



Updating soil information for the Sahara using digital soil mapping

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There has been much focus on improving sub-Saharan soil information through various initiatives (e.g. African Soil Information System AfSIS) but there is no complementary data for the Sahara and North African arid zone. These environmentally sensitive areas are affected by key soil degradation processes and the lack of detailed mapping hinders the assessment and mitigation of soil threats such as desertification. We use digital soil mapping approaches across the whole North African aridic area to improve existing coarse scale mapping by predicting soil classes at 250m pixel resolution. The methodology consisted of two phases. The first identified anomaly areas such as sand seas, bare rock and salt pans using albedo and land cover data. The second refined the remaining areas by applying digital soil mapping approaches to predict soil classes. We applied a number of models (Random Forest, Neural networks and Bayesian Belief networks) using available Sahara-wide environmental co-variates. The output for the best performing model for each 250m pixel was selected as the resulting soil class. This produced a consistent soil type map across the whole area (11 million sq km). Increased resolution of soil mapping in the Sahara region can be utilised for a number of applications. In particular, implementing early warning systems for desertification in peripheral desert areas and identifying the responses of different soil components in arid areas to climate change.