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Data Article

Human and remote sensing data to investigate the frontiers of urbanization in the south of Mexico City

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ABSTRACT

The data presented here were originally collected for the article "Frontiers of Urbanization: Identifying and Explaining Urbanization Hot Spots in the South of Mexico City Using Human and Remote Sensing" (Rodriguez et al. 2017) [4]. They were divided into three databases (remote sensing, human sensing, and census information), using a multi-method approach with the goal of analyzing the impact of urbanization on protected areas in southern Mexico City. The remote sensing database was prepared as a result of a semi-automatic classification, dividing the land cover data into urban and non-urban classes. The second data set details an alternative view of the phenomena of urbanization by concentrating on illegal settlements in the conservation zone. It was based on voluntary complaints about environmental and land use offences filed at the Procuraduria Ambiental y del Ordenamiento Territorial del Distrito Federal (PAOT), which is a governmental entity responsible for reviewing and processing grievances on five basic topics: illegal land use, deterioration of green areas, waste, noise/vibrations, and animals. Anyone can file a PAOT complaint by phone, electronically, or in person. The complaint ends with a resolution, act of conciliation, or recommendation for action by other actors, such as the police or health office. The third

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data about unemployment was extracted from Mexico's National Census 2010 database available via public access.

Specifications Table

Subject area	Sustainability, urbanization, geography
More specific subject area	Sustainable land use, Volunteered Geographic Information (VGI), GIS
Type of data	Satellite images, VGI, python code, census data, ArcGIS toolbox
How data was acquired	Underlying RapidEye data from the German Aerospace Center was obtained through funding by the German Federal Ministry of Economy and Energy. VGI was obtained from the PAOT (on September 3, 2015) and 2010 census data was downloaded from Mexico's National Census Bureau, (INEGI, 2010), both open access. For further analysis, ArcGIS 10.3 was used.
Data format	TIF (analyzed), SHP, DBF, TBX (ArcGIS toolbox), python file.
Experimental factors	The analysis based on a grid obtained through optimal value of autocorrelation using ArcGIS 10.3, the optimized hot spot analysis tool.
Experimental features	Combination of remote and human sensing (steps 1 and 2 of the graphical abstract [4]) with census information in a framework of optimized hot spot analysis.
Data source location	South of Mexico City
Data accessibility	Data are included in this paper

Value of the Data

- As the frontiers of urbanization are spaces with a high potential for conflict, these new data and combination of data types present a methodology with the capacity for replication of studies in many cities.
- A combination of human (VGI) and remote sensing is relevant for a more reliable and validated analysis of urban growth.
- Due to the decreasing costs of satellite imagery and the increasing availability of VGI, this type of analysis has been proven to be cost effective for future urban growth research.
- Other socio-economic variables can be easily integrated into the analysis for further investigation.

1. Data

For the urban change data, two tiles (IDs 1447913 and 1447914) of RapidEye 3A level products (5 m per pixel) covering the south of Mexico City in November 2009 and August 2014 were classified using E-cognition [5], which is a standard software for land use change analysis. Afterwards, we conducted change detection. The given urban change data contain four classes: 0=non-urban in 2009 and 2014; 1=urban in 2009 and 2014; 2=urban in 2009 but non-urban in 2014; and 3=non-urban in 2009 but urban in 2014. The ecological complaints were reported between 2002 and 2013. The data set includes 971 complaints concerning violations of the status of the conservation area (see Fig. 1 and related paper [4] for an explanation of "conservation area"). The smallest available basic geostatistical area (AGEB) contained a shape file with population data already included in the attributed table and a table containing economic characteristics for the Federal District of Mexico City. Important abbreviations for our analysis in the data set