

Interactive comment on “Soil, snow, weather, and sub-surface storage data from a mountain catchment in the rain–snow transition zone” by P. R. Kormos et al.

Anonymous Referee #2

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Presented for the review are the article and the dataset that comprises weather, snow, soil and stream flow observation data from a small catchment located in Northwestern US within the rain-snow transition zone. The data has been collected in detail: hourly weather, soil moisture, snow depth and flow rate observations are complemented with 10 weekly snow survey data, and provided with 2.5-meter DEM and fine resolution soil properties data. The time-series are fault-free, well-organized and presented in ASCII text or ESRI Shape format, suitable both for common spreadsheet and GIS software. The authors mention several limitations in the data collection, namely the discharge data and the snow depth data. The equipment malfunctions, according to

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the paper, may account to 1.5 month of missing discharge measurements and to 4 months of missing snow depth measurements from ultrasonic sensors. Additionally, the soil moisture data collected at the southwest-facing slope display gaps (Fig. 4d) that are not discussed in the text (Part 5.4).

The provided dataset is suitable for purposes of snow cover model evaluation, as it provides thorough measurements of meteorological variables, soil temperature and snow cover characteristics. The instrument set-up and location seem to be relevantly chosen according to local topography and landscape, thus providing opportunity to correlate snow cover characteristics to physical conditions of the underlying surface.

Soil moisture modelling is another application of the described dataset, as the provided observations of the vertical soil moisture content distribution are suitable for models to be calibrated against. Distributed soil texture data is also provided.

Specific Comments:

- The authors mention (p. 814, line 14 - 25) hydrological modelling and annual water balance calculations as possible applications for the provided dataset. This statement seems to be rather optimistic for two main reasons: the size of the catchment under consideration and the duration of the observation. The catchment area of 1.5 ha (it would be more appropriate to provide the area in sq. km) allows for its qualification rather as a hydrotape than an elementary basin. This assumption can be supported by the ephemerality of the local stream. Further investigation is probably required to assess the minimum size of the catchment to form permanent stream under given conditions. One-year duration of the observations seems to be also unsuitable for water balance calculations. No direct measurement of the evaporation is mentioned, which would be most appropriate for water balance studies. I suggest the authors to moderate the aforementioned statement (p. 814) on possible application of the dataset.
- Part 2: More detailed soil layer description apart from references to other studies would be more useful for a reader.

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- A more detailed description of the underlying bedrock and its hydrogeological properties would be more appropriate. The importance of such ephemeral streams as the one under consideration is mentioned in the paper, yet no further description is given concerning the interaction between the surface and the groundwater storage.

- Part 5.3: I also recommend to provide the description of the stream ice conditions. Weather time series show air temperatures as low as -18°C , yet no cease in stream-flow is observed due to freezing. This aspect should be either outlined in the paper, or illustrated by any observations available.

Technical corrections:

- The rain-on-snow first mention on p. 812 line 5 requires an abbreviation.

- SOIL_TEXTURE_PROFILES.TXT: in the header the column names 'easting' and 'northing' are swapped.

- SOIL_SURFACE_TEXTURE.txt: in the header the column name 'pct_course' should be named 'pct_coarse'.

- README_DATA.txt: line 347 'pct_course' should read 'pct_coarse'.

With the corrections mentioned above, the dataset and corresponding paper will be suitable for publication.

Please also note the supplement to this comment:

<http://www.earth-syst-sci-data-discuss.net/6/C285/2014/essdd-6-C285-2014-supplement.pdf>

Interactive comment on Earth Syst. Sci. Data Discuss., 6, 811, 2013.