Displaying Drifter Data in Google Earth

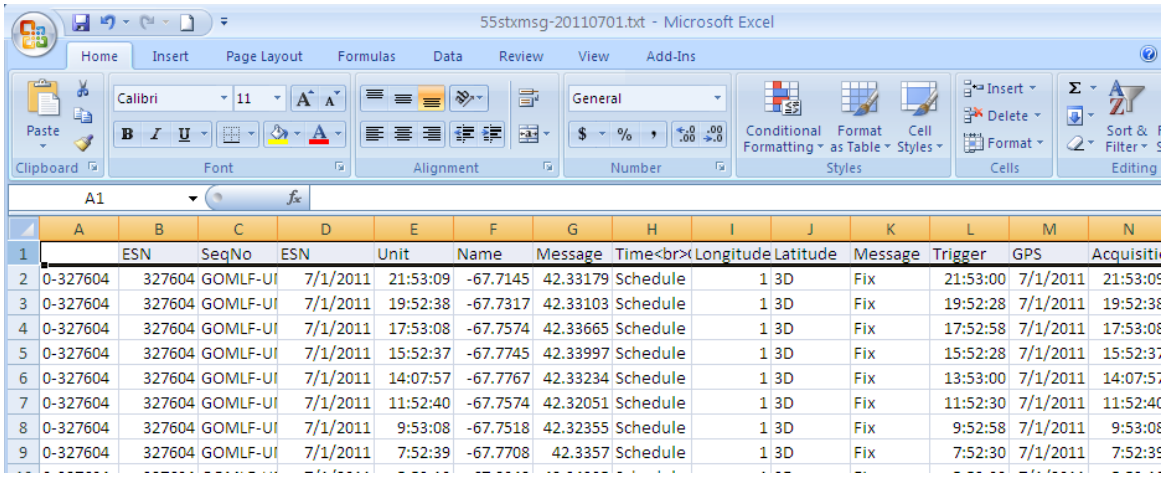
This tutorial uses an on-line program to translate Excel files into KML files (Excel to Kml).
To learn more about Excel to Kml, go to: http://www.earthpoint.us/ExcelToKml.aspx

1. Download a text file or Excel file of drifter locations from the ComTech website or another website as described in an earlier tutorial.

2. Open Excel and import the text file into the program if it is not in an Excel format. (If you need more information on how to do this, Google on "importing text files into excel" for a plethora of on-line tutorials; I find the non-Microsoft ones best.)

3. For ComTech text files: Press File > Open and navigate to your text file. Indicate the fields are delimited, check both "tab" and "space" for delimiters, and then indicate that the column data format is "general". Press Finish.

At this point, the Excel file should look something like this:



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		ESN	SeqNo	ESN	Unit	Name	Message	Time 	Longitude	Latitude	Message	Trigger	GPS	Acquisiti
2	0-327604	327604	GOMLF-UI	7/1/2011	21:53:09	-67.7145	42.33179	Schedule	1	3D	Fix	21:53:00	7/1/2011	21:53:09
3	0-327604	327604	GOMLF-UI	7/1/2011	19:52:38	-67.7317	42.33103	Schedule	1	3D	Fix	19:52:28	7/1/2011	19:52:38
4	0-327604	327604	GOMLF-UI	7/1/2011	17:53:08	-67.7574	42.33665	Schedule	1	3D	Fix	17:52:58	7/1/2011	17:53:08
5	0-327604	327604	GOMLF-UI	7/1/2011	15:52:37	-67.7745	42.33997	Schedule	1	3D	Fix	15:52:28	7/1/2011	15:52:37
6	0-327604	327604	GOMLF-UI	7/1/2011	14:07:57	-67.7767	42.33234	Schedule	1	3D	Fix	13:53:00	7/1/2011	14:07:57
7	0-327604	327604	GOMLF-UI	7/1/2011	11:52:40	-67.7574	42.32051	Schedule	1	3D	Fix	11:52:30	7/1/2011	11:52:40
8	0-327604	327604	GOMLF-UI	7/1/2011	9:53:08	-67.7518	42.32355	Schedule	1	3D	Fix	9:52:58	7/1/2011	9:53:08
9	0-327604	327604	GOMLF-UI	7/1/2011	7:52:39	-67.7708	42.3357	Schedule	1	3D	Fix	7:52:30	7/1/2011	7:52:39

In Excel

1. Delete all of the columns to the right of the latitude column.

2. Delete all of the columns to the left of the date column.

3. Erase all of the words in the first row, but don't delete the row. We'll replace these words in a few minutes.

4. You should now have four columns that contain the: date, time, latitude, and longitude.

5. Find the column of longitudes and write the word "Longitude" in the first row over the longitude column. Capitalization is important.

6. Do the same for Latitude.

Your spreadsheet should now look something like the image below.

	A	B	C	D	E	F	G
1			Longitude	Latitude			
2	7/1/2011	21:53:09	-67.714491	42.331792			
3	7/1/2011	19:52:38	-67.731721	42.33103			
4	7/1/2011	17:53:08	-67.757406	42.336652			
5	7/1/2011	15:52:37	-67.774529	42.339967			
6	7/1/2011	14:07:57	-67.776718	42.332339			
7	7/1/2011	11:52:40	-67.757385	42.320505			
8	7/1/2011	9:53:08	-67.751784	42.323552			
9	7/1/2011	7:52:39	-67.770817	42.335697			
10	7/1/2011	5:53:10	-67.804205	42.343948			
11	7/1/2011	3:52:39	-67.822659	42.348915			
12	7/1/2011	1:53:24	-67.828109	42.35164			
13	7/1/2011	0:01:22	-67.824204	42.346705			
14	6/30/2011	21:53:34	-67.81384	42.336974			
15	6/30/2011	19:52:45	-67.815557	42.351244			
16	6/30/2011	17:53:09	-67.842529	42.377079			
17	6/30/2011	15:52:47	-67.881238	42.395071			

7. Delete any rows that are missing Longitude and/or Latitude data. They are of no value and can create trouble later on.

8. Now insert two columns to the left of the Longitude column. You should have two empty columns in columns C and D.

9. In cell C1 enter “TimeBegin” and in cell D1 enter “TimeEnd”. Capitalization is important, no spaces.

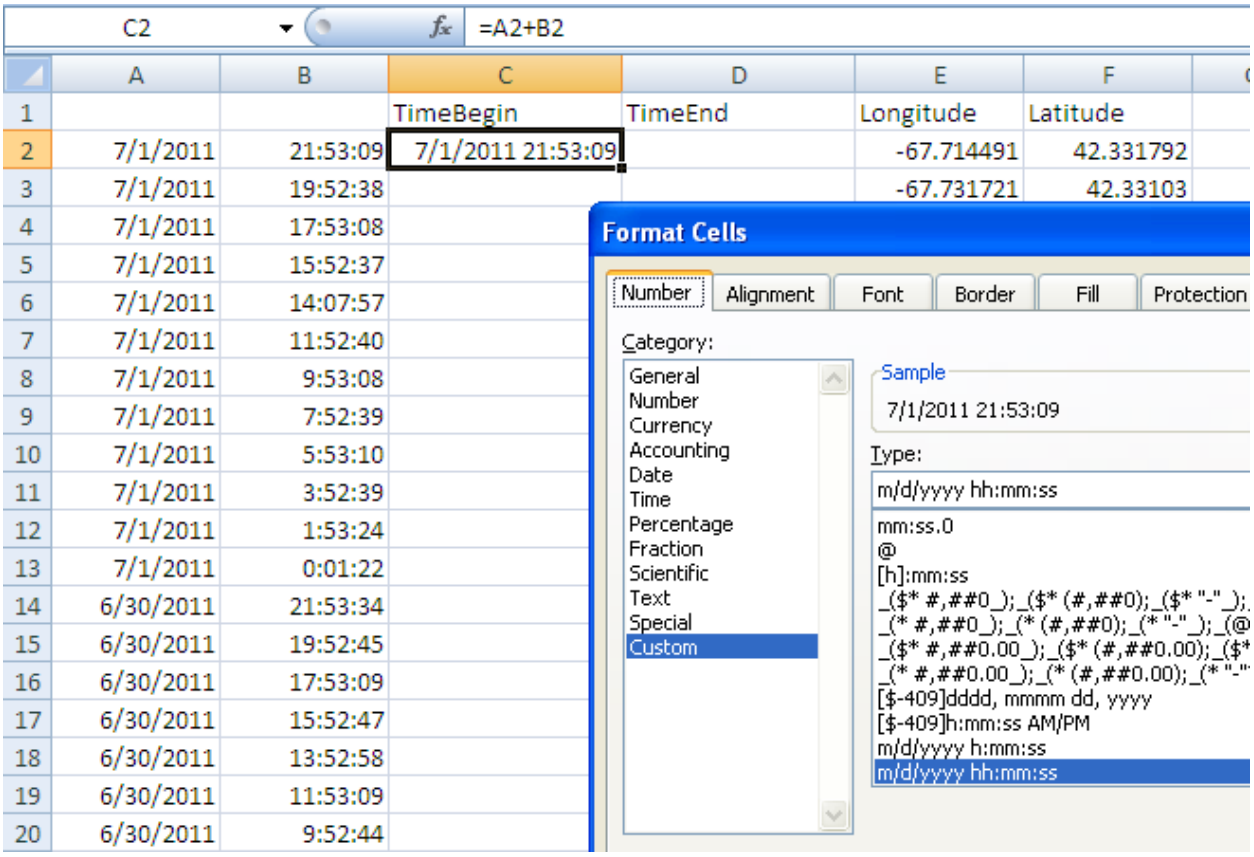
10. In cell C2, add the date of cell A2 to the time of cell B2 by entering “=A2+B2”. Enter. (Just Date or Time will not appear until you do the next step, don’t worry.)

11. Now change the format of cell C2 by right-clicking it and choosing “Format Cells…”.

12. This step is shown in the image below. In the Format Cells window that opens, under the Number Tab, choose “Custom”. In the box immediately under Type: enter “m/d/yyyy hh:mm:ss”. Under Sample, you should see both the date and the time appear. Press the OK button, and see the date *and* the time appear in cell C2.

In our drifter animation, this is the time that the icon representing this location will begin to show up.

13. Fill the C column with combined dates+times by copying cell C2 all the way to the bottom of the data. [Do this by dragging the lower right corner of the outlined cell to the bottom of the page. Ask for help if this is unclear.]



	A	B	C	D	E	F
1			TimeBegin	TimeEnd	Longitude	Latitude
2	7/1/2011	21:53:09	7/1/2011 21:53:09		-67.714491	42.331792
3	7/1/2011	19:52:38			-67.731721	42.33103
4	7/1/2011	17:53:08				
5	7/1/2011	15:52:37				
6	7/1/2011	14:07:57				
7	7/1/2011	11:52:40				
8	7/1/2011	9:53:08				
9	7/1/2011	7:52:39				
10	7/1/2011	5:53:10				
11	7/1/2011	3:52:39				
12	7/1/2011	1:53:24				
13	7/1/2011	0:01:22				
14	6/30/2011	21:53:34				
15	6/30/2011	19:52:45				
16	6/30/2011	17:53:09				
17	6/30/2011	15:52:47				
18	6/30/2011	13:52:58				
19	6/30/2011	11:53:09				
20	6/30/2011	9:52:44				

Next, we need to calculate the time when we want the icon to disappear. In most cases, I like to have about six icons show up at once on the Google Earth screen during an animation. This creates an illusion of a "tail" and helps show the movement of the drifter.

Note that in the Excel spreadsheet, the most recent locations are towards the top, and the older locations are towards the bottom. If we want six locations to show up at the same time, we need to enter a more recent TimeEnd for older locations.

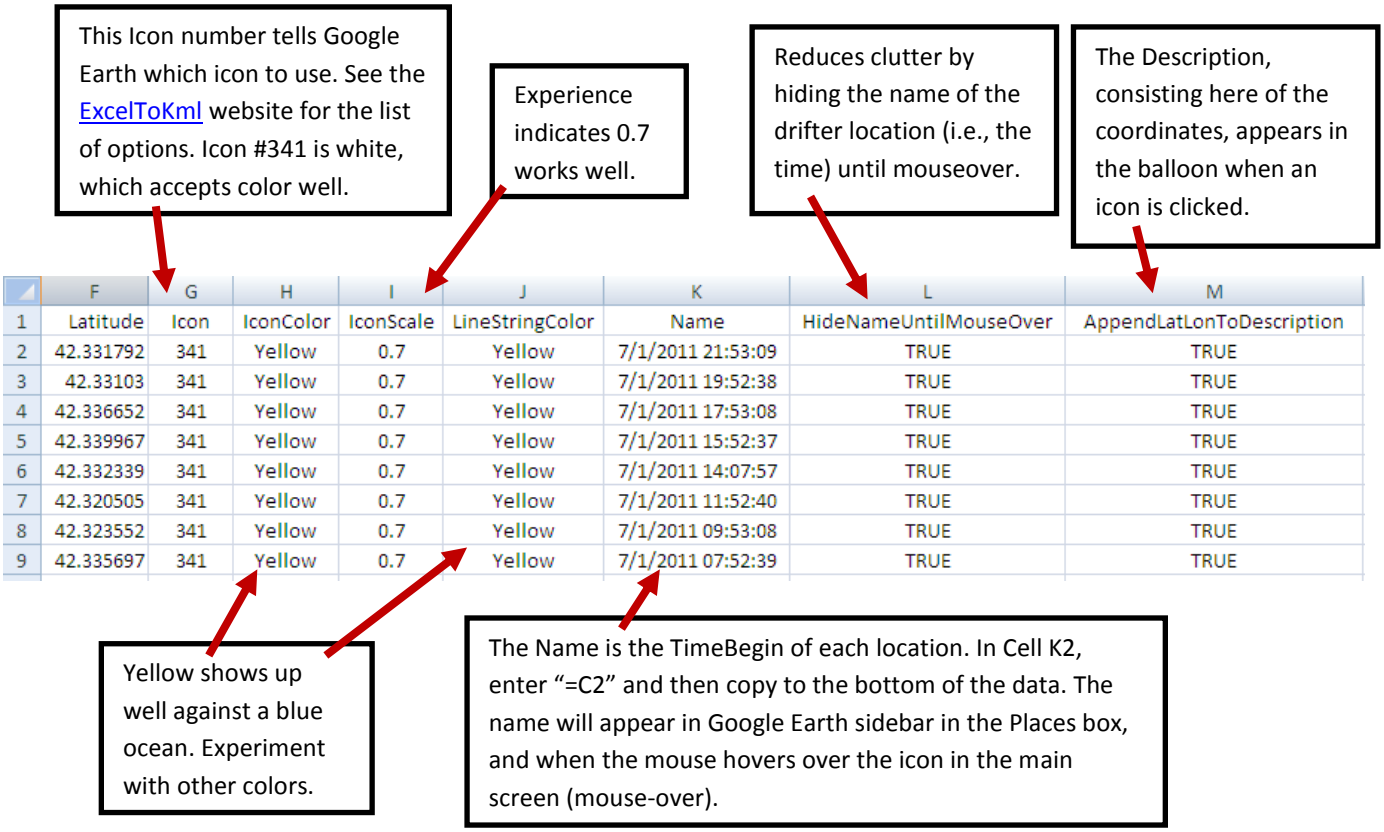
14. Go to Cell D7 and enter "=A2+B2". Format this cell in the exact same way we formatted Cell C2. Copy this expression from Cell D7 all the way to the bottom of the data.

15. In Cell D6, enter "=A$2+B$2", format it the same as the other cells, and copy it into cells C2..C5. We should now have complete columns of data for columns A through F.

The spreadsheet should now look like the example below. Note that in column D, the first five rows of data all have the same TimeEnd, which will essentially be the end of the animation. In this way, the animation will end with about five locations visible on the screen.

	A	B	C	D	E	F	G
1			TimeBegin	TimeEnd	Longitude	Latitude	
2	7/1/2011	21:53:09	7/1/2011 21:53:09	7/1/2011 21:53:09	-67.714491	42.331792	
3	7/1/2011	19:52:38	7/1/2011 19:52:38	7/1/2011 21:53:09	-67.731721	42.33103	
4	7/1/2011	17:53:08	7/1/2011 17:53:08	7/1/2011 21:53:09	-67.757406	42.336652	
5	7/1/2011	15:52:37	7/1/2011 15:52:37	7/1/2011 21:53:09	-67.774529	42.339967	
6	7/1/2011	14:07:57	7/1/2011 14:07:57	7/1/2011 21:53:09	-67.776718	42.332339	
7	7/1/2011	11:52:40	7/1/2011 11:52:40	7/2/2011 19:46:18	-67.757385	42.320505	
8	7/1/2011	9:53:08	7/1/2011 09:53:08	7/2/2011 15:45:16	-67.751784	42.323552	
9	7/1/2011	7:52:39	7/1/2011 07:52:39	7/2/2011 11:46:16	-67.770817	42.335697	
10	7/1/2011	5:53:10	7/1/2011 05:53:10	7/2/2011 07:45:14	-67.804205	42.343948	
11	7/1/2011	3:52:39	7/1/2011 03:52:39	7/2/2011 04:15:54	-67.822659	42.348915	
12	7/1/2011	1:53:24	7/1/2011 01:53:24	7/1/2011 23:45:20	-67.828109	42.35164	
13	7/1/2011	0:01:22	7/1/2011 00:01:22	7/1/2011 19:46:16	-67.824204	42.346705	
14	6/30/2011	21:53:34	6/30/2011 21:53:34	7/1/2011 15:45:18	-67.81384	42.336974	
15	6/30/2011	19:52:45	6/30/2011 19:52:45	7/1/2011 11:46:20	-67.815557	42.351244	
16	6/30/2011	17:53:09	6/30/2011 17:53:09	7/1/2011 07:45:18	-67.842529	42.377079	

16. In columns G through M, fill in the labels along Row 1 and the words or numbers in the underlying rows as shown in the image below.



	F	G	H	I	J	K	L	M
1	Latitude	Icon	IconColor	IconScale	LineStringColor	Name	HideNameUntilMouseOver	AppendLatLonToDescription
2	42.331792	341	Yellow	0.7	Yellow	7/1/2011 21:53:09	TRUE	TRUE
3	42.33103	341	Yellow	0.7	Yellow	7/1/2011 19:52:38	TRUE	TRUE
4	42.336652	341	Yellow	0.7	Yellow	7/1/2011 17:53:08	TRUE	TRUE
5	42.339967	341	Yellow	0.7	Yellow	7/1/2011 15:52:37	TRUE	TRUE
6	42.332339	341	Yellow	0.7	Yellow	7/1/2011 14:07:57	TRUE	TRUE
7	42.320505	341	Yellow	0.7	Yellow	7/1/2011 11:52:40	TRUE	TRUE
8	42.323552	341	Yellow	0.7	Yellow	7/1/2011 09:53:08	TRUE	TRUE
9	42.335697	341	Yellow	0.7	Yellow	7/1/2011 07:52:39	TRUE	TRUE

After going through the entire process and seeing what these formatting instructions control what the user sees on Google Earth, please come back to this point and play with all of these values to see what changing them does to the final animation.

Refer to the ExcelToKml website (http://www.earthpoint.us/ExcelToKml.aspx) for ideas on how to change the values. You may want to add a column called "LineStringWidth" with a value other than "2" to make the line that connects the locations thinner or thicker.

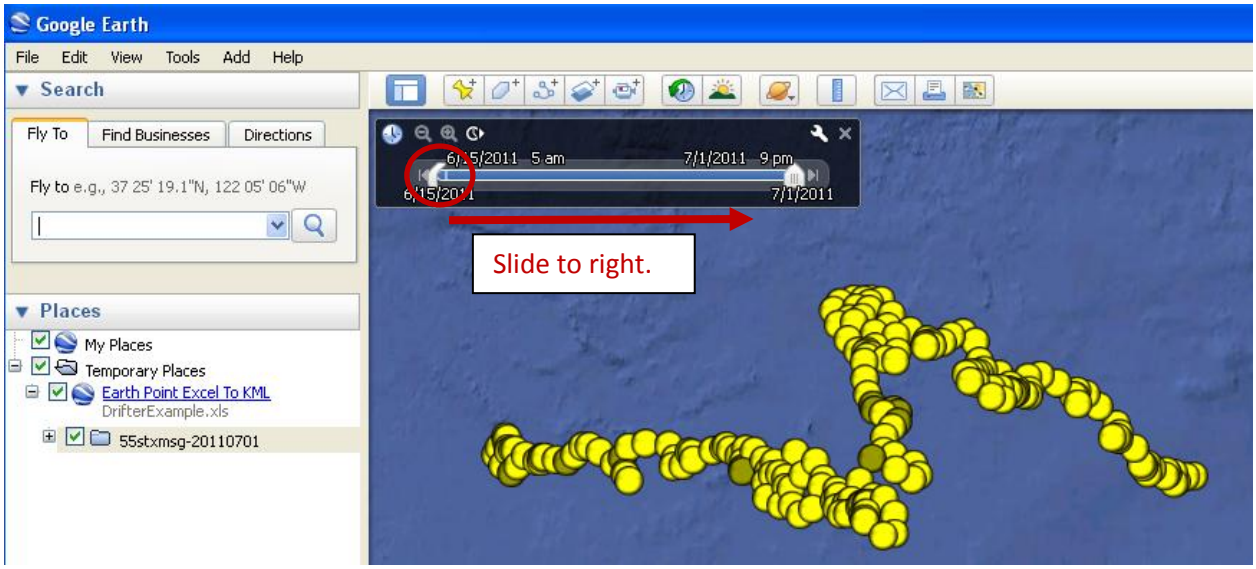
The spreadsheet is now ready for entering into the ExcelToKml website.

Go to http://www.earthpoint.us/ExcelToKml.aspx.

Sign in to the website using **mate** as the e-mail address, and **drifters** as the password. (You can do this without signing is but the number of rows you can process in the program will be limited, it is best to sign in. When you return to your home institution, please set up your own account, this website service is free for educators.)

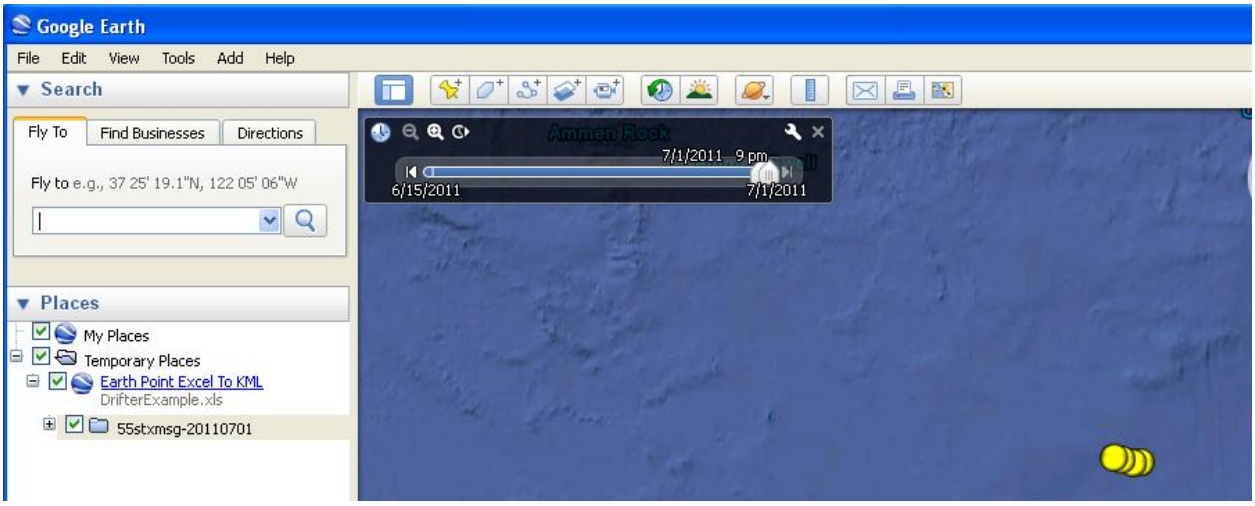
Enter the location of your Excel spreadsheet into the Browse box as shown below. Press the "View on Google Earth" button. In the window that appears, select "Open", knowing that you can always save it later.

As Google Earth opens, the screen will look something like this, with *all* of the locations visible:



To fix this, take the left-hand button of the animation slider and move it all the way to the right, so that it touches the right-hand button.

Now the image should look something like this:



It's often useful to set the animation to "loop" and the time to UTC. Click the little wrench in the upper right of the animation slider window.