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Multitemporal Analysis of Coastal Built-up Development: Use of SPOT and Landsat TM Imagery

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Mediterranean coastal landscape is subject to increasingly complex land use/land cover (LU/LC) changes. Majority of these changes occur as a result of urbanization, tourism, agriculture and transportation activities. Diversity and extent of human activities on the coast results with complex changes in short term. Therefore, high temporal and spatial resolution of change detection may facilitate analyzing above mentioned changes more accurately. In this context, SPOT (Satellite Pour l'Observation de la Terre) dataset have advantages in terms of both high spatial resolution (10 m) and frequent temporal coverage for landscape monitoring and modeling. The coastal zone of Erdemli district, located in the west of the central district of Mersin (SE Mediterranean Coast of Turkey) is currently experiencing problems due to development of multistory buildings as summer apartments near the coastline and expansion of rural settlements in close proximity to the coast. This development on the coast threatens both agriculture areas and natural vegetation and causes landscape fragmentation. The aim of this paper is to monitor qualitative and quantitative aspects of built-up development in the coast of Erdemli (Mersin/Turkey) and analyze its negative impacts on the coastal landscape. Panchromatic SPOT datasets with a ground resolution of 10 m acquired in 1989, 1995, 2001 and 2007 were combined with multispectral Landsat images prior to classification. Urbanization on the coastal zone was mapped at finer spatial (i.e. 10m) and time (i.e. 6 years) scales and current change trends were determined understand dynamics of built-up development on the coast.