



Using satellite image data to estimate soil moisture

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Soil moisture is considered as an important parameter in various study fields, such as hydrology, phenology, and agriculture. In hydrology, soil moisture is an significant parameter to decide how much rainfall that will infiltrate into permeable layer and become groundwater resource. Although soil moisture is a critical role in many environmental studies, so far the measurement of soil moisture is using ground instrument such as electromagnetic soil moisture sensor. Use of ground instrumentation can directly obtain the information, but the instrument needs maintenance and consume manpower to operation. If we need wide range region information, ground instrumentation probably is not suitable. To measure wide region soil moisture information, we need other method to achieve this purpose.

Satellite remote sensing techniques can obtain satellite image on Earth, this can be a way to solve the spatial restriction on instrument measurement. In this study, we used MODIS data to retrieve daily soil moisture pattern estimation, i.e. crop water stress index (cws_i), over the year of 2015. The estimations are compared with the observations at the soil moisture stations from Taiwan Bureau of soil and water conservation. Results show that the satellite remote sensing data can be helpful to the soil moisture estimation. Further analysis can be required to obtain the optimal parameters for soil moisture estimation in Taiwan.