Geophysical Research Abstracts
Vol. 18, EGU2016-18064, 2016
EGU General Assembly 2016

Insights into soil-landscape evolution when DSM doesn't work

Jacqueline Hannam, Thomas Mayr, and Joanna Zawadzka
Cranfield University, Cranfield Soil and AgriFood Institute, SEEA, Cranfield, United Kingdom (j.a.hannam@cranfield.ac.uk)

DSM relies on relationships between environmental covariates and soil to predict how soil changes in the landscape. Many applications focus on the success of the spatial predictions using validation data. However when DSM performs poorly the reasons behind this are commonly put down to data scarcity, quality or applicability rather than exploring potential pedological explanations.
We present several different DSM studies applied at national scales and where aspects of the process have been unsuccessful. In some cases this can be explained to some extent by the efficacy of the training data and a mis-match between the feature space in the training data and the predicted areas. Areas where these issues are taken into account offer insight into the co-evolution of soil and landscape but where the classic relationship of CLORPT is challenged or where processes are operating at scales that are not represented by the co-variates. Examples include poor prediction of podzolic soils that have evolved due to temporal changes in vegetation and land use. By including temporally varying co-variates in the DSM process we may begin to improve our DSM predictions but more importantly identify how soil environments evolve and respond to temporal perturbations. This could also be used to ascertain how soils will change and evolve in the future at landscape scales as a consequence of climate or land use change.