Wildfire & Air Quality Tracker User Guide

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Revision History

Version #	Implemented By	Revision Date	Approved By	Approval Date	Reason
1.0	Ryan Kaszubski Ahmad Aoun Kevin Kluka	12/04/22	Ryan Kaszubski Ahmad Aoun Kevin Kluka	12/04/22	Final Submission

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1. Introduction

This User Guide contains information and instructions on how to use the Wildfire Air Quality Tracker (WAQT) web application.

2. Getting Started

2.1 Home Page

Upon opening the application, the Home Page will be displayed:

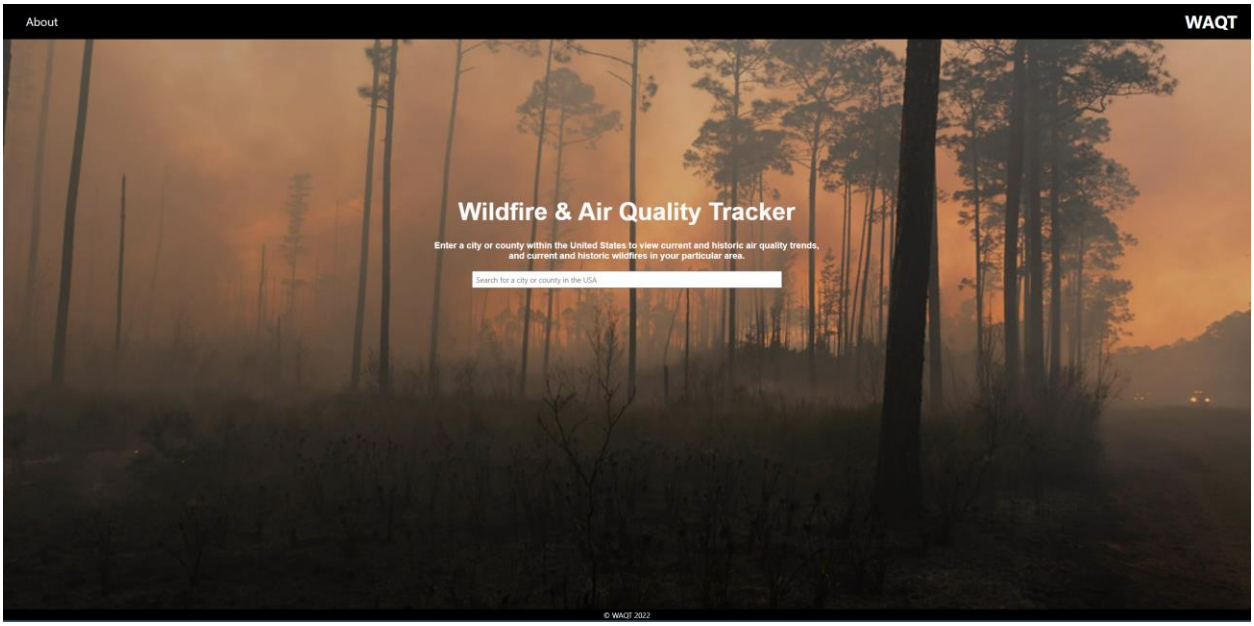

Figure 1: Home Page

The Home Page is intentionally simplistic. From the Home Page, a user can either navigate to the About Page or type in and select a U.S. city or county in the search bar to navigate to the Results Page.

2.2 About Page

To navigate to the About Page, simply click ‘About’ in the upper left-hand corner of the WAQT web application:

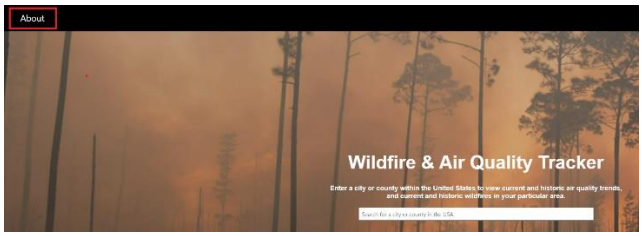

Figure 2: About Navbar Button

The About Page contains five sections:

1. About WAQT
2. The Major Pollutants
3. US Air Quality Index
4. Air Quality Measures
5. Wildfire Statistics

2.2.1 About WAQT

This section of the About Page contains information about the WAQT web application and its purpose:

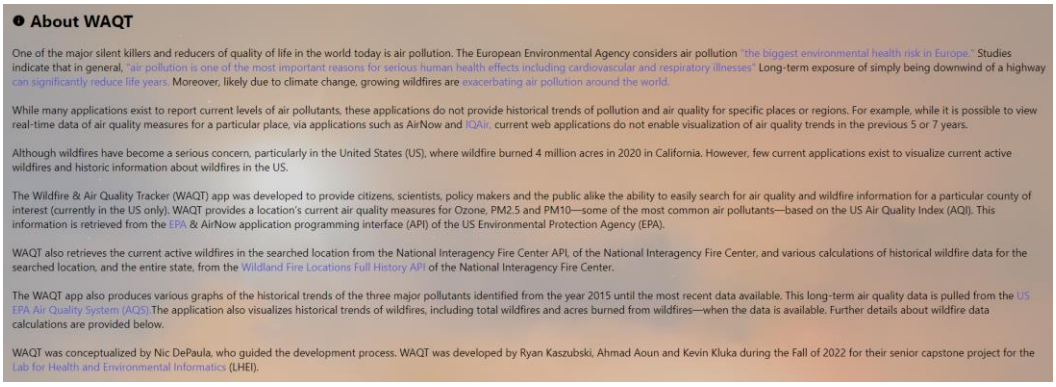

Figure 3: About WAQT

In addition to general information about WAQT, the ‘About WAQT’ section also contains links to relevant articles from credible sources to reenforce why WAQT exists. It also contains links to the EPA, AirNow, National Interagency Fire Center, Wildland Fire Locations Full History, and US EPA AQS APIs, as the WAQT web application pulls and aggregates its data from these sources.

Lastly, the ‘About WAQT’ section contains information about Dr. Nic Depaula, who directed the project, and his institution, the Lab for Health and Environmental Informatics (LHEI).

2.2.2 Major Pollutants

The 'Major Pollutants' contains information about the 3 major air pollutants that the WAQT Application tracks and measures, along with relevant links to additional information from credible sources:

1. Ozone (O2)
2. Particulate Matter 2.5 (PM 2.5)
3. Particulate Matter 10 (PM10)

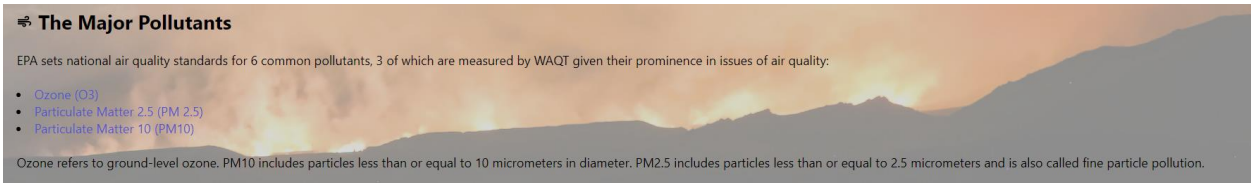

Figure 4: The Major Pollutants

2.2.3 US Air Quality Index

The 'US Air Quality Index' section provides information about the AQI values that the WAQT web application tracks and displays. It explains the different AQI values, and contains a link to the U.S. governmental EPA page for additional information.

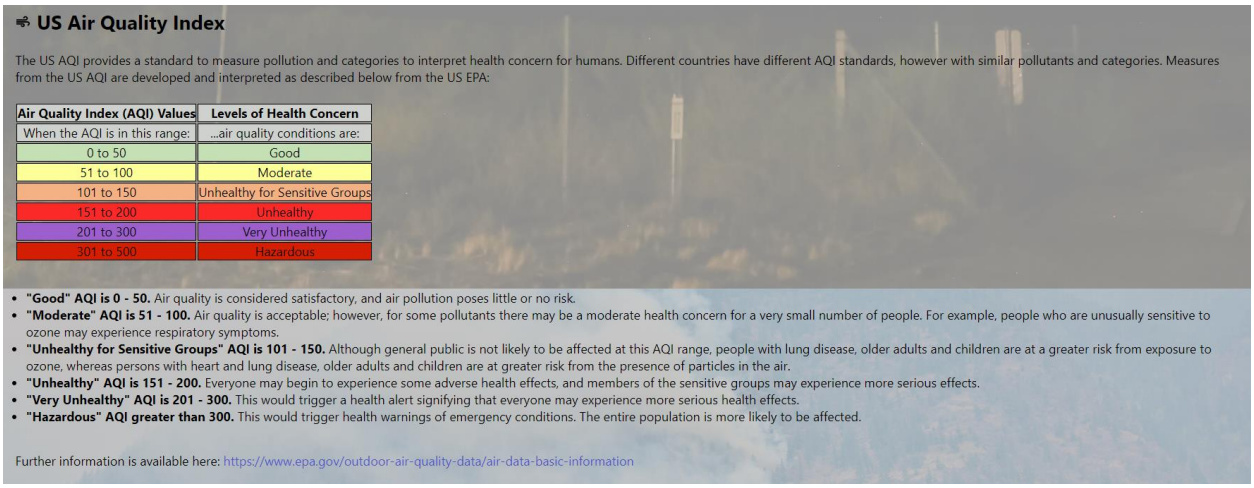

Figure 5: US Air Quality Index

2.2.4 Air Quality Measures

The 'Air Quality Measures' section provides information about the 3 major air pollutants the WAQT web application tracks, and provides information about the measurement ranges and their meaning:

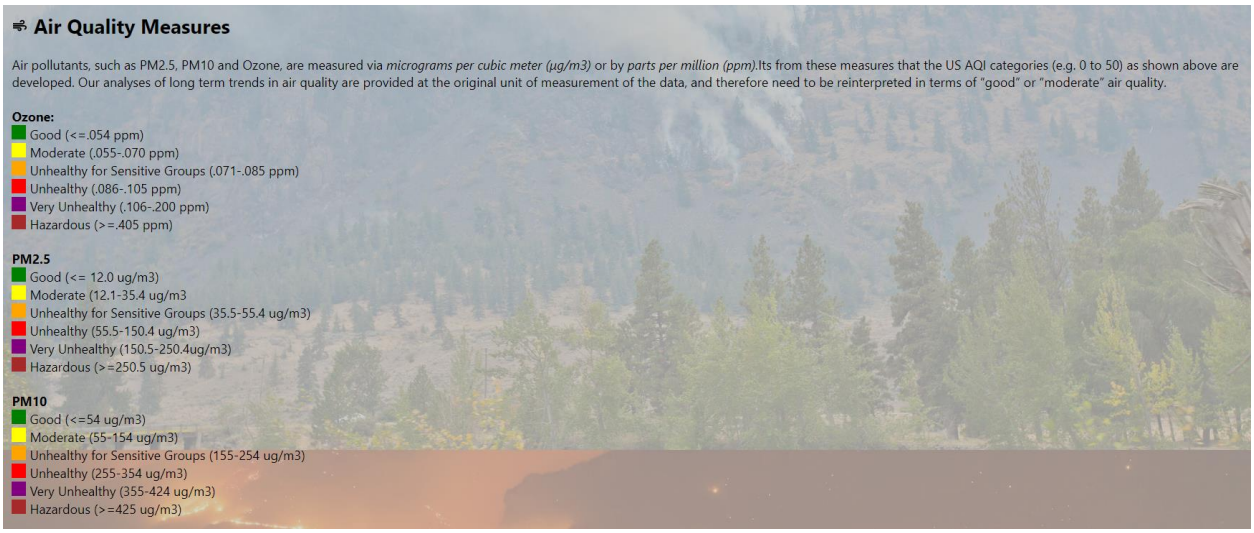

Figure 6: Air Quality Measures

2.2.5 Wildfire Statistics

The 'Wildfire Statistics' section explains the calculated measurements that get displayed in graphs and tables on the Results Page when a user searches a U.S. location from the Home Page:

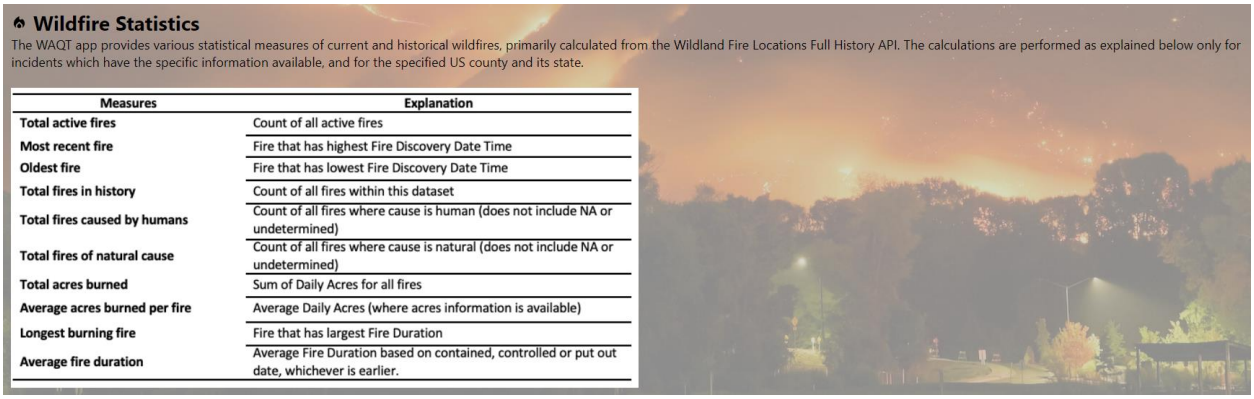

Figure 7: Wildfire Statistics

2.3 Results Page

From the Home Page, a user can use the search bar in the center of the page to type in a U.S. city or county to search wildfire and air quality information about that location:

Figure 8: Search Bar

As a user types, autocomplete is used to suggest valid U.S. cities and counties:

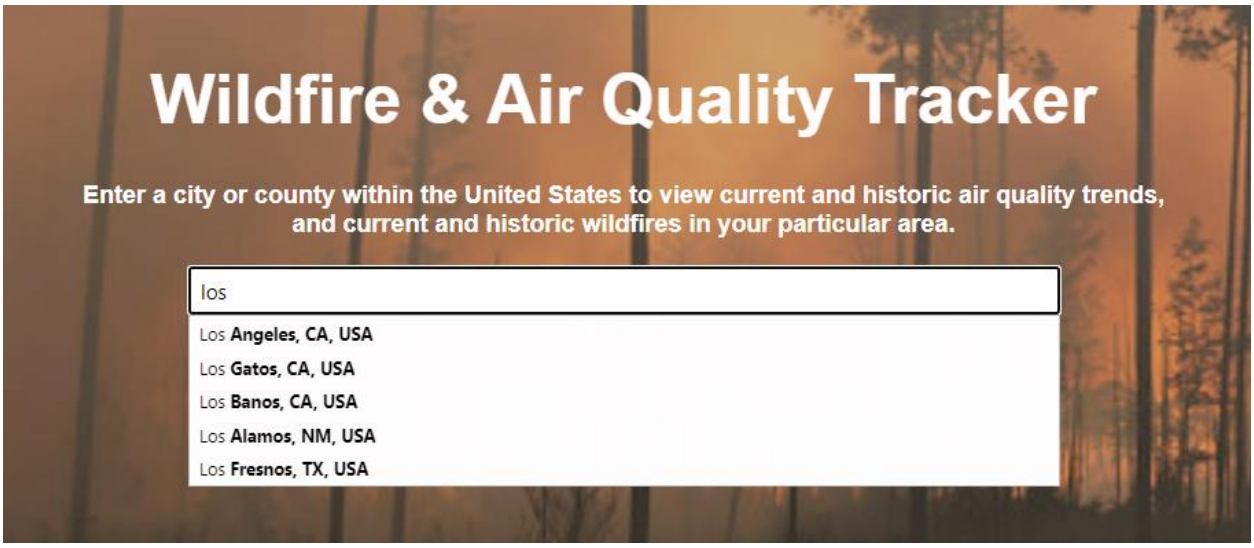

Figure 9: Autocomplete

After a user selects a location from the autocomplete, the Results Page is displayed with wildfire and air quality information pertaining to the selected location.

The Results Page contains 5 sections:

1. Current AQI
2. Current Active Wildfires
3. Current and Historical Wildfire Statistics
4. Air Quality Historical Trends
5. Wildfire Historical Trends

2.3.1 Current AQI

The 'Current AQI' section displays current AQI information about the user searched location. There is a question mark icon that explains the current AQI rating in greater detail. Additionally, this section displays current levels of Ozone, PM2.5 and PM10 for the user searched location. Lastly, there are relevant links to the Air Now website, as well as links to supplemental information about the air quality metrics on the About Page.

Figure 10: Current AQI

2.3.2 Current Active Wildfires

The 'Current Active Wildfires' section shows a Google map, centered on the location of the user query. Surrounding the central searched location are map markers of fire icons marking the central locations of any active fires in the area. Clicking on a fire map marker displays name, start date, cause, and location information about the fire:

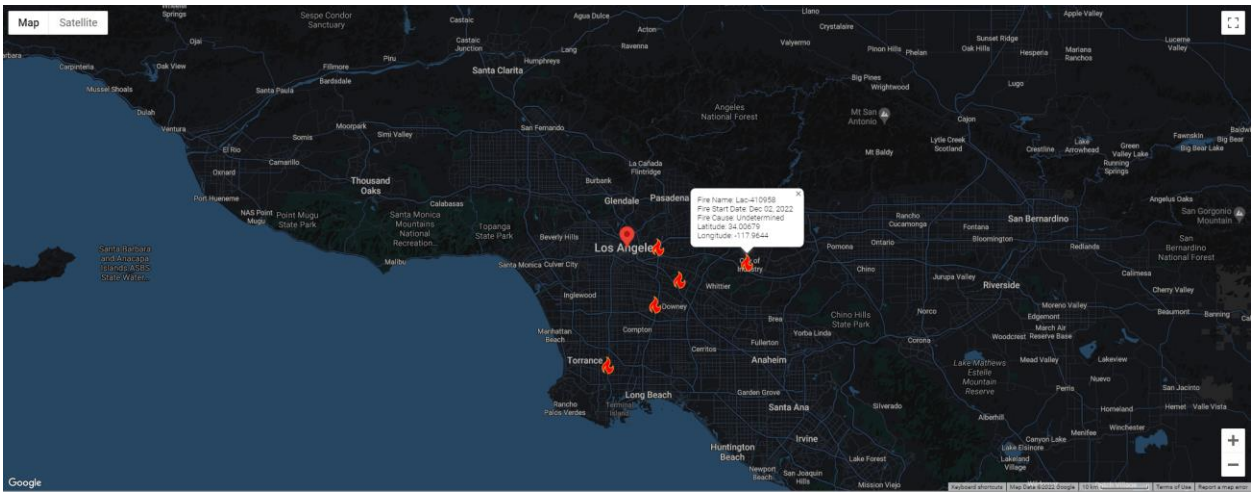

Figure 11: Google Map and Fire Markers

Additionally in this section, the active wildfires corresponding to the fire map markers in the Google map are listed in a table below the map:

Fire Name	Fire Start Date	Fire Cause
Lac-413528	Dec 04, 2022	Undetermined
Lac-413524	Dec 04, 2022	Undetermined
Lac-413440	Dec 04, 2022	Undetermined
Lac-412641	Dec 03, 2022	Undetermined
Lac-411786	Dec 03, 2022	Undetermined

Figure 12: Active Wildfire Table

Lastly, this section contains a link to the [WFIGS Active Fires API] website, as a source to the data presented.

2.3.3 Current and Historical Wildfire Statistics

The 'Current and Historical Wildfire Statistics' section contains past and present data about the user searched location, specifically the city/county and then the state in which the city/county resides.

Figure 13: Current and Historical Wildfire Statistics

The end of the section also contains a link to the National Interagency Fire Agency website, from which the data is pulled and aggregated from.

2.3.4 Air Quality Historical Trends

The 'Air Quality Historical Trends' section displays line graphs that show the highest levels of historical PM2.5, PM10, and Ozone measurements for the user searched location:

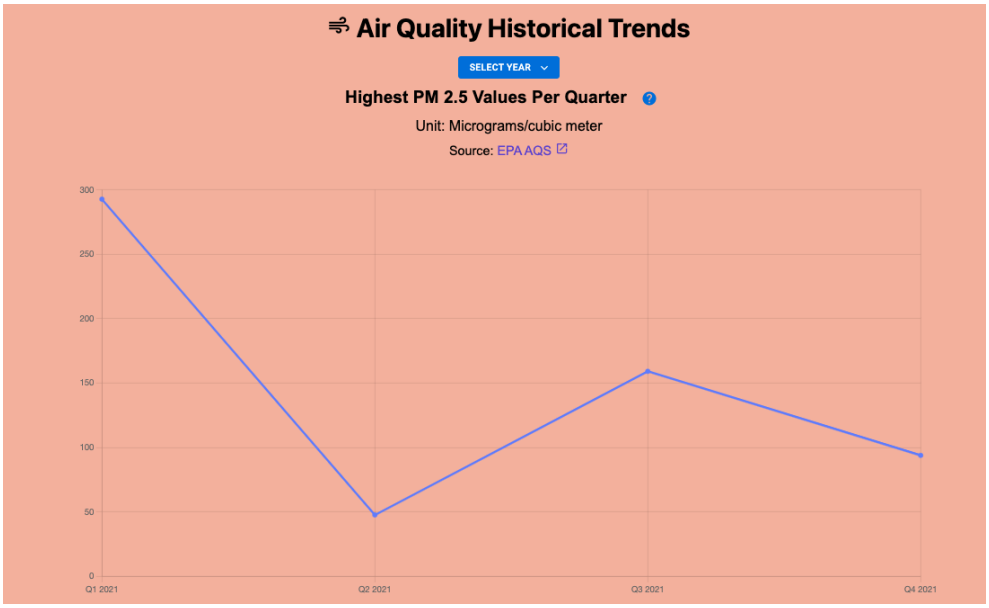

Figure 14: Highest PM2.5 Values Per Quarter

Figure 15: Highest PM10 Values Per Quarter

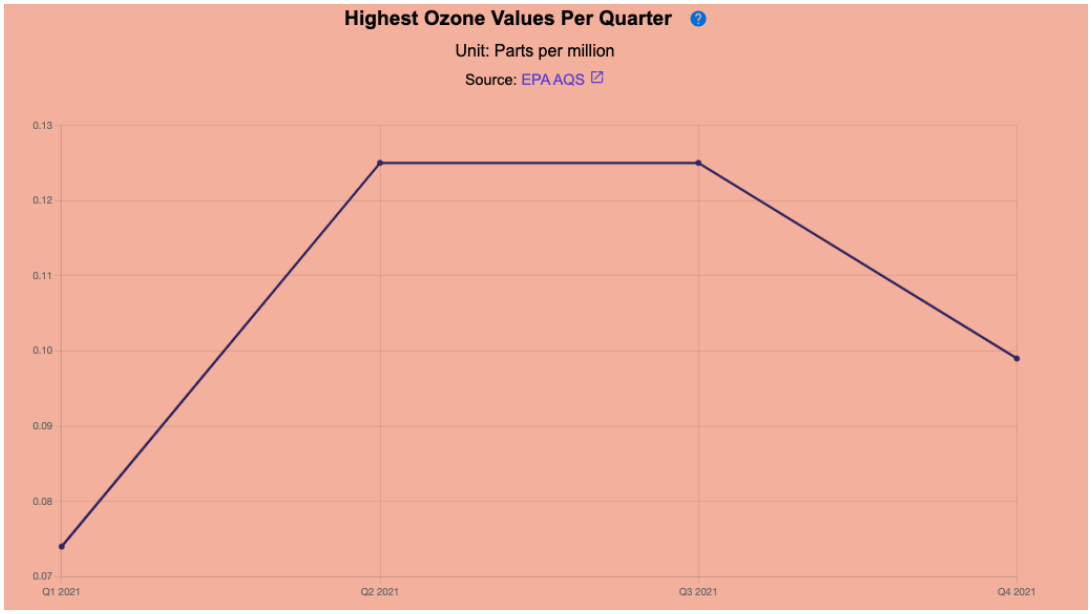

Figure 16: Highest Ozone Values Per Quarter

The year in which the graphs display data can be changed by the ‘Select Year’ drop down menu:

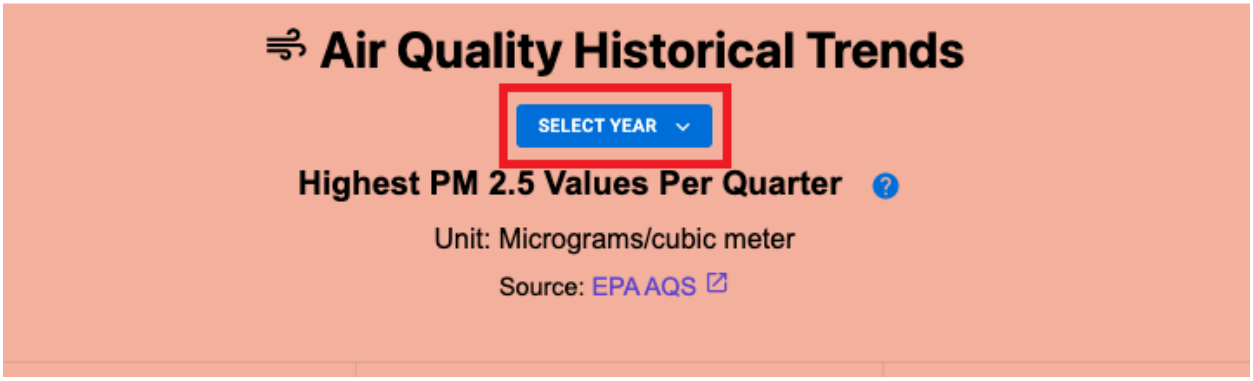

Figure 17: Air Quality Historical Trends Year

There are also units of measurement information displayed for each graph and a link to the EPA AQS source, in which the data is pulled from.

2.3.5 Air Quality Historical Trends

The 'Air Quality Historical Trends' section displays graphs that visualize past wildfire trends about the user searched location. There are five graphs displayed: Total Fires per Month, Total Acres Burned per Month, Average Fire Duration per Month, Top 10 Fires by Duration, and Top 10 Fires by Total Acres Burned.

Similar to the previous 'Air Quality Historical Trends' section, the time frame (x-axis) for which the graphs display information about can be changed by the 'SELECT YEAR' drop down menu. Also similar to the 'Air Quality Historical Trends' section, there are links to resources from which the data is sourced from (National Interagency Fire Center)

The 'Total Fires per Month' graph, shows the number of total fires in the county of the user searched location, per month:

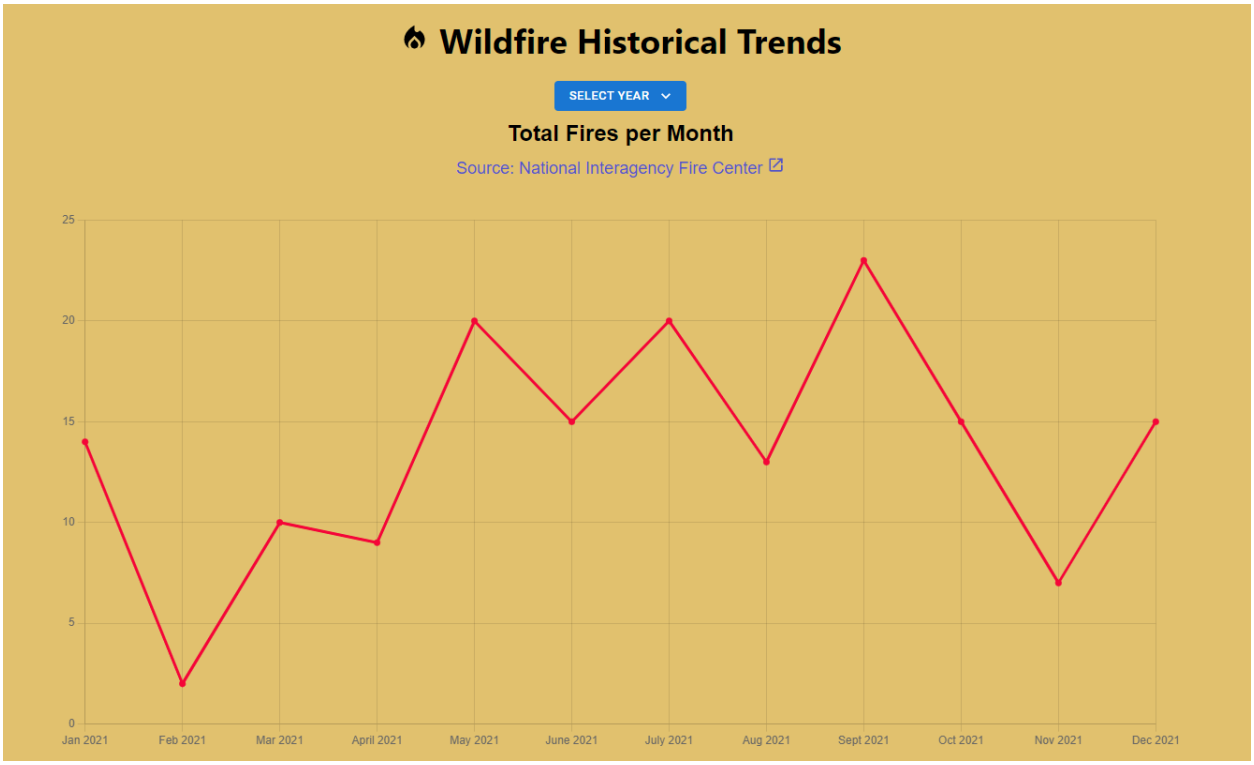

Figure 18: Total Fires per Month

The ‘Total Acres Burned per Month’ graph displays the total amount of acres burned per month in the user searched county:

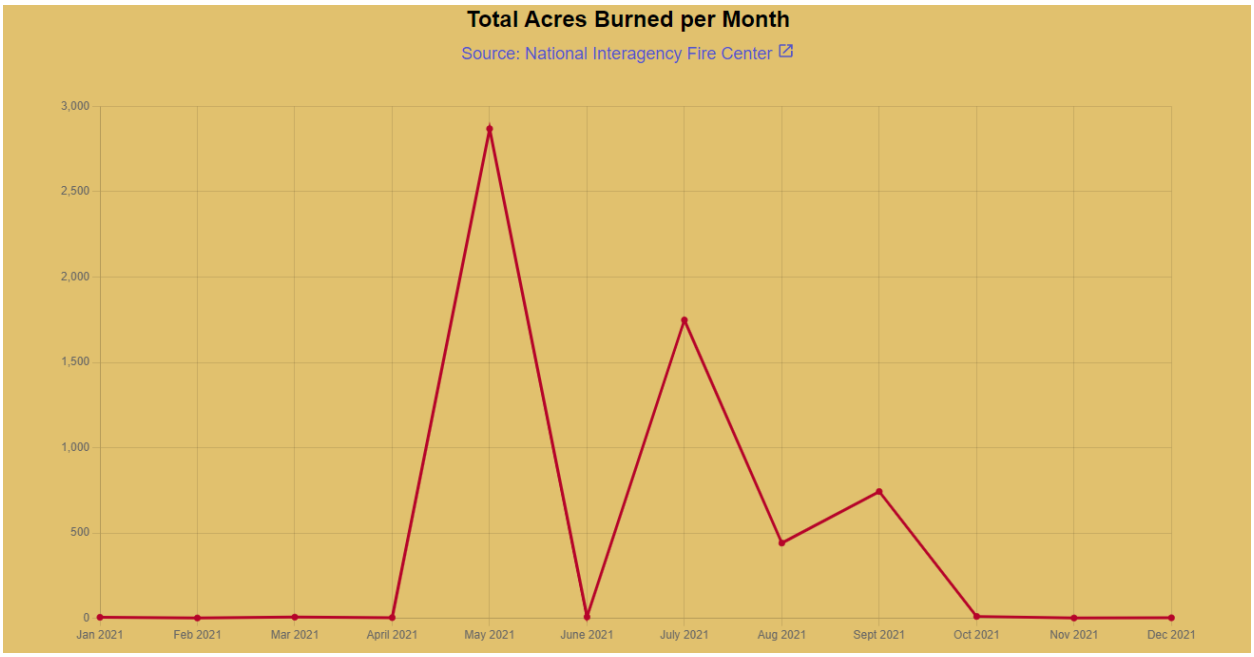

Figure 19: Total Acres Burned per Month

The ‘Average Fire Duration per Month’ graph displays the average duration for each fire in the county of the user searched location:

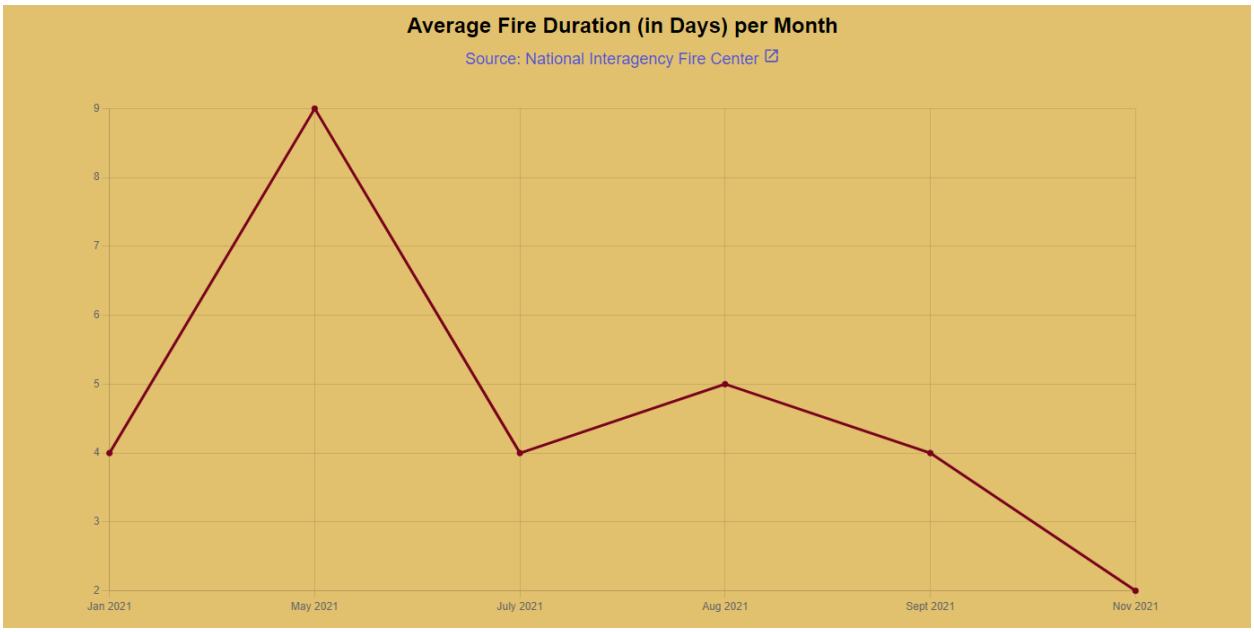

Figure 20: Average Fire Duration per Month

The ‘Top 10’ bar graph displays the top 10 fires by duration, from most to least, left to right for the county of the user searched location:

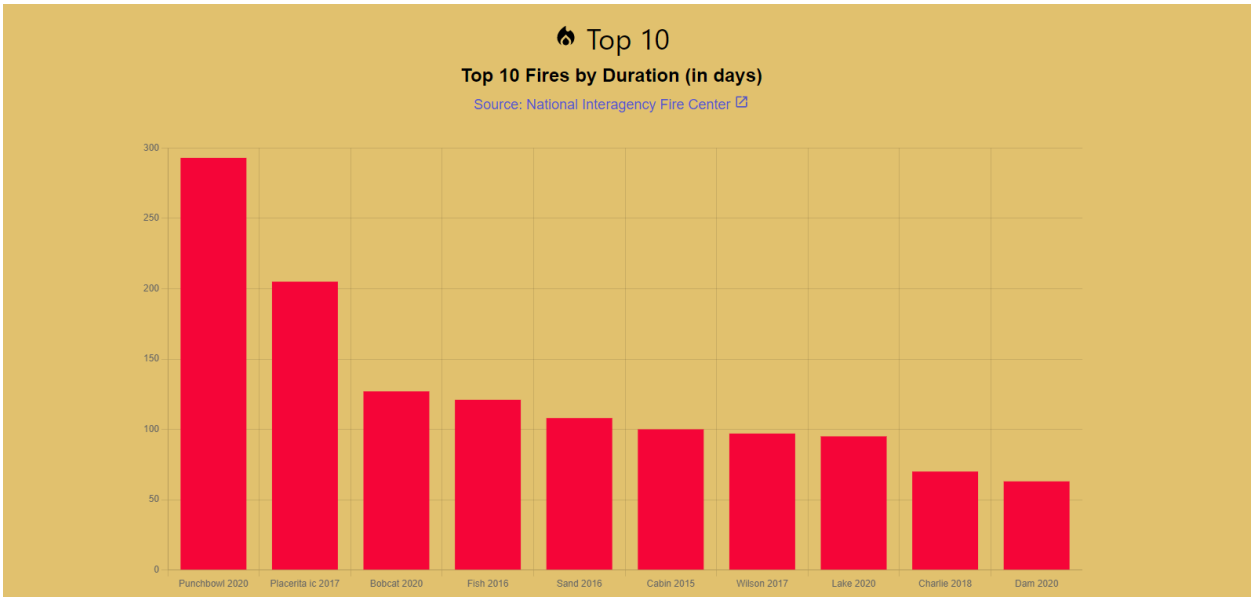

Figure 21: Top 10 Fires by Duration

The ‘Top 10 Fires by Total Acers Burned’ graph displays the top 10 fires by total number of acres burned, from most to least, left to right for the county of the user searched location:

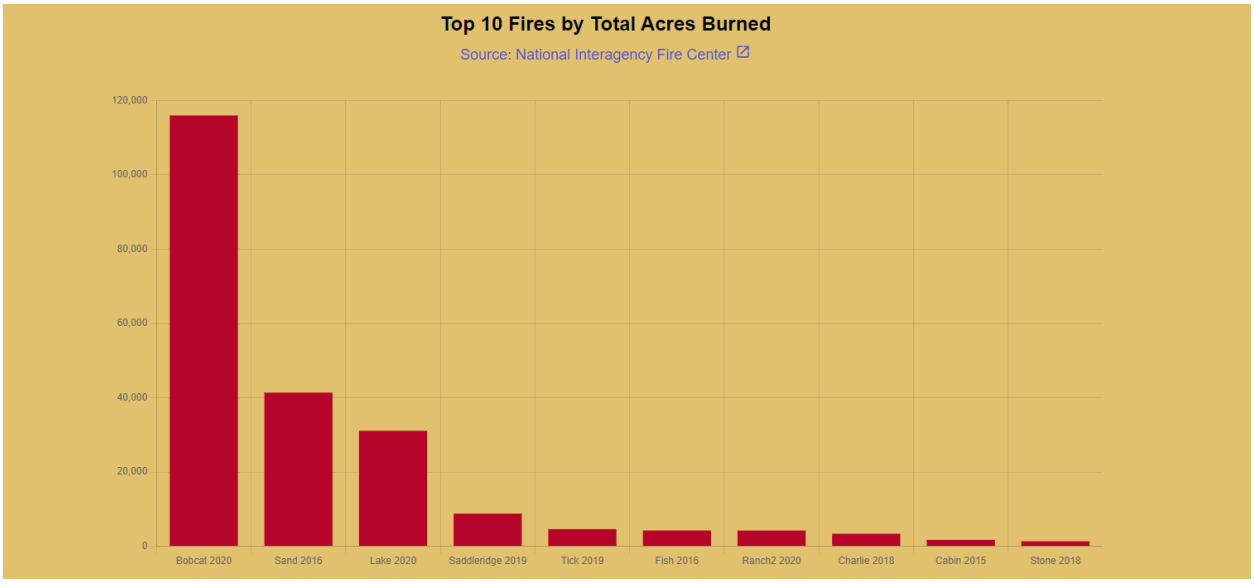

Figure 22: Top 10 Fires by Total Acres Burned

2.3.6 Print Button

Lastly, in the Results Page, near the top of the page is a Print Button, which allows a user to print the entirety of the Results Page:

Figure 23: Print Button

2.4 Navigation Bar

The Navigation Bar is dynamic, such that it changes slightly depending on what page you are on, however a user can always travel to the other pages that are not currently showing, via the Navigation Bar links:

Figure 24: Navigation Bar