

Interactive comment on “Impact of climate change and anthropogenic activities on stream flow and sediment discharge in the Wei River basin, China” by P. Gao et al.

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The manuscript brought up common issues caused by climate changes and anthropogenic activities such as elevated irrigation demands and water control projects. There are several aspects need to be addressed before it becomes publishable:

1. The information of land use is insufficient. The author claimed no significant land use changes during 1980-2005 based on a geodatabase. Even if the land cover types do not vary drastically, evapotranspiration rate may differ by changing forest age and species. Twenty five years are long enough for the vegetation to naturally evolve. For

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the sake of evaluating forest ET impact on streamflow, a runoff ratio (annual water yield/precipitation) is preferred to be evaluated in the area.

2. The analyses of climate variables are incomplete. Precipitation is among the most influential meteorological variables other than air temperature, turbulent flux, and relative humidity. The latter two are usually harder to acquire, but air temperature has a major impact on ET, hence the streamflow regimes. Monthly or annual temperature data are needed.

3. The analyses of precipitation and streamflow were based on data from flood season, June-September. What has happened to rest of the seasons, do the low flows change at all? There is the need to justify the reason of using high flow only.

4. Impact of human activities on streamflow reduction were claimed to be 68% to 94% besides precipitation reduction. The portion was estimated by calculating the difference of annual average streamflow and sedimentation from a set of regression equations before and after the transitional year. This method needs serious justification. The annual water yields are affected by many factors, and precipitation and human activities only two of them. It is somehow too bold to predict water yield by regression method and assign the portion not covered by precipitation change to human activities. A more legitimate way is to estimate water yield and sedimentation by conceptual models. The models do not have to be complicated, WEPP, for example, can be used for erosion estimation.

5. In Figure 3, the transition year determination is inconsistent. Some are at the cross of mean value line (horizontal) and trend line (dash), some are not. The method needs justifications.

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