

Interactive comment on “Low Water Stage Marks on Hunger Stones: Verification for the Elbe River in 1616–2015” by Libor Elleder et al.

Libor Elleder et al.

libor.elleder@chmi.cz

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Corresponding author Libor Elleder (CA): Answers to unknown reviewer (R1)

CA: An error in the text, which I found, was corrected in the text independently from the reviewers. The beginning of Magdeburg record is 1727 not 1726 (it is an end of not monitored water level period). I am sorry for the mistake. I hope, all your comments were accepted

1/R1: Particularly on the first part of the paper, it is not very easy to read, and some sentences are too long English use may need some improvements. I cannot help on this because I am not native speaker, but I have provided some editing comments. CA: I hope, the proofreading by native speaker (It was done by a professional proof-reader

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Erin Naillon, please see the acknowledgments) improved the English and facilitated better understanding and reading (R1: not very easy to read) of the text significantly.

2/ R1: Specific comments:

R1: Lines 97-98. Suggested modification of the sentence.

A remaining issue is to verify the credibility of the information on low water levels, and its transformation to provide robust information on runoff previous to 1825 and even before 1726.

CA: It was changed after proofreading as follows: But what credible documents of low water levels existed before 1851 (the start of record-keeping in Děčín), 1825 (the start of record-keeping in Prague) or 1727 (the start of record-keeping in Magdeburg)?

R1: Lines 104-106. Suggested change: These palaeoflood indicators comprise various type of sedimentary (e.g. slackwater flood deposits) and botanical evidences such as impact marks and damages on trees (Benito et al, 2004, 2015).

CA: I fully accepted, I change the text accordingly (included the suggestion of Reviewer2) These palaeoflood indicators comprise various types of sedimentary (e.g. slackwater flood deposits) and botanical evidence such as impact marks and damage on trees (Benito et al., 2004, 2015, Wilhelm et al., 2019, Schulte et al. 2019).

R1: Line 106-107. However, similar methods for estimating low water levels and flow rates are seldom addressed, with some exceptions (Shamir et al., 2013). Shamir, E. et al., 2013. Geomorphology-based index for detecting minimal flood stages in arid alluvial streams. *Hydrol. Earth Syst. Sci.*, 17, 1021-1034.

CA: I have included the citation with comments, the sentence after proofreading.

Low water levels and flow rates for preinstrumental hydrology are seldom addressed, with some exceptions. For instance, Shamir et al. (2013) presented methodology to identify field-based geomorphologic marks of low flows in ephemeral arid streams that

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can be indicative of minor flash floods. Unfortunately, the motivation is different and the potential for indicating historical low flows in humid climates has low utilisation.

R1: Line 107-108. Therefore, low water level indicators available through documentary sources are unique data records (Brazdil et al., 2018) for recording past hydrological droughts, with the precision given by physical imprints provided by epigraphic marks.

CA: I fully accepted, I change the text accordingly to you

R1: Line 129 Objectives.

The specific issues and questions addressed are: Line 133. Are there consistent relations in the heights of stage minima among different stones?

CA: I fully accepted, I change the text accordingly Are there consistent relations in the heights of stage minima among different stones?

R1: Line 136. Suggest change the title 2. The Elbe river region in the Czech Republic

CA: I fully accepted, I change the text accordingly The Elbe River region in the Czech Republic and the city of Děčín

R1: Line 145. Delete "rock"

CA: I have deleted the expression "rock", "the sandstone formation" remain here

Below Děčín, it then flows through a landscape of sandstone formations.

R1: Line 167. Ploucnice River and Jilovsky stream should be placed on map in Fig 1

CA: Is done

R1: Line 174. Insert in brackets like this (1 ell=59 cm)

CA: I have inserted in the text: of the Prague ell units of length (1 ell = 59 cm)

R1: Line 183. (see chapters on methodology and documentary sources).

CA: I modify this and replace by more suitable (see chapter 3.5.). It still bears the orig-

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inal German, now popular, name of 'Heger', or supervision. Later, the observation was transferred to a new water gauge [G1851] (see Chapter 3.5.).

R1: Line 196. Check if the proper word is acquired or recorded by

R1: Line 361. The brackets are confusing. Probably better as . . .in Strahov, Wiesenfeld, C2 1844).

CA: o.k. I deleted remove the right bracket after 1643. It cannot be ruled out, for example, that mapping of the Vltava River (by David Altmann of Eidenburg) and the river regulation by Kryšpín Fuk (1640-1643), abbot of the Premonstratensian monastery in Strahov, (Wiesenfeld, 1844) were made possible just by a drier period, probably culminating in 1642 (documented by Pekař, 1998).

R1: Line 426. Rhine from 70 AD to 1858 . . . Please, check if 70AD is correct or some numbers are missing.

CA: o.k. Is really o.k. A.D.70

R1: Line 482. . . . Walter, 1901) of which reported altitudes exist for 1541, . . .

CA: o. k.: There were a total of 10 DM marks: 1541, 1692, 1750, 1764, 1797, 1823, 1848, 1858, 1891 and 1893. Walter reported the height above sea level for the marks from 1541, 1750, 1858, 1891 and 1893.

R1: Line 494. Figure caption is confusing until the text is read. Probably change the caption as follow. Fig. 2. Drawing documenting the position of the hunger stones known as Ara Bakchi, Altarstein or Elfenstein near Bacharach, perhaps in the dry season of 1636, 1639 or 1642 (Merian, 1645).

CA: It was accepted, the caption is after proofreading, as follows

Fig. 2. Drawing documenting the position of the hunger stones known as Ara Bakchi, Altarstein and Elfenstein near Bacharach, perhaps in the dry season of 1636,1639 or 1642 (Merian, 1645), the position of which is marked by a red triangle in a cut-out view

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of Bacharach.

R1: Line 513. . . . water levels of the Elbe River occurs typically from June to.. Line 571. Add space after between.

CA: o.k.

R1: Line 649. Perhaps you meant August 2017

CA: o.k.

R1: Line 666. In the locality opposite to Prossen. . .

CA: After proofreading: I included "to", the proof-reader excluded it, I respected the proofreading In the locality opposite Prossen village is a stone that is most often mentioned.

R1: Line 678. Marked DM minima includes years 1893..

CA: After proofreading: The marked DM includes minima: 1893, 1904, 2003 and 2018.

R1: Line 738. . . . than marking the flood mark, due to the following reasons:

CA: I accepted it fully, after proofreading: It is more difficult to make a mark of the minimum water level than to make a flood mark, due to the following reasons:

R1: Line 763. Insert in brackets the translation of the inscription, otherwise we cannot follow the meaning of the popular inscription.

CA: In connection with the 1904 mark, the popular inscription 'Wenn du mich siehst dann weine', (If you see me, you will weep) was created.

R1: Line 916. Perhaps you meant "phenological" CA: OK

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2019-113>, 2019. C3

Please also note the supplement to this comment:

<https://www.clim-past-discuss.net/cp-2019-113/cp-2019-113-AC2-supplement.pdf>

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2019-113>, 2019.

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