



# ***Interactive comment on “Flow pathways and nutrient transport mechanisms drive hydrochemical sensitivity to climate change across catchments with different geology and topography” by J. Crossman et al.***

## **Anonymous Referee #2**

Received and published: 15 September 2014

### General:

This manuscript presents an ambitious study of climate change effects on phosphorus dynamics, taking several aspects of hydrology and P processes into account.

The study is partly even too ambitious, because the structure with supplementary file makes it heavy to read. The message could be more concentrated.

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Is the supplementary really needed? It looks like some of the results are now presented twice, first in the main text and then in supplementary file, e.g. Figure 7 and SI7. The first two pictures in supplementary are already published, and the third one is really difficult to understand. Instead would be nice to have a map which shows also location of agricultural land, wetlands and artificial areas.

On page 8070, line 5. Eutrophication is also other harmful aspects than reduction of oxygen. In worst case it alters the whole ecosystem.

Same page, line 9. Only part of the PP is converted to bioavailable P, e.g. Hartikainen et al. 2010.

Page 8071, line 6. Are unknown physics of climate processes really only parameter uncertainty? Not a system uncertainty etc? And parameter uncertainty comes then from model description and measurements, where measured value does not completely describe what it is supposed to describe.

In methods section would be to have description of water quality measurement, where, how often and the analysis methods. Also, some sentences of agriculture, as it covers the main land use. What is the main crop, what is the growing season. And especially, how is the climate change assumed to affect crop and growing season. . .

Page 8074, line 5. What is the annual P?

Reference to the HBV model is missing.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 8067, 2014.

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