

# GeoFieldBook LAFAYETTE COLLEGE Department of Geology

and Environmental Geosciences

sites.lafayette.edu/geofieldbook geofieldbook@lafayette.edu ©2012

# Acknowledgements

This App was made possible because of the efforts of several different people:

Dr. Chun Wai Liew, Department of Computer Science,

Andy Ho, Kumera Bekele, CS students

David Sunderlin, Department of Geology and Environmental Geosciences

Lawrence L. Malinconico, Department of Geology and Environmental Geosciences

All at: Lafayette College, Easton, PA 18042

# GeoFieldBook

## Description

GeoFieldBook is designed for use in structural geology field projects as a complement or replacement for the traditional paper geology field notebook. The App integrates the iPad's GPS, camera, and data management capabilities to allow geologists to record structural and formation information, automatically log geo-location data, link images to each record, input pre-defined formation names for different locations, and then export the field notes to formatted .csv files for easy integration into digital mapping and analysis applications.

Record types currently supported

- Bedding
- Contacts
- Faults
- Joints
- Other (generic entries)

### The Main Windows

The App is divided into two working areas.

- A. Opening screen (fig. 1)
  - a. The left window displays the list of Projects.
  - b. From this screen, the user can manage their Projects and Formations
- B. Main screen (fig. 2)
  - a. The left window displays the list of Records within a given Project.
  - b. The right window will display the information for a record selected in the Project records list (left window).
  - c. From this screen the user can add a record, edit individual records, edit the list of records within the selected Project and export the Project (all records) for use in other programs.



Figure 1



Figure 2

The various options will be described in the following sections.

## **Creating and Managing Your Project Folders – from the Opening Screen**

#### Adding a Folder

- From the startup screen (fig. 3), click the + button (red circle) that is top right in the *Projects* window.
- In the subsequent popup window, type in the name of the new field project and click Add.
- The new folder will show up in the *Projects* window.

#### **Deleting Folders**

- Click the *Edit* button (blue circle) that is on the top left of the *Projects* window.
- The red circle will appear to the left of the folders.
- Click on the Red Circle (fig. 4) and the Delete option will appear to the right of the folder name.
  - Click the delete button to remove the project folder. Note this is undoable.



a Verizon 🗢		15:27	75%
Projects	÷		TSI .
🗢 Sın Ysidro			
astern Pennsylvania			
😑 Big Horn Basin			
		GeoFieldBook	
Formations		LAFAYETTE COLLEGE Department of Geology	
F'		1	

Figure 4

Managing the Formation Lists

#### Add a Formations List

- From the startup screen, click the *Formations* button (green circle, fig 3) that is in the bottom right of the *Projects* window.
- A *Manage Formations* popup window will appear (fig. 5).



Figure 5

- Click the *Edit Locations* button then click the *Add Folder* option.
  - A popup window will prompt you to give the new formation list (folder) a name. When that is complete click Add.
- You will notice that on this screen you also have the option of deleting or rearranging the order of formations in this list. Please note that you cannot delete a Formations list if it is the active one. To delete a Location folder, select any other folder in the list before selecting the *Edit* option.

Add formation names to a formations folder

- From the *Manage Formations* popup window (fig. 6), select the folder to which you wish to add formation names. The formation list at the right will be empty if this is a newly created folder. When you click the Edit Formations button an +Add Formation option will appear.
  - Click this option, add the formation name and click Add.



Figure 6

- Do this for all the formations that you wish to enter for this field area and click Done.
- If the list is long, you may have to scroll the list to get to the +Add Formation at the bottom

#### Import a Formation List

Formations lists can be saved on a computer for ease of entry and long-term use. The formation lists need to be created and saved as a .csv (comma separated values) file.

- 1. A spreadsheet program works well for this. The file must have the following format:
  - First column: folder name (location) for stored formations list
  - Subsequent columns contain formation names. The first formations will end up at the top of the scroll wheel list in the GeoFieldBook App.
  - Save as a .csv file using the name "formations".

You can save multiple locations in a single .csv file. Each line in the .csv file is a different set f formation names.

										, .				
0	00						formations.csv						0	
0		🖻 🖒 🛷		∑ • A <sub>11</sub>		150% - 🕜								
														- 10 M
Net	w Open Save Print Import	Copy Paste Forma	it Undo Redo Au	itoSum Sort A-Z Sor	t Z-A   Gallery Toolb	ox Zoom Help								
		D . T . TT	= = hull a	oz . (=.00		A - A -								
Ve	rdana 👘 10 👘	$B I \subseteq \equiv$	= =  A9  \$	% 3 .00 ₽										
	Sheets Charts SmartArt Graphics WordArt													
<	> A	B	C	D	E	F	G	Н	1	J	K	L	M	
1	Big Horn Basin	Cody	Frontier	Shell Creek	Thermopolis	Sykes Mounta	i Morrison	Sundance	Gypsum Sprin	Chugwater	Dinwoody	Phosphoria		
2	San Ysidro	Mancos	Dakota	Morrison	Summerville	Todilto	Chinle							
3	Eastern PA	Schoharie	Oriskany	Rondout	Bloomsburg	Shawangunk	Martinsburg	Jacksonburg	Beekmantown	Allentown	Leithsville	Hardyston		
4														
5														- 1

A sample file is shown in fig. 7.

Figure 7

- 2. To load the formations file into the GeoFieldBook App:
  - a. Open iTunes with your iPad connected.
  - b. In iTunes select the iPad from the list on the left.
  - c. Go to the Apps option at the top of the iTunes window
  - d. Scroll down to File Sharing at the bottom of the window and select the GeoFieldBook App (fig. 8).
  - e. Drag and drop the formations.csv file into the File Sharing window. You can also use the Add button to select the formations.csv file.



- f. Return to the GeoFieldBook App on the iPad while still hooked up to iTunes
- q. Select the *Formations* button from the main screen
- h. Select the Import Formations button...when done you should get a message stating that the import was successfully completed.
- 3. To delete a formations file:
  - a. Open iTunes.
  - b. Select the formations.csv file so it is highlighted.
  - c. On the keyboard, hit *delete*. This removes the file only from iTunes. The formation sets remain in the GeoFieldBook App until you delete them from within the program. You can add more formation sets by following the procedure in step 2 above. They are simply added to the lists within the application.

Creating and Managing Your Field Observations

From the main screen, create or select a project folder. When you do this, the left window will open with the project name in the top middle of the left window.

- To create a data record, click the Add Record button at the bottom right of the left window (fig. 9).
- A scroll-wheel window will then open asking you to select the type of record that you want to create. Scroll to your selection and then tap the Add button at the lower right of the scroll-wheel window to open up a new field observation window.







Figure 10

Creating a Field Record

Once you have an observation type, the main data entry window will appear. This window will be slightly different for each observation type. We will use the "Contact" type as an example.

Note\*\*\* Before you start to enter data, make sure that the appropriate formation list is being used (bottom middle of the left window – figs. 10 and 11). If it is not correct, simple click on the formation list and a scroll wheel will appear giving you the option to change the formation list.

Projects Test Project 1 Edit	14:39	100% 🕿 Done
Contact	$\bigcirc$	Contact
Latitude: Longitude:		Name: Name
	Browse Take Photo	Longitude: Longitude Date: Date Time: Time Acquire Data
	Strike: Strike Dip: Dip	Dip Direction: Dip Direction
	Upper Formation:	Lower Formation:
Add Record San Ysidro Export	Field Observation:	

The main data entry window (data fields are empty) is shown in figure 11.

Figure 11

Elements of the data window:

- A. <u>Name Field</u> (red outline in fig. 11): Tapping in this field will bring up the keyboard and you can type in your observation name/number. When you are done, the keyboard can be hidden by tapping the keyboard symbol on the bottom right of the keyboard.
- B. <u>Location Field</u> (dark blue outline in fig. 11): When you tap the *Acquire Data* button, the current date and time will automatically populate the Date and Time fields and your location in decimal degrees will populate the Latitude and Longitude fields. The location information will be determined after a 10 second interval in order to allow the internal GPS to stabilize.

- C. <u>Attitude Information Fields (green outline in fig. 11)</u>: The attitude information fields are entered using scroll wheels. The application does not automatically acquire Strike and Dip information so these will need to be measured using a Brunton compass or other device and then entered into these fields. If the user elects to use the right-hand rule for strike and dip, the dip direction field need not be completed.
- D. <u>Formation Field(s)</u> (yellow outline in fig. 11): The formation fields are entered using scroll wheels as well. The contact observation will have two fields upper and lower formation, while all the others will only have a single formation field. Your options will be determined by the formation names listed under the Location set you have selected and the formation list that is associated with it.

If you have to add formations you can do so by returning to the Manage Formations page and using the *Add Formation* button at the bottom of the formations list.

(Note\*\*\*; There currently is a glitch that occasionally occurs when you add a formation name to a location set. When you return to the data entry screen and try to enter a formation, the scroll wheel may be completely empty. There are two ways around this:

- Simply save the observation you are working on using the *Done* button (upper right of the observation window). Choose a different *Location* set (bottom-middle button on the left *Projects* window) and then do it again and reselect the *Location set* that you want to use.
- If you have only one *Location set* you may have to completely quit the application and then return to it for any added formations to show up.
- We are working to fix this.
- E. <u>Field Observation Field</u> (maroon outline in fig. 11): You can use this field to enter any additional information that you want to record. When you tap in the field, the keyboard will appear. When you are done, once again, use the keyboard symbol on the bottom right of the keyboard to make it disappear.
- F. <u>Take Photo Field</u> (light blue outline in fig. 11): You can take a picture of the field observation using the iPad camera. Simply tap the *Take Photo* button. The camera will appear use it to take a picture. If you like what you have taken, click *Use*. If not, click *Retake* and take the picture again, then click *Use*. You will be returned to the field observation page with the picture populating the space above the *Browse* and *Take Photo* buttons. If you have a previously acquired picture, you can use the *Browse* button to peruse your iPad's photo album and select a picture to use.

Note\*\*\*; The picture you take from within the GeoFieldBook App is saved to your iPad's photo album. When you export the data file (see below), a copy of the picture is exported along with the data, but the original picture always remains in your iPad's photo album. The *Projects* window with several observations entered will look like the page shown in fig. 12:



Figure 12

All saved observations are shown in the *Projects* window on the left. They are ordered by time of acquisition with the most recent on the bottom of the list. Note that there may be more records than can show in the window at any one time. You can access them by simply scrolling through the list.

#### Editing Existing Records

Existing records can be edited (not a suggested practice – but possible) by simply selecting the desired record from the list on the left and then pressing the *Edit* button at the top right of the observation window (right window). Remember to press the **Done** button (top right of the observation window when it the *Edit* mode) when you have completed your edits. All fields can be edited, including the photo. However, a better practice would be to add a new record with the revised information or to make a note of what you think should be changed in the Field Observation text box.

#### Exporting Data Files

The data files created in GeoFieldBook can be exported to a .csv file for use in other programs like Excel or Google Earth.

- 1. From the opening page, select the project folder that you want to export.
- Tap the Export button (purple outline in figs. 11 and 13 – bottom right of the List Window)
- 3. This creates a file with the same name as the project folder. When it has been created you will get a message that the data have been successfully exported.



Figure 13

Note\*\*\* You will have to follow the same procedure for each project folder that you would like to export.

**Retrieving Data Files** 

Currently the only way to access the exported data file is through iTunes.

- 1. Plug the iPad into your computer.
  - a. Open iTunes with your iPad connected.
  - b. In iTunes select the iPad from the list on the left.
  - c. Go to the Apps option at the top of the iTunes window
  - d. Scroll down to File Sharing at the bottom of the window and select the GeoFieldBook App. (fig. 14).
  - e. In the window on the right the exported data will show up as a folder with the exported project as the folder name.
  - f. Simply drag this folder to your desktop. This will place a copy of the folder on your computer.





- 2. Data
  - a. Inside the folder you will find a .csv file also named after the project (fig. 15).
  - b. There will also be a folder which contains all of the images linked to



Figure 15

each record that you saved with an image.

c. The data file can be opened in a spreadsheet program and will have the following format (fig. 16):

🐔 I	Excel Fi	le Ed	it Vi	iew Ir	nsert F	ormat	Tools	Data	Window	Help 🐓			M 2 🍪	୭ ଏ	0 0		•	<b>(</b> 3	:01) Th	u 1:44 I	M Q
Verdan	a 🔻	10 *	В	I ∐			A0 \$	%	00, 0, <b>⇔</b> 0, <b>⇔</b> 00,	🐖 🐖 🖽 * 👲	• <u>A</u> •						-		00	O Form	atting Pale
0	0								2	an Ysidro.csv								$\bigcirc$		o fx	
0	a 🗆 4		R		12	Ma . 6	M -	- 7	A. Z.		759/ -	0							▼ Fon	t	
			4					<u></u>	ZO AO		73/0	•							Name	Verdana	i .
New Op	ben Save Pr	int impo	rt Cop	by Paste	Format	Undo Re	She	ets	Charts	-A Gallery Toolbox SmartArt Graphics	Zoom	ordArt	_	_	_	_	_	_	Size:	10 *	0
	A B		c I	D	E	E	G	Н			K	L	M	N	0	P	-	0	D	I IT	
1 Name	Type	Longi	tude L	atitude	Date	Time	Strike	Dip	Dip Direction	Observations	Formation	Lower Formation	Upper Formation	Trend	Plunge	Image file	name	-	D	$I \supseteq $	
2 SY1	Bedding	-106	.84787	35.50665	5/8/12	12:32:03		215	36 SW	77? Morrison 77? Lots of sandy	Morrison					San Ysidro	SY1.jpg	1			
3 SY2	Other	-106	.84598	35.50778	5/8/12	2 12:42:38	(null)	(null)		Simply a picture looking north	into core of t	ne anticline				San Ysidro	SY2.jpg		A <sup>2</sup>	A a	
4 SY3	Other	-106	.84266	35.5039	5/8/12	2 12:59:34	(null)	(null)		Looking into south end of the	core of the an	ticline.				San Ysidro	SY3.jpg				
5 SY4	Other	-106	.84267	35.50373	5/8/12	2 13:03:06	i (null)	(null)		Picture lookin SW at fracture s	et in Tedilto fi	n				San Ysidro	SY4.jpg		- Alue	nhor	
6 SY5	Other	-106	.84119	35.5025	5/8/12	2 13:22:23	(null)	(null)		Looking N along the axis of the	e anticline					San Ysidro	SYS.jpg		V NUI	ilber	
7 SY6	Contact	-106	.84275	35.50308	5/8/12	2 13:31:07	(null)	(null)	SW	No S&D		Todilto	Summerville			San Ysidro	SY6.jpg				
8 SY7	Contact	-106	84285	35.50331	5/8/12	2 13:36:08		312	65 SW	Picture looking NNW along the	contact	Summerville	Morrison			San Ysidro	SY7.jpg		Forma	t: Gener	ai 👘
9 SY8	Contact	-106	84276	35.5029	5/8/12	13:50:20	(null)	(null)	SW	No S&D		Summerville	Morrison			San Ysidro	SY8.ipg				
10 SY9	Bedding	-106	84627	35.50359	5/8/12	14:03:37	(null)	(null)		Dave with bone and gastrolith	Morrison					San Ysidro	SY9.ipg		Decim	al: 두.0	.00
11 SY10	Other	-106	83604	35,49995	5/8/12	14:46:44	(null)	(null)		Picture looking NW						San Ysidro	SY10.ipg			.00	->.0
12 SY11	Bedding	-106	83529	35.50134	5/8/12	14:53:28		69	35 SE		Morrison					San Ysidro	SY11.jpg		h Alle		d Concine
13 SY13	Bedding	-10	6.8346	35.50198	5/8/12	15:07:46	i (null)	(null)		Coal layer near top of the Mor	Morrison					San Ysidro	SY13.jpg		P Alig	mment an	a spacing
14 SY14	Other	-106	83421	35.50362	5/8/12	15:27:33	(null)	(null)		Picture lookin S along strike an	nd offset bed					San Ysidro	SY14.jpg		h Ron	dore and S	hading
15 SY12	Other	-75	20375	40.70701	5/24/13	2 13:10:21	(null)	(null)		Picture of QAL unconformity						San Ysidro	SY12.jpg		P BON	aers anu s	naunig
16																			Pag	e Setup	
17												<b>T</b> .									

Figure 16

Issues – Suggestions – Concerns

We welcome your feedback and will do our best to address issue in a timely fashion.

This document can be downloaded from:

http://sites.lafayette.edu/geofieldbook

The application can be found online at:

http://itunes.apple.com/us/app/geofieldbook/id526812324?mt=8&uo=4

Please contact us at: geofieldbook@lafayette.edu