

## ***Interactive comment on “The impact of climate change on hydrological patterns in Czech headwater catchments” by A. Benčoková et al.***

### **Anonymous Referee #1**

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#### General comments

I apologize for any mistakes I may have made that are a consequence of my not fully understanding the Methods or Results.

The services of a Copy Editor to work with the authors and improve their use of English would help significantly.

Specific comments Address relevant scientific questions within the scope of HESS – the manuscript addresses the Aims and Scope of the Journal as I read their description, presenting a study of temporal (including projected) characteristics of water resources.

Present novel concepts, ideas, tools, or data – while the concepts, ideas, and tools may not be entirely novel, the combination of these factors and the data are an appropriately

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novel application

Are substantial conclusions reached – I believe the authors have offered substantial conclusions, despite the problems with the input, climate data. It is important to know how climate change may affect headwater streams, as well as larger drainages. The projected changes in flow are significant, including possible cessation of flow, with major impacts on stream ecology.

Scientific methods and assumptions valid and clearly outlined – as mentioned elsewhere, I am confused by the various input data: observed (measured?), simulated, projected. The authors should offer a clear, succinct, and simple (as possible) description of how they processed input climate (temperature, precipitation) data, especially for the calibration and validation periods.

Results sufficient to support interpretations and conclusions – the Results fully support the author's conclusions and interpretations

Description of [methods] sufficiently complete and precise to allow reproduction – the modeling process is quite complex and needs additional clarification; perhaps a flow chart would help explain how the various 'models' are integrated. My understanding of the modeling design would be that Brook90 would be calibrated and validated with measured runoff and observed weather data. Future runoff would be estimated with downscaled climate projections.

Give proper credit to related work; clearly indicated new/original contribution – the authors give appropriate credit to related work. I do not know if their references include all pertinent literature

Title reflect content – suggest replacing 'hydrological' with 'flow' to more accurately reflect the content

Abstract provide concise and complete summary – the Abstract accurately and fully summarizes the paper

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Presentation well structured and clear – the paper is well structured, the presentation is logical and sequential, but I became confused by the full modeling process.

Language fluent and precise – the authors' use of English is generally correct but frequently awkward. The manuscript would benefit with the services of a Copy Editor.

Mathematical [content] correctly defined and used – the quantitative content is mostly 'black box', using output from published models. The authors adequately explain (and reference) the basic structure of the models they used but integration of the various models becomes confusing. Somewhere in the process, there seems to be a loss of connection with any true, measured data.

Any parts [need to be] clarified, reduced, combined, or eliminated – the modeling process needs to be clarified; possibly with a flow chart

Number and quality of references – both the number and quality of references are satisfactory, with an appropriate mix of international and regional journal citations

Amount and quality of supplementary material – not applicable, none provided

Technical corrections

Section 2.3. What is the location (Latitude, Longitude) of the climate station and the distance to the two stream catchments?

Section 3.3. I am confused by the runoff data mentioned in this paragraph. I had presumed you were comparing modeled versus measured (Sections 2.3 and 2.4) runoff but the second sentence favorably compares "runoff ... calculated from ... RACO data" with the "simulation based on observed data". If the 'observed data' are weather data, I am further confused as the preceding paragraphs report major differences between measured and RACO-simulated data. If the input data are in disagreement, how can the output compared favorably? If the 'observed data' are runoff data from the weirs, why is it 'simulated' rather than simply measured at the weirs? Figure 3 doesn't mention 'simulated' observed runoff.

Section 4. I am assuming the first sentence is referring to ‘climatic’ data. This sentence captures my confusion among measured, simulated, modeled, etc. data that are used in this manuscript.

The first three paragraphs of this Section leave me totally confused. Quite possibly this is in large part my shortcoming.

I recommend not starting the Discussion with problems in the input data. A brief review of the study would be more appropriate; criticism of the process should come later.

Are RCM and RACO data synonymous?

Table 1. The authors need to clarify which of these data are measured, ‘corrected’, or projected

Tables 4-7. Captions should be revised to read “Percent change in monthly ...”

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 1245, 2010.

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