Overall Review: Data in remote mountain regions is hard to obtain and hard to organize and quality control. For this reason, this dataset is worth sharing, particularly as part of a special issue on mountain datasets. However, the paper as written is very general. It does not reference other datasets available for the same region or provide specific details about this particular dataset. Therefore, I recommend a number of revisions to improve the data archive and the paper before publication.

Comment:
In particular, I cannot find photographs of the sites or sketches defining what various parameters mean relative to each other (such as what exactly does “edge”, “road” and “stream” in snow depth files refer to - - how far are these from each other, and what differences are they trying to capture). I also cannot find details on soil profiles, soil characteristics, or information on how calibration was conducted to convert the raw instrument readings to volumetric water content. For using the soil moisture data, it would also be very valuable to know how deep the soil is above bedrock. (For example, at Gin Flat, Flint et al. 2008 found that water pooling on the bedrock below their soil moisture sensors was incredibly important to the soil water content evolution: http://tenaya.ucsd.edu/~dettinge/flint08.pdf . This paper also gives a good example of laboratory measurements of soil samples from the site, which I could not find in the data files here.) Please forgive me if I have missed anything that is in the data files, and in that case, please consider my comments an indication that the paper and readme files should be clearer on how to find such relevant data.

Response:
Thank you for identifying a clear oversight in our documentation. We have added maps and available photos of each distributed snow and soil moisture monitoring site in the University of California Merced dataset. Unfortunately, we do not have a complete photographic record of each measurement node. We do plan to obtain photos during the next snow-free period and post those to the dataset. In addition, we have added a more complete site description with the photos and maps. The following text has been added in a modified form to both the manuscript text and the README file with the data:

At each of the 4 locations (Merced Grove, Gin Flat, Smoky Jack, Olmsted Quarry), the snow depth sensor nodes were distributed according canopy coverage (drip-edge, under canopy, open canopy), as well as aspect (Rice and Bales, 2010; Kerkez et al., 2012). Each site encompasses approximately 1-3 hectares.

One meter deep soil pits were excavated at Merced Grove, Gin Flat, and Smoky Jack and the face of each pit was instrumented with soil moisture sensors at 10, 30, 60, and 90 cm depths, while at Olmstead Quarry soil pits were instrumented at depths of 10, 30, and 60 cm due to the swallow soil. The soil moisture sensors were installed in undisturbed soil. The soil profiles were then back-filled and hand compacted to maintain the original soil horizons and density as much as possible. Depth to bedrock was not determined at these sites. A Judd snow depth sensor was also mounted 3 m above ground surface.

The soil moisture sensors installed for this study, were the 5TE (5.2-cm probe length), the successor to the family of Decagon ECH2O sensors studied by Kizito et al. (2008). That study evaluated the EC-5 and ECH2O-TE sensors for a wide range of soil solution salinity, temperature, and soil types. Their calibration measurements showed little probe-to-probe variability and demonstrated that a single calibration curve was sufficient for a range of mineral soils, suggesting there is no need for a soil specific calibration (Bales et al., 2011).

To convert the Level 0 (raw data) to volumetric water content (VWC), the Topp equation (Topp et al., 1980) is applied: $VWC = 4.3\text{x}10^{-6}\ \varepsilon^3 - 5.5\text{x}10^{-4}\ \varepsilon^2 + 2.92\text{x}10^{-2}\ \varepsilon - 5.3\text{x}10^{-2}$, where ε is the dialectic permittivity, which is the raw values report by the Decagon 5TE.

References
Kerkez, B., S. D. Glaser, R. C. Bales, and M. W. Meadows (2012), Design and performance of a wireless sensor network for catchment-scale snow and soil moisture measurements, Water Resour. Res., 48, W09515, doi:10.1029/2011WR011214.

Kizito, F., C.S. Campbell, G.S. Campbell, D.R. Cobos, B.L. Teare, B. Carter, and J.W. Hopmans. 2008. Frequency, electrical conductivity, and temperature analysis of a low-cost capacitance soil moisture sensor. J. Hydrol. 352:367–378.

RC Bales, JW Hopmans, AT O'Geen, M. Meadows, P.C. Hartsough, P. Kirchner, C.T. Hunsaker, D. Beaudette, Soil Moisture Response to Snowmelt and Rainfall in a Sierra Nevada Mixed-Conifer Forest, *Vadose Zone Journal,10:786-799, 2011*.

Rice, R., and R. C. Bales (2010), Embedded-sensor network design for snow cover measurements around snow pillow and snow course sites in the Sierra Nevada of California, Water Resour. Res., 46, W03537, doi:10.1029/2008WR007318.

Topp GC, David JL, and Annan AP. 1980. Electromagnetic, Determination of Soil Water Content: Measurement in Coaxial Transmission Lines. Water Resour Res 16(3): 574–582.

Comment:
The paper should reference other data sets that this data set should be used with: These include: Lundquist et al. 2016 streamflow data (you cite this later in the paper but don't mention it has data complimentary to this paper) https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016WR019261 Other iSnobal snow modeling in this region with associated datasets: Hedrick et al. 2018: Paper: https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2018WR023190 From Hedrick's acknowledgements section: "The data set used to produce the results presented in this study is available at https://doi.org/10.5281/zenodo.1343653. The interpolation from point to grid for the forcing data is available as a standalone Docker container in a software repository at

https://doi.org/10.5281/zenodo.1343647." Link to Hedrick's data archive: https://zenodo.org/record/1228400#.W9OJzBNKjUI. The ASO 50-m SWE data surfaces are also available in this repository and are relevant to the data you are sharing here.

Response:
References to these complimentary datasets have been added to the text.

Comment:
page 5, line 10; The Tuolumne sensor is representative of its PRISM grid cell, but not its PRISM elevation band. Tuolumne is in a rain shadow, and the multiplication factor used in Lundquist et al. 2016 is based on the ratio of the 800-m PRISM climate normals for the Tuolumne snow site and the Dana Meadows snow site, so you can use PRISM climate normals to scale these and should explain that. (Feel free to contact me if you're confused by what I've written here.)

Response: The text has been modified to clarify the method by which these data may be scaled to other parts of the basin.

Comment:
I'm presuming you got rid of the data from the RAWS radiometers that had shading by trees and surrounding terrain (these sensors have problems in this area), but it would be helpful to have more information on the QC criteria for doing so. Karl Lapo has a github repository on methods for Mountain station quality control (with particular focus on solar radiometers) that may be helpful: https://github.com/klapo/moq

Response: Radiometer data has not been corrected for shading effects and we have added text to make this clear. The subset of radiometer records used by Roche et al. (2018) were manually corrected to eliminate shading effects, scaled to theoretical clearsky values generated by point runs of Snobal, and then converted to a cloudiness factor (0 to 1), the ratio of observed to theoretical values. The cloudiness factors are not included with the dataset and we have added text referring the reader to Roche et al. (2018) for a detailed description of methods.

Comment:
page 6, line 12: data "were" (not was) collected.

Response:
We have corrected the verb. Thank you.

Comment:
Are your basin and grid data the same or different from those in Hedrick et al. 2018 in the zenodo repository? It would be good to comment on the differences/similarities.

Response:
The basin and grid used by Hedrick et al. (2018) is different from the grid used in Roche et al. (2018). Our grid is 100-m resolution and covers the entire Merced and Tuolumne watersheds to their respective foothill reservoirs. Hedrick et al. (2018) use a 50-m grid that covers the watershed draining to Hetch Hetchy Reservoir within the greater Tuolumne River watershed and is not aligned with our grid.

Comment:
Did you compare the canopy data (tree height, etc.) with that available from the lidar maps in this region? Given that this area has been extensively flown by lidar, I would imagine you checked it in at least a subset of the areas and could comment on how well it compares. It would inform subsequent users of which dataset they might prefer to use.

Response:
We did not compare canopy data with available LiDAR maps in this region and have added text stating this.

Comment:
Table 1. I'm not sure where you're getting the numbers for instrument height, as my impression is that this is quite variable across the region. Please comment on how these values were obtained and how consistent you think they are. Even better, in the data files, include metadata on sensor heights for each particular sensor.

Response:
We have added parameter information tables to the dataset (and removed the instrument height column from Table 1). The tables include where the raw data may be obtained, which parameters are included in the dataset at each level of refinement (Levels 0, 1, 2), the water years available in the dataset, and an estimate of instrument height where relevant and the source of that estimate.

Comment:
Table 4. The canopy parameters here don't make sense with the rest of the dataset. These look like they are model parameters and thus should be reported in your modeling paper. If these are

directly linked to observations, you should better explain how these were observationally derived.

Response:
We have removed Table 4 and directed the reader to Roche et al., 2018 for relevant details. The ascii files containing the distributed values remain in the dataset.

Comment:
Some of your sensors have much longer records than 2010-2014. It would be very helpful to reference the total potential duration of each sensor, as well as link to an archive where someone who wants access to that data could acquire it (presuming they want to QC the data themselves). Also, explain why you focus your data reporting on this short period (is it the only time frame you had UC Merced snow depth and soil moisture?)

Response:
We have added parameter information tables to the dataset. The tables include where the raw data may be obtained, which parameters are included in the dataset at each level of refinement (Levels 0, 1, 2), the water years available in the dataset, and an estimate of instrument height where relevant and the source of that estimate.

The dataset is limited to roughly 2010-2014 as this was a period including wet, average, and dry years for a snow modeling sensitivity analysis. It was also chosen to overlap with available UC Merced distributed snow measurements along the Tioga Road corridor.

Comment:
Figure 3. You're presenting a dew point lapse rate and goodness of fit. You need to explain which stations (all? or only some?) went into this fit (because you will get quite different answers depending on what you include) and then let the reader know that there are two papers that explicitly analyzed lapse rates (temperature, Lundquist and Cayan 2007, and dew point, Feld et al. 2013) for this same area, and these papers demonstrate variability beyond a linear fit in space and time, and those data are available in conjunction with the Lundquist et al. 2016 data paper. In this context, your data could be a nice supplement to anyone wanting to follow up by combining the two datasets.

Response:
We used all stations with temperature and relative humidity data shown in bold in Table 1 (n=23) and used in Roche et al. (2018). This has been clarified in the text and the figure caption. We have added a statement about the potential usefulness of our dataset in combination with that of Lundquist et al. (2016) in furthering the analyses of Lundquist and Cayan (2007) and Feld et al. (2013).

Comments concerning the dataset files:

Comment:
I was able to download the data from the link. (This is good, as I have had that _not_ work in more papers than I care to mention.) Upon opening these files, I still had many questions, as detailed below: How were the soil moisture measurements calibrated? How do you get volumetric water content? Do you have photos and sketches of the soil types and compositions at each depth where you have a sensor? I can’t find these in the files.

Response:
We have added additional site metadata (available photos and maps) to the UC Merced dataset. The soil moisture sensors were not calibrated for the specific soil compositions at Merced Grove, Gin Flat, Smoky Jack, and Olmsted Quarry. Calibration measurements showed little probe-to-probe variability and demonstrated that a single calibration curve, using the standard Topp equation, as described above, was sufficient for the range of mineral soils, suggesting that there is no need for a soil specific calibration (Bales et al., 2011).Therefore, soil composition data was not evaluated for the sites along Big Oak Flat and Tioga Pass Roads.

Comment:
What is a .JNB file? There are a lot of these under Merced Level_2 measurements, and I can’t open them with a text editor. There does not appear to be a README in that folder that explains what software is required here. Also, if it is specialized software, I strongly encourage you to include the data in a more general form.

Response:
A .JNB file is a SigmaPlot™ proprietary file. These files were inadvertently left in one location in the dataset after plot preparation. These files have been removed from the dataset.

Comment:
Are there pictures of the sites? Maps that identify which sites are which? It’s hard to navigate the giant zip folder of all the data. Some kind of supplementary road map to start with would help a lot. A pdf with maps and pictures and explanations would help quite a bit. For example, I open a file called “SmokyJack,” and it tells me there is snow and soil at the “edge”, “met”, “open”, “road”, “stream” and “under” - - what do those mean? Is there a photo of the site? Multiple photos would help. The paper doesn’t describe the design behind these installations.

Response:

Maps, available photos, and detailed site descriptions have been added to the metadata for UC Merced sites. Descriptions of the design is above and now included in the manuscript text.

Comment:
The collection of all data plots is not very informative, as most of the time series are too long (and not plotted on the same graph with other regional time series) to detect outliers.

Response:
We provide data in plot ready form so the interested user can look at different levels of detail.

Comment:
Actual photographs of the sites, actual instrument heights at specific sites, and actual information on how QC was conducted would be helpful.

Response:
Available photos, maps, and more detailed site descriptions of the UC Merced sites are now included in the dataset. Estimated instrument heights are now included for each site by parameter as well as the method by which the estimate was made. We have added the following statement to the README file regarding QA/QC under Level 1 data: Level 1: "QA/QC data (assure serial continuity of the data, flag missing data, filter non-physical values)".

Comment:
How were "nearby stations" selected (how close was nearby)? How much data were removed in the higher level data? When was a site determined to have too much shading of the radiometer?

Response:
Nearby stations were selected to be as close as possible geographically to the site of interest and with the highest coefficient of determination for the parameter of interest. This has been addressed in the README file. The amount of data removed in higher level data varied by site and parameter. This can be determined by comparing level 1 with level 0 data. No determination of "too much shading" was made for the radiometer data. This data is left "as is" and this has been clarified in the manuscript text and in the README file.

Comment:

What is fuel moisture temperature and how is it measured? (Is this standard? I saw an instrument placed in a stick at Dana Meadows but am not sure how such a stick was selected and/or what exactly was being measured there.)

Response:
Fuel moisture measurements are beyond the scope of the dataset, though raw data are included for completeness because these data were collected with air temperature and humidity measurements by Dr. Dan Cayan and Douglas Alden at Scripps Institution of Oceanography. As noted in the README files, questions regarding this data should be directed to these folks.