

Clim. Past Discuss., community comment CC1
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Comment on cp-2022-75

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Community comment on "Earliest meteorological readings in San Fernando (Cádiz, Spain, 1799–1813)" by Nieves Bravo-Paredes et al., Clim. Past Discuss.,
<https://doi.org/10.5194/cp-2022-75-CC1>, 2022

A number of minor changes are offered here to improve the grammar in the English text:

Line 7 - change download to "downloaded"

Line 9 - insert the word "are" between "previously more" to read "previously are more"

Line 12 - change "composed by different" to "composed of different"

Line 15 - change "data have been described" to "data are described"

Lines 22-23 - change

Line 36 - change "from 18th century" to "from the 18th century"

Line 36 - change "focused in 19th" to "focused on 19th"

Line 62 - change "San Fernando in the Bay of Cadiz" to "San Fernando on the Bay of Cadiz"

Line 69 - Reword the sentence to read: "The data compiled in SF1799-1813 came from data generated by a plan to carry out astronomical...."

Lines 74 & 75 - Change the first two sentences to: "The ROA observations were made using different instruments and different units. A total of 45862 discrete observations were made from 1799 to 1813."

Line 81 - change "provokes" to "means"

Line 92 - change "There is not station elevation..." to "There is no station elevation..."

Line 94 - change "100 feet from sea level" to "100 feet above sea level". Is this Burgos feet or unknown?

Lines 143-144 change "instead of the real number of the original document" to "instead of the actual number in the original document"

Line 236 - Insert the word "the" ahead of each instance of "dashed gray line" "solid gray line"

Line 238 - THE black line ...

Line 238-239 - THE dashed black line

Line 239 - This LINE corresponds to the

Lines 261-262 - as above, insert the word "the". THE daily average air temperature for 1997-2021 is depicted by the solid black line. THE dashed black....

Line 263 - change "Just like pressure data" to "Just like the pressure data"

Lines 308-309 - change "months there is not rainfall data" to "months there is no rainfall data"

Other comments

Lines 20-23 - The authors discuss the importance of the creation of long-time series of meteorological variables. However, as this paper does not have continuous data to append to a Cadiz-centered series then I do not think this is pertinent to the discussion. Perhaps a focus on data search and rescue that can direct searches for other data that might fill the remaining gap.

Lines 94-96 - I do not agree with the reasoning for the choice. The same instruments could just have easily been moved to another site. It is best to leave this unknown or without reasonable uncertainty bounds.

Line 99 - do we have any reason to believe it is the same George Adams barometer in both periods?

Lines 113-114 - since this is an English language paper, it is better to convert the WpSW to WxSW and so forth, while noting it is "p" in Spanish. That is, reverse the usage as presently presented.

Line 117 - what level of precision were the prevailing wind data given in 1812-13?

Lines 119-121 - How were the wind force terms converted into a numerical value?

Line 122 - Are the wind force terms in 1812-13 consistent with the earlier series?

Lines 139-141 - if the basic quality control steps are identical to those done with other records, a reference to the source could be included here.

Lines 143-148 - I think this section could be removed without losing any information as to the checks described after these lines.

Line 182 - can remove "The density of the mercury changes with temperature." This is redundant as the other sentences say the same.

Lines 190-191 and 198 - There are two bold-faced notes that begin with Error. The note is in Spanish. If the authors need to provide additional information then this should be done as I am not sure what their intention is concerning the notes.

Line 193 - change Pascal to hectoPascal

Line 210 - change "the coefficient of determination" to "the correlation coefficient between"

Line 225 - how were the adjustments made to compare them - were the same times of observation available in both periods? Were these adjustments only made to monthly average values or to the original readings?

Lines 235-239 - the usefulness of this figure hinges on the questions concerning line 225.

Lines 249-250 - change "Due to this fact, it has been added 0.22 inches of pressure to the original pressure observations" to "Due to this UNDER-READING, 0.22 inches ARE ADDED to the original pressure observations"

Figure 4 caption - you need to state what the black line is, which you do in the text.

Lines 256-259 - Given the different observation times, and the lack of details on the correction procedure with respect to these differences, I am not clear on why I should believe the data shows similar "behavior", by which I think the authors mean the average annual, monthly, and diurnal ranges of pressure. The gridded data may or may not be accurate but I have no way of comparing them based on the information as presently provided.

Lines 261-262 - Why is the DAILY for 1997-2021 being compared to the MONTHLY for 1805-1809? Why not MONTHLY for 1997-2021 to compare with the MONTHLY gridded 1805-1809 data?

Line 270 - change coefficient of determination to CORRELATION COEFFICIENT and elsewhere where it appears after this line. Monthly values for all three series need to be compared, not the mix of monthly and daily averages.

Lines 274-275 The average temperature in the summer months in 1799-1813 is slightly higher than the same months in 1997-2021. Does this likely mean that thermometer exposure in 1799-1813 is biasing the readings too high?

Lines 275-276 - "and is quite similar to the monthly temperature of EKF400v2 dataset." Make clear if this is the same summer months. If not, state which months are being compared and separate it from the previous sentence if not just the summer months.

Lines 276-288 - The most direct comparison is presumably between the gridded data point nearest to Cadiz/San Fernando and there is a significant difference. I think a more direct way would be to look at the prevailing winds and see if they support sustained - presumably southerly wind components - during these months. If so, then this might support the higher temperatures and suggest an under-reading in the gridded series. If not, then there is a possibility of an issue with the data at the observatory at this time.

Line 285 - omit the words "of the world" at the start of the line.

Lines 287-288 - occurred throughout SOUTHWEST Europe. The remainder of the lines can be then eliminated as there is no reason to speculate about a supposed global scale warming in a winter that followed a major volcanic eruption in late 1808.

Lines 289-294 - how do these winds compare with modern data. A better use of the wind direction and wind force data would be to calculate, however crude, a scalar wind (zonal and meridional components). Deviations of these components from the average could be used to see if they were consistent with estimated temperature anomalies. As presently written, there is little useful information to be gleaned from this paragraph.

Lines 308-309 - Is this actually saying that no rainfall was recorded in these months? Another question: how frequent is snowfall at the site? It may be that precipitation can simply be called rainfall if snow is rarely observed or measured.

Lines 309-312 - Just because the pressure falls, does not mean rainfall will occur. I think that given the frequency of rainfall observations, weekly readings only, and otherwise only monthly totals, then the check against daily pressure is not very meaningful, particularly in the summer half of the year. Remove the sentence "According to the represented...data are consistent."

Lines 321-323 - There is definitely a difference between the unrecorded, or lost, measurements and the rain days. Remove "Therefore, there could be some error in these months."

Lines 326-328 - Are the gridded values of pressure anomalously low or not in the wet months? A climatology for each month would be useful to compare.

Line 339 - can remove "(but highly cited)" and make it "the circa 1809 unlocated volcanic eruption."

Lines 340-361. There is no reason to use the monthly EKF400v2 dataset to try and compare with daily data for the battle. This gives no useful information to compare with what is known from the surface data in Wheeler (1985). The daily data from the observatory is consistent, as the authors state, with the lower pressure and rains noted but that is all. The best way to study the weather at Trafalgar is to map out a larger region at the sub-daily scale using land data and ship observations.

Lines 363-373. The reduced temperature range in the winter of 1809, which was apparently unusually warm in the area, might simply be due to some combination of warm southerly winds, enhanced cloud cover, and perhaps higher wind speeds (which the

authors could check from the data) and not invoke the volcano. The summer anomalies are more interesting, because one would expect clearer skies to prevail in the summer half of the year and the anomalies for 1805-08 are consistent with cooler temperatures, possibly associated with an aerosol layer diminishing incoming solar radiation. There is no reason to use 1997-2021 in the comparison and I would drop this part of the discussion and remove it from Table 1.

Lines 382-390 - there is too much speculation about alleged gaps in observed rainfall in 1809 to make any useful comments relative to the cited literature. If the rainfall was above average as stated in January and March 1809, that is consistent with my comments about a warm and wet winter reducing the diurnal range of temperature. The authors need to look at all of their data to see if there is internal consistency between the data and what they assert is occurring or might be occurring.

Lines 398-404 - This is a more interesting description of possible aerosol effects on the state of the sky. Is there any information on such sky states in later eruptions such as Krakatoa (1883)?

Line 405 - I think the first sentence overstates the rarity of such records, particularly in Europe. More useful, is the fact that it is on the periphery of Western Europe far from many other such sites in Europe.

The authors need to note that the data are not directly homogeneous or part of a continuous time series, so its usefulness is limited until and unless other data and/or methodologies can allow the construction of such a time series. Some internal checks on some of the subsets of data might be useful - compare day versus night diurnal ranges of temperature in 1799-1801 with modern data to see if unusual patterns exist, which might reveal information about the exposure of the thermometer. This might lead to a more accurate way to adjust these isolated series.

Lines 433-436 - The understanding of the weather of the battle of Trafalgar was not really significantly improved. The data is broadly consistent with what is known but the single record itself cannot do this - more data over a larger region is required as mentioned earlier.

