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Discussions

Interactive comment on "Quantitative contribution of climate change and human activities to runoff changes in the Wei River basin, China" *by* C. S. Zhan et al.

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Thanks for the reviewer's suggestions. First, actually the Budyko curve provides a simple estimation of mean annual evaporation based on water-heat balance mechanism within a closed river basin, and can not provide accurate mean annual evaporation. Our expression in the paper will be changed to "the mean annual evaporation can be relatively precisely estimated by the Budyko curve." Second, we did not fully express the third assumption, which should be revised to the statement that any departure from the Budyko curve would be caused by climate variation and human activities. Perhaps the impact of human activities on the Budyko curve is negligible, however the impact of human activities on runoff perhaps is large, and we can indirectly establish the correlation of the Budyko curve and human activities based on the relationship P=E+R. This is the starting point of the paper. Third, RH presents runoff change caused by human activities and here human activities mainly include different measures of water and soil conservation, river dam construction, water intake from rivers, water transfer and so on, and evapotranspiration from crops and reservoirs does not be considered. Here we assume climate change and human activities are mutually independent, just like the original method, P and E0 may be influenced by human activities, but here we neglect it. Therefore, the original method (Fig.1) is improved to(Fig.2), it is a new and significant exploration over the climate elasticity method reported in the literature. We will revise the description of the RH, and the related define.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 2149, 2014.

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Interactive Comment

$$\Delta Q_C = \varepsilon_P \frac{d_P}{P} + \varepsilon_{E_0} \frac{d_{E_0}}{E_0} \quad , \quad \Delta Q = \Delta Q_C + \Delta Q_H$$

Fig. 1.

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Interactive Comment

$$\Delta Q = \varepsilon_P \frac{d_p}{P} + \varepsilon_{E_0} \frac{d_{E_0}}{E_0} + \varepsilon_H \frac{d_{R_H}}{R_H}$$

Fig. 2.

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