

## ***Interactive comment on “Determinants of thermal regime influence of small dams” by André Chandesris et al.***

**Anonymous Referee #3**

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General comments:

The purpose of this study was to quantify the downstream impacts of different types of small dams on summer water temperature in lowland streams. The topic of this manuscript is of high importance, and the research is critically needed since water temperature could impact the structure of aquatic communities and the functioning of the aquatic ecosystem as stated by the authors. The data set on water temperature the authors have collected seems to be robust, and with quite enough number of sites. I personally appreciated the calibration process made for the instruments to insure reliable data. The discussion is quite thorough and insightful, but more focus on literature review (others work) rather than focusing on the discussion of the current work. I found that data analysis severely lacking, and the presentation of the results to be

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using individual sites as examples that are difficult to judge if they are really representative. Therefore, without adequate data analysis I felt that the conclusions were not well supported. The language used is not sufficiently comprehensible and needs to be improved before publication. Many other specific and technical comments can be found below.

Specific comments: (P=Page, L=Line)

1. P5, L159: Why authors calculate median differences and not mean? Please justify why this metric instead of means.
2. Section 3.5: What is the scientific method used for group clustering?
3. Section 3.7: the results presented in this section are unclear and the purpose of presenting such results is unclear as well. I found it very hard to link this section with the discussion section. This would be easy for the reader if the results and discussion section were compiled in one section.
4. P7, section 3.8: Authors mention that the maximum daily temperature threshold of 22°C is arbitrary value. While later in the discussion, the authors indicate that the choice of a 22°C is actually not arbitrary. I suggest that authors delete the word arbitrary and explain the basis of this threshold choice.
5. P8, L255: the authors mention warmer, drier, colder and wetter years. Please discuss how these classifications are made?
6. P18: Fig.4: what is the reason for comparing temperature of different sites (Dompierre and Neuf) in different years (e.g. 2010 and 2016).
7. P19: Fig.3 caption: the authors state “Time series of water temperatures upstream (blue line) and downstream (red line) of the dams of Dompierre and Peroux, Veyle stream (2010 and 2015, two warm summer years, respectively + 1.1 °C and 2° C, Table 2)”, but when looking back in table 2, I have seen that air temperature difference from normal in 2010 is very small (+ 0.3) and NOT +1.1. The +1.1 °C air temperature

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difference from normal is in the year 2009. Therefore, 2009 is almost four times warmer than 2010, hence one may expect the comparison between 2009 and 2015 instead of 2010 and 2015?

8. P19: Fig.3: Since air temperature difference from normal in 2010 is very small (+ 0.3), why the difference between upstream and downstream water temperature at Dompierre dam is very high? This cannot be due to long residence time and average surface are in absence of warm condition, so what could be the reason/s?

9. It is insecurely to compare 2014 (cold and wet year) with 2015 (warm and dry year) for at least one site (e.g. Dompierre dam) to see the effect of air temperature.

Technical corrections:

1. P18: in Fig.2 caption, what is the word “respectively” refer to?

2. P1, L18-19: “The mean increase of the minimum daily temperature was 1°C, with 85 % of the time-series showing an increase > 0.5 °C”, this sentence is not clear or grammatically incorrect.

3. P2, L63-64: “surface release reservoirs”, should read “surface reservoirs’ release”.

4. P5, L148-149: “in the main flow of the channel” should read “in the main flow channel”.

5. P5, L151: “method Dunham et al. (2005).” should read “method introduced by Dunham et al. (2005)”.

6. P5, L157: the authors state that “and the median values were recorded for the period”, how do you record the median? It should read “calculated” instead.

7. P6, L182: “Furthermore, the average temperature downstream of the structure was systematically higher or equivalent than that measured upstream” should read “Furthermore, the average temperature downstream of the structure was systematically equivalent or higher than that measured upstream”.

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8. These are limited examples and the paper contains more. All grammatical errors should be fixed before publication.

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