

Oil and Gas Wells within Los Angeles County, and the Threats that their Proximity Poses to Public Schools

A report by Gwen. <https://github.com/gowin20>

UCLA Geog 7, 9/10/2020

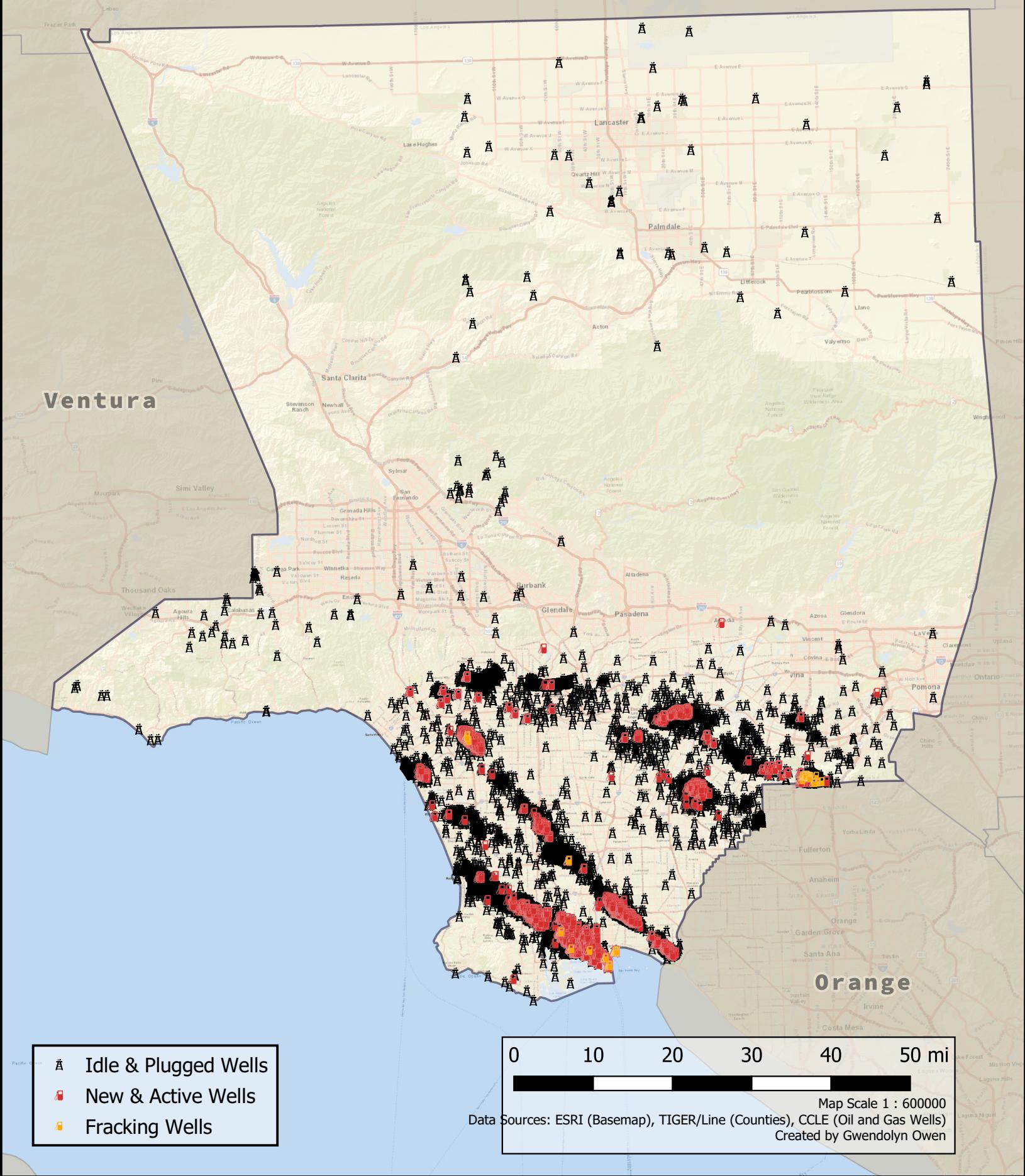
Summary

This report consists of maps and infographics depicting the statistics and distribution of oil & gas wells in Los Angeles, specifically in relation to the county's public schooling system. The goal of this report is to establish a solid foundation for analyzing the potential threats posed by these oil and gas extraction sites to schools throughout the county. In particular, several schools are identified as at-risk school locations (Found in Figure 11). 80 schools that are not individually named are also very close to active wells, meaning they are also at-risk. To reduce this risk, Los Angeles policymakers should consider increasing the required setback distance between oil wells and other property.

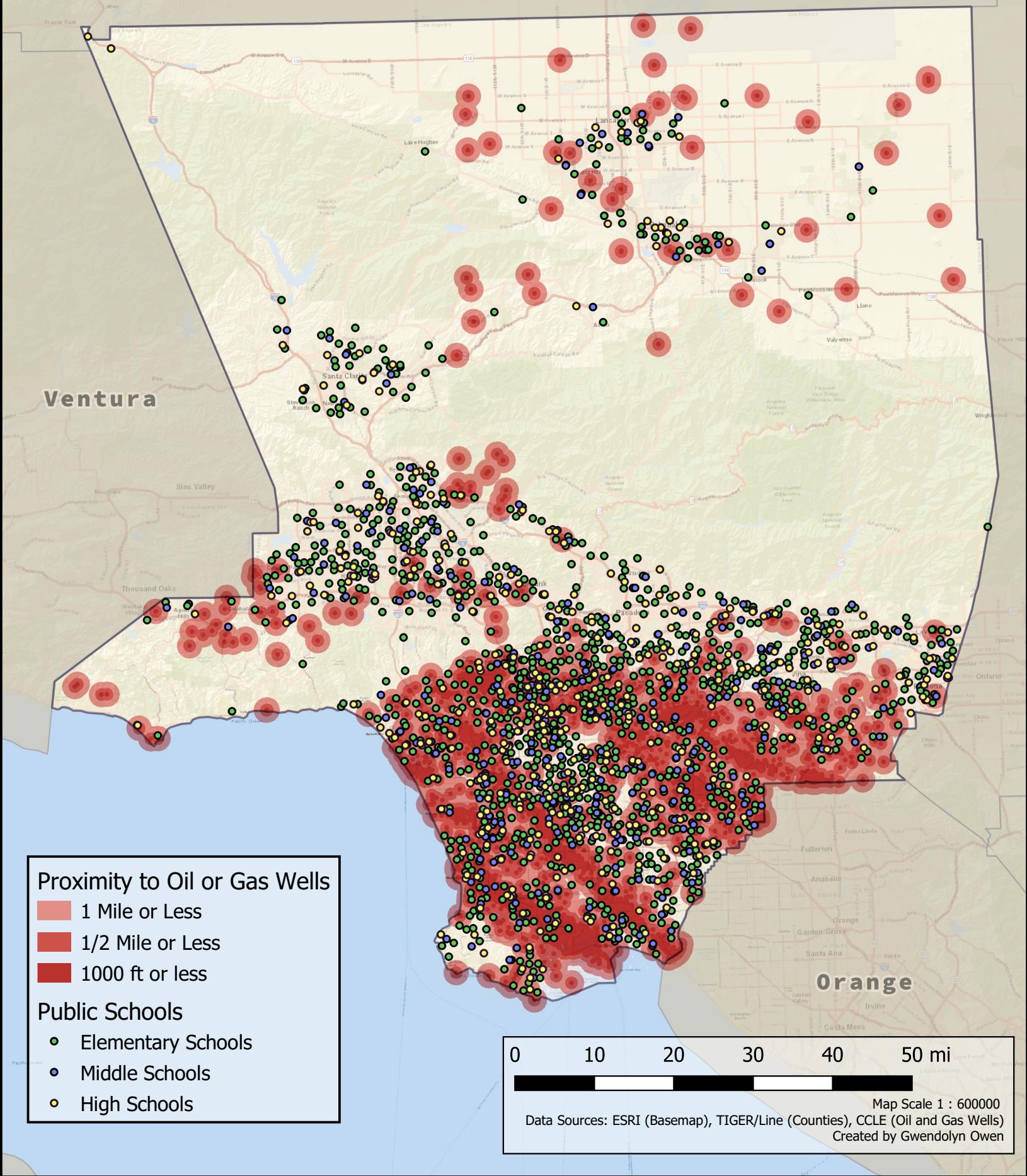
Table of Contents

3. Map One: Oil and Gas wells within LA County
4. Map Two: Proximity of Public Schools to Oil & Gas Wells in Los Angeles County
5. Map Three: Proximity of Public Schools to Active Oil & Gas Wells in Los Angeles County
6. Informational Figures
10. Analysis of Possible Hazards
12. GIS Methodology
14. Sources

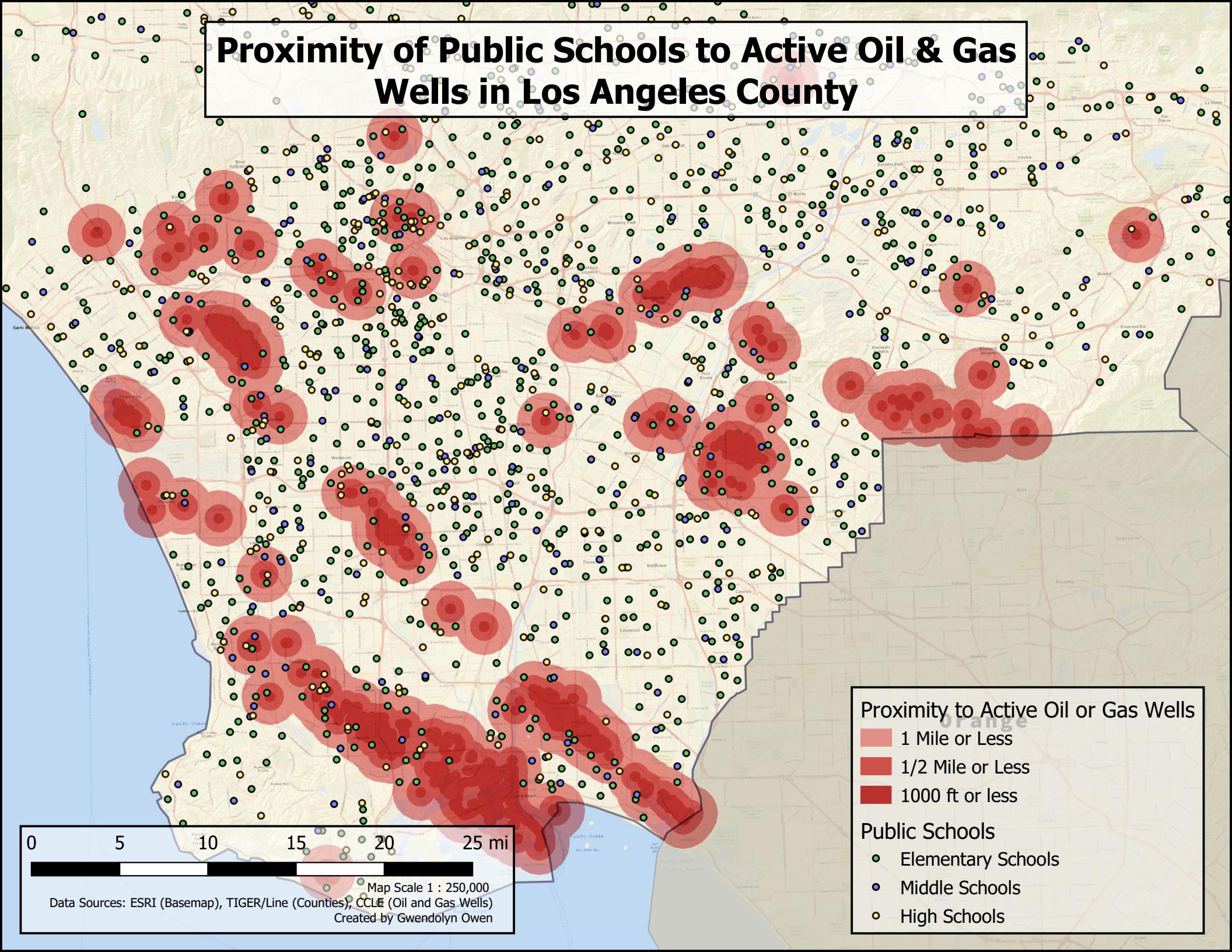
Oil & Gas Wells in Los Angeles County



Proximity of Public Schools to Oil & Gas Wells in Los Angeles County



Proximity of Public Schools to Active Oil & Gas Wells in Los Angeles County



Informational Figures

[Figure 1] Number of Different Public School Types near Oil & Gas Wells

Proximity to Oil & Gas Wells	Elementary Schools	Middle Schools	High Schools	Any School
1000 Feet	137	42	77	256
1/2 Mile	452	106	172	730
1 Mile	763	178	277	1218

[Figure 2] Number of Public Schools near Types of Oil & Gas Wells

Proximity to Oil & Gas Wells	New and Active Wells	Idle, Abated, and Plugged Wells	Any Well
1000 Feet	27	229	256
1/2 Mile	121	609	730
1 Mile	310	908	1218

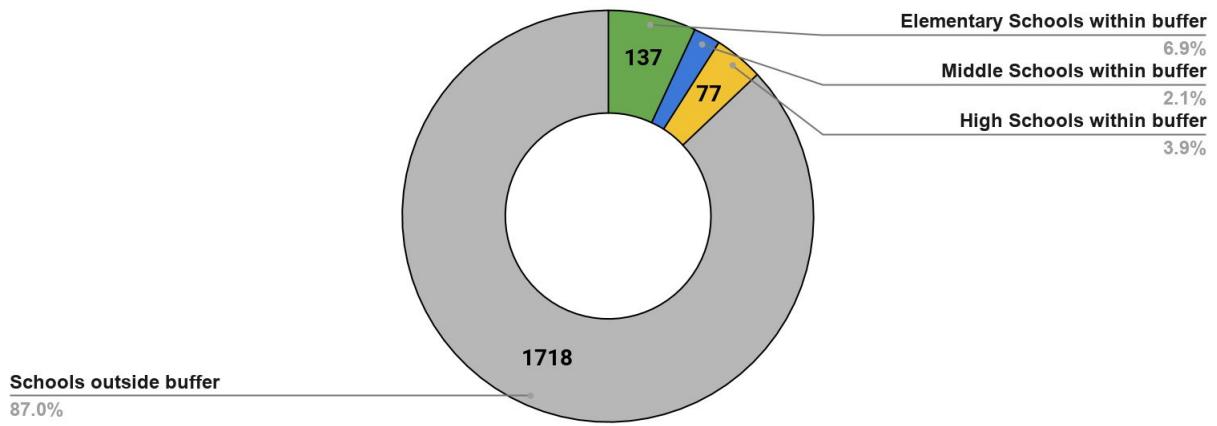
[Figure 3] Number of Total Oil & Gas Wells near Public Schools

Proximity to Schools	Elementary Schools	Middle Schools	High Schools	Any School
1000 Feet	1029	308	523	1664
1/2 Mile	6838	2840	2524	8091
1 Mile	15484	10040	7636	16067

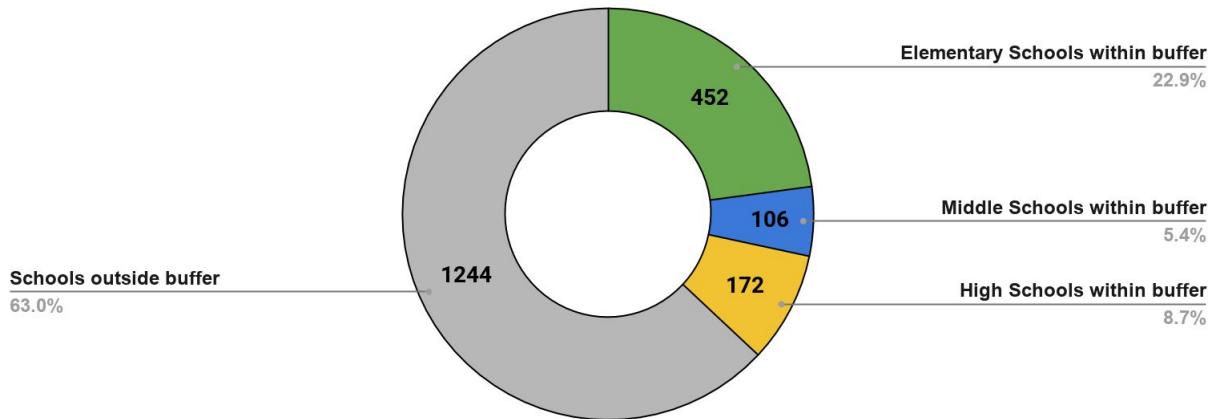
[Figure 4] Number of New & Active Wells near Public Schools

Proximity to Schools	Elementary Schools	Middle Schools	High Schools	Any School
1000 Feet	53	9	25	80
1/2 Mile	703	261	139	849
1 Mile	2660	1609	959	2814

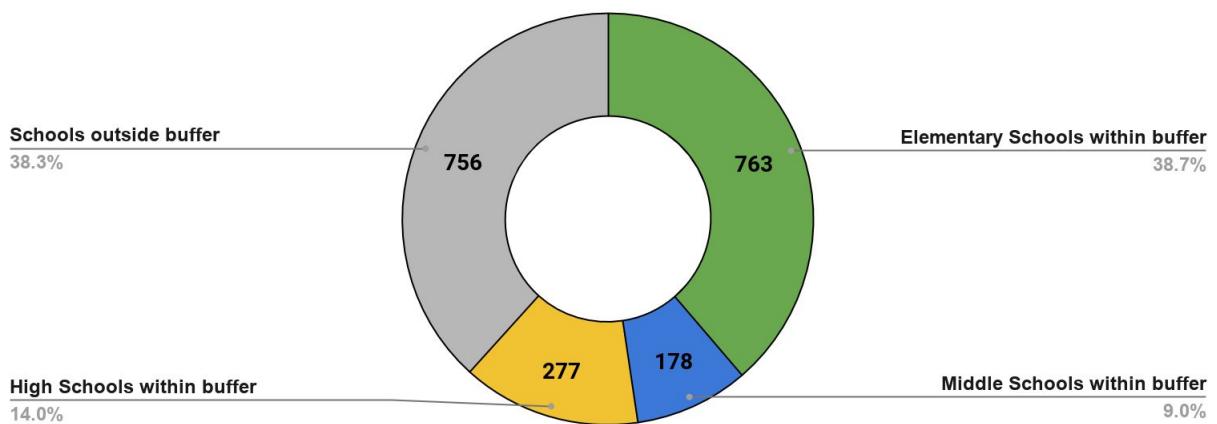
[Figure 5] Public Schools Considering a 1,000 Foot Buffer Around Oil & Gas Wells



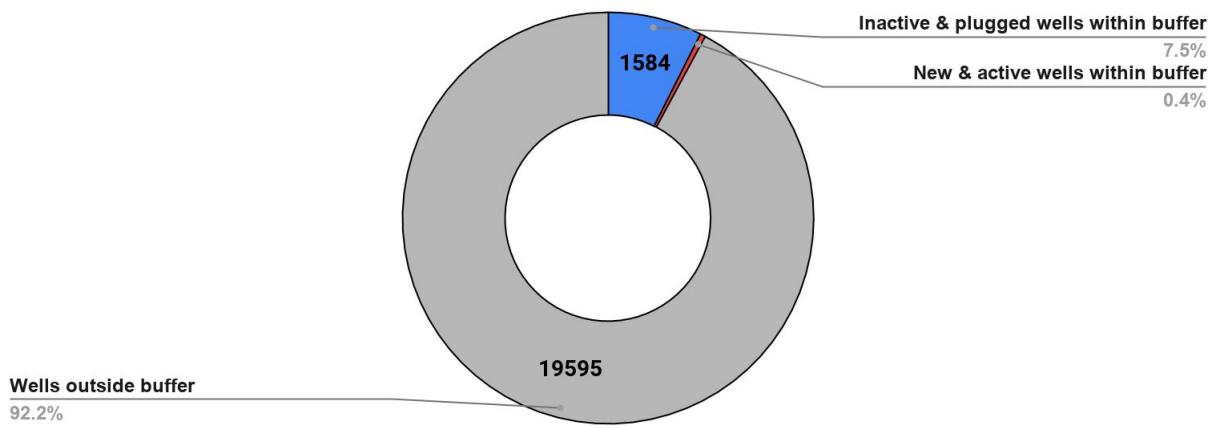
[Figure 6] Public Schools Considering a 1/2 Mile Buffer Around Oil & Gas Wells



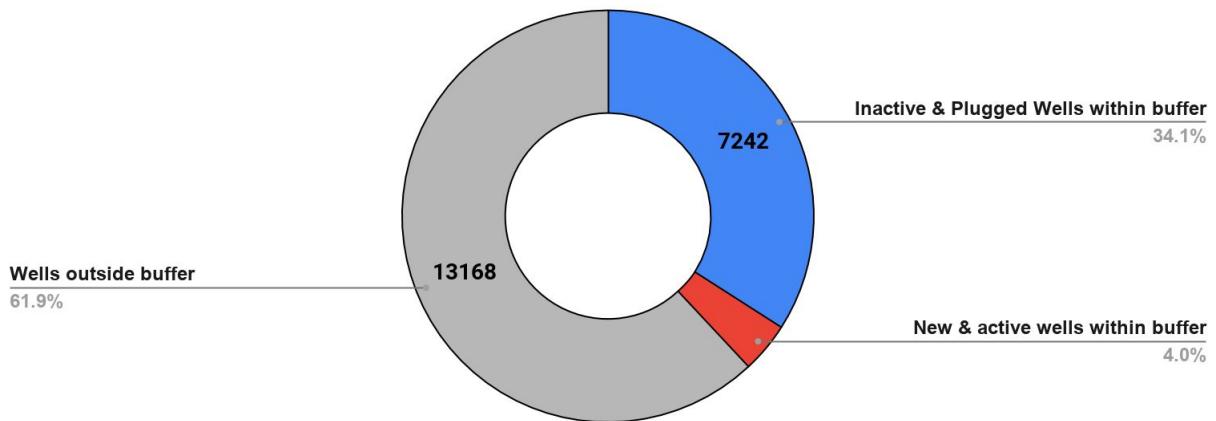
[Figure 7] Public Schools Considering a 1 Mile Buffer Around Oil & Gas Wells



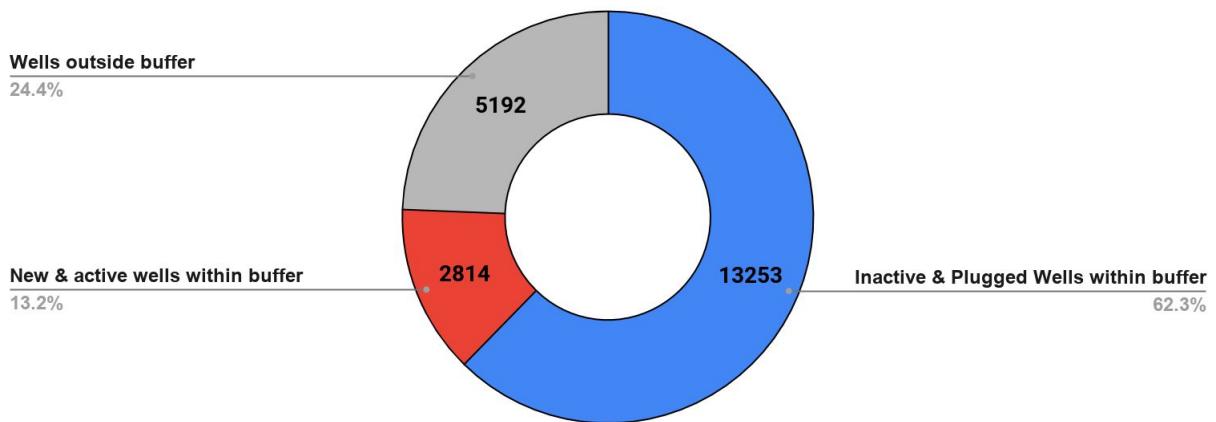
[Figure 8] Gas & Oil Wells Considering a 1,000 Foot Buffer Around Public Schools



[Figure 9] Gas & Oil Wells Considering a 1/2 Mile Buffer Around Public Schools



[Figure 10] Gas & Oil Wells Considering a 1 Mile Buffer Around Public Schools



[Figure 11] List of Schools within 1 Mile of Active Fracking Zones

School	District
George De La Torre Jr. Elementary	Los Angeles Unified
Fries Avenue Elementary	
Glenn Hammond Curtiss Middle	
Wilmington Park Elementary	
Annalee Avenue Elementary	
Avalon High	
Broadacres Avenue Elementary	
Magnolia Science Academy 3	
Phineas Banning Senior High	
Gulf Avenue Elementary	
Franklin Classical Middle	
California Academy of Mathematics and Science	
Chavez Elementary	Culver City Unified
Stevenson Elementary	
El Rincon Elementary	

Proximity-Based Hazards

The close proximity of many LA County Public Schools to Oil & Gas wells poses many health and safety hazards to students. These oil and gas wells have been a known health problem for a long time, but continually pose risks to entire communities because of a lack of strong regulation.

The Los Angeles Basin is the largest urban oil field in the country, and as such presents a unique problem. There are 68 active oil fields in the county, each with many wells. As indicated by the figures and maps in this report, there are tons of these wells - 21,259 in total. Of these wells, 1,664 of them are within 1,000 feet of public schools. When increasing this buffer distance to one mile, we shockingly find that 16,067 wells lie within one mile of public schools.

While an abundance of these wells exist in Los Angeles county, many of these wells should not be a cause of too much concern. While 16,067 wells lie within a mile of public schools, 13,253 of these are idle, abated, or plugged. This does not mean that these wells are not a health risk. Idle and abated wells can be restarted at any time. However, they are not as immediate a threat to public health as new and active wells.

The “new and active wells” category consists of wells which are currently active or being drilled. There are 80 of these wells within 1,000 feet or less of public schools, and 2,814 within a mile. These wells pose an active risk to the community - according to an LA Department of Public Health report, these wells actively decrease air quality, cause loud noises at all times, and emit strong odors. According to Stand-LA, studies have shown that oil development contributes to both short and long-term health defects, including headaches, nosebleeds, respiratory illness, and increased risk of cancer.

The existing regulations of these wells are somewhat lax. Currently, Los Angeles zoning code requires a setback distance of 300 feet away from Oil & Gas wells. At this distance, regardless of other circumstances, many health and safety impacts are unavoidable. The Los Angeles Health Department recommends that this buffer be expanded to at least 1,500 feet. However, even at this distance, hazards such as fires and explosions can still cause a large problem. Additionally, due to gaps in long-term exposure data, we do not know the risk of disease and cancer that this distance poses. (LA Department of Public Health)

Finally, there are several active wells scattered around Los Angeles which use Fracking. Fracking is a much more polluting process than traditional oil drilling. Fracking sites across the country are suspected of contaminating populations' drinking water. Additionally, fracking sites release incredible amounts of toxic air pollutants, which have been linked to many serious illnesses. These include asthma, childhood leukemia, and birth defects - all of which are incredibly relevant to school-aged children (NDRC). Within LA County, 15 schools lie within 1 mile of active fracking zones. Figure 11 depicts this list. These schools are some of the most communities at risk due to these oil and gas wells.

GIS Methodology

During the creation of this report's maps and infographics, I used several different techniques and processes within QGIS. This is a description of those techniques.

To begin with, I wanted to make sure that the files I used within my project were organized and easy to access. I used QGIS' group feature to create several top-level groups, including Oil Wells, Schools, and Base Layers. Many other groups and layers are nested within each group. Notably, the "Schools" group contains 35 buffers in total. "school buffers," which includes a group for each level of schooling I have designated in this report. This contains 35 buffers in totalCreating the infographics required the use of many different buffers, meaning the layers can easily become overwhelming when not organized properly.

I also used several geoprocessing and spatial analysis techniques. To create buffers, I used the QGIS "Buffer" tool and dissolved results. I then used SQL filtering operations in order to filter layers by type, including a dot layer for each level of schools designated in this report. I also created specific layers for wells which use fracking, new / active wells, and idle / plugged wells. I then used the "Join attributes by location (summary)" tool to obtain statistics on the amount of schools which fall within oil well buffers, and the amount of oil wells which fall within school buffers. Finally, I used the "Select by location" research operation to obtain a list of schools near fracking sites.

For the visuals of my map, I used the ESRI Standard Basemap as a base for Los Angeles county. I think that this provides nice context without being too visually cluttered. I also obtained shapefiles for all California counties from TIGER/LINE, and used them to provide additional visuals and context. I also found a custom oil well SVG icon online to use for my Oil & Gas well map. Finally, I applied the standard techniques of print layout creation to make a visually

appealing legend and context for the map. To create the infographics and tables, I exported the data to Google Sheets. I then used their customization tools to make the data visually appealing.

Map Notes:

For visual clarity, I have excluded the Catalina and San Clemente Islands from my maps. No oil wells are found on them. Additionally, for the “Active Oil & Gas Wells” map, I only displayed the section of LA county which contains active oil or gas wells.

Sources

Maps

TIGER 2016 County Shapefiles

Provided Shapefiles containing LA county, Oil & Gas wells, and Public Schools
ESRI Standard Basemap

Analysis

(Stand-LA)

<https://www.stand.la/history-of-oil-in-los-angeles.html>

<https://www.stand.la/health-and-safety.html>

(LA Department of Public Health)

http://publichealth.lacounty.gov/eh/docs/ph_oilgasfacilitiesphsafetyrisks.pdf

(NDRC) <https://www.nrdc.org/issues/reduce-fracking-health-hazards>

<https://www.latimes.com/california/story/2020-03-06/state-orders-allenco-energy-site-shutdown-south-l-a>

<https://www.osha.gov/SLTC/oilgaswelldrilling/healthhazards.html>

<https://blogs.cdc.gov/niosh-science-blog/2018/08/24/oil-and-gas-vapors/>