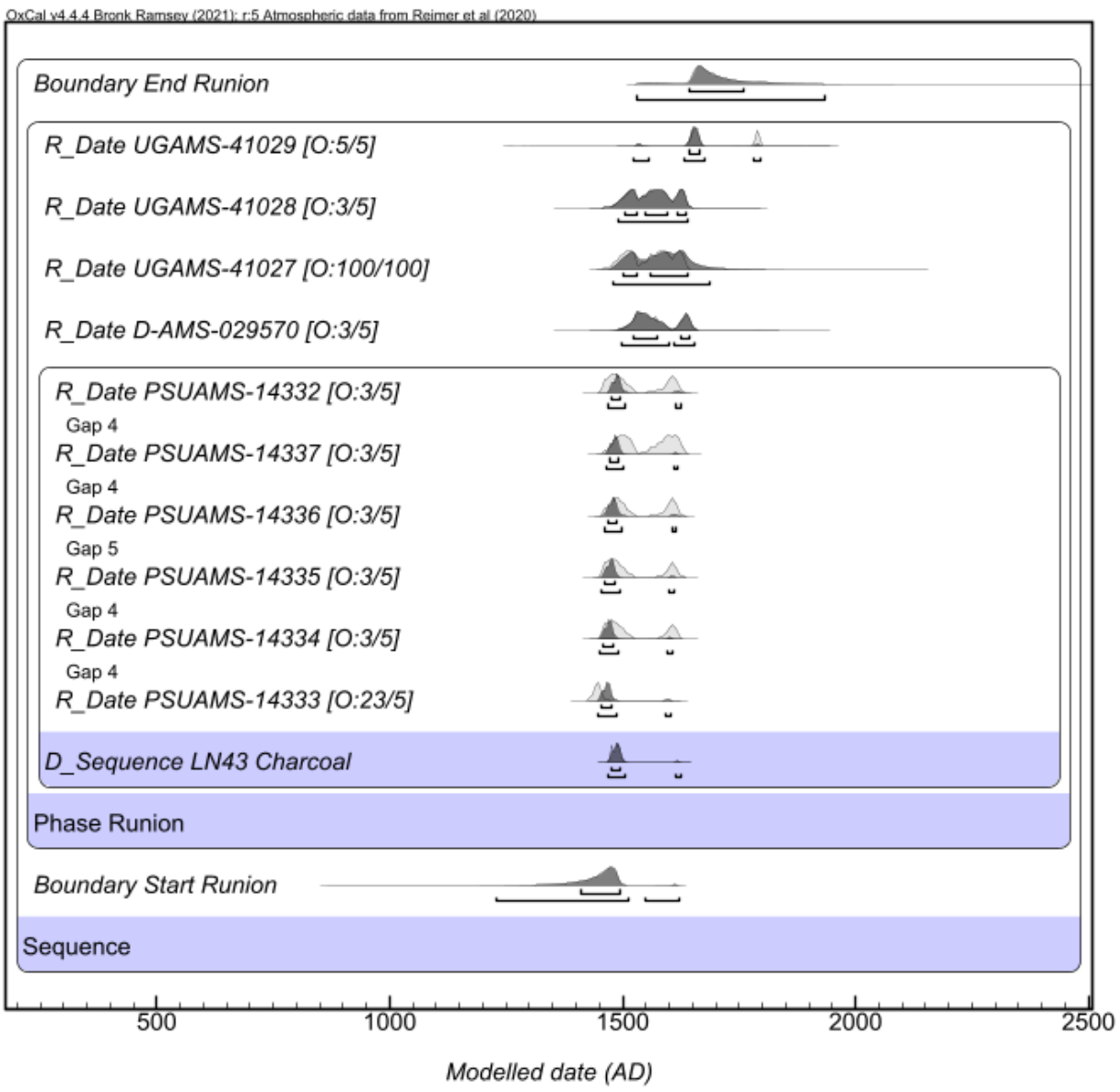
Supplementary Figure 7. Bayesian chronological Model F for 9PM260.



Supplementary Figure 8. Bayesian chronological Model G for the Lindsey site (9MG231).



Supplementary Figure 9. Probability distribution for the difference between the modeled start and end boundaries for Lindsey. OxCal code is included below as Model G.



Supplementary Figure 10. Bayesian chronological Model H for the Runion site (40WG20).

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