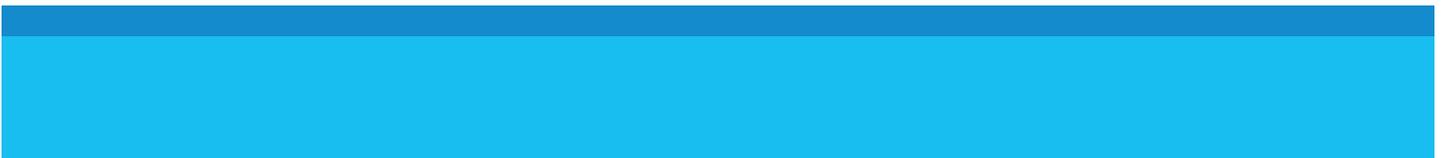


BMC Air Quality Dashboard

USER GUIDE



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1. Overview

This document contains documentation and reference materials supporting the BMC Air Quality dashboard development. The purpose of this dashboard is to allow users to explore Ozone and PM2.5 Air Quality data in the BMC area through daily recorded data and yearly summaries.

This document is organized into **User Guide** and **Technical Documentation** sections. The goal of the **User Guide** section is to describe the core functionality of the dashboard from a user's perspective, providing an overview of the dashboard organization and highlighting specific features of interest. The goal of the **Technical Documentation** section is to equip developers with the tools and knowledge needed to make updates to the data showcased in the dashboard.

2. User Guide

The dashboard is a single page arranged into 5 panels to provide users with smooth navigation and an interactive experience.

2.1 Dashboard Components

The dashboard allows for the user to explore the air quality in the BMC area, which is quantified by daily AQI readings. Users may switch between pollutants, sources, time periods or select any subset of sensors using the filters on the left-hand side of the dashboard (1). The map view in the middle of the dashboard (2) shows sensor locations, marks normal or errant operation of sensors by color, and shows the distribution of the Vulnerable Population Index (VPI). Below the map, the sensors selected through filters are summarized by AQI category (3). In the top-right corner of the dashboard, users can find the total number of sensors selected through filters, and the number of sensors that had exceeded the acceptable AQI threshold of 100 during the selected time period (4). On the right-hand side of the page, 2 charts work in tandem to display daily AQI, temperature and precipitation readings (5).

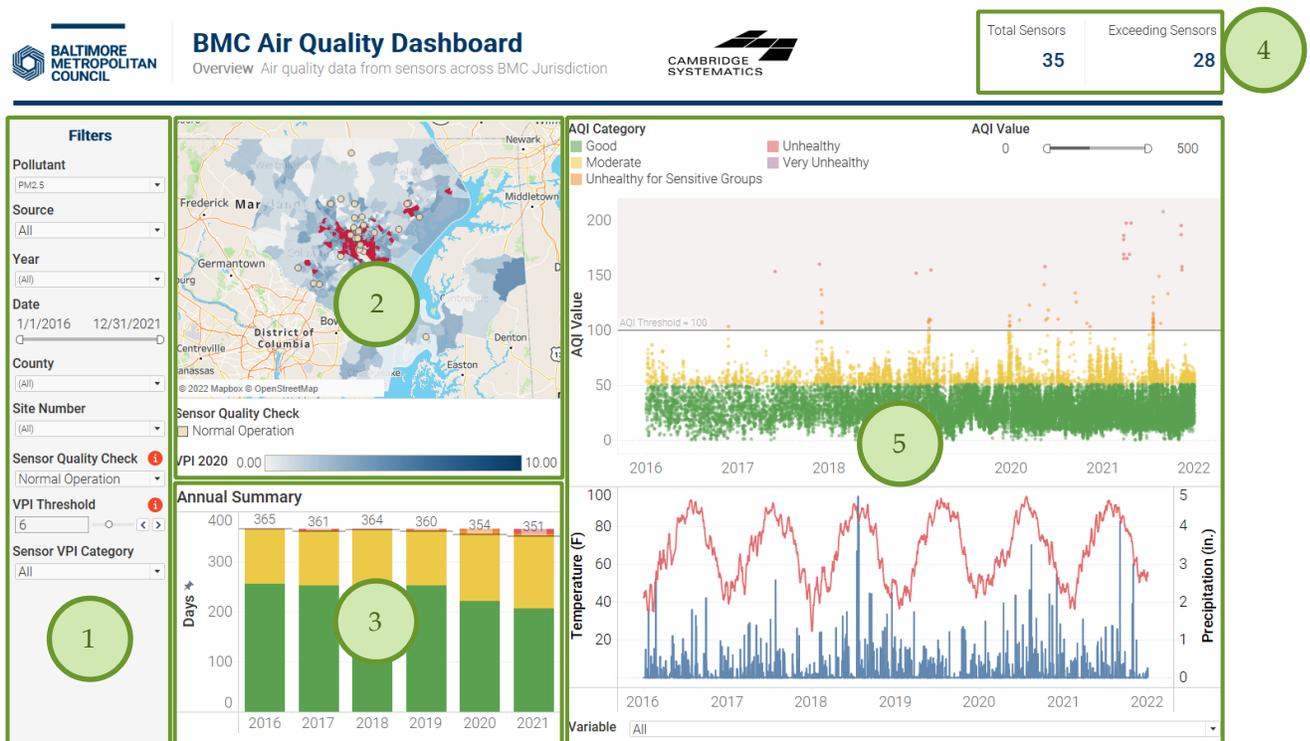


Figure 1 BMC Air Quality Dashboard

Dashboard Main Components

- 1 – Sensor and Date Filters
- 2 – Sensor Map
- 3 - Annual Summaries
- 4 – Sensor Counts
- 5 – Daily Readings

2.2 Dashboard Sections

2.2.1 Sensor and Date Filters

Data filters that allow users to zoom into the markets of greatest interest are located on the left hand panel as shown in **Figure 1**. Users can select one or more filters at any instance to create a subset of the sensors to be included in the display.

Users can select the desired options from a dropdown menu that appears after clicking the downward arrow on the right of each filter box. The figure on the right shows the full list of filters.

Users should first choose to view either Ozone or PM2.5 data. Next, they can filter the source from which the data is loaded (AQS EPA or PurpleAir), dates of results, counties which sensors are located in, or specific site numbers that they want to focus on. While sensors that are tagged as “Normal Operation” will be the default display, users may also view “Errant Readings Flagged” sensors by changing the “Sensor Quality Check” filter. Sensors that have readings of AQI 200 more than another sensor within 5 miles were flagged as errant. Users can change the VPI threshold using the slider or left and right arrows, and then use the “Sensor VPI Category” filter to select whether they want to display sensors that are above or below the VPI threshold.

Filters

Pollutant
PM2.5

Source
All

Year
(All)

Date
1/1/2016 12/31/2021

County
(All)

Site Number
(All)

Sensor Quality Check ⓘ
Normal Operation

VPI Threshold ⓘ
6

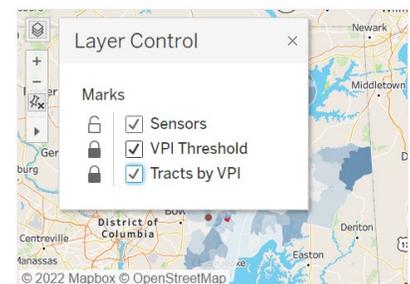
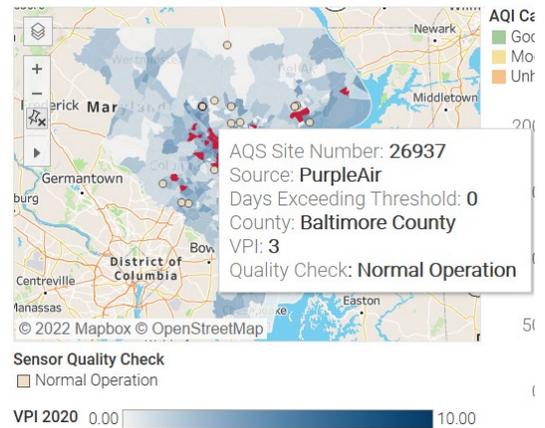
Sensor VPI Category
All

2.2.2 Sensor Map

The sensor map in the middle of the screen shows the locations of the sensors selected. Hovering over a sensor bubble will display a tooltip with sensor information. Hovering over the map will show a toolbar on the left side of the map, where users can control layers displayed, zoom in or out of the map, reset the map view to the original, and change the cursor function to zoom area, pan, or a selection tool. Users may also filter the rest of the views by using the selection tool to select a subset of sensors.

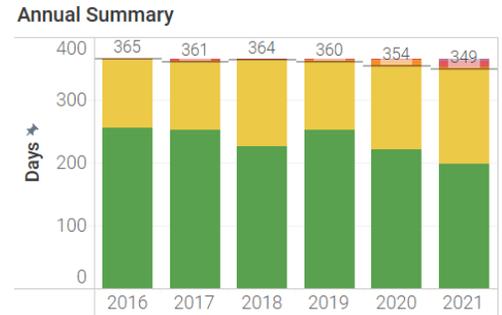
Sensors bubbles are beige for “Normal Operation” and dark brown for “Errant Readings Flagged”. Each census tract is colored a different shade of blue depending on its Vulnerable Population Index.

Layer control allows users to change the layers shown. The “Sensors” layer includes all the beige and/or brown bubbles and the “Tracts by VPI” layer includes the blue census tracts. The “VPI Threshold” layer shows users the tracts that have VPIs above the VPI threshold set by the user in the filters panel. Tracts with VPI at or above the threshold will be shaded red, while tracts below the threshold will be transparent. If the “Tracts by VPI” layer is being displayed, these tracts will be their respective shade of blue.



2.2.3 Annual Summaries

The annual summaries chart aggregates by year the maximum AQI category recorded by any sensor in the set of selected sensors. Hovering over each section in the chart produces a tooltip with the AQI category and the number of days when that category was the highest. The grey lines indicate the total number of days that did not exceed the acceptable AQI threshold of 100 in that year.



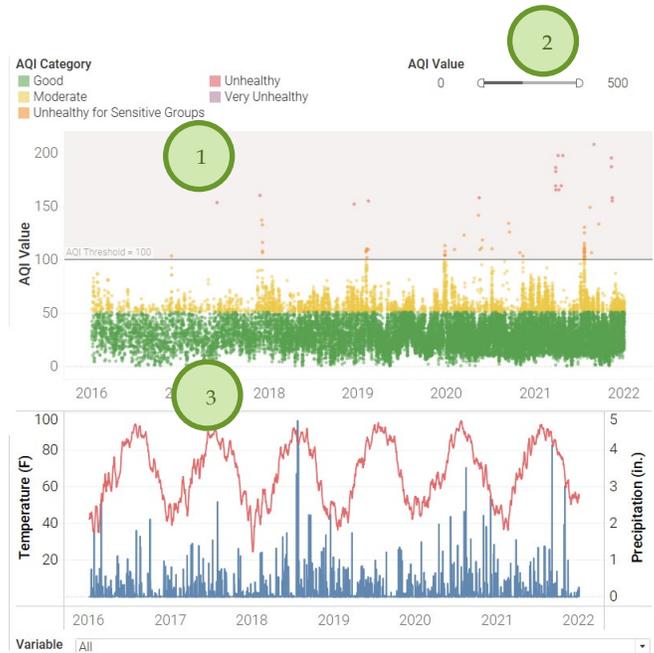
2.2.4 Sensor Counts

The top-right banner shows summary statistics based on the sensors selected by users. Hovering over each number will also produce a tooltip with their definitions.



2.2.5 Daily Readings

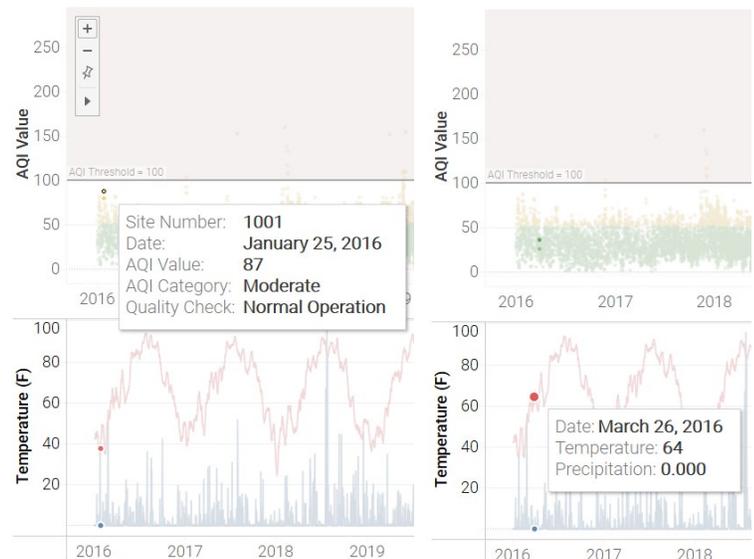
The daily readings panel consists of 2 charts – AQI and a combined chart of temperature and precipitation. The AQI chart (1) shows all daily readings of the pollutant selected from the sensors selected. The readings are colored according to their AQI category. A grey line and shaded region indicate the acceptable AQI threshold. The slider in the top-right corner (2) allows users to change the range of AQI values shown in the chart.



The chart on the bottom shows daily temperature and precipitation (3). Users may choose to display both variables, or just one of either temperature or precipitation using the drop down list at the bottom of the chart.

Hovering over a point on the AQI chart will produce a tooltip listing the site number, date, AQI value, AQI category and sensor quality check. All sensors that recorded readings on that date will be highlighted in the chart, and the temperature and precipitation values on that date will be highlighted in the chart below.

Hovering over a point on the temperature/precipitation chart will produce a tooltip listing the date, temperature and precipitation. All AQI readings on that date from sensors selected will also be highlighted in the chart above.

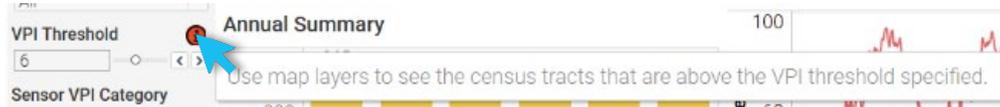


2.3 Dashboard Features

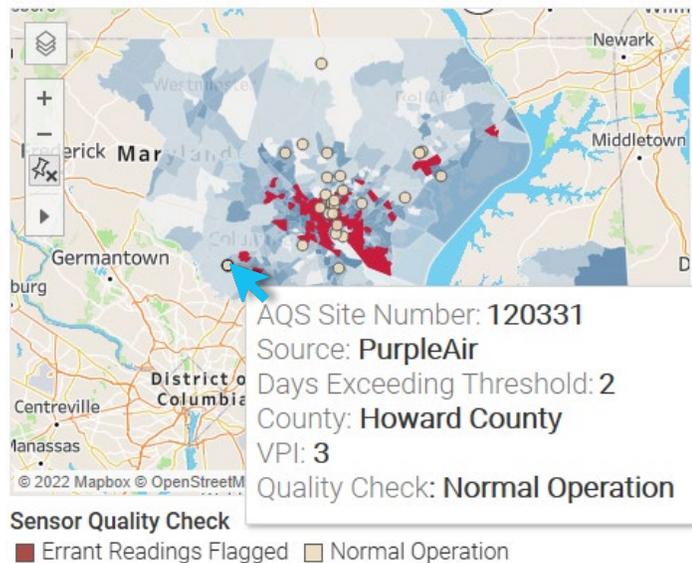
Each dashboard is equipped with auxiliary features that help enhance the user experience and provide a rich set of “details on demand,” or further details that are hidden in a visualization’s default state but are available upon user need via user interaction (e.g., tooltips).

2.3.1 Quick Tips

- **Info Bubbles** Users can hover over the red (i) bubble placed near a filter or component to enable a tooltip that shows additional information about that filter or component.



- **Tooltips** Users can hover over chart and map components to obtain further details via tooltips.



2.4 Saving Data and Images

Users can save data, tables, charts, and map images from the dashboard corresponding to the filter selections that are made. Users can also save the whole dashboard as an image or save any specific table, map, or chart as an image or data file. The procedures for saving are described in the subsequent sections.

2.4.1 Saving as Images

Through Tableau Online, to save the dashboard as an image, users can navigate to **Choose a format to download > Image** on the main menu bar of Tableau Online.

Through Tableau Reader, to save the dashboard as an image, users should exit the full-screen view and navigate to **Dashboard > Export Image** on the main menu bar of Tableau Reader. Users will be asked to provide a file name and folder location to save the dashboard as an image.

2.4.2 Exporting as PowerPoint

Through Tableau Online, to save the dashboard as a PowerPoint, users can navigate to **Choose a format to download > PowerPoint** on the main menu bar of Tableau Online as shown in Figure 4.1.

Through Tableau Reader, to save the dashboard and/or the elements of the dashboard as a PowerPoint, users may navigate to **File > Export as PowerPoint** on the main menu bar. Users will be asked to select the content to include in the PowerPoint slide from the following three options:

- **This View** – Tableau generates a PowerPoint slide with the current view.
- **Specific sheets from this dashboard** – Users can select and generate PowerPoint slides for each element selected (i.e., the selected charts, maps, summaries generated in separate sheets).
- **Specific Sheets from this workbook** – Users can select and get PowerPoint slides on each element selected (i.e., the selected charts, maps, summaries generated in separate sheets). In this case, users will find the elements/sheets in the Tableau file. Please note that, the last two options will provide the same outcome for the LOCUS dashboard in question.

Finally, users will be asked to provide file name and folder location to save the dashboard as a PowerPoint file.

2.4.3 Exporting as PDF

Similar to exporting as PowerPoint, users can also export the dashboard and its element to a PDF file. To do so, users may navigate to **File > Print to PDF** on the main menu bar in Tableau Reader or select **PDF** as download option in Tableau Online. Likewise, in PowerPoint export, users will have options to export only the dashboard using **Active sheet** option. Users can export all the different sheets with different elements of the dashboards (i.e., the entire workbook) in a single PDF file by selecting **Entire workbook**. Finally, users will be asked to provide a file name and folder location to save the dashboard as a PDF file.

2.4.4 Saving a Chart or Table

To save a specific table or data for any chart shown on the dashboard, Tableau Reader users must select the specific table or chart first. Then, users may navigate to **Menu > Worksheet > Export > Image**.

Cross-tabulation can also be generated by selecting **Crosstab to Excel** option. This procedure will generate the crosstab in an Excel sheet, but the file is **NOT** automatically saved. Users must save the file in Excel software to store the data on their local system.

Tableau Reader users can copy and paste a chart or underlying data to a presentation slide or document using the quick export feature of the dashboard. Users need to right-click on a chart and navigate to **Copy** option to copy the chart as an image, data table, or cross-tabulation and paste it in a document.