

EGU2020-10631

<https://doi.org/10.5194/egusphere-egu2020-10631>

EGU General Assembly 2020

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Yearly land cover mapping between 1984 and 2018 in the Haouz plain (Marrakech, Morocco) using robust decision trees approaches.

Vincent Simonneaux¹, Paul Baby², and Mohamed Hakim Kharrou³

¹IRD / CESBIO (Centre d'Etudes Spatiales de la Biosphere), Toulouse, France (simonneaux@ird.fr)

²Université Paul Sabatier, Toulouse, France / Université des Sciences et Technologie de Hanoi, Vietnam

³Université Mohamed 6 Polytechnique, Benguerir, Maroc

Land Cover is a major variable required for agricultural management and biophysical modelling. Remote sensing is the more efficient manner to map this information although robust method are still hardly available especially in semi-arid areas where the development of crops is very heterogeneous, where crops often have low vegetation coverage (e.g. tree plantations) and where several crops are sometimes associated on the same plot (e.g. trees with understory of annuals). Besides, the major problem of classical land cover classification approaches is that they require ground data every year for calibration.

To solve both land cover complexity and ground data availability problems, we propose decision tree approaches based on phenological criteria assumed to remain true for any year. The present work was achieved in the Haouz plain (Marrakech, Morocco) where land cover belongs to six main classes, namely: bare soil, evergreen trees (olive and citrus), deciduous trees (apricot, apple, pomegranate...), winter crops (wheat), summer crops (melon and watermelons), fall crops (peas and broadbean). A decision tree is build based on phonological criteria supposed to be independent of the year, related either to the dynamic of NDVI (min, max and range of NDVI as compared to thresholds) and the period in which the peak or the minimum of NDVI happen (linked respectively to the max of vegetation of annual crops and to the leave fall for trees). This decision tree was applied to map the irrigated areas in the Haouz plain between 1984 and 2018 at yearly time scale using the Landsat archive downloaded from USGS. Only five years with not enough clear images were discarded. The time series obtained are consistent with the known changes that took place in the Haouz plain since 1984, namely a strong development of tree plantations, and of summer crops in some areas. The advantage of processing each year instead of only some key dates (e.g. 3 or 4 images as often encountered in studies when Landsat archive was not so easily available as now) is that it gives a better idea of uncertainties and provides a more robust trend. This work will be continued with estimates of the irrigation water consumption linked with these land cover changes.