Interactive comment on “One-way coupling of an integrated assessment model and a water resources model: evaluation and implications of future changes over the US Midwest” by N. Voisin et al.

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Response to reviewers

The authors would like to thank the two anonymous reviewers for their constructive comments. The clarity of the paper has improved and added information provides more evidence supporting our conclusions. The most important changes are:

- clarification: supply (flow) vs. actual supply (met demand). Figure 2 (modeling framework) has been revised for more clarity on the datasets and models involved as well as their spatial and temporal resolutions. We justify better why the Midwest is a good region for the modeling experiment.

- additional A2 scenario: Figures 7, 8, 9, and 12, and Tables 2 and 4 have been updated accordingly.

- We added more metrics to provide supporting evidence of the drivers of change for the unmet demand and met demand. Metrics include: relative changes in natural flow, regulated flow, demand, unmet demand and met demand, and corresponding elasticities with respect to changes in natural flow and changes in demand. The elasticities are the ratios of the relative changes in met demand for example, over the relative change in natural flow or demand. It allows quantifying the sensitivity of the variables to changes in predicted flow and demand. Larger elasticities with respect to changes in flow than with respect to changes in demand suggest that changes in flow are the largest driving component for changes in met and unmet demand. Smaller differences in elasticities indicate a growing significance in the changes in demand in the water resources assessment. Table 3 presents the different metrics for the Missouri, Upper Mississippi, Ohio and Midwest.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 6359, 2013.
Relative Change in Annual regional demands

Spatial and temporal disaggregation to monthly 0.5 degree & Projection to daily subbasin mask

Subbasin daily water demands

Daily regulated flow, supply, and deficit for each subbasin

Fig. 1.

C4292

Table

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Fig. 2.

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