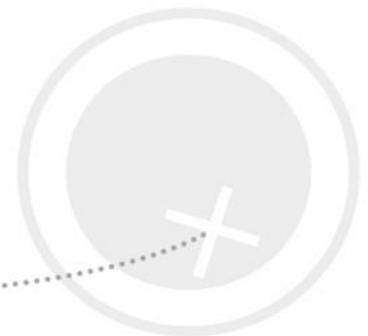




GIS for Schools

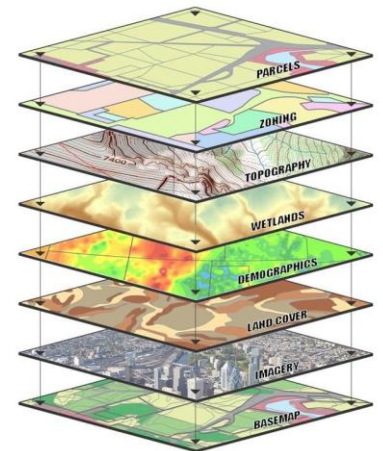
Professional Learning



Part One: What
is GIS and why
should I use it?

What is GIS?

- A GIS is a Geographic Information System.
- This is a method of capturing, storing and representing information in something called a layer
- Each layer contains its own geographic dataset
- Maps are made in GIS by assembling different types of layers
- Each map needs a basemap, something for all of the other layers to be projected on



Who uses GIS?

- Research institutes
- Environmental scientists
- Health organisations
- Land use planners
- Government agencies
- Defence force
- Police departments
- Campus administration
- Retail
- Telecommunications
- Agribusiness
- Real estate
- Mining and petroleum
- Transport sector
- Asset management
- Disaster management
- Private businesses




GIS as a Career

- Huge growth industry
- Rise in open data
- Demand for smart cities
- Now offered as degree at universities across Australia

How do I implement it in the classroom?

- Field trips
- Student reports and investigations
- Update preexisting activities (i.e. choropleth maps)
- Attention grabbers
- Create exams
- Find resources easy

Where to start?

Survey123	ArcGIS Online	Story Maps
Collect data in the field using Survey123	Create maps and analyse data in the classroom using ArcGIS Online	Publish your maps with text, video and other multimedia using StoryMaps
		
https://survey123.arcgis.com/	https://www.arcgis.com/home/signin.html	https://storymaps.arcgis.com/en/

How to Guides

Visit <https://esriaustralia.com.au/gis-for-schools/professional-development> for the following guides:

1. What is GIS and why should I use it?
2. Activating your account
3. Adding students and teachers
4. Introduction to ArcGIS Online

Learning Materials

Bring GIS into your classroom with easy to use, curriculum-linked instructional material. They require no logins or installation, and are device neutral.

<https://esriaustralia.com.au/gis-for-schools/learning-materials>



How to use Learning Materials

The screenshot shows the ArcGIS Online interface with a map of Australia. Callout boxes point to the following features:

- Print map**: Points to the 'Print' icon in the top toolbar.
- Change the basemap**: Points to the 'Basemap' button in the top toolbar.
- See the Legend**: Points to the 'Legend' button in the top toolbar.
- Turn layers on and off**: Points to the 'Layers' button in the top toolbar.

On the left side of the interface, there is a 'Make your own map' section with the following steps:

- 1. Choose an area.**
Pan and zoom the map to an area or search by its name or address.
- 2. Decide what to show.**
Choose a Basemap then Add layers on top of it.
- 3. Add more to your map.**
Add map notes to draw features on the map.
Display descriptive text, images, and charts for map features in a pop-up.
- 4. Save and share your map.**
Give your map a name and description then share it with other people.

Part Two: Setting
up your school and
using ArcGIS Online

Navigating ArcGIS Online

Home Gallery Map Scene Groups Content Organization

The main mapping platform where you can add and analyse layers	3D viewer	See all of the maps you have made	Manage users (adding, deleting etc)
--	-----------	-----------------------------------	-------------------------------------

GIS for Schools Overview Members Licenses Status Settings

Invite members Search members Full name Table Last login Filter

Filters

- User type
 - Creator
 - Editor
 - Field Worker
 - GIS Professional Advanced
 - GIS Professional Basic
 - GIS Professional Standard
- Role
 - Administrator
 - Data Editor
 - Hidden User
 - Publisher
 - User
 - Viewer

1 - 50 of 55

Member	Credits remaining	Last login	User type	Role
Skye Rodgers srodgers93	No limit	Today	Creator	Administrator
Training user edu005	No limit	Today	Creator	Publisher
Training user edu001	No limit	Today	Creator	Administrator
Training user edu003	No limit	Feb 19, 2019	Creator	Publisher
Training user edu009	No limit	Feb 19, 2019	Creator	Publisher
Training user edu002	No limit	Feb 19, 2019	Creator	Publisher
Training user edu004	No limit	Feb 19, 2019	Creator	Publisher
Training user edu006	No limit	Feb 19, 2019	Creator	Publisher
Training user edu007	No limit	Feb 19, 2019	Creator	Publisher
Training user edu008	No limit	Feb 19, 2019	Creator	Publisher
Training user edu010	No limit	Feb 19, 2019	Creator	Publisher

This is where you can add teachers and students (see next page in booklet)

Make all users **Creator**

Change privileges of each user by clicking the drop-down arrow. Teachers should be **Administrators** and students should be **Publishers**

Click the more options button to reset a student's password or delete them

Adding Teachers and Students

ArcGIS Online uses different User Types and Roles to control the scope of privileges that can be assigned to members.

There are many different types of User Types, including: viewer, editor, field worker, creator, and GIS Professional. We recommend assigning both teachers and students as creators*, so they have full access to all capabilities.

There are also five different roles, including: viewer, data editor, user, publisher, and administrator. We recommend students are publishers, and teachers are administrators

*If you know you are going to use ArcGIS Pro, assign students as GIS Professionals.

1. Get started by pre-populating an Excel sheet for import. It should look like this:

	A	B	C	D	E	F	G	H	I
1	First Name	Last Name	Email	Username	Role	User Type	Password		
2					Publisher	Creator	Password1		
3					Publisher	Creator	Password1		
4					Publisher	Creator	Password1		
5					Publisher	Creator	Password1		
6					Publisher	Creator	Password1		
7					Publisher	Creator	Password1		
8					Publisher	Creator	Password1		
9					Publisher	Creator	Password1		
10					Publisher	Creator	Password1		
11					Publisher	Creator	Password1		
12					Publisher	Creator	Password1		
13					Publisher	Creator	Password1		
14									
15									
16									
17									
18									
19									
20									

Using this as a template, fill in the first four columns. Students will be asked to reset their password when they sign in, so the one that is used now is only temporary.

Remember to always check with your IT department about what student details you can disclose, as you might not be able to disclose any. You can use generic student accounts to avoid releasing student information. See example below:


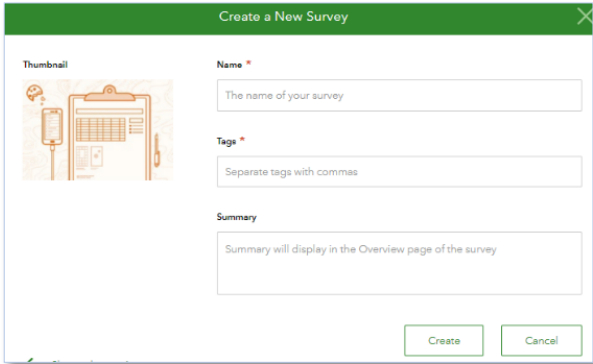
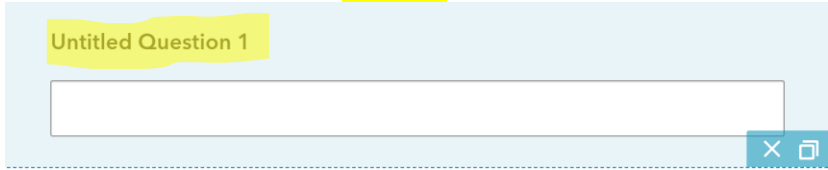
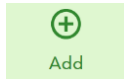
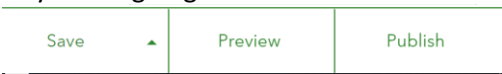


	A	B	C	D	E	F	G
1	First Name	Last Name	Email	Username	Role	User Type	Password
2	Student	1	softwarelicensing@madeupschool.com	student001	Publisher	Creator	Password1
3	Student	2	softwarelicensing@madeupschool.com	student002	Publisher	Creator	Password1
4	Student	3	softwarelicensing@madeupschool.com	student003	Publisher	Creator	Password1
5	Student	4	softwarelicensing@madeupschool.com	student004	Publisher	Creator	Password1
6	Student	5	softwarelicensing@madeupschool.com	student005	Publisher	Creator	Password1
7	Student	6	softwarelicensing@madeupschool.com	student006	Publisher	Creator	Password1
8	Student	7	softwarelicensing@madeupschool.com	student007	Publisher	Creator	Password1
9	Student	8	softwarelicensing@madeupschool.com	student008	Publisher	Creator	Password1
10	Student	9	softwarelicensing@madeupschool.com	student009	Publisher	Creator	Password1
11	Student	10	softwarelicensing@madeupschool.com	student010	Publisher	Creator	Password1
12	Student	11	softwarelicensing@madeupschool.com	student011	Publisher	Creator	Password1
13	Student	12	softwarelicensing@madeupschool.com	student012	Publisher	Creator	Password1

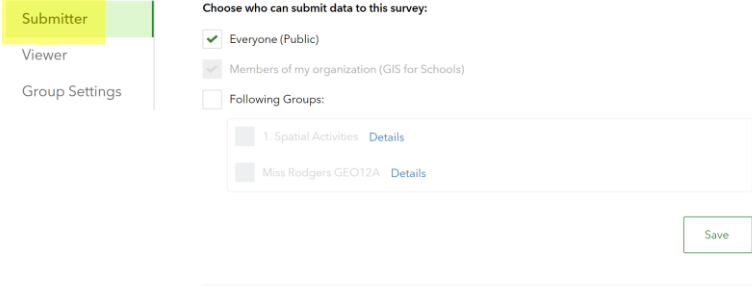
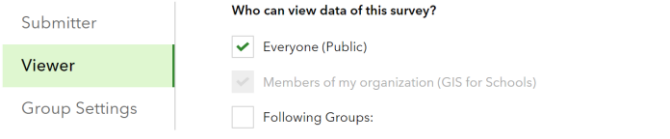
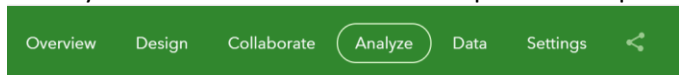

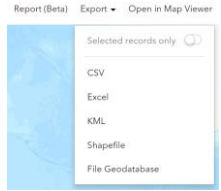
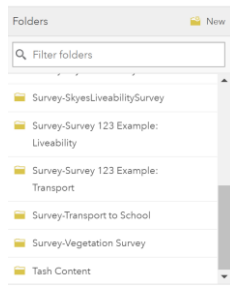
- Go to <https://www.arcgis.com/home/signin.html> and sign in
- Select the Invite Members button from the top of the page
- You will be asked which method you would like to use to add your members. To use the Excel document, we need to choose the first option
- Select Add New Members from a File
- Once you have imported student or teacher details, you can assign them particular extensions available to you
- Review the list and press Okay
- Remember to change teachers to Administrators on the members page

Part Three:




















Using Survey123

Creating a Survey123

<p>Create a Survey</p>	<ol style="list-style-type: none"> 1. Go to www.survey123.arcgis.com 2. Click on the My Surveys heading 3. Then select  4. Use the web designer, then get started building your survey. 5. Give your survey a name, tags (key words describing your survey), and a summary – then select 'Create'. 
<p>Add questions</p>	<ol style="list-style-type: none"> 1. Drag and drop the question type* you want in your Survey 2. To edit the question, click the question  <ol style="list-style-type: none"> 3. You can make the question required if needed <p style="text-align: center;">Validation</p> <p style="text-align: center;"><input type="checkbox"/> This is a required question</p> <ol style="list-style-type: none"> 4. To add another question press Add  <ol style="list-style-type: none"> 5. Remember to Save as you are going  <p style="text-align: center;"><i>*Question types can be found on Page 11</i></p>
<p>Publishing your survey</p>	<ol style="list-style-type: none"> 1. When you are ready to publish, press the Publish button  <ol style="list-style-type: none"> 2. If you want to change how the fields will look when exported to Excel, you can press Modify Schema 3. Press Publish
<p>Sharing your survey</p>	<ol style="list-style-type: none"> 1. Click on the Collaborate tab. Note: your survey must be published to access this page  <ol style="list-style-type: none"> 2. Under the Submitter subtab, you can choose who* can contribute to the survey 3. Share via the URL below

	 <p>4. Under the Viewer subtab, you can choose who can see the results of the survey</p>  <p>5. Share via the URL</p>																								
View results	<p>1. Click on the Analyze tab or visit the URL from the previous step</p> 																								
Export to Excel	<p>1. Click on the Data tab</p>  <p>2. Click on Export, then choose Excel</p> 																								
View in ArcGIS Online	<p>1. In ArcGIS Online, click the Content tab</p> <p>2. Find your survey folder from the folder list on the left</p>  <p>3. Click on the survey you want</p> <p>4. From the list, you can choose from a variety of options. The fieldworker view will allow you to edit points if they are incorrect, the stakeholder view will allow you to simply see the layer. It is safer to choose stakeholder when working with students. Click the layer you want</p> <table border="1" data-bbox="446 1753 1274 1921"> <tbody> <tr> <td><input type="checkbox"/></td> <td> Group B Water Quality_stakeholder</td> <td> ...</td> <td>Aug 14, 2018</td> <td>rodgers93</td> <td>0</td> </tr> <tr> <td><input type="checkbox"/></td> <td> Group B Water Quality</td> <td> ...</td> <td>Aug 14, 2018</td> <td>rodgers93</td> <td>0</td> </tr> <tr> <td><input type="checkbox"/></td> <td> Group B Water Quality_fieldworker</td> <td> ...</td> <td>Aug 14, 2018</td> <td>rodgers93</td> <td>0</td> </tr> <tr> <td><input type="checkbox"/></td> <td> Group B Water Quality</td> <td> ...</td> <td>Aug 14, 2018</td> <td>rodgers93</td> <td>0</td> </tr> </tbody> </table> <p>5. Copy the service URL and add to ArcGIS by choosing 'Add Layer from Web'</p> <p>6. Alternatively, you can search for the layer* in ArcGIS Online</p>	<input type="checkbox"/>	Group B Water Quality_stakeholder	...	Aug 14, 2018	rodgers93	0	<input type="checkbox"/>	Group B Water Quality	...	Aug 14, 2018	rodgers93	0	<input type="checkbox"/>	Group B Water Quality_fieldworker	...	Aug 14, 2018	rodgers93	0	<input type="checkbox"/>	Group B Water Quality	...	Aug 14, 2018	rodgers93	0
<input type="checkbox"/>	Group B Water Quality_stakeholder	...	Aug 14, 2018	rodgers93	0																				
<input type="checkbox"/>	Group B Water Quality	...	Aug 14, 2018	rodgers93	0																				
<input type="checkbox"/>	Group B Water Quality_fieldworker	...	Aug 14, 2018	rodgers93	0																				
<input type="checkbox"/>	Group B Water Quality	...	Aug 14, 2018	rodgers93	0																				

Types of Questions

-  Singleline Text Allows for an open, qualitative question
-  Single Choice Allows recipients to choose one option from a list
-  Multiple Choice Allows recipients to choose multiple options from a list
-  Rating Allows recipients to make a rating out of 5
-  Number Allows recipients to input numbers only
-  Time Allows recipients to set the time they inputted the data
-  File Upload Allows recipients to upload a file
-  GeoPoint Allows recipients to mark a location on a map
-  Website Allows recipients to input a website
-  Group Allows survey maker to group a set of questions
-  Multiline Text Allows for an open, qualitative question over multiple lines
-  Single Choice Grid Allows single choice, over multiple criteria
-  Dropdown Allows recipients to choose a single choice from a list
-  Likert Allows recipients to provide a closed opinion
-  Date Allows recipients to say put a date in
-  Image Allows recipients to upload an image
-  Signature Allows recipient to draw
-  Email Allows recipients to input an email address
-  Note Allows for other notes

How would you rate Melbourne's public transport system?

☆☆☆☆☆

Rating

Water Quality ●

pH

EC

Group

What vegetation was at each water source

	Native habitat	Introduced habitat	Combined
Creek	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dam	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
River	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Single Choice Grid

I think my city is safe

Strongly disagree Disagree Neutral Agree Strongly agree








Likert Scale

Part Four:

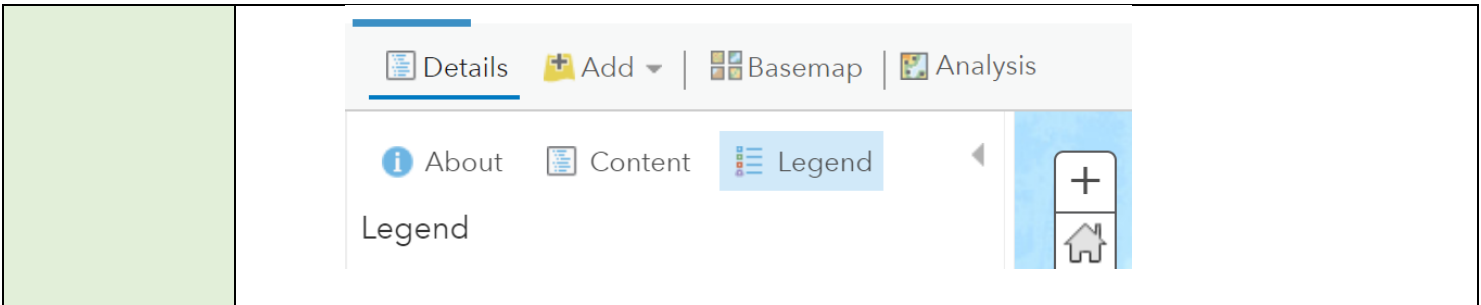
Using ArcGIS

Online

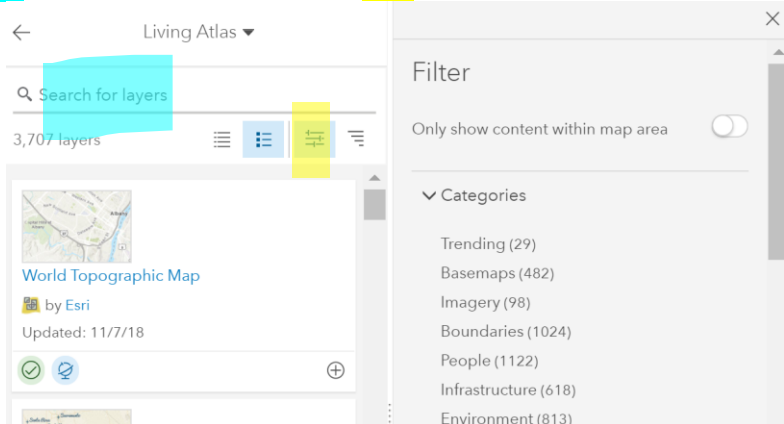
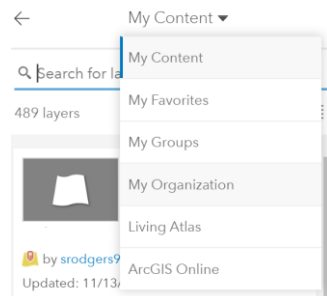
Basic Skills


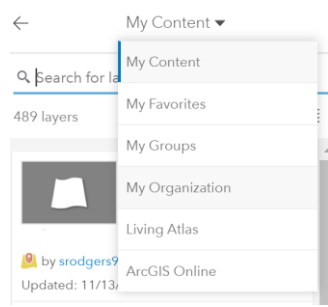


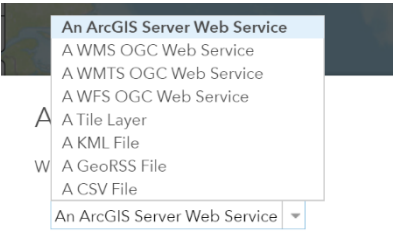
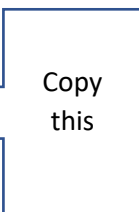

<p>Change the basemap</p>	<ol style="list-style-type: none"> 1. Press  Basemap then select any of the available basemaps from the window. 2. Click on your desired basemap to load it to your map.
<p>Make a map layer transparent</p>	<ol style="list-style-type: none"> 1. Click on the map layer you wish to make more transparent, and press the  More Options icon. 2. Select Transparency and shift the slider to your required transparency.
<p>Rename a map layer</p>	<ol style="list-style-type: none"> 1. In the Content window, click on the name of the layer you wish to edit. 2. Select the  button, and select Rename. 3. Rename the layer, then click OK.
<p>Delete a map layer</p>	<ol style="list-style-type: none"> 1. In the Content window, click on the name of the layer you wish to remove. 2. Select the  button, and select Remove.
<p>Apply a filter</p>	<p>Applying a filter lets you present a focused view on a feature layer in a map.</p> <ol style="list-style-type: none"> 1. Click on the name of the layer you wish to filter. This will reveal additional edit icons. 2. Select the  Filter icon. This will open the Filter window. 3. The options available will differ depending on the details on your layer. <i>The example below is a filter applied to plate tectonic data. We have asked to only view the plate type which is converging.</i> <div data-bbox="492 894 1352 1024" style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>TYPE <input type="text" value="TYPE"/> is <input type="text" value="is"/> Converging <input type="text" value="Converging"/></p> <p><input type="checkbox"/> Ask for values <input type="radio"/> Value <input type="radio"/> Field <input checked="" type="radio"/> Unique</p> </div> <ol style="list-style-type: none"> 4. Click APPLY FILTER to action. 5. To remove your filter, click the Filter icon again, and opt to REMOVE filter.
<p>Save your map</p>	<ol style="list-style-type: none"> 1. Press  Save 2. Select Save As if this is a new map. 3. Add the appropriate details, then select SAVE MAP <div data-bbox="402 1287 570 1329" style="margin: 10px 0;"> <h3>Save Map</h3> </div> <div data-bbox="402 1371 1174 1581" style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Title: <input type="text" value="Map title goes here"/></p> <p>Tags: <input type="text" value="You must add a tag x Add tag(s)"/> <input type="text" value="This could be a keyword to describe your map x"/></p> <p>Summary: <input type="text" value="OPTIONAL MAP SUMMARY"/></p> <p>Save in folder: <input type="text" value="NDasios_EducationManager"/></p> </div> <div data-bbox="816 1591 1146 1650" style="margin: 10px 0; text-align: center;"> <p>SAVE MAP CANCEL</p> </div>
<p>Share your map</p>	<ol style="list-style-type: none"> 1. Make sure you have saved your map. 2. Press  Share 3. Choose a privacy level for your map - If you select Everyone, your map will be public

	<ul style="list-style-type: none"> - The second checkbox means anyone within your Organisation (School account) will be able to see the map - For the highest security, you should select one group to share your map with. <p><i>NB: Selecting NONE of the checkboxes means your map will be private.</i></p> <p>4. Share your map via the URL under the heading Link to this map.</p> <p>Share</p> <p>Choose who can view this map. Your map is currently shared with these people.</p> <p><input checked="" type="checkbox"/> Everyone (public) <input checked="" type="checkbox"/> Classroom GIS Initiative <input type="checkbox"/> Members of these groups:</p> <div style="border: 1px solid black; padding: 5px;"> <p><input type="checkbox"/> 1. Spatial Activities (Open Data) <input type="checkbox"/> 2. Education Map Gallery (Open Data) <input type="checkbox"/> 3. Help and Support (Open Data) <input type="checkbox"/> Classroom GIS Featured Content <input type="checkbox"/> Training Group</p> </div> <p>Link to this map https://arcg.is/KG1zD Facebook Twitter</p> <p><input checked="" type="checkbox"/> Share current map extent</p> <p>Embed this map</p> <p><input type="button" value="EMBED IN WEBSITE"/> <input type="button" value="CREATE A WEB APP"/></p>
<p>Print your map, or save your map as an image</p>	<ol style="list-style-type: none"> 1. Press the icon – you can choose to export your map to a printable or saveable format. 2. Ensure the map is zoomed to the level you require. 3. Once you have printed, you can right click the ‘print’ and save it as an image. This image can be pasted into a Word Document or report.
<p>Add a bookmark</p>	<ol style="list-style-type: none"> 1. To bookmark a place or area, you must first zoom in on the map until you have achieved the view you require. 2. Then, select , and press Add Bookmark. 3. Give your new bookmark an appropriate title. 4. Press the enter key to save your new bookmark. 5. To delete a bookmark, press the red cross. Press the yellow pencil icon to Edit.
<p>Measure</p>	<ol style="list-style-type: none"> 1. Press the Measure button 2. You can measure an area or the distance between two points 3. You can change the unit to meters or kilometers <div style="text-align: center;"> Kilometers ▾ </div> <hr style="width: 50%; margin: auto;"/> <p style="text-align: center;">Measurement Result</p> <hr style="width: 50%; margin: auto;"/> <ol style="list-style-type: none"> 4. You can also see the latitude and longitude anywhere on the map by pressing the location button
<p>See the Legend</p>	<ol style="list-style-type: none"> 1. Press the Details tab 2. Under Content, Press the Legend button



Adding Data

<p>Add a map note</p>	<ol style="list-style-type: none"> 1. Press the Add button, and select Add Map Note. 2. Give your map note a name. 3. You can select a point, free-hand line, or area to note on the map. 4. Place the 'feature shape' wherever you want it to be located on the map. 5. Then, an additional window will appear. 6. You can give your map note a title, description, add a website hyperlink or image. You may also edit the symbol by selecting CHANGE SYMBOL. 7. Press CLOSE when you are happy with your completed map note. The map note will now appear in the Content window, alongside the map layers. You can tick the checkbox to turn the layer on and off.
<p>Add layers from the Living Atlas</p> <p>See Appendix</p>	<ol style="list-style-type: none"> 1. Press the Add button, and select Browse Living Atlas 2. You can search for a term in the search bar or filter by category or country  <p>The screenshot shows the 'Living Atlas' search interface. It has a search bar with the text 'Search for layers' and a dropdown menu showing '3,707 layers'. Below the search bar is a preview of a map layer titled 'World Topographic Map' by Esri, updated on 11/7/18. To the right, there is a 'Filter' panel with a toggle for 'Only show content within map area' and a list of categories: Trending (29), Basemaps (482), Imagery (98), Boundaries (1024), People (1122), Infrastructure (618), and Environment (813).</p> <ol style="list-style-type: none"> 3. If you want to find out more about a layer, you can click on it for more information 4. To add to the map, simply hit the + icon in the bottom right hand corner
<p>Add layers from your Organisation</p>	<ol style="list-style-type: none"> 1. Press the Add button, and select Search for Layers 2. From the drop down, choose My Organisation  <p>The screenshot shows the 'My Content' search interface. It has a search bar with the text 'Search for la' and a dropdown menu showing '489 layers'. Below the search bar is a preview of a map layer titled 'by srodgers9' updated on 11/13. To the right, there is a 'My Content' panel with a list of options: My Content, My Favorites, My Groups, My Organization, Living Atlas, and ArcGIS Online.</p> <ol style="list-style-type: none"> 3. To add to the map, simply hit the + icon in the bottom right hand corner

<p>Add layers from ArcGIS Online</p>	<ol style="list-style-type: none"> 1. Press the  button, and select Search for Layers 2. From the drop down, choose ArcGIS Online  <ol style="list-style-type: none"> 3. To add to the map, simply hit the  icon in the bottom right hand corner
<p>Add layers from the web</p>	<ol style="list-style-type: none"> 1. Press the  button, and select Add Layer from Web 2. You can add data from the following types of servers and files <ul style="list-style-type: none"> ✓ ArcGIS Web Server ✓ WMS Server ✓ WMTS Server ✓ WFS Server ✓ A Tile ✓ A KML ✓ A GeoRSS ✓ A CSV 3. Copy the URL* into the space provided 4. Make sure to select the correct server or file from the drop down  <ol style="list-style-type: none"> 5. Select Add Layer <p><i>*Where do I get the URL from?</i> Open data sources like National Map (https://nationalmap.gov.au/) are a great place to start. Look for the layer information and within this is usually the feature service URL. See if the acronym matches the above list and if so, copy the URL into ArcGIS Online.</p> <p>Data Custodian Geoscience Australia Esri ArcGIS MapServer URL <a data-bbox="690 1522 1193 1564" href="http://services.ga.gov.au/gis/rest/services/NM_Cultivated_a">http://services.ga.gov.au/gis/rest/services/NM_Cultivated_a</p> <p>Layer names: Native_Vegetation_2Mill_to_70K_Scale,Native_Vegetation_60Mill_to_2Mill_Scale,No_Data</p> 
<p>Add data from an Excel sheet</p>	<ol style="list-style-type: none"> 1. Press the  button, and select Add Layer from File 2. Make sure your Excel sheet is 'cleaned' and get rid of unnecessary columns/rows

	A	B	C
1	Data Source from Esri Australia 2018		
2			
3	Country	Statistics	
4	Australia	55	
5	New Zealand	28	
6	Africa	47	
7	France	69	
8	Sweden	45	
9	United States	35	

	A	B
1	Country	Statistics
2	Australia	55
3	New Zealand	28
4	Africa	47
5	France	69
6	Sweden	45
7	United States	35

3. If your headers have spaces, be sure to use an underscore instead (headers only)

Statistics About Cars	
55	
28	

Statistics_About_Cars	
55	
28	

4. Make sure your file is saved as a CSV (Comma delimited)
5. Select the file and choose Add
6. ArcGIS will process the CSV but ask you to help define the parameters
7. If you used an Address or Place, choose that option
8. If you used coordinates (i.e. data from a GPS) choose that option

Add CSV Layer

Locate features by:

Coordinates Addresses or Places None, add as table

In: Australia

Review the location fields. Click on a cell to change it.

Field Name	Location Fields
Property	Not used
Address	Address or Place

ADD LAYER CANCEL

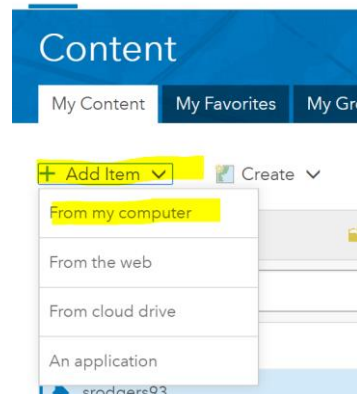
9. Select what country your data is in or choose World
10. Select what column has the location data (this will be your columns from Excel)
11. Select Add Layer

Add layer from a Shapefile

Shapefile: a data storage format. A zip file that contains extensions .shp, .shx, .dbf, and .prj.

1. Press the **Add** button, and select **Add Layer from File**
2. Select the Shapefile* and press import
3. If the Shapefile is too large, you will need to 'host' it in your ArcGIS account. Do this from the Content page of ArcGIS Online (below), then add the layer as a web layer.

Home Gallery Map Scene Groups



**Where do I get the Shapefile from?*

Open data sources such as Data.Gov (<https://search.data.gov.au/>) provide Shapefiles as an option to download. It is often referred to as SHP.

Queensland transport regional boundaries

Transport and Main Roads

Queensland Transport (former) is broken into 5 operational areas - Northern, Southern, Central, South East Queensland (South), South East Queensland (...)

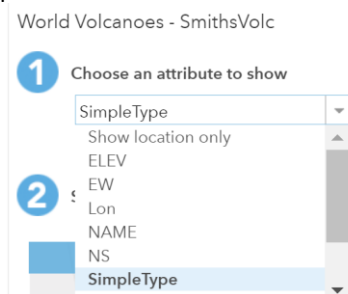
Dataset Updated 17/03/2017 | Open Data Quality: ★★☆☆☆ ©



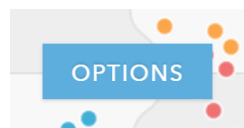
Styling a Layer

Styling a layer

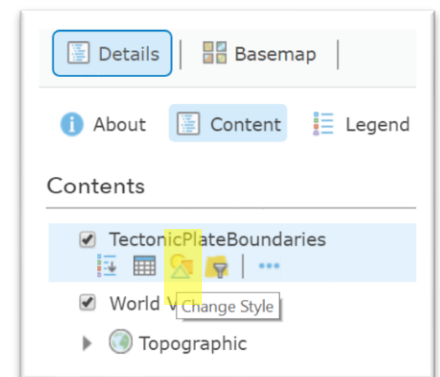
1. Open the **Details** window, and select **Content** to view all your map layers.
2. Click on the name of the layer you wish to change.
3. Click on the **Change Style** icon.
4. **Choose an attribute to show** by selecting from the options in the dropdown menu
5. **Select a drawing style** from the available options. These are the different columns of data and display differently on the map



6. Once you've selected the attribute you wish you display, there are a variety of different options you can choose from. These will differ depending on the type of layer.
7. To edit the style (colours, size or symbols), press the Options button

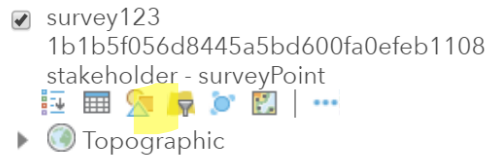


8. From this, you can change the symbol, colour range, scale and overall size. Just click over the symbols to change them.
9. When you are done, press OK

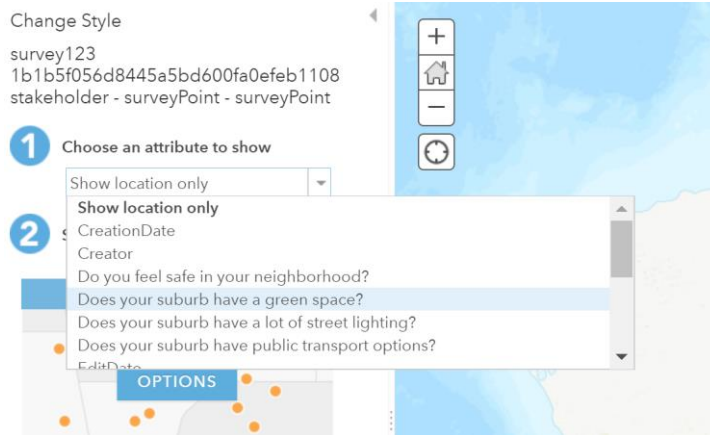


Styling a Survey123 layer

1. Click on the layer with the Survey123 data
2. Click the **Change Style** button



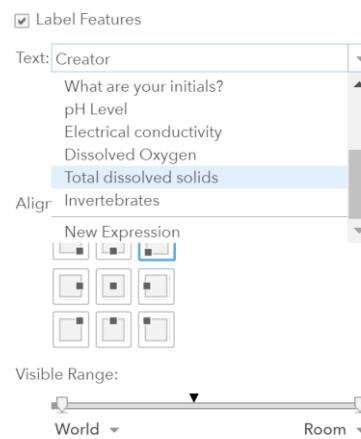
3. You can choose your Survey123 question from the drop down arrow



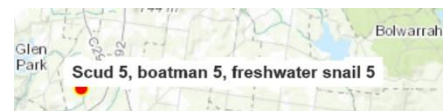
4. Complete the same steps as outlined on the previous page to style the layer

Adding labels

1. Select the **More Options** button, and click **Create Labels**
2. Choose the desired data from the drop down

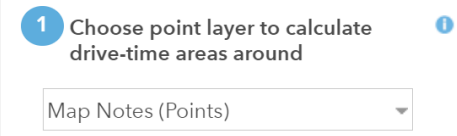
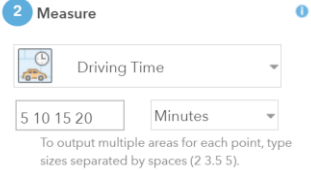


3. By ticking the halo button, the words will appear clearer on the map



Completing Analysis

<p>Join Features (Choropleth)</p>	<p>(Layer must already be uploaded as Point Data). Click Analysis</p> <ol style="list-style-type: none"> 1. Click Summarize Data 2. Click Join Features 3. Choose your target layer from the drop down menu. Select the base map you are joining (the boundary layer). In my case, my map was the World Countries (Generalized). 4. Choose the layer that we are joining (your data layer). I am joining the Aids statistics. 5. Click Choose a spatial relationship 6. Click Choose the fields to match 7. Select the fields from each drop down menu that are the same. This will be the location you are joining. In my case, I am joining countries so I have selected country to country. If you are doing suburbs, you would select suburb to suburb. Remember, it must be the information from your excel column. 8. Give your choropleth layer a name. It automatically creates the name 'Join Features to _____'. It is good practice to change this otherwise all of your choropleths will have the same name. 9. Uncheck 'map extent'. 10. Click Run Analysis. It will take 1-2 minutes while the system thinks. 	
<p>Create Watershed</p>	<ol style="list-style-type: none"> 1. Click Analysis 2. Click Find Locations 3. Click Create Watershed 4. Select the pin icon and drop it on a water source (click the pin icon once, then click on the map again) <div data-bbox="721 1402 1252 1549" style="text-align: center;"> <p>1 Point features to use for calculating watersheds</p> </div> <ol style="list-style-type: none"> 5. Ignore Step 2 6. Give the result layer a name 7. Uncheck 'Use current map extent' 8. Click Run Analysis. It will take 1-2 minutes while the system thinks. 	
<p>Trace downstream</p>	<ol style="list-style-type: none"> 1. Click Analysis 2. Click Find Locations 3. Click Trace Downstream 4. Drop a pin on the water source (click the pin icon once, then click on the map again). Note: if you already have dropped a pin to complete a watershed, choose Drawn Input Points from the drop down instead 5. Ignore Step 2 6. Give the result layer a name 	

	<ol style="list-style-type: none"> 7. Uncheck 'Use current map extent' 8. Click Run Analysis. It will take 1-2 minutes while the system thinks.
<p>Create Drive Times</p>	<p>(Point data must already exist in a layer. If you need to create your own, simply Add A Map Note).</p> <ol style="list-style-type: none"> 1. Click Analysis 2. Click Use Proximity 3. Click Drive Time Areas 4. Choose your point layer from the drop down  <ol style="list-style-type: none"> 5. Choose either Drive, Walk or Truck time from the drop down 6. Add in your parameters. If you want to test multiple areas use a space to separate as seen below  <ol style="list-style-type: none"> 7. Give the result layer a name 8. Uncheck 'Use current map extent' 9. Click Run Analysis. It will take 1-2 minutes while the system thinks.
<p>Data Enrichment</p>	<p>(Polygon layer must already exist. If you need to create your own, add a Map Note or run a Drive Time analysis).</p> <ol style="list-style-type: none"> 1. Click Analysis 2. Click Data Enrichment 3. Click Enrich Layer 4. Choose the layer with the polygon 5. Select the variables you want to investigate 6. Give the result layer a name 7. Uncheck 'Use current map extent' 8. Click Run Analysis. It will take 1-2 minutes while the system thinks. 9. To see the results, click anywhere on the blue polygon. A pop up will appear with the information

Part Five: Creating a Story Map

What is a Story Map?

Esri Story Maps let you combine authoritative maps with narrative text, images, and multimedia content. They make it easy to harness the power of maps and geography to tell your story.

Types of Story Maps

Great for virtual tours

Great for long stories with accompanying maps or other multimedia

Great for 1 phenomena case studies by large amounts of people

Great for online reports or textbooks

Create a New Story

Pick an App Ask the Pros

MAP TOUR

MAP JOURNAL

CASCADE

MAP SERIES

CROWDSOURCE

SHORTLIST






SWIPE/SPYGLASS

BASIC

CLOSE



☉ = need map(s) to begin 🌐 = creates a map

Search the Gallery for our favourite Story Maps:

-  The Uprooted
-  The Two Koreas
-  The Cost of Beef
-  Where does Australia import its food from?
-  What causes ocean currents?



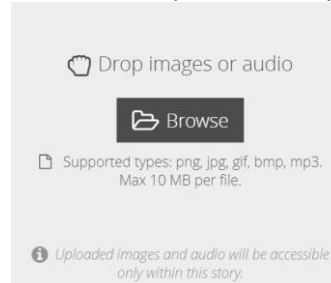
Creating a Cascade Story Map

Story Maps	
Creating a Story Map	<ol style="list-style-type: none"> 1. Go to https://storymaps.arcgis.com/en/ and sign in 2. Click on the My Stories tab 3. Select Create Story
Creating a Cascade Map Title	<ol style="list-style-type: none"> 1. On the first page, type in your story title and subtitle <div data-bbox="597 430 1305 877" data-label="Image"> </div> 2. Add an image by clicking the image button below the title <div data-bbox="786 911 1117 1079" data-label="Image"> </div> <p>Unsplash is a great source for high quality images</p> <div data-bbox="391 1129 1500 1205" data-label="Image"> </div>
Adding a section to a Cascade	<ol style="list-style-type: none"> 1. To add a section, press the  icon. It will appear if you scroll down from the title page 2. You can choose from the following section types: <div data-bbox="607 1304 1295 1430" data-label="Image"> </div>
Cascade section: Text	<ol style="list-style-type: none"> 1. Choose Text from the section choice 2. Add the text you would like. Please note a different text section is started every time you press enter <div data-bbox="678 1562 1219 1717" data-label="Image"> </div> 3. To style the text, you can press the paragraph button that appears on the left . This will allow you to change the size and alignment. Alternatively, you can highlight the text you change to bold, italics, underline, hyperlink, and colour.
Cascade section: Media	<ol style="list-style-type: none"> 1. Choose Media from the section choice 2. You can choose from a variety of Media choices, including: <div data-bbox="521 1929 1377 1961" data-label="Image"> </div>

ArcGIS: is a link to your AGOL account. In this section, you can also upload your own photos. To access this feature, make sure you have saved your Story Map by pressing the save icon in the top left hand corner



Once you have pressed save, you will see the option to add photos in the ArcGIS tab



Flickr: you can search for a photo or a Flickr account

Google+: search your Google photos

Unsplash: high quality, copyright free photos

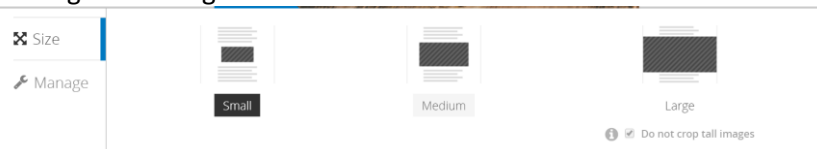
Link to Content: link to Youtube videos or other content

- Once you have selected your media, you can edit it by selecting the pencil icon in the bottom left hand corner. You can add multiple photos via the plus icon in the bottom right hand corner.



Subtitles can go underneath here

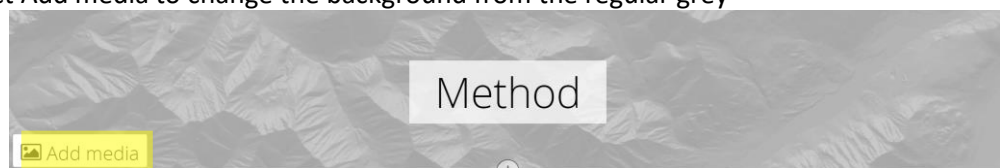
You can change the size of the media via the Size sub-tab. You can change the media all together by pressing the Manage sub-tab.

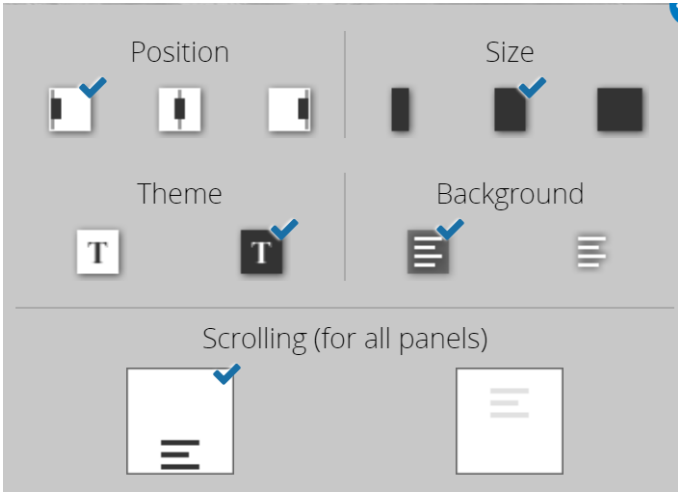
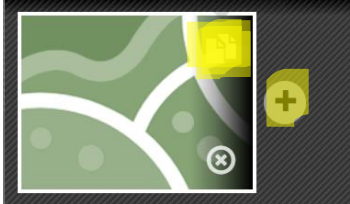
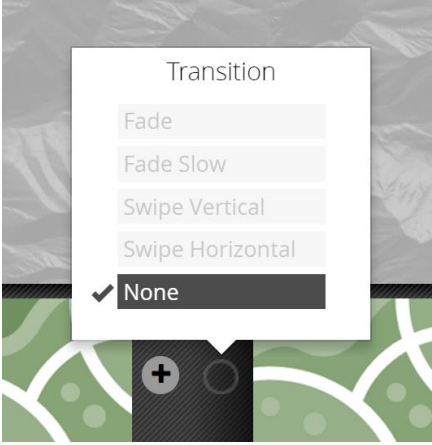


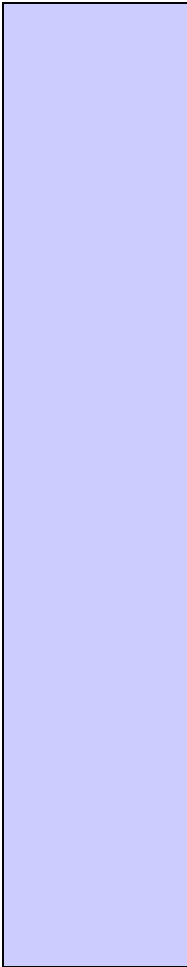
- If you have added a map, layers can be chosen via the edit tab. They will appear in the top right hand corner of the map
- Be sure to press the tick icon when you are done editing

Cascade section: Title

- Choose Title from the section choice
- Type your title in the space provided
- Select Add media to change the background from the regular grey



<p>Cascade section: Immersive</p>	<p>4. The same Media options will appear as previously explained</p> <ol style="list-style-type: none"> 1. Choose Immersive from the section choice 2. Choose your Media to add to the background. The same Media options will appear as previously explained 3. You can add text or an image in the Immersive pop up box. The same styling features are available as previously explained 4. If you want to add a Legend for your map, add a screen shot in the Immersive pop up 5. By clicking the pencil icon, you can change where the Immersive pop up box appears and the size of the box  <p>6. You can add another section by pressing the plus or the duplicate icon in the bottom panel</p>  <p>7. You can change the transition between these sections by selectin the transition icon</p> 
	<p>Reordering a Cascade</p>
<p>Create bookmarks in a Cascade</p>	<ol style="list-style-type: none"> 1. Press the Settings toggle wheel



2. Click on the Bookmarks tab
3. Click the Sections you want bookmarked
4. Type the bookmark title in the space provided

Logo & Sharing **Bookmarks** Appearance

Bookmarks are links to story sections that are shown in the header. Creating concise bookmarks for the main sections of your story helps readers get oriented.

Section	Bookmark
<input type="checkbox"/> (Cover)	<input type="text"/>
<input checked="" type="checkbox"/> Hello, this is a text section in Story Maps.	<input type="text" value="Hello, this is a tex"/>
<input checked="" type="checkbox"/> Method	<input type="text" value="Method"/>
<input type="checkbox"/> Type title here	<input type="text" value="Type title here"/>

Apply Cancel

5. Press Apply

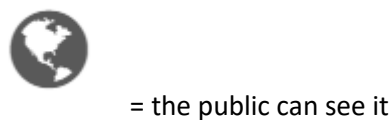
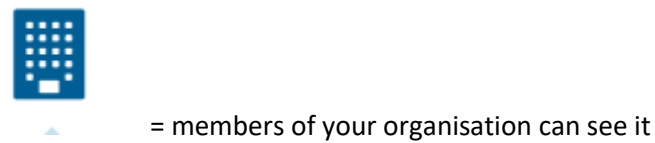
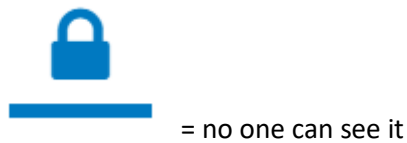


Save and Share your Cascade

1. Press the Save icon



2. Choose a Sharing level from the below:



3. Get the URL by pressing the Share or Print icon in the top right-hand corner



Appendix

Some of our favourite Living Atlas layers:

Human Geography	Physical Geography
<ul style="list-style-type: none"> • Australia Average Household Size • Australia Average Annual Rent • Australia Population Over 65 • Australia Population Under 15 • Population Density Around the Globe • Global Human Footprint Index • Undernourished population by country • Transit Access • Armed Conflict Location Event Data • Global Social Progress Index • World Port Index • Women as Speaker of at least one House of Parliament, 2017 • Percent of Coast Densely Populated • Malaria Prevalence among Children in Africa, 2015 • Change in Malaria Prevalence among Children in Africa, 2000 to 2015 • Significant Fossil Sites • Highway Access Oceania 	<ul style="list-style-type: none"> • World Distance to Water • Urban Water Stress • Degree of Water Stress • Actual Evapotranspiration • Landforms of the World • World lithology • Seamounts, Vents and Seeps • Recent Earthquakes • Major Earthquakes • World Temperature Change scenario • World Precipitation Change scenario • World Bioclimates • Seafloor Temperature • Sea Surface Temperature • Tree Cover Loss • Biodiversity Hot Spots (2016) • Percent of High-Impact Coral Bleaching Events • Percent of Coral Reefs at Risk • Cold Water Reefs • Major Global Cyclones 1924-2014 • Major Ocean Currents

Note: Because of the overlap between different units and different subjects, these layers have been split into human and physical geography categories as opposed to year levels.

Found another Living Atlas layer we love? Email education@esriaustralia.com.au to have it added.

Glossary

Layer: a layer is a mechanism to display geographic datasets in ArcGIS.

Point Layer: a layer where the data is portrayed on the map as points only. These could be circles or other symbols.

Polygon Layer: a layer where the data is portrayed as one or more areas with more than 3 sides.

Feature Service: a service that allows data to be used over the internet.

Geographic Inquiry Process



Step	What to do
1. Ask a geographic question	Ask a question about spatial relationships in the world around you
2. Acquire geographic resources	Identify data and information that you need to answer your question
3. Explore geographic data	Turn the data into maps, tables, and graphs, and look for patterns and relationships
4. Analyze geographic information	Determine what the patterns and relationships mean with respect to your question
5. Act on geographic knowledge	Use the results of your work to educate, make a decision, or solve a problem