<p style="text-align:center">**Annotated Resource List**</p>

<p style="text-align:center">**Melanie Greenwald**</p>

<p style="text-align:center">**High School Research & AP Environmental Science**</p>

When researching resources for this assignment, my goal was to find open-access and student-friendly geospatial sources that made connections between humans and the environment. It is important for students to make connections between human activity and changes happening to our biosphere, geosphere, and atmosphere. In addition, these sources focus on local problems near Long Island to make geospatial data more engaging for students. The resources in this assignment were collected from colleagues at the Manhasset Secondary School as well as The Wonder of Science. My first source, Earth Map (https://earthmap.org/) features environmental, social, and economic layers for students to gain a broad picture of how humans impact all facets of our society. The second source I used, Water Quality Indicators Map (https://echo.epa.gov/maps/water-quality-indicators/wqimap), focuses historical data showing how human activity can create changes to waterways throughout the United States over the past 10 years. The sources Real-Time Air Quality PM2.5 in NYC (https://a816-dohbesp.nyc.gov/IndicatorPublic/data-features/realtime-air-quality/) and Canadian Wildland Fire Information System Interactive Map (https://cwfis.cfs.nrcan.gc.ca/interactive-map) provide real-time data on issues in air quality from air pollution and wildfires. The fifth source I am using NOAA Surface Air Temperature Interactive Map (https://www.nnvl.noaa.gov/view/globaldata.html#GFST) challenges students to observe climate and make connections between human activity and temperature/precipitation. My last geospatial resource 2018 Squirrel Census Fur Color Map (https://data.cityofnewyork.us/Environment/2018-Squirrel-Census-Fur-Color-Map/fak5-wcft) provides a fun way for students to think about human impacts on biodiversity and our living biosphere in Central Park. These geospatial datasets would be a great asset for my classroom lessons to create meaningful and authentic learning experiences as well as make connections between our own actions and our impact on the environment.

1.

Title of the resource	Earth Map
Web Link	https://earthmap.org/
Course and topic	AP Environmental Science: Global Change
3-5 sentence description of the resource	This resource shows human impacts on the natural system by location and region. The resource features 18 topics (such as energy, land cover, protected areas, etc.) and each topic features different layers that can be toggled on/off. The resource shows how developed nations have a larger impact on the environment comparative to developing nations.
3-5 sentences describing how it can be used in a lesson	In a lesson, students can use this resource to write a CER (claim, evidence, reasoning) on how humans have affected various environmental factors. Students can choose a specific country and a different topic to research (such as climate projections, emissions, agriculture, etc.). Students can use this map to collect data and then present their findings in the class using a United Nations Socrative seminar.
Modifications	• Students can use the CER graphic organizer

needed to use this resource in teaching	https://docs.google.com/drawings/d/1Ig95nCtQ-4mkaXnNGxVZa0kWXkO_c0RAs9LDmzRVdlg/edit to organize their thoughts prior to the Socrative seminar. • Students can use the Earth Map Introduction video https://www.youtube.com/watch?v=S79YvFLcy7c&ab_channel=EarthMap as a step-by-step guide for navigating this resource.
Other information	Includes all countries and regions.

2.

Title of the resource	Water Quality Indicators Map
Web Link	https://echo.epa.gov/maps/water-quality-indicators/wqimap
Course and topic	AP Environmental Science: Aquatic and Terrestrial Pollution
3-5 sentence description of the resource	This resource shows the average phosphorus concentration in US waterways over a period of 10 years. Red diamonds indicate a higher concern and blue diamonds indicate a lower or no concern for phosphorus pollution in the water. In New York State, the resource shows a higher concern for phosphorus pollution in areas of high population and high industry.
3-5 sentences describing how it can be used in a lesson	In a lesson, students can use this resource to plan an investigation into measuring phosphorus in the local water. Students can sample water from the nearby Manhasset Bay to test the water quality. Students can use a spectrophotometer to measure the current phosphorus levels and compare the phosphorus concentrations from the sample to the historical data.
Modifications needed to use this resource in teaching	• Students can use the WQI Tool https://echo.epa.gov/help/wqi-help to explore how to use the interactive monitoring map • Students can use the graphic organizer Planning and Carrying Out Investigations https://drive.google.com/file/d/1wYMg5ru3-9ZXGBc443aWCTjH67ywjwlw/view as a guide for how to design an experiment • Students can use the HACH video as a visual guide on how to take measurements using a spectrophotometer https://vimeo.com/1074349520?fl=pl&fe=sh
Other information	Specific to United States.

3.

Title of the resource	Real-Time Air Quality: PM2.5 in NYC
Web Link	https://a816-dohbesp.nyc.gov/IndicatorPublic/data-features/realtime-air-quality/
Course and topic	AP Environmental Science: Atmospheric Pollution
3-5 sentence description of the	This resource shows real-time PM2.5 air quality measurements in different locations around New York City. The resource has graphs of hourly PM2.5 showing a rise in PM2.5 matching vehicle usage patterns (such as peaking during morning and afternoon commutes). The resource also shows areas such as Midtown West, the BQE, and FDR Drive having higher

resource	concentrations of PM2.5 due to the high volume of vehicles.
3-5 sentences describing how it can be used in a lesson	In a lesson, students can use this resource to Students can make predictions about air quality around New York City. Using a whiteboard or poster paper, students can draw a system showing how pollution from areas of high commercial use and vehicles can become harmful to humans. Students can then label the inputs, outputs, and parts of the system that contribute to an increase in PM2.5
Modifications needed to use this resource in teaching	• Students can read through the New York State Department of Health article on Particle Pollution and Health https://www.health.ny.gov/environmental/indoors/air/pmq_a.htm to determine how to read air quality indexes as well as determining the causes of PM2.5 in New York • Students can use the graphic organizer Systems and System Models https://static1.squarespace.com/static/59c3bad759cc68f757a465a3/t/5b50e028aa4a99d8b864133e/1532026920409/Systems.pdf to draw a representation of the factors that contribute to atmospheric pollution in New York City • Students can use the video Systems and System Models https://www.youtube.com/watch?v=8kj__V8ehDU as a tool for creating their systems drawings
Other information	Includes all countries and regions.

4.

Title of the resource	Canadian Wildland Fire Information System Interactive Map
Web Link	https://cwfis.cfs.nrcan.gc.ca/interactive-map
Course and topic	AP Environmental Science: Land & Water Use
3-5 sentence description of the resource	This resource shows real-time and historical wild fires throughout Canada. The resource shows the pattern between location and wildfires within Canada with more wildfires depicted in red and less wildfires shown in blue. In addition, the resource shows a higher number of wildfires in summer and fall and a decrease in wildfires in winter and spring. The resource also shows historic wildfire data showing a trend of higher wildfires in the 2020s compare to the early 2000s.
3-5 sentences describing how it can be used in a lesson	In a lesson, students can use this resource to ask questions about patterns in wildfires in Canada. Students can observe the data to generate questions about how seasonality and location can affect the distribution of wildfires in Canada. Students can also use the historic maps to ask why the number of wildfires have been increasing due to human activities. Students can share their questions on a large white board to present to the class at the beginning of a unit.
Modifications needed to use this resource in teaching	• Students can use the Canadian Wildland Fire Glossary https://www.ciffc.ca/sites/default/files/2021-03/CWFM_glossary_v2021-03-18-EN.pdf for definitions of terms used on the interactive map • Students can use the Asking Questions Single Point Rubric (https://docs.google.com/document/d/1Mfw_PaY0flw8m3c7S_UFtU2Sltb__NtfngxA1WfBwPM/template/preview) as a resource for students to understand the criteria that

	is expected of them when creating questions.
Other information	Specific to Canada.

5.

Title of the resource	NOAA Surface Air Temperature Interactive Map
Web Link	https://www.nnvl.noaa.gov/view/globaldata.html#GFST
Course and topic	AP Environmental Science: Earth Systems & Resources
3-5 sentence description of the resource	This resource shows real-time average surface air temperature around the world. The resource shows the relationship between temperature and latitude with higher temperatures (more red) closer to the equator and colder temperatures (more blue) closer to the poles. In addition, the resource shows the relationship between time of day and temperature with locations in daytime warmer than during the nighttime.
3-5 sentences describing how it can be used in a lesson	In a lesson, students can use the resource to analyze climate patterns. Students can observe which locations have an overall warmer climate based on time of day and season and create a climate graph. Students can present their graphs in a gallery walk to compare the climate of different locations around the globe.
Modifications needed to use this resource in teaching	• Students can use the video Climate Graphs Explained https://www.youtube.com/watch?v=0d9NPbfD_SM&ab_channel=SimpleGeography as a resource for how to set up the axis for a climate graph. • Students can use the graphic organizer Analyzing and Interpreting Data https://drive.google.com/file/d/1__JPpQ9VtWKbrFTAEHTslQABaQefuBNX/view to record data in a graph and describe the relationship between month and precipitation/temperature.
Other information	Includes all countries and regions.

6.

Title of the resource	2018 Squirrel Census Fur Color Map
Web Link	https://data.cityofnewyork.us/Environment/2018-Squirrel-Census-Fur-Color-Map/fak5-wcft
Course and topic	AP Environmental Science: The Living World: Biodiversity
3-5 sentence description of the resource	This resource shows the spatial distribution of squirrels by fur color in Central Park in New York City. The resource shows an overwhelming population of gray squirrels, which is the most common native squirrel to New York. The resource shows a higher proportion of brown color squirrels in the south of Central Park compared to the north.
3-5 sentences describing how it can	In a lesson, the distribution of squirrel fur color can be used to discuss biodiversity in New York City. Students can observe the distribution to compare species richness to species evenness throughout the park. Students can then brainstorm features in the park that allow for habitats and food sources that can account for the distribution of squirrels in the park.

be used in a lesson	Students can then present their findings on a powerpoint slide.
Modifications needed to use this resource in teaching	• Students can use Using NYC Open Data https://www.youtube.com/watch?v=xyIRu7uGMlA&ab_channel=NYCOfficeofTechnology%26Innovation as a tutorial for how to access and analyze the data.
Other information	Specific to Central Park.

Works Cited:

2018 Squirrel Census FUR Color Map | NYC Open Data. (n.d.).

https://data.cityofnewyork.us/Environment/2018-Squirrel-Census-Fur-Color-Map/fak5-wcft

Analyzing and Interpreting Data.pdf. (n.d.). Google Docs.

https://drive.google.com/file/d/1__JPpQ9VtWKbrFTAEHTslQABaQefuBNX/view

Bozeman Science. (2013, January 17). Concept 4 - Systems and system models [Video]. YouTube.

https://www.youtube.com/watch?v=8kj__V8ehDU

Canada, N. R. (n.d.). *Canadian Wildland Fire Information System | Interactive map*.

https://cwfis.cfs.nrcan.gc.ca/interactive-map

CIFFC Training Working Group. (2021). Canadian Wildland Fire Glossary.

https://www.ciffc.ca/sites/default/files/2021-03/CWFM_glossary_v2021-03-18-EN.pdf

Earth Map. (n.d.). https://earthmap.org/

Earth Map. (2021, December 16). Earth Map Introduction [Video]. YouTube.

https://www.youtube.com/watch?v=S79YvFLcy7c

Engaging in Argument from Evidence Graphic Organizer. (n.d.). Google Docs.

https://docs.google.com/drawings/d/1Ig95nCtQ-4mkaXnNGxVZa0kWXkO_c0RAs9LDmzRVdlg/

edit

NOAA View Global Data Explorer. (n.d.). https://www.nnvl.noaa.gov/view/globaldata.html#GFST

NYC Office of Technology & Innovation. (2013, December 19). Using NYC open data [Video]. YouTube.

https://www.youtube.com/watch?v=xyIRu7uGMlA

Particle pollution and health. (n.d.). https://www.health.ny.gov/environmental/indoors/air/pmq_a.htm

Planning and Carrying out Investigations Graphic Organizer.pdf. (n.d.). Google Docs.

      https://drive.google.com/file/d/1wYMg5ru3-9ZXGBc443aWCTjH67ywjwlw/view

Real-Time air quality in NYC – Environment & Health Data Portal. (n.d.). Environment & Health Data

      Portal. https://a816-dohbesp.nyc.gov/IndicatorPublic/data-features/realtime-air-quality/

Simple Geography. (2023, January 13). Climate Graphs Explained (and how to make one) [Video].

      YouTube. https://www.youtube.com/watch?v=0d9NPbfD_SM

Stickel, A. & Jeremy Peacock. (n.d.). Systems and system models. In thewonderofscience.com.

      https://static1.squarespace.com/static/59c3bad759cc68f757a465a3/t/5b50e028aa4a99d8b864133e/

      1532026920409/Systems.pdf

The wonder of science. (n.d.). The Wonder of Science. https://thewonderofscience.com/

TNT Plus Reagent Line. (n.d.). Vimeo. https://vimeo.com/1074349520?fl=pl&fe=sh

Water Quality Indicators help | ECHO | US EPA. (n.d.). https://echo.epa.gov/help/wqi-help

Water Quality Indicators Map | ECHO | US EPA. (n.d.). https://echo.epa.gov/maps/water-quality-

      indicators/wqimap