TUTORIAL: MAPPING POINTS IN EXCEL WITH POWERVIEW

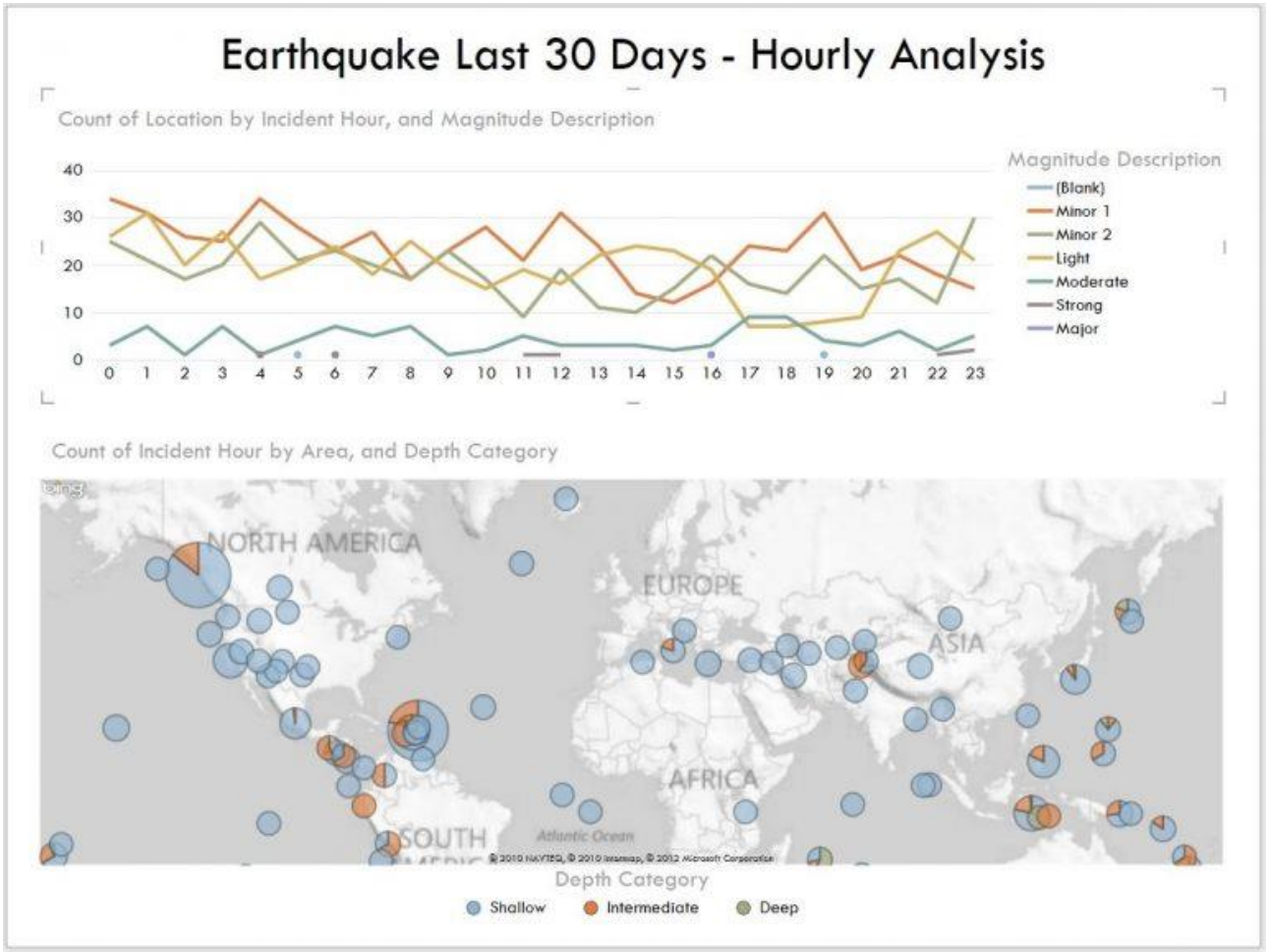
Today's tutorial will present how to use the new PowerView add-in in Excel to produce simple dashboards and maps.

Not being trained as a GIS officer, I've always been a bit jealous of my colleagues who could produce nice maps in only a few clicks. However, learning GIS systems such as ArcGIS or QGIS looks a bit complex for newbies. If you'd still want to impress your GIS colleagues – or just don't have any one around to do your mapping for you – we're going to discover today a new tool that allows user-friendly and simple creation of dashboards for quick reporting, including some mapping functions.

This tool is based on a software many of you already master, Microsoft Excel: it's an add-in called PowerView that has been introduced in the 2013 edition.

There are currently 4 options to create maps with Excel:

- With a background map in Excel as Dashboard option
- With Bing Map
- Mapping points in Excel with PowerView, that we'll learn today
- Using Power map in Excel

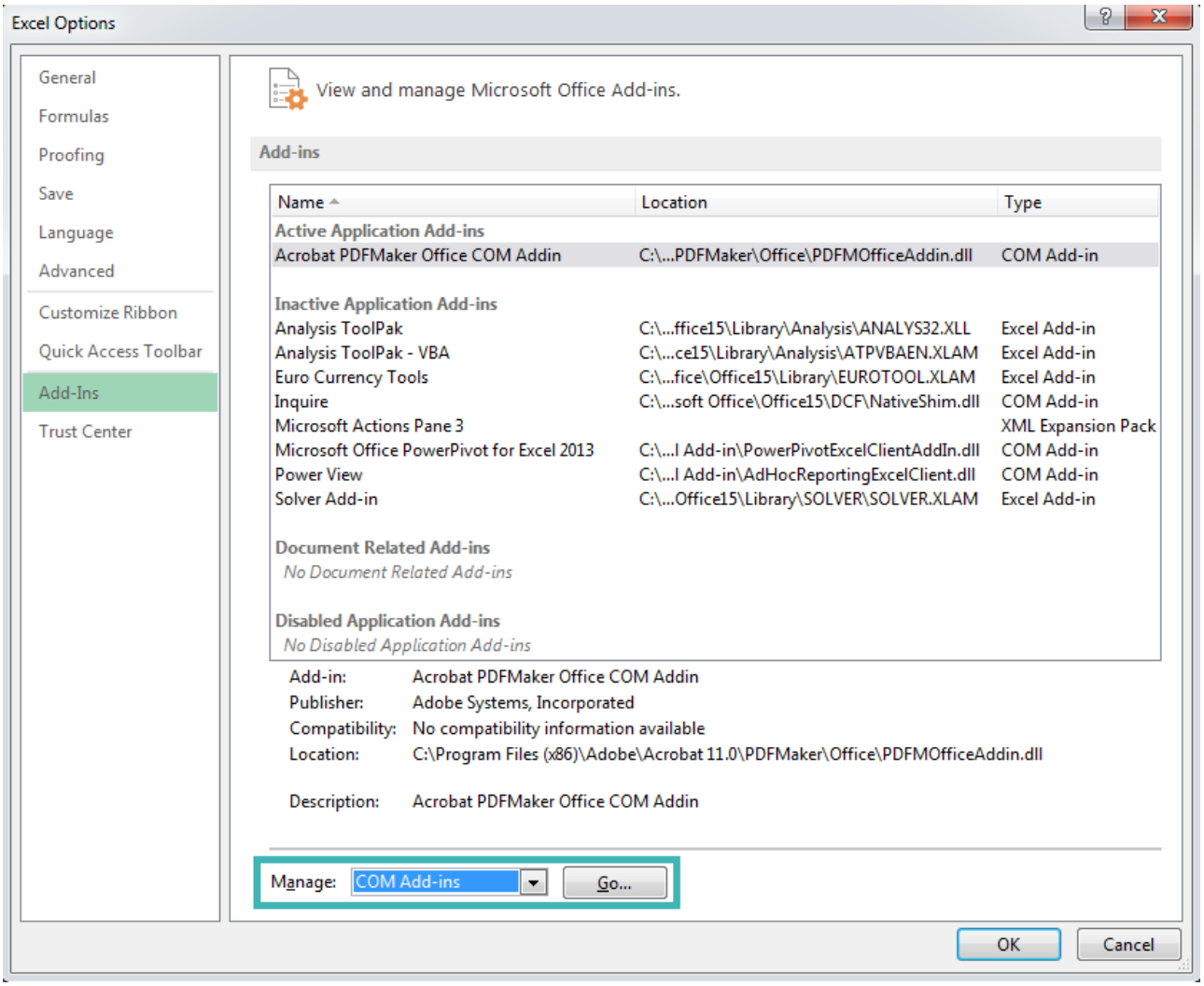


For this tutorial, we'll need 4 things:

- Excel 2013 with the adds-in PowerView + PowerPivot installed (Office Professional Plus)
- An Internet access for the Map Tiles (based on Bing Maps)
- A set of geo-located point you want to feature on a map. If you don't have your own data, you can use **the attached spreadsheet**, with data from a school survey in Central African Republic produced by OCHA.
- An up-to-date version of Microsoft Silverlight.

I. Installing PowerView

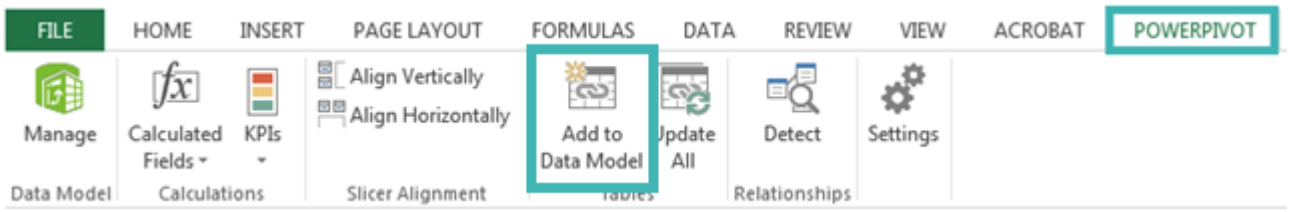
Open the spreadsheet containing your data in Excel 2013 and go to the Options menu. In the "Adds-in" section, at the bottom, select "Excel adds-in" in Manage and click the "Go" button:



In the window that appears, select "Microsoft Office PowerPivot for Excel 2013" and "Powerview".

II. Creating a dashboard

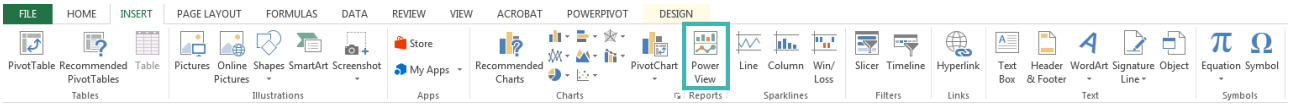
You'll notice that a new tab appeared in the Excel top menu:



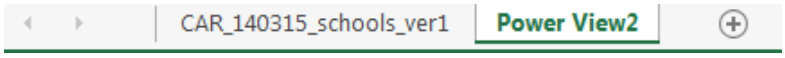
In this new Powerpivot menu, click on the "Add to Data Model" button – you'll need to have opened a valid dataset file like the one provided earlier.

A new window will open, just close it, we don't need to edit anything here for a basic use (if you click again on the "Add to Data Model" button, you'll notice that Excel will refuse to add the same dataset again). Excel automatically selected all your data.

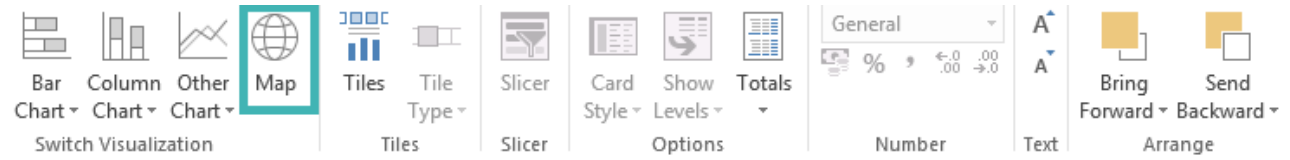
We are now ready to go to the "Insert" menu and click on the (new too) "PowerView" button:



After a few seconds, Excel will create a new sheet for your PowerView dashboard:



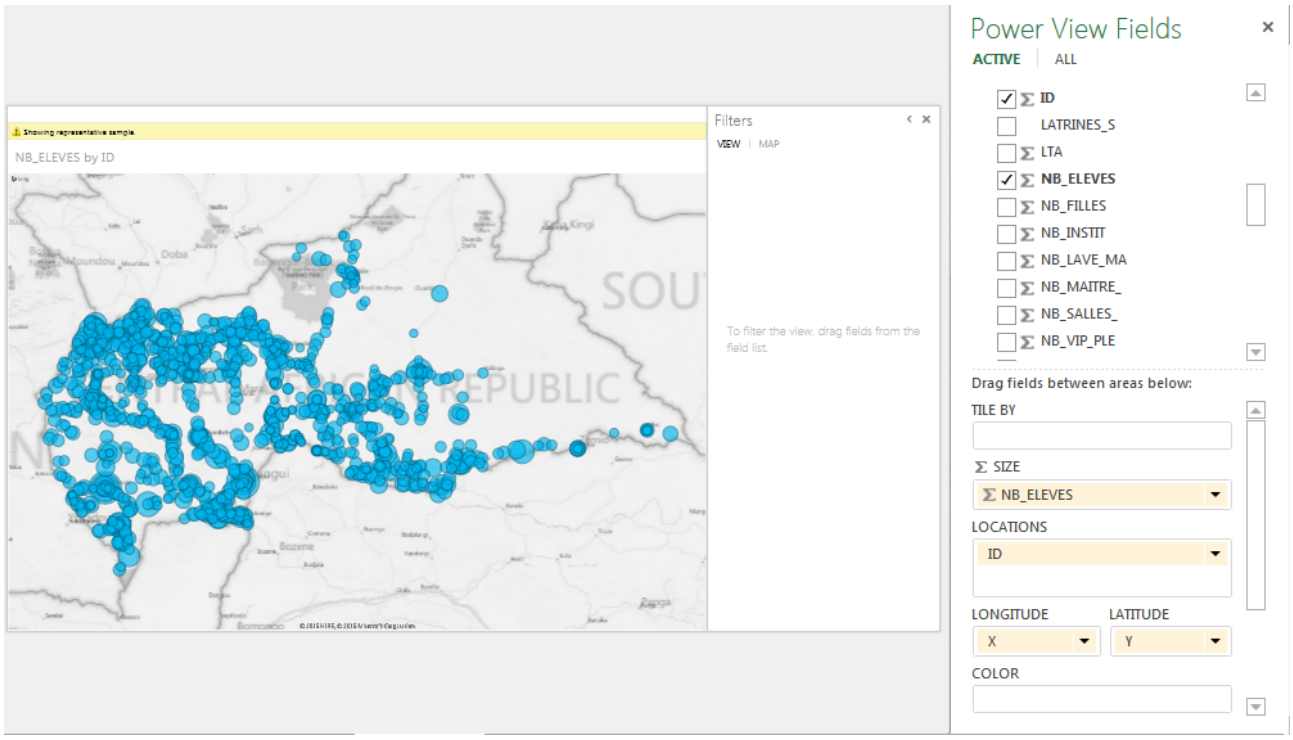
The Design tab should also automatically open. This menu will allow you to add the different elements of your dashboard: charts, tiles, and what's interesting to us here, maps:



Click on the "Map" button. Excel will automatically select some data to prepare the map, however it will most likely not suggest what you'll want.

Use the menu "Power View Fields" on the right to select the data you want to display, using drag & drop. In this basic example, the location of schools is displayed (Longitude = X, Latitude = Y) with circles proportional to the number of students (Size = NB_ELEVES).

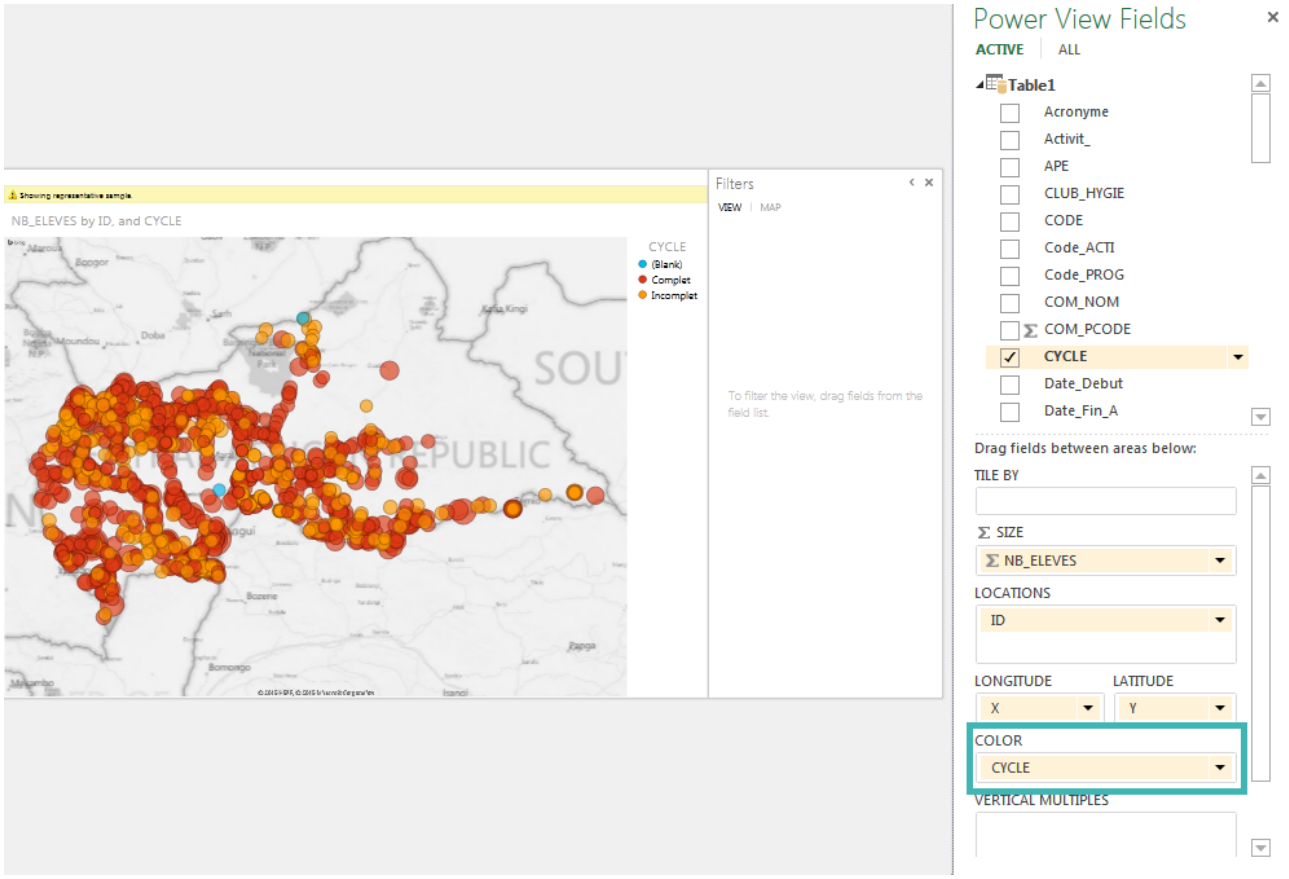
Excel should automatically zoom to the area where your data is (in this example, the Central African Republic) and select a sample if there is too much data.



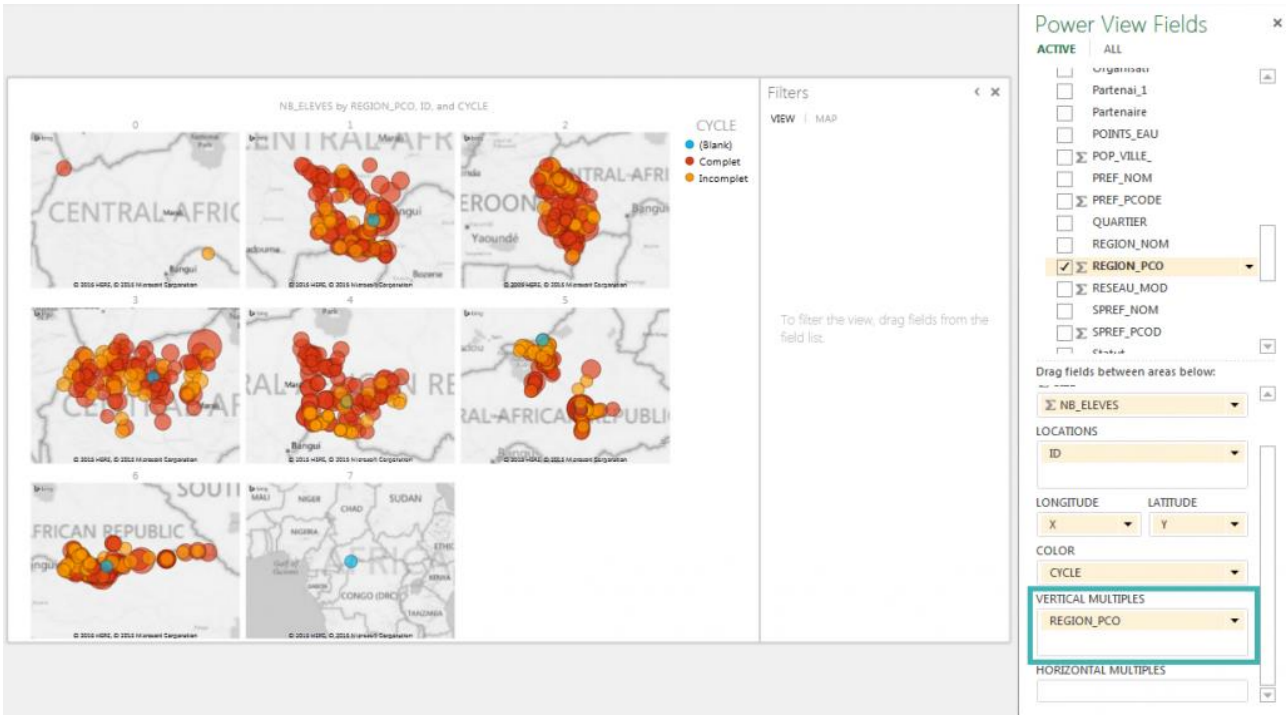
A few tips:

- You can substitute the Latitude/Longitude by an address, using the Locations field. In fact, **the Locations field cannot be empty, even if you don't actually use it to locate your data**: if you intend to use X/Y columns and not addresses like in our example, use a dummy column for the Locations field. Just make sure you're using a column on which every line has data, e.g. the ID column (if not, the empty lines won't be displayed).
- The Σ character means that a field requires numeric data (size), and which columns fit it.
- Use the button on the top right of the map to maximize it on the sheet.
- You can display more information on each location by scrolling over it, it will display an information bubble.
- Excel automatically includes the area and level of zoom to display all your data, but you can also move manually on the map like on any web mapping platform.
- To remove a criteria, click on the drop-down menu on the right of each field and select "Remove field".

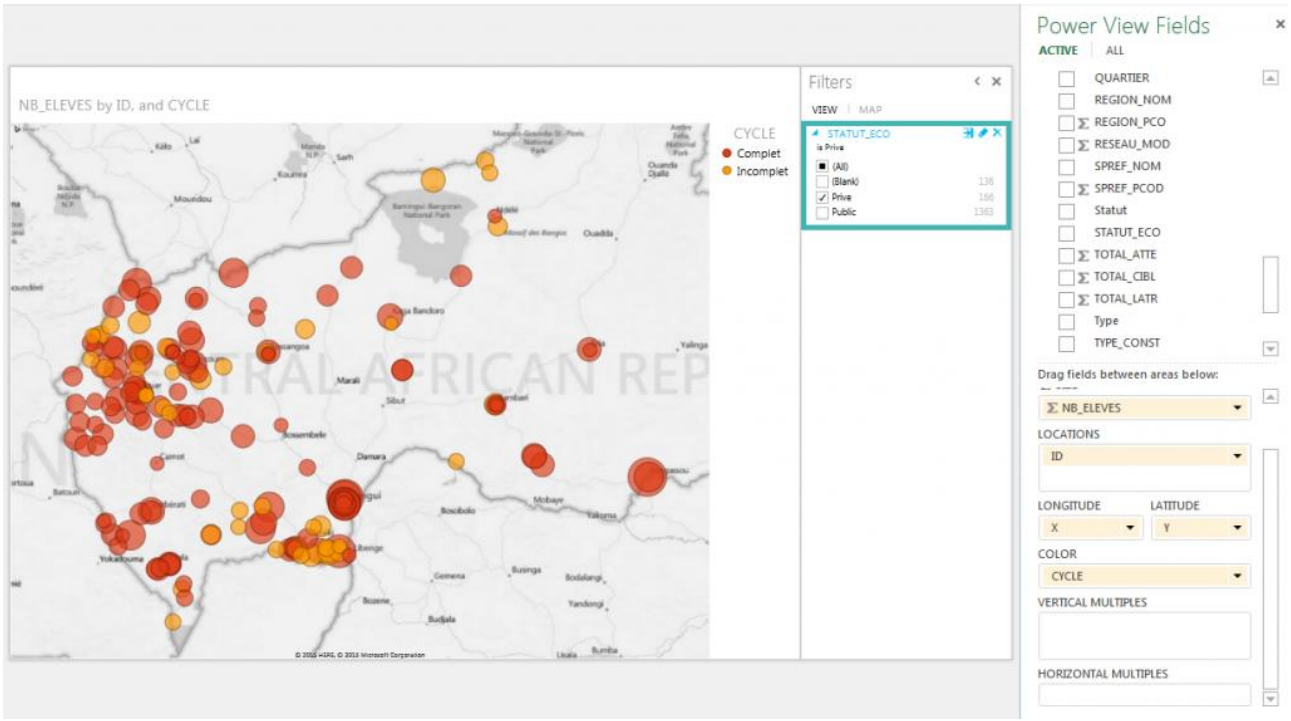
You can also play with the Colour of the circles, for instance here differentiating the schools based on the CYCLE column:



The field Vertical multiples and Horizontal multiples allow you to display several maps based on a column, for instance here the REGION_PCO to show several mini maps based on the region:



Finally, you can add Filters, also by dragging & dropping columns in the corresponding menu. For instance, here only the private schools are displayed, using STATU_ECO column as filter:



You now have seen all the important aspects of PowerView mapping, we're now ready for a small exercise!

III. Let's test your new skills!

Want to impress your colleagues with this magical add-in? Not so fast, we first need to make you're fully proficient with your new toy.

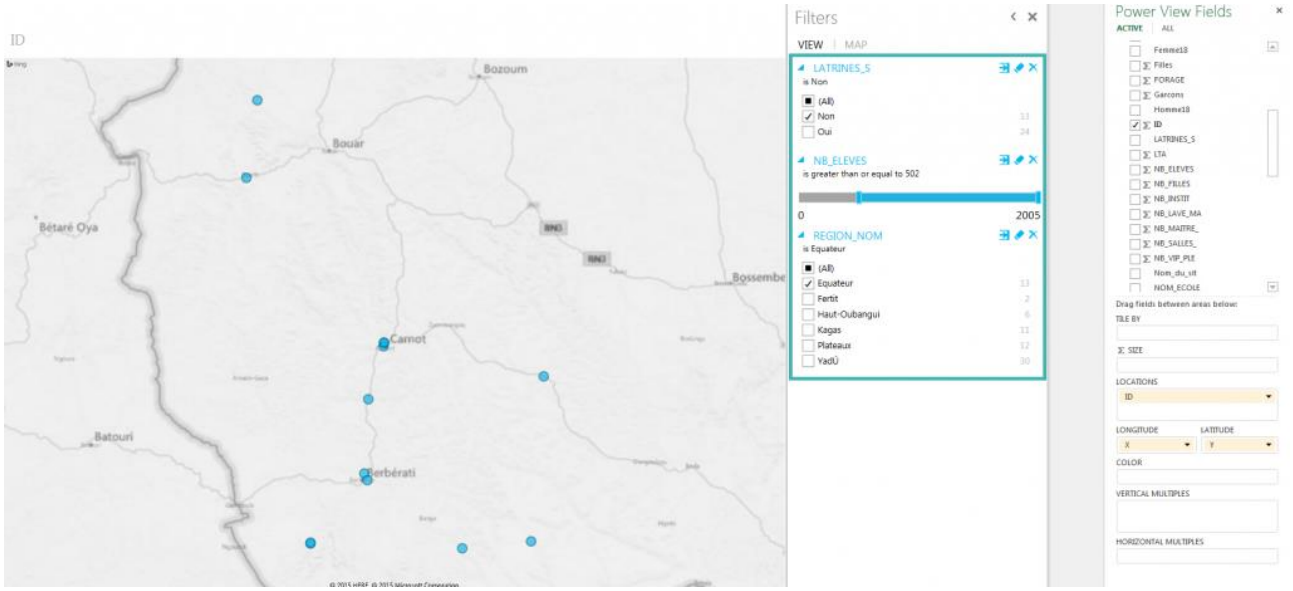
Here a quick exercise to check it, you have 10 minutes to perform it:

"As a WASH coordinator you need to target all schools in the region "Equator" which do not have any latrines yet for your programme planning cycle. For now, you focus on schools with more than 500 students. Prepare a dashboard to plan your intervention".

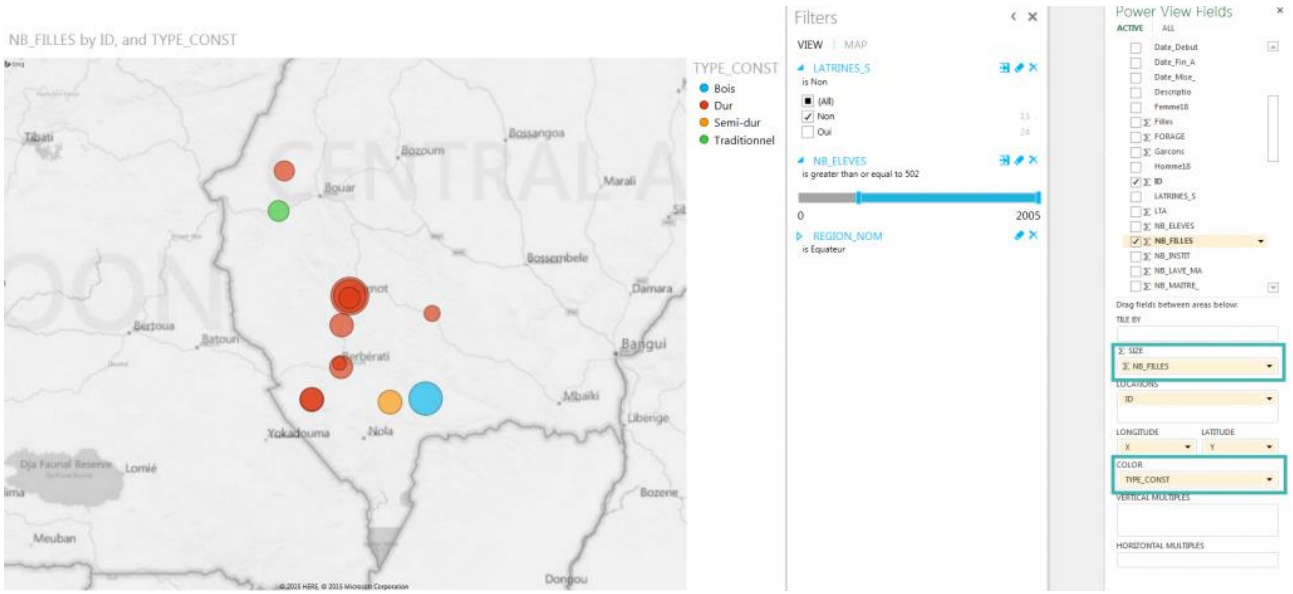
… and it's time! Did you managed to get that dashboard? Let's check if you followed the procedure well:

- Insert a new Power View into your Excel Table and create a map
- Map out all schools, using Latitude/Longitude (but also filling the Locations field as explained above), and filter only the ones with REGION_NOM "Equator"
- Filter for all schools without any latrines (LATRINES_S)
- Filter for schools with more than 500 students (NB_ELEVES)

The resulting map should display 13 schools:



If you want to improve your dashboard even more, you can display the Size of the circles based on the number of girls (NB_FILLES) to prioritize the schools with more female students since not having latrines is a protection concern. You can also display Colour based on Construction type (TYPE_CONST) to give pointers to your construction team:



So, based on this dashboard, which schools would you target first?

IV. Conclusions

IV.1. Pros & cons

As you've seen, this technique offers interesting advantages, however it also has its disadvantages. In a nutshell:

Pros	Cons
Filtering	Resource-consuming for your computer
Mapping without much data treatment	Mapping only works when online
Mapping locations based on two columns (GPS coordinates and addresses)	Map can only be printed or print screened (no export options as graph)
Mapping of categories based on colours	The size of the points cannot be changed easily
Mapping of point sizes based on numerical value	A bit more complex and some more advanced knowledge is needed
Mapping data out of more than one table	

IV.2. Potential use cases

Still wondering how you can use PowerView for your missions? No worry, we've also thought of that. Here's a list of potential situations in which you could utilize this new tool:

- Mapping out infrastructure points with additional attribute data, such as schools, water points, health centres, etc.
- When you need to visualize data spatially based on more than one database/table: like 3W data with programme intervention to demonstrate that there is no duplication (donor reporting)
- When you need to visualize MDC data which you don't want to treat any further, can be combined with Power Pivot Charts and Tables
- When you display statistical data linked to points and there is no GIS capacity available

We've reached the end of this tutorial, I hope you liked it and use it to help many a beneficiary with Excel (not that I doubt you're not already doing it).

Feel free to comment/ask questions. We haven't planned to produce tutorials on the other 2 Excel mapping techniques soon, but let us know if you think it'd be useful!