

Interactive comment on “Hydrologic effects of land and water management in North America and Asia: 1700–1992” by I. Haddeland et al.

I. Haddeland et al.

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Reply to general comment: In a revised version, we will include some more background information (see also response to the other reviewers). Also, in the vegetation dataset used here (see also e.g. Nemani et al., 1996), grassland in general has lower LAI values than croplands, which is the main reason simulated streamflow decreases when converting from grasslands to croplands.

Reply to other comments: (1): We agree with the reviewer, and suggest using “historical vegetation” instead of “vegetation scenarios”.

(2): The current vegetation images (Ramankutty and Foley (1999) and Hansen et al. (2000) do differ somewhat, but the main vegetation patterns are similar around

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the globe. The important issue for this study, though, is what kind of vegetation has been replaced by croplands. For this, it is assumed that the natural vegetation by Ramankutty and Foley represents what kind of vegetation would have occurred in the areas now covered by crops. A few sentences, or an extra column, comparing the two vegetation images will be included in a revised version. The classes in Table 1 are composites of the classes in Figure 4, and we agree that this should have been explained in the paper. See also comments to the other reviewers

(3): For the simulations for e.g. the year 1950, all dams built in 1950, or before, were included in the modeling scheme, and we agree that this should have been stated more clearly in the text.

(4): This is true, and should have been mentioned in the paper and will be in a possible the revised version. According to the Ramankutty and Foley dataset, 3 percent of the global land area was converted to cropland in the year 1700.

(5): In the revised version of the paper, we will make the conclusions more clear. E.g. we will distinguish between areas where historical land cover changes have lead to increased and decreased runoff, which would make it easier for the reader to follow the authors' logics.

(6): The results indicate that there isn't always enough water available to meet the needs of the irrigated crops. However, as is also mentioned in the paper, the simulated water use is most likely somewhat underestimated (see also reply to the other reviewers).

(7): Thanks for the suggestions, we agree and will resolve these points in the revised paper.

(8): Thanks for the suggestions, we agree, and the term will be defined in the paper.

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