

## ***Interactive comment on “Responses of runoff to historical and future climate variability over China” by Chuanhao Wu et al.***

### **Anonymous Referee #1**

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This paper describes the projected effects of climate change on runoff and water availability in China using a framework based on runoff elasticity. In general the paper is well written and of sufficiently wide geographical scope to be interesting to a broad readership, but several key assumptions in the methodology, which are neither documented nor discussed, preclude a recommendation to publish without major revisions. These are:

1. More information on the parameters used in the hydrological modeling is necessary, especially those used with VIC to calculate runoff. These assumptions lie at the heart of the elasticities calculated, which will be heavily influenced by the structure and parametrisation of that model. [Section 2.1 Line 5].
2. There is some discussion of uncertainty in Section 4.3 but it is very general and not

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quantitative. In particular, the detailed choice of which formulation of the Budyko model used to compute elasticities is investigated but neither the runoff model nor the PET equation are examined in this regard.

3. PET is calculated using the Thornthwaite method, which is a surprise since with the data available there is information to justify the use of more physically accurate PET calculations. Justification for the use of the temperature-based Thornthwaite method is required, especially given that it may oversimplify (and artificially constrain) the results of the Budyko calculation which features subsequently. [P5 line 5]

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