Geophysical Research Abstracts, Vol. 8, 09976, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09976

A Bayesian approach to characterizing uncertainty in remotely sensed soil moisture measurements using the NAFE dataset

Mark Thyer (1) and Jeff Walker (2)

(1) School of Engineering, University of Newcastle, Australia. (Email: mark.thyer@newcastle.edu.au, Fax: 61-2-49216991) (2) Department of Civil and Environmental Engineering, University of Melbourne, Australia, (Fax: 61-3 8344 6215 Email: j.walker@unimelb.edu.au)

Remote sensing of soil moisture has considerable potential for improving the prediction of hydrological fluxes in gauged and ungauged catchments. However, techniques such as passive microwave radiometric measurements only provide an indirect measure of surface soil moisture content, confounded by variations in soil temperature, vegetation moisture content and surface roughness. The efficacy of remotely sensed soil moisture for data assimilation applications is dependent on accurate and reliable quantification of its uncertainty. The extensive dataset collected during the National Airborne Field Experiment (NAFE '05) conducted in Australia in November 2005 provided an excellent opportunity for characterizing the uncertainty in remotely sensed soil moisture measurements. Bayesian techniques are becoming popular for estimating uncertainty for hydrological applications. Their key advantages are an ability to i) quantify the various sources of uncertainty, ii) incorporate expert information through appropriate prior specification and iii) test and verify assumptions. The insights and challenges provided by utilizing a Bayesian approach to identifying the uncertainty in remotely sensed soil moisture measurements undertaken during NAFE will be outlined.