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Hydrology and Earth System Sciences Discussions

Interactive comment on "Watershed discretization based on multiple factors and its application in the Chinese Loess Plateau" *by* Y. Xu et al.

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The NRCS CN method is commonly used as a model simulating the rainfall-runoff process. The minimum calculated units for CN method are Hydrological Response Units (HRU). The article "Watershed discretization based on multiple factors and its application in the Chinese Loess Plateau" developed a detailed delineation method. Besides land use and soil types, vegetation condition and slope were included as discretized factors. The results shown that new unit (land type unit) is better than HRU that was divided base on soil and landform, which is suitable for eco-hydrological process simulation. Because of soil erosion and human activities, the landform and vegetation in the Chinese Loess Plateau are fractured. The land type unit delineation is promising for

better assessment the impact of re-vegetation on runoff. This paper can be consider for publish after some revision.

1) It is mentioned for several times that the slope in the watershed "range from 0° to 66.2°". This must be a result of GIS software calculation based on DEM. However, the slope in the Loess Plateau can be more than 66.2° in some area such as gully head and landslides. 2) Meteorological data for this study are "The daily precipitation data, maximum and minimum temperatures, average wind speeds and relative humidity". The solar radiation data are missed. It may cause some error when the PET (potential evapotranspiration) is simulated by Penman-Monteith or Priestly-Taylor method. You'd better use Hargreaves method for PET simulation. 3) Table 2 shows that the third and fourth slope classes (15°-25° and 25°-35°) take more than 60% area of the watershed. When the area percentage thresholds increased, flats (<15°) and steep area (>35°) will be excluded. It may be a disadvantage of this method, especially in different types of erosion simulation (which is mentioned in discussion). It may be better that reducing the slope classes and using the critical slope gradient as partition. It's also helpful for reducing the computation amounts.

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