基于温度植被干旱指数的江苏淮北地区农业旱情监测

Agricultural drought monitoring in north Jiangsu by using temperature v

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中文摘要：

　　为实现江苏省淮北地区农业旱情监测，利用Savitzky-Golay（S-G）滤波方法，对2011-2012年江苏省淮北地区1－5月MODIS
tion index, NDVI）和地表温度（land Surface temperature, LST）8 d产品进行重构，去除原8 d数据的噪声，填补受云影响而缺失
温度植被干旱指数（temperature vegetation dryness index, TVDI）；分析TVDI和土壤湿度之间的关系，构建土壤湿度反演模型
型的精度。研究结果表明：1）S-G滤波方法能够提高MODIS LST和NDVI数据质量，并能对缺失数据进行填补；2）TVDI方法
验区具有一定的普适性，反演精度较高（R2=0.575，RMSE=2.59%）；3）TVDI方法在江苏省淮北地区干旱监测中得到了较好
和2012年春旱。该研究可为农业旱情的快速监测提供借鉴。

英文摘要：

　　Abstract: This paper focuses on developing an agricultural droughty monitoring method in north Jiangsu province based on the
Imaging Spectroradiometer (MODIS). In order to build soil moisture estimation model, we collected gravimetric water content of soil
moisture of the sites in 2012, and downloaded the 8-day MODIS reflectance and land surface temperature data from January to May i
gravimetric water content of soil included soil moisture at 10 cm depth and at 20 cm depth. The used MODIS data have some noise f
acquired because of cloud. Therefore, a Savitzky-Golay (S-G) filter method was selected to remove NDVI and LST noise, and generat
Vegetation Dryness Index (TVDI) was calculated from the re-created NDVI and LST data. A correlation analysis between TVDI and s
conducted. The results showed that TVDI was more correlative with soil moisture at 10 cm depth compared to at 20 cm depth, and th
correlative with soil moisture at 20 cm depth. Based on the TVDI and soil moisture data at 10 cm depth, an empirical model for soil m
addition, an empirical model was also built to describe the relationship between soil moisture at 10 cm and 20 cm depth. Finally, the tw
20 cm depth in the area from MODIS data, and the estimated soil moisture was used to monitor field droughty status with a criterion
show that S-G filter method removes the MODIS data noise, and can be used to generate the lost data. The correlation analysis betw
higher correlation with soil moisture at 10 cm depth, and a linear model can be used to best-fit the relationship between TVDI and the
analysis between soil moisture at 10 cm depth and at 20 cm depth shows that soil moisture at 20 cm depth has higher correlation with
can be used to best-fit the relationship between soil moisture at 10 cm depth and at 20 cm depth. The validation experiments show th
moisture estimation with an r2 of 0.575 and a RMSE of 2.59 %. Using this model, soil moisture maps at 10 cm depth were obtained. T
soil moisture at 10 cm and 20 cm depth was used to obtain soil moisture maps at 20 cm depth. Wheat field draught maps in north Jian
wheat field draughty evaluation. Validation experiments showed that the experiments showed the droughty monitoring method was p
appeared in north Jiangsu province.

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