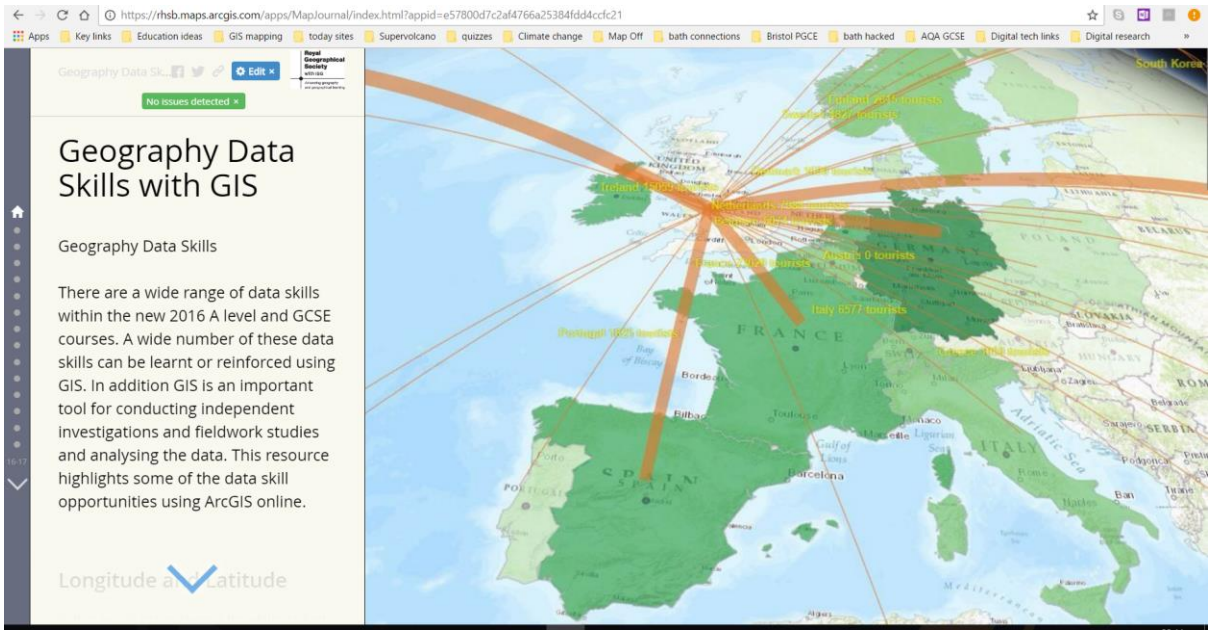
Data skills Storymap

This link provides an overview of the range of key data skills which can be supported using ArcGIS online http://arcg.is/2mtIrb3



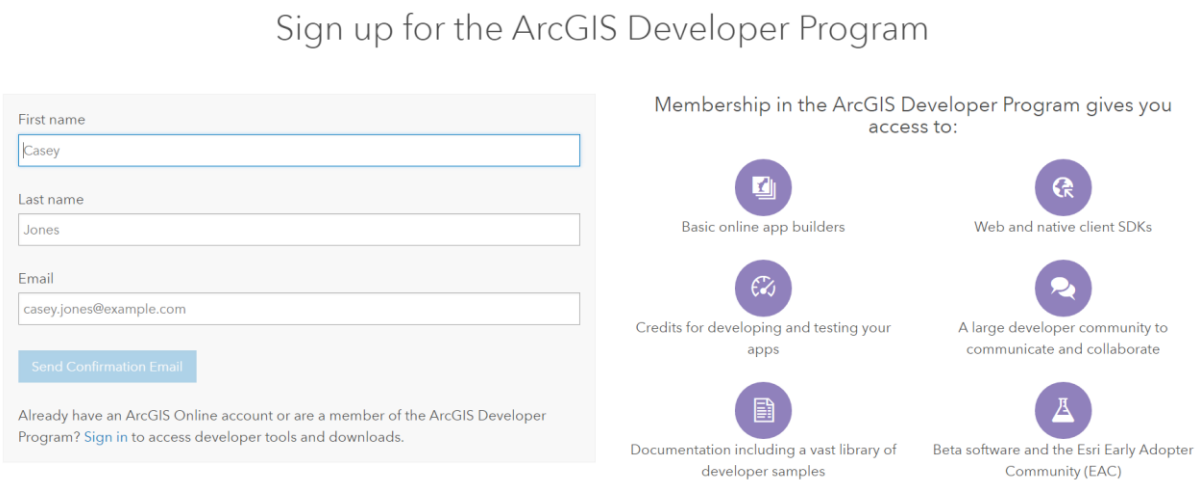
Managing student accounts and Free Esri developer account

As a school you can pay for an education account of ArcGIS Online. This is very cheap, around £120 a year, and gives you around one or two thousand credits and up to 500 users.

You can set up accounts for your students within your organisation. This will give them ability to access maps, save their maps and perform spatial analysis. However, they can use up your credits and it takes time to both create and later delete accounts manually.

An alternative would be to get students doing their projects to set up a free Esri Developers Account. With this account they get full access to ArcGIS online functionality and 50 free credits each month. This saves a school needing to manage these accounts. This is explained here https://developers.arcgis.com/pricing/

Here is the link to sign up https://developers.arcgis.com/sign-up



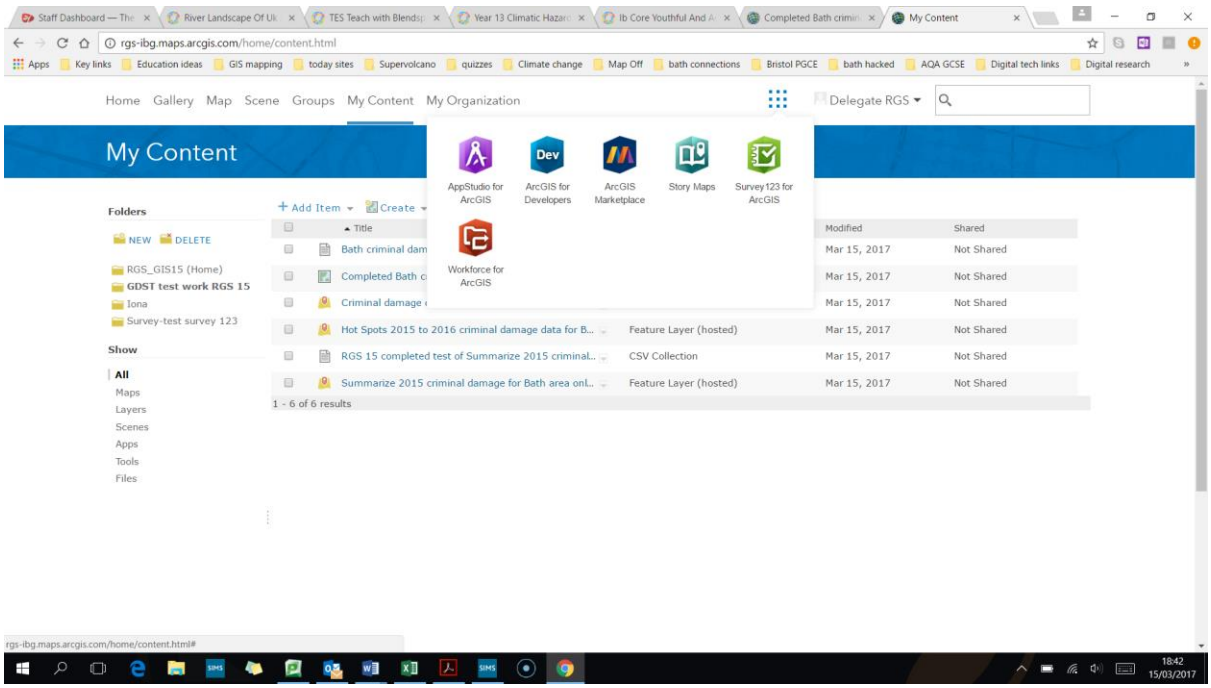
Students can sign up with a school email. They respond to the confirmation email and set up a password. Then they simply open a new tab and go to www.arcgis.com and type in their new account log in details and are ready to go. It just takes a couple of minutes.

Teachers may also want to have such an account for themselves to play with and test ideas out without risking the school's credits.

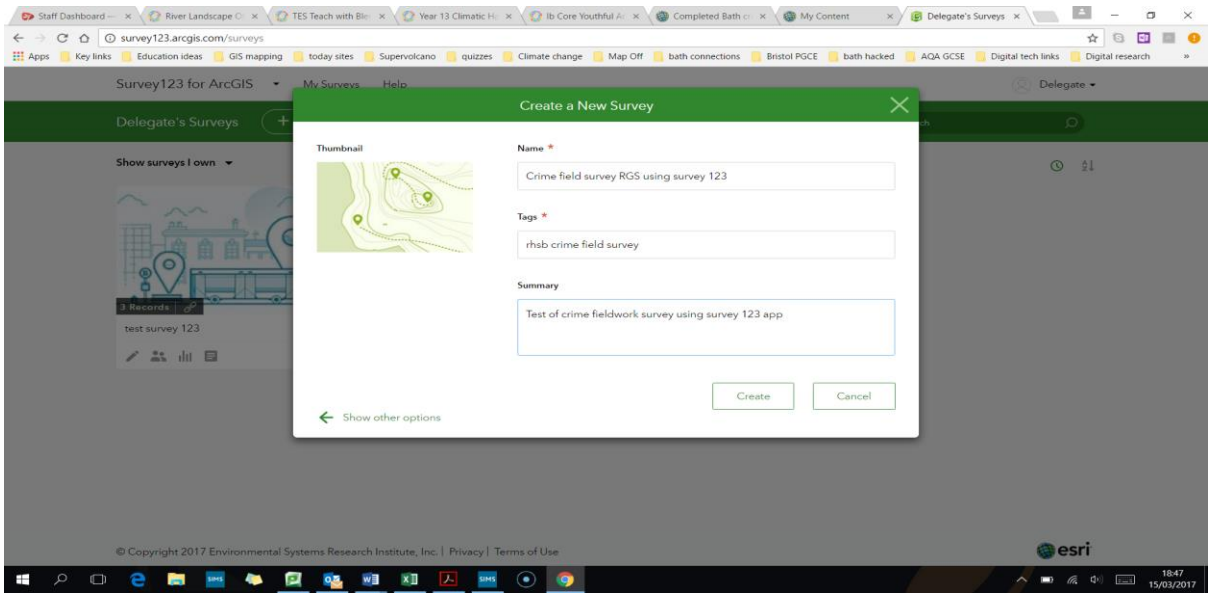
Creating primary data layers for ArcGIS and running calculations

There are several ways to input primary fieldwork data your students collect into ArcGIS online. You can create a spreadsheet with longitude and latitude references, save it as a csv file and bring this in. You can also create a layer from scratch and neat online forms to fill in the data using survey 123. Let's look at this option.

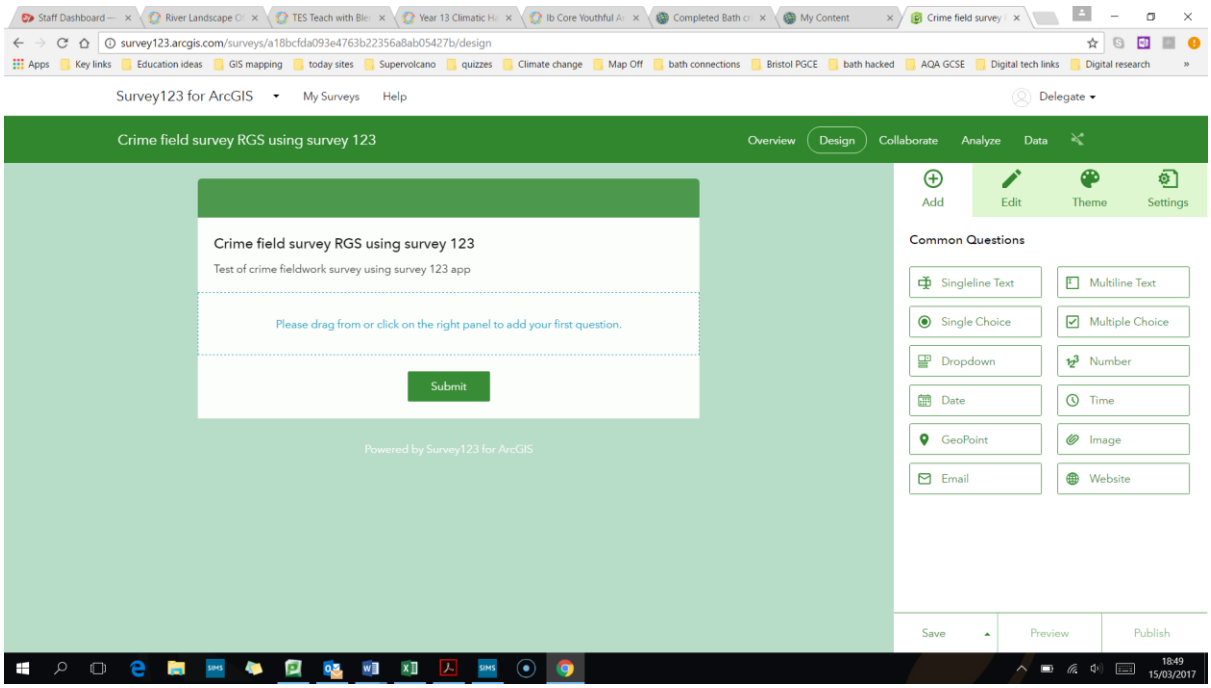
1. When you are logged into your account you will see a mini grid of nine dots towards the top right. Click on these and see the apps you can use. Click on the one called survey 123.



2. This opens and new tab. You may need to sign in. Then click on "create a new survey" in the top left. In the pop up box give it a name like "crime field survey" and fill out the other boxes. Then click create.



3. You now have a survey template form you can create for your data. You can play with the different types of questions. This is a format that students should be able to understand.



4. Add some questions. For example:

Single line text – “site number”

Perhaps a drop down box with the question “what zone are you in” and the options like “CBD”, “inner city”, etc

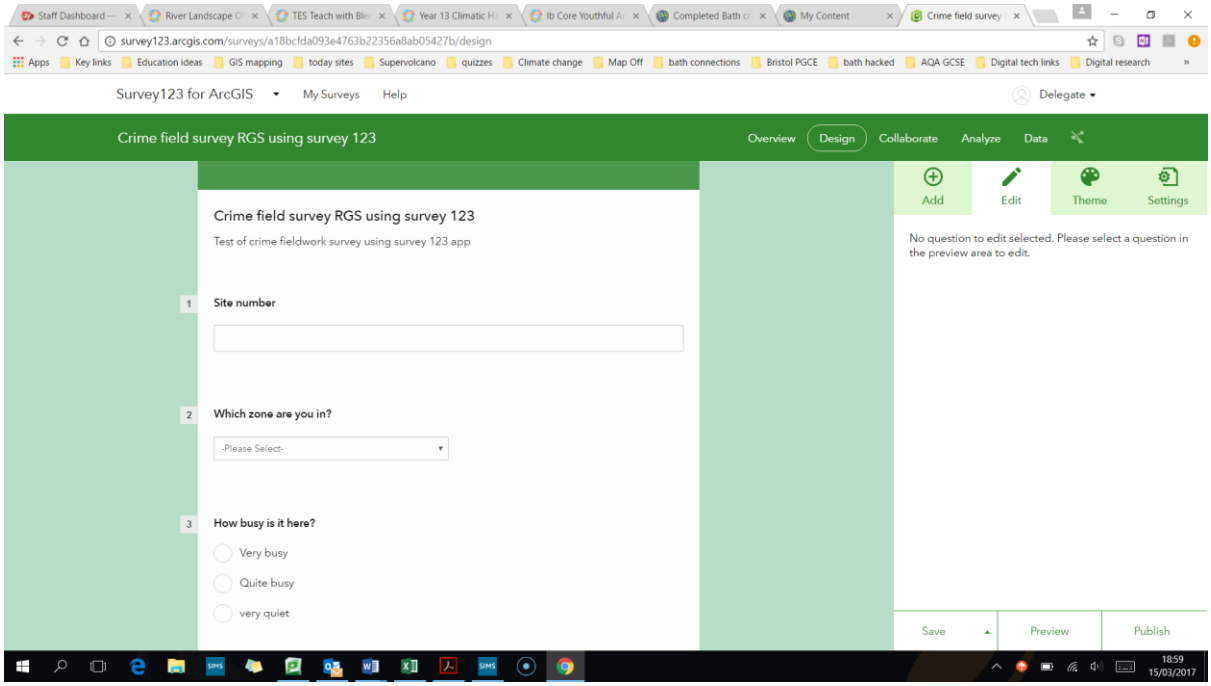
A single choice question “how busy is it here” with options like “very busy”, “quite busy”, “very quiet”.

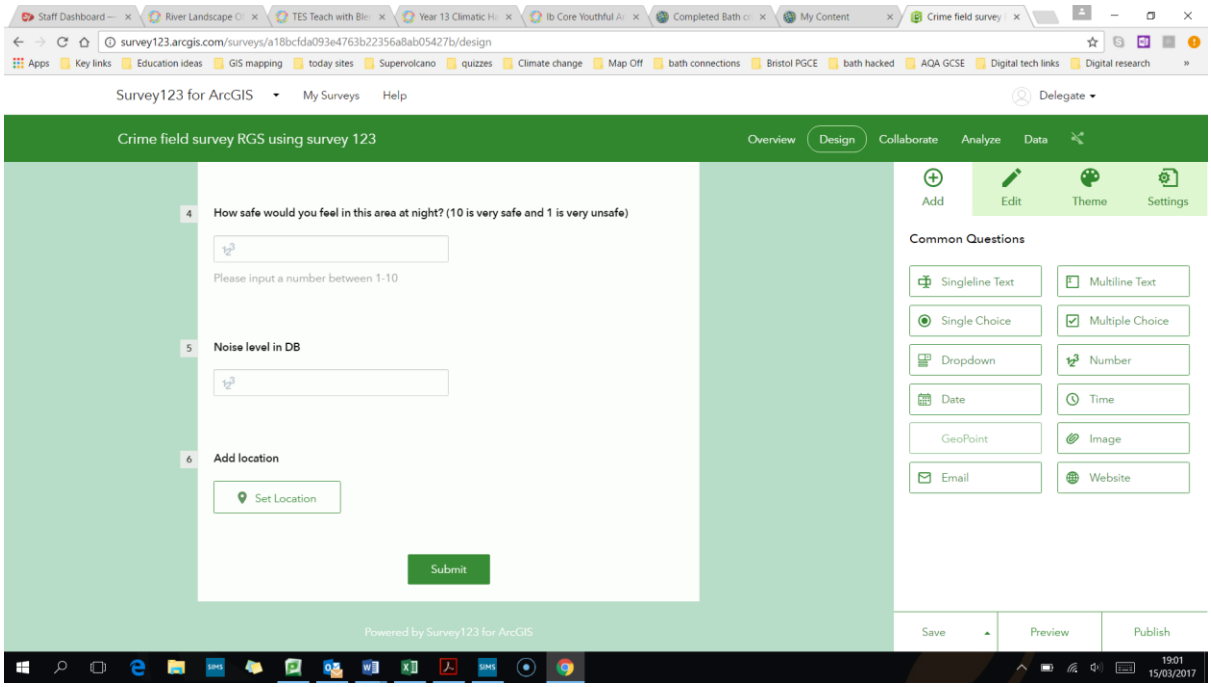
A number question “How safe would you feel in this area at night? (10 is very safe and 1 is very unsafe)”.

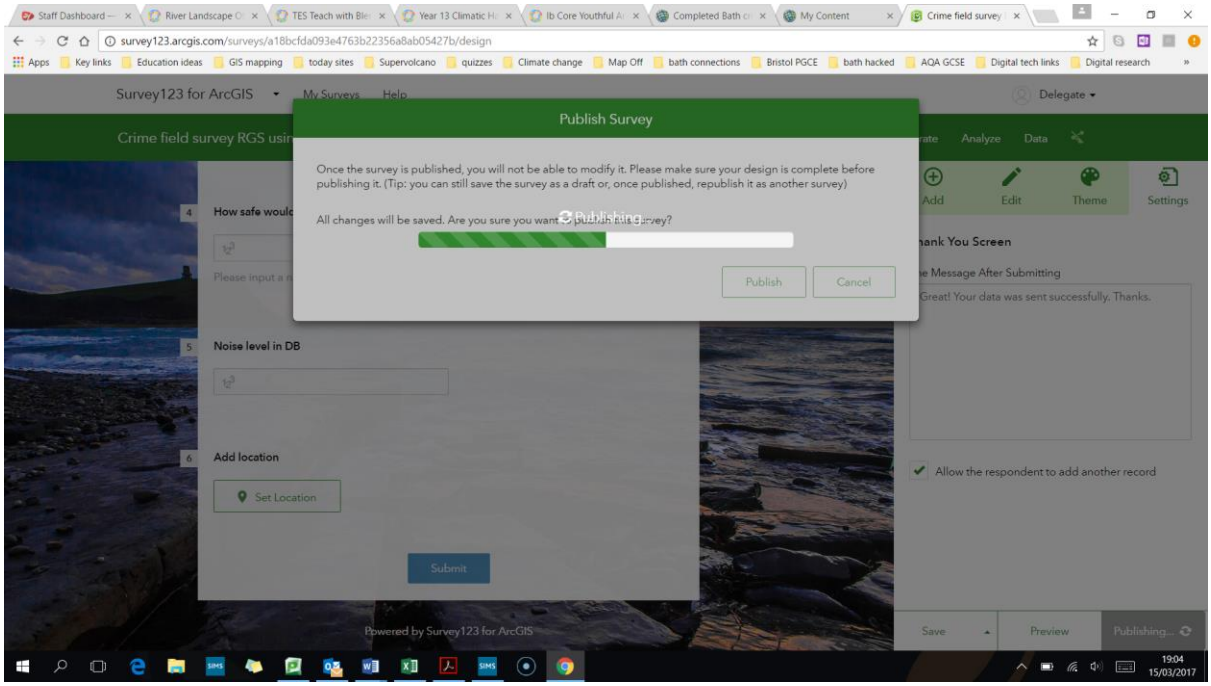
A number question “what is the noise level in DB”

Finally add a Geopoint and zoom to the location where the fieldwork will occur in the map settings.

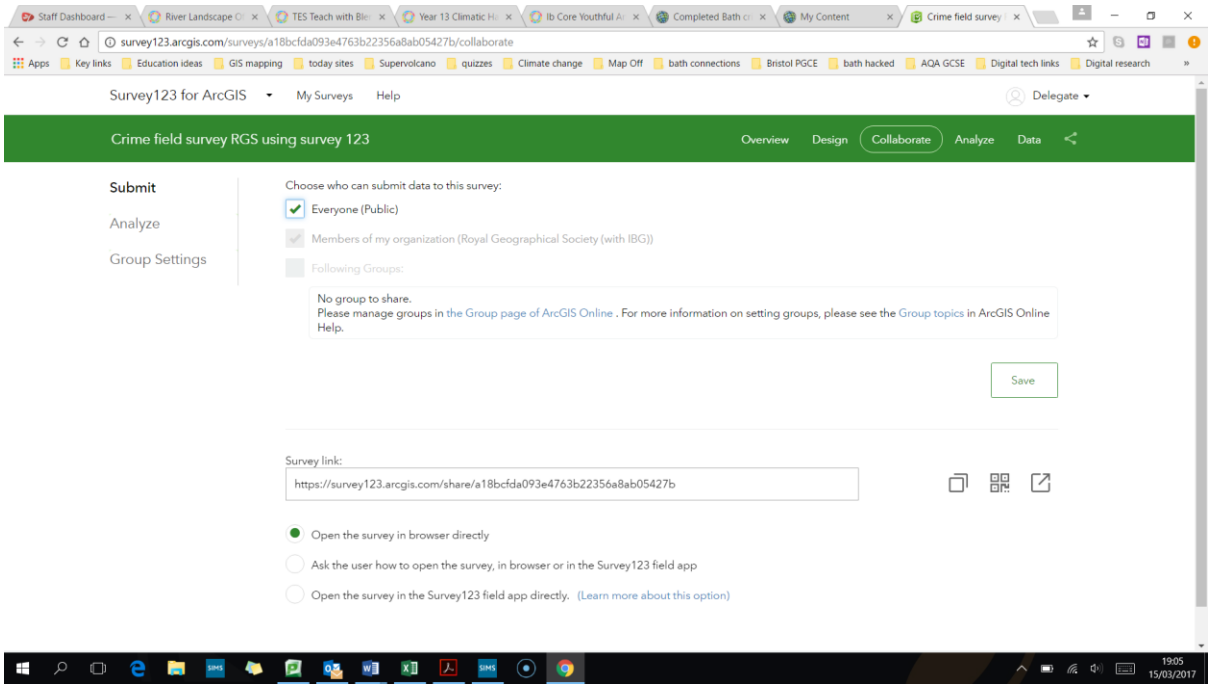
You can preview your form and then publish it.


survey123.arcgis.com/surveys/a18bcfda093e4763b22356a8ab05427b/design
Survey123 for ArcGIS
My Surveys
Help
Delegate
Crime field survey RGS using survey 123
Overview
Design
Collaborate
Analyze
Data
Add
Edit
Theme
Settings
Crime field survey RGS using survey 123
Test of crime fieldwork survey using survey 123 app
1 Site number
2 Which zone are you in?
-Please Select-
3 How busy is it here?
Very busy
Quite busy
very quiet
No question to edit selected. Please select a question in the preview area to edit.
Save
Preview
Publish

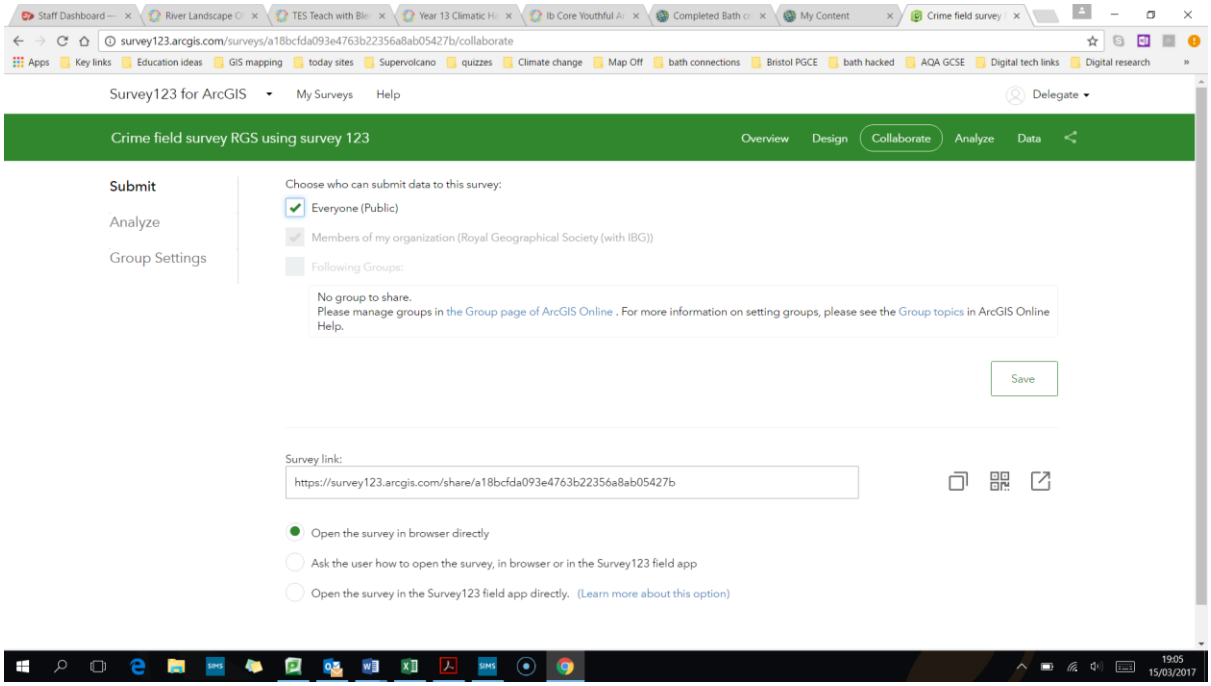

survey123.arcgis.com/surveys/a18bcfda093e4763b22356a8ab05427b/design
Survey123 for ArcGIS
My Surveys
Help
Delegate
Crime field survey RGS using survey 123
Overview
Design
Collaborate
Analyze
Data
Add
Edit
Theme
Settings
4 How safe would you feel in this area at night? (10 is very safe and 1 is very unsafe)
Please input a number between 1-10
5 Noise level in DB
6 Add location
Set Location
Submit
Powered by Survey123 for ArcGIS
Common Questions
Singleline Text
Multiline Text
Single Choice
Multiple Choice
Dropdown
Number
Date
Time
GeoPoint
Image
Email
Website
Save
Preview
Publish

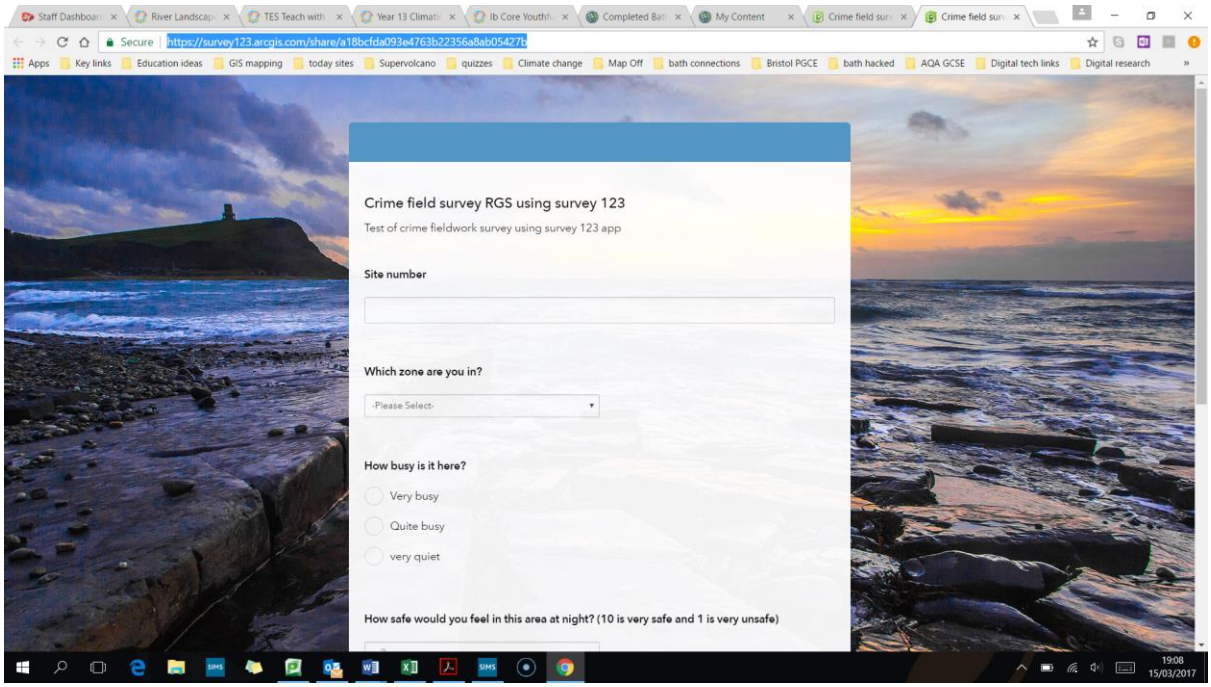


5. Then click the “collaborate” button on the top right and make sure you share it with everyone (save this new setting)

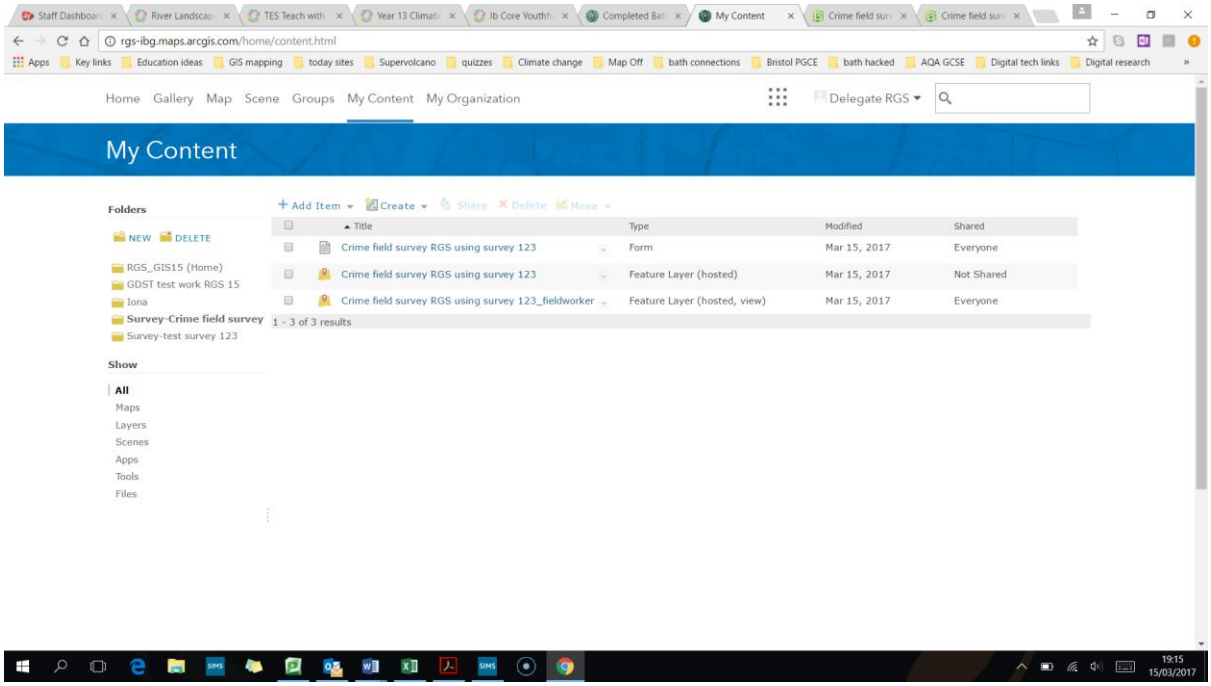


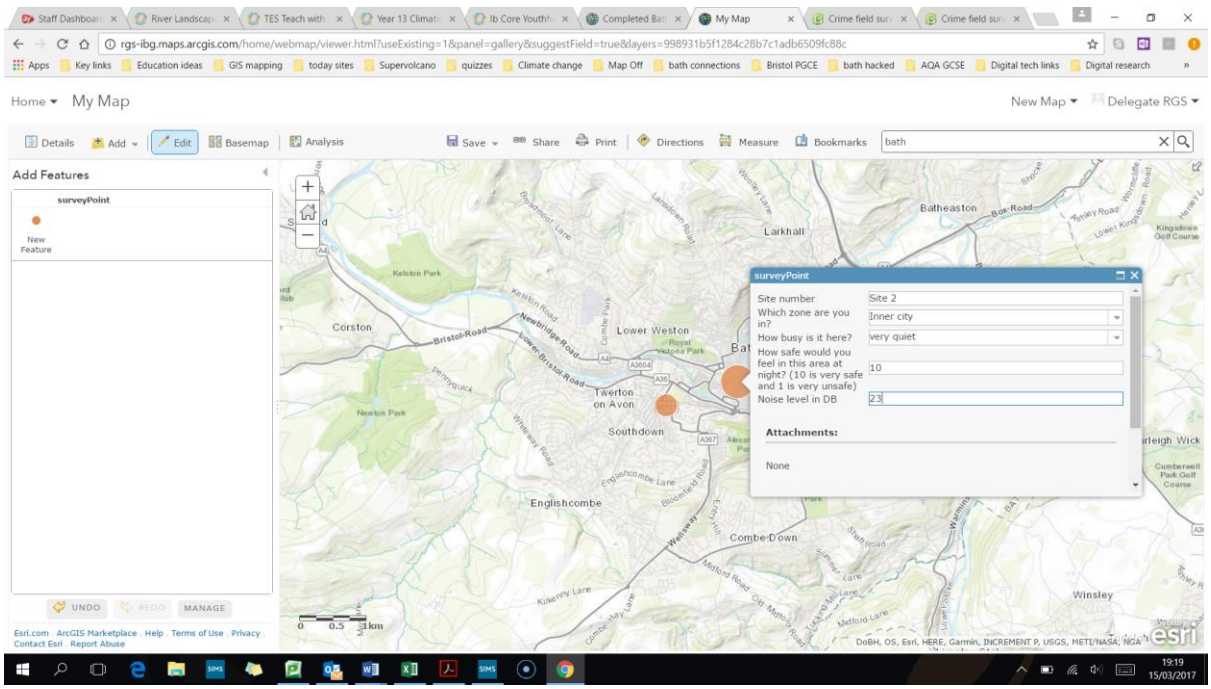
6. Share the survey link with anyone you want to input data. It can be used on any device and in the field if you have internet connection. Have a go entering data using this link: https://goo.gl/XhEzC2



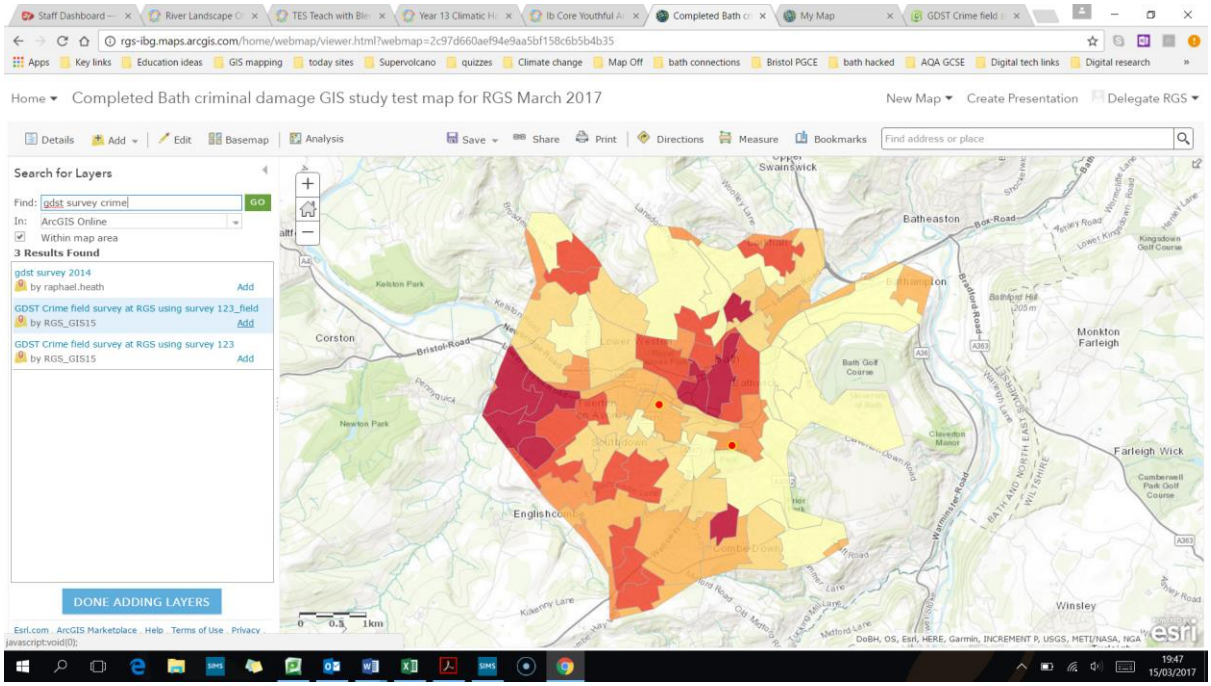


7. You can enter data using this form. If you go back to your contents within your ArcGIS account you will now see a new folder with the 123 survey layers in it. One has your survey name followed by “fieldworker”. You can click this and then open it in a map directly and add data as you normally would for an editable layer within the map view. (note when you first click the layer it opens the layer details information. Under the settings you may want to change the editing rights if many students are going to edit and view the same layer).

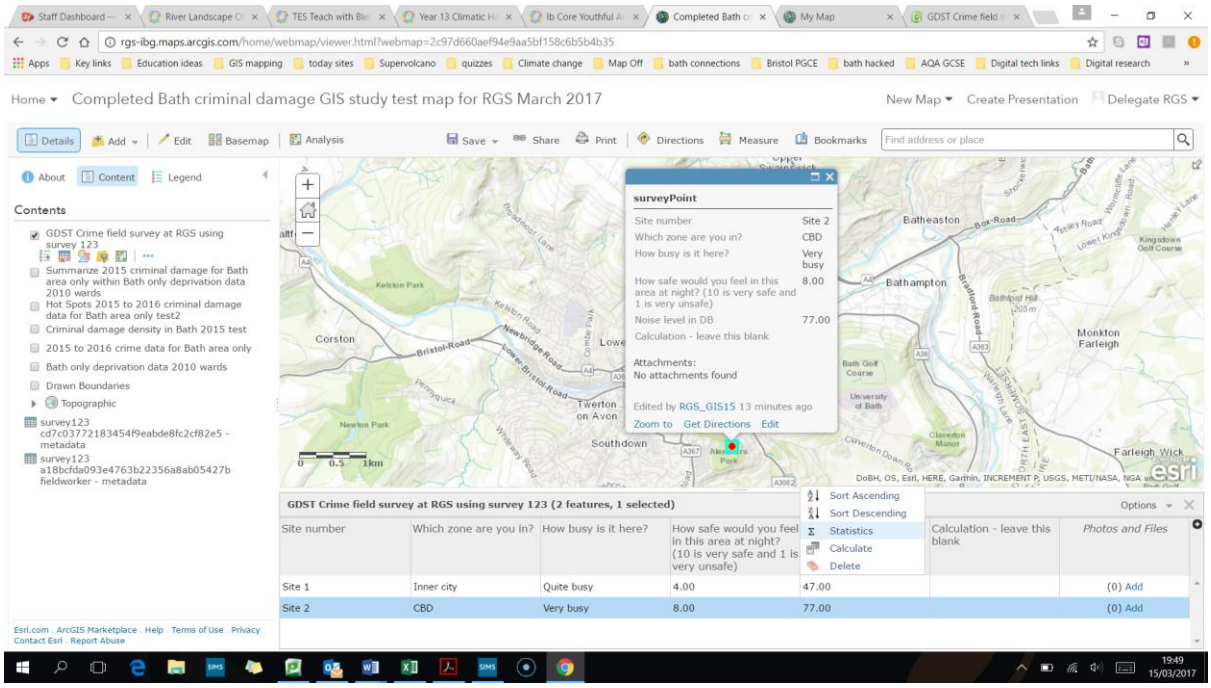


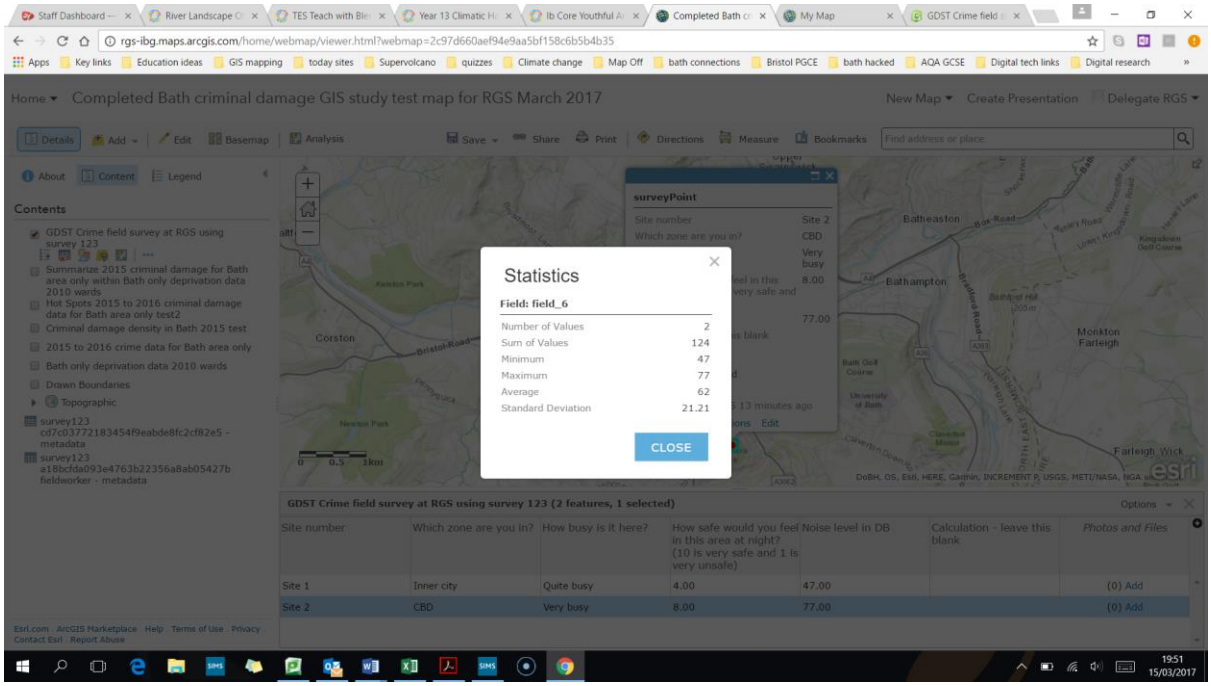


8. For other users/ students to add the layer to a map they need to search for it. In the map click the add button in the top left. Then pick “search for layers” and search for the name “GDST crime survey” and add it to the map (you may need to make sure you are searching ArcGIS online and not just your organisation in the options under the search box).

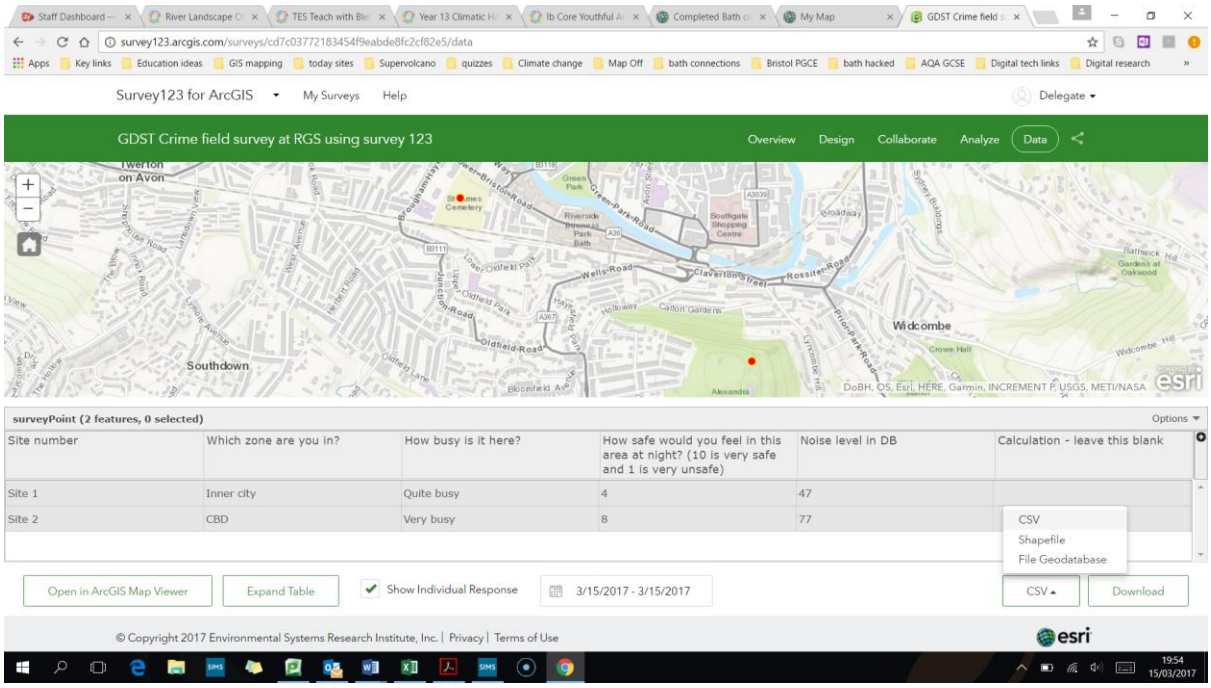


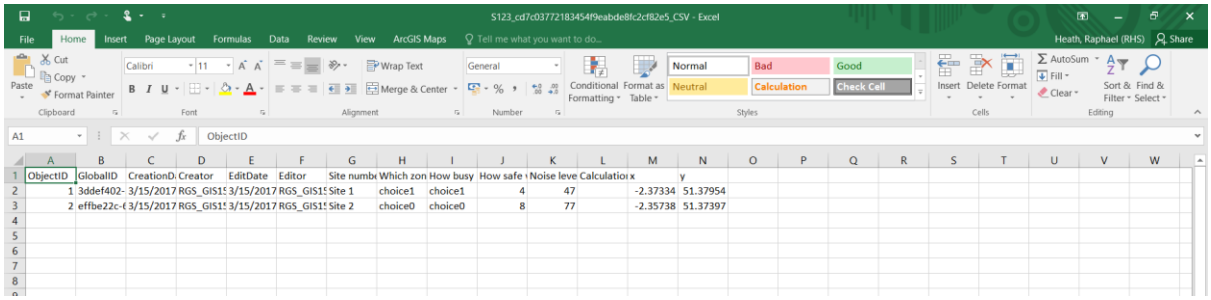
9. Within the map view you can bring up the table of the data. Click on the layer name in the contents of your map. Under it is a table symbol to click on. Within the table you can click on the column heading and this brings up the option for statistics based on this layer's data which is a useful data skill link. This includes mean and standard deviation of the data.



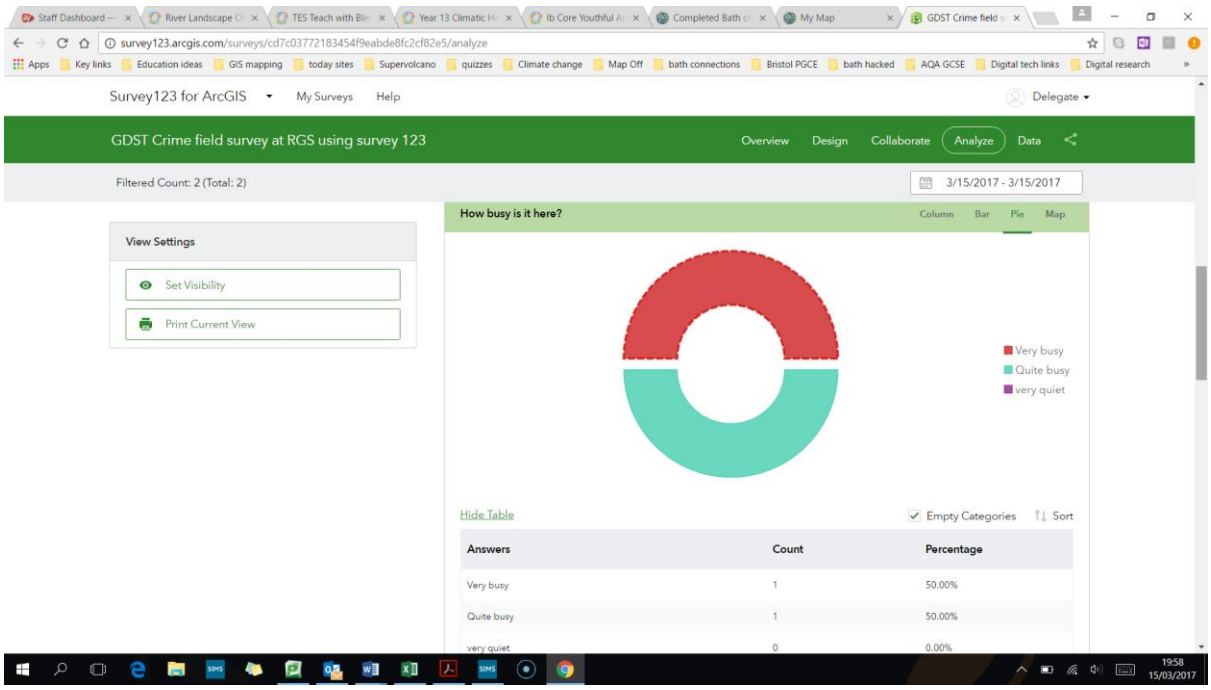


10. Note. If you go back to your Survey 123 log in you can also view data about this layer when you click on “data”. This also lets you export/ download the data to a csv file which you can open in a spreadsheet in order to do other graphical analysis on your data.

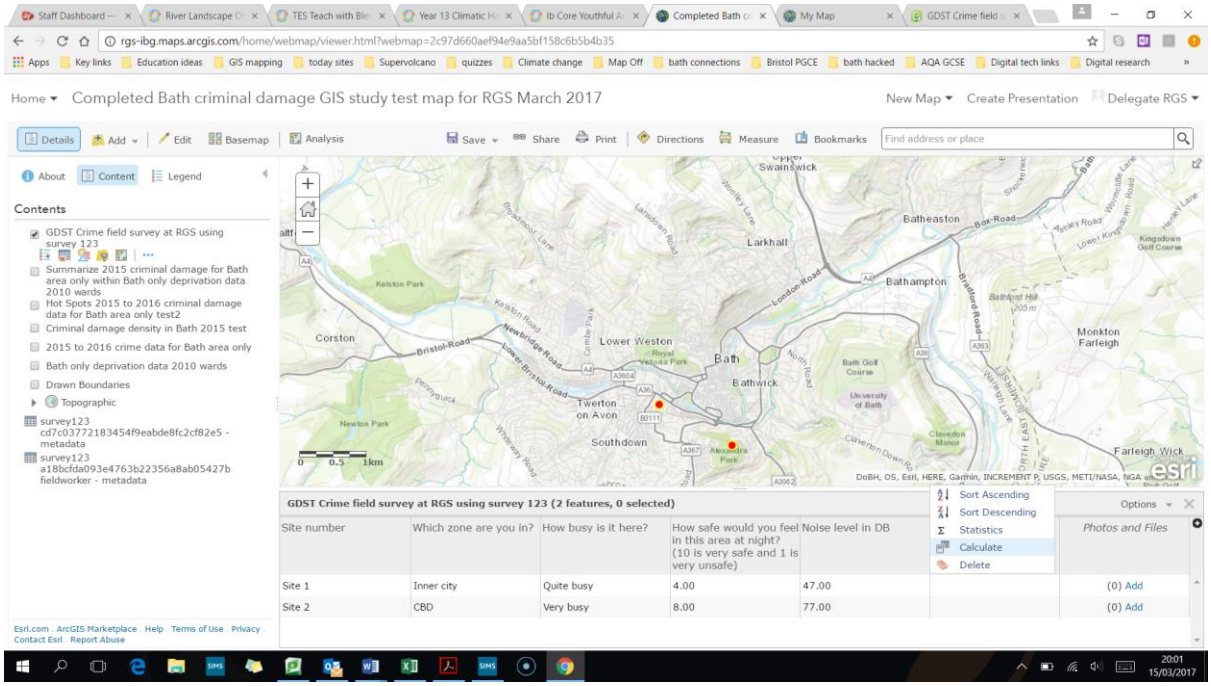


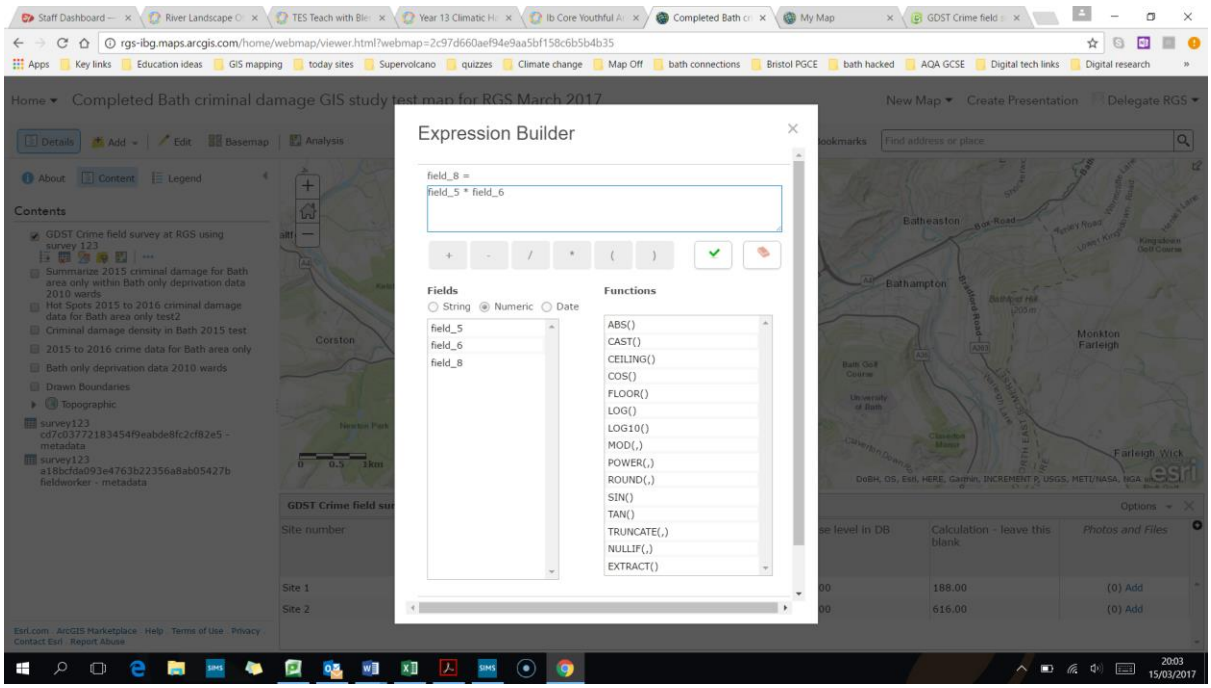


11. Also the "analyse" tab within Survey 123 lets you see graphical representation of your data.



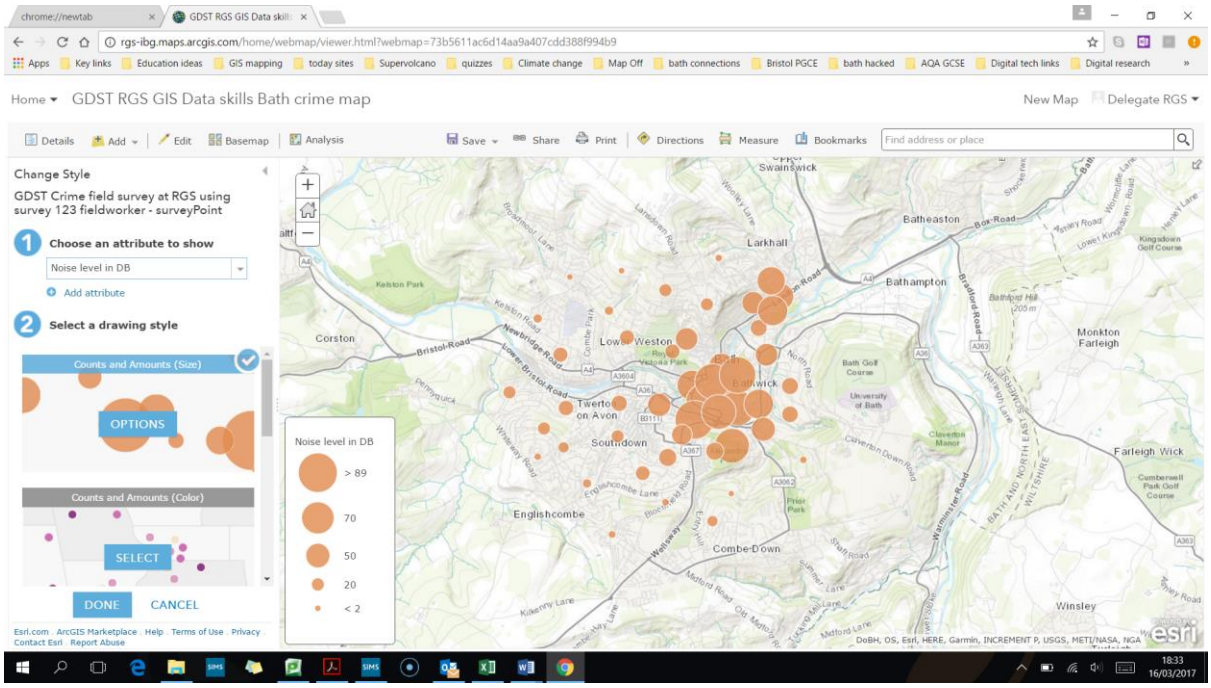
12. Note in the map view for this layer. Under the table – if you are the creator and owner of this layer, you can run a calculation within a field. For example, for river data you can calculate the discharge, or create a total score for crime vulnerability data. Click on the top of a column in the table and then calculate and run a formula.

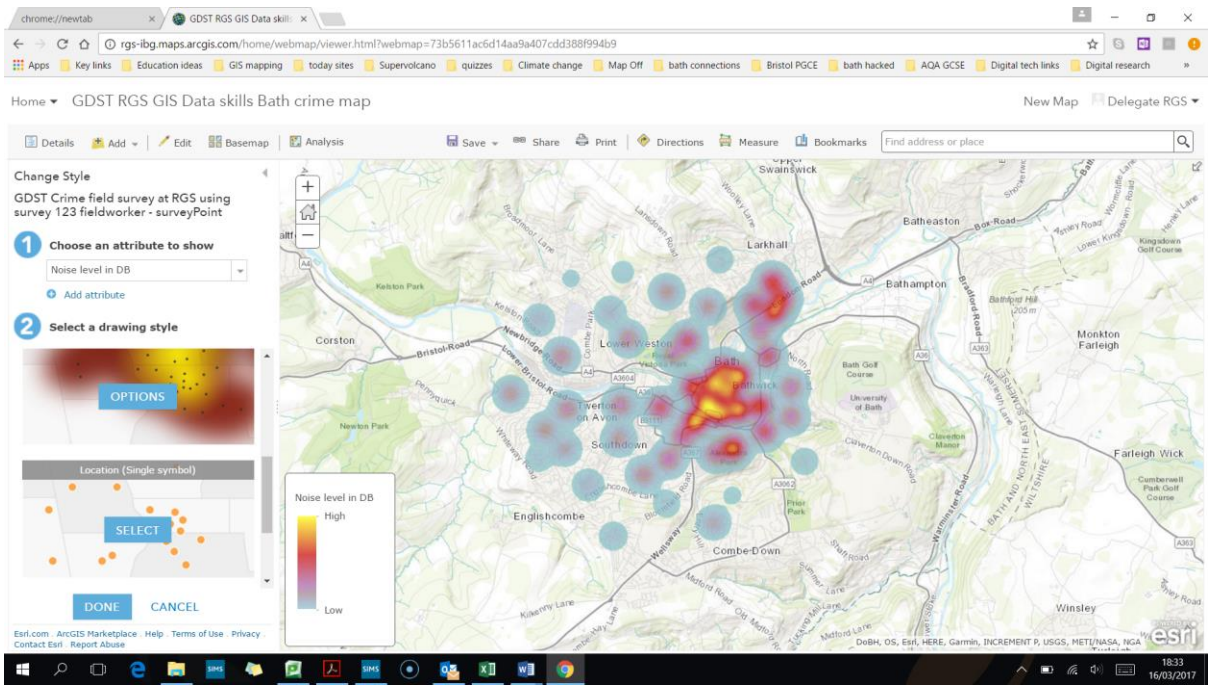

Completed Bath criminal damage GIS study test map for RGS March 2017
New Map
Create Presentation
Delegate RGS
Contents
GDST Crime field survey at RGS using survey 123 (2 features, 0 selected)
Site number
Which zone are you in?
How busy is it here?
How safe would you feel in this area at night? (10 is very safe and 1 is very unsafe)
Noise level in DB
Photos and Files
Site 1
Inner city
Quite busy
4.00
47.00
(0) Add
Site 2
CBD
Very busy
8.00
77.00
(0) Add
Sort Ascending
Sort Descending
Statistics
Calculate
Delete


Expression Builder
field_8 =
field_5 * field_6
Fields
String
Numeric
Date
field_5
field_6
field_8
Functions
ABS()
CAST()
CEILING()
COS()
FLOOR()
LOG()
LOG10()
MOD(,)
POWER(,)
ROUND(,)
SIN()
TAN()
TRUNCATE(,)
NULLIF(,)
EXTRACT()

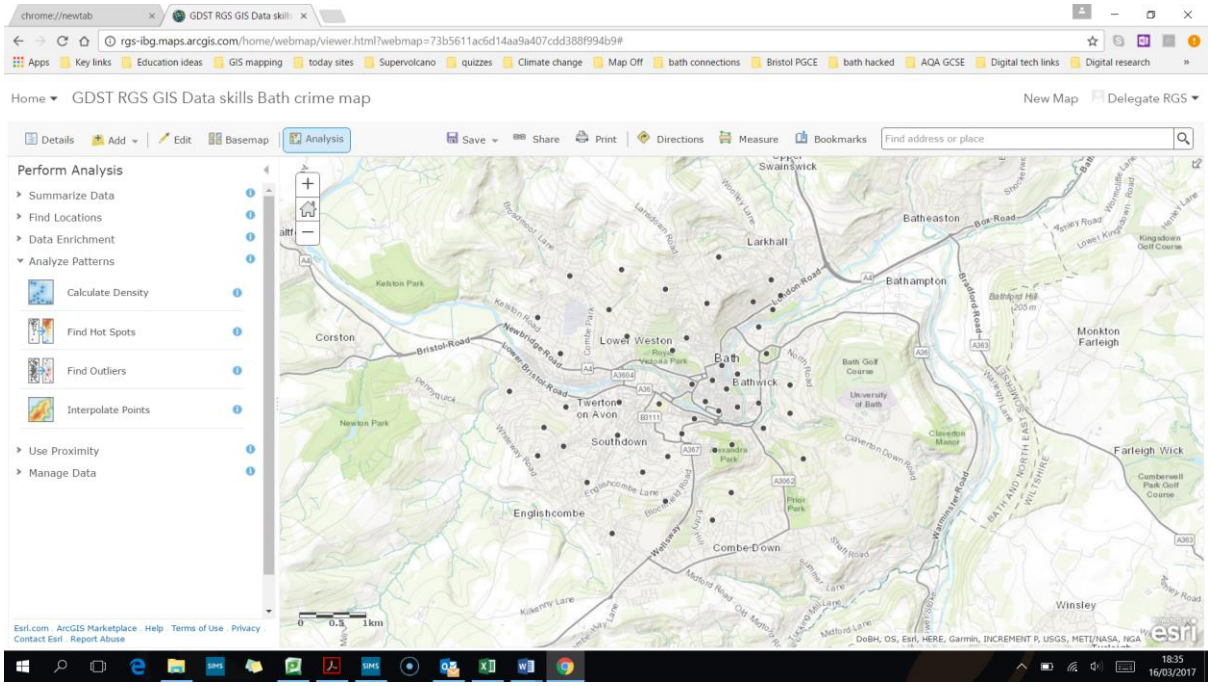
Data analysis of primary data within ArcGIS online

1. NOTE – this activity continues from the instructions in part 2 of this workshop. Once you have a full set of data entered (at least around 30 points) then you can run some analysis on them such as a density map or interpolation. Lets first show the data as proportional circles and heat map. Play with these by clicking on the layers name and then pick the change style icon under it – the circle triangle and square symbol. Display the noise level data.

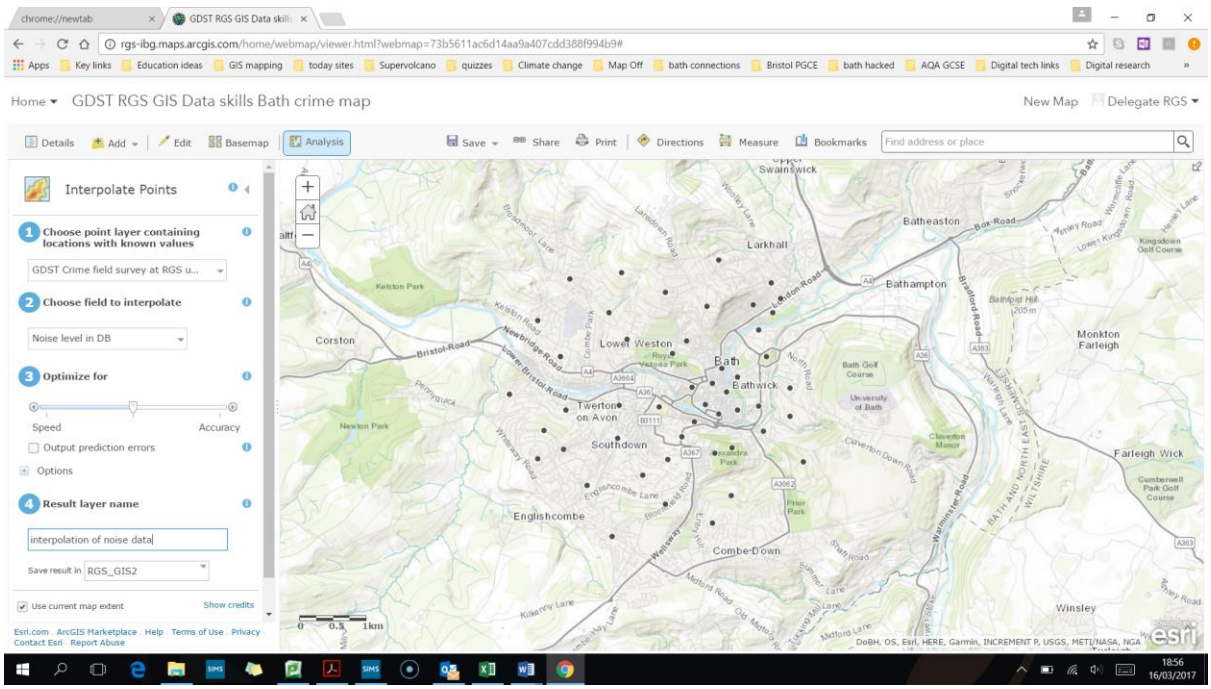


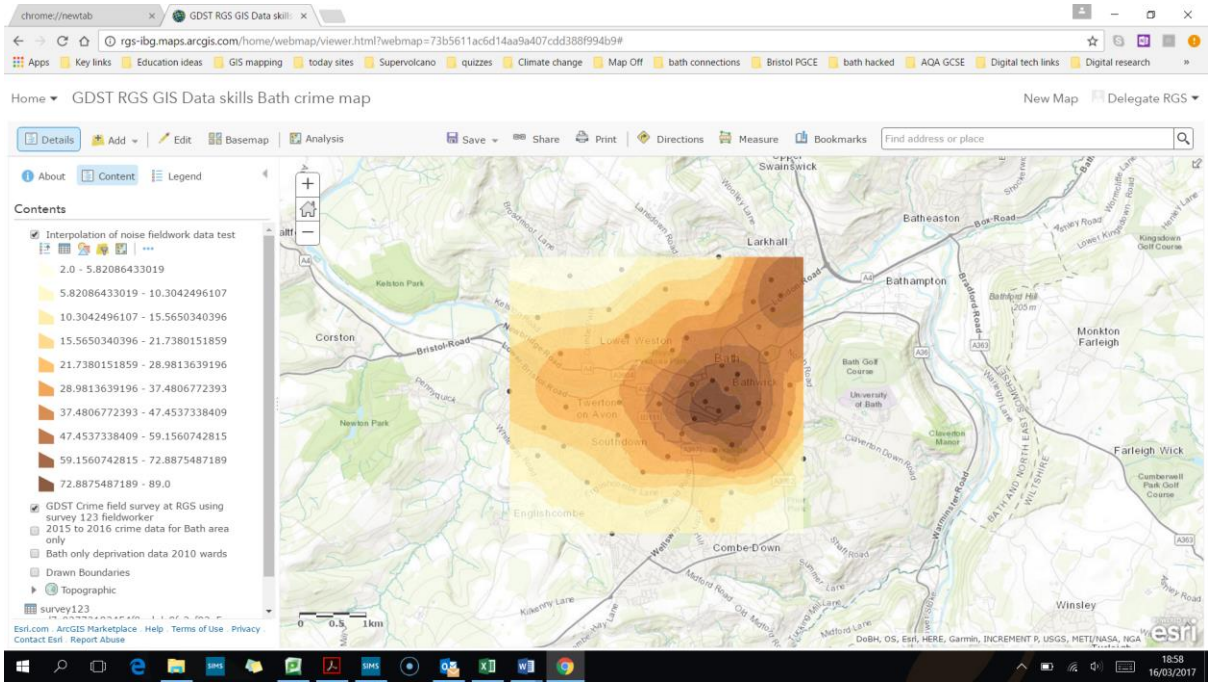


2. Now click cancel or done on the change symbols menu. Then click on the analysis button in the top left. Then pick “analyse patterns” and then “interpolate points”.

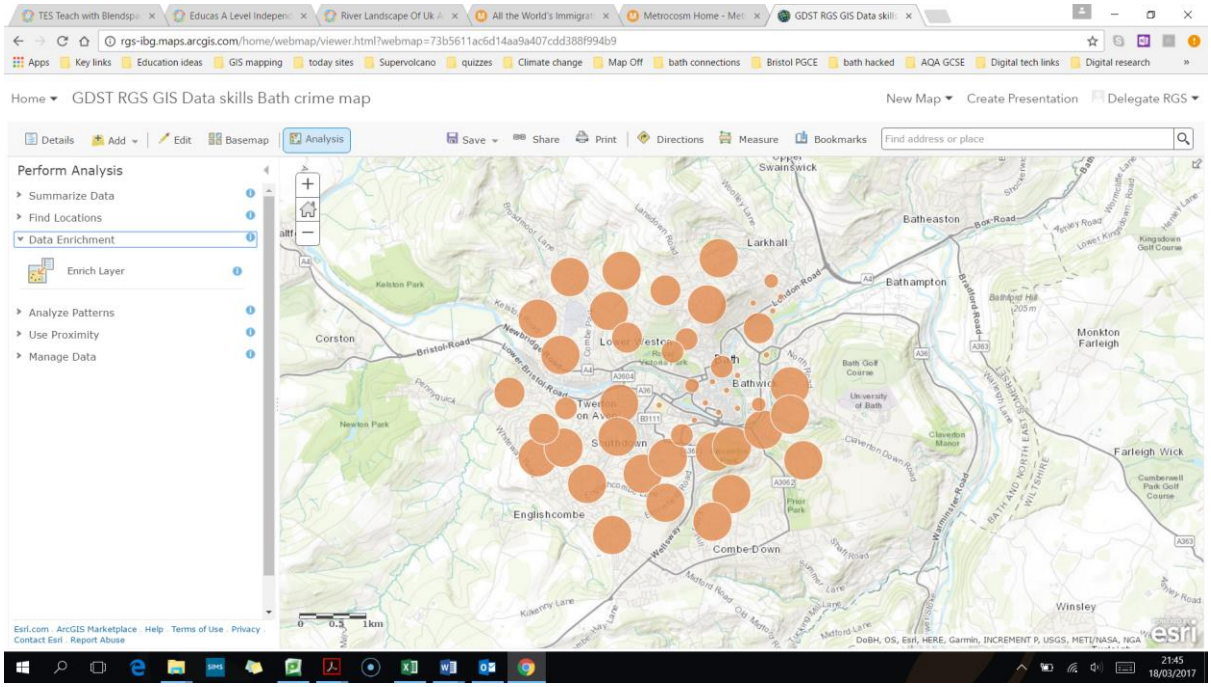


3. Then in the sub menu in box one choose the crime field survey data layer. Then in the box pick the noise level data. Ignore box three. Give it a clear name in box 4 like Interpolation of noise fieldwork data. Then run analysis

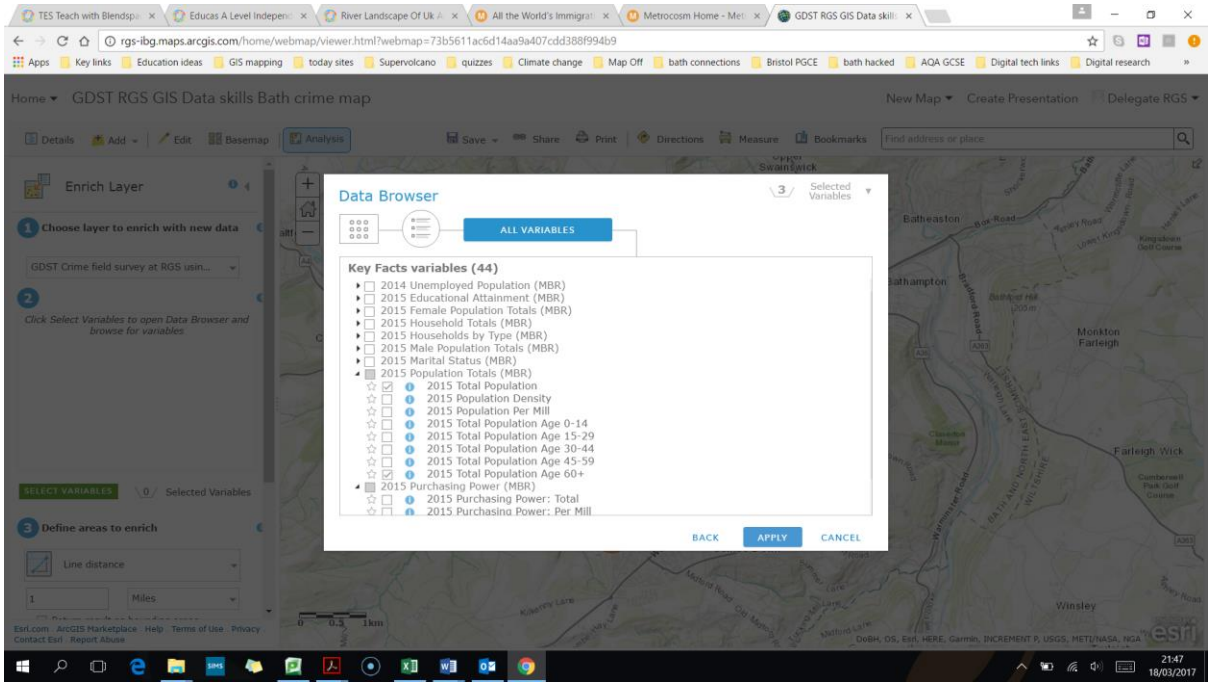




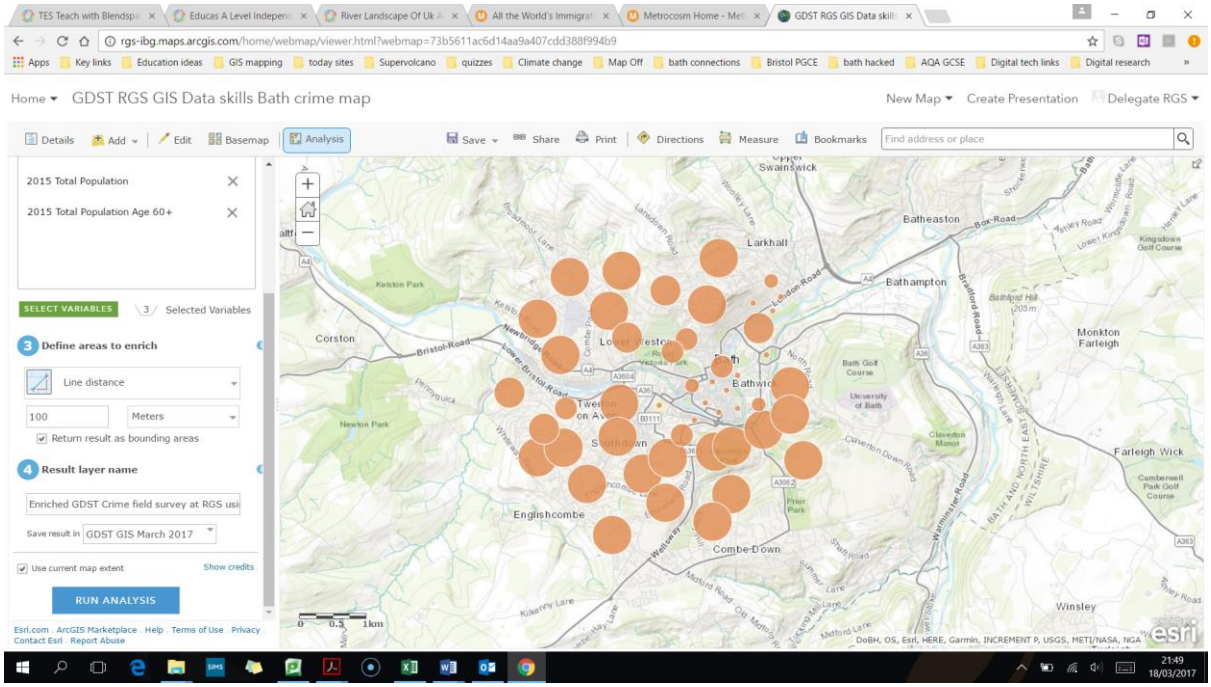
4. We can also gather data for our fieldwork points from Esri's data sets – called data enrichment. Click on the Analysis button on the upper left of the page and in the next menu pick data enrichment. Click enrich data.



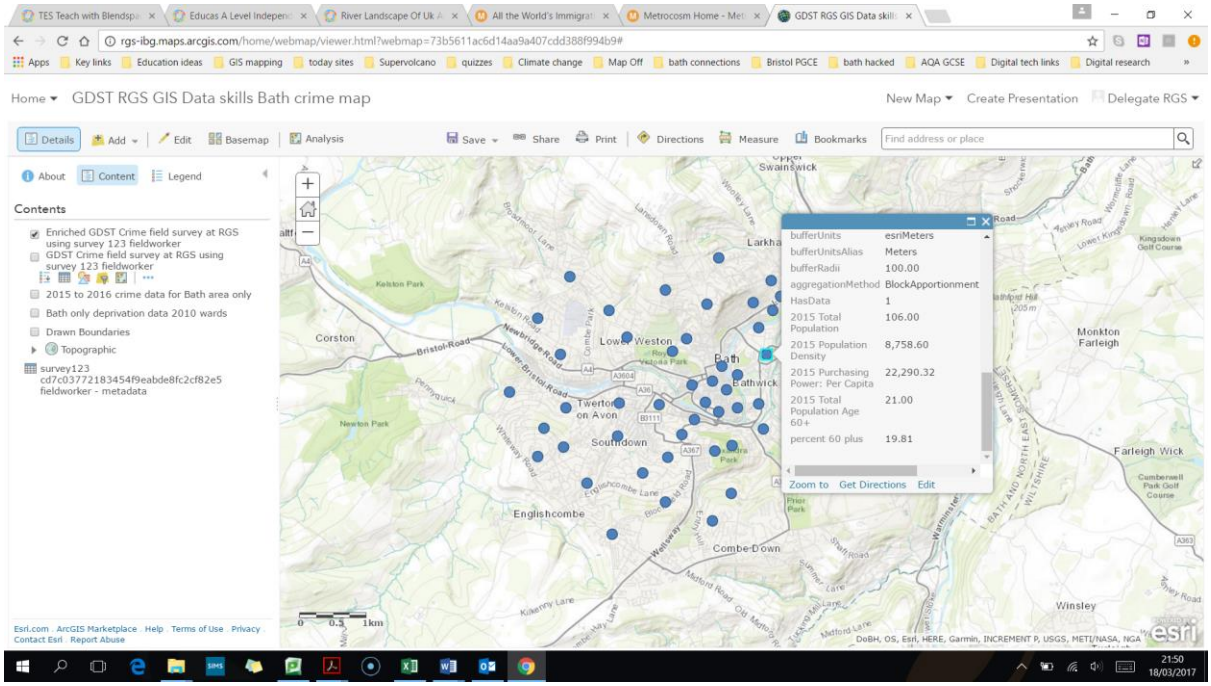
5. Then in the first box pick your layer with fieldwork data. In the second box click on select variables – and choose some items like total population, income per person, number aged over 60.



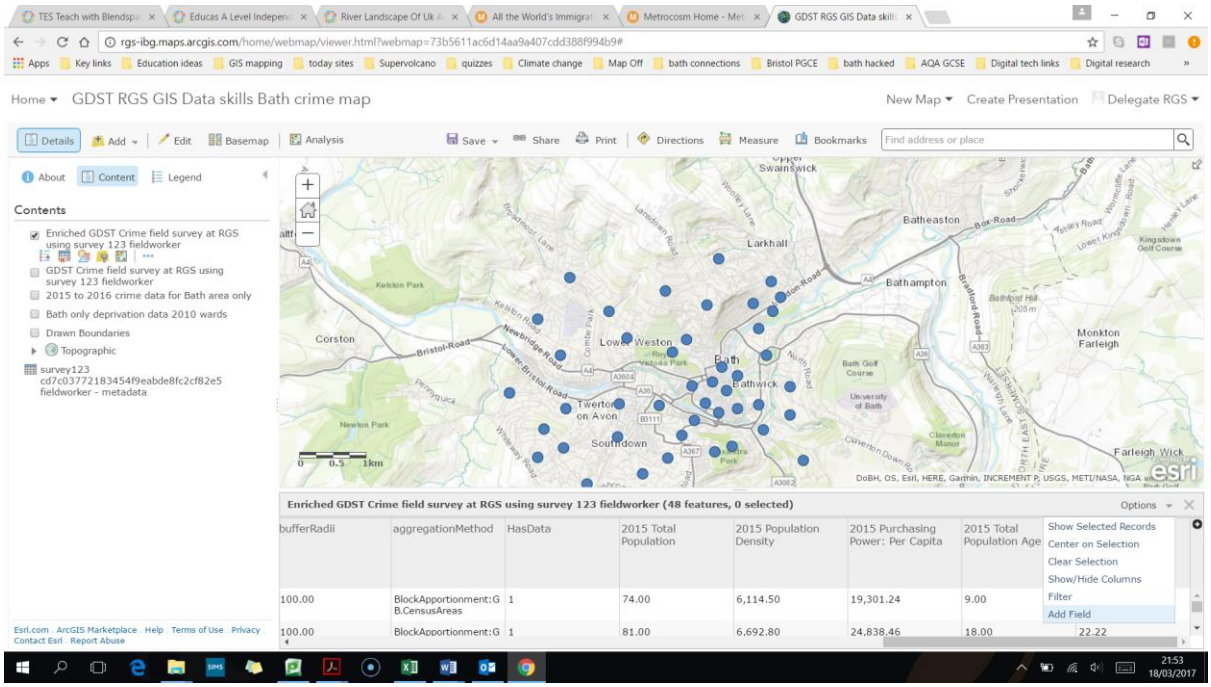
6. Then in box three define the search areas to a line distance and 100 metres. In box 4 give the layer a name like enriched fieldwork data on Bath. Then run analysis.



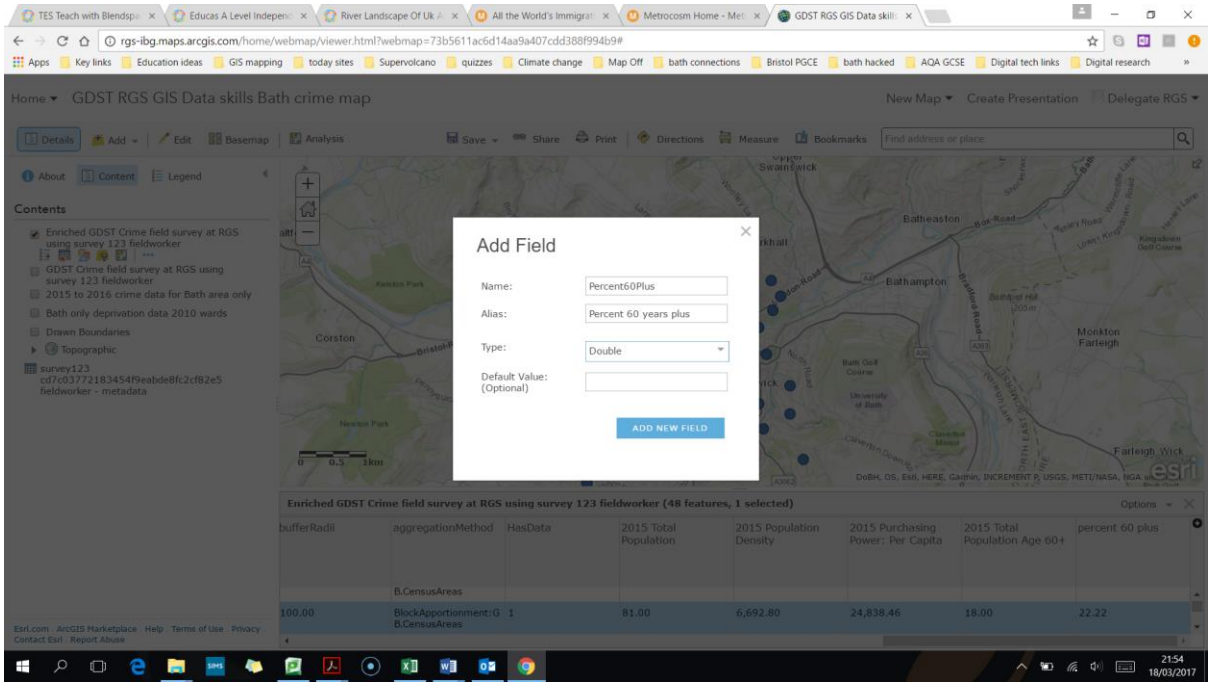
7. This will produce a copy of your fieldwork dots, but with additional data when you click on them.



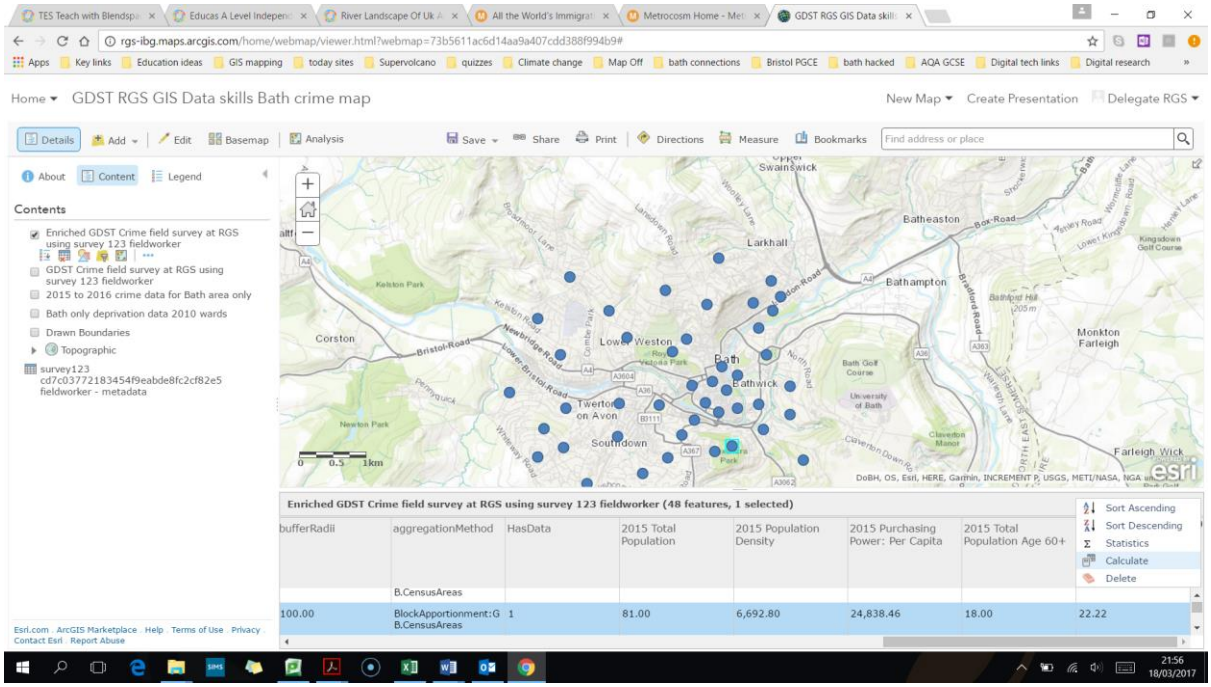
8. Bring up the table of data for this layer (click on the layer name in the contents and then the table symbol). Then on the options on the top right of the table – choose to add a field



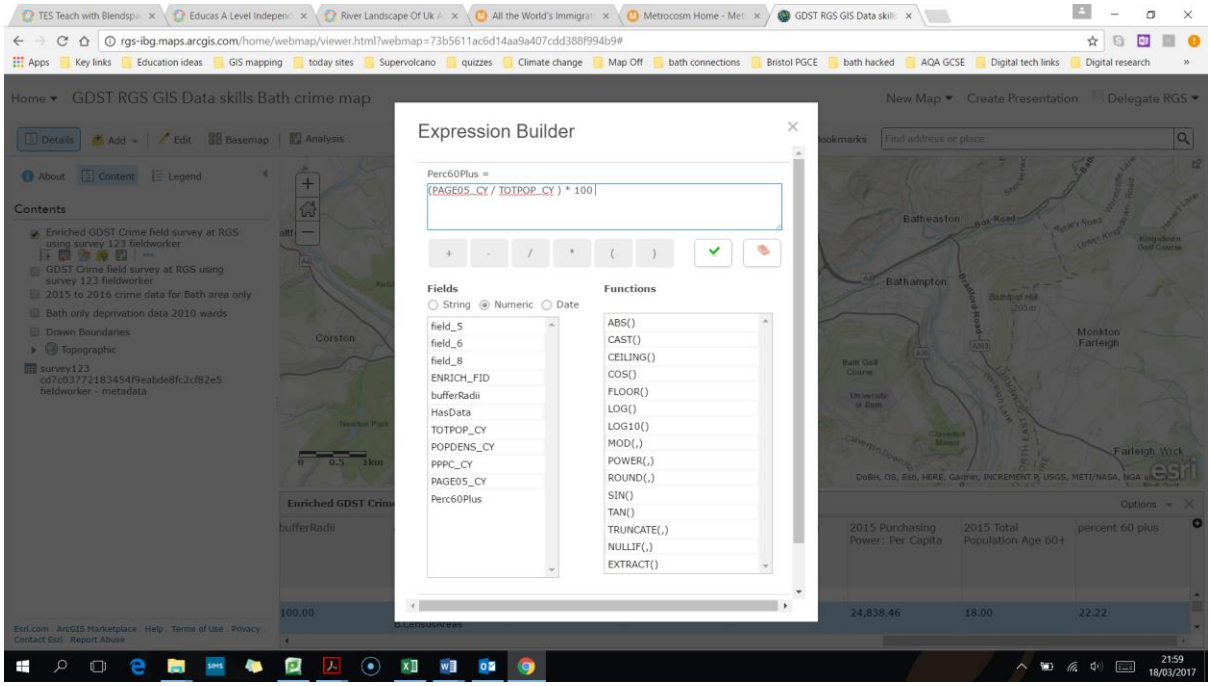
9. Then give this new field a name of “Percent60Plus” and an alias of “percentage over 60 years” and pick “double” under type – which is numbers with decimal points. Then “add new field”.



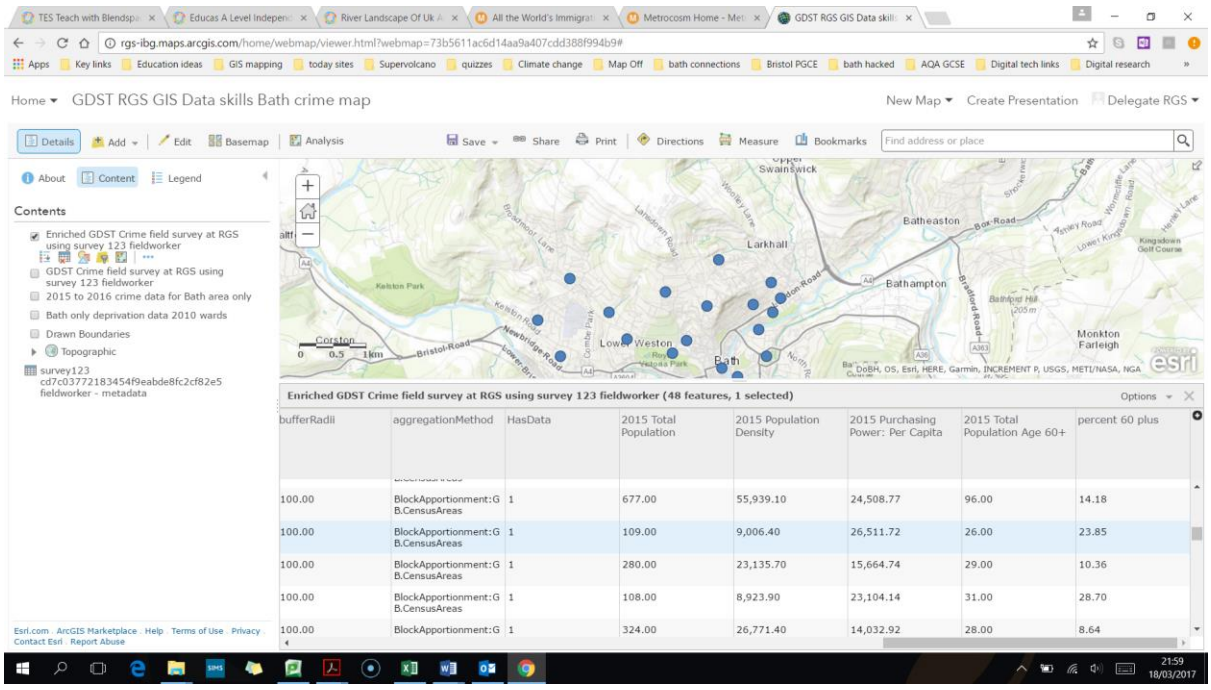
10. This creates a new blank column in your table. You can add data to this manually or by running a calculation. Click on the top of this new column on then on the sub menu “calculate”.



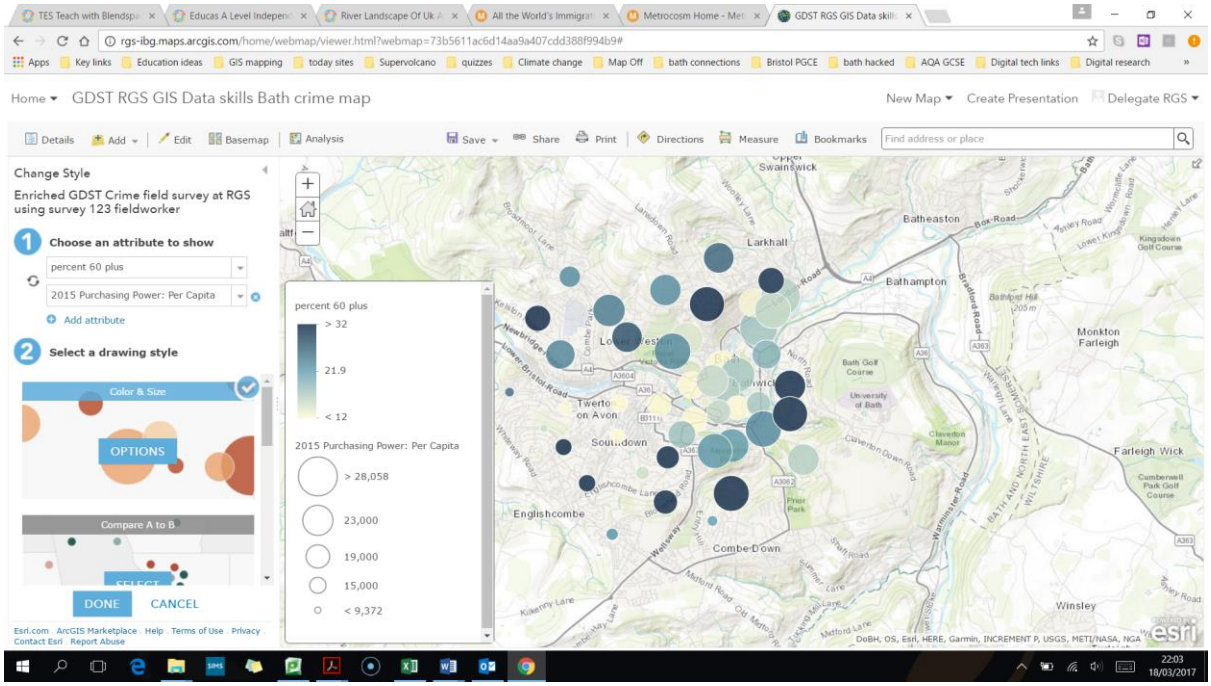
11. In the pop up box type a formula: (PAGE05_CY / TOTPOP_CY) * 100 This will calculate the percentage of the population that are over 60 years old within 100m of your study sites. Click calculate to run this.



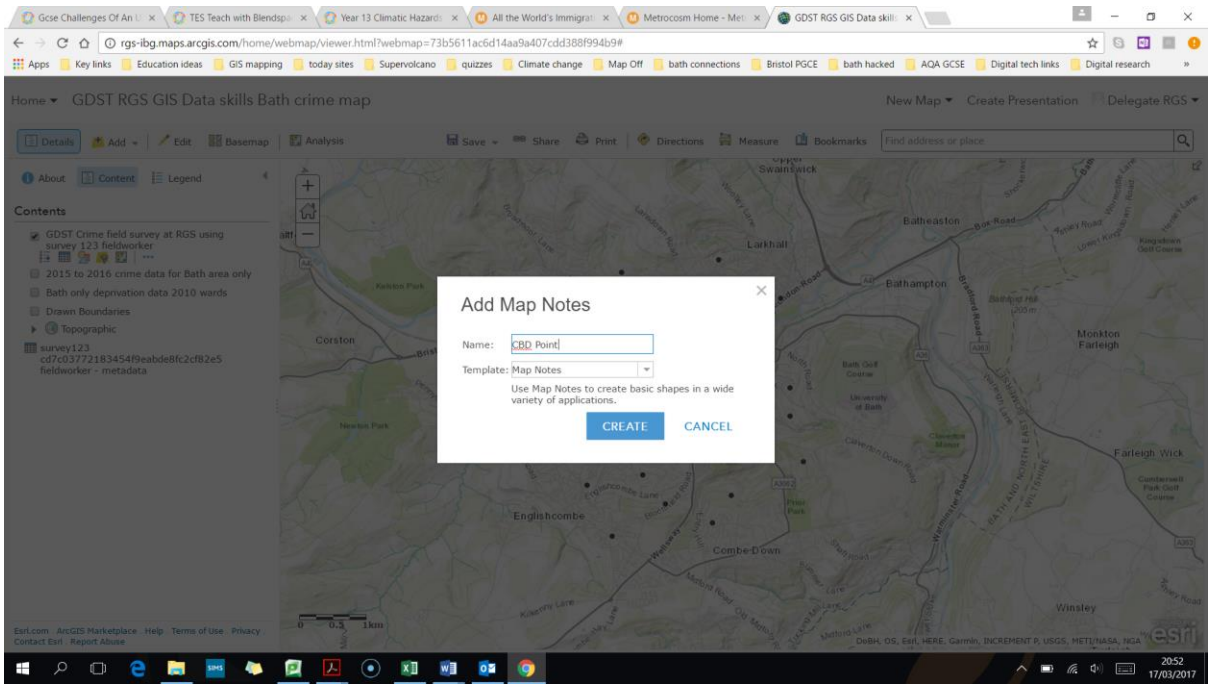
12. You will now see the data calculated as the percentage in this column in your table.



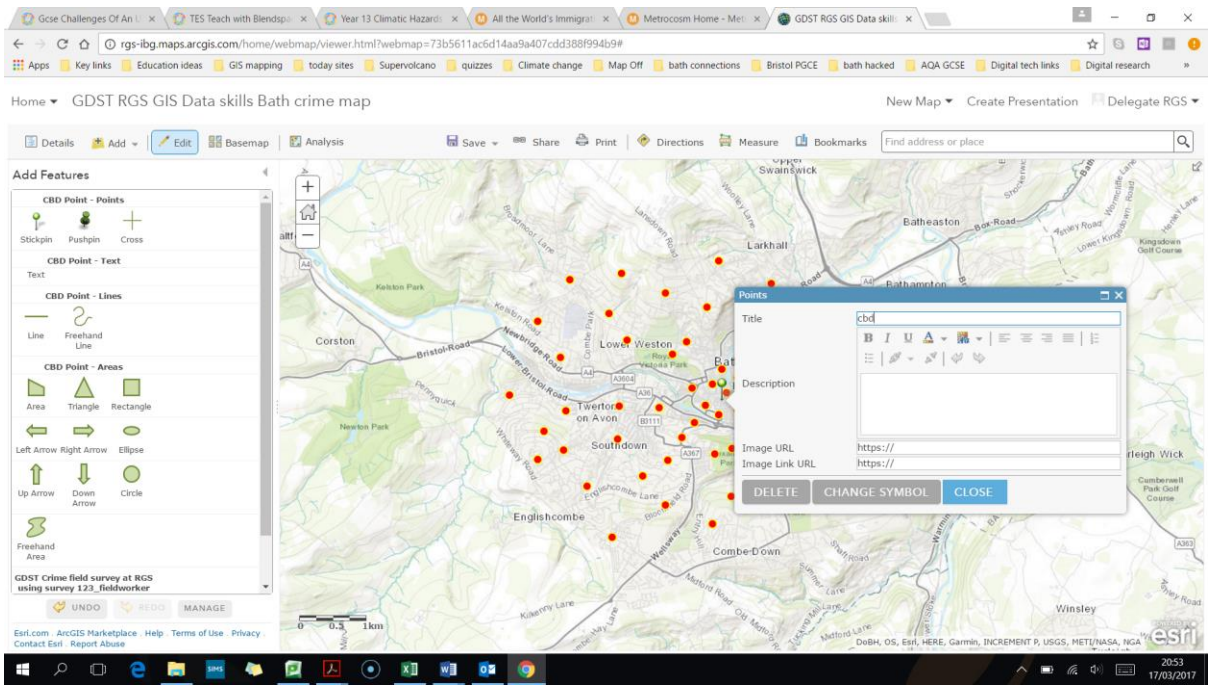
13. You can show this data within the change style options for this layer. Note that you can show two things at the same time if you wish. So if you pick the percentage over 60 and also add an attribute and put in the purchasing power you can see the colour shading showing areas with higher percentage over 60 and the size of the circle showing the purchasing power.



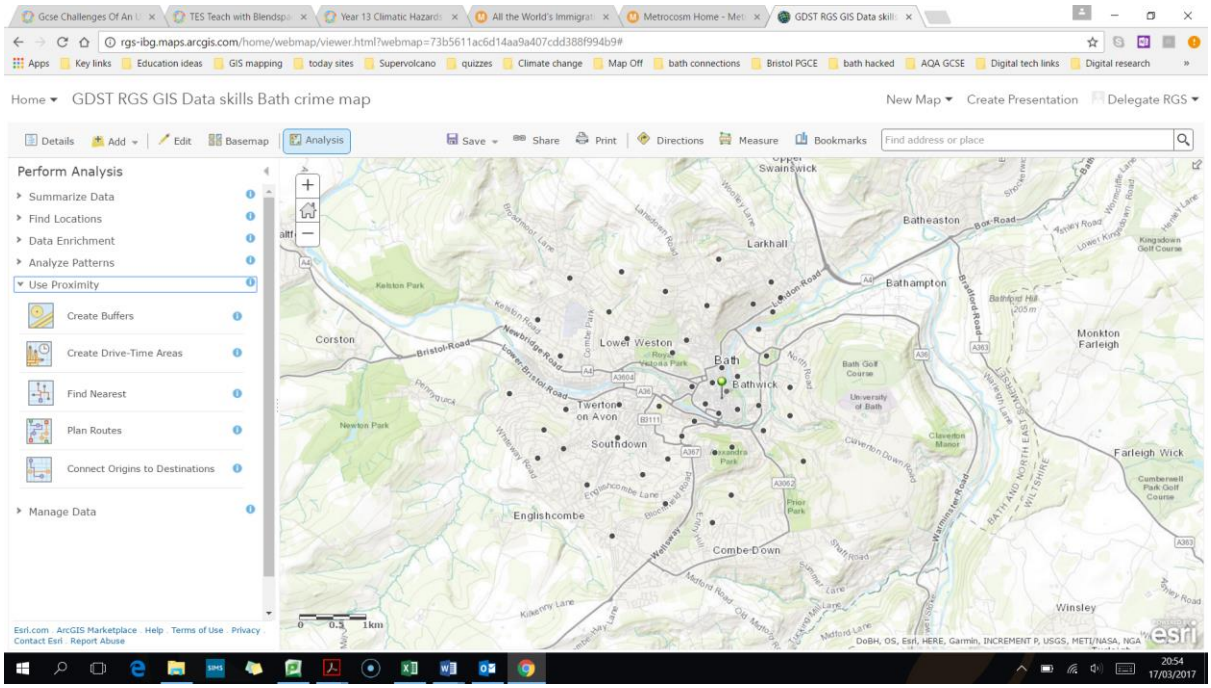
14. We could do another spatial analysis by looking at whether noise increased with distance from a point, say the city centre. First click on add and then map notes and give it a name like “CBD point”.



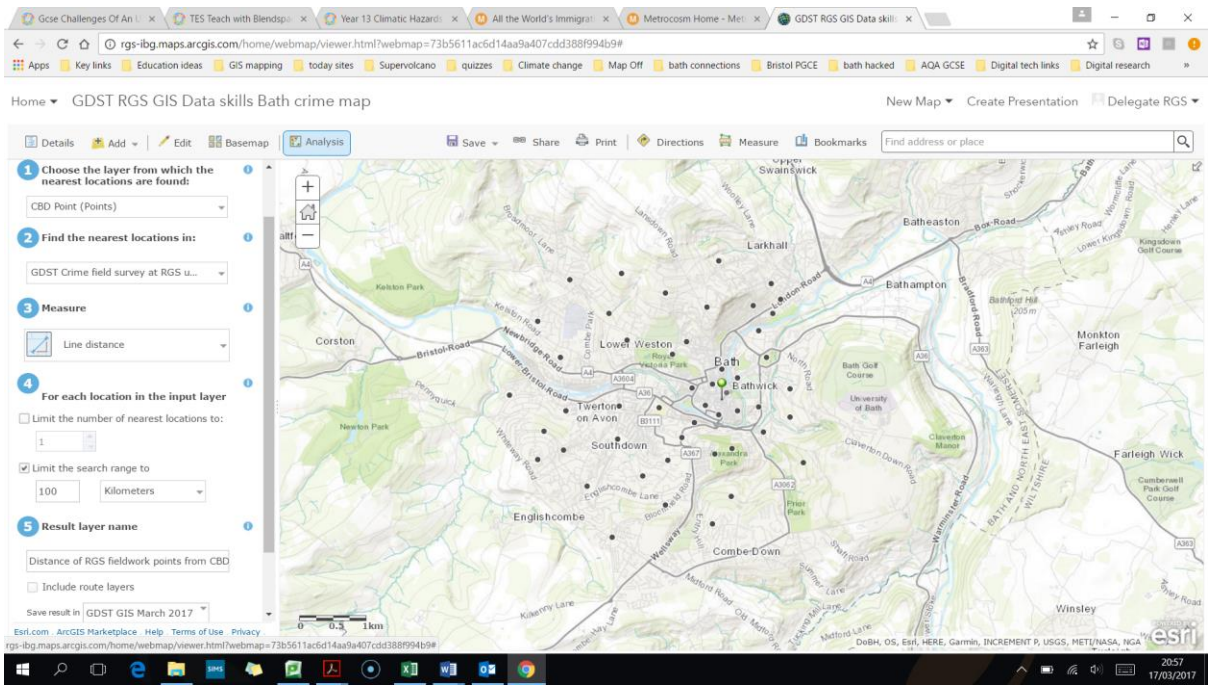
15. Then choose a pin and place it in the centre of the city. The click close on the pop up box.



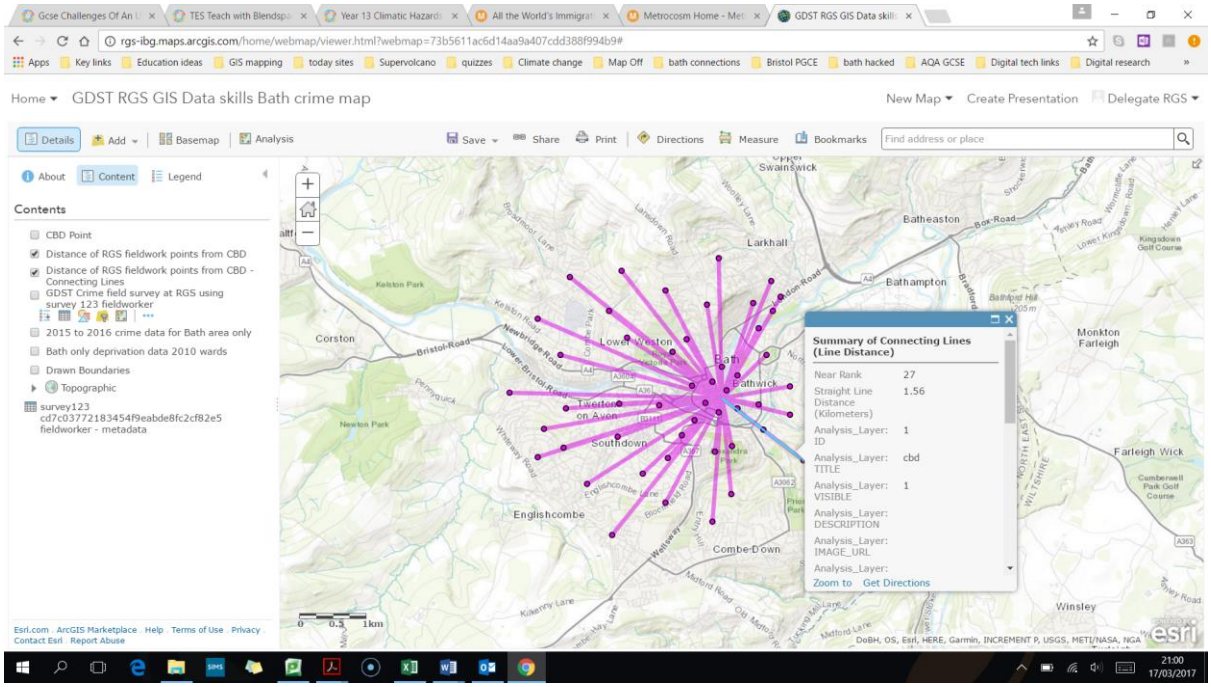
16. Then click on “analysis” at the top left and then from use proximity pick “find nearest”.



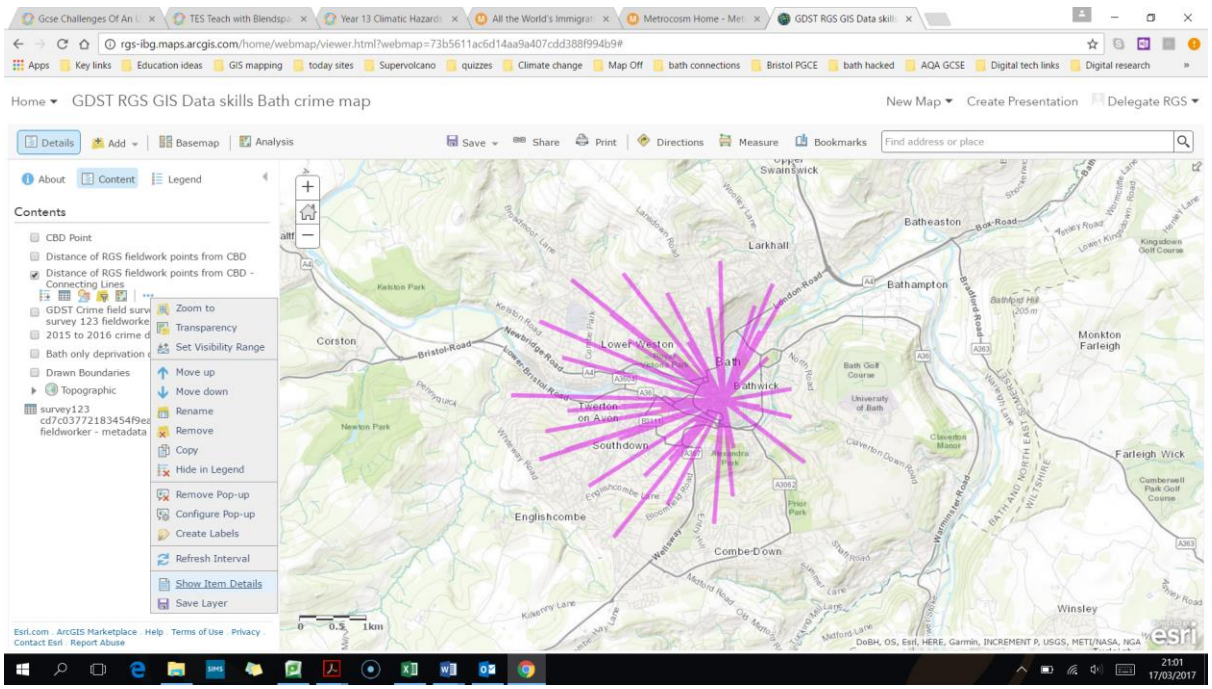
17. Then in box 1 choose the CBD point layer. In box two pick the crime fieldwork data you put in. Under measure choose line distance (you can try out other options like drive distance). In box 4 untick the “limit number of features to..” Give it a name in box 5 like “Distance of RGS fieldwork points from CBD” and run the analysis.



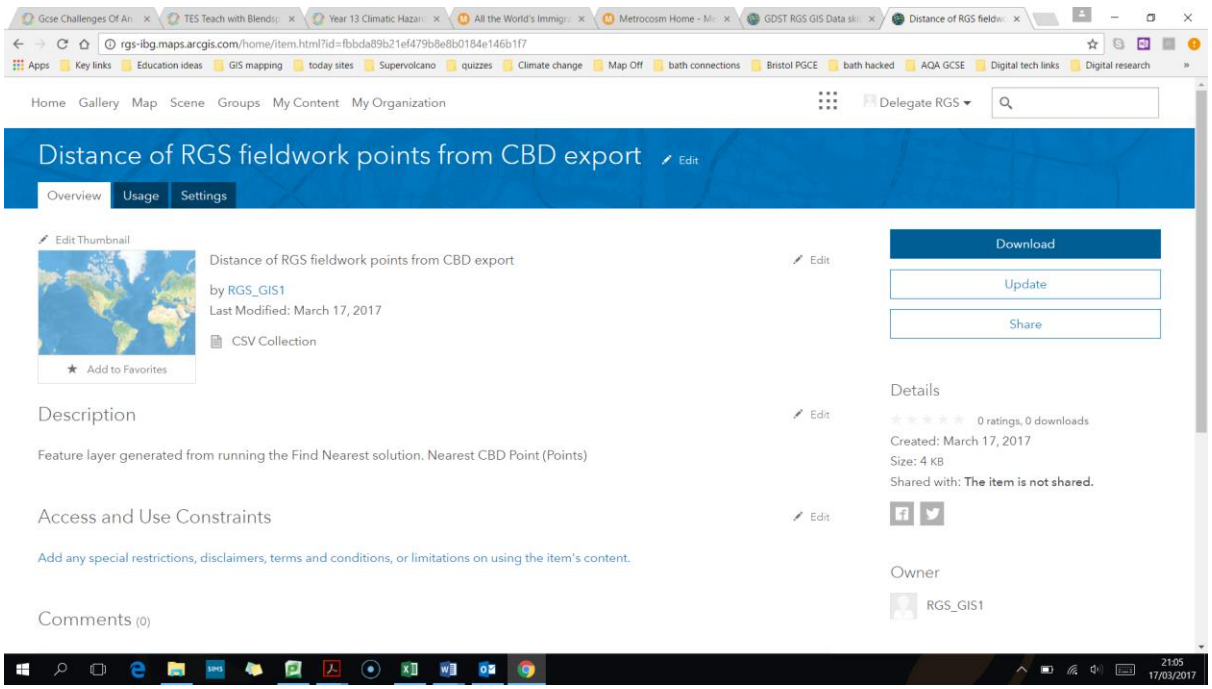
18. It will create two new layers. One with lines and one with dots. Click on the line and you will see that it has the original fieldwork data and also new fields including the distance calculated.



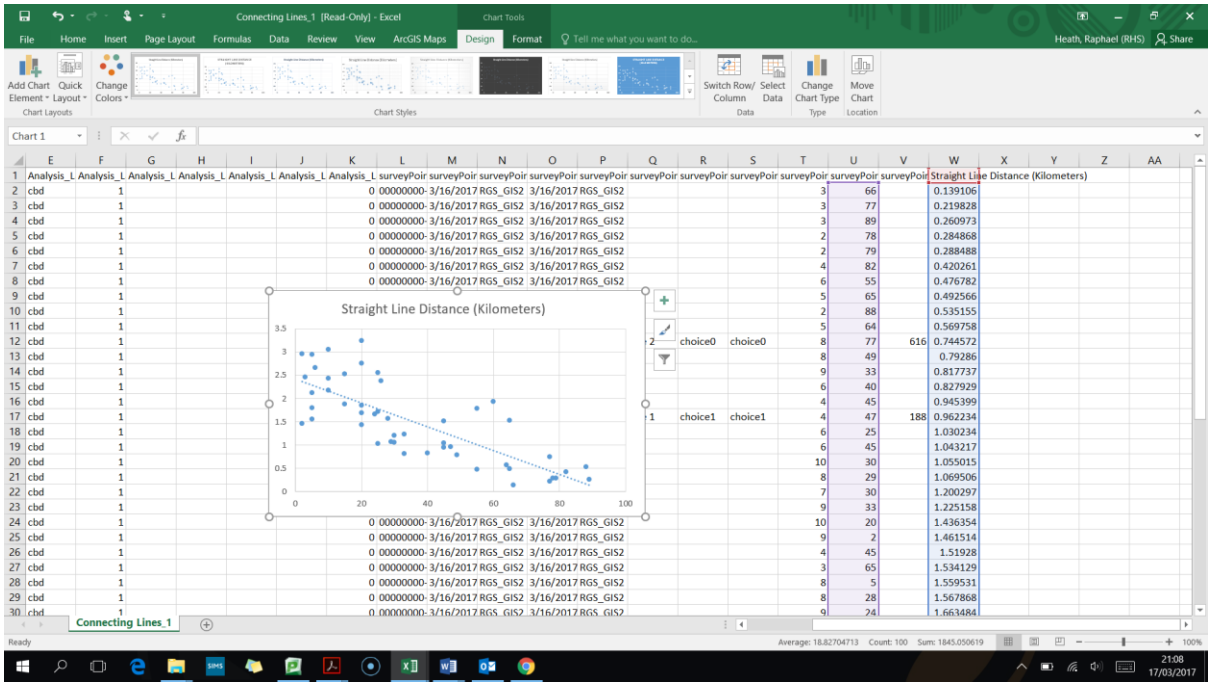
19. Now click on the new layer with the lines data and then the three little dots under the layer name to bring up a sub menu – and within this click show item details near the bottom of the list.



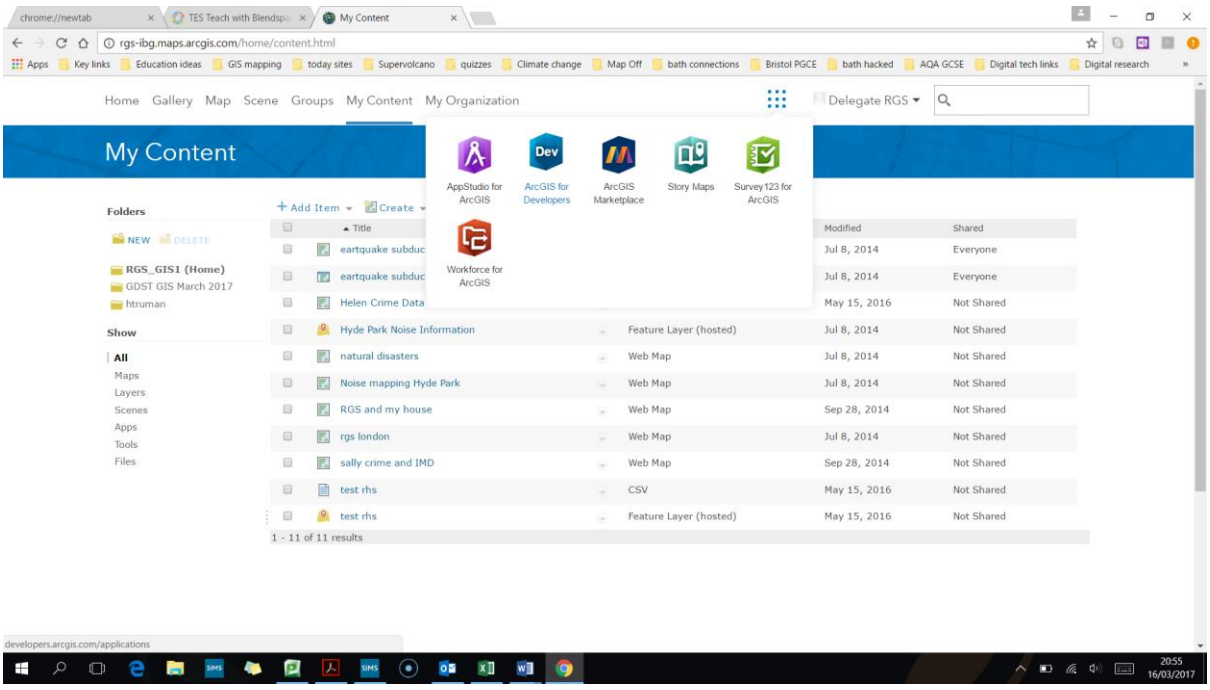
20. Then in the new tab that opens for you, click on “export data” in the bottom right, and then choose “as CSV file” and fill in the file name details. Then in the next screen that loads click on “download” and open the spreadsheet with the lines data.



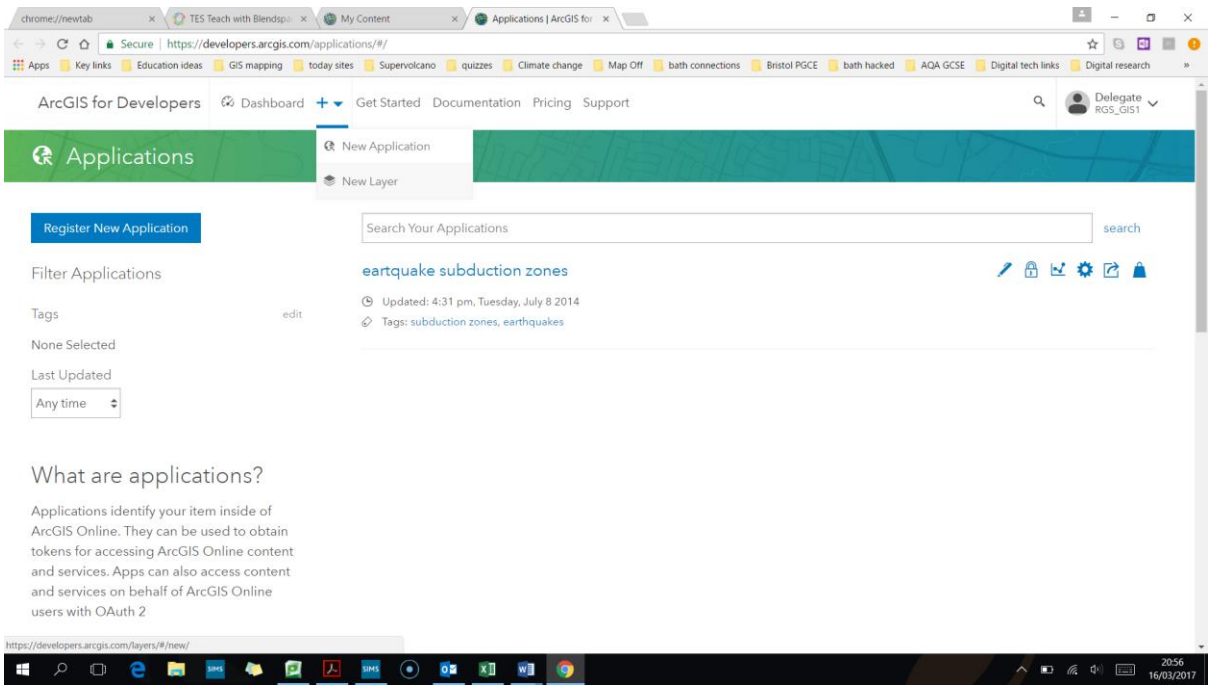
21. The column U contains the noise fieldwork data and column W the calculated distance from the CBD. Choose these two to create a scatter graph to see the correlation between distance from CBD and noise levels. You can run a correlation statistical test on this also.



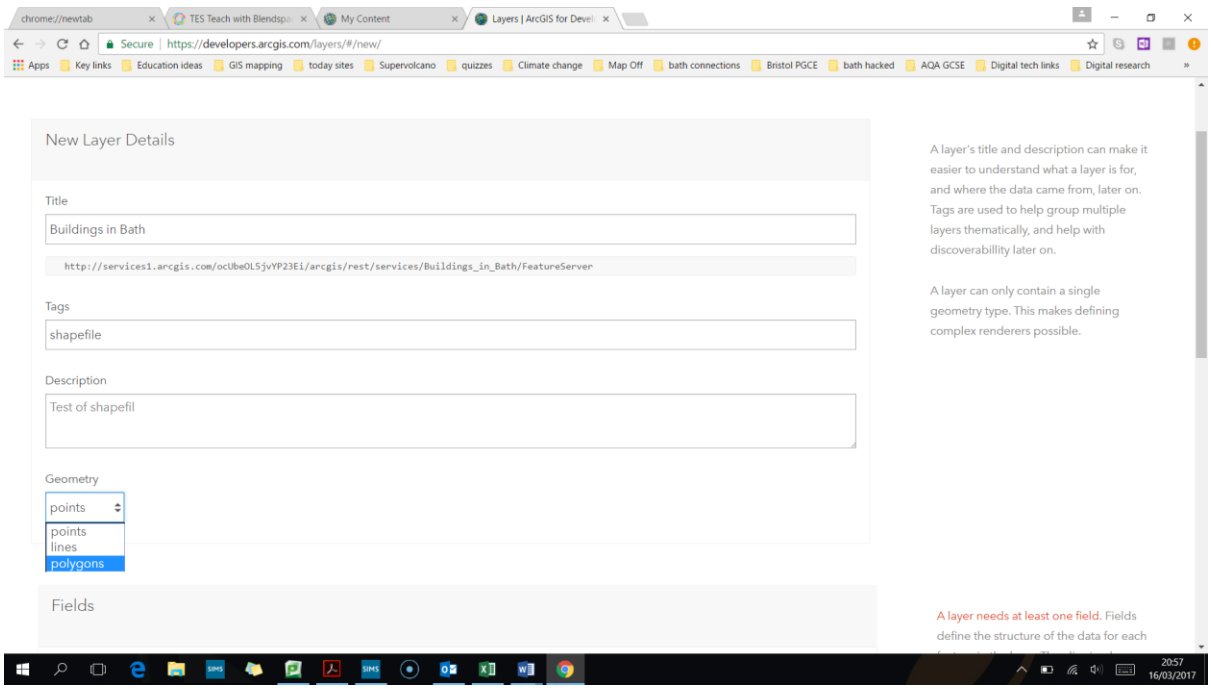
22. If you want to create a shape file, for example drawing buildings on to the map which you then want to assign data to such as land use or building height, you need to go back to “my content” section in your account. Click on the 9 dots on the top right and pick “ArcGIS for developers”.



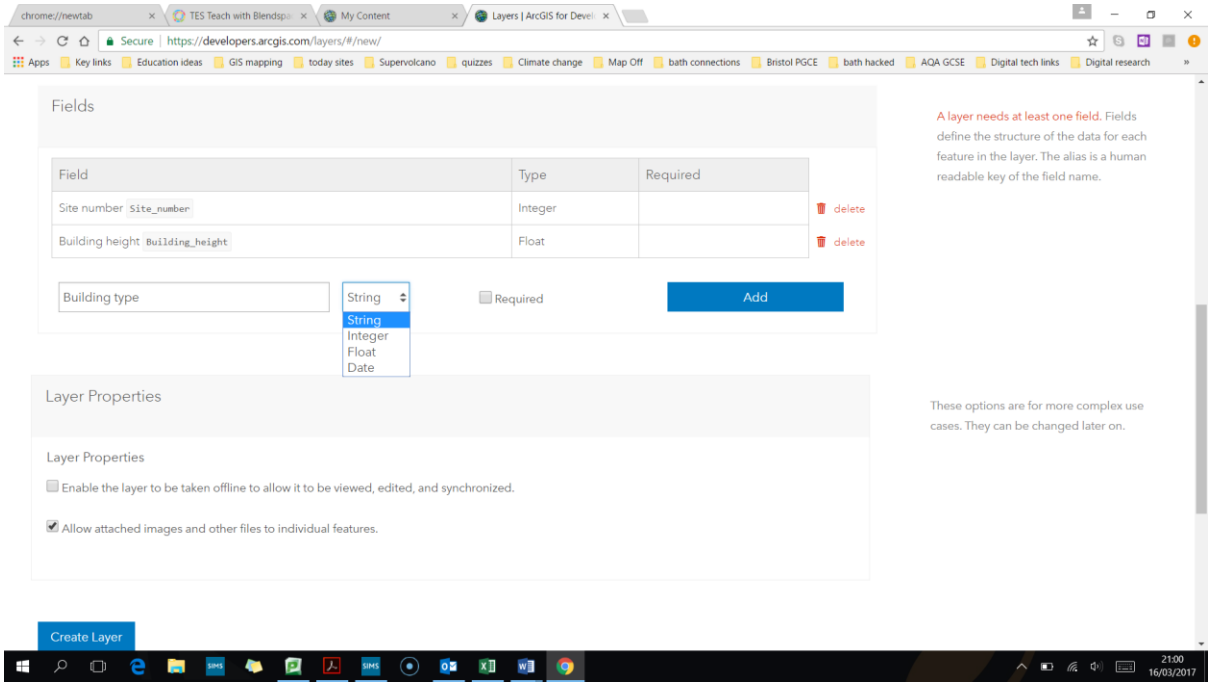
23. Then at the top under “dashboard” click the drop down menu and then “new layer”



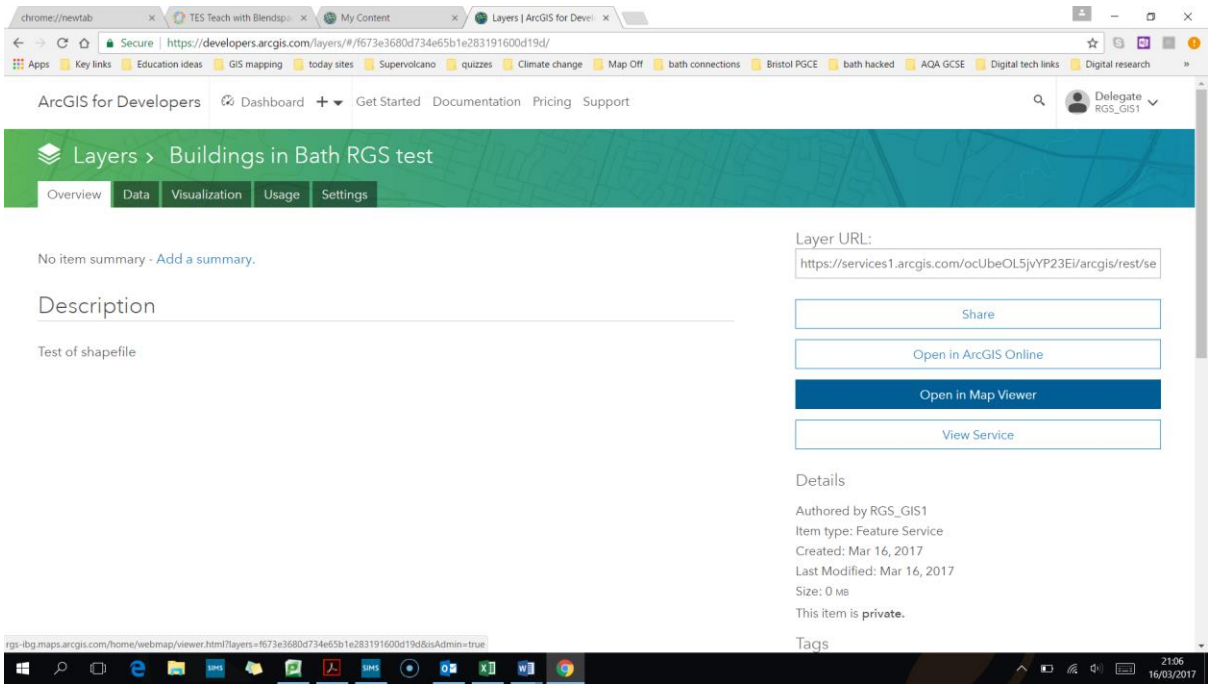
24. Then fill out the details like naming it “buildings in bath”. Under the “geometry” pick “polygons”. (note you can create a point layer here instead of using survey 123 shown earlier).



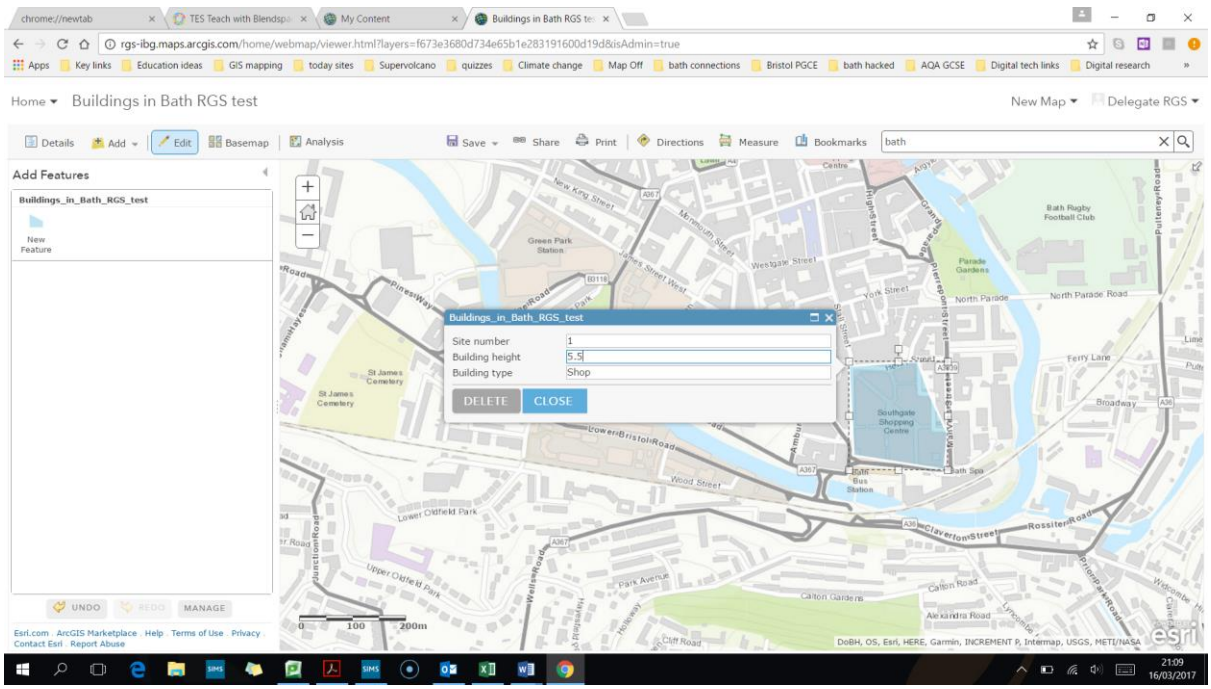
25. Then enter names for the fields like “site number”, “building height”, “building type”. Note you need to pick the field type – the choices are “string” which means text, “integer” which means whole number only, “float” which means a number with decimal points, and Date. If you want to run numerical calculations you need to ensure you use integer or float on the data. Then click create layer.



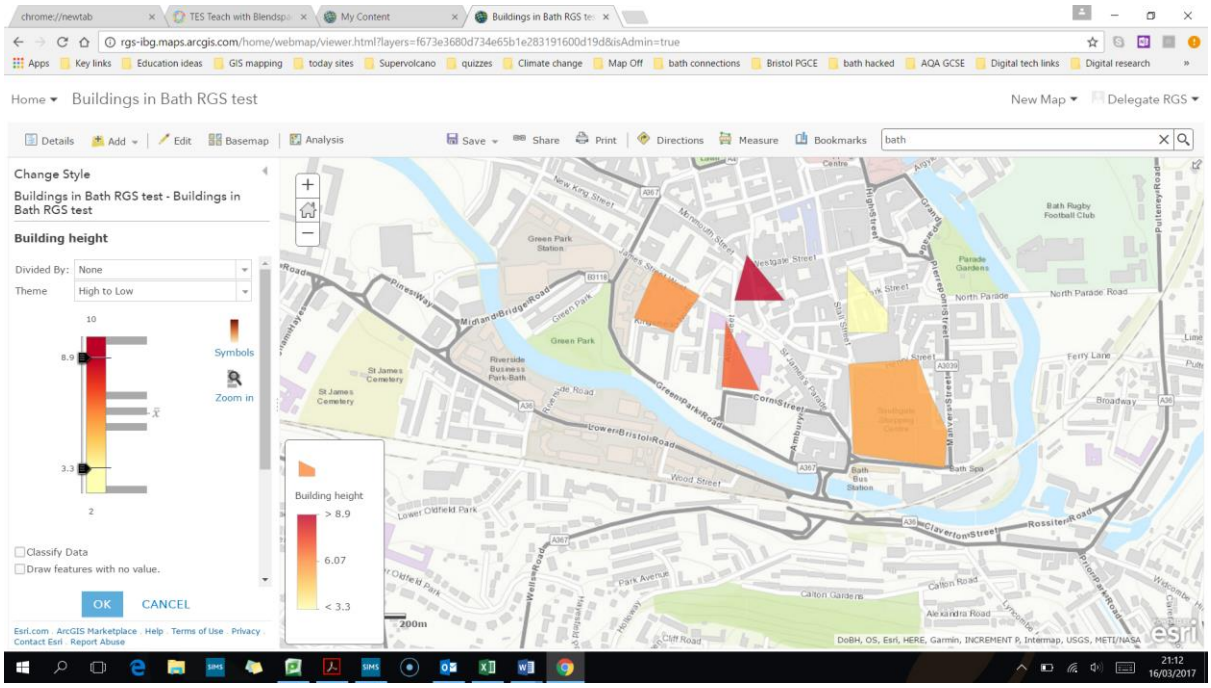
26. On the next screen click “open in map viewer”



27. Then click on “edit” in the map on the top left. Click on the “new feature” option and then start drawing shapes onto the map and adding data to them as you go.



28. Add a few shapes to the map and then change their style to colours based on the building heights.



29. An alternative way of adding point data into your maps by setting it up in a spreadsheet and then importing it is show within the next set of activities.