# Getting started with

# ArcGIS Online

esri UK



Mapping Without Limits

ArcGIS Online is a Complete, Cloud-Based Mapping Platform

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Make and share beautiful maps, and do everything in between. It's possible only with ArcGIS Online, a scalable and secure software-as-a-service hosted by Esri.

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# Getting to know ArcGIS Online

ArcGIS Online is a massive cloud based mapping and analysis platform that allows you to explore and better understand the world from local to global scales. It incorporates, maps, apps, Storymaps, analysis and much more to create a learning tool that can be used from primary through to university. This tutorial will take you through the basics of using ArcGIS Online so that you can apply it to your own education context. ArcGIS Online is a platform for creating and sharing ideas with the world. A vast array of people and organisations are already doing this from The National Trust to NASA, and everyone in-between. Join the fun and enjoy!

# Maps in 2D

1.  To get started open a browser (preferably Chrome, Firefox, Edge or IE11) and go to
    http://www.arcgis.com/features/
    a.  You should now be on the website shown below



2.  You can start using ArcGIS Online straight away without logging in (we will get to that later in the tutorial).
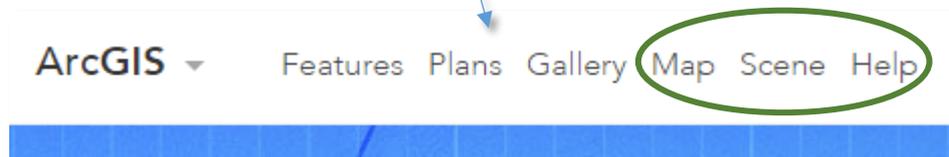


    The main areas that are of interest in this tutorial are shown ringed in green above:
    a.  Map – takes you to the main 2D map viewer
    b.  Scene – opens up the 3D globe
    c.  Help – takes you to a large collection of help documents, videos and other tutorials

    To get started, click on Map to open the 2D map viewer

3. Spend a little time exploring the map (i.e. go and find your house!). Zoom in and out of the map using the mouse wheel or the plus and minus icons in the top left to get used to the controls:
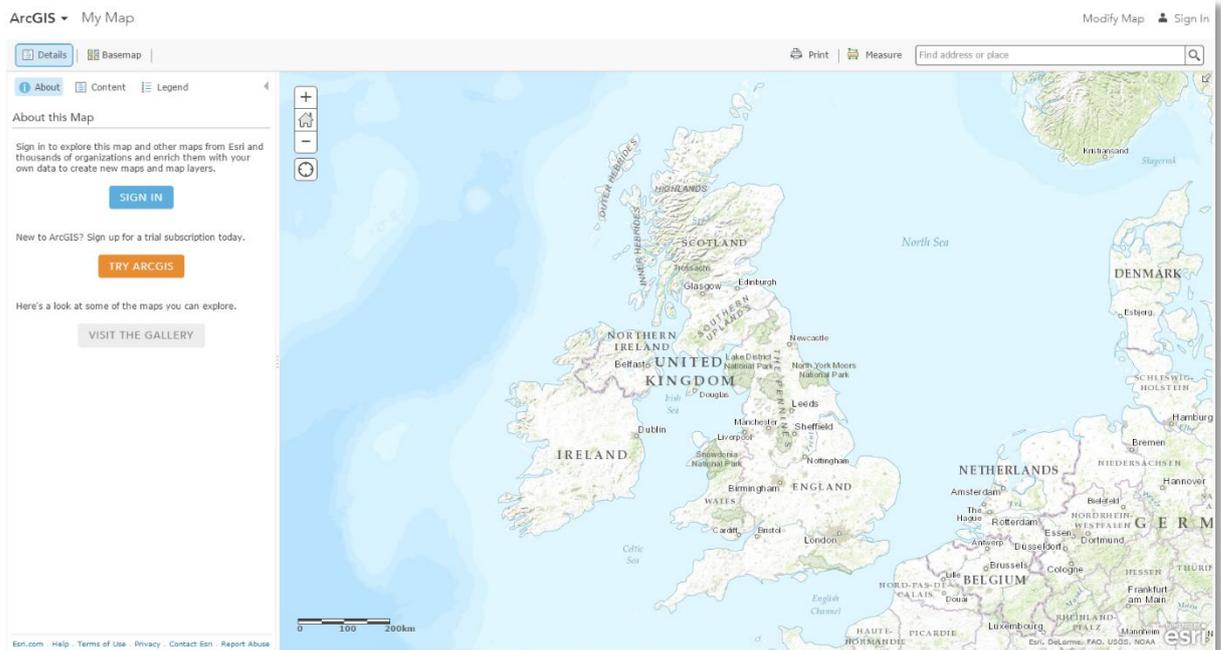


a. Hold the left mouse button down to drag the map around
b. Zoom out to see the full extent of the map
c. Zoom in and find your house

4. Try out the different base maps. How could you use them in your lessons?
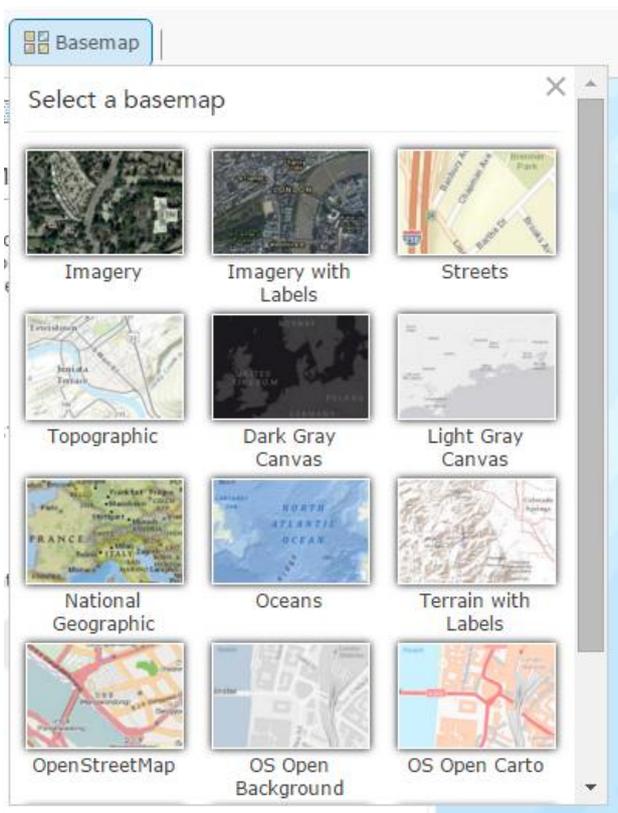


ArcGIS Online has a large array of global and Great Britain focused mapping that you can use in your teaching. This includes Ordnance Survey maps, Imagery, National Geographic maps and much more.

Just click on the Basemap to see it in the map viewer.

N.B. the grey and dark grey base maps are useful for showing off your data in a simple uncluttered way.

3

5. ArcGIS Online has many useful tools. The first one we will use is the measure tool. This tool allows you to measure length, area and to find your latitude and longitude on the map. Hover over the icon to discover which tool does which type of measurement.

**Top-tip for using the length and area tool – click on the starting point of the item you wish to measure and click again on the next points along the item. When you want to stop measuring, double click to finish.**

Use the **Measure** tool to discover:
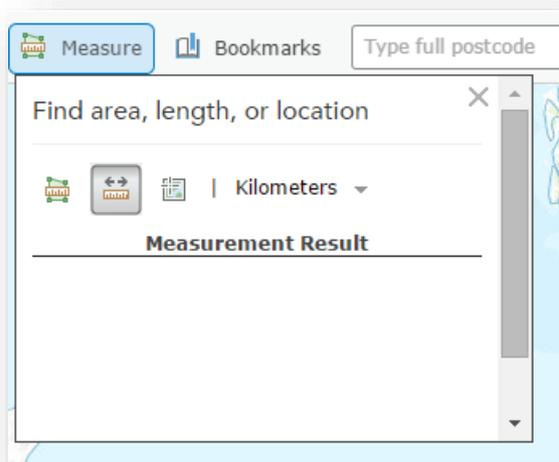


a. The distance from your house to your school _____

b. The distance from your house to New York_____

c. Compare the width of the mouth of the Ganges _____(just south of Bhola) with the mouth of the river Thames _____

d. Use the measure area tool to work out the area of your village/town/city _____

e. What is the latitude and longitude of your school_____  _____

# Adding layers to your Web Map

There are many ways to add different layers to your map. The first is to use the drawing tools in ArcGIS Online. These tools allow you to draw, add text and link images and websites to your map.

In the following section we are going to use the drawing tools in ArcGIS Online to create a map showing the locations of <u>four</u> different places around the world that you have either visited or would like to visit. This could be great Year 6 or 7 starter with ArcGIS Online.

To add the layer you need to expose the Add button. To do this click on the Modify Map button in the top right of the screen. This button hides additional functionality to keep the interface as simple as possible.

Modify Map    Sign In
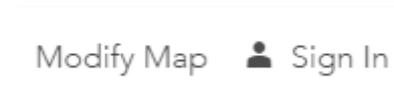
1.  In this first example we will add a simple drawing layer called a Map Note. Click on the Add Button on the left hand side and choose Add Map Notes:
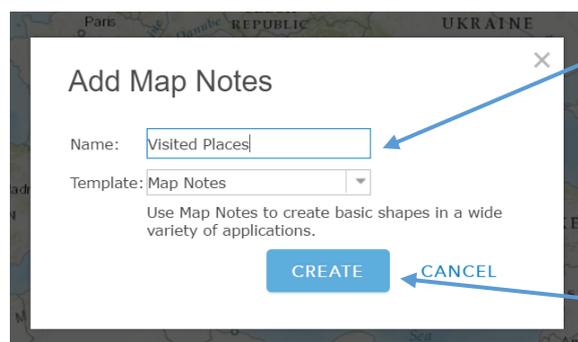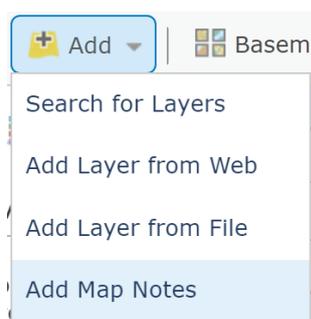
Edit the name to create a sensible name. **Also note that there are many templates available using the drop down arrow.** Click on Create.

You have now created a new layer within the contents, think of this layer as a piece of tracing paper that wraps around the world. You can now draw on this, add text and link images and web pages to specific locations around the world.

**Questions to think about before adding a point:**

How will you find your places on the map? Pan and Zoom? Search?

What images will help to showcase your locations?

What sentences are you going to write about your chosen places?

What websites could you link to for extra information?

2. To add information to the map; find your first location and click on one of the point symbols either the **Stock Pin**, **Pushpin** or **Cross**. Then click on the map where you wish to add your point. In this example I have chosen Ben Nevis as one of my locations.
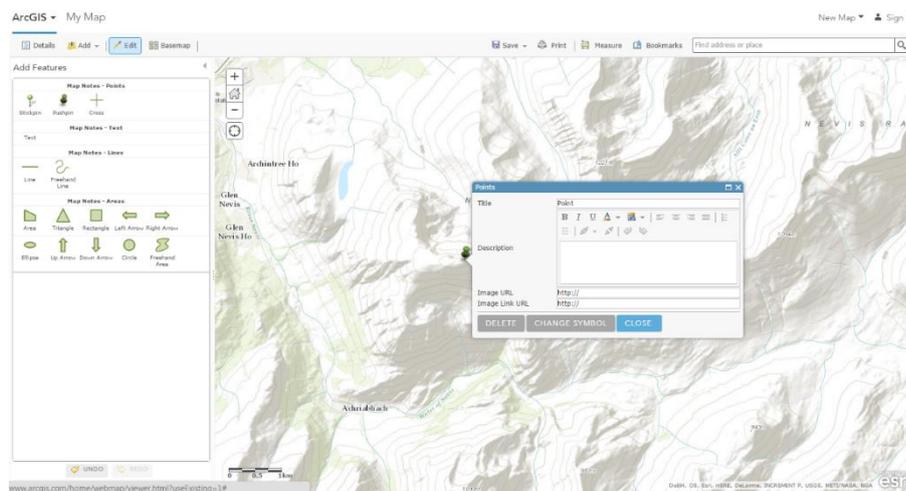


3. In the pop up window shown above we can add information about the location. The pupils needs to think of a title, some appropriate sentences to explain about the location and they can also link to an image and a website about the place. The image and web site linking is explained below:

In the Image URL box paste the web link to a picture of the place. For example:

http://www.walkhighlands.co.uk/munros/ben-nevis-1.JPG the URL must finish with a .jpg, .png or some other image format.

In the Image Link URL box paste a link to a web site about the place. Like this:

http://ben-nevis.com/

**Top-tip – make sure that you either delete or overwrite the http:// in the text boxes when you paste the links in!**



When finished, your pop up window should look similar to this, but related to your location:



6
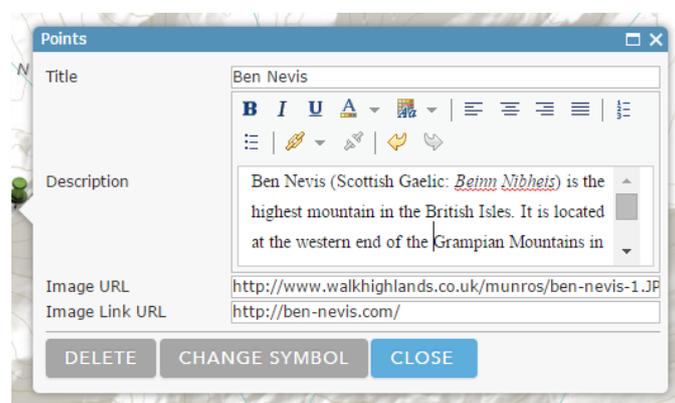
You can also change the map icon by clicking on the Change Symbol button and choosing from one of the many icons available. Once you have done all of this, click off the Edit button (top left) and then click on the map icon to see all of this information appear in the newly configured pop up, like this:
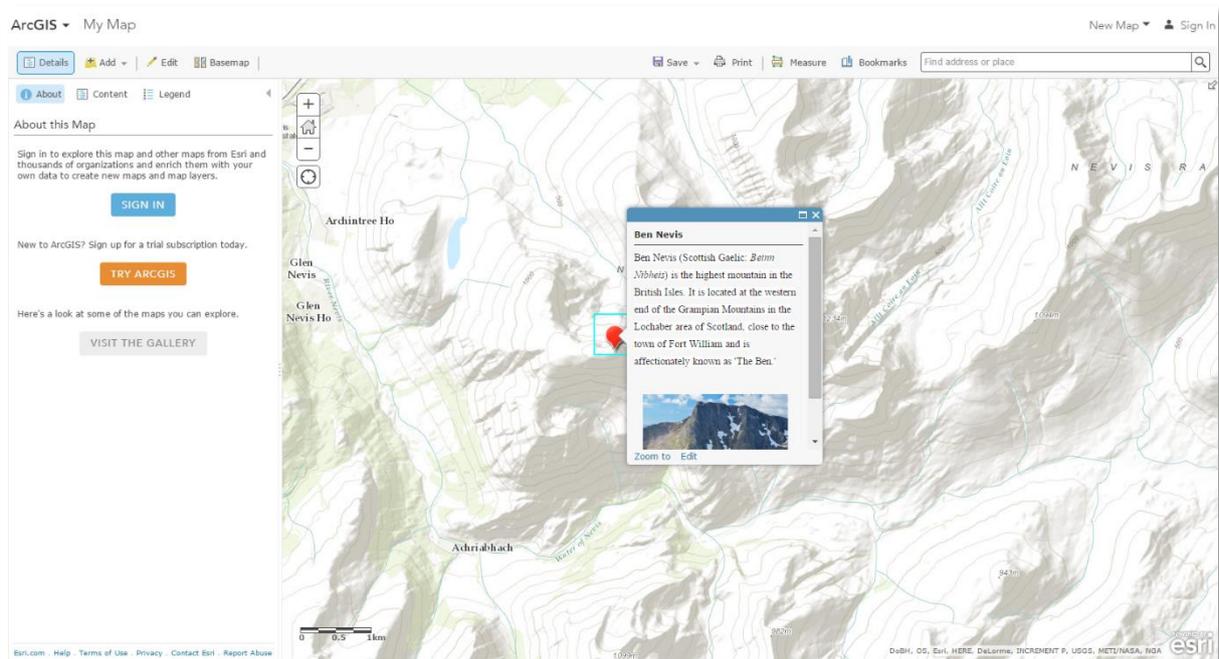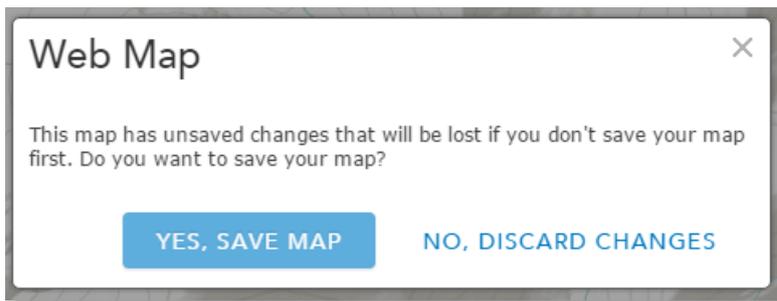


**Repeat this process for the rest of your places.**

4. It is worth noting that we have not logged in or installed anything to get this far. However, if you want to save your map and share it with other people you do need to log into an account. To do this you can easily create a free Public account for ArcGIS Online or use your organisations subscription account to save all of your work. You can create a free account here https://www.arcgis.com/home/createaccount.html or contact your IT team to get access to your organisations Subscription account.

When you have your login details click on Sign in in the top right of the screen.
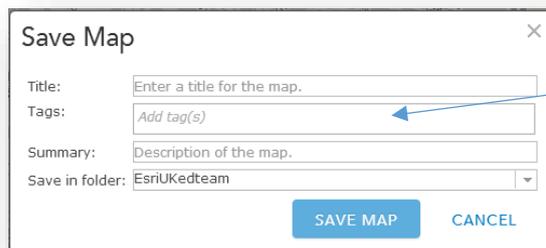


N.B. the Free Public account is a single user account that has less functionality than an organisations Subscription account. The Subscription account has GIS analysis tools, mobile mapping and the ability to manage student/pupil accounts amongst the differences with the free account.

5. When you login you will automatically be asked to save your map, choose Yes, Save Map:

**Web Map** ✕

This map has unsaved changes that will be lost if you don't save your map first. Do you want to save your map?

YES, SAVE MAP    NO, DISCARD CHANGES

In the next window fill out the details and click on Save Map

**Save Map** ✕

| Title: | Enter a title for the map. |
| Tags: | Add tag(s) |
| Summary: | Description of the map. |
| Save in folder: | EsriUKedteam ▼ |

SAVE MAP    CANCEL

N.B. Tags help you search and find your content

In ArcGIS Online, when you save a map you create a **Web Map**. However, a **Web Map** is not just a map on the web! Think of a **Web Map** as being similar to a Word document, but for maps. A Word document contains text, images, font, font size, colour etc. A Web Map contains similar things but for your maps. All of the different layers that you have added, your Bookmarks, location, transparency, pop up settings, filters and anything else that you have specified when you were creating your map.

By using the Save button you have just created your first **Web Map**.

# Now let's try 3D!

You can explore the 3D scene without logging into an account, however to be able to do some of the sections below, including adding layers and slides you will need to have signed into an account.

1. In ArcGIS Online, 3D is often referred to as a **Scene**. So, to get started go to:

ArcGIS ▼  My Places around the world

| Home |
| Features |
| Plans |
| Gallery |
| Scene » |
| Groups |
| My Content |

Edit    Basemap

Legend

8
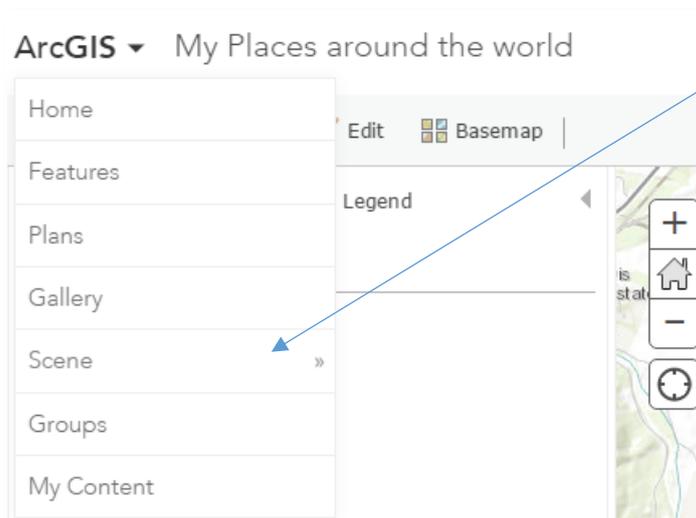
2. This will take you to the 3D globe viewer:
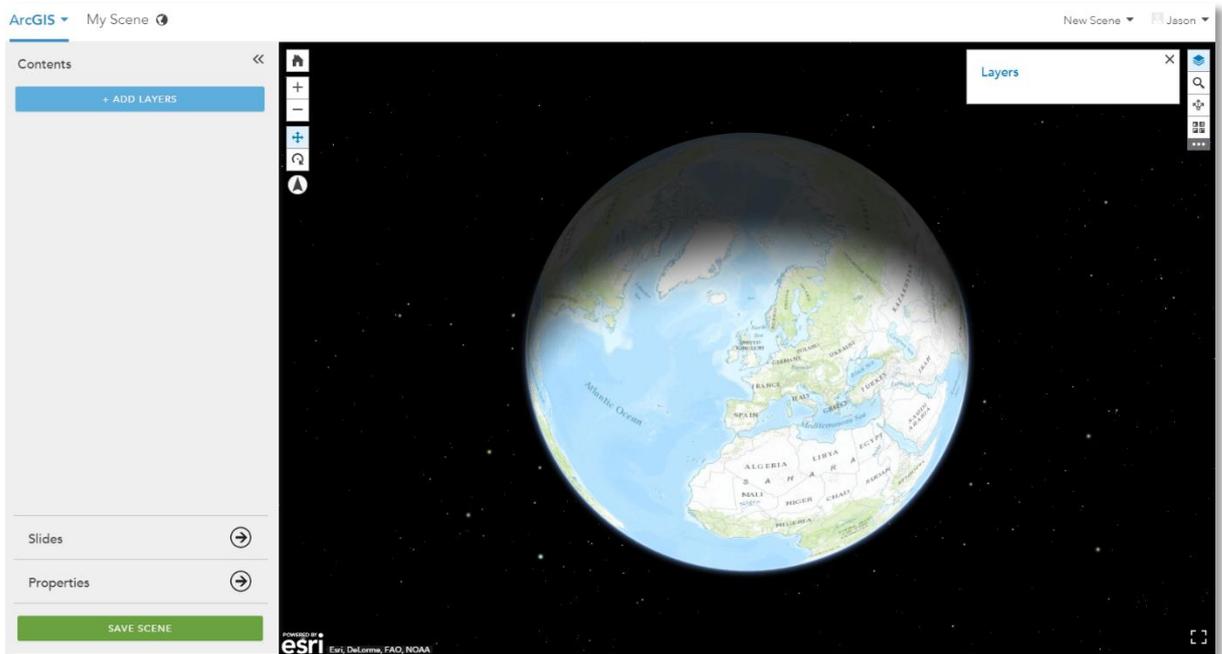


3. You can use the mouse wheel to zoom in and out of the globe, and hold down the right click to rotate. Or use these buttons to Pan and Rotate for a 3D perspective
   Experiment with the controls to get used to them. N.B>. Rotate works better closer to the ground.

   ← Pan

← Rotate
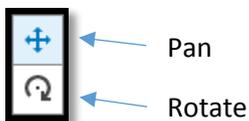
4. Unlike most other digital globes, you can easily change the type of map shown on the globe in ArcGIS Online. You can change to imagery, National Geographic, Oceans amongst others. To do this click on the base map selector icon shown below and choose your base map:

Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.
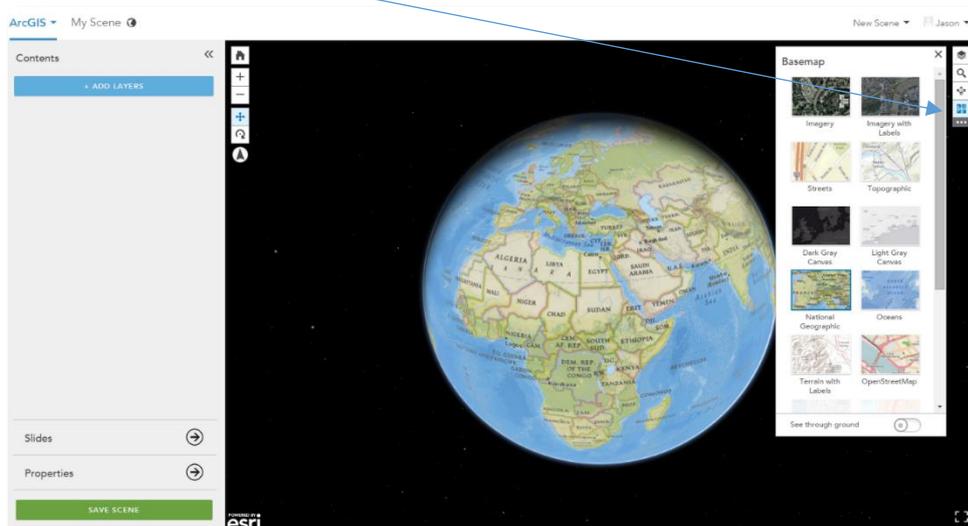
Explore some of your favourite places. Below is Helvellyn in the Lake District showing some excellent glacial features.
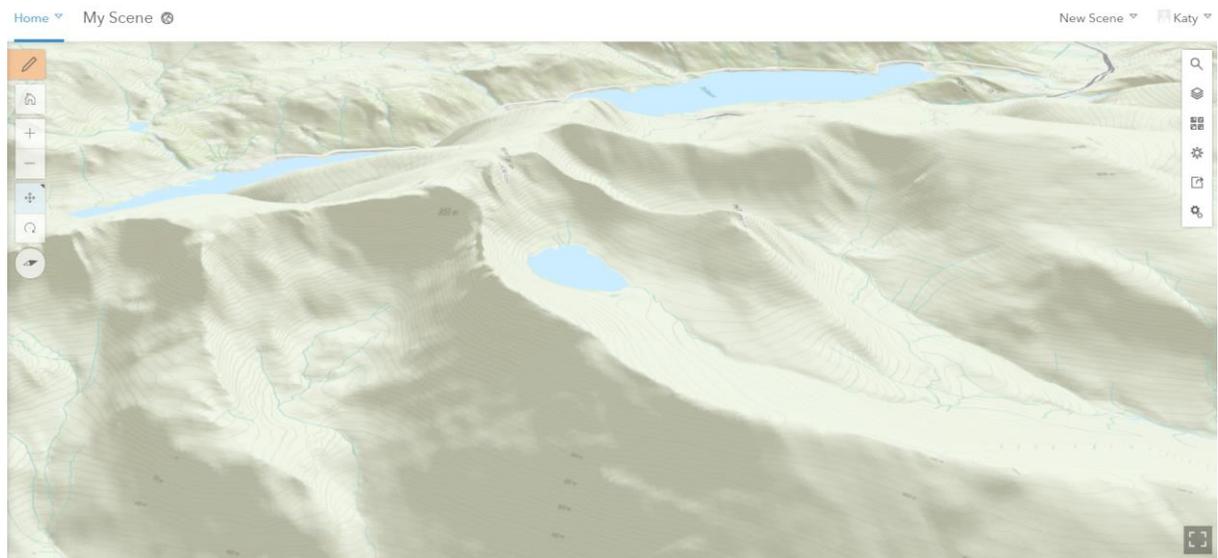


5. The 3D Scene viewer in ArcGIS Online can be used like a simple 3D PowerPoint as you can save Slides of different locations around the world. To do this click on the Slides button and then use the Capture Slide button to start capturing and naming different locations around the world. This could be set as homework or you could create a slide series showing different locations that related to a particular lesson.
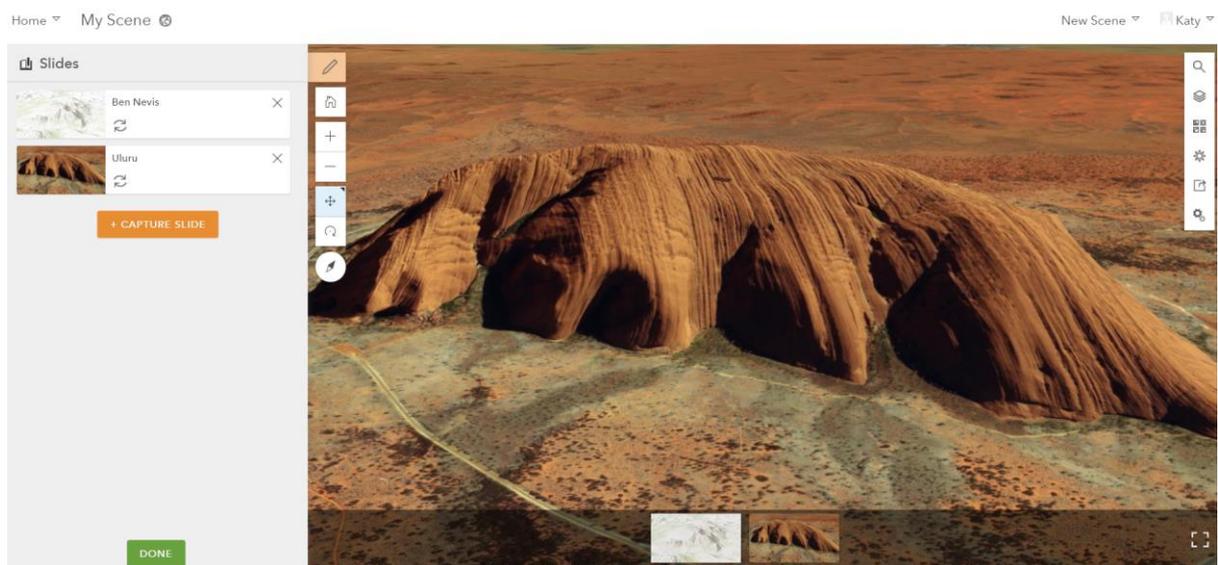


When you have finished creating Slides click on Done.

6. To save all of this work click on the Save Scene button and fill out the details in the new window:
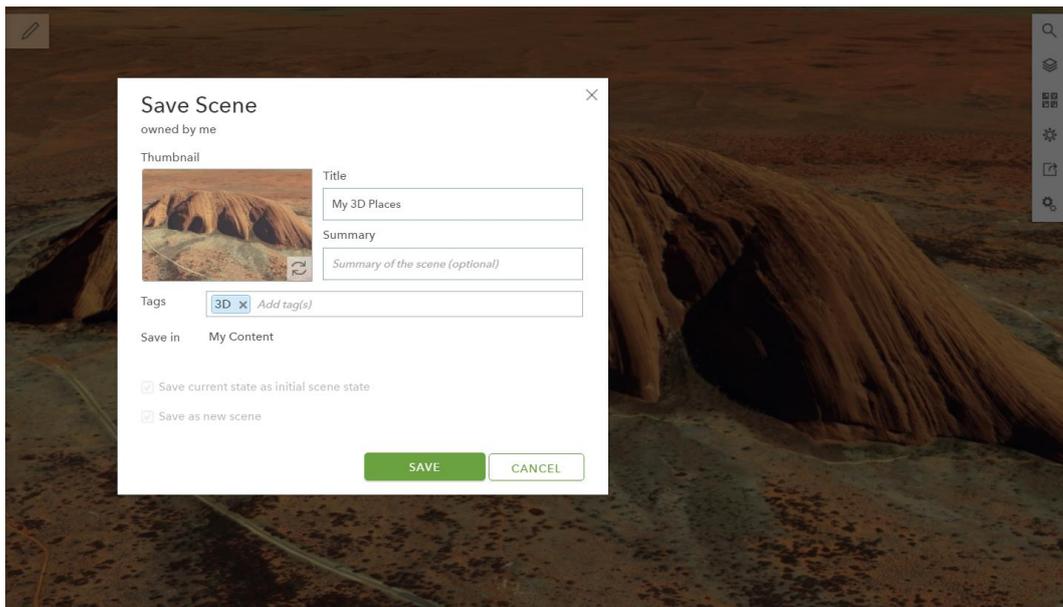
The Slides and the all of the 3D information are now saved as a Web Scene for you to use later. A Web Scene is the same as a Web Map that we saved earlier, but for 3D.

To access the Slides just click on the thumbnail images at the bottom of the screen.

# Back to 2D - Adding data and Smart Mapping

<u>Question</u> - How many earthquakes were there last week with a magnitude of greater than one, and where did they occur?

You can use ArcGIS Online to answer this question through inquiry based learning and allow your pupils to handle large volumes of real data along the way.

ArcGIS Online allows you to add your own or other data (primary and secondary data) to a map really easily. This could be a large file of earthquake data as in the following example or a small spreadsheet of micro climate data collected by your students. The principles are exactly the same, regardless of what the data is about. So…



1.  Go back to the 2D mapping, if you are still in your 3D Scene then click Home then Map, or if you are in your My Contents page, click Map from the top bar. If this is not a new map then

    If this is not a new map, click on New Map in the top right of the screen and then Create new map.

esri UK
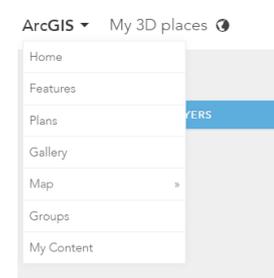
2. To answer the question above we need find a reliable source of earthquake data that we can easily access. Many organisations provide data in a format that ArcGIS Online can use, in this case it is the United States Geological Survey (USGS). They collect seismic data from around the globe and make it openly available. The link to their website to get the data is a little long if you have this document in print, so here is the short version followed by the full address:



Short URL http://on.doi.gov/1Jpg5og

Full URL http://earthquake.usgs.gov/earthquakes/feed/v1.0/csv.php
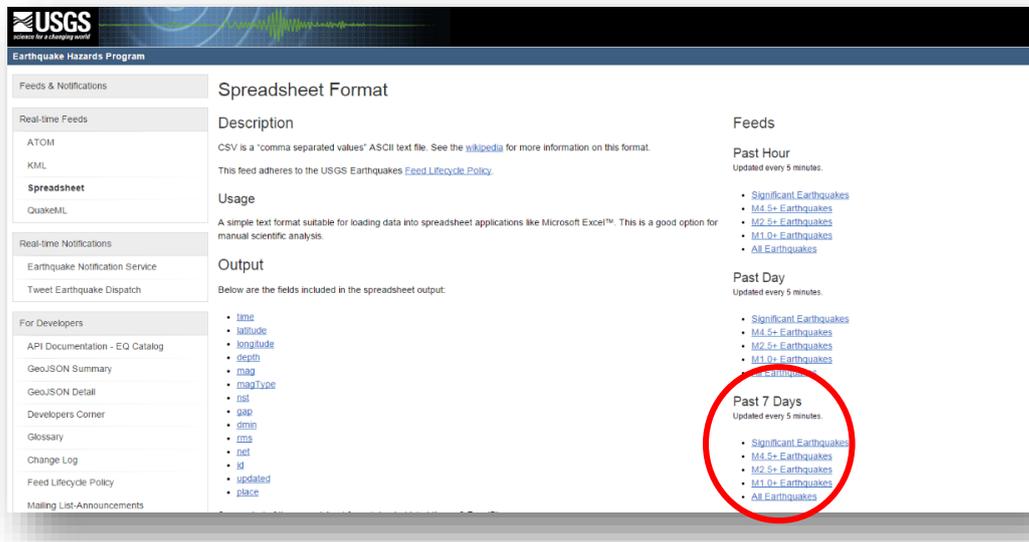
Use one of these links to go to the web site.
In this example we are interested in the earthquakes from the Past Seven Days and with a Magnitude Greater than 1.

Click on the M1.0+ Earthquakes link circled above on the right hand side.

The data will either be downloaded to the bottom of your screen or will open up in Excel, depending on your browser settings. It is important to know where the file has been saved to your PC. In most cases it will be saved in the Downloads folder.

Have a look at the data in Excel and you will see that it is complicated and noisy, not usually a lot of fun for pupils or teachers (there will be about 1000 earthquakes). However, ArcGIS Online can make sense of this data very quickly as it has Longitude and Latitude in the table. To add the data to the map, locate the downloaded file in windows explorer; arrange your screen to look like this and follow the instruction:

Drag and drop the file onto the map
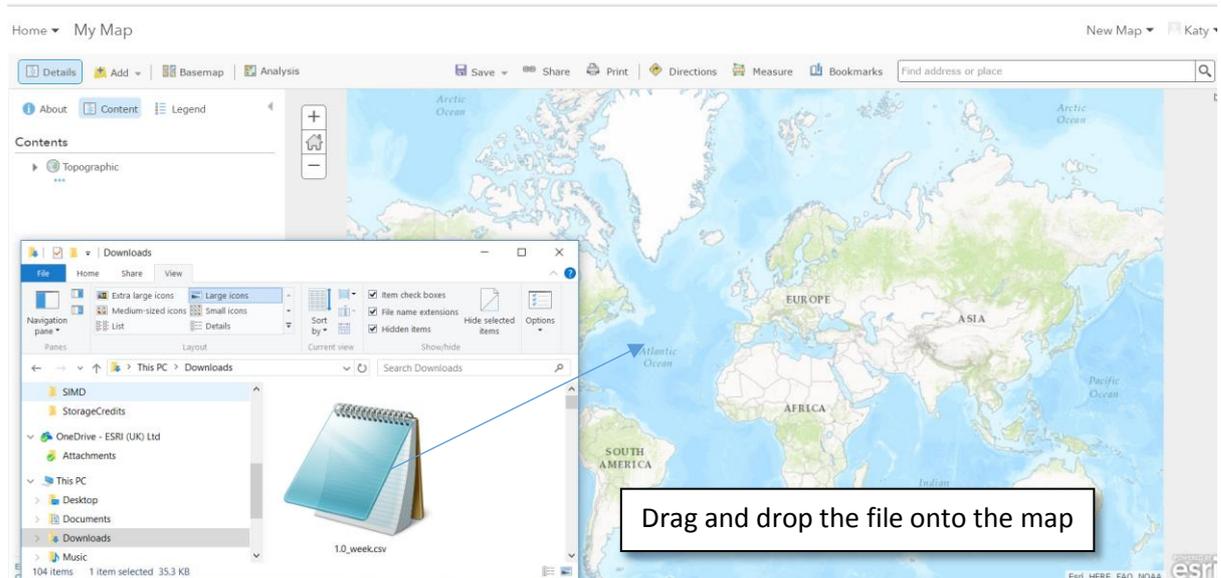
Drag and drop the data onto the map and watch how the data is automatically added to the map as ArcGIS Online knows how to map spatial information.
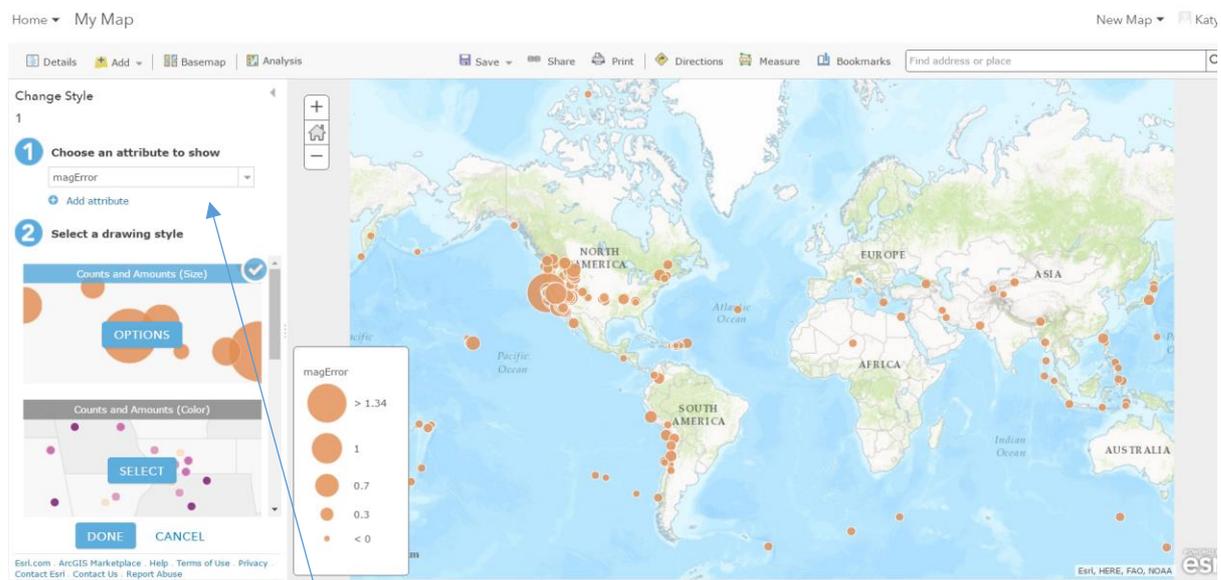


ArcGIS Online uses a sophisticated cartographic engine called Smart Mapping to make choosing the right colours and symbols for your data easy. The Smart Mapping capability in ArcGIS Online has chosen to show the data using MagError as shown in section 1 above with different sized circles. Change the data which is being symbolised using the drop down arrow to explore the different data attributes available.
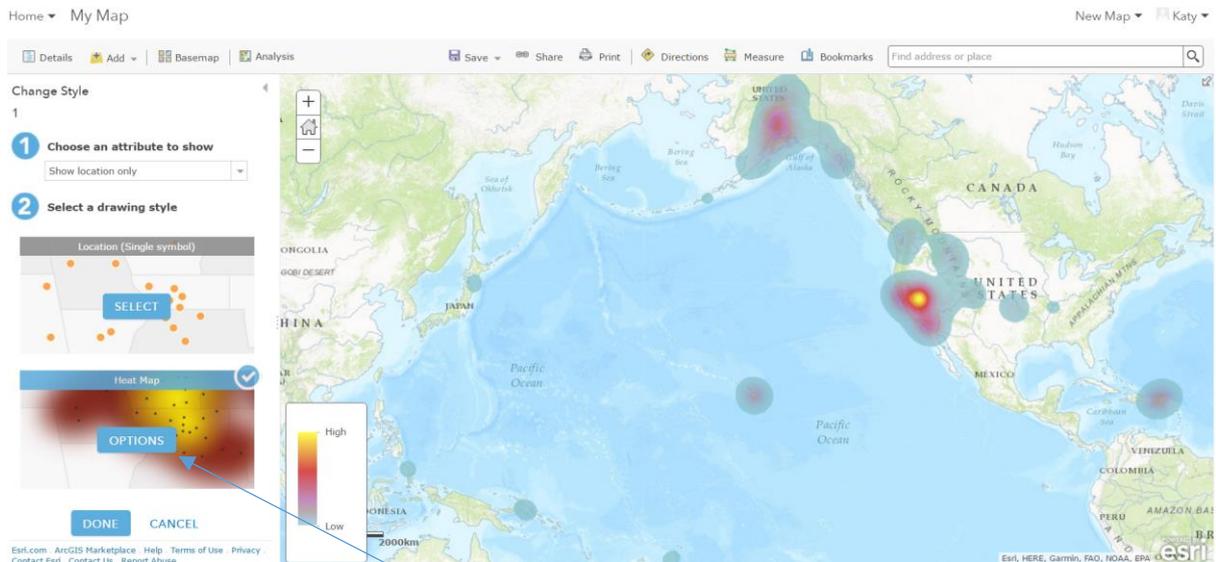
Zoom into the map a little and try the Heat map option available to see the distribution of the data.
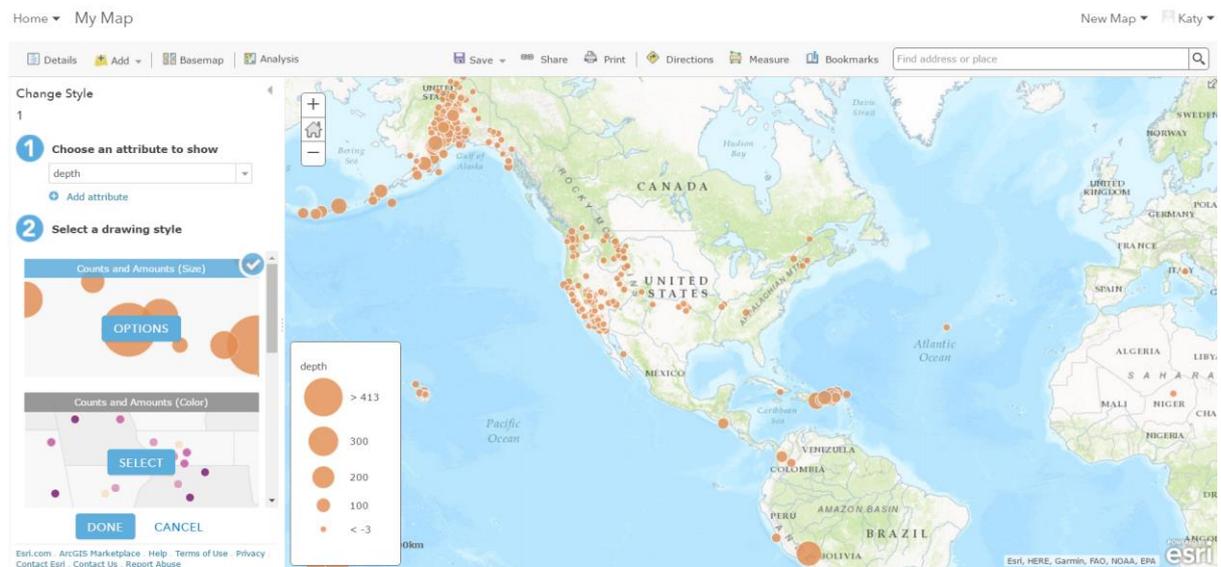


Go back to the Counts and Amounts mapping option with Depth chosen from the drop down menu in Section 1 as shown above.

We can even dig deeper into the data and explore what earthquakes cause the most damage and loss of human life. Shallow, large magnitude earthquakes are usually the biggest killers as most of the energy is released close to the surface where people live. We can find this combination in the data by mapping Depth and Magnitude on the same point using proportional symbols and a colour gradient. Click on the Add Attribute link in section 1 and choose Mag as shown below:
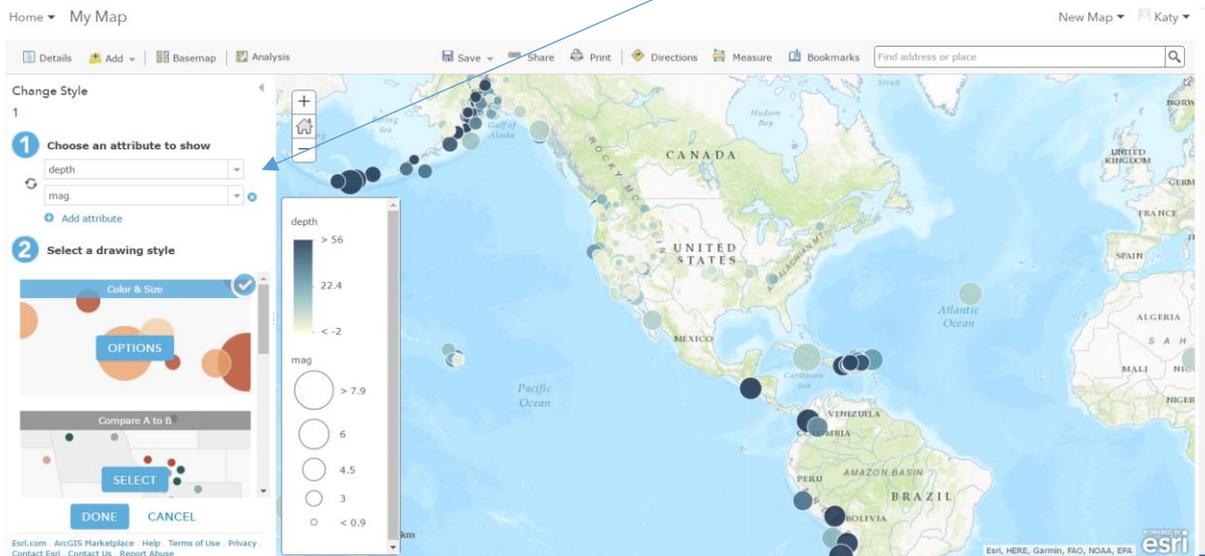


At the moment the shallow earthquakes are shown as a white-ish colour that does not highlight their importance in a strong enough way.

To improve this, click on Options in the Colour & Size section and then Options again as shown below:
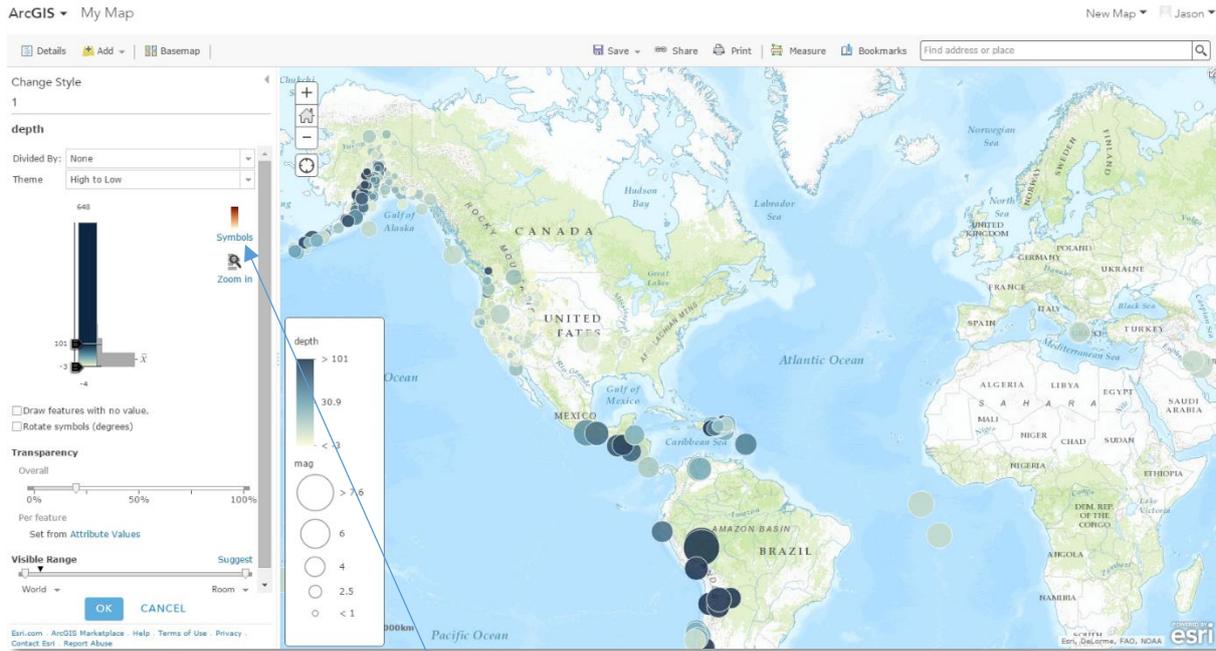
ArcGIS Online has a range of different options of changing the style of your maps but in this case we will just change the colour. Click on Symbols, Fill and scroll down and choose the red colour ramp and click on the Invert Colour Ramp button.
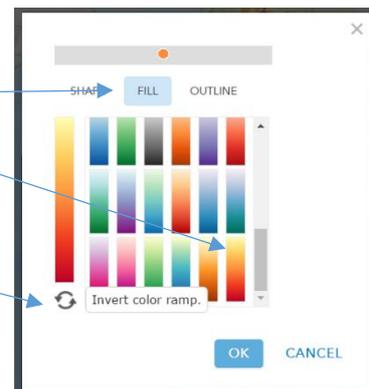


Click OK and Done until you get back to you map like this:
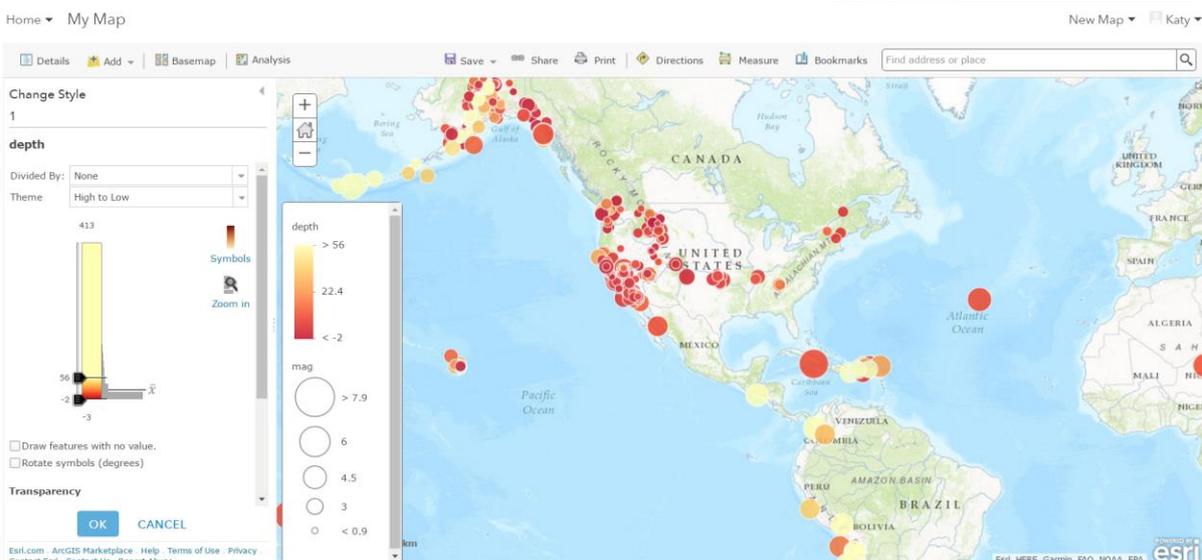


The large red circles now locate the shallow depth and high magnitude earthquakes. Click OK and Done to keep the changes you have made.

Top Tip – all of the controls for the layer will be shown if you mouse over the layer

Change Style

Show key

☑ 1

Analysis

Show table

Other tools including Rename

Topographic
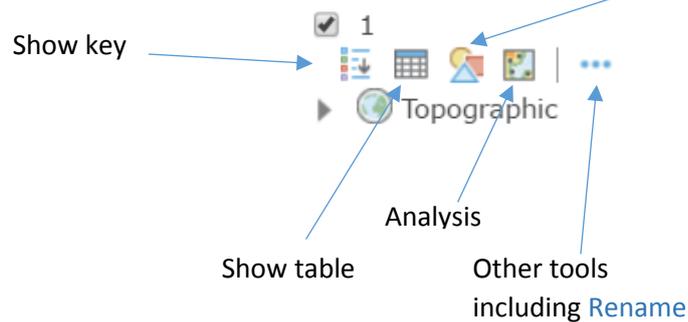
3. You can use these same techniques with local data your pupils may have collected on a field trip or work around the school. If we take a microclimates example around your school you can use the Location function in the Measure tool to collect the latitude and longitude. Just copy and paste the locations into a table like this one, save it as a CSV file in Excel and then just drag and drop it onto the map. All of the same mapping options will be available to you!

| Latitude | Longitude | Location name | Wind speed m/s | Temperature C | Light as Lumens |
|---|---|---|---|---|---|
| 51.260168 | 1.083104 | Playing field | 15 | 16 | 30,000 |
| 51.260756 | 1.084756 | In the Quad | 3 | 19 | 20,000 |
| 51.260941 | 1.083957 | Behind science block | 9 | 17 | 16,000 |
| 51.260890 | 1.085319 | Staff car park | 12 | 20 | 25,000 |

4. If we come back to the question we asked at the start of this section:

## How many earthquakes were there last week with a magnitude greater than one, and where did they occur?

I think that we have comprehensively answered that using real data from a world leading organisation, who also happen to use ArcGIS Online for their mapping. The pupils are using real data and real tools to address real issues.

We can also take this investigation even further with ArcGIS Online as it contains millions of maps that could be of interest to us. At the beginning of the lesson we could have set a slightly different investigation question, such as:

## Is there a relationship between plate boundaries and earthquakes?

We have already mapped the earthquakes using data that was just 5 minutes old from the USGS. The item that is missing for this investigation is a plate boundaries map. However, we can search in ArcGIS Online to try and find one. So, to start searching for layers in ArcGIS Online click on Add and then Search for Layers.
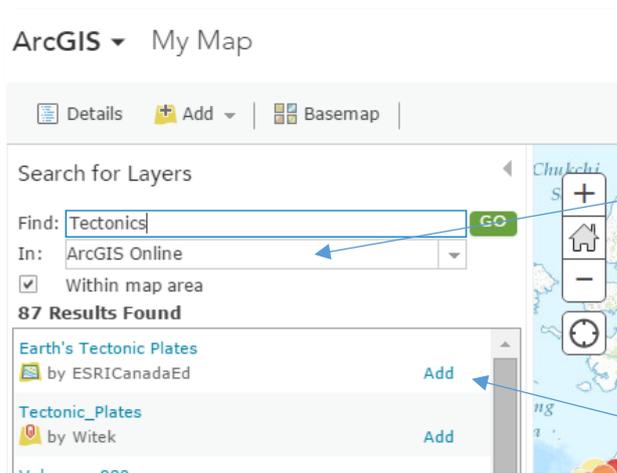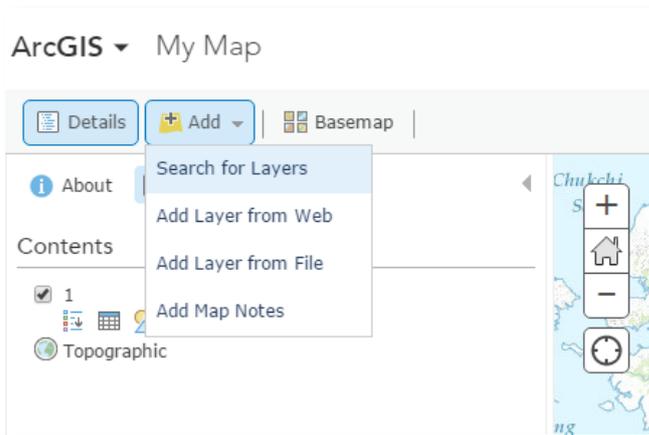
In the Find box type Tectonics, then insure you are searching in ArcGIS Online using the drop down arrow, rather than your organisation.

You will see that a variety of people and organisations have added plate boundary maps. In this example let's choose the top search Item from Esri Canada.

Click on Add to overlay the plate boundaries on the earthquakes map.

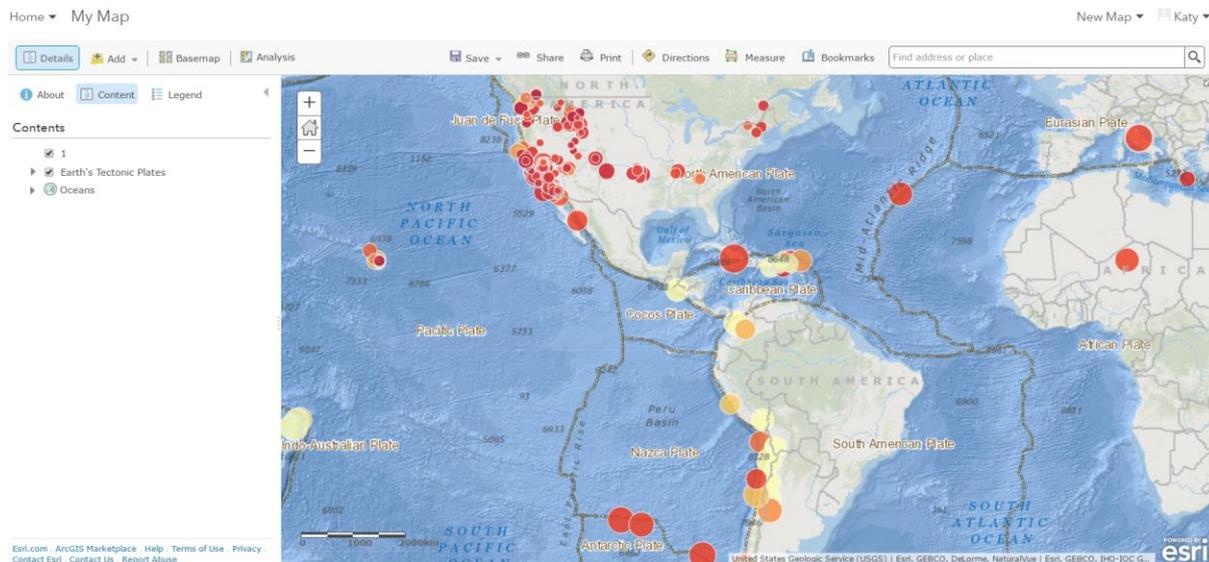Then Done Adding layers at the bottom.

You can now see the plate boundaries and their association with earthquakes from the last 7 days:
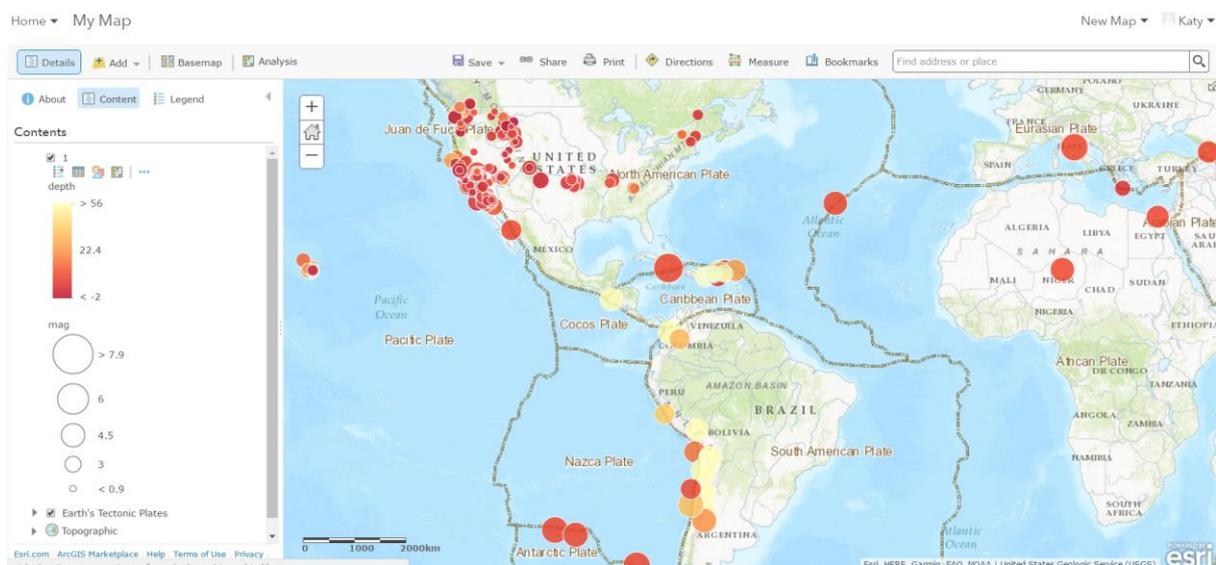


You could also change the base map to the Oceans base map to drain away all of the water to reveal the sea floor topography and the effects of plate tectonic activity i.e. sea floor spreading, trenches, Hot spotting (Hawaii).

Click Save and add a title and tags to your map, so we can add another element to this investigation.

# Creating a Web App – the elevation profile tool

ArcGIS Online is an extensive platform that also allows you to create and publish your own specialised Web Apps.

In this example we are going to use the Elevation Profile Web App template to create a tool that will allow us to see a cross section through a subduction zone or an elevation profile of any other part of the world that we choose to look at.

As you have saved your map the Share button becomes comes available. Sharing your content is a very important part of the ArcGIS Online platform. In the free version you can choose to keep the content private or share with the world. There is also social sharing via Twitter, Facebook etc.

Click on the Share button to see this window:

Click on Everyone to see all of the options become available.

These are Groups that have been created in your account to help you organise your work. You can create as many Groups as you need. If you tick on one of the boxes the map will be shared to that Group.
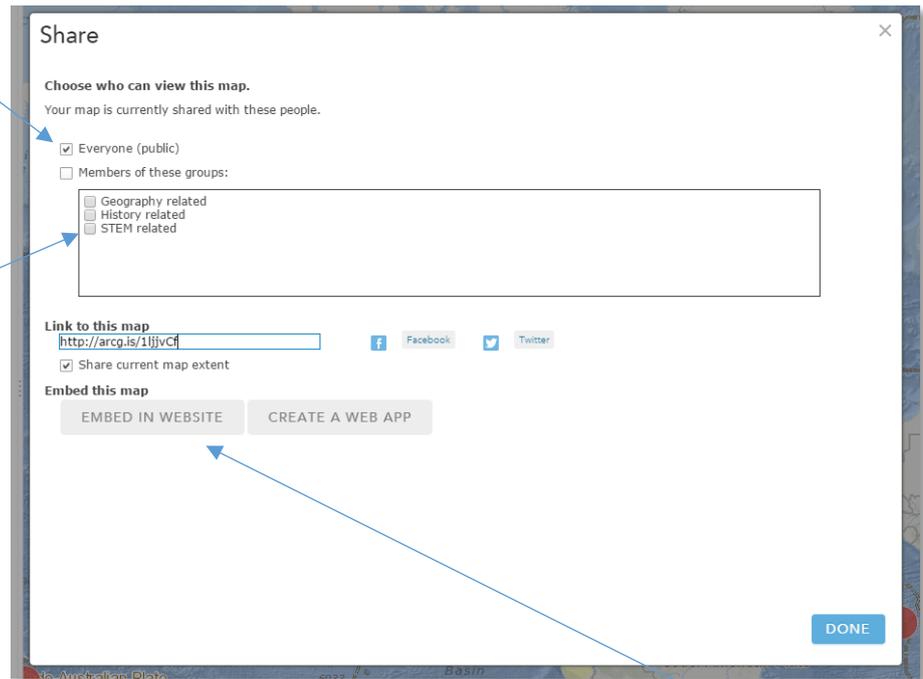
Before we go on to create the Elevation Profile **Web App** it would be useful to click on the Embed in Website button to explore this capability.

ArcGIS Online automatically creates the website code (iframe) to make it easy to embed your maps in to the school website, blogs or any other web pages you may use. Just choose what functionality you want the map to have from the tick boxes and then just copy the code and either send it to the person who looks after your web site or just paste it in yourself for an instant interactive map. Easy!
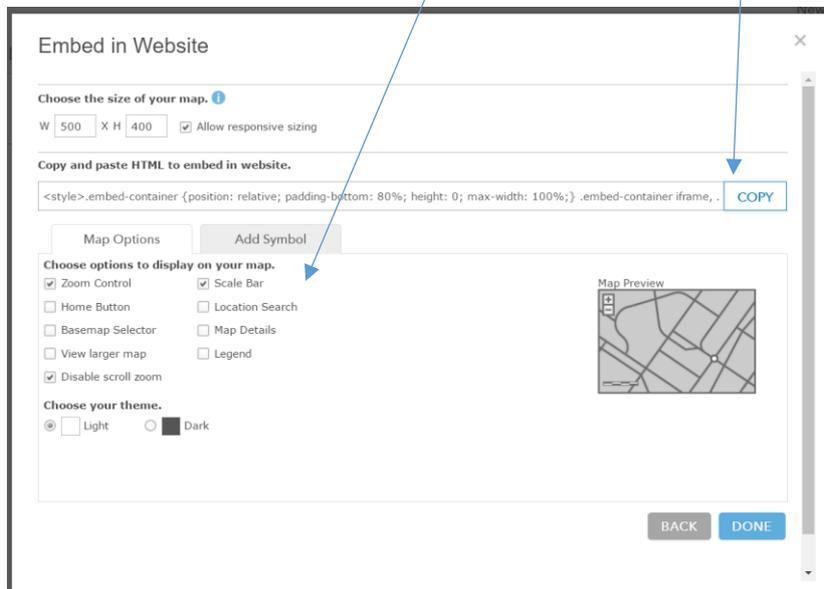
Why not have a 'Map of the Month' competition and put the winning map up on the school site for the pupils and parents to see, not to mention Ofsted!

OK, let's get back to the Elevation Profile tool. Click on Back.

Then click Create a Web App
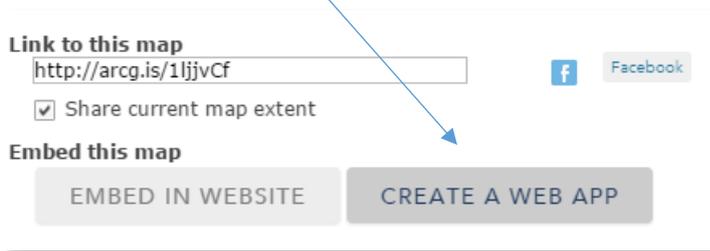


There are a wide range of Web App templates for you to choose from depending on what you want to do. Take some time to explore some of the other templates, especially the Social Media and Storymaps as these are particularly powerful.

In this example we just want to work with Elevation Profile template. Click on it.
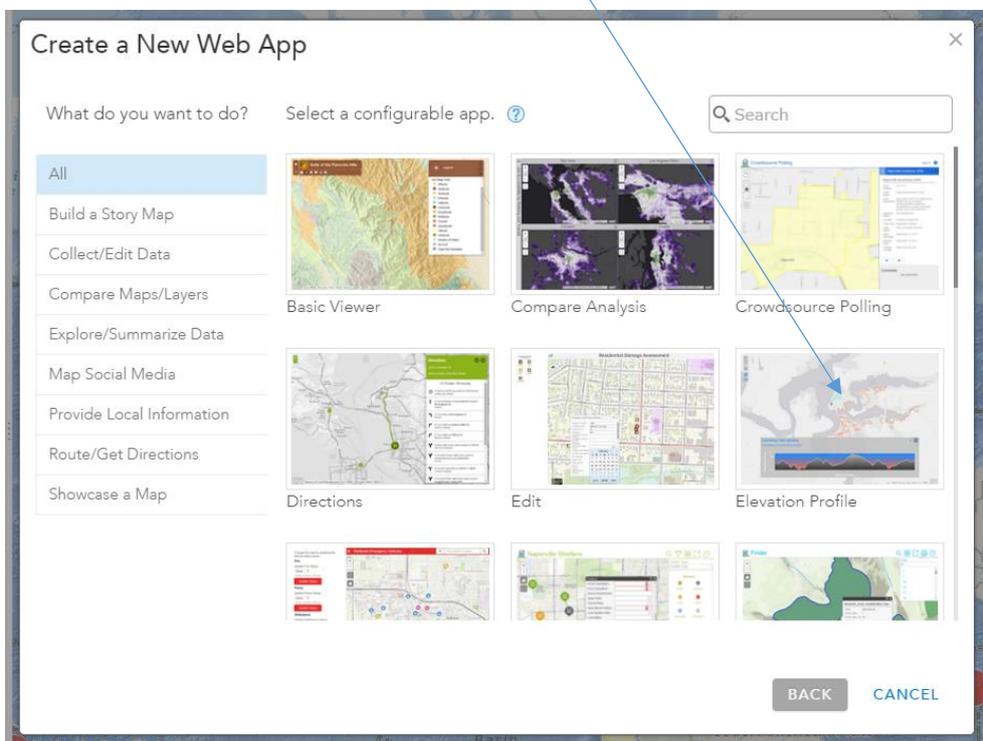
Click on Create App
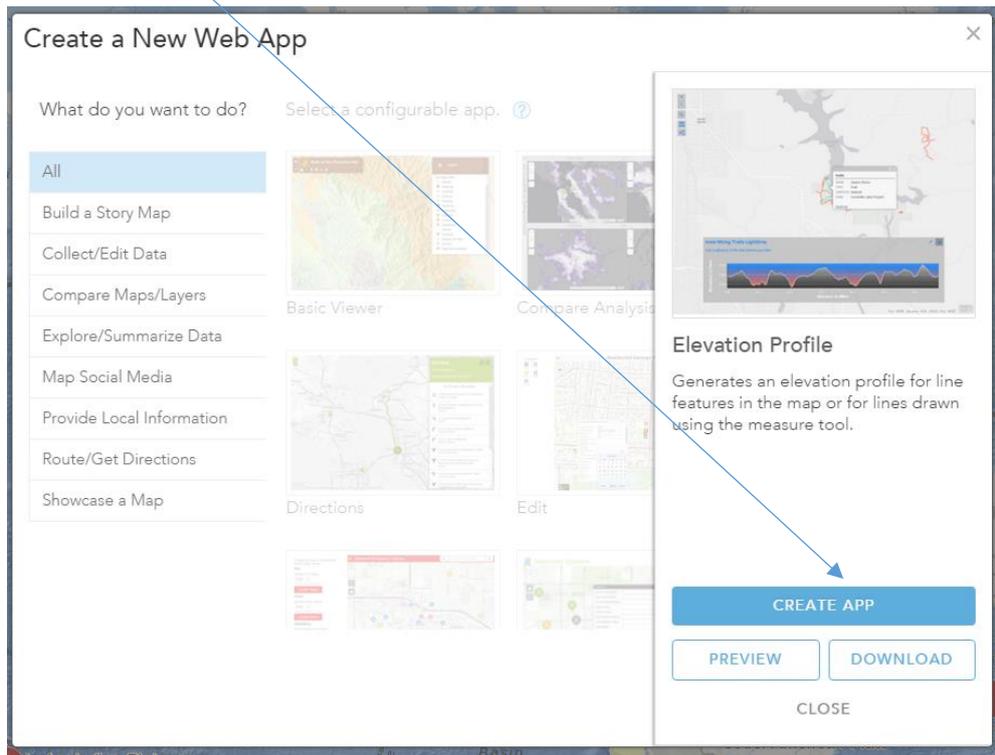


N.B. If you have an understanding of coding you can download any of the templates and customise them. They are all Open Source and also available on GitHub.

These could also form the basis a Computer Science lesson.

Give the app an appropriate name and click on Done
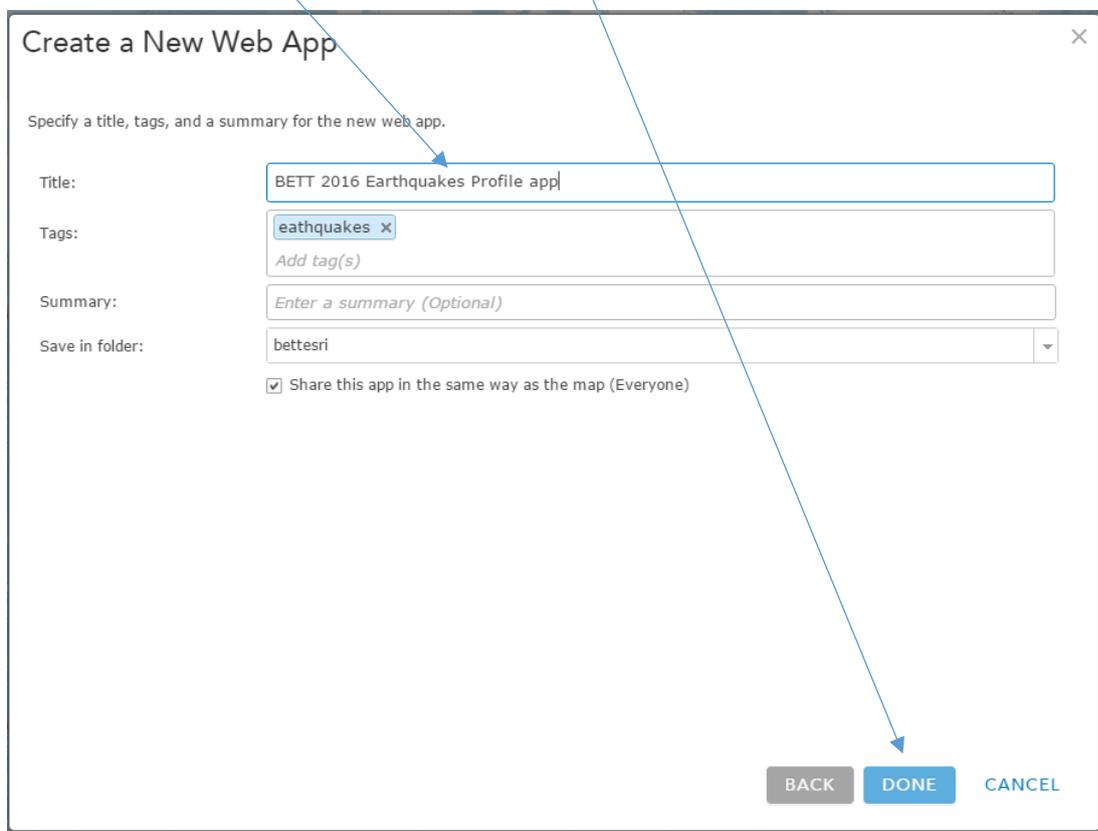
The Web App is highly customisable so you can create your own personalised app. As always with ArcGIS Online you can dive deep or shallow, depending on what you want to do:

- In the General tab you can add a title (e.g. 2017 Earthquake Profile App) description and a splash screen for when the app starts up.
- In the Theme tab you can also configure the layout, colours and add custom css if you wish.
- The Option tab allows you to add a legend, dialog and a basemap gallery.
- In the Elevation Profile section change the units from miles to kilometres.
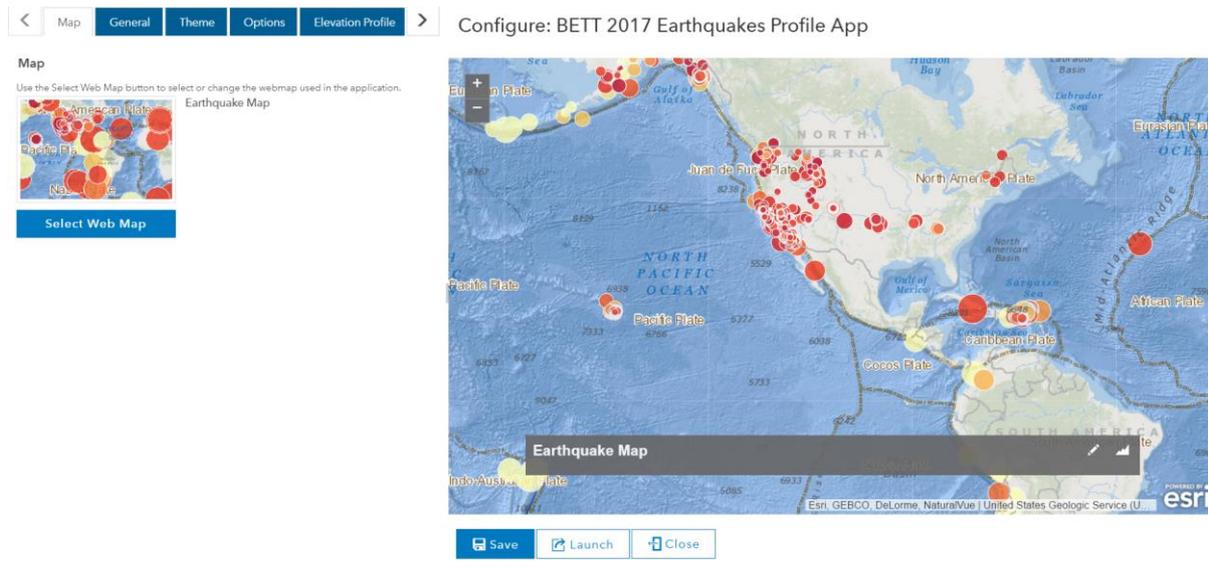


Click on Save and then Launch which will open the app in a new page.
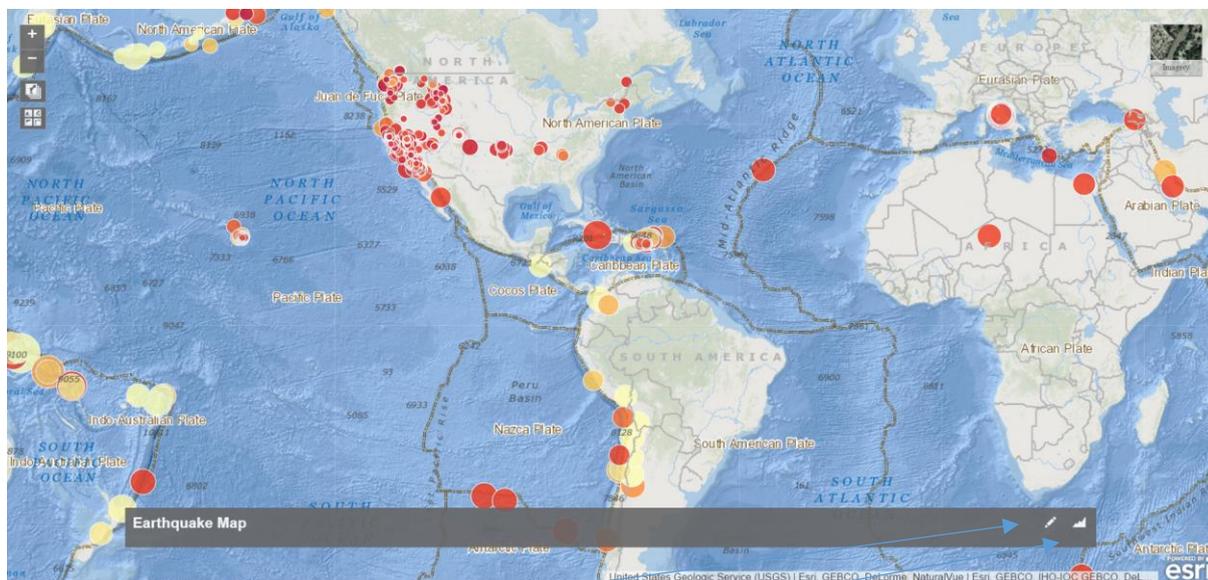


The app is easy to use. The pencil icon is used to draw a line across the area that you want to see an elevation profile for.

The graph symbol next to the pencil just toggles to profile tool on and off.

To see a cross section through a subduction zone pan and zoom into Japan and draw a line as shown below:
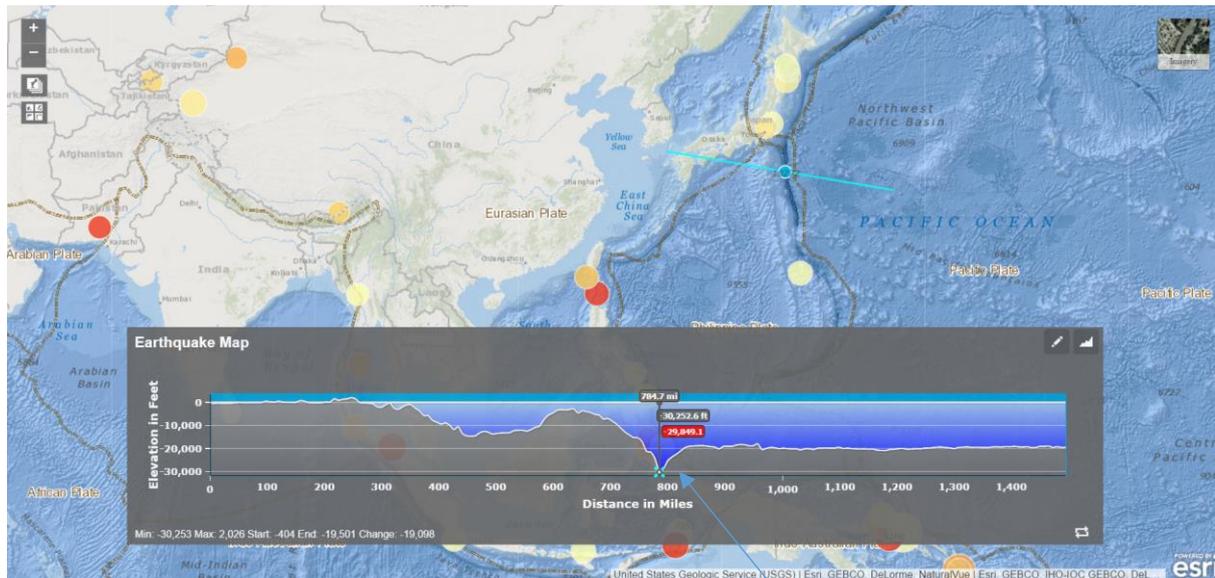


The Pacific Plate being subducted under the Philippine Plate, creating a deep trench at the point of the collision.

# Where is all of my content saved?

All of the maps and content you create in ArcGIS Online is saved in the Esri cloud and nothing is saved locally on your PC or network. To see your content go back to the confirmation page of your app and click Close, this will take you to the item description for the app you have just created. Click My Content to go back to the main content management part of ArcGIS Online.



You can see some folders that have already been created for this example to organise your work and you can see the three items that you created. You can also create Groups and explore the Groups that have been created for you by simply clicking on Groups.



All of your work is saved here so that you can access it anytime anywhere.

# Getting support for ArcGIS Online

There are a range of ways to get support for using ArcGIS Online. These include our Facebook page:

https://www.facebook.com/GISforSchools/

Our Twitter page:

https://twitter.com/GIS4Schools
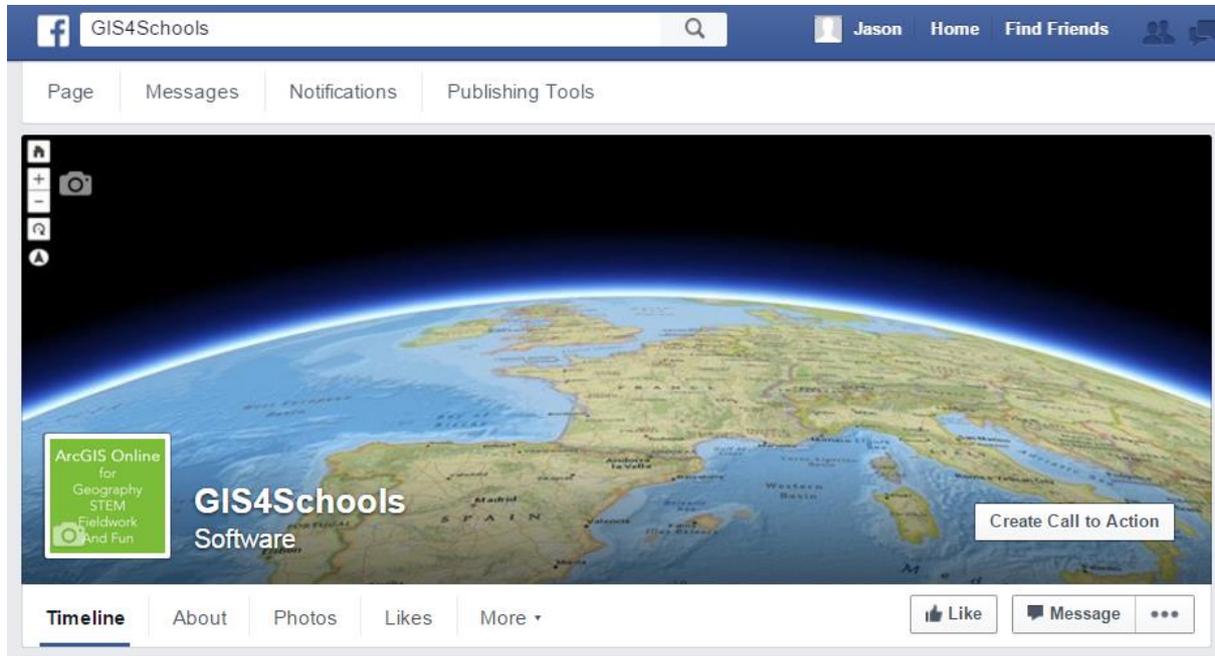
The ArcGIS Online Help pages:



http://doc.arcgis.com/en/arcgis-online/

A collection of resources in a Storymap:

http://esriukeducation.maps.arcgis.com/apps/MapSeries/index.html?appid=0f9b161d6d5041e6b50
30e89e8cc017b


Or simply email us at schoolscommunity@esriuk.com