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Multi-Model Assessment of Evapotranspiration over the Upper Blue Nile Basin

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The Blue Nile River originates in Ethiopia where water scarcity is prominent and food security is at risk. To have a proper water resource planning for this region, accurate estimation of evapotranspiration (ET) over the Blue Nile basin is vital. However, ground measurement over large areas is not realistic while remote sensing ET products cannot be used as prediction for agricultural planning. Distributed hydrological models, on the other hand, overcome both disadvantages thus can provide guidance for agricultural practice. Therefore, it is worthwhile evaluating the performance of multiple commonly cited distributed hydrological/land surface models in the upper Blue Nile River Basin in terms of ET.
Specifically, we computed the ET using a hyper-resolution hydrological model Coupled Routing and Excess STorage (CREST-SVA) (Shen and Anagnostou, 2017) that physically couples water and energy balances at the soil vegetation atmosphere layer with closed energy balanced solution. Estimates were derived for a long-period (>30 years) at high spatiotemporal resolution (500m and 3 hourly) by forcing CREST-SVA with ERA-Interim atmospheric reanalysis (ECMWF) and MSWEP (Beck et al., 2017a) blended precipitation product. Forced by ERA, CREST (ET) with ET from other hydrological/land surface models are validated against the Moderate-resolution imaging spectroradiometer (MODIS) ET product at daily and grid scale. The performance analysis of the different models provides insights on model selection in similar regions and hydrologic conditions.
References
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