Clim. Past Discuss., 3, S865–S870, 2008
www.clim-past-discuss.net/3/S865/2008/

Climate of the Past Discussions

Interactive comment on "Maximum growing season temperature in Western Europe: multi proxy reconstructions in Fontainebleau from 1596 to 2000" *by* N. Etien et al.

N. Etien et al.

Received and published: 20 March 2008

Answer to Referee #1

Abstract

1. The abstract is patchy and needs to be rewritten. As it stands, there is no flow and important information (on research question and objectives, data and methods, as well as the key findings) is largely missing.

The abstract has been rewritten.

Introduction

The introduction has been rewritten almost entirely.

2. The second sentence needs at least one reference (line 25, page 1064).

Initial version: Multi-proxy reconstructions show a large dispersion in the estimated decadal and centennial temperature range. Corrected version: At the scale of the Northern Hemisphere, the magnitude of decadal to centennial temperature change remains associated with a significant uncertainty (see Juckes et al, 2007 for a recent review).

3. The third sentence is incorrect, as various recent studies have proved the ability of tree-ring data to retain low frequency information. This is particularly the case for the herein used reference (Esper et al., 2002, Science), which introduced a tree-ring width based millennial-long temperature reconstruction representative for large parts of the NH, which allowed multi-centennial trends to be well preserved.

Initial version: Recent studies have highlighted the intrinsic limitations of dendrochronological records on multi-decadal time scales, due to the requirement to correct for age effects on tree growth (Esper et al., 2002). Corrected version: Recent statistical methods have been developed in order to best preserve the decadal variability of dendrochronological records (Esper et al., 2002). Other methods are being developed in order to combine low and high frequency records at hemispheric (Moberg et al., 2005) or regional scale (Guiot et al., 1983).

4. Sentence four addresses the segment length curse that is valid for individual tree-ring detrending, but should cite Cook et al. (1995, The Holocene) instead.

Initial version: The segment length of individual tree records is an upper limit to the longest periodicities potentially recorded in such records (Briffa, 2000). Corrected version: This sentence was removed.

5. Sentence five is out of place and fairly incomprehensible without any reference. However, I assume that the authors refer to Moberg et al. (2005), a study that certainly should not be claimed classic.

CPD

3, S865–S870, 2008

Initial version: Classically, reconstructions are discussed for high and low frequencies, below or above 40 or 80 years. Corrected version: This sentence was removed. An equivalent idea is presented in the sentence quoted above: Other methods are being developed in order to combine low (etc).

6. The authors provide an absolutely incorrect list of references when stressing EU-scale temperature reconstruction (line 9-11, page 1065).

Initial version: Several attempts have been made to quantify European temperature changes during the past centuries (Overpeck et al., 1997; Jones et al., 1998; Mann et al., 1998; Crowley, 2000; Briffa, 2000; Briffa et al., 2001; Esper et al., 2002; Luterbacheret al., 2004; Guiot et al., 2005; Moberg et al., 2005). Corrected version: At the European scale, several attempts have been made to quantify temperature changes during the past centuries (Briffa et al, 2002; Chuine et al., 2004; Luterbacher et al, 2004, 2007; Xoplaki et al., 2005; Guiot et al, 2005; Büntgen et al, 2006; Meier et al., 2007).

7. I have to admit that, after such a sloppy start, it is a kind of difficult to stay interested in such a lenghty manuscript on the combination of two records. The five introduction subchapters (1-5) are not well balanced, and their connection is partly missing. The authors introduce: (1) a broad paleoclimatic perspective, (2) general perspectives on potentials and limitations of various tree-ring parameters, (3) grape harvest data from Burgundy, (4) the ability of an existing (in review) multi-proxy reconstruction (1900-present) from this data (living oak trees in Fontainebleau), and (5) the structure of this study.

The introduction was rewritten following: (1) The aim of the study (Documenting the climate natural variability) (2) Interest of regional studies, contribution of tree-ring data (3) Type of data used in our reconstruction (d18O, Grape harvest dates): strength and weakness of these proxies (4) Outline of the paper.

8. The authors further refer to a paper in review at Climatic Change, which seems to

CPD

3, S865–S870, 2008

be of some methodological relevance for this study. This overlap becomes even more critical, when 20th century data are shared.

The paper, mentioned by the referee, was provided. It has been accepted since then for publication at Climatic Change. The overlap is not critical as the main interest of the paper submitted at Climate of the Past lies in the four century long reconstruction and not on the calibration methodology. The two papers are complementary.

Data and methods:

9. The data and methods section is over excessive! The authors provide all kinds of side information regarding sampling site (2.1), local forest and castle history (2.2), sample preparation (2.3), isotopic analysis (2.4), and grape harvest data (2.5). In fact, most of these detailed descriptions are not really necessary to understand the reconstructed temperature history, and only distract from those informations that are directly related to the multi-proxy approach. Therefore, I strongly recommend shortening this chapter by approximately 2/3, which is particularly valid for 2.1-2.3.

This part has been considerably shorten and focused. 2.1 Sampling site: still exists but is shorter, and appears as an introduction to the Material and method section. 2.2 Fontainebleau Forest and Castle history has been removed. 2.3 Sample preparation is shorten and focused on dating procedure 2.4 Isotopic analyses was shorten (the d13C description was transferred to an appendix. The reason why this isotope is not used in the reconstruction is made clear). 2.5 Grape harvest data was slightly modified Initially this section contained 3573 words. It is now 1119 words long (that is approx. 2/3 shorter).

10. In contrast, methodological explanation of the final reconstruction (data merging and calibration) is largely missing. The results chapter is poorly structured, since it comprises misplaced methodological elements that should be moved to previous chapters or removed entirely. It is also mixed with components of the discussion. A more rigorous presentation of key findings would greatly improve traceability and study' s

CPD

3, S865–S870, 2008

overall flow.

This section has also be shorten and clarified. The structure has been changed as follows: 3.1 Proxy records has been slightly changed. 3.2 Calibration is made clearer, the uncertainty calculation is made explicit. This section is now untitled: Reconstruction methodology and uncertainties. 3.3 Reconstruction and comparison with other reconstruction becomes: Fontainebleau Tmax AMJJAS from 1596 to 2007. The comparison with other reconstructions was moved in the discussion (section 4). The reconstructed temperature series is described more thoroughly. 3.4 Spectral properties has been shorten.

Section 3 (Results) of the new version, is devoted to the description of the data and of the uncertainties on the reconstruction. The calibration is not presented in detail. The reader is invited to refer to the preliminary study (Etien et al. accepted for publication at Climatic Change).

11. A discussion chapter is missing

In the new version, a section 4 was elaborated. It deals with the comparison of our reconstruction with other Western Europe temperature reconstructions. It is divided in two sub-sections:

Comparison with early instrumental data from De Bilt and Central England Comparison with reconstructions based on proxies

12. The conclusion and perspective chapter is reasonably well written and straight to the point.

This section was slightly changed in order to take into consideration the revisions.

13. In short, the manuscript' s current version does not reach the quality necessary for publication in Climate of the Past, even though the data utilized are merit. The paper is in a form, which makes it virtually impossible to review the key methodological steps and uncertainties. The primary reasons for this conclusion are relate to the poor

CPD

3, S865–S870, 2008

organization and unbalanced presentation of the paper (e.g., imprecise introduction, unnecessary data description, unclear presentation of the key findings, no discussion chapter, overestimation of results), and the low level of accuracy (e.g., choice of references, repetitions, English style), which all contribute to a substantial lack of focus. Nevertheless, a more condensed article considering careful interpretation of data, focused writing, and simplified figures could perhaps add towards a paper that would allow the science in this analysis to be better reviewed.

We took into consideration all these comments: as explained above we completely reorganise the paper and rewrite most paragraphs. The plan is hopefully more logical. The unnecessary figures were removed. The English style has been checked.

Interactive comment on Clim. Past Discuss., 3, 1063, 2007.