

# **A Crop Drought Index for Groud Truth validation**

Jinlong Fan<sup>1</sup>

<sup>1</sup>National Satellite Meteorological Center, Beijing, China [fanjl@cma.gov.cn](mailto:fanjl@cma.gov.cn)

**Abstract:** Drought is a kind of widely existing nature hazard. There are about 150 drought definitions in the world according to the report from National Drought Mitigation Center of United States of America. Therefore, various drought indices have been developed to depict the drought conditions. However, there is no one index that may be applied to everywhere or in any circumstance. Each index has its own strengths and weaknesses. In terms of the methodology of the drought monitoring, drought monitoring with remote sensing is a powerful way. It is feasible to monitor drought in large area by using remote sensing, in particular for the crop drought. It is quite similar that various remote sensing based drought indices have also been developed to depict the drought condition, such as thermal inertia, vegetation index, vegetation temperature index, crop water supply index, vegetation temperature condition index, vegetation health index and so on. In order to verify and validate these indices derived from remote sensing data, in particular categorize these indices into different level from severe drought to wet condition, it is strongly needed to collect the ground truth data of the drought as the reference. The occurrence of crop drought stress is closely related to the tolerance to water stress of crop and the environmental condition in the field. It is possible in some cases to depict the drought with the single index, like soil moisture or crop canopy water content but a single index is not able to extend widely due to the complexity of the drought. In order to develop a more powerful index, the field experiments have been carried out and the biophysics parameters that are related to the drought were observed. They are the chlorophyll content, crop water content, crop temperature, soil moisture and soil temperature. A comprehensive index was formulated based on the sensitivities of these parameters to the drought and was used to depict the crop drought. This index is expected to evaluate the drought and used to collect the drought condition at large area and finally used to validate and verify the drought index retrieved from remote sensing data.

**Keywords:** Drought, Crop Stress, Comprehensive Index, Drought Monitoring with Remote Sensing, Ground Validation and Verification