RAPID LAND COVER MAPPER

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Mapping land use and land cover (LULC) over large areas and through time has always presented major challenges. There are two contrasting approaches to LULC mapping: automated/semi-automated classifications and manual photo interpretation. The first approach is fast and efficient in classifying large areas, but is problematic when comparing two or more time periods. The photo interpretation method produces good results for time-series mapping, but is very labor-intensive for large areas. We developed a new tool called the Rapid Land Cover Mapper (RLCM) that addresses these challenges.

The RLCM tool is a vector/raster hybrid approach that lends itself to both multiple-resolution and time-series mapping of LULC and many other geographic themes. Conceptually, it is based on the traditional dot grid method for calculating areas that has long been employed by foresters and other users of aerial photography. The RLCM tool first generates a digital dot grid and overlays it on an image within ESRI's ArcMap GIS Software** (Figure 1).

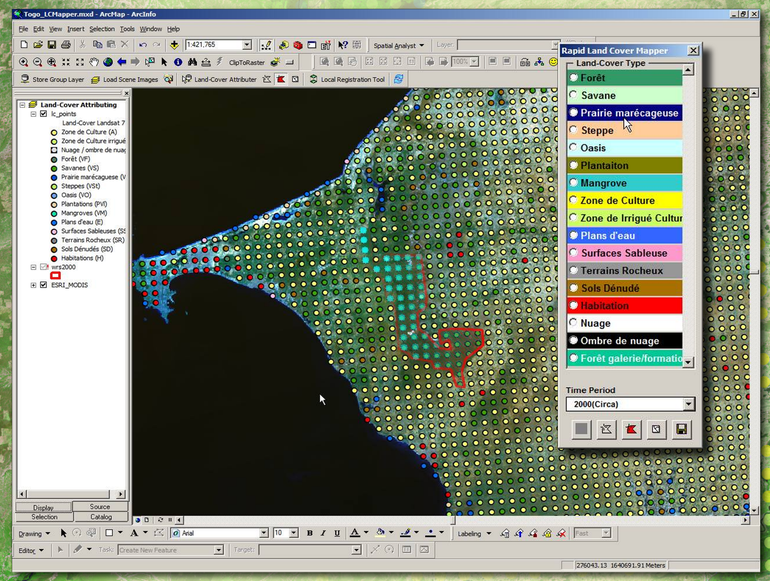

Figure 1: RLCM application environment.

Using standard photo interpretation techniques, the analyst identifies the discrete LULC class for each dot. The RLCM tool facilitates the selection of dots within a common LULC class and applies that classification attribute to them. Once the dot grid matrix is completely classified for a given time period, a raster LULC map can be generated. The same process can be applied to different time periods and the resulting maps can be compared to assess change (Figures 2 and 3).

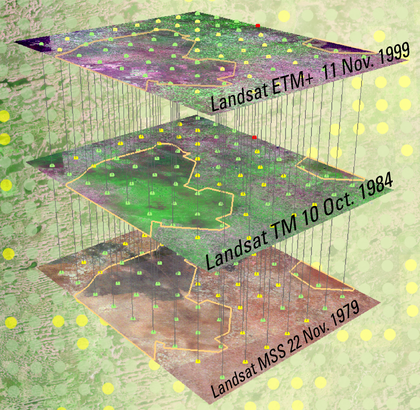

Figure 2: Time series mapping.

RLCM's relational database schema allows for an infinite number of time-periods for a study area. It also captures the acquisition date of the image being interpreted, dating the classification, and providing the potential for variable temporal analysis.

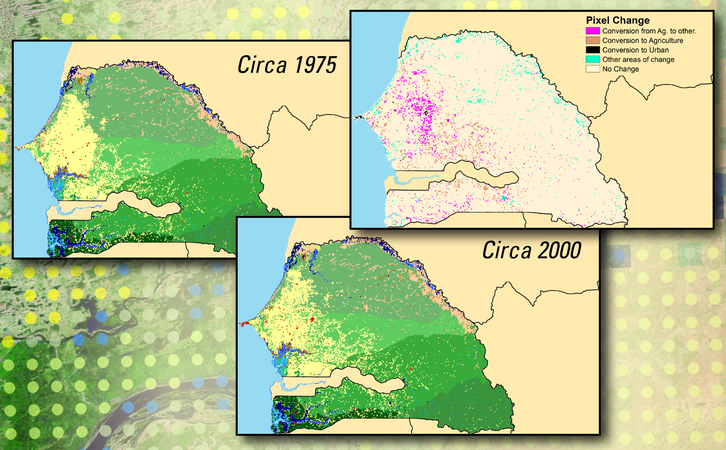

Figure 3: Senegal land cover maps (c.1975 and c. 2000) and change map.

The RLCM approach has five significant advantages. First, as in photo interpretation, RLCM enables an analyst to compare images from different sources and of varied scales and formats. Second, through local knowledge photo interpreters are able to integrate many different landscape characteristics into an interpretation (Figure 4). Third, the method is relatively rapid and therefore usable for large area mapping (Figure 5). Fourth, RLCM is effective for time-series mapping because the interpreter can determine whether real LULC change has occurred at each dot over time. Finally, this approach allows the use of nested dot grids for the creation of multiple-resolution LULC data sets.

The RLCM tool is scheduled for release on June 15, 2007. Software will be available for download from the U.S. Geological Survey Center for Earth Resources Observation and Science RLCM Web page (http://edcintl.cr.usgs.gov/rlcm).

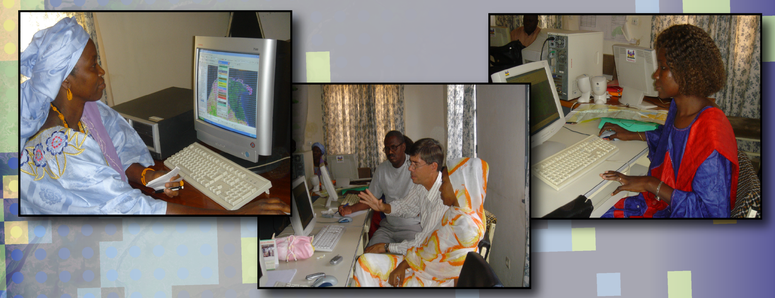

Figure 4: A West Africa Land Use / Land Cover workshop in October 2006 using the RLCM.

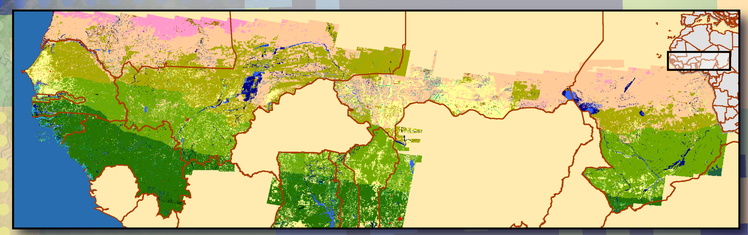

Figure 5: Preliminary map of the 2000 land cover assessment of West Africa using the RLCM application.

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