Geophysical Research Abstracts
Vol. 15, EGU2013-3901, 2013
EGU General Assembly 2013


# Digital soil mapping of a soil classes map at 1:50,000 scale in the Doubs department, France

Sebastien Lehmann, Micheline Eimberck, Manuel P Martin, and Dominique Arrouays
INRA Orléans, US 1106, Unité INFOSOL, Orléans, France (sebastien.lehmann@orleans.inra.fr)

Recent advances in segmentation processing and in classification using boosted regression trees provide new prospects for predictive digital soil mapping. The availability of numerous soil data through the French soil database Donesol, and easy to access environmental co-variates (DEM and derivatives, geological maps, land cover maps...) makes it possible to produce a predicted soil type map, at a scale of about 1:50,000, validated by point data in the area of Vercel (Jura, France). On this area, the approach we detail here led to mapping a surface only $\frac{1}{4}$ of which was previously mapped. 2348 point data scattered over the whole territory were used to calibrate and validate the model. First, we produced a predictive map from point data. Half of these data were used to calibrate a model using boosted regression trees. The remaining half were used for validation. We tested 8 iterations using data integrating increasingly large spatial domains. The derivates from the DEM were averaged using circular windows of growing size (diameters from 30 to 1800 m). The resulting map was affected by some noise that we removed, using a filter based on the dominant classes, in order to obtain a map with clear, abrupt limits. Secondly, we used the same approach taking the soil units as calibration data (using a buffer around the limits in order to get "pure" pixels).
Finally, the soil surveyor expertise was used to produce a synthesis of these two predictions to obtain a chloropleth map of soil units. The time saved by this approach, in comparison to a classical one, is estimated to be about 70-80 days for 36,000 ha. DSM alone is not sufficient, knowledge of the terrain and external validation remain essential.