

Interactive comment on “Extracting Weather Information from a Plantation Document” by Gregory Burris et al.

Anonymous Referee #1

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This paper appears to make a solid contribution to the historical climatology of the southern United States by explaining and making accessible the extensive weather- and climate-related data of a historical document, the records of Stanley Plantation, Virginia. The paper explains the document’s context, categories of observations, potential uses and weaknesses for climate and weather reconstruction; it provides two examples of how its records may be used to illustrate local climatic change between the period of observations (1816-42) and recent decades. It demonstrates the potential for further historical climatology based on plantation records. Within my range of expertise, I would judge the submission as nearly publishable as is, but I would recommend minor revisions:

-There are numerous minor grammatical and syntactical errors and passages that

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could be made more concise and less repetitive.

-In section 3.1.1, it is important to note that historical climatologists working in other regional contexts (particularly early modern Europe and China) have long dealt with issues of the objectivity and potential for quantification of descriptive weather observations and have developed methods to address them such as monthly and seasonal indices (for an overview, see Christian Pfister and Sam White, “Evidence from the Archives of Societies: Personal Documentary Sources,” in *The Palgrave Handbook of Climate History*, ed. Sam White, Christian Pfister, and Franz Mauelshagen (London: Palgrave Macmillan UK, 2018), 49–65, https://doi.org/10.1057/978-1-137-43020-5_5). Therefore, with regard to these weather descriptions, it may be more helpful for the authors to discuss the particular strengths and weaknesses and the objectivity and subjectivity of these particular plantation records, rather than going over issues in personal weather descriptions in general. They may (although I wouldn’t consider it necessary) also wish to propose a method for extracting objective and quantifiable information from the narrative descriptions in their records.

-While the article does mention changing agricultural practices at Stanley Plantation (p.5, lines 15-25), the authors could do more to contextualize and emphasize the magnitude of agricultural experimentation and changes in land use in Virginia at this time, under pressure from changing markets, declining soil fertility, and new notions of agricultural “improvement.” This history is discussed in more detail in another close examination of long-term Virginia plantation records (although not for purposes of historical climatology): Lynn Nelson, *Pharsalia: An Environmental Biography of a Southern Plantation, 1780-1880* (University of Georgia Press, 2007). I was surprised not to see this publication in the works cited, and I believe it would be helpful for this project. In this regard, or in section 4.2, the authors should also indicate (if possible) whether changing agricultural practices including the introduction of new cultivars appear to create artificial breaks or inhomogeneities in the timing of plant phenological observations.

-The authors mention crop pests in section 4.1: does the presence of any of these also

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indicate specific climate conditions (similar to malaria, as discussed in the article)? If they do, it's worth mentioning; but if not, I don't recommend any changes. -The authors may save a few lines in the discussion of challenges in early thermometer readings in section 4.5 by citing to Dario Camuffo, "Evidence from the Archives of Societies: Early Instrumental Observations," in *The Palgrave Handbook of Climate History*, ed. Sam White, Christian Pfister, and Franz Mauelshagen (London: Palgrave Macmillan UK, 2018), 83–92, https://doi.org/10.1057/978-1-137-43020-5_7 and Ingeborg Auer, "Analysis and Interpretation: Homogenization of Instrumental Data," in *The Palgrave Handbook of Climate History*, ed. Sam White, Christian Pfister, and Franz Mauelshagen (London: Palgrave Macmillan UK, 2018), 99–105, https://doi.org/10.1057/978-1-137-43020-5_9, which already summarize these issues. I offer this only as a suggestion.

-In general, I would like to see some verification of the accuracy and consistency of the climate information provided in the plantation documentation, or a suggestion how it might be verified. This verification could come from examination of its internal consistency: e.g., do variations in weather descriptions match variations in the timing of plant phenological observations? Or it could come from comparison with external information: e.g., does the Stanley Plantation document appear to consistently match other nearby records of climate or weather variability (e.g., stories about weather in a local newspaper, or descriptions of seasons in a local history) or well-observed extreme events that affected the region (e.g., the unusual winter of 1827-28 discussed in Cary J. Mock et al., "The Winter of 1827–1828 over Eastern North America: A Season of Extraordinary Climatic Anomalies, Societal Impacts, and False Spring," *Climatic Change* 83 (2007): 87–115, <https://doi.org/10.1007/s10584-006-9126-2>)? In other words, even if the document does not provide a complete record of weather variability, is there a way to see if serves at least as a consistent high-pass filter for major variations and extremes? Even if the authors do not provide such verification here (and I do not regard it as essential for publication of this manuscript) could they suggest how it may be done in the case of this and other plantation records? That could be helpful for future research.

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