Water Stress Estimation in California Using Surface Energy Balance Algorithm for Land

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Abstract

California is undergoing severe drought during the past dacade. A strict quantitative water management is called for to support its ecological and social system. This paper applied the Surface Energy Balance Algorithm for Land (SEBAL) model to estimate the spactial evapotranspiration and water stress in central California. The data were collected from Landsat 7 products. 30m $\times$ 30m evapotranspiration were estimated and compared with the NCEP North American Regional Reanalysis data. Results showed that the remote sensing model could capture the basic pattern of evapotranspiration and water stress distribution. Further research is required to attribute the uncertainties in the calculation.

1 Introduction

California has experienced the most severe drought conditions in its last dacade (***?***).

2 Methdods and Data

2.1 Study Area

2.2 Brief Introduction of Sebal Model

Physical Variable	Data Source	Spatial Resolution
[rgb]1,0,0Radiance	LandSat 7	30m×30m
[rgb]1,0,0Elevation	SRTM[1]	30m×30m

[rgb]1,0,0Air Temperature	Albedo	Canopy Characteristics	Cloud Amount/Frequency
Cloud Base Pressure	Cloud Liquid Water/Ice	Cloud Top Pressure	Dew Point Temperature
Evaporation	Freezing Rain	Geopotential Height	Heat Flux
Humidity	Hydrostatic Pressure	Longwave Radiation	Planetary Boundary Layer Height
Potential Temperature	Precipitable Water	Precipitation Amount	Precipitation Rate
Rain	Runoff	Sea Level Pressure	Shortwave Radiation
Skin Temperature	Snow	Snow Cover	Snow Depth
Snow Melt	Snow Water Equivalent	Soil Moisture/Water Content	Soil Temperature
Surface Air Temperature	Surface Pressure	[rgb]1,0,0Surface Winds	Tropopause
Upper Level Winds	Vegetation Cover	Vertical Wind Motion	Water Vapor
Wind Shear			

2.3 Data Sources

3 Results and Discussion

4 Conclusion

References and Notes

1. D. Griffin, K. J. Anchukaitis, *Geophysical Research Letters* **41**, 9017 (2014).

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