Supporting Information for MagIC as a FAIR repository for America's archaeomagnetic legacy data

Shelby A. Jones [1,2], Eric Blinman [2], Lisa Tauxe [1], Jeffrey Royce Cox [2], Stacey Lengyel [3], Robert Sternberg [4], Jeffrey Eighmy [5], Daniel Wolfman [6], Robert DuBois [6]

[1]Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA 92093

[2]New Mexico Department of Cultural Affairs, Office of Archaeological Studies, Santa Fe, NM, 87507

[3]East Tennessee State University, Johnson City, TN, 37614

[4]Franklin and Marshall College, Lancaster, PA, 17604

[5]Unaffiliated

[6]*Posthumously

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Introduction

Four subsets of data from the Four Corners region were explored in the development of the polynomial fit model of paleosecular variation. Only the selected model based on the subset of data that satisfy $\alpha_{95} \leq 4$ was included in text and transformed into to a VGP projection. The other three are presented here in Figure S1.

Due to the low density of accepted data from the Lower Mississippi River region, from Mesoamerica and from South America, those data were not graphically depicted in the text. The magnetic declination and inclination of the sites from these regions, with respect to time, are presented here in Figures S2, S3, and S4.

Reproductions of previously published but difficult to access VGP models for the other regions are available by contacting the corresponding author.
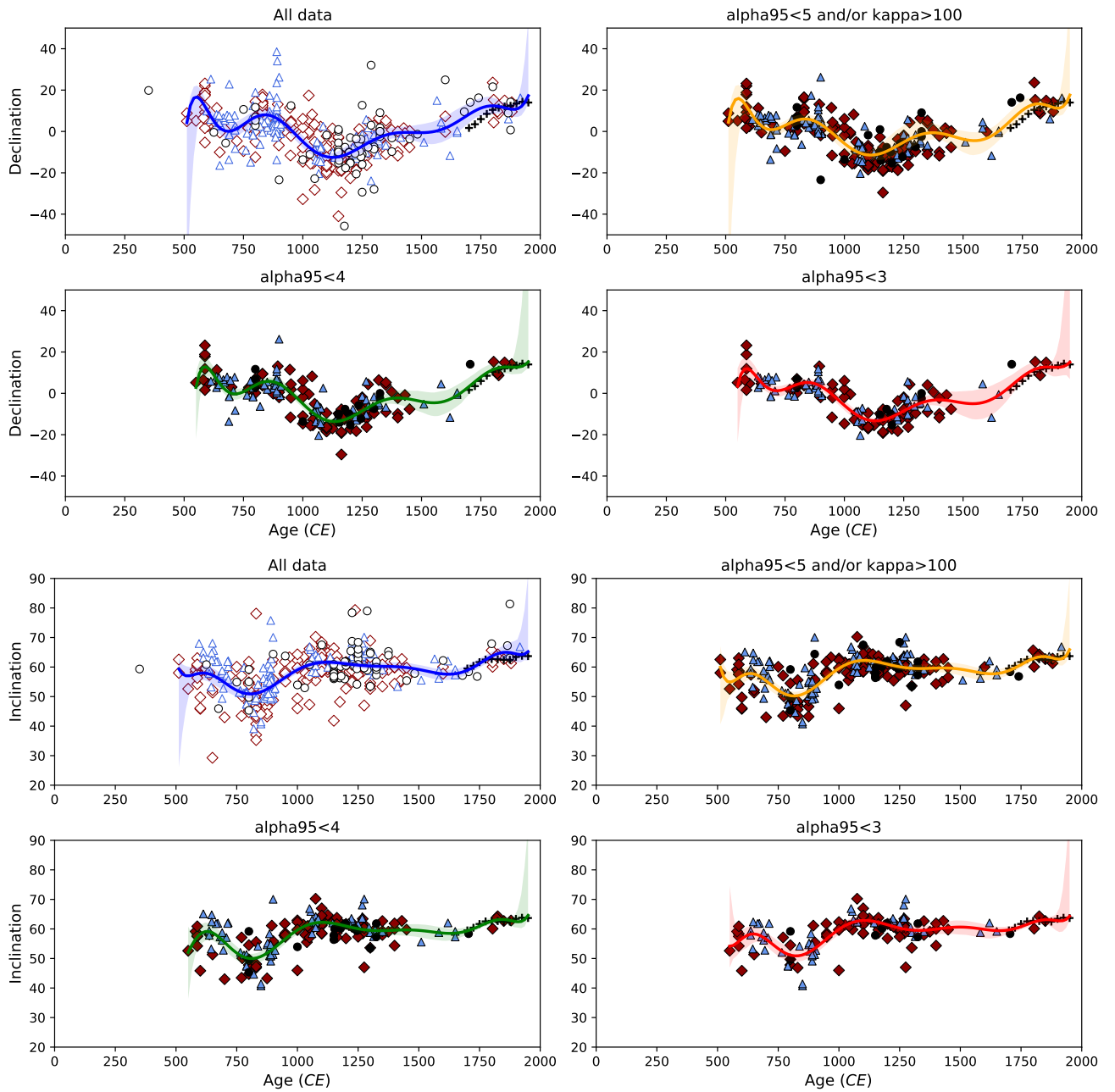
Figure S1: Other polynomial fit models explored

Blue (top-left): The model derived from all the data (402 data points in the last 2000 years) does not reliably fit the declination predictions from gufm, black plus-sign symbols.

Yellow (top-right): The model derived from the subset of data that passed this paper's selection criteria (239 data points in the last 2000 years) has a phase offset in the declination during the $8^{th} - 14^{th}$ centuries that does not fit the data adequately.
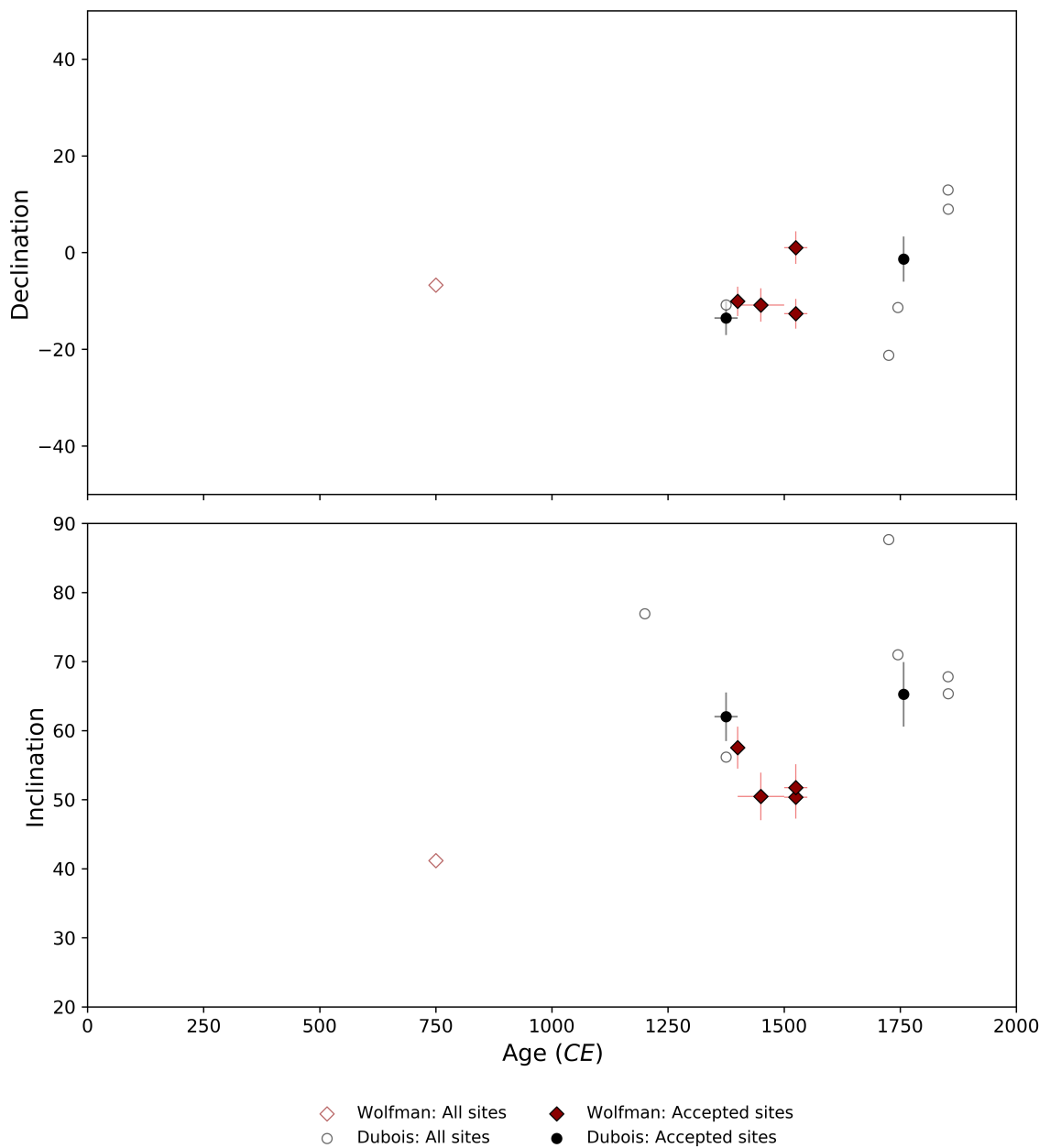
Red (bottom-right): An alpha95 threshold of 3 degrees, decreased the subset of data available for modeling to 130 data points in the last 2000 years and was deemed to be an overly strict interpretation for the data.

Green (bottom-left): A balance of precision and quantity of data was favored, resulting in the preference to select this model based on the subset of data with an alpha95 threshold of 4 degrees (152 data points during the last 2000 years) for conversion into VGP coordinates.
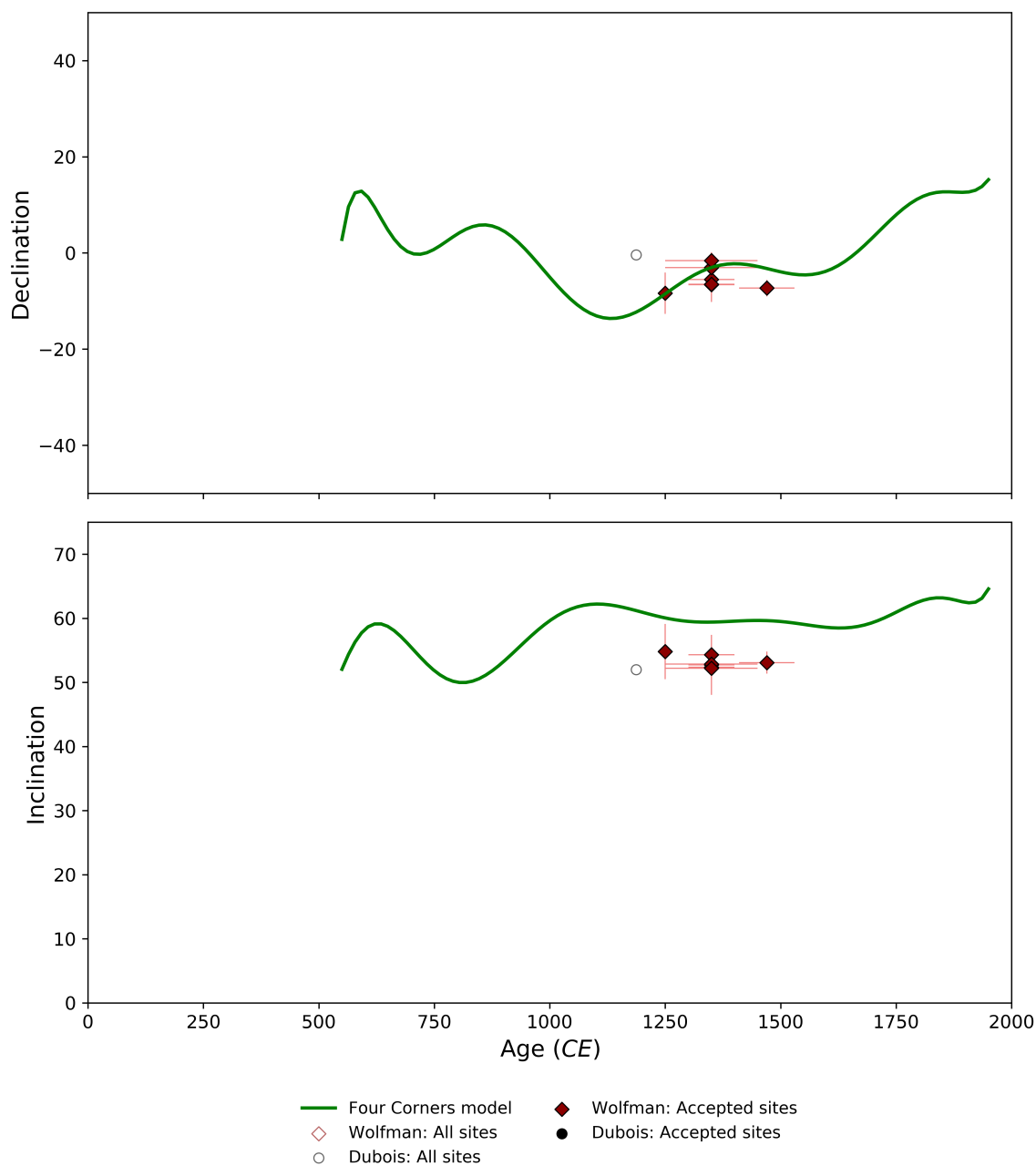
Figure S2: Lower Mississippi River region

Within the Lower Mississippi River region, DuBois sampled material from 287 burned features, Wolfman sampled 33 features, and Eighmy sampled 63. Of these only twenty-two have independent age chronology (ten of which are older than 2000 years before present), and seven passed this paper's acceptance criteria (Table 4 in the main text). Those data are presented here, with respect to age. There are too few data to confirm or refute the previously published models for the region that were compiled by Wolfman.

Figure S3: Northern Mesoamerica

Due to the latitudinal dependence of inclination, the data from Mesoamerica were interpreted in two divisions - northern and Mesoamerica. The few sites in the northern region (24 archaeological features), are culturally similar to the indigenous populations of the southern Four Corners region and are in close enough proximity that they coupld potentially be included in regional modeling efforts in the future. Those data are presented here, with respect to age. The eight sites are overlaid on top of the new polynomial fit model for the Four Corners region. The inconsistency noted between the inclination data and the model could be the result of a latitudinal dependence but could also be an artifact in the model, due to low data density in the Four Corners region, during the same time interval.

Figure S4: Southern Mesoamerica

Of the 376 archaeomagnetic sites sampled in the southern region of Mesoamerica, forty-seven have independent age constraints and only twenty-four passed this paper's acceptance criteria (Table 4 in the main text). Those data are presented here, with respect to age. The data are too dispersed to confirm or refute the previously published models for the region that were compiled by Wolfman.
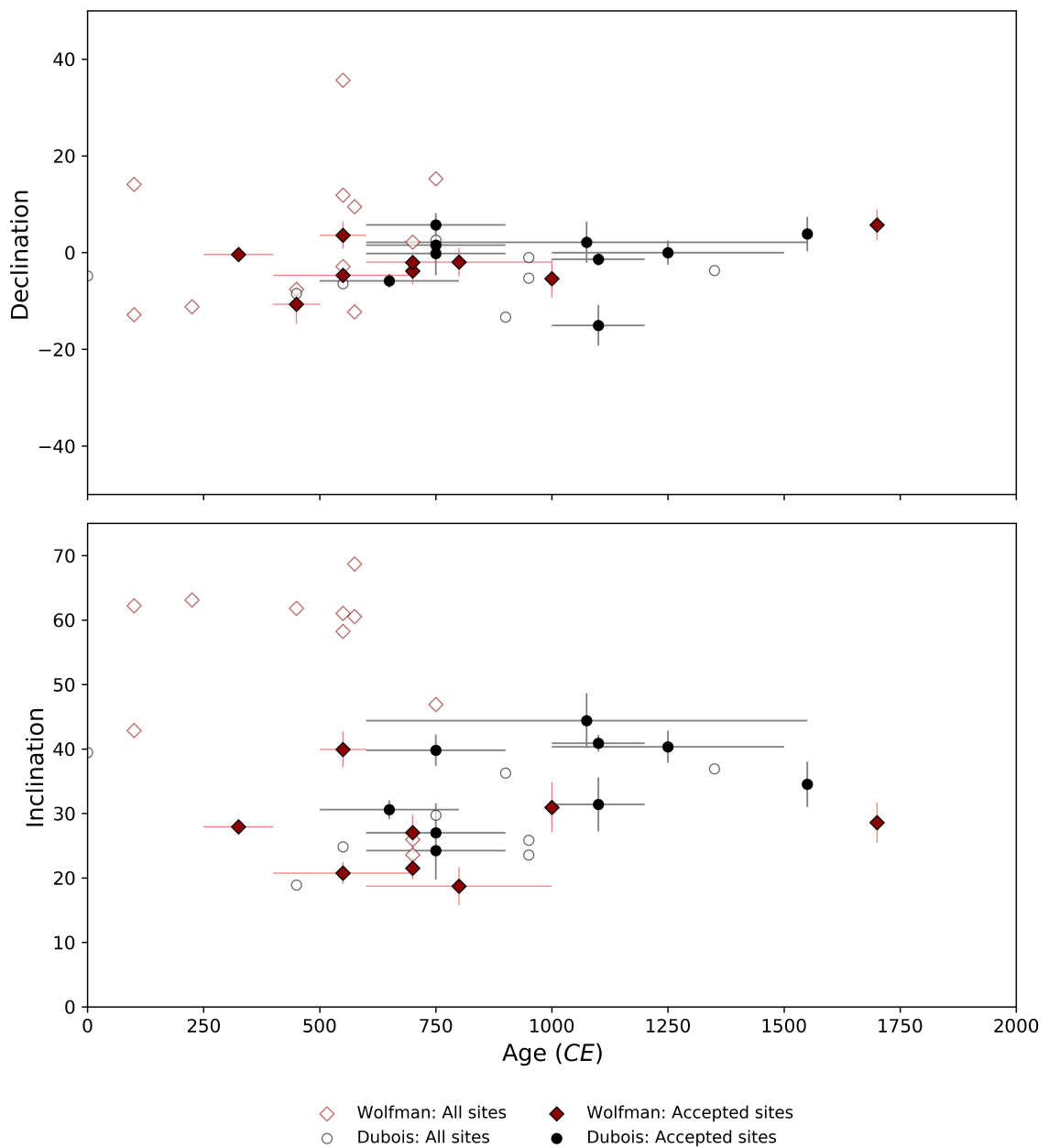
Figure S5: South America

South America is the least sampled region in the archive and of those, only fourteen archaeomagnetic sites passed our acceptance criteria. Those data are presented here, with respect to age. There are too few data to confirm or refute the previously published models for the region that were compiled by Wolfman and Dodson.