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National Neighborhood Data Archive (NaNDA): Polluting Sites by Census Tract and ZIP Code Tabulation Area, United States, 2000-2018

P.I. Documentation for Polluting Sites by ZIP Code Tabulation Area Data

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nanda_pollutst_zcta_2000-2018_01P.dta
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Overview and Data Dictionary

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Dataset Overview

Description

This dataset contains counts of polluting sites in each United States ZIP code tabulation area (ZCTA). Polluting sites are taken from the US Environmental Protection Agency's (EPA) Toxics Release Inventory. These facilities are typically larger and involved in manufacturing, metal mining, electric power generation, chemical manufacturing, and hazardous waste treatment.

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Data Sources

We obtained latitudes and longitudes of polluting sites from the Toxics Release Inventory (TRI) published by the U.S. Environmental Protection Agency (2018) for reporting years 2000 through 2018. Agencies with ten or more employees that manufacture, process, or use chemicals from a list maintained by the EPA are required to self-report data for the TRI annually (U.S. Environmental Protection Agency, 2021).

ZIP code tabulation areas are taken from the U.S. Census Bureau's (2019) TIGER/Line ZCTA shapefiles.

Coverage

The dataset contains one observation per ZCTA in the United States, including U.S. island territories.

Methodology

This dataset is one of several created to investigate the impact of disamenities (Weiss et al., 2011) on neighborhood walkability. Walkability blends geography, urban planning, and public health to measure how friendly an area is to walking through built and social environmental features such as pedestrian street design, transit nodes, land use mix, parks, greenspace, and welcoming public spaces (Sallis et al., 2009, Chudyk et al. 2017). However, neighborhood disamenities such as crime, pedestrian safety (e.g. due to high volumes of traffic), and noxious land uses might inhibit walkability by dissuading people from using neighborhood resources such as parks and recreational facilities (Weiss et al., 2011). In addition, residence in neighborhoods with a high density of traffic and industrial facilities has been shown to contribute to chronic respiratory morbidity in children, which may have broad implications for other urban populations that commonly have high asthma prevalence and exposure to a high density of traffic and stationary air pollution sources (Patel, 2011).

To create this dataset, we obtained the latitudes and longitudes of all polluting sites appearing in file type 1A (Facility, Chemical, Releases, and Other Waste Management Summary Information) of the EPA's Toxics Release Inventory (TRI) in reporting years 2000 through 2018. Using ArcGIS Pro, we performed a spatial join to assign each polluting site's latitude and longitude to

the ZCTA within which it falls. Finally, we counted the total number of polluting sites within each ZCTA in each year.

Unlike in the census tract version of this dataset, we counted only polluting sites within the ZCTA itself. We did not add a 0.5-mile buffer to approximate the effect of sites in nearby or adjoining neighborhoods. We made this decision because ZCTAs are larger than census tracts, with less potential for spillover effects.

Usage Notes

Zip Codes and ZIP Code Tabulation Areas

Users should be aware that ZCTAs are not equivalent to ZIP codes. ZIP codes are linear mail delivery routes created by the US Postal Service. ZIP code tabulation areas are spatial features consisting of census blocks grouped by the predominant ZIP code found on the block (United States Census Bureau, 2020).

In some cases, a location's address is not the same as its ZCTA. For example, some ZIP codes represent single-point addresses such as large post offices or office buildings. Also, the ZIP code for an address may not match its ZCTA if the ZIP code is not the most common ZIP code on the block. See the Census Bureau's ZCTA overview at https://www.census.gov/programs-surveys/geography/guidance/geo-areas/zctas.html (United States Census Bureau, 2020) for more information on how ZCTA boundaries are calculated.

Users wanting to combine this dataset with ZIP code geocoded data must use a ZIP code to ZCTA crosswalk. Such a crosswalk is available on the UDS Mapper website at https://www.udsmapper.org/zcta-crosswalk.cfm (John Snow Inc., 2018). Sample code for merging the UDS Mapper crosswalk with NaNDA datasets is available on the NaNDA repository at https://www.openicpsr.org/openicpsr/project/120088/ (Chenoweth & Khan, 2021).

Related Datasets

Data users interested in walkability and neighborhood disamenities (such as pollution and traffic) might find useful data in these other NaNDA datasets:

- Primary and secondary roads by ZIP code tabulation area, United States, 2010
- Street connectivity by ZIP code tabulation area, United States, 2010
- Traffic volume by ZIP code tabulation area, United States, 1963-2019

Data users interested in other resources that contribute to walkability, such as parks, public transit, and retail and other destinations, may find the following additional NaNDA datasets to be of use:

- Arts, entertainment, and recreation services by ZIP code tabulation area, United States, 2003-2017
- Eating and drinking places by ZIP code tabulation area, United States, 2003-2017

- Retail establishments by ZIP code tabulation area, United States, 2003-2017
- Parks by ZIP code tabulation area, United States, 2018
- Public transit stops by ZIP code tabulation area, United States, 2016-2018

Variables

Variable	Type	Obs	Unique	Mean	Min	Max	Label
zcta19	string	629736	33144	.	.	.	ZIP code tabulation area, 2010 TIGER/Line shapefiles (2019 version)
year	int	629736	19	2009	2000	2018	Year of EPA TRI report
count_tri_facilities	int	629736	49	0.688552	0	52	Number of EPA Toxics Release Inventory sites in ZCTA

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