

Google My Maps Smoke Activity

Use instructional powerpoint named "Smoke My Maps Activity"

Using models to create maps

Students will learn to run a simulator used to map potential smoke plumes from a proposed prescribed burn and create a Google My Maps which can be used to communicate the results of the simulation with the public. Using the VSmoke simulator, students can explore different scenarios; you can change the number of acres burned, simulated weather conditions, change the fuel type, etc. Encourage students to be systematic about what changes they make to the simulator; changing a single parameter (for example, from 1 acre to 100 acres to 1000 acres) will allow them to explore how that parameter impacts the smoke plume.

It is important that students create different layers for each piece of information that they add to the map. If you add a point to the layer with the simulation results you will lose the polygons. Each layer should be carefully named and information about the simulation run can be added to map marker popups to be viewed as a slide show (don't worry if it is hard to read screenshots in edit mode, when you preview it you can expand the images and they will be easy to read).

Privacy

Note: caution students not to put personal information on their maps, such as the location of their homes. You may also wish to use parks or other public locations as a substitute for your school to protect student privacy. Another technique is to have students create avatars and

aliases to protect privacy. Students are asked to drop a placemark on their school and measure/map the distance to the nearest fire. If you prefer, you can ask students to use a park or other public place rather than their school. Caution students not to mark their homes on their maps for privacy reasons.

Running the VSmoke simulator

We have students locate their simulated fire on My Maps and obtain the Latitude and Longitude from their map so that they will be able to place a map marker on their My Maps. Although you can double click on a location in the simulator map to begin the simulation this does not give you a map marker in the KML file, and it is less confusing to begin with locating the fire in the My Maps and adding the Lat/Long information to the simulator (you can also use this as a lesson in formatting Lat/Long data).

The simulator provides the following background information which includes a link to the users manual:

- **VSmoke-Web is a web-based implementation of VSmoke ([Lavdas, 1996](#)) and is designed to assist with planning prescribed burns in the Southern United States. VSmoke is a simple gaussian smoke dispersion model that calculates isopleths of surface smoke concentration. Output from the model represents *peak hourly concentrations of PM_{2.5}* or visibility (under development). Contour values and their colors correspond to the PM 2.5 thresholds for the Air Quality Index (AQI) and reflect potential health impacts ranging from moderate to hazardous ([Visit AirNow for mode AQI info](#)).**

Additional Activities

The AirNow model used in the VSmoke simulation can be used for additional activities to explore air quality impairments from smoke coming from current fires. The AirNow website

provides a KML download which may be used in Google My Maps and Google Earth Pro (note: many websites will call a KML download file a "Google Earth" file, but if it is in the proper format it can also be used in Google My Maps).

https://www.airnow.gov/index.cfm?action=google_earth.index

See screenshots below for instructions on downloading the AirNow map.



 Search... GO

Local Air Quality Conditions
Zip Code: Zip Co Go State: Alabama Go My Current Location

Air Quality Index (AQI) in Google Earth

Air Quality Index (AQI) forecasts and current conditions are now available in Keyhole Markup Language (KML) format. This allows for AirNow data to be displayed in 3D viewers such as Google Earth. Follow the instructions below to install and run the AirNow KML files in Google Earth.



1. If you already have the Google Earth software installed, simply click [here](#) to download the AirNow KML files.

either download the files to your computer or automatically launch Google Earth with the AirNow data in the program.

3. If you do not have Google Earth installed, you can download it free from Google on the following website: <http://www.google.com/earth/index.html>. Once installed, follow steps 1 and 2 above.

Other 3D viewers:

Having AirNow data in KML format allows for other 3D "virtual globes" such as Microsoft Live Earth and NASA World Wind the ability to display AQI information. Efforts are currently underway to refine the AirNow KML files so they can be reliably used in these other programs. Instructions will be provided as the AirNow KML becomes operational for software other than Google Earth.

This page was last updated on Thursday, March 10, 2016

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[Google Drive Help](#)

[Google My Maps Help](#)

Google Earth Pro Smoke Map Activity

Use instructional PowerPoint presentation for Smoke Google Earth Pro Activity

Using models to create maps

In this activity students will review skills developed in the [Avatar](#) Activity, the [Ecoregions Google Earth Pro](#) Activity and the [Fire Google Earth Pro](#) Activity; once again students will search for and add a placemark to the location of their schools. You can also have students use the avatars they created in the [Avatar Activity](#) to narrate their work and place their findings in context.

This activity adds new concepts to our understanding of GIS by using models based on many sources of information to create dynamic maps which show changes in smoke plumes over time. According to the [overview provided by the US Forest Service](#):

- "BlueSky is a framework that contains and combines models and data about weather, fires and fuels, emissions, and terrain. By integrating these models into a unified framework, BlueSky is able to predict smoke concentrations and trajectories, and can be used to create forecasts helpful to land and fire managers."

[The Fire Activity](#) introduced the idea that NASA uses probabilities to determine whether the color of a given pixel in a satellite image is caused by a fire vs. some other object (for example, is the pixel red because it is part of an image of a fire vs. a red fire truck vs. a reflection of a sunset?). The Smoke Activity continues the idea of modeling to create maps by adding an additional layer of complexity; we can take several models and link them together to create a larger, integrated modeling framework. The smoke model in BlueSky is a sophisticated model that draws data, imagery and model outputs from many sources and combines the information into one map of active fires and smoke plumes.

To explore the idea that models can be useful for determining whether an image is what you think it is, you can ask students to look at the weather models in the second activity and suggest ways to distinguish between fog, clouds and smoke. How do you know that you are looking at smoke and not a rain cloud?

Google Earth Pro vs. Google My Maps

Mapping smoke from current fires requires a more sophisticated platform than Google My Maps, and as a result this is a Google Earth Pro activity. Google Earth Pro allows us to use image overlays, network links, time animations, and other more advanced tools that are not found in My Maps.

Students will need to have the Google Earth Pro download on their computers to do this activity. The browser based Google Earth Web does not currently support the functionality that we require for mapping smoke in a dynamic fashion. Google Earth Pro is free. You may have to have your IT coordinator allow downloads to student computers. [The link for the download is here.](#) One benefit of using Google Earth Pro is that all student generated content is housed on the student's own computer, it is not posted to the web (Google Earth Pro accesses the base map imagery from the web, but does not upload the points, lines, polygons, etc. created by the students).

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Maps for BlueSky Daily Runs

If you cannot use Google Earth Pro, there are maps available on the [BlueSky Daily Runs website](#), but only for the current and previous days. You can use these maps to discuss concepts such as the use of models for forecasting. There is a good overview of smoke forecasting vs. weather forecasting, and [how the BlueSky model works click here](#)

[U.S. Forest Service BlueSky Daily Runs](#)

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