In this talk we present an update on the status of a project which is putting field trip data from New York State Geological Association   (NYSGA) Guidebooks into a format which is accessible in Google Earth and other apps with geospatial capabilities. As portable devices such as iPhones and iPads have become available, it has become apparent that modifying our results to permit them to be used where web access is not available would make them more useful, particularly for those using them in the field.

We will review our work to date, show how it can be accessed by anyone using the web, and then describe how a subset of the data is now available as a FileMaker database, which can be viewed, used and edited with the free IOS app, FileMaker Go.

Initially intended to be presented as a Powerpoint® Presentation, this talk was modified to permit a real time demonstration of FileMaker Go. To accomplish this we gave the presentation directly from an iPad Mini, using the interactive whiteboard app, Doceri.   This document consists of screenshots from the iPad, interspersed with text describing what the images are intended to portray.
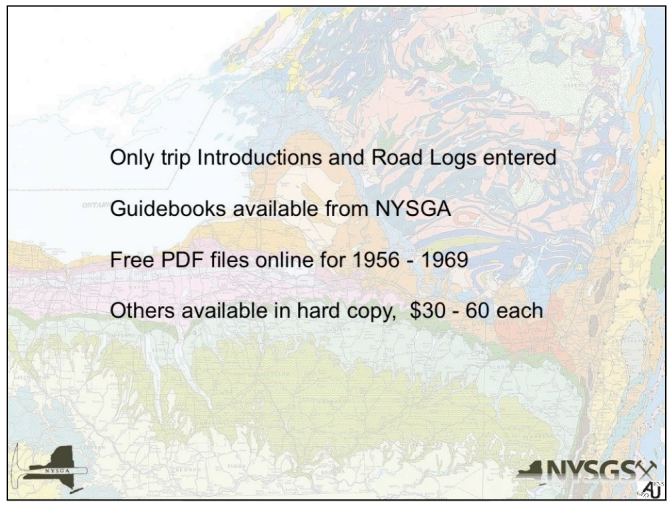

The NYSGA has been hosting field conferences and printing Guidebooks since 1928. Those held since 1956 continue to have considerable relevance to geology. The NYSGA started here in converting the paper copies into pdf files, so we also started there with our translation efforts.   It is often enlightening to see how interpretations of specific outcrops and road-cuts have changed over the years.

Although the papers presented in these Guidebooks have undergone some level of peer review, it is unlikely that all such reviews have been as rigorous as might occur in more formal publications.

Similarly, because size limits are not as restrictive, these Guidebooks often contain much more thorough descriptions of rocks and their interpretations than is customary in more formal publications.

Academic libraries and Geology Departments in the northeastern part of the U.S. typically have copies of these Guidebooks, but elsewhere in the world they can be hard to find. By making available the Introductions and Road Logs for the field trips, we hope to give people everywhere an idea of what they contain. They can then purchase those Guidebooks of interest.

Only trip Introductions and Road Logs entered

Guidebooks available from NYSGA

Free PDF files online for 1956 - 1969

Others available in hard copy, $30 - 60 each

The Road Logs list the various Stops which the Field Trip Leader found of sufficient interest, and with sufficient access, to visit, leave the vehicles, collect specimens, etc. In addition they often contain what we call "Views" where features of interest to the participants are pointed out, but no stop is made.

Even with a library containing all of the Guidebooks, however, finding which Field Trip visited a particular locality can be a daunting experience. Our project facilitates this by putting geospatial data on each Stop or View and then displaying these on a map.

Similarly, those seeking stops where a particularly feature is displayed, or a certain fossil has been collected, can search the database and export files containing only those locations. These files, too, can be viewed on a map.

Year	Host Institution	Location	Pages	Price	Year	Host Institution	Location	Pages	Price
1956	University of Rochester	Rochester	121	Free pdf	1985	Skidmore College	Saratoga Springs	268	$25.00
1957	NY State Museum	Wellsville	66	Free pdf	1986	Cornell University	Ithaca	279	$30.00
1958	City College of CUNY	Peekskill	51	Free pdf	1987	SUNY New Paltz	Kingston	350	$30.00
1959	Cornell University	Ithaca	136	Free pdf	1988	SUNY Plattsburgh	Plattsburgh	278	$30.00
1960	Hamilton College	Clinton	61	Free pdf	1989	OCCC	Middletown	302	$30.00
1961	R.P.I.	Troy	96	Free pdf	1990	SUNY Fredonia	Fredonia	437	$30.00
1962	Brooklyn College	Port Jervis	90	Free pdf	1991	SUNY Oneonta	Oneonta	488	$30.00
1963	SUNY Binghamton	Binghamton	116	Free pdf	1992	Colgate (2 Volumes)	Hamilton	258	$30.00
1964	Syracuse University	Syracuse	126	Free pdf			Saranac Lake	75	
1965	Union College	Schenectady	111	Free pdf	1993	St. Lawrence Univ.	Canton	271	$30.00
1966	SUNY Buffalo	Niagara Falls	116	Free pdf	1994	University of Rochester	Rochester	590	$30.00
1967	SUNY New Paltz	Newburgh	128	Free pdf	1995	Union College	Schenectady	425	$30.00
1968	Queens Coll. CUNY	Flushing	260	Free pdf	1996	College of Staten Island/CUNY	Staten Island	178	$25.00
1969	SUNY Plattsburgh	Plattsburgh	183	Free pdf	1997	Hamilton College	Clinton	264	$25.00
1970	SUNY Cortland	Cortland	139	$25.00	1998	SUNY Binghamton	Binghamton	135	$25.00
1971	SUNY Potsdam	Potsdam	150	$25.00	1999	SUNY Fredonia	Fredonia	412	$30.00
1972	Colgate; Utica College	Utica	222	$25.00	2000	Hobart & William Smith Colleges	Geneva	178	$25.00
1973	SUNY Brockport	Rochester	177	$25.00	2001	LDEO/ Columbia University	Lower Hudson Valley	204	$25.00
1974	SUNY Fredonia	Fredonia	187	$25.00	2002	Colgate University	Lake George	375	$30.00
1975	Hofstra University	Hempstead	327	$30.00	2003	SUNY Oneonta & Hartwick College	Oneonta	292	$30.00
1976	Vassar College	Poughkeepsie	297	$30.00	2004	SUNY Potsdam	Potsdam	283	$30.00
1977	SUNY Oneonta	Oneonta	455	$30.00	2005	SUNY Oswego	Oswego	125	$30.00
1978	Syracuse University	Syracuse	385	$30.00	2006	SUNY University at Buffalo	Buffalo	478	$30.00
1979	R.P.I.	Troy	457	$30.00	2007	SUNYCortland	Cortland	187	$30.00
1980	Rutgers at Newark	Newark, NJ	400	$30.00	2008	Colgate University	Lake George	154	$30.00
1981	SUNY Binghamton	Binghamton	282	$30.00	2009	SUNY New Paltz	New Paltz	254	$60.00
1982	SUNY at Buffalo	Amherst	385	$30.00	2010	College of Staten Island/CUNY	Staten Island	190	$60.00
1983	SUNY Potsdam	Potsdam	103	$20.00	2011	Syracuse University and CNYPG	Syracuse		$60.00
1984	Hamilton College	Clinton	352	$30.00	2012	Hamilton College	Clinton		$60.00

28 Guidebooks: 185 Field Trips with 1,434 Stops and 2,452 Views

To order guidebooks, visit:
http://www.nysga.net/Guidebooks.html

As of December, 2012, we have translated 28 Guidebooks (those highlighted in yellow in the figure to the left). These contain 185 Field Trips with 1,434 Stops and 2,452 Views. It is not unreasonable to expect another dozen or so to get done in the next year, which should fill in the gaps up to1994. There is some discussion within the NYSGA of providing additional free pdf files, perhaps through the 1970's, so this might be just in time. An initiative begun by Bill Kelly, when he was the State Geologist of New York, aimed to identify those sites of particular significance to geology to ensure that they were not unwittingly damaged or destroyed by state operations. For a while this was in the public domain, but eventually the New York State Geological Survey decided to keep it as an in house document. Most of those sites are visited by NYSGA Field Trips.

As initially imagined, the database was to be used by Google Earth. That software permits users to move Placemarks from one folder to another, and then to download the folder as a kml or kmz file. Hence it allowed folks to put together their own field trips. Searching, however, was limited - one could only search for terms in the Name field of a Placemark. Google Earth still provides the best platform on which to view our data. Often the "Time Slider" can be adjusted to find imagery taken under different conditions of foliage cover, water levels, lighting, etc., which may reveal features hidden in other views.

We use Google Earth's organization: Placemarks from one Field Trip are given the same color and then put into a folder which is given the name of that Field Trip. These Field Trip folders are put into larger folders named with the year those Field Trips were led. The image on the next page illustrates this.
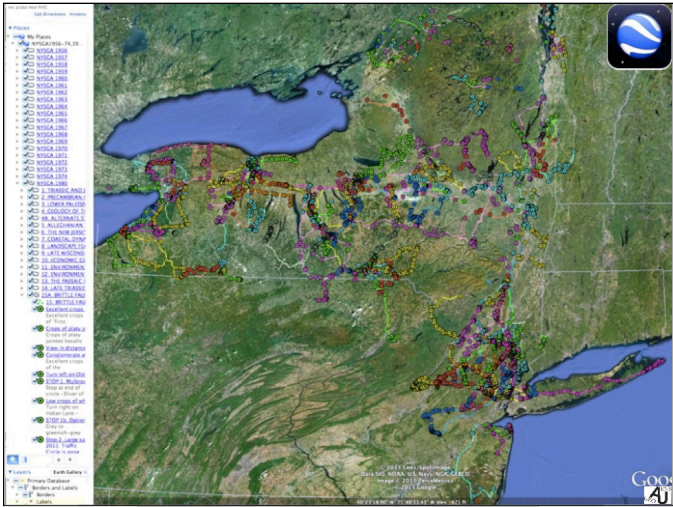
For those who participated in one of the Field Trips, this organization could prove beneficial. Photos taken in sequence, but perhaps with insufficient documentation, might be geotagged long after the trip was run, by moving along in order from one stop to the next and copying latitudes and longitudes from the Placemarks. To this end, the routes taken by Field Trips are also saved as Paths in the kml/kmz files. We have not yet imported these into any IOS apps other than Google Earth Mobile.

Descriptions of Stops and Views vary from terse to verbose. If a Road Log description simply refers the user to the text, a section from the text is usually inserted in its place. Otherwise the descriptions are copied with few edits. Obvious spelling errors might be corrected, and others might be introduced owing to the vagaries of Optical Character Recognition (OCR) software. Where highways have been re-routed or quarries have been closed and reclaimed, there might be some annotations. These are in blue text, and should have the date of the modification listed. Warnings and admonitions are highlighted in red text. These font variations, and others, are coded with HTML tags, which work well with Google Earth, but many of the IOS mapping apps show the tags, rather than interpreting them. Two conventions have been used to facilitate searches: Fossil names, italicized in the original, are set off by <i></i> tags, and fold generations use F tags. Many tables, particularly those showing stratigraphy, are included as HTML tables, although more complicated ones, such as those showing chemical compositions, may be absent.
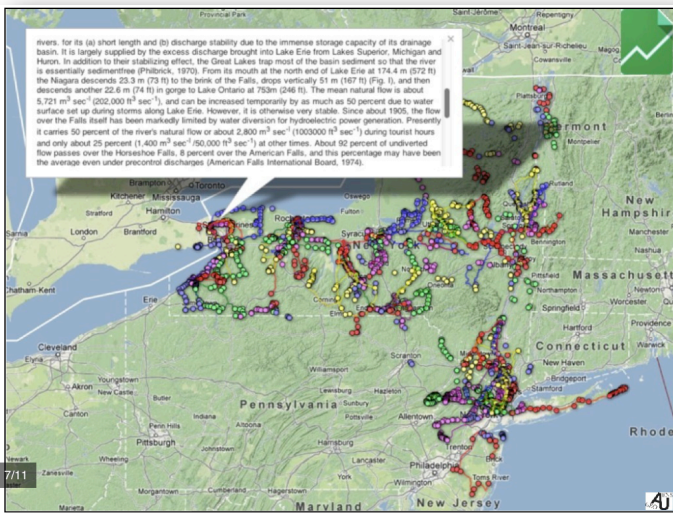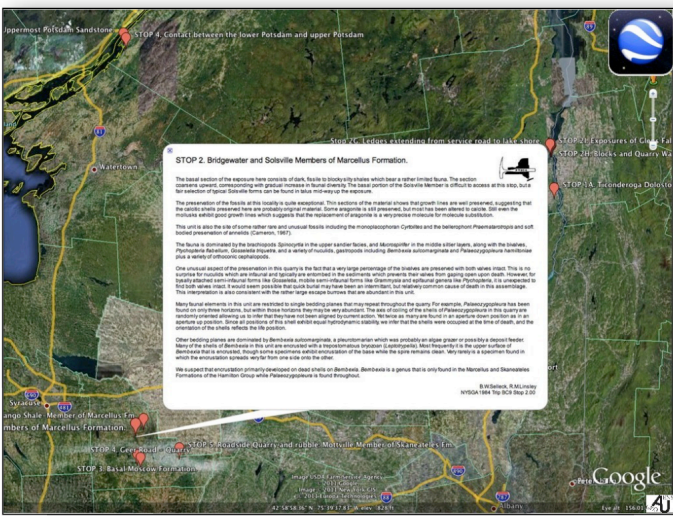
Participation in a Penrose conference on Google Earth, etc., in January, 2011, introduced us to Google Fusion Tables. We uploaded our kml/kmz files, as shown in the image to the left, and reported on this development at the Northeast GSA Conference in Pittsburgh in 2011. These provide the user with considerable search capabilities, the ability to download custom designed kml / kmz files, and an opportunity to upload images, data, etc. (So far no one has availed themselves of this opportunity, unfortunately.)

As the capabilities of Fusion Tables fit this project so

well, we will continue to deploy our data here for as long as Google continues to support this platform. The new Google Maps Engine may provide even better support, and a straightforward upgrade path, but this remains to be seen. It may also bring to a close the free access to Fusion Tables as we know them.

In any event, using Fusion Tables requires web access, and much of the region visited by NYSGA field trips has spotty or no cellphone coverage. As portable IOS platforms such as iPads and iPhones are now in common use, it seemed worth the effort to transform our data into a format which they could access. Filemaker has an app called Filemaker Go which is free and can open and modify data in databases produced with their desktop software. Much of our data works well with this software, although the path data does not. This path data consists of long lists of geographic coordinates, which cannot be accessed by most IOS apps other than Google Earth Mobile. (If some care is taken to construct an appropriate cache, Google Earth Mobile can be used without web access.) The rest of our data is point data, Stops and Views, and Filemaker Go is adept at dealing with these.

It was not difficult to input our data into a Filemaker database, and Filemaker Go can search it efficiently, producing "Found Sets" which meet a host of criteria. Fusion Tables has Filters, which act as "And" conditions to narrow down searches further and further, but Filemaker Go also permits a search to be expanded, using "Or" conditions. Exporting the found set in a format which can be used by other apps imposes some limitations. The largest text field which can be edited in IOS is about 64K. Because we accumulate data in a single field before exporting it as a kml file, we monitor its contents and export it when it starts to fill up.

As currently set up, the file can output the data either as: 1. A kml files for an Avenza app called PDF Maps, and 2. A csv files for another IOS app called PocketEarth. PDF Maps limits imports to 200 placemarks per map, PocketEarth has no such limits.
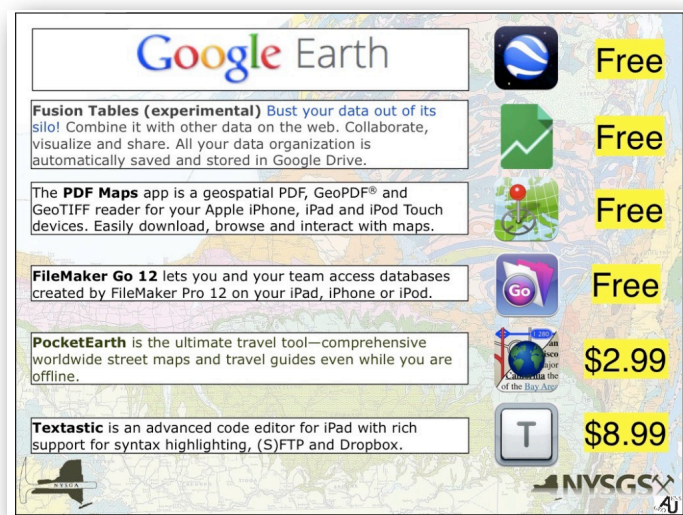
Other apps, with different import formats, are available and additional ones will surely appear over time. The techniques we use can probably be modified to accommodate these, using the desktop version of Filemaker to alter the file. Alternatively, as the output files are text files, they could be modified with IOS apps such as Textastic.

We use these two apps because they represent very different approaches to mapping on IOS devices. PDF Maps uses GeoPdfs, which are digital versions of already existing paper maps, or user made maps which have been given geospatial attributes. PocketEarth is an app which supports many of the IOS navigation aids (such as rotating the map view so that the direction you are heading is at the top) and uses the OpenStreetMap dataset. Furthermore, with web access, PocketMaps will determine routes from one point to another, and save these results for use when the web is not accessible.

To demonstrate a workflow, we start with an image from the search screen on Filemaker Go:

In this case "Baird" was typed into the Trip Leader field, and the button labeled Fossils was clicked. This inserts the text "<i>" into the Description field. As described above, this tag is used only when the species name of a fossil is given in the road log description. The Fold Generation button inserts "F<sub>" into the Description field, and the three Word Count shortcut buttons permit the user to limit the found set to small, medium or large descriptions. The "Only Stops" button keeps Views from cluttering up the found set.

Hitting Go results in a found set of 32 records.

From this screen you can:

1. Click on a stop to see its description

2. Click on the Pocket Earth button to output the found set as a csv file for Pocket Earth

3. Click on the KML button to output the found set as one or more kml files

4. Click on the Back button to go back to the earlier search screen

Here are screen shots showing the results of each of these actions.

The description is presented with all of its HTML formatting correctly rendered. It will scroll if longer than one page. Although the contents of the Description field are displayed on PDF Maps and Pocket Earth, they do not

render the HTML, and they display data in much smaller windows. Hence it is thought that the user will use this screen as the primary way to view this data.
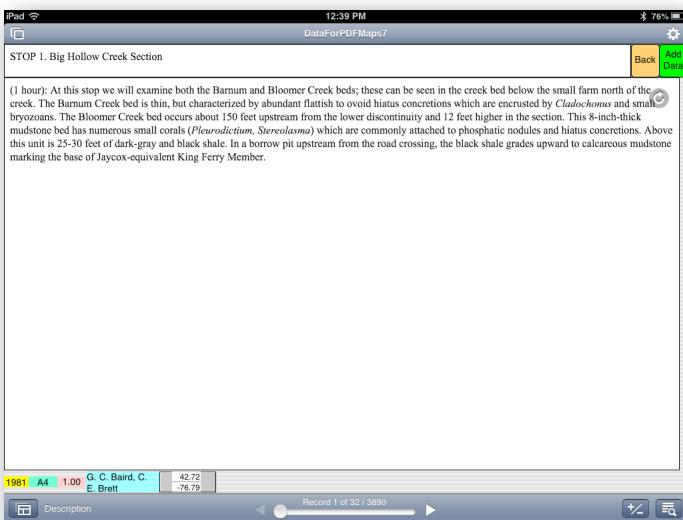
The orange button will take you back to the Found Set, and the green button will open up another page to permit you to take photographs of the stop and record your notes in an audio file.

It is my hope that with a convenient app some users will take it upon themselves to augment our database with photos and notes describing the current state of the outcrop, etc. To this end, the button called "Add Data" brings up a view with containers for photos and sound
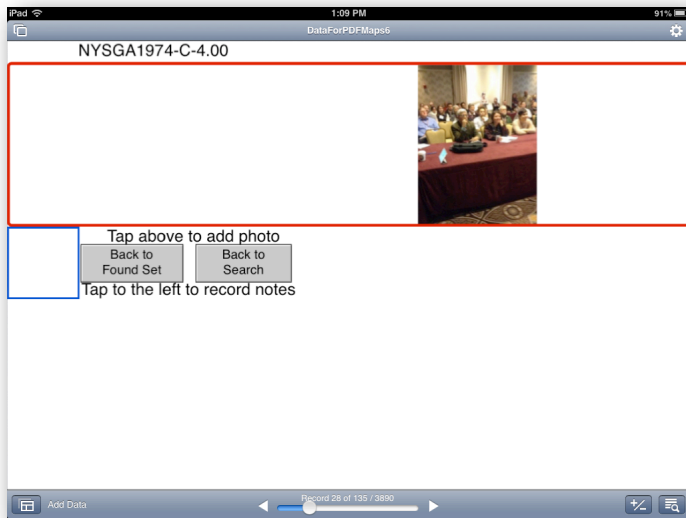
recordings. Once the back in range of WiFi, the user can convert this audio to text, and then upload the photo and text notes to the Fusion Table.

To emulate this during the live demo of Filemaker Go, I repeated the action of an earlier speaker and took a photo of the audience.

Although only a thumbnail is displayed on the page, the photo is saved at full 1024 x 768 resolution.
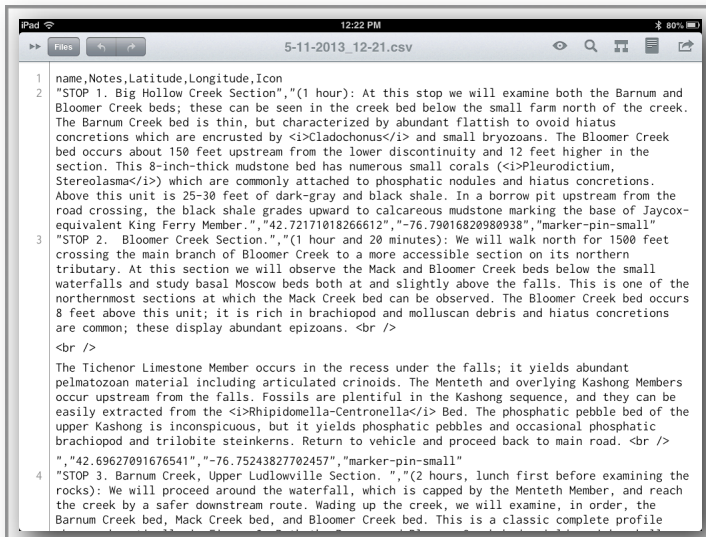

From the Found Set view, the Pocket Earth button will output a csv file with headers on the first line. Occasionally this will not be accepted by Pocket Earth because a scripted Export is not UTF-8. This is what Pocket Earth expects, and when special characters (such as ° or ü) occur in the Description or Name fields the results cannot be read. In such cases the user should export using Merge from the Filemaker Go app instead of using the button which calls a script. The output will then be UTF-8. If its extension is changed from .mer to .csv Pocket Earth will import it without a problem. The app Textastic does this easily. The makers of Pocket Earth have assured me that the next update will permit imports of .mer files, so this additional step should soon be unnecessary
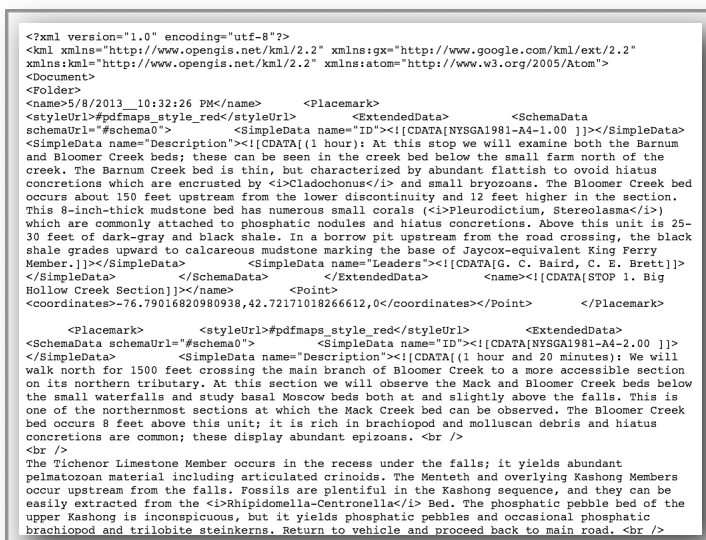
Another approach might be to replace the special characters with HTML entities. Usually, these are escaped with CDATA tags to make the text more easily read by humans in apps such as PDF Maps and Pocket Earth, so this approach was not chosen.


From the Found Set view, the KML button produces an output which is a little different from the default kml files produced by Google Earth: Some of the tags need to begin with "SimpleData," etc., if it is to be opened in PDF Maps. Google Earth and Google Earth Mobile can still open it.
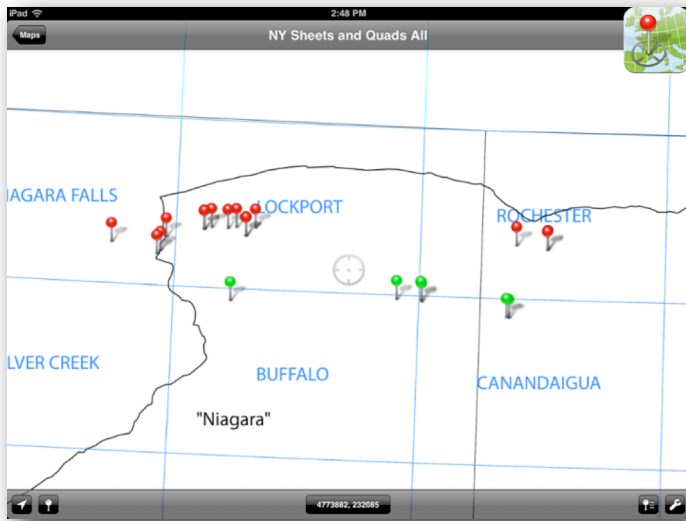
Importing data on PDF Maps: The PDF Maps app imports placemarks into pre-existing maps. In general the user will not know where the data exported from Filemaker Go is going to be, so importing it into an index map may be the most efficient approach. This one is available at the web site where you downloaded the pdf you are reading. It shows the 1 x 2 degree USGS sheets in blue. These can be downloaded for free as geo.pdf maps from the USGS warehouse. The NY State Geology map sheets are shown in black. The surficial maps corresponding to these sheets can be downloaded for free from http://ottohmuller.com/NYSurficialMaps/index.html.

The user can then load the appropriate map and import the placemarks into it:
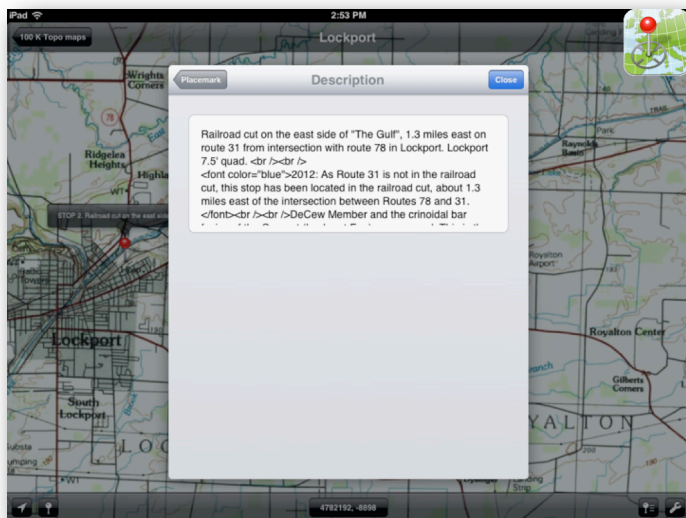
Here is an example showing a placemark on the Rochester 1 x 2 degree sheet. Clicking on the pin opens a dialog box, from which the Description field has been selected. Containing the same data as the Filemaker Go screen, the text is displayed as simple text, and is not formatted as HTML, although the tags are visible. Many users will find these topo sheets to be all they need to navigate to all of the Stops and Views of the database.
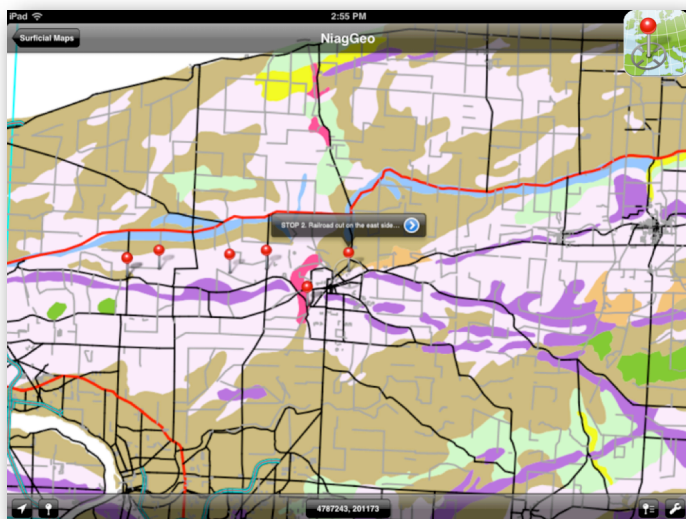

Additional geo.pdf maps might be useful to see the context as shown on Geology or Surficial Geology maps. Here is a screen shot of some stops shown on the Niagara Surficial Geology sheet. Programs such as Avenza's MAPublisher, or many of ESRI's applications can output geopdf maps, and these can be imported into PDF Maps easily and without modification.

At a larger scale, the 7.5 minute US Topo geopdfs available from the USGS can provide additional detail. These maps have digital contours and roads, aerial photos, names on many roads, and are revised every three years.

For some users and purposes, Pocket Earth might be a better choice:
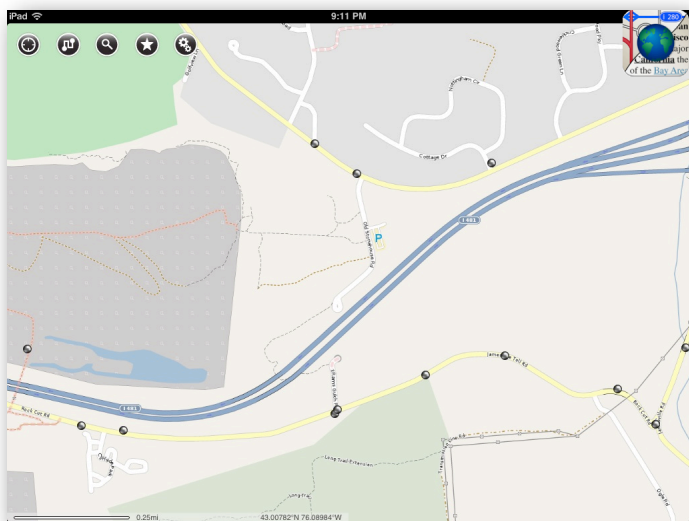
Here is the same region shown in the figure above, but with the Open Street Maps display of Pocket Earth. Zooming in reveals names on nearly every road, the maps are updated frequently by volunteers, and many conveniences afforded by the iPad platform are available.
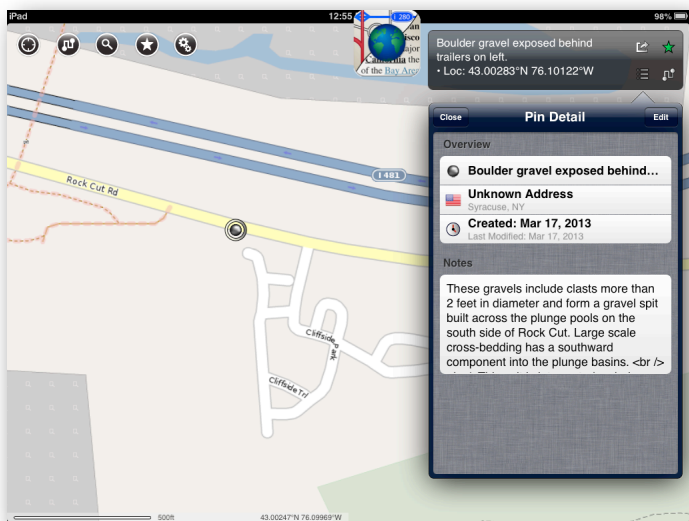

The image above was zoomed in for this one, and a placemark was selected. The Description field is displayed, once again showing the HTML tags rather than rendering the text with the format.

All of the apps used on the iPad also work well on the iPhone / iPod Touch. Here are screen shots showing the Find screen with and without the keyboard, and the Found Set screen. The reasons for the strange formatting of these screens on the iPad should now be apparent. Everything works the same on both platforms.
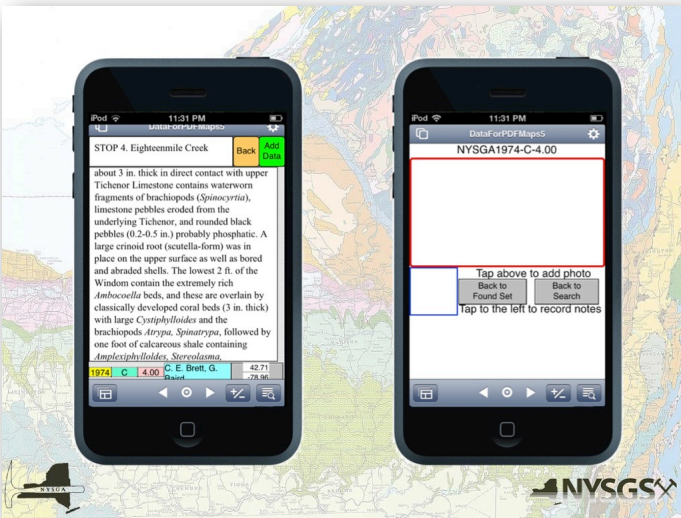
Here the Description field is displayed on the left, with HTML formatting rendered correctly. And, as before, the Add Data button opens a page which permits photos and audio to be added to the Stop or View. Of course any photos will be at the size and resolution of the camera built into the hardware.
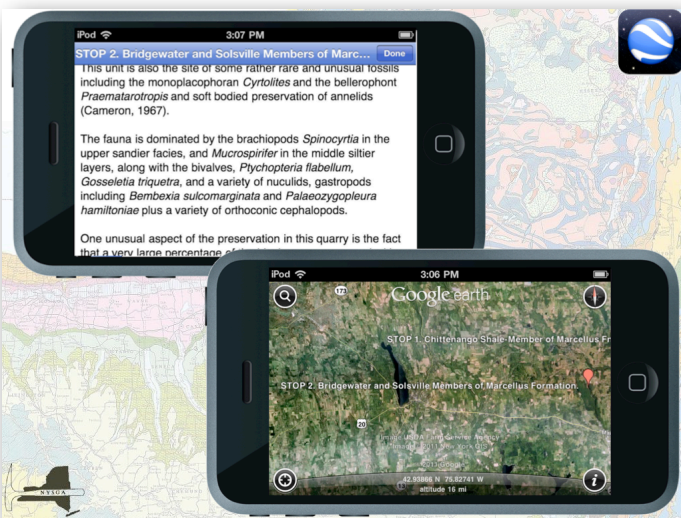
As before, Google Earth Mobile displays the Description field with HTML formatting rendered correctly. If web access is not available, the user should insure that adequate caches are saved to the device before venturing out into the field.
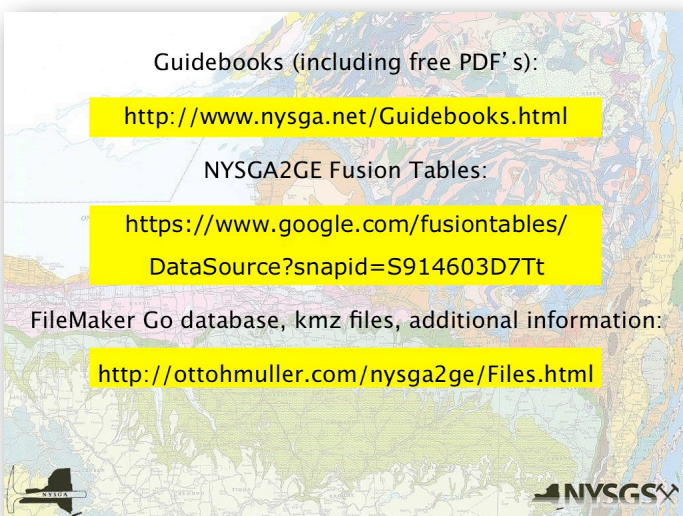
PDF Maps imports kml / kmz files as before, although much less of the map is visible on the smaller screen.

And Pocket Earth can import csv files.

Always a work in progress, current files are available on the web at the addresses shown in the figure below.

Guidebooks (including free PDF's):

http://www.nysga.net/Guidebooks.html

NYSGA2GE Fusion Tables:

https://www.google.com/fusiontables/
DataSource?snapid=S914603D7Tt

FileMaker Go database, kmz files, additional information:

http://ottohmuller.com/nysga2ge/Files.html

To go to them from this document, click on these links:

http://www.nysga.net/Guidebooks.html

https://www.google.com/fusiontables/DataSource?snapid=S914603D7Tt

http://ottohmuller.com/nysga2ge/Files.html