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Landsat Time-Series analysis to assess agricultural spatial-temporal patterns in the Socialist/Post-Socialist Romanian Flood Plain

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The increasing availability of the Landsat image archive and the development of approaches to make full use of these data provide novel insights into the drivers and dynamics of land use systems change. The goal this paper is to identify the spatial and temporal patterns transitions in agricultural lands from socialist to post socialist Romania. We used annual time series images of Landsat to assess how the agricultural lands have evolved as shapes, sizes and predominant crops. We have focused on cloud free images from three seasons: spring, summer and autumn for a time period from 1980 up to 2013. Unfortunately, the availability of such multi-seasonal cloud-free image dates is often limited and we had to use compositing algorithms in order to obtain reliable images for the entire crops seasons. We focused especially on shapes and sizes of agricultural land and we used object based image analysis to semi automatically map and classify the agricultural fields. A very interesting pattern is observed consisting in transitions from large agricultural fields during socialist period to small heterogeneous patches after socialist period and again to large agricultural lands in the last years. The study demonstrates the value of the temporal depth of the Landsat archive and highlights that trajectory-based change detection approaches can be highly beneficial for gaining insights on the effect of land use patterns