Interactive comment on "Toward high-spatial resolution hydrological modeling for China: Calibrating the VIC model" *by* Bowen Zhu et al.

Anonymous Referee #1

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This study implemented a high-resolution (1/16) hydrological modeling over China based on the Variable Capacity (VIC) hydrologic model, wherein the VIC parameters was calibrated with the streamflow data record from 29 gauging stations. Comparing with the available in-situ/satellite-based products, the validation analyses demonstrated that the calibrated VIC hydrological modeling at a 0.0625° spatial resolution is overall able to reproduce the key water budget terms, including the runoff hydrographs, evapotranspiration (ET) patterns, and soil moisture (SM) dynamics. The results may benefit the VIC model to be coupled with the operational China Land Data Assimilation System (CLDAS). Although this manuscript is well written and of good readability, I do have a few concerns to be addressed.

1. The form of this manuscript is very reminiscent of past work by others. A general

comment is that the authors need to clearly highlight the unique of such high-resolution off-line modeling dataset comparing with the existing similar datasets, including global coverage. 2. Some assertions about model performance are made arbitrarily due to lacking of authoritative criteria. For instance, in terms of evaluating model calibration, the authors can cite one reference (Moriasi et al., 2007, doi:10.13031/2013.23153) that places a lower range to describe a "satisfactory" calibration. 3. Typically, the hydrological model is calibrated with long-term (>10-yr at least) streamflow observation record and validated over another independent period. In the current version, however, the record length of most calibration stations (Table 2) is too short (less than 3-yr) to ensure the robustness of model performance. Also, the streamflow validation over an independent period is still lacking for each calibration station. 4. Soil moisture (SM) memory play an important role in the land surface water and energy budget. The authors should add the evaluation with respect to the SM persistency. 5. VIC outputs include a set of snow related files, which are important for water and energy balance in the cold or mountainous regions. Please add the validation analysis of VIC snow output. 6. Line 240-242. Please provide more details on the parameter interpolation. 7. Line 282-283. "southeastern China" should be "southwest China". 8. Line 340-343. This sentence is subject to grammar mistake. Please double-check this issue. 9. The quantitative metric information is absent in most of figures. For instance, please add the RMSE information in each panel of Figure 4 and Figure 7. 10. Figure 3 presents the comparison of monthly discharge, but the Y-axis is labeled with runoff (mm), rather than with discharge (m3/s). Please address this issue.