Geologic maps in a Google Fusion Table environment, a case study in New York

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Presented at: *Innovative Approaches to Teaching Sedimentary Geology, Geomorphology, and Paleontology*
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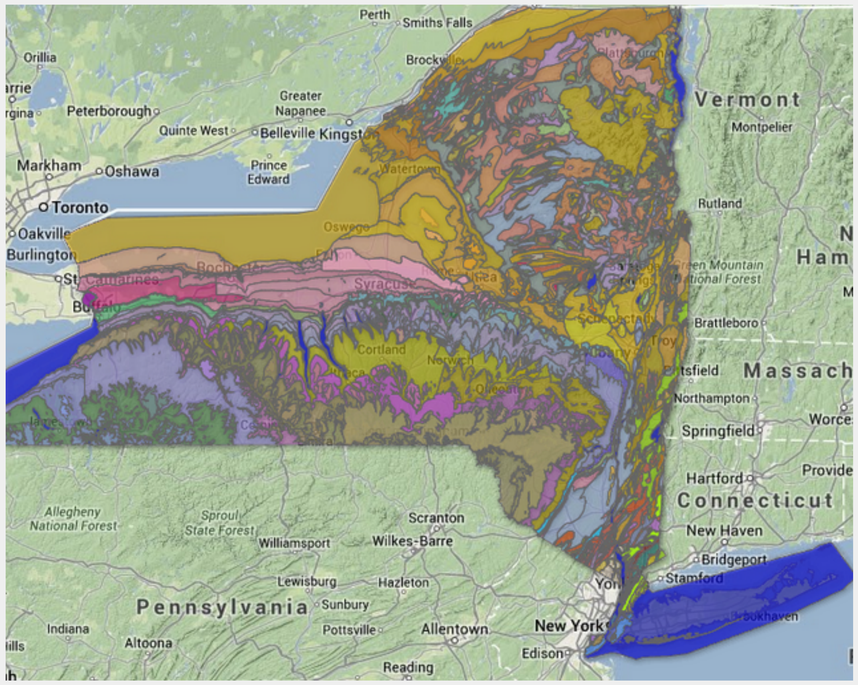
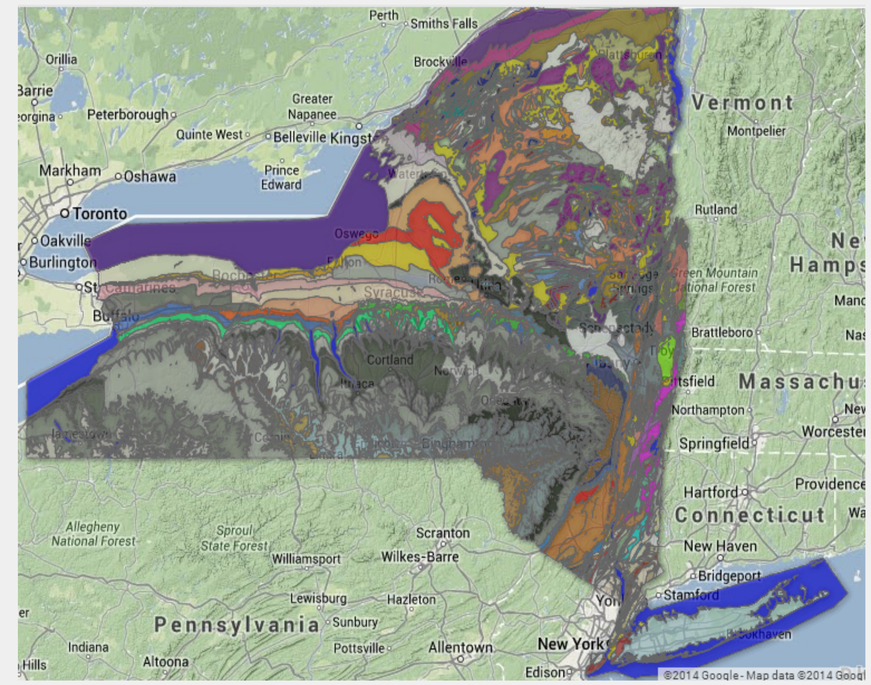
The goal of this project was to create, color, organize and share geologic maps in a Google Fusion Table. There are several advantages to using Google products. One, the data reside on Google servers; two, the Fusion Table app provides a means of organizing, analyzing and visualizing the data; and three, these resources make the geologic data easily accessible, shareable and free. Geologic data for New York State has been published by the New York State Museum, both in printed maps and in GIS format. While this data is available to the public, there has not been an easy way to visualize and analyze the data. We present here the steps required to move geologic data from the native format (shapefile) into the Fusion Table, and then offer suggestions on the use of the database functionality in the app.See the handout for the steps...

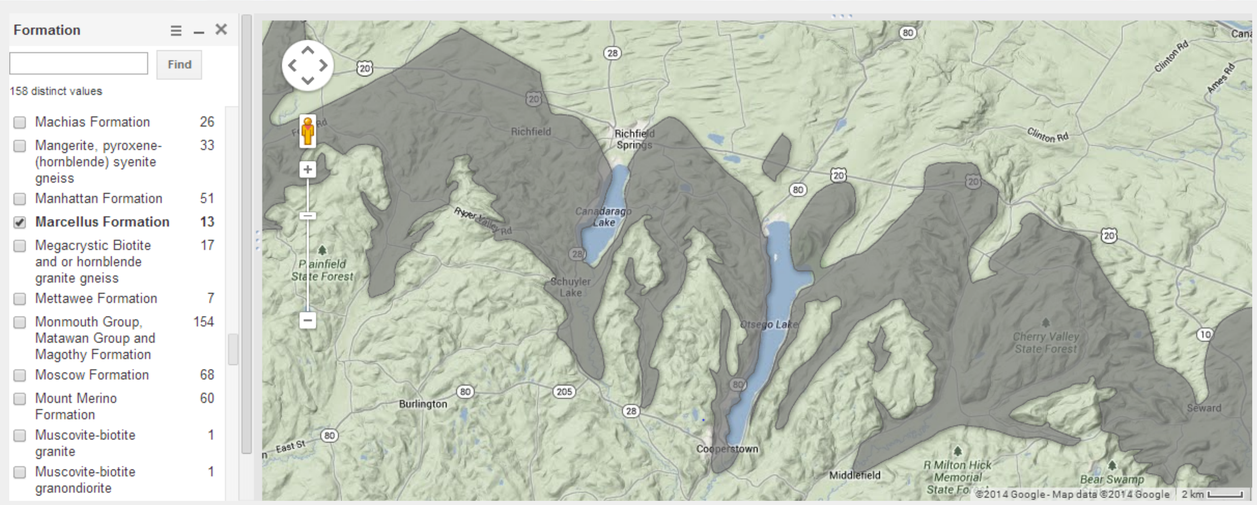


Bedrock Geology Map of NYS, with colors matched to published NYSGS maps

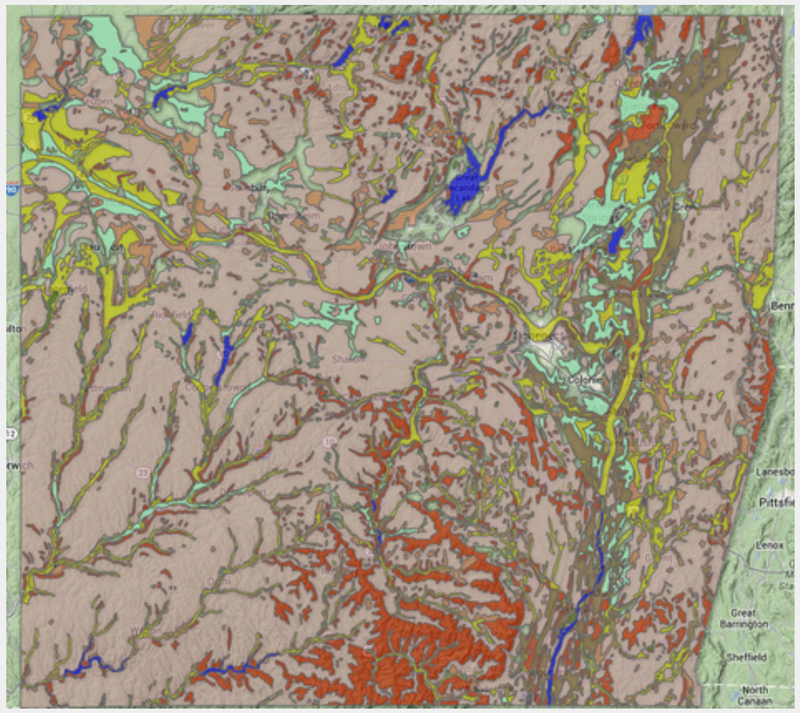
See Catskill Headwaters Research web site: http://www.oneonta.edu/academics/chresi/Water%20Well%20Data.html



Bedrock Geology Map of NYS, with colors designated to specific rock types

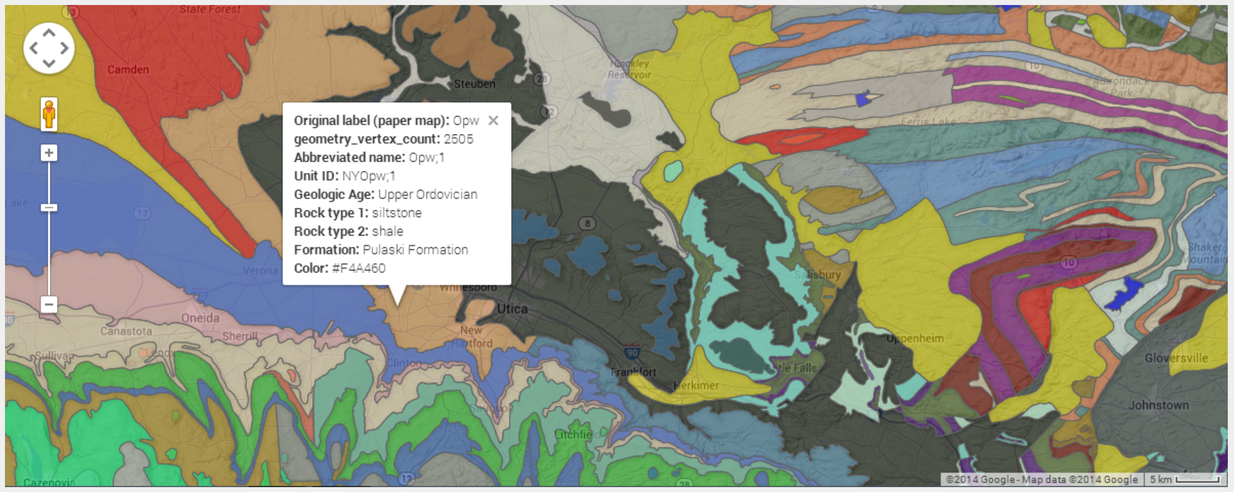


The Filtering Feature allows users to search for specific area types based on any of the loaded characteristics. For example, the map to the left is filtered on the Marcellus Shale formation, to show where this bedrock feature is visible at the surface.



Surficial Geology of the Hudson Mohawk sheet, with colors matched to published NYSGS maps

The interactive Google Fusion maps have customizable dialogue boxes that display information when a polygon is clicked. This eliminates the need for map legends, and any of the loaded data in the spreadsheet can be included or excluded from the display window.



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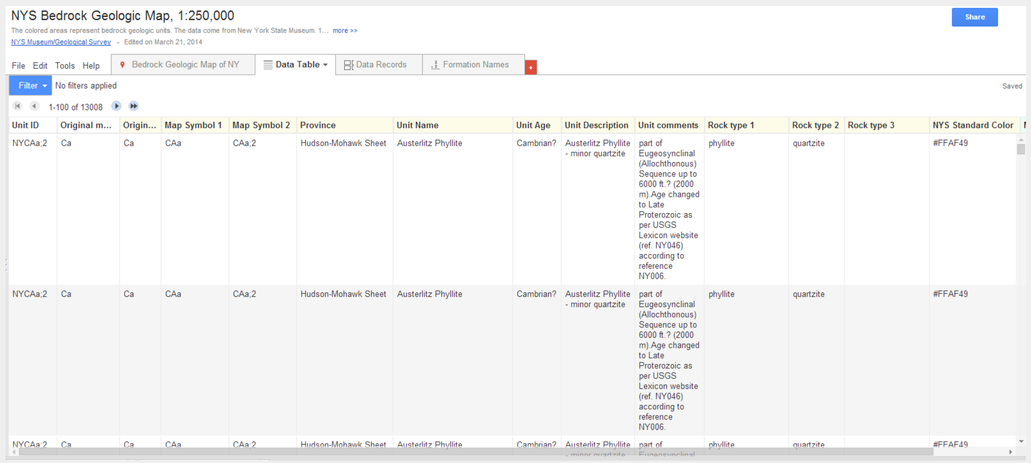
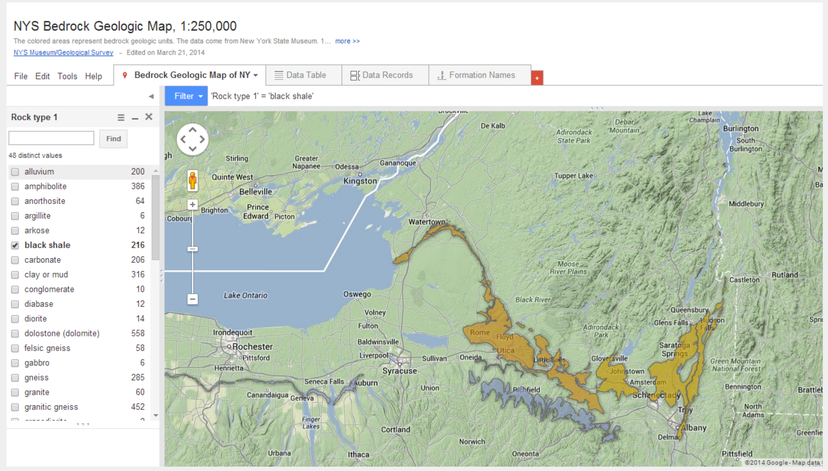
What is a Fusion Table?

- It starts as spreadsheet (columns of attributes; rows of data locations)
- The data can be points, lines, or areas
- The attributes can be numbers or text, including links to online data such as photographs
- At least one column must have latitude/longitude coordinates for the data, in decimal degrees and with longitude as negative (if west of Greenwich, England, or east of 180)



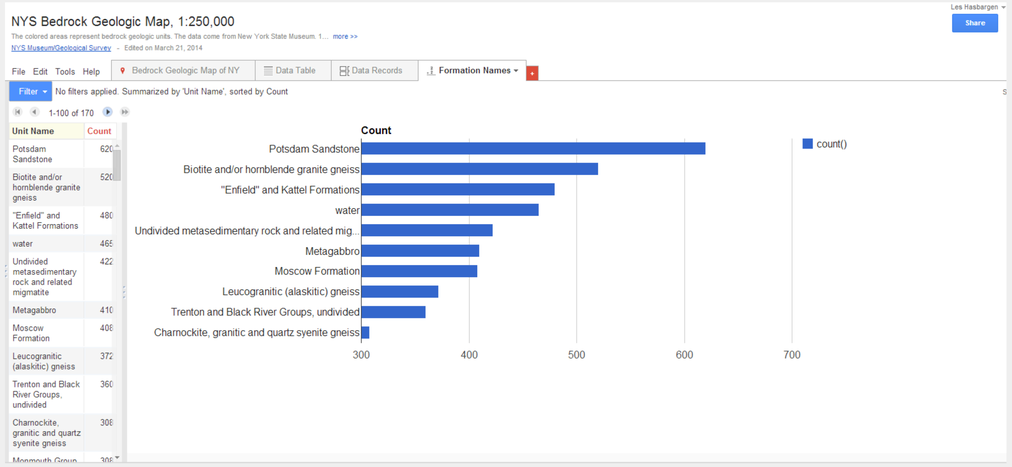
What can I do with the Fusion Table?

- Each tab shows the data is various views: as a table; as a single data entry with attributes; and as a map
- You can rename and re-order the tabs (click the name, then click the small triangle menu list for options)
- You can change the map background (aerial image, Google map, shaded relief)
- On any tab, you can filter the table by any column (numeric range, or feature type)



How do I create the Fusion Table?

- If you have simple point locations, create a spreadsheet with lat/lon, point identifier, data type, attributes (strike-dip measurement; rock description; fault zone; etc), photo links, and the like
- Save your spreadsheet as a comma separated file
- In Google Drive, select Create…Fusion Table/Select File
  - You will need to have the Fusion Table app enabled for your account (and yes, you will need a personal gmail account with Google)
- Select the comma separated value file
- If the latitude and longitude are correctly recognized and entered in the file, you should see the Fusion Table with several tabs and menu items
- For the process of creating a geologic map from a shapefile, see the following online document: https://docs.google.com/document/d/1HUJlQ2swEK5cxeT28Jw6GauyehFtFUcQOPcs4ae70xQ/edit?usp=sharing



What are the most common polygons in my geologic map?

- You can create new views of the data by clicking the "red + sign" at the end of the tabs in the Fusion Table
- Select Summarize...then Add Summary (note that you can add maps, and charts (especially useful with time series or quantitative data), and select the column you would like to summarize (count how many of each type in the column). You can order the results by clicking the "Count" column. This has been done for unit names above, and you can see which formation has the most polygons.
- You can also run sequential filters to narrow down your search by age and type, for instance