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Web Mapping
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Final Report: Fracking in California

Link to Final Web Map:

I. Problem Description

The problem faced is fracking in California, its effects on groundwater and in turn threats to human health. Fracking causes overdrawn groundwater basins that are a water source for certain counties. This leads to a diminishing potable water source. Fracking wells can also cause increased health risks for locations in proximity to fracking wells. Many of these fracking wells are placed in areas already suffering from water, air and soil pollution due to industrial activities. These wells are disproportionately drilled close to communities of color. These populations near wells are at higher risk for respiratory and neurological problems along with cancer and birth defects.

Our objective is to create a scrollytelling map to give an overview of fracking in California. This map will show which counties and groundwater basins are being affected as well as the locations of active fracking wells in the counties. This map will also provide information on fracking in general, identify the counties and groundwater basins affected and dive a little deeper into one county that accounts for 75% of the oil and gas produced in California (NRDC 2014). Our map will help educate our intended audience on the issue related to fracking.

Our intended audience for the created web map includes policy makers, individuals affected by fracking and activist groups looking to oppose fracking in California. This map will help to educate policymakers on which counties are being affected by fracking and where groundwater basins are shrinking. This map will help inform individuals located in counties where fracking is occurring that they may be at risk and give them more information on the issue. Finally, this map will help activist groups opposing fracking in California learn about affected areas, so they know which local governments to communicate with and populations to advocate for.

II. Datasets

California Geographic Boundaries
Link: https://data.ca.gov/dataset/ca-geographic-boundaries

Population of Counties in California (2020)
Link: http://worldpopulationreview.com/us-counties/ca/

CA Fracking Wells
Link: https://drive.google.com/open?id=1kF7-pHg94COQo69L7gjEcs1co54yNLf7

CA Groundwater Basins
Link: https://drive.google.com/open?id=1kF7-pHg94COQo69L7gjEcs1co54yNLf7

III. Dataset Descriptions

California Geographic Boundaries

This dataset will allow us to highlight the ten specific counties where fracking is occurring. This will help our intended audience visualize areas that are affected by fracking. This data will also be used to specifically outline and draw attention to Kern County for a deeper look at fracking effects on a county in California.

Population of Counties in California (2020)

This data allows us to show the amount of the population potentially impacted by fracking in Kern county where a majority of the fracking activity in California occurs. This will help to show that there hundreds of thousands of people in California who are facing health risks associated with fracking.

California Fracking Wells

This dataset shows the locations of fracking wells on our map. We will find the fracking wells that are located in the ten fracking counties. This allows map users to quickly glance and determine where the highest density of fracking wells is located in California. This happens to be Kern County.

California Groundwater Basins

This dataset shows the location of groundwater basins in California. We will isolate the groundwater basins that are in counties where fracking is occurring. This data also helps to show groundwater basins that are a potable water source for residents in these fracking counties and what areas may be in danger due to side effects of fracking on groundwater.

Additional Datasets

Income Data for Select Counties

A dataset showing average income for select counties would help to demonstrate that certain populations are disproportionately affected by fracking. This data was not included because there was a time constraint for completing the final web map.

Choropleth Map of Total Water Consumption of Fracking Wells

In order to create a choropleth map showing the total water consumption of fracking wells, total water volumes and fracking wells that use groundwater would be needed which might take time to track down and synthesize. This data would provide a stronger link between fracking and diminishing groundwater supply. This data was not included because there was a time constraint for completing the final web map.

IV. Methodology

California Geographic Boundaries

The first step is to isolate the ten desired counties in California that have fracking activity. This will be done in MapBox to create a layer that can be added on to our final web map. The final county layer on the map will consist of three layers, fill, outline and label. This final county layer will first be visible along with the paragraph pertaining to counties in the scrollytelling map. It will also be visible in other sections as needed.

Population of Counties in California (2020)

The first step will be to determine the population of Kern county from the date set. This will allow the map to demonstrate the potential population affected by fracking in Kern County. This value will appear in a popup in the section that dives deeper into fracking in California highlighting Kern County.

California Fracking Wells

The first step involves isolating the active wells in ArcGIS by pulling up the attribute table and selecting the ‘active’ well type. Once this has been done and a new shape file is created, we will add all the active wells from shapefile to a MapBox layer. This layer will be added to our map and paired with a paragraph that provides more information on the dangers and side effects of fracking wells. This layer will also be visible in other sections as needed.

California Groundwater Basins

The first step occurs by creating a new layer in ArcGIS that only includes the groundwater basins that are partially in or within the ten counties with fracking activity. Once this is done, the file is imported to MapBox and a layer is created to be added to the map. The final groundwater basins consist of two layers, a fill layer and an outline layer. This final layer will appear with a paragraph about the groundwater basins as well as other sections when needed.

V. Issues Overview

Some issues we faced when creating our map include having layers revert when scrolling back on the map, adding website links to the text and adding a popup in the scrollytelling coding. To fix the layers not reverting when scrolling back up through the map, we added the layers to “on chapter exist” and changed the opacity to zero. To add website links to the text we had to add “this is a link" in the code in order for the link to not create errors and appear on our map. This allows the layers to revert to desired settings. To add the popup in the scrollytelling coding we added an event listener to listen for a click on the Kern County layer. We also had to reformat the scrolling part of the map so the click action would select the right layer.

VI. References

California Department of Conservation. “California Announces New Oil and Gas Initiatives”. November 2019.

Center for Biological Diversity. “Fracking in California: Questions and Concerns.” Accessed February 2020.

Land Management Bureau. “Notice of Availability of the Record of Decision for the Bakersfield Field Office Hydraulic Fracturing Supplemental Environmental Impact Statement, California.” December 2019.

NRDC. “Fracking Threatens Health of Kern County Communities Already Overburdened with Pollution.” September 2014.

Physicians for Social Responsibility. “New Analysis of Fracking Science Finds Serious Harm to Public Health, Environment and Climate.” June 2019.

U.S. Congressman Salud Carbajal. “Carbajal Introduces Bill to Halt Future Oil and Gas Drilling on California’s Central Coast”. February 2020.

U.S. Department of the Interior, Bureau of Land Management. “Bakersfield Field Office Hydraulic Fracturing, Final Supplemental Environmental Impact Statement.” October 2019.