Instructions for “Joekit” and “Tallykit”; Spreadsheets to Google Earth maps

Before you start

1) Ensure you have downloaded the latest version of Joekit.jar and Tallykit.jar from http://code.google.com/p/joekit/downloads/list

    a) Note: Joekit gets updated often, particularly when someone informs us of a problem. Even after you’ve downloaded the program, check periodically for new versions.

    b) To report a problem please email medical.datafeedback@amsterdam.msf.org

2) Ensure Google Earth is installed on your computer. If you are working offline (without internet) please ensure the local imagery has been downloaded at a site that has internet access (see the Guide to Google Earth in the GIS Toolkit)

What are Joekit and Tallykit?

Both tools take spreadsheet data in Excel format and convert them into KML files which display in Google Earth. Joekit converts line list data to KML files and Tallykit converts tally sheets into KML files. They can do more sophisticated actions like animations, changing the size or colour of points based on information in the spreadsheet, or looking up points for which you have the place name but not the geographical coordinates in a “gazetteer” file.

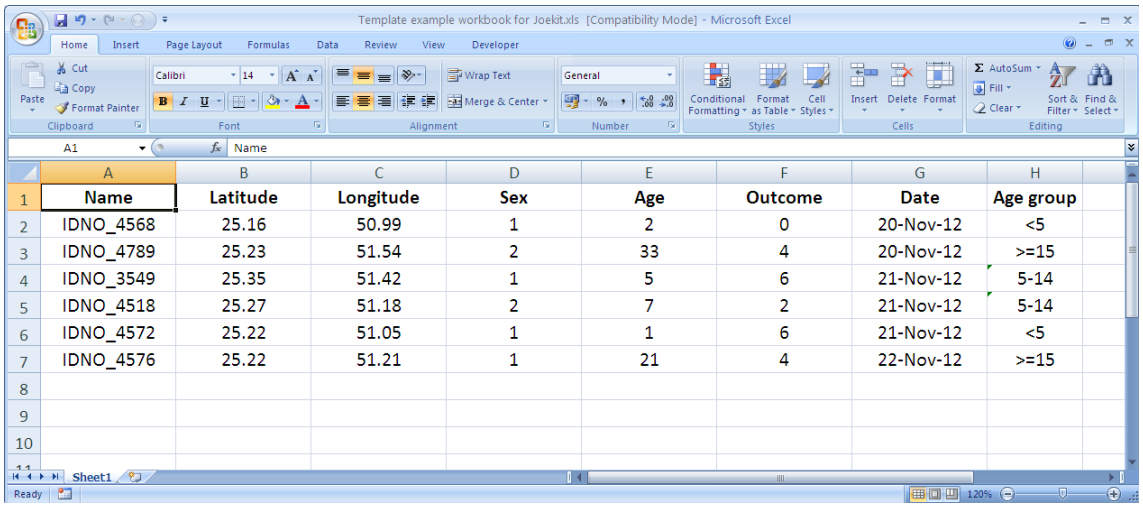
Joekit

How does Joekit work?

Joekit takes a spreadsheet with lines representing each point to be mapped (such as individual patients, health clinics or water points), columns representing the place (e.g. latitude and longitude coordinates) and columns containing any additional information you want to display for each point; and creates an interactive map that anyone can see with free, widely-used software (Google Earth).

What does a line list look like?

A line list can be as simple as a list of names and latitude and longitude coordinates as long as there is one line per person or object (Figure 1).



	A	B	C	D	E	F	G	H
1	Name	Latitude	Longitude	Sex	Age	Outcome	Date	Age group
2	IDNO_4568	25.16	50.99	1	2	0	20-Nov-12	<5
3	IDNO_4789	25.23	51.54	2	33	4	20-Nov-12	>=15
4	IDNO_3549	25.35	51.42	1	5	6	21-Nov-12	5-14
5	IDNO_4518	25.27	51.18	2	7	2	21-Nov-12	5-14
6	IDNO_4572	25.22	51.05	1	1	6	21-Nov-12	<5
7	IDNO_4576	25.22	51.21	1	21	4	22-Nov-12	>=15
8								
9								
10								

Figure 1: Simple line list format for mapping

Note that the top row (row 1) must contain the column labels and the labels can only be in a single row. Joekit assumes the spreadsheet data starts in the second row. Joekit will not work if there is no label row or if there are multiple label rows.

If you call one column “Name”, its contents will become the default label text in the map. Similarly, columns called “lat” or “latitude” or “long” or “longitude” will become the default geographical coordinate columns. Please see the Frequently Asked Questions (FAQ) section for alternative column labels.

Here’s what this simple spreadsheet looks like as a Google Earth map (Figure 2):

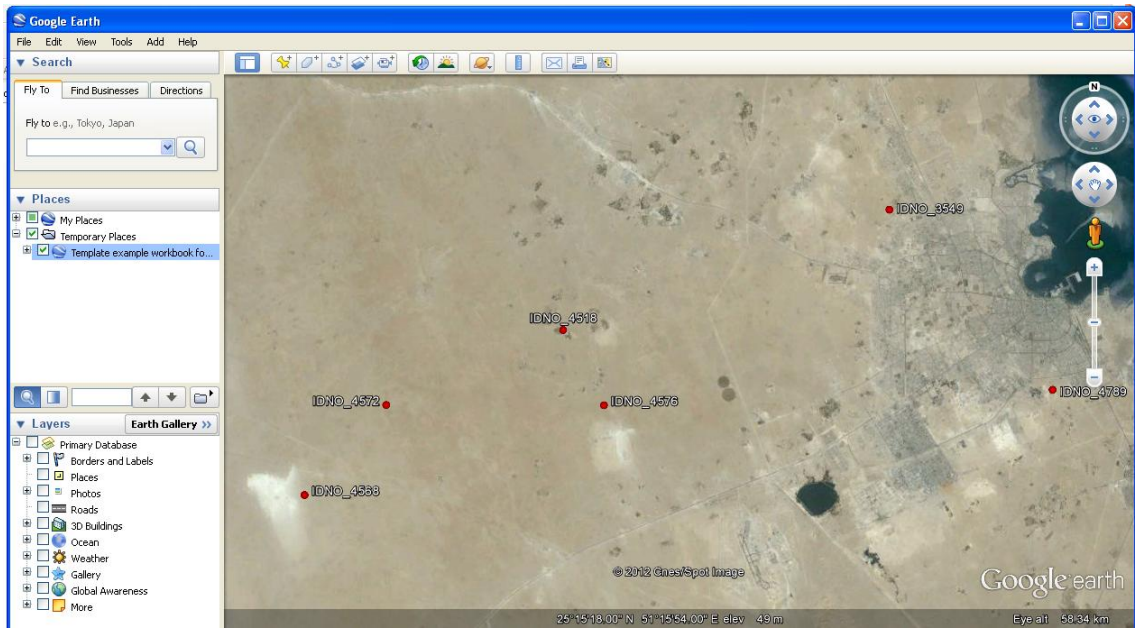


Figure 2: Google Earth map of simple spreadsheet data (Qatar)

How did you create that map?

This simple map was created by Joekit using the following steps:

1) Double-click the "Joekit.jar" program to open it. The Joekit display window appears with a section for mapping options on the left and a preview window on the right (Figure 3)

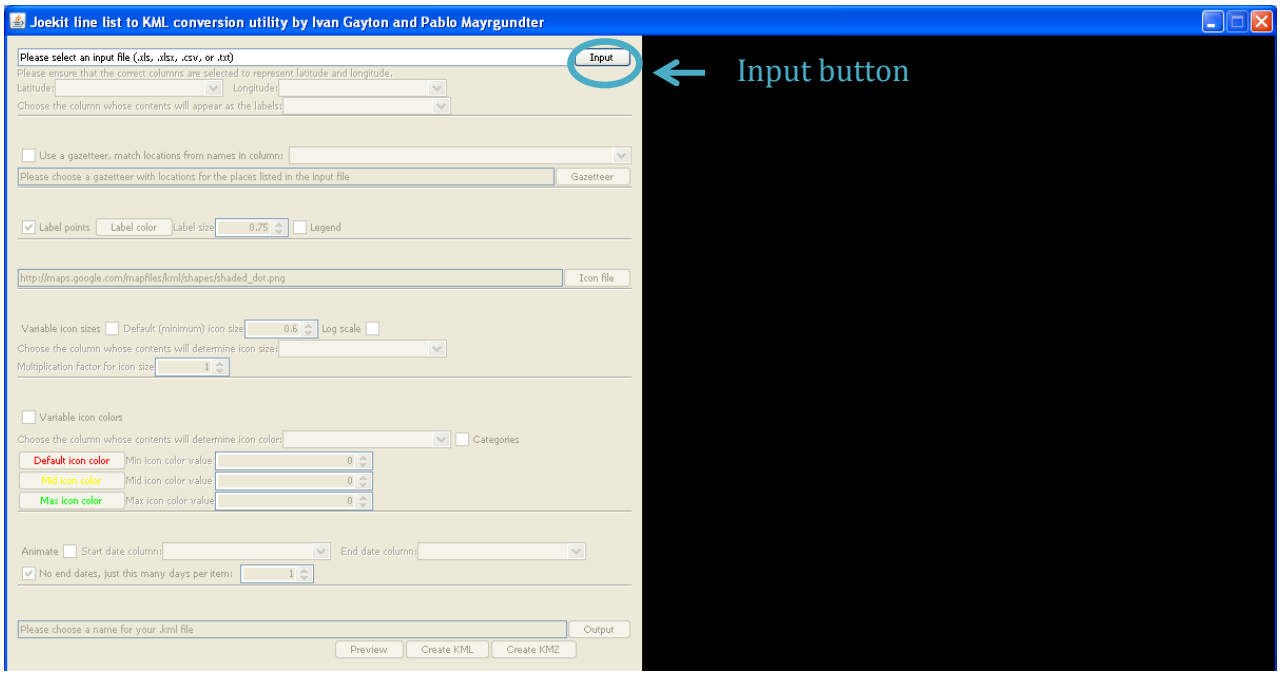


Figure 3: The Joekit display window (with input button indicated)

2) Click the "Input" button at the top, and navigate to the spreadsheet file (Template example workbook for Joekit.xls) you wish to map. A very simple preview will appear in the window on the right (Figure 4)

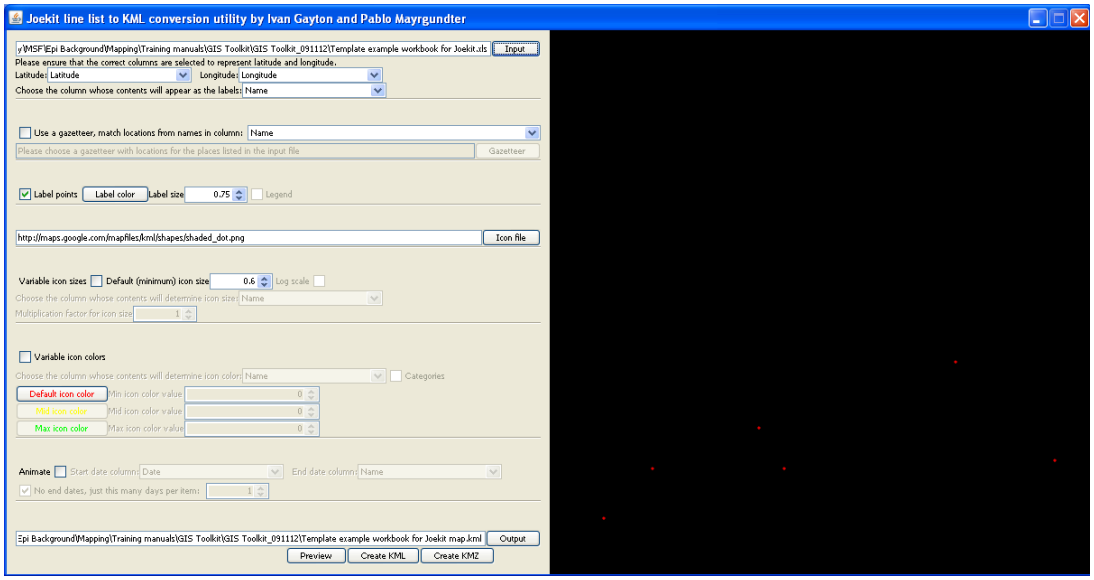


Figure 4: Simple preview of mapped data points

3) Click the "Create KML" button at the bottom (the KMZ button will be explained later)

4) A map is created! By default it is saved in the same folder as the spreadsheet, and has the same name but with the extension "…map.kml" instead of ".xls"

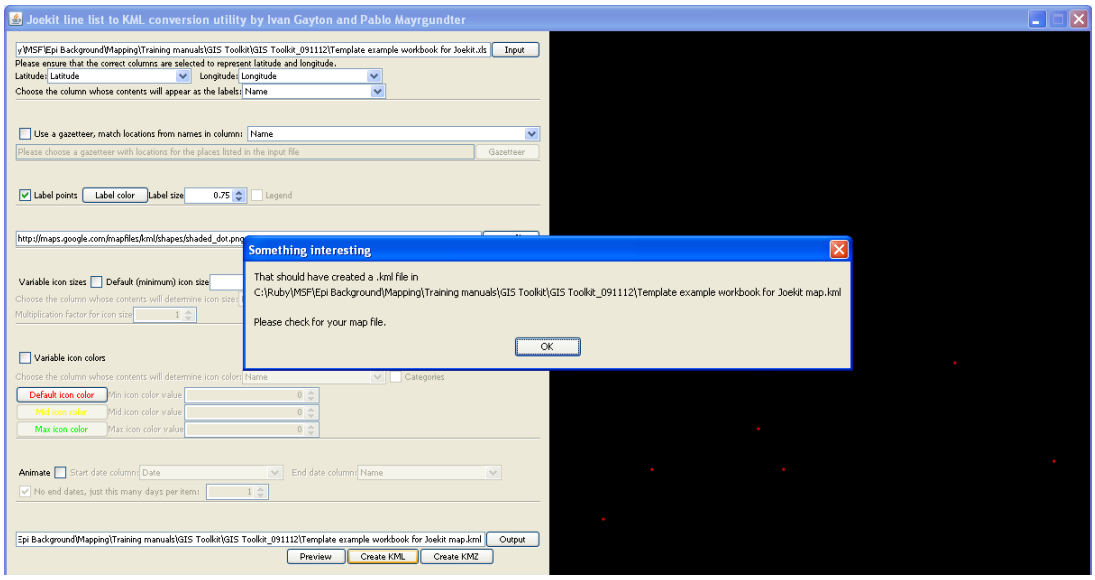


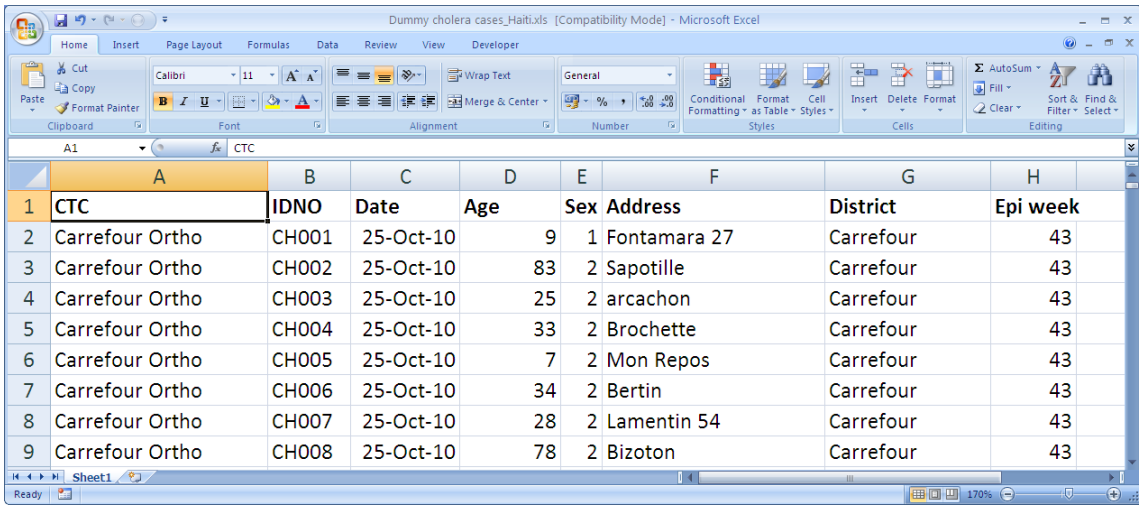
Figure 5: Message indicating location of the KML file created

5) Double-click the .kml file to open it in Google Earth

What if my spreadsheet doesn't have geographical coordinates?

You can use a "Gazetteer" to build your map. A gazetteer is a file combining place names with geographical coordinates. Please contact the GIS team in the Manson Unit who will try to produce an appropriate gazetteer or you can produce a gazetteer yourself (see the Guide to Gazetteers in the GIS Toolkit).

Open the file 'Dummy cholera cases_Haiti.xls'. You will see that the spreadsheet of individual cholera patient data does not contain any longitude or latitude coordinates. Instead there is an 'Address' column containing place names. Note this is fake/dummy data.



	A	B	C	D	E	F	G	H
1	CTC	IDNO	Date	Age	Sex	Address	District	Epi week
2	Carrefour Ortho	CH001	25-Oct-10	9	1	Fontamara 27	Carrefour	43
3	Carrefour Ortho	CH002	25-Oct-10	83	2	Sapotille	Carrefour	43
4	Carrefour Ortho	CH003	25-Oct-10	25	2	arcachon	Carrefour	43
5	Carrefour Ortho	CH004	25-Oct-10	33	2	Brochette	Carrefour	43
6	Carrefour Ortho	CH005	25-Oct-10	7	2	Mon Repos	Carrefour	43
7	Carrefour Ortho	CH006	25-Oct-10	34	2	Bertin	Carrefour	43
8	Carrefour Ortho	CH007	25-Oct-10	28	2	Lamentin 54	Carrefour	43
9	Carrefour Ortho	CH008	25-Oct-10	78	2	Bizoton	Carrefour	43

Figure 6: Cholera linelist data (fake) for Carrefour, Haiti

Open Joekit and input the file 'Dummy cholera cases_Haiti.xls'. The following message will appear 'None of the rows of this spreadsheet successfully generated a point. Please check your lat/long columns, or consider using a gazetteer!' (Figure 7)

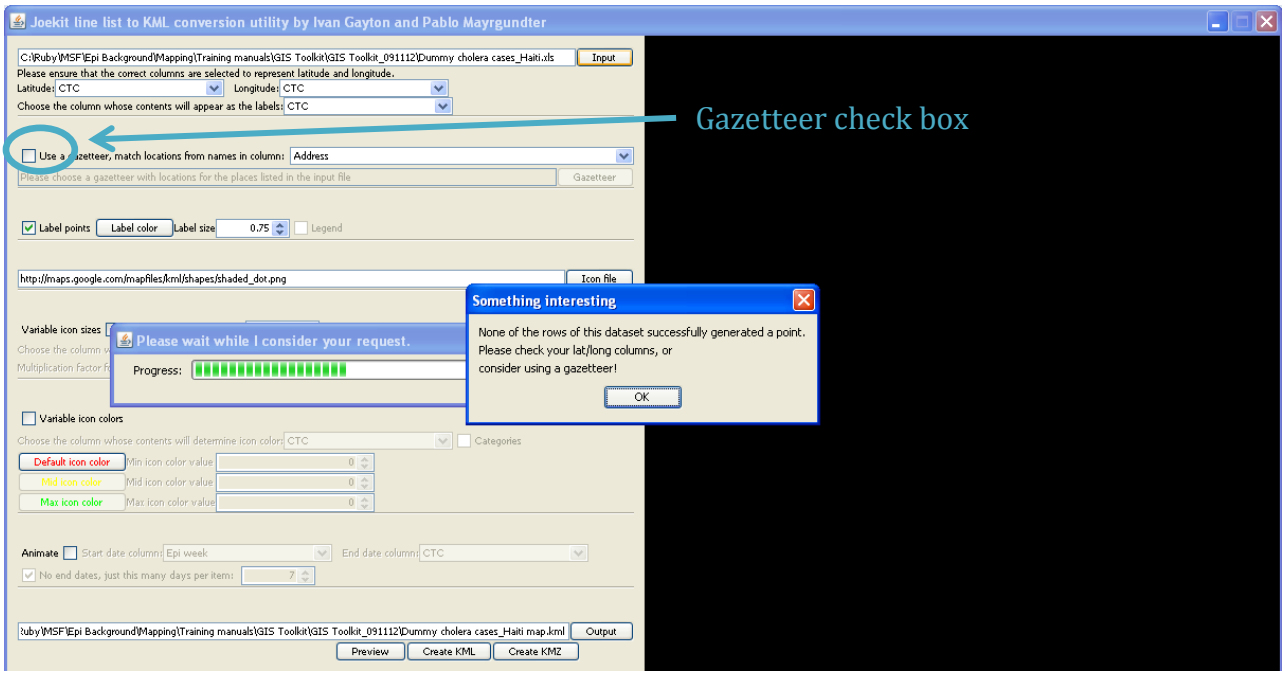


Figure 7: Message indicating that a gazetteer is needed to map the data

To add a gazetteer, click OK and check the box 'Use a gazetteer, match locations from names in column' and select the column label from the drop-down list corresponding to the place names in your spreadsheet ('Address'). It does not matter what is selected in the latitude and longitude boxes as the gazetteer overrides this. Click on the gazetteer button and select the file 'Carrefour Neighborhood Polygons.kml'. Gazetteers should be .kml files (see the Gazetteer guide in the GIS Toolkit). Joekit looks for these place names in the gazetteer and maps the spreadsheet data. Any points that cannot be mapped are listed in an error window (Figure 8). However the reason for the error is not given. Please check these data lines in your spreadsheet (see FAQs for common errors). You can copy and paste this list into MS Word.

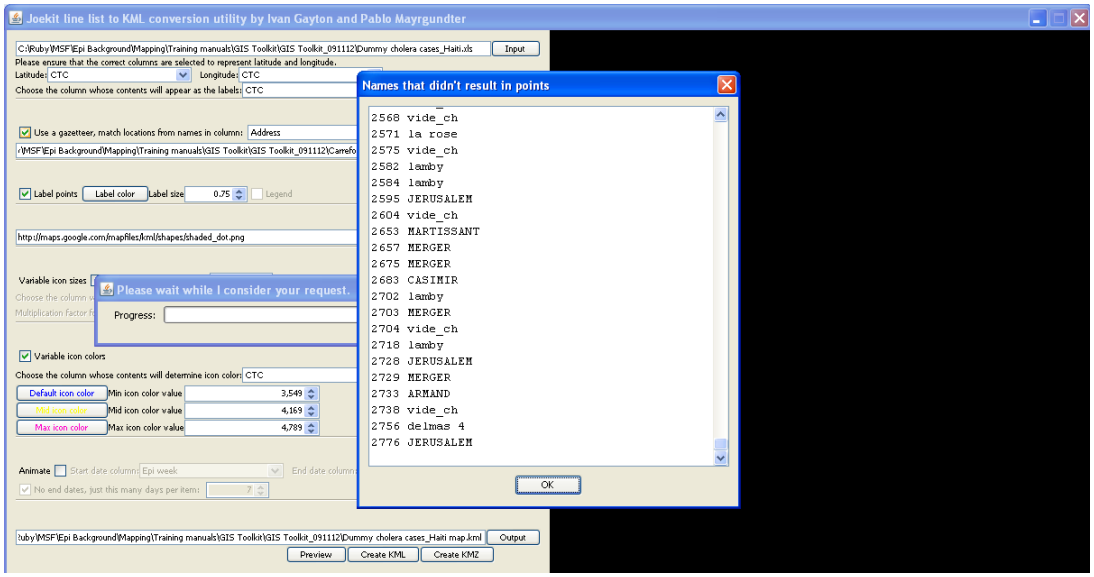


Figure 8: Error window indicating the data points that could not be mapped

Click OK to preview the mapped points (Figure 9).

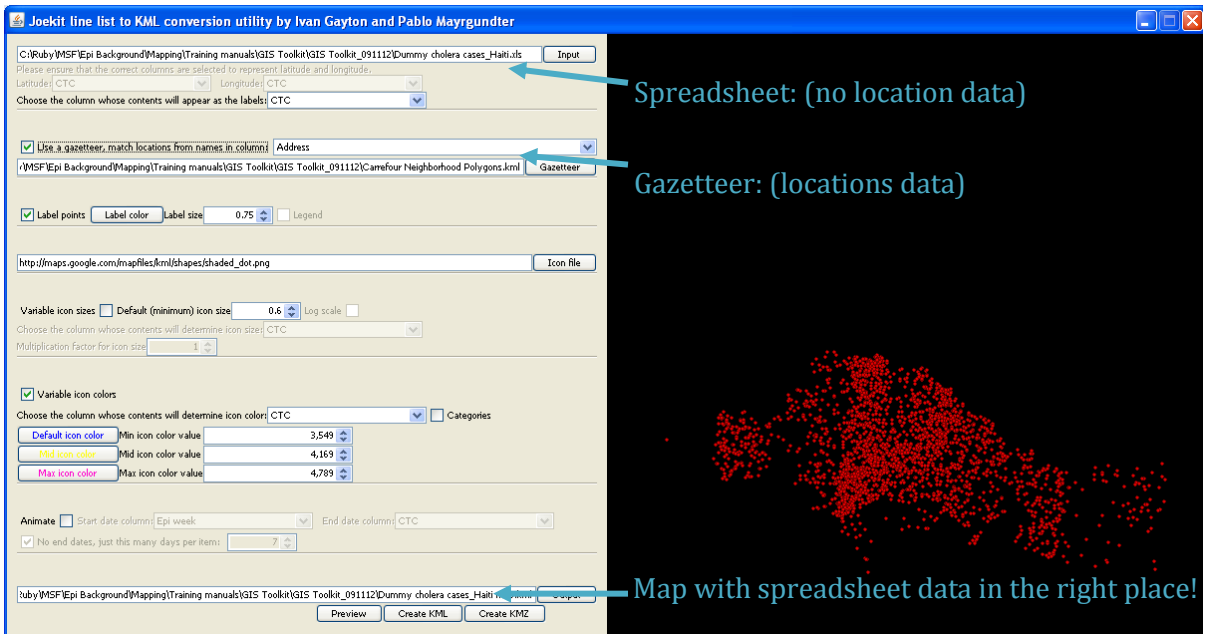


Figure 9: Using a gazetteer within Joekit to map data

As before, click on the 'Preview KML' button to preview the mapped points and the 'Create KML' button to create the Google Earth KML file (Note: to remove labels, deselect the label points tick box)

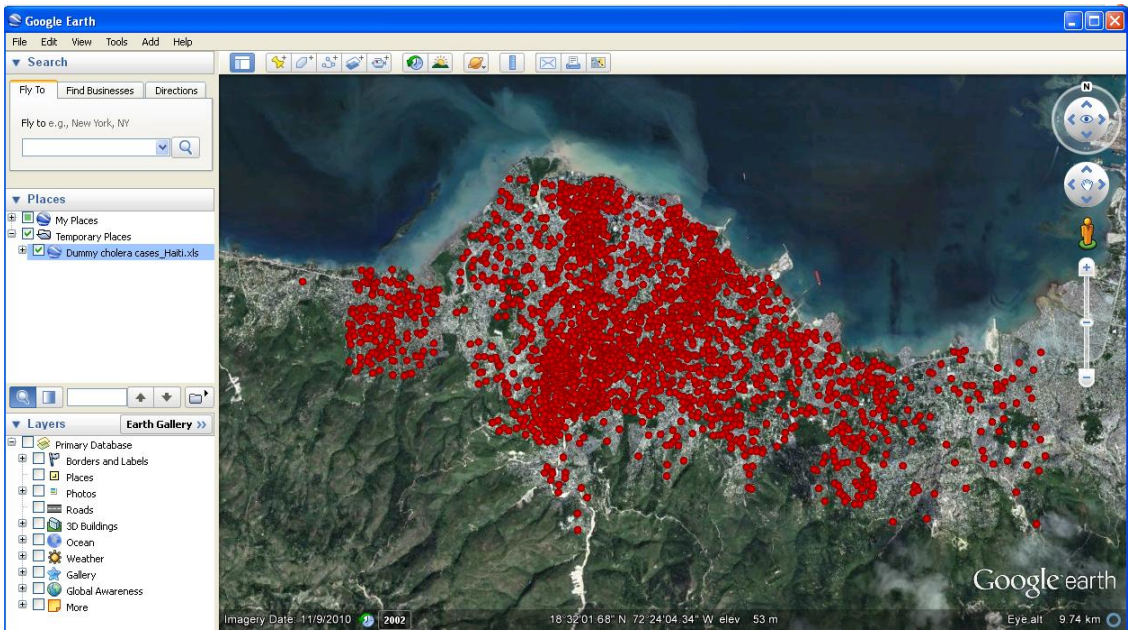


Figure 10: Cholera cases in Carrefour, Haiti mapped in Google Earth as 'jitterdots'

Alternatively you can create variable size points at the centroid of each polygon. In the example above check the box “Variable Icon Sizes” and for ‘Choose the column whose contents will determine icon size’ select the variable “Instances” from the drop-down box (this is not an actual column in the excel spreadsheet but simply tells Joekit to apply the number of cholera cases per quartier (polygon) to the icon size). ‘Click ‘Create KML’ and view the cumulative cholera cases as variable sized dots (Figure 11).

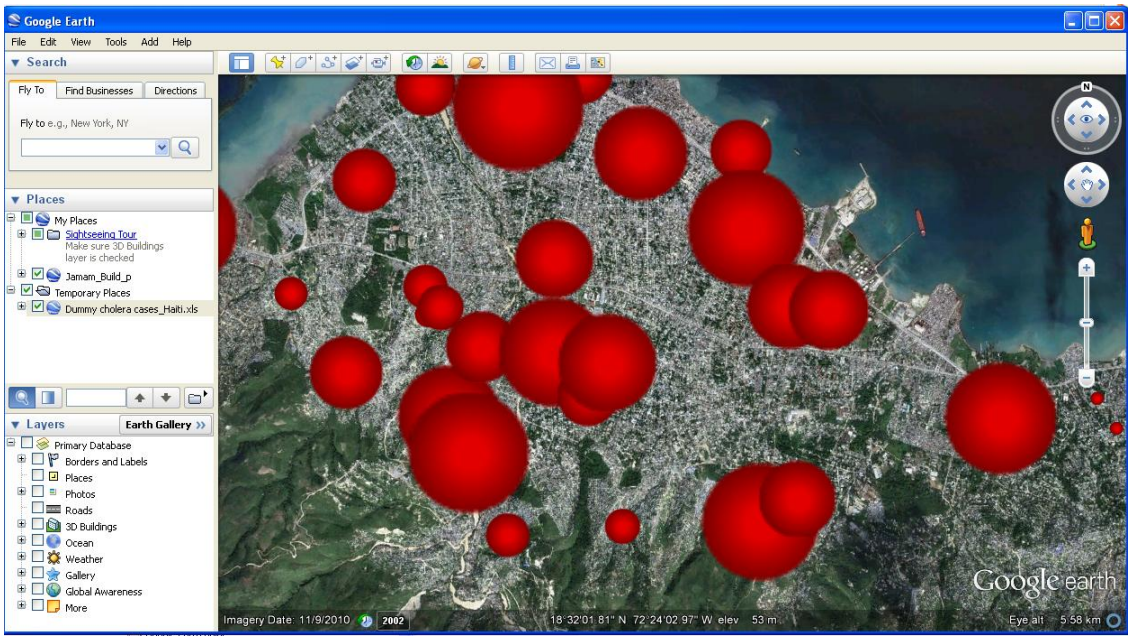
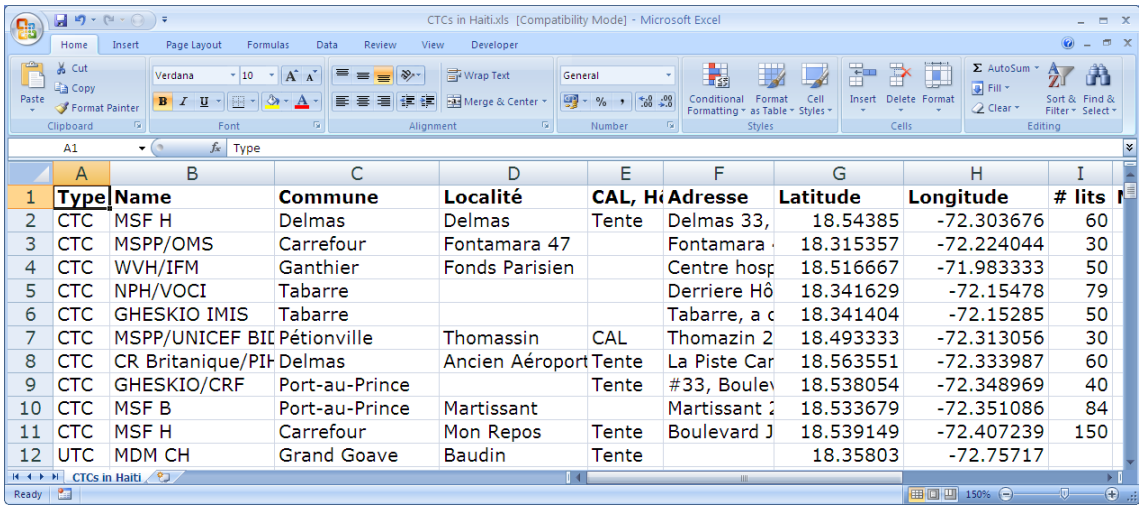


Figure 11: Cholera cases in Carrefour, Haiti mapped in Google Earth as variable icon sizes

But how can I put more information on the map?

To illustrate, here is a more complicated spreadsheet that shows some information about Cholera Treatment Centres in Haiti in 2010 (Figure 12).



	A	B	C	D	E	F	G	H	I
1	Type	Name	Commune	Localité	CAL, H	Adresse	Latitude	Longitude	# lits
2	CTC	MSF H	Delmas	Delmas	Tente	Delmas 33,	18.54385	-72.303676	60
3	CTC	MSPP/OMS	Carrefour	Fontamara 47		Fontamara	18.315357	-72.224044	30
4	CTC	WVH/IFM	Ganthier	Fonds Parisien		Centre hosp	18.516667	-71.983333	50
5	CTC	NPH/VOCI	Tabarre			Derriere Hô	18.341629	-72.15478	79
6	CTC	GHESKIO IMIS	Tabarre			Tabarre, a c	18.341404	-72.15285	50
7	CTC	MSPP/UNICEF BII	Pétionville	Thomassin	CAL	Thomazin 2	18.493333	-72.313056	30
8	CTC	CR Britanique/PII	Delmas	Ancien Aéroport	Tente	La Piste Car	18.563551	-72.333987	60
9	CTC	GHESKIO/CRF	Port-au-Prince		Tente	#33, Boulev	18.538054	-72.348969	40
10	CTC	MSF B	Port-au-Prince	Martissant		Martissant 2	18.533679	-72.351086	84
11	CTC	MSF H	Carrefour	Mon Repos	Tente	Boulevard J	18.539149	-72.407239	150
12	UTC	MDM CH	Grand Goave	Baudin	Tente		18.35803	-72.75717	

Figure 12: Spreadsheet of cholera treatment centres (CTCs) in Haiti

Input this file (CTCs in Haiti.xls) into Joekit. Verify that Joekit has selected the correct columns for latitude, longitude and name in the drop-down lists, we can check the box “Variable Icon Sizes” and for ‘Choose the column whose contents will determine icon size’ we select the column “# lits” (number of beds).

How can I change the appearance of the dots and labels?

The dots are too big

If we click the ‘preview’ button the dots are large and difficult to distinguish (Figure 13).

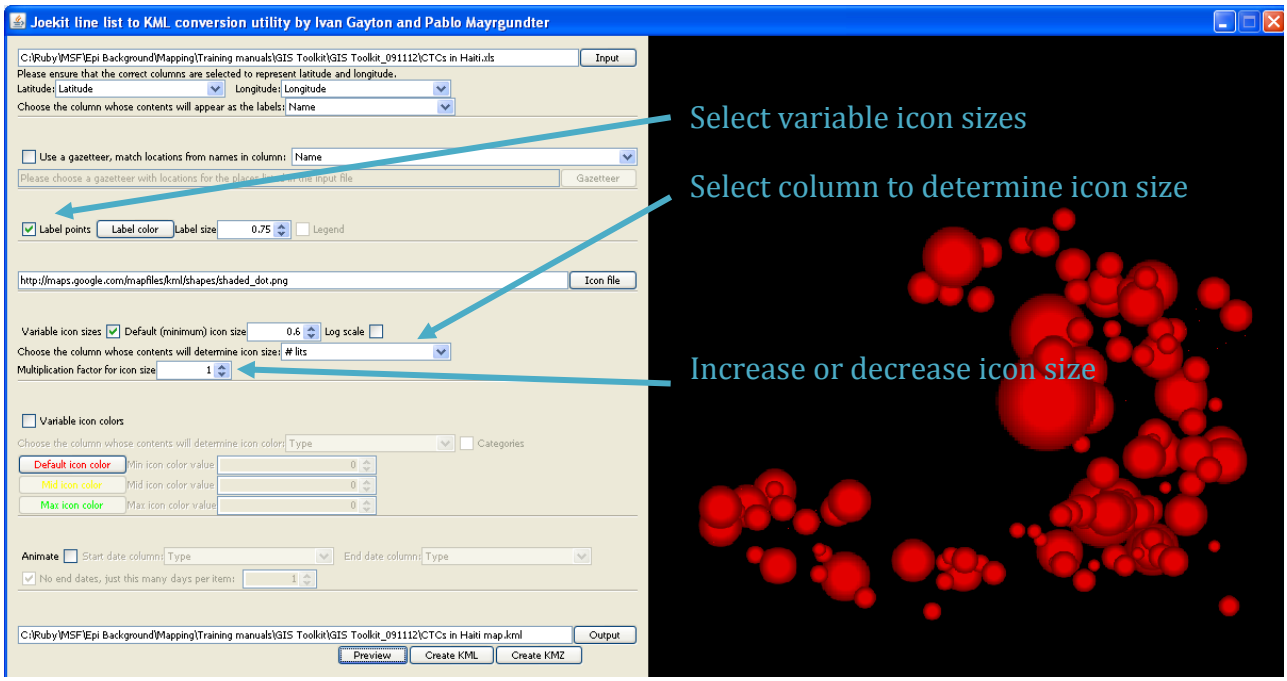


Figure 13: Variable icon sizes to represent the relative sizes of spreadsheet data

For 'Specify an adjustment factor for icon size' type 0.1000 (ten times smaller) and click the 'preview' button. We can now see the individual Cholera Treatment Centres (Figure 14). Note for very large numbers you can select the log scale box.

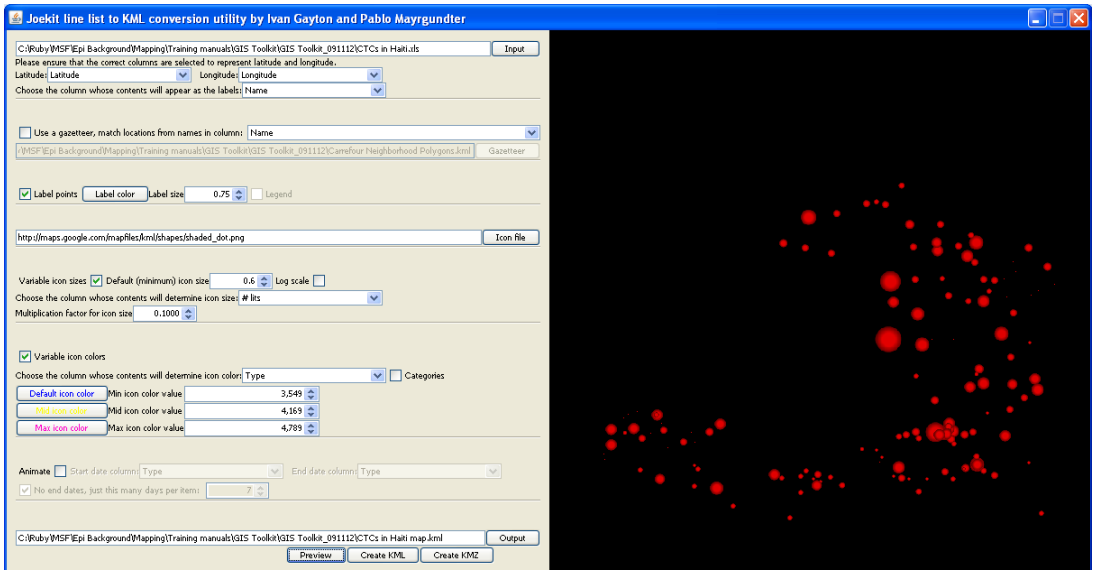


Figure 14: Adjusting the icon sizes using the adjustment factor

If we click the 'Create KML' button and open the resulting map in Google Earth, we can see the coverage of Cholera Treatment Centres in Haiti (Figure 15). The more beds the bigger the dot.

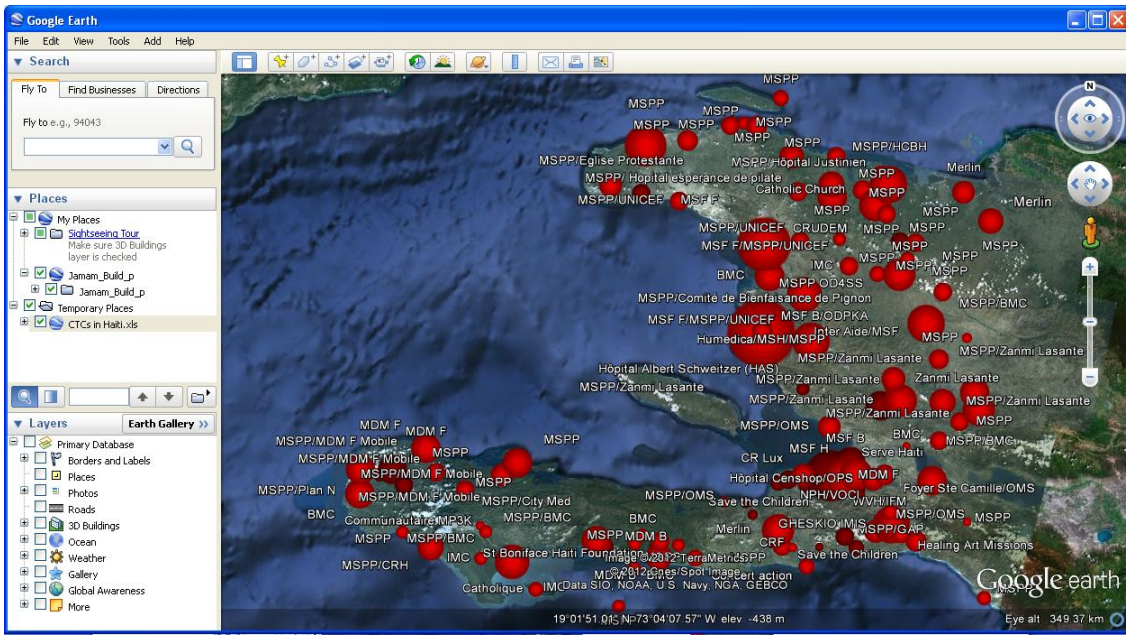


Figure 15: Cholera Treatment Centre coverage in Haiti using Google Earth

How can I see additional information for each dot

By clicking on any dot, we can see all of the information that was in the spreadsheet row for that particular CTC (Figure 16).

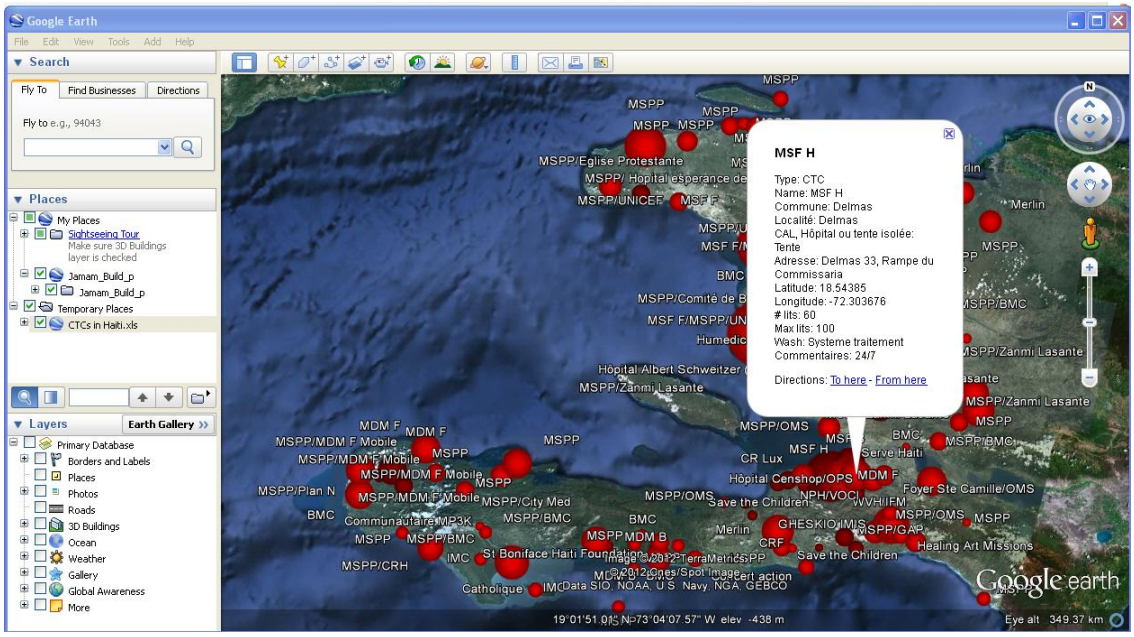


Figure 16: Information window for each data point displayed in Google Earth

I want to change the labels of the dots

In addition we can edit the colour and size of the labels. Click on the label colour button in Joekit and select a colour from the panel. Sample text is indicated below the panel (note the labels do not appear in the preview window with the dots but only when the KML file is opened in Google Earth).

Similarly the label sizes can be varied in the 'label size' window (note there is no maximum size, there are no units and the sizes are dependent on the computer and Google Earth settings).

To remove labels, deselect the label points checkbox

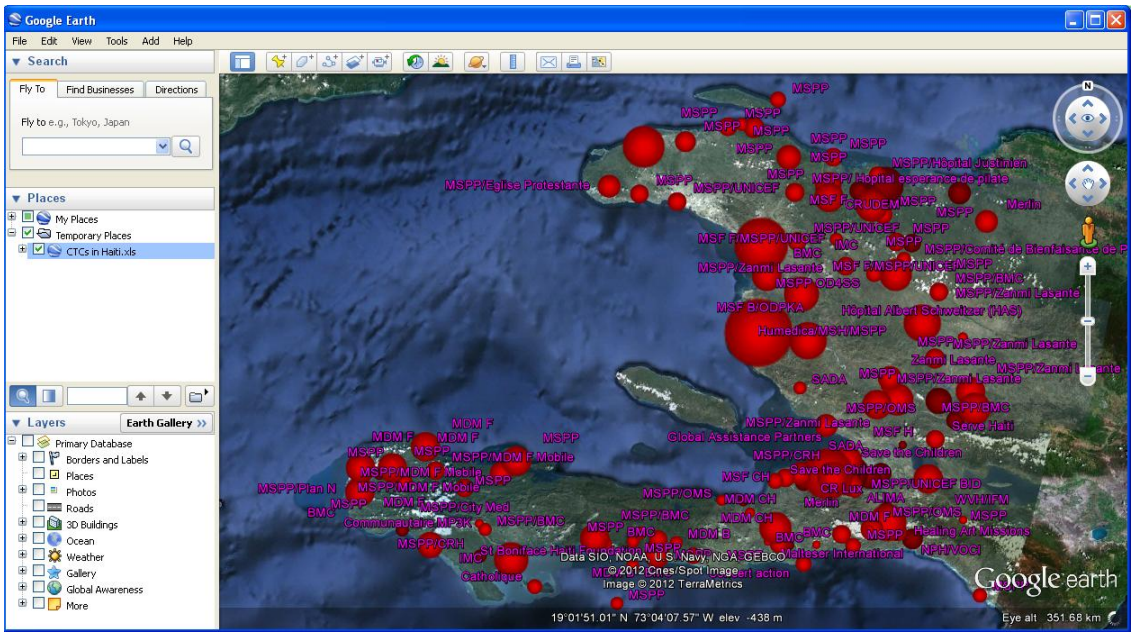


Figure 17: Change label colour and size

I want to change the shape of the dots

You can even use a different symbol (instead of the standard dot generated by Joekit). Click on the 'icon file' button and select the file 'MSF logo without text.png' (almost any image file can be used here). The default icon file is http://maps.google.com/mapfiles/kml/shapes/shaded_dot.png which all Google Earth programs can access. Open the resulting KML file in Google Earth (note if you already have the previous map open in Google Earth, you can click on 'File' and then 'Revert' in Google Earth to refresh the map with the new data. The CTCs should now appear with the MSF icon (These were not all MSF CTCs. This is simply an exercise).

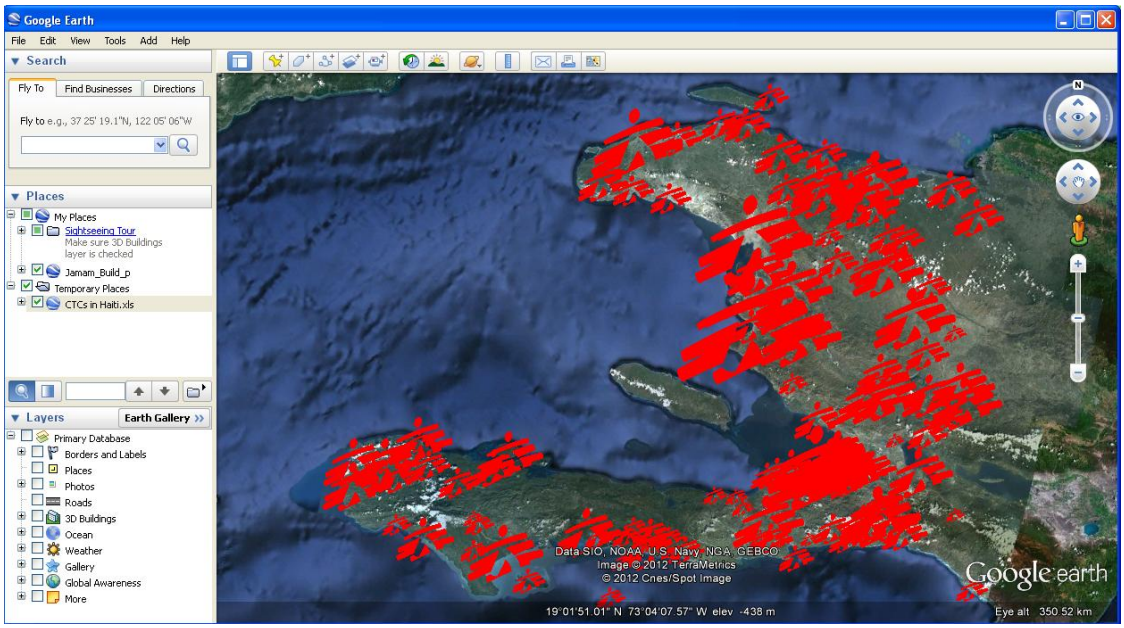


Figure 18: Altering the icon type

If you wish to email a '.kml' file in which you have changed the icon, you will need to save the file as a file with the extension '.kmz' in Google Earth (File→Save→Save place as). You can then send this file in which the new icon is embedded.

I want to change the colours of the dots

You can even use different colours to represent different types or values in your data. Reopen Joekit and input 'Template example workbook for Joekit.xls' verifying that Joekit has selected the correct columns for latitude ('Lat'), longitude ('Long') and name ('Name') in the drop-down lists.

Check the 'Variable icon colours' box. For a variable with two categories you can choose a colour for each. For the drop down box 'Choose the column whose contents will determine icon colour' select the variable 'sex'. The min, mid and max values will automatically choose 1, 1.5 and 2 respectively. If not, select these values. Click the 'Default icon colour' and select a colour from the panel (the colour for males). Do the same for the 'Max icon colour' (the colour for females). The 'Mid icon colour' is not important for this example (but the value must lie between the min and max). Click 'Create KML' and view in Google Earth (Figure 19).

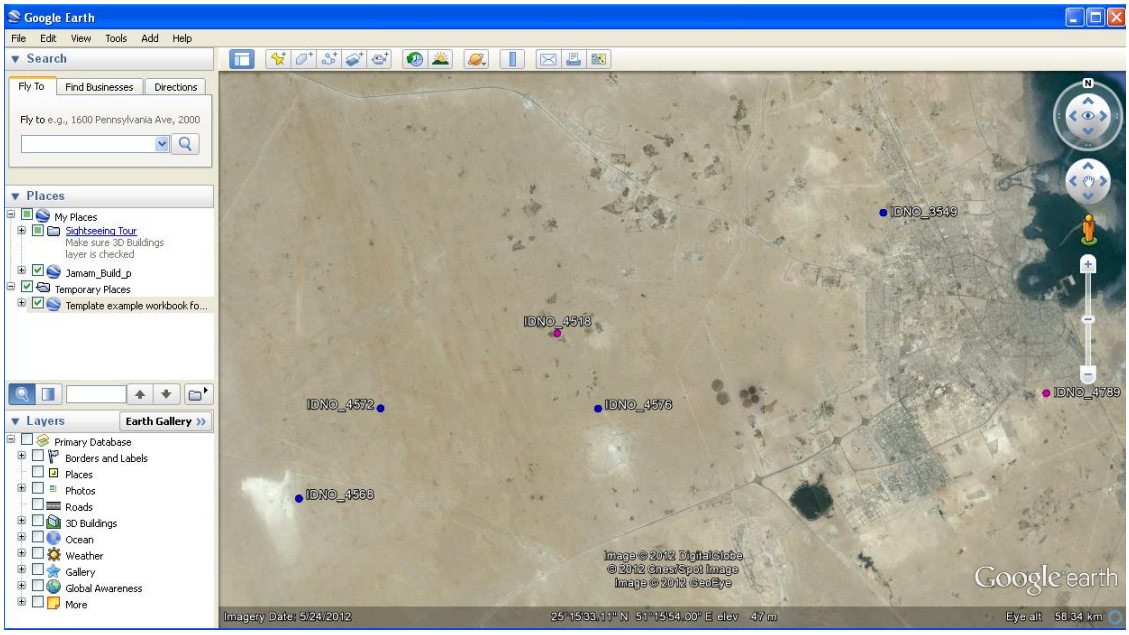


Figure 19: Using different colours for binary categorical variables (sex)

For a continuous variable you can vary the icon colour through a range. For example for the drop down box 'Choose the column whose contents will determine icon colour' select the variable 'age'. For the min, mid and max values choose 0, 5 and 15 respectively. Click the 'Default icon colour' and select a colour from the panel (e.g. red). Do the same for the 'Mid icon colour' (e.g. yellow) and the 'Max icon colour' (e.g blue). The icon colours will vary between these colours according to the age value. Create KML and view the different age groups in Google Earth (Figure 20). The selection of colours and value cut-offs can be quite tricky so consider creating categorical data (e.g. age groups) instead.

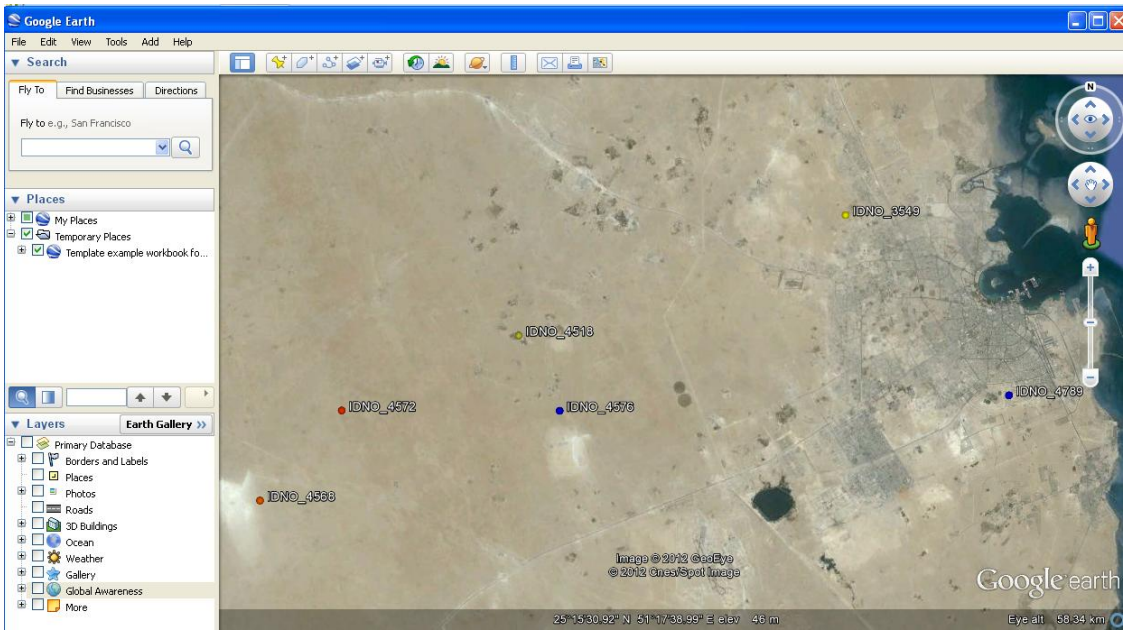


Figure 20: Varying icon colour with variable values (age)

For a variable for which you already have categories, Joekit will automatically assign a colour to each value. For example select the categories checkbox and for the drop down box 'Choose the column whose contents will determine icon colour' select the variable 'outcome'. A window appears with the automatic icon colours. Create KML and view the different outcomes in Google Earth (Figure 21). You could also select age group as a category instead of using age as a continuous variable.

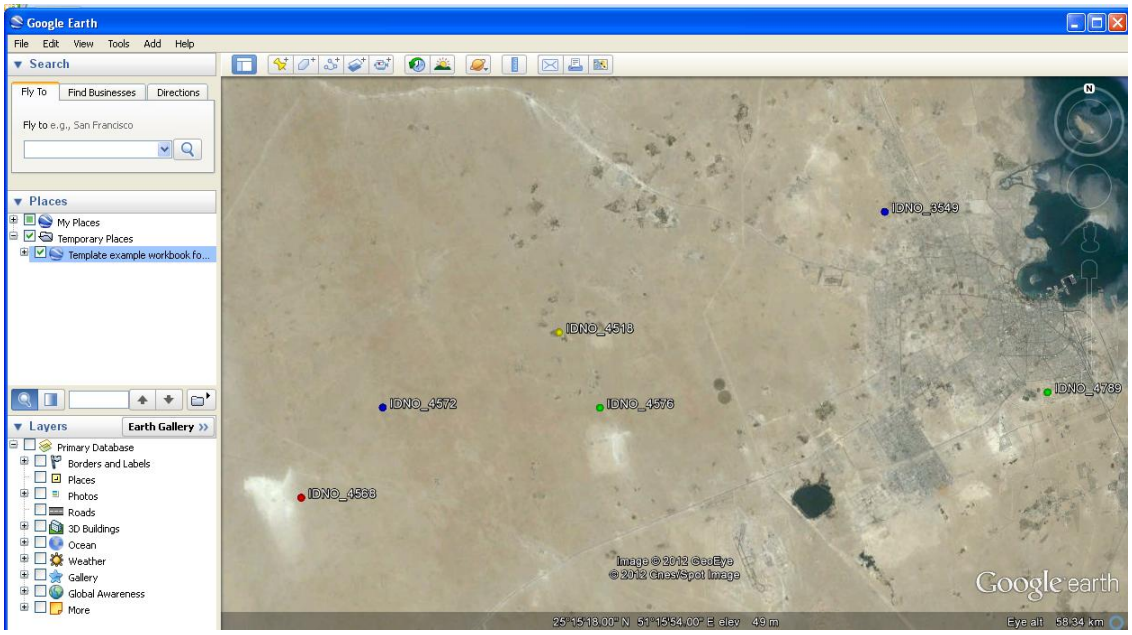


Figure 21: Representation of categorical data by icon colour (outcome)

I want to add a legend to the map

To add a legend, please select the legend checkbox. The automatic legend will appear as a pop-up window in Joekit. Create KML and view the automatic legend in Google Earth (Figure 22). Note the legend option only works for variable icon colours not variable icon size. An automatic folder called 'files' is created in the same location as the spreadsheet containing the legend image file (legend.png).

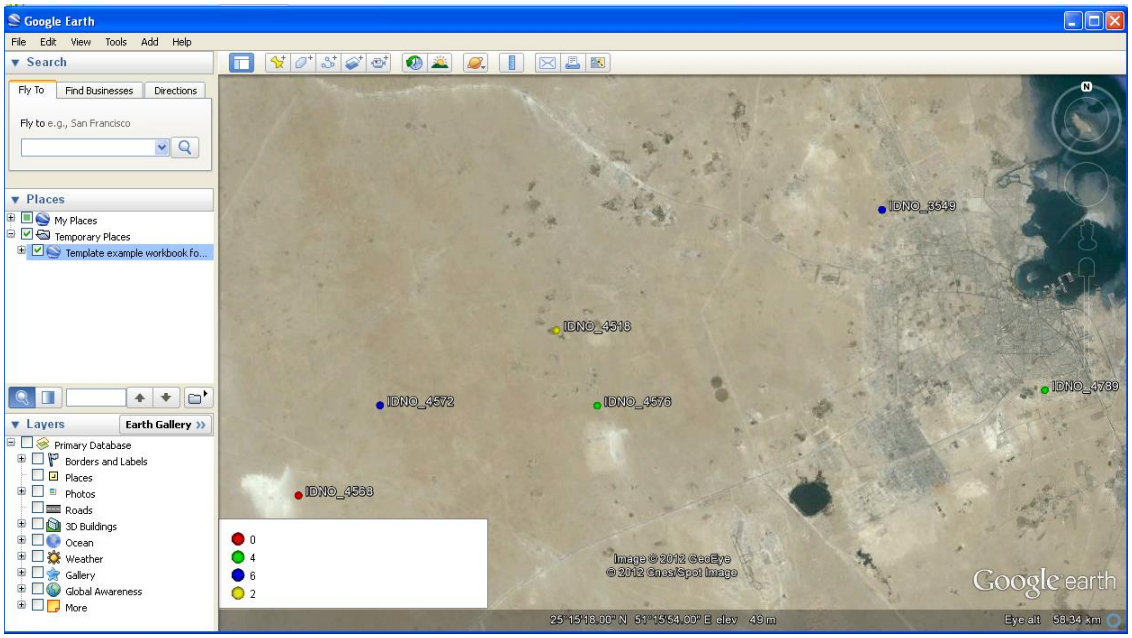


Figure 22: Automatic legend for categorical data created by Joekit for Google Earth

Animation

Joekit will also create time series animations of your spreadsheet data.

For the cholera example, check the 'Animate' box and for the drop down box 'Start date column' and 'End date column' select Date. Deselect the "no end dates" box if there is only a start date for the data. If you wish to observe the data daily, select the 'No end date, just this many days per item' checkbox and choose 1 day. For weekly data, choose 7 days etc . You may wish to deselect the 'variable icon colours' box so that all patients are a single dot colour.

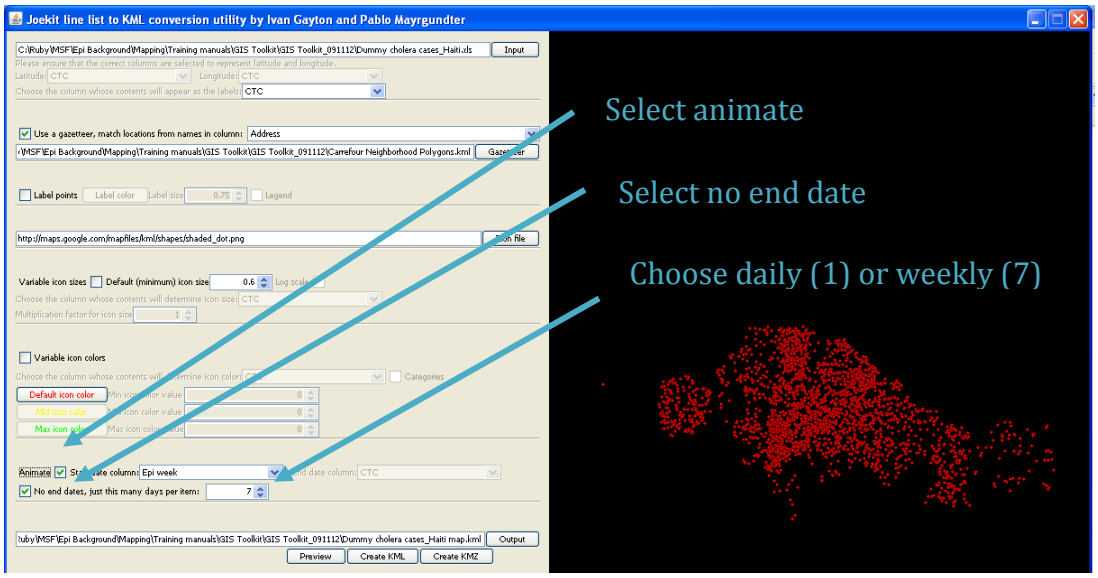


Figure 23: Animation options in Joekit

'Click 'Create KML' and view the time series animation in Google Earth. To play the time-series movie, please see the Guide to Google Earth in the GIS Toolkit.

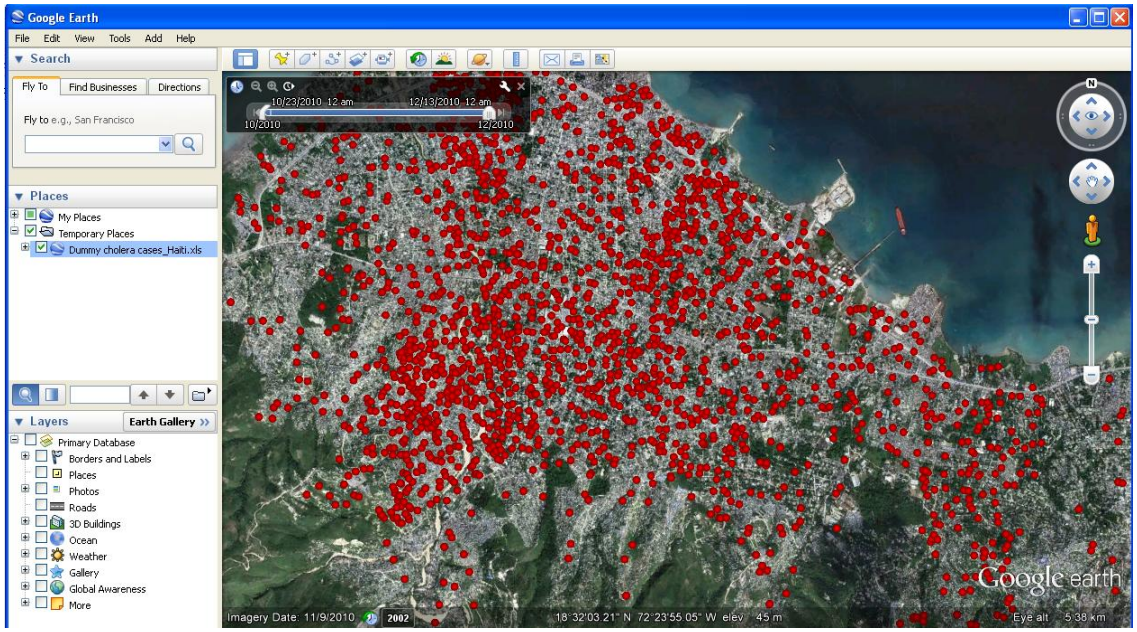


Figure 24: Time-series animation of cholera cases in Carrefour, Haiti

You can also create animations with icon size and colour proportional to the number of daily cholera cases per quartier. To do this, replace the gazetteer with 'Carrefour Neighborhood Points.kml'. Check the box "Variable Icon Sizes" and for 'Choose the column whose contents will determine icon size' select the variable "instances" (this does not exist as a column in the spreadsheet but simply tells Joekit to apply the number of cholera cases per quartier to the icon size). In addition you can vary the icon colour by checking the 'Variable icon colours' box. For the drop down box 'Choose the column whose contents will determine icon colour' select the variable 'instances'. The min, mid and max values will automatically be chosen but you can change these. Click the 'Default icon colour' and select a colour from the panel (the colour indicating a low number of cases per quartier). Do the same for the 'Mid icon colour' (the colour indicating a moderate number of cholera cases per quartier) and the 'Max icon colour' (the colour indicating a high number of cases per quartier). Select animate (based on "Date"). Click 'Create KML' and view in Google Earth (Figure 25).

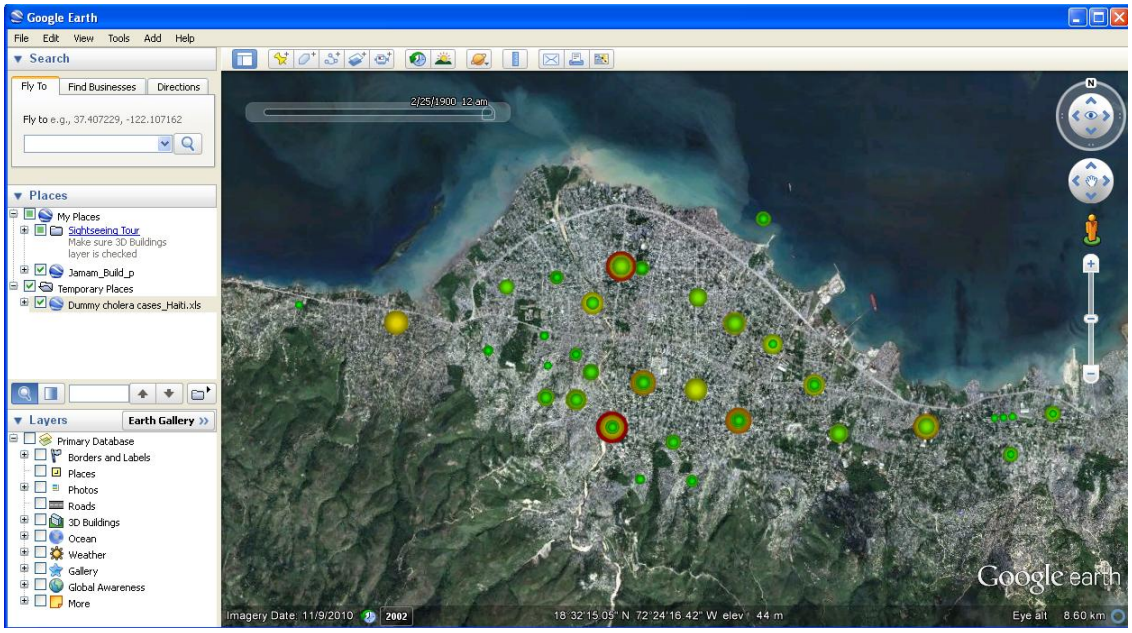
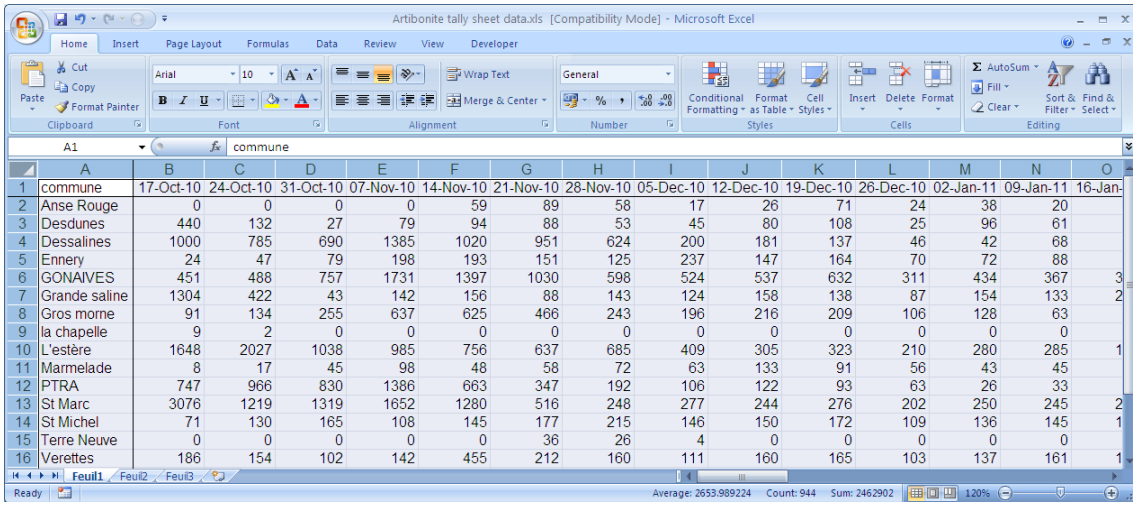


Figure 25: Time-series movies with variable icon sizes and colours to distinguish quartiers with high weekly numbers of cholera cases in Carrefour, Haiti

Tallykit

What does a tally sheet look like?

A tally sheet usually merges line lists into daily or weekly data (Figure 26). Tally sheets do not contain geographic coordinates as they merge many individual data points. Therefore tally sheets will always need a gazetteer.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	commune	17-Oct-10	24-Oct-10	31-Oct-10	07-Nov-10	14-Nov-10	21-Nov-10	28-Nov-10	05-Dec-10	12-Dec-10	19-Dec-10	26-Dec-10	02-Jan-11	09-Jan-11	16-Jan-
2	Anse Rouge	0	0	0	0	59	89	58	17	26	71	24	38	20	
3	Desdunes	440	132	27	79	94	88	53	45	80	108	25	96	61	
4	Dessalines	1000	785	690	1385	1020	951	624	200	181	137	46	42	68	
5	Ennery	24	47	79	198	193	151	125	237	147	164	70	72	88	
6	GONAIVES	451	488	757	1731	1397	1030	598	524	537	632	311	434	367	3
7	Grande saline	1304	422	43	142	156	88	143	124	158	138	87	154	133	2
8	Gros morne	91	134	255	637	625	466	243	196	216	209	106	128	63	
9	la chapelle	9	2	0	0	0	0	0	0	0	0	0	0	0	
10	L'estère	1648	2027	1038	985	756	637	685	409	305	323	210	280	285	1
11	Marmelade	8	17	45	98	48	58	72	63	133	91	56	43	45	
12	PTRA	747	966	830	1386	663	347	192	106	122	93	63	26	33	
13	St Marc	3076	1219	1319	1652	1280	516	248	277	244	276	202	250	245	2
14	St Michel	71	130	165	108	145	177	215	146	150	172	109	136	145	1
15	Terre Neuve	0	0	0	0	0	36	26	4	0	0	0	0	0	
16	Verettes	186	154	102	142	455	212	160	111	160	165	103	137	161	1

Figure 26: Tally sheet of weekly cholera cases in the Artibonite delta, Haiti

How to create maps from tally sheets?

1) Double-click the “Tallykit.jar” program to open it. The Tallykit display window appears with a section for mapping options on the left and a preview window on the right (Figure 27). Tallykit is much more straightforward to use than Joekit and has a simpler display window.

Figure 27: The Tallykit display window

2) Click the "Input" button at the top, and navigate to the spreadsheet file you wish to map (please select 'Artibonite tally sheet data.xls').

3) Select the gazetteer 'Communes Artibonite.kml' and click on 'Preview KML'. A simple preview will appear in the window on the right.

4) Click 'Create KML' and double-click the resulting file (that will be called 'Artibonite tally sheet data map.kml' and found in the same folder as the tally sheet).

5) Tally kit has automatically created a time-series of weekly cholera cases as variable sized dots that can be viewed in Google Earth (Figure 28)

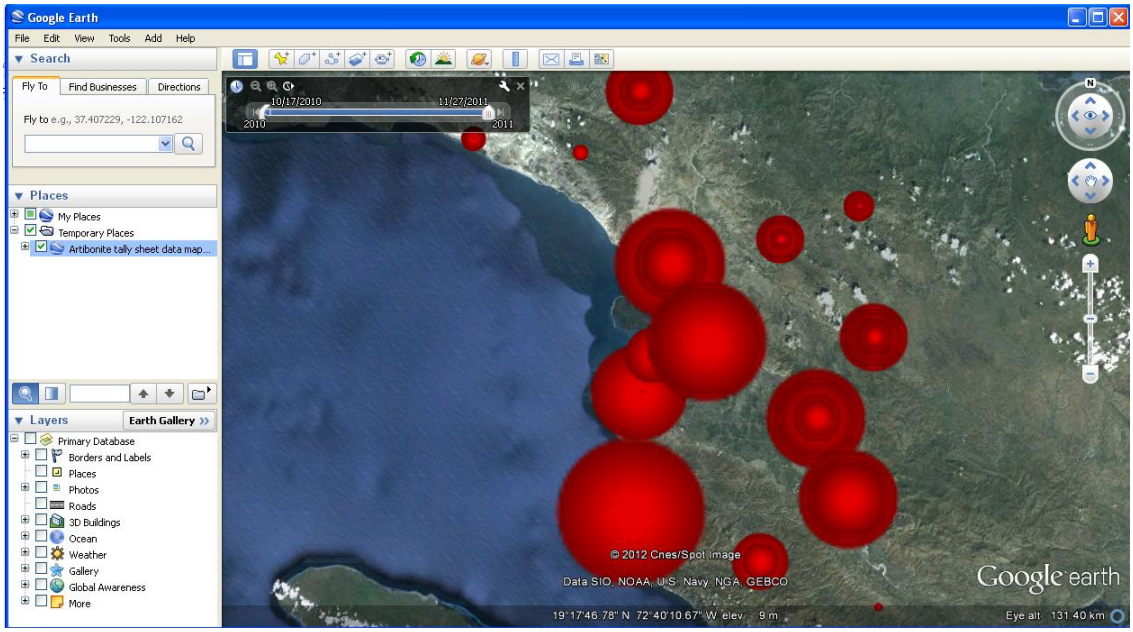


Figure 28: Cholera cases in the Artibonite delta, Haiti presented as variable sized icons per commune per week in a time series movie in Google Earth

Frequently Asked Questions (FAQ)

Spreadsheet format

1. Joekit will also recognise some alternative column labels automatically:
    a. Latitude = "lat", "latitude", "north" or "northing"
    b. Longitude = "long", "longitude", "east" or "easting"
    c. Names to link to gazetteer = "name", "id", "place name", "placename", "address" or "location"
    d. Names to use as default label = "name", "id", "label", "place name" or "placename"
    e. Size = "size"
    f. Color = "color" or "colour"
    g. Date (or start date) = "date", "start date", "startdate", "start", "begin", "time" or "week"
    h. End date = "end date", "enddate", "finish" or "end"
2. For the latitude and longitude columns, the negative sign ('-') is important as South (S) and West (W) labels cannot be read by Joekit
3. Spreadsheets should only have a single header row as Joekit cannot handle more than 1 header row.
4. Dates should always be in the European format (dd/mm/yyyy). Epidemiological weeks are not currently recognised so please ensure there is a date column
5. Potential errors. Joekit may not recognise data containing symbols, accents, quotation marks and non-roman letters.

Joekit screen format

1. If the preview window disappears, simply click the 'Preview KML' button again
2. If the dots seem to disappear each time another window overlaps the Joekit window, do not worry. This is a flaw seen on some PCs only but no data has been lost. Simply click the 'Preview KML' button again

3. If you are inputting different files into Joekit it can sometimes apply formatting from a previous action or jam on a 'please wait while I consider your request' window. Simply close Joekit and reopen.

4. If you are inputting spreadsheets that do not require a gazetteer, please ensure the box 'Use a gazetteer, match locations from names in column' is deselected, otherwise Joekit will still ask for a gazetteer.

5. Remember for data that requires a polygon gazetteer, the dots generated are 'jitterdots' i.e. dots randomly located within the 'placename' polygon. They DO NOT indicate the exact location of the patients or spreadsheet data.

Google Earth formatting

1. If, after viewing your data in Google Earth, you wish to make changes to the formatting of that data (e.g. icon or label sizes), make the changes in Joekit, click the 'Create KML' button and instead of double-clicking on the new KML file, in Google Earth (which is currently displaying the old KML file) go to File→Revert and the newly formatted data will appear