Assessment of impact of land cover / use change over the San Luis Potosi Valley (Mexico): Multitemporal analysis based on satellite imagery.

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One of the factors which influence the retention or depletion of an aquifer is the change in cover / land use (LCUC); therefore, it has been shown that vegetative cover is important for the preservation of land and water infiltration. For this reason, it has conducted an assessment of LCUC and the impact of this factor over the San Luis Potosi Valley. To perform this work, we used vectorial urban cartography from Instituto Nacional de Estadística y Geografía (INEGI), for the years 1959, 1970, 1993, 2000, 2005 and 2010; and thematic information of land cover / use and surface temperature, extracted from Landsat TM5 images for the years 1976, 1995, 2000, 2007 and 2011. Landsat TM5 scenes were obtained from GLOVIS system and were processed with ENVI 4.5 software. All vector and raster information were georeferenced by DATUM WGS84 and the UTM coordinate system. The nomenclature used for different vegetation covers was taken from INEGI cartography, and includes the following classes: coniferous forest, hardwood forest, desert scrub, mesquite, native grassland, induced grassland, rain crops, irrigated crops and other kinds of vegetation._Results from this study show that the greatest change of urban surface occurred from 1970 to 1993, when the urban area quadrupled its surface. In this sense, we can verify that the urban surface increased 17 times your size from 1959 to 2010. The increasing urbanization has caused the deterioration of some natural areas, because in the region it has intensified irrigated agriculture and induced grassland, while rain crops decreased considerably. Moreover, urban growth accelerated the increase in industrial activity and the burning of natural vegetation, thereby causing a greater extraction of groundwater, and reducing recharge zones. Coupled with LCUC, the analysis of superficial temperature shows a rate of increase of 3.2°C over the last 35 years, resulting in an increase in evaporation, thus hindering the optimal recharge in the aquifer of the Valley of San Luis Potosi.