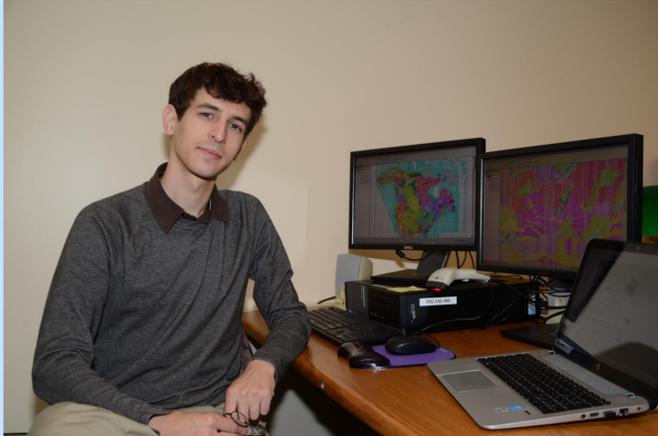


Illegal Dumpsite Prospector: A Tool for Illegal Trash Dump Analysis

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Meet The Author



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ABSTRACT

Illegal dumping of household waste, construction debris, tires and other refuse poses a challenge to both state land conservation efforts and private landowners' property rights in Pennsylvania. Illegal dumping is particularly prevalent in rural areas. Historically, efforts to monitor and mitigate illegal dumpsites have been managed and organized through municipal and county governments and has not been systematically monitored or assessed at a large scale in an ongoing manner.

This project used data from surveys of illegal dumping conducted in 2010 to demonstrate how visual analytics and geovisualization tools could potentially be used as part of a hypothetical ongoing statewide effort to monitor, assess, predict and mitigate illegal dumping. The project produced an interactive web-based visual analytics tool that presents illegal dumps within useful geographic context and empowers the user to make deeper inquiries about individual dumpsites, about dumpsites with specific attributes, and about the relationship between illegal dumps and their surroundings.

"Illegal Dumpsite Prospector" is a browser-based visual analytics dashboard implemented in Javascript with multiple open-source libraries. A coordinated view approach presents significant variables associated with dumpsites using a map supplemented by a table and appropriate charts; analytics charts also serve also as control elements to filtering the dumpsite dataset.

LAYOUT OF THE ILLEGAL DUMPSITE PROSPECTOR TOOL

Inset Map
Places the current extent of the primary map pane within the context of the study area and surrounding region.

Layer control
Toggles basemap between simple and satellite imagery; allows user to control overlay of demographic data from census.

Filter indicator & Reset Control
Indicates the fraction of the dumpsite dataset that is displayed under the current filter settings; allows user to reset all filters.

Primary Map Pane
Illegal dumpsites are rendered in situ as proportional symbols- size represents the mass of trash at a site and color represents whether the site is active.

Only dumpsites within the current extent of the primary pane are sampled in the analytics panes.

Interacting with the analytics panes filters the dumpsites.

A choropleth overlay gives relevant demographic data at the sub-county level from the 2010 US Census.

Sorted Data Table
Lists the 12 largest dumpsites in the primary map pane area under the current filter settings; shows the mass of trash and whether the site is in active use.

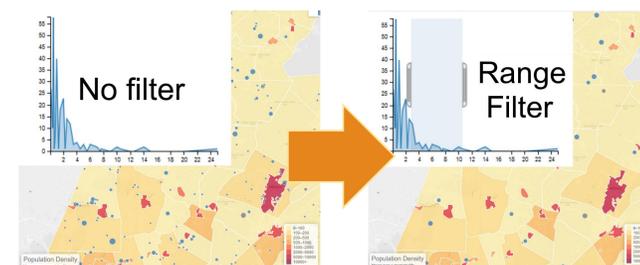
IMPLEMENTATION

Illegal Dumpsite Prospector uses the following open-source libraries:

Leaflet v 1.2.0	crossfilter v. 1.3.12
d3 v. 3.5.17	Leaflet-Minimap 3.6.0
dc v. 2.0.2	Bootstrap v. 4.0.0b2
turf v. 3.0.11	

Data is drawn from the following sources:

Mapbox.com (basemap)	Keep PA Beautiful (illegal dumps dataset)
DigitalGlobe (satellite basemap)	US Census 2010 (municipal boundaries, demographic data)



Multidimensional filtering with coordinated views

Selecting data dimensions in individual analytics panes filters the dumpsite displayed in other panes and within the primary map pane.

USE THE TOOL ONLINE:

<https://www.geovista.psu.edu/StudentProjects2/DumpSites/>

SOURCE CODE:

https://bitbucket.org/geog461wcarlsen/final_project_app