

Interactive comment on “Multi-decadal river flows variations in France” by J. Boé and F. Habets

Anonymous Referee #1

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Review of manuscript: doi:10.5194/hessd-10-11861-2013 "Multi-decadal river flows variations in France" by J. Boé¹ and F. Habets²

The article assesses the role of large-scale circulation in long-term variability of river runoff in France. The study is based on large set of meteorological, oceanological and hydrological data, including reanalysis, observations and model simulations. The article proves the strong impact of the Atlantic Multidecadal Variability (AMV) on spring river flow decadal variability. The summer low frequency discharge variation is explained by AMV control of spring soil moisture conditions.

The article is quite interesting and important for understanding of processes, improving of hydrological predictions and risk assessment.

At the same time, several parts of the manuscript suffer from an absence of well-

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described logical framework and clear writing, making it difficult to read.

The authors process numerous data that they describe in dedicated section, but the necessity to use such a huge dataset is not explained in the beginning.

The presentation of the results and article logic is quite specific: the big part of explanations is given in figures' captions and scattered in the text. The conclusions of the sections are often a good step for the next work/section, but they are not clearly related to the initial objective of the section. Some questions/explanations are only addressed in following sections.

I recommend to enlarge the description of each section in the Introduction, clearly explaining the logical schema of article. The section 3. "Multi-decadal variability in observed French hydro-climate" is written in the manner to prove the representability of use Gave d'Ossau gauging station for all France. And on the way, other issues are studied (spatio-seasonal patterns, role of evapotranspiration, modification of the statistical distribution of low and high discharges, use spatially-averaged precipitation for analysis etc). It needs the structural improvement. The Conclusion section is well written but actually represents the Discussion. I suggest to divide it and put in separate section.

Specific comments: pp-lines

11863-28: "Historical period" has very large interpretation. What do you mean exactly?

11864-18: "current literature" do you mean your article? And is it your suggestion or this idea was already proposed by other researchers?

11864-25-29: In spite of good reasoning of the study overall, the formulation of the objective of the article is quite vague.

11865-06: " Series at all selected gauging stations start before 1940 and cover at least 70 yr (the median length is 90 yr)". This sentence is confusing.

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11866-5-10: Four precipitation data-set were used. Argue please the necessity of each one in "Data description" section.

11867-27: Explain why did you applied exactly 19yr window for filtering.

11869 -6 : "magnitude of decadal variations in river flows is generally greater than in precipitation". What does it mean? Develop please your idea.

11869-27: "as spring evapotranspiration in France tends to be energy-limited rather than water-limited" the reference is needed.

11870-8-13: "which could have important practical impacts" - which impact and on what? Develop please this phrase.

11870-16: "spring precipitation averaged over France" Which data-set was used for averaging and why?

"Note that the average of precipitation over France is used here because of the lack of precipitation data specific to each river basins on the whole period of interest." In "Data" the authors cited 4 data-sets providing precipitation. Why is it impossible to calculate the average for each basing at least from one data-set ? Next, on fig.6. authors give more details, but this manner of presentation of results does not facilitate article reading. Fig. 6b is necessary to prove the use of average over whole France value of precipitation. How "different locations (HPS data)" were selected. What was the principle? In the context as it is described in text the use of average over whole France value just simplifies the work but not justifies.

11874-9: "...decades with below normal river flows are characterized by non-significant and moreover generally larger precipitation in summer". The sentence is not exact " non-significant and moreover generally larger"?

11876: In what degree the runoff/precipitation relations obtained from simulated runoff and observed are different? Why did you selected the ratio obtained from simulated runoff? Taking into account the length of your in situ data-set, it is natural to work with

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observed discharges.

11877-24: "This is a physically plausible mechanism, consistent with the decadal variations simulated at several stations..." Please detail how much stations? "Several stations" is not most part?

11877-28: It is not clear if this paragraph is an attempt to explain the absence of relation between SWI and summer discharges for some (how much?) stations or it is already the general discussion.

11878 -1: "GHG could be associated with..." The sentence is very long and general. Please rephrase and better explain your idea.

11880-17-20: This conclusion seems dubious as the "direct anthropogenic effects" on river flow can be also much lower that of expected.

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