



Trends of land surface heat fluxes on the Tibetan Plateau from 2001 to 2012

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Regional distribution of land surface heat fluxes have been estimated on the Tibetan Plateau utilizing remote sensing products and reanalysis data. A parameterization approach of effective roughness was introduced to the Surface Energy Balance System (SEBS) model to account for the subgrid-scale topographical influences. The distribution of land surface heat fluxes, including net radiation, ground heat flux, sensible and latent heat flux, were mapped based on the revised SEBS model and their annual trends were investigated from 2001 to 2012 on the Tibetan Plateau. It was found that, land surface net radiation flux is slightly decreasing except for high mountainous regions, such as areas around the Kunlun Mountains, Karakorum, Himalayas and Hengduan Mountains. The sensible heat flux is mainly decreasing especially in the central and northern plateau. Along the Yarlung Tsangpo River and in the southeastern plateau, sensible heat flux has an increasing trend. The latent heat flux is increasing nearly in all parts of the Tibetan Plateau except for areas along the Yarlung Tsangpo River and in the southeast plateau. The reason of land surface heat fluxes change is complicated, partly could be contributed by surface air warming and moistening, precipitation increasing, wind stilling and total cloud cover decreasing and so on. Many efforts need to be done to access the understanding of land surface heat fluxes change on the Tibetan Plateau.