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Hydrology and Earth System Sciences Discussions

Interactive comment on "Estimation of evapotranspiration in the Mu Us Sandland of China" *by* S. Liu et al.

Anonymous Referee #2

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This paper provided a potential solution for ET estimate from the satellite remote sensing data over a Chinese sand-land, it covered a very interesting and scientifically relevant topic, it was just the demand for the Hei River basin research, and was well organized. Therefore, I strongly suggested accept it after a minor revision.

However, many improvements are still needed both literary as well as on the presentation of the used methodologies. The major shortages of this manuscript are that the authors do not well address the results of the proposed methodology by using more ground observation data. At this stage, only one ground-measured monthly ET value had been used for validating authors' method or results.

The authors used a fixed Priestley-Taylor coefficient for different land surface types.

And they select a value of 1.26 from other persons' papers, but they do not explain whether this value was suitable for this study area.

The specific comments

-P5980 L17-20: As regard to the air temperature, the spatial variation in topography in Mu Us sand-land was not sharp. Therefore, the regional air temperature could be directly obtained using an interpolating method.

-P5982, L3-4: Tt could not add any new information by downscaling coarse resolution data to coarse resolution data, for example, from 8 km x 8 km to 1 km x 1 km. And you used AVHRR data from 1981-2000 and MODIS data from 2001 to 2003. Why did you not resample MODIS images from 1 km to 8 km?

-P5982, L9-10: How do you obtain the ratio? Please explain in detail.

-P5982, L16: What does NDVImax stand for? How do you obtain NDVImax? Please explain.

-P5983, L10-12: The parameter "r" in Eq. 5 is diurnal mean albedo while "r" in Eq. 1 or Eq. 2 is monthly mean value of many days' instant albedo for satellite overpass times. There is some difference in the results of these two processing, which would cause a large accumulative Rn error at monthly scale.

-P5983, L21-23: As I know, Eq.7 is not put forward by Zeng. Please show the original literature. Have you compared monthly accumulative total Rn and Rnl from Eq.5 and Eq.7 with ground-measured data? Please explain.

-P5984, L2-4: Please explain the relation between these 17 stations and your study area. Why did not you use the same data from Dongsheng Station and Ejinhollo Station as shown in table 2?

-P5984, L6: For the surface temperature, did you select from remotely sensed data or Weather Station data? Regional values or points' valuesïij§Please explain?

-P5984, L8: Have you validated this method by using ground observation data (as described at P5980, L29)?

-P5984, L16: Which one do you use in this paper? (Tmax-Tmin le 12)? or (Tmin le 5)?

-P5984, L17: Tmax and Tmin are air temperatures? How do you obtain their regional distributions? Please explain in detail.

-P5985, L4: Why do you set alpha=1.26? This is good for free water surface. But your study area is sand-land. Please explain.

-P5985, L12-17: Please show the original and corrected latent heat flux curves for this month.

-P5985, L15-16: ... while the estimated ET of corresponding pixel was 80.8 mm. Please explain if your remote sensing images, for example, AVHRR's and MODIS's band reflectance images, have been geographically corrected? What tool or algorithm? Give the precision of your geographical correction. How do you select a proper pixel corresponding with ground observation site?

-P5985, L21-22: If you have only collected ET observation data from microlysimeter for one day, you can not obtain monthly total ET by multiplying it with 30. But if you have many days' ET data, you can use them for validating your model. Please show your validation results.

-P5985, L26 - P5986, L2: The validation in this paper is insufficient, please add more if possible

-P5990, L15-16: Priestley Taylor coefficient, this is a key parameter for you model. But a fixed value is used for different land-surface types, for example, sand-land, grassland and forestland, which will make remarkable error in estimating regional ET.

-P6002, Fig.6: Here, ET stands for regional mean values or some points' values? How about precipitation?

-P6004, Fig.8: You need build such a relationship for all the pixels in Fig.2 and Fig.7

-P6006, Fig.10: The relationship between ET and NDVImax. You need build such a relationship for all the pixels. Why there are only these points in Fig.10?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 5977, 2009.