

Interactive comment on “Extreme pointer years in tree-ring records of Central Spain as evidence of volcanic eruptions (Huaynaputina, Peru, 1600 AC) and other climatic events” by M. Génova

J. Martin-Vide (Referee)

jmartinvide@ub.edu

Received and published: 15 January 2012

General comments

1. The article identifies the pointer years based on numerous tree-ring chronologies of the central Iberian Peninsula range over the last 406 years (1600-2005). The results contribute to improve the knowledge on climate variability on a plurisecular scale, as well as the occurrence of extreme weather along the last four centuries, in central Spain. In general terms the article is very interesting. 2. The article uses a wide database (numerous tree chronologies, 15 sites, broad altitude range, N and S slopes, high number of samples in each site, and a long period). 3. The text is comprehensive,

C2283

written in a concise way. There is a quite clear discursive line through the text that allows understand as a whole the main ideas. 4. The author demonstrates a good knowledge and understanding of the subject. 5. The statistical methods are appropriated. 6. The title is not precise enough. I would prefer ‘Extreme Pointer Years in Tree-Ring Records of Central Spain as Evidence of Weather Extremes and other Natural Events’, or something like this. 7. By the way, in my opinion the Huaynaputina volcano relationship with negative pointer years in the beginning of 17th century is quoted but not proved completely. On the other hand taking into account some atmospheric circulation causes, including the effect of low-frequency variability patterns (eg. NAO) will help to explain the occurrence of the pointer years in the discussion. 8. The abstract is OK. No key words? Summing up: The subject of the paper is interesting for Dendroclimatology studies and for improving knowledge on climate variability in Southwest Europe. My decision is that an extended paper version (author should extend Sub-section 3.2. and Discussion) will be acceptable for publishing.

Some specific comments

* Page 4225, line 11: Where it says ‘our country’, it should say ‘Spain’ or ‘Iberian Peninsula’. * Page 4226, line 2: Precipitation series longer than one century in Iberian Peninsula are not ‘very rare’, just ‘rare’. Most of the meteorological stations located in the capital of the provinces started their records in the last decades of 19th century. * Page 4226, lines 12-13: I would replace ‘macro-climatic events on a global scale, such as volcanic eruptions’ by ‘macro-climatic events on a global scale, such as the effects of big tropical volcanic eruptions’. * Page 4226, line 25: Where it says ‘southeast-northeast’, it must say ‘southwest-northeast’. * Page 4227, line 1: Idem. * Page 4228, lines 11-12: Add ‘and’ between the lines. * Page 4231, lines 13-14: I think it is better to write ‘Frosts can be counted on from the months of November through to April’, instead of ‘Frosts can be counted on from the months of January through to April, in November and December’ * Sub-section 2.4: It is important for the study to give some information about the pluviometric variability. For instance, add the value

C2284

of the coefficient of variation of annual precipitation at Puerto de Navacerrada (probably higher than 20%). * Page 4233, line 4: Justify the use of the 0.32 threshold. * Sub-section 3.2.: Extend it, it is crucial for this study. Readers need more details. * Page 4234, lines 15-20: Although the precipitation of Madrid, near the study area, is much lesser than the Puerto de Navacerrada one (only one third, approximately) they are well correlated. As the Madrid precipitation series start in 1859 the author could try to extend the analysis comparison period. * Page 4234, lines 21-25: Just as complementary information, I checked the Quinn's list on El Niño events. Here you are the results: - Your biennial 1707-1708 coincides with the 1707-1708 strong El Niño. - The biennial 1715-1716 followed the 1714-1715 strong El Niño. - The biennial 1762-1763 followed the 1761 strong El Niño. - The biennial 1793-1794 followed the 1791 very strong El Niño - The biennial 1813-1814 and the 1814-1815 coincide with the 1814 strong El Niño. - The biennial 1688-1689 followed the 1687-1688 strong El Niño. - The biennial 1941-1942 followed the 1940-1941 strong El Niño. - The biennial 1958-1959 followed the 1957-1958 string El Niño. * 4. Discussion: As complementary information, Madrid precipitation series confirm the dry summers of 1962, 1963 and 1965, with 0.0, 0.0 and 5.3 mm in August, respectively, and also in 1985, with 0.0 in the same month. The opposite can be seen in 1957, 1973 and 1976. The summers (July and August) of 1958, 1964, 1980 and 1994 were very dry in Madrid. * 4. Discussion, page 4238, line 10: In the period 1990/92 to 1995 central and SW Iberian Peninsula suffered one of the most severe droughts in 20th century. This is related to strong positive NAO index (This means precipitation higher than normal in regions well exposed to the west winds in North Europe, and different behaviour in tree-rings). * 4. Discussion, final: It is important to consider that the big tropical volcanic eruptions produce a radiative forcing, as well as a dynamical forcing. This last means that the atmospheric circulation is affected in wide zones. The Marc Prohom's Doctoral Thesis proved that in the winters (+1 and +2) after a big tropical eruptions the precipitation decreases by 30% in many regions of Iberian Peninsula, due to the reinforce of Azores anticyclone and the west circulation in central and north of Europe. The temperature decreases 0.3-0.4°C

C2285

in the same winters. You can consult PHOHOM, M.J.; ESTEBAN, P.; MARTIN-VIDE, J.; y JONES, P.D. (2003): Surface Atmospheric Circulation Over Europe Following Major Tropical Volcanic Eruptions, 1780-1995. *Volcanism and the Earth's Atmosphere*, Geophysical Monograph 139, American Geophysical Union, pp. 273-281.

* Table 1, first row: 'Aspect'? * Table 3: Unify 'Climate' in sixth column (top) and 'Climate SG' in caption. * Figure 3(a): It is a bit confusing because the 12 monthly lines are very close to each other and the vertical scale is not appropriated. You can remove them. * Figure 3, caption: I suggest replacing 'Oscillations' by 'Temporal evolution' or something like this. * Figure 4(b): Although the correlation is statistical significant without any doubt, please add the p-value. * Figure 6: Vertical scale?

Interactive comment on *Clim. Past Discuss.*, 7, 4223, 2011.

C2286