

Drought Monitoring, Prediction and Adaptation under Climatic Changes

Su, Z.¹; Ma, Y.²; Van der Velde, R.¹; Dente, L.¹; Wang, L.¹; Menenti, M.³; Sobrino, J.⁴; Li, Z.-L.⁵; Verhoef, W.¹; Jia, L.⁶; Wen, J.⁷; He, Y.⁸; Li, W.⁹; Liu, Q.¹⁰; Yu, Q.¹¹; Li, X.⁷; Zhong, L.²; Zheng, Y.⁹; Tian, X.¹; Li, L.¹¹; Qin, C.¹; Timmermans, W.¹; Van Helvoirt, M.¹; Van der Tol, C.¹; Salama, Mhd. S.¹; Vekerdy, Z.¹

¹Faculty of ITC, University of Twente, NETHERLANDS; ²Institute of Tibetan Plateau Research (ITP/CAS), CHINA; ³TU Delft, NETHERLANDS; ⁴Universitat de Valencia, SPAIN; ⁵LSIIT, University of Strasbourg, FRANCE; ⁶Wageningen University and Research Centre, Alterra, NETHERLANDS; ⁷Cold and Arid Regions Environmental and Engineering Research Institute (CAREERI/CAS), CHINA; ⁸National Meteorological Center, Beijing, CHINA; ⁹China University of Geoscience, Beijing, CHINA; ¹⁰Institute of Remote Sensing Applications, Chinese Academy of Sciences (IRSA/CAS), CHINA; ¹¹Institute of Geographical Sciences and Natural Resource Research (IGSNRR/CAS), CHINA

The objective of this project is to develop a quantitative and operational system for nationwide drought monitoring and drought impact assessment for application in agriculture and water resources and environment in China using ESA, Chinese and other relevant satellite data as major data source in combination with other data source (e.g. meteorological and drought statistics, etc.). An extension to drought prediction and adaptation to climate change will be made compared to the Dragon I drought monitoring proposal. In detail the project aims to generate: (1) real time drought monitoring and prediction system, (2) improved understanding of land surface processes and land-atmosphere interactions over different terrains (e.g. agriculture land, forest, Gobi desert, high plateau, polar environment), (3) algorithms for estimation of land surface parameters and heat fluxes, (4) assessment of economic loss caused by drought and adaptation measures under climatic change, (5) training of young scientists in the area of water, climate and environment. An Internet based system will be developed to provide information concerning the drought evolution situation and to support drought relief decision-making.

We report on progresses in retrievals of soil moisture using in-situ observations, satellite sensors and numerical modeling. The used sensors include ASAR, ASCAT, AMSR-E and SMOS. The accuracy of available soil moisture products are assessed using in-situ data collected in the soil moisture monitoring networks developed for this and other projects. The use of these satellite retrievals in drought monitoring is demonstrated by analyzing the droughts in recent year in SE China.