

Palmer Drought Severity Index mapping using Satellite Imagery

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ABSTRACT

It is necessary to manage water resources in rural areas in order to achieve proper development of new water resources, sustainable usage and reasonable distribution. This paper aims to analyze multi-temporal Landsat-7 ETM⁺ data for soil moisture that is essential for crops in Ansong area. The ETM data was also fused with KOMPSAT-1 images to produce watershed maps. Vector data was implemented and overlaid such as facility location, facility type, irrigation areas, and water pipeline, reservoir inventories.

Images taken in April showed that rice paddy had as low reflectance as artificial features. Compared with April scenes, those taken in May and June showed wetness index increased in the rice paddies. The regression coefficient was meaningful between wetness index and soil moisture measured in the field.

The mountainous areas have almost constant moisture index, so the difference between the dates was very low; while reservoirs and rivers has dramatic changes. We can calculate total potential areas of distribution of moisture content within the basin and estimate the areas being sensitive to drought. Finally we can point out the sites of small rice paddies lack of water and visualize their distribution within the same basin.

It can be said that multi-temporal Landsat-7 ETM⁺ and KOMPSAT data can be used to show broad drought with quick and simple analysis. Drought sensitiveness maps may enable the decision makers on rural water to evaluate the risk of drought and to measure mitigation, accompanied with proper data on the hydrological and climatic drought.