

Visualizing Real Time Air Quality

ESDR Visualization Tool

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Community Robotics, Education and Technology Empowerment

The Problem

Municipal, county, and federal governments **stream real time air quality and environmental data**, however this data is often inaccessible or difficult to process, let alone visualize.

Furthermore, there are many other types of environmental sensors that collect data owned by citizens, however this data is often **lost over time or inaccessible**.

The Solution

The Environmental Sensor Data Repository (ESDR)

- collects
- archives
- and presents

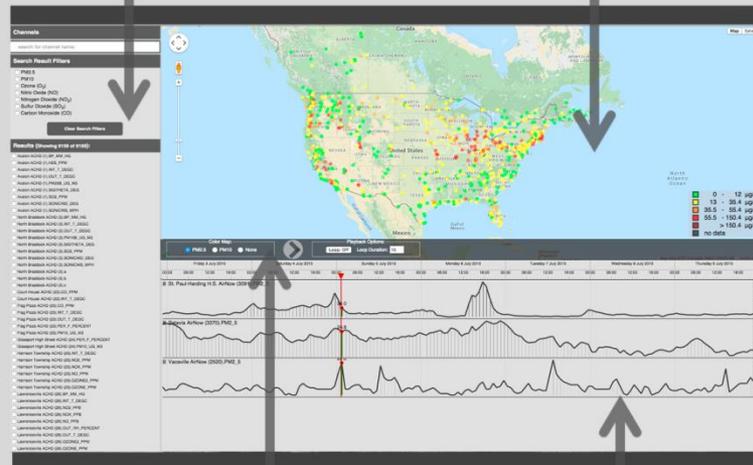
streaming, real time environmental sensor data and allows governments and citizens to **upload directly** to the server.

The ESDR visualization tool allows users to explore the environmental data as **interactive graphs** in which they can manipulate **temporally**.

Or, users may explore data **spatially** by honing into an area on the map and turning on sensors within a locality.

Search channels by name and **filter** results by sensor type.

Map displays **sensor location** and **nodes color** to show data change over time



Timeline to scrub through data and recolor the nodes over any date range

Interactive graphs may be dragged and scaled for desired time range

Timeline Method

Data for a given time range is retrieved from the ESDR data store in bins of 512 data points and specifying how many bins and at what offset to begin retrieving from.

To implement the coloring of the nodes, data is called from the server and processed into an array. A binary search finds the nearest timestamp to draw.

Impact

The ESDR visualization tool empowers people to take control of their air quality. The tool also allows people to quickly gauge their air quality compared to other areas around the United States, and soon the world.

Nevertheless, the website is in its first stage of development and future versions would include sophisticated coloring mechanism, geographical search, and statistical tools to find abnormal spikes to increase functionality.

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