

Field Data Collection

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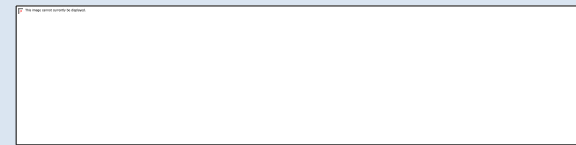
*Empowering Colleges:
Expanding the
Geospatial Workforce*



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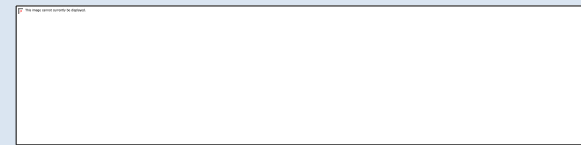
Some of our Demonstration Projects

- <http://geotechcenter.org> and <http://vinedinoto.wix.com/geospatial>
- Historical Markers
<http://vinedinoto.wix.com/geospatial#!historical-markers/ab7se>
- Winery Locations
<http://vinedinoto.wix.com/geospatial#!blank/zdlcb>
- Light Poles on Campus to determine Dark spots
- Trees for Urban Heat Islands



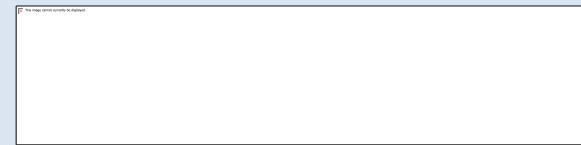
Field Data Collection

- There are multiple solutions to collecting of data in the field, this presentation will examine a single example.
- Esri Collector will be used, there are Open Source options (EpiCollect) for field data collection.
- You must have an ArcGIS Online Account to use Collector or Esri Portal. While the App is free to download on an Android or Apple device.
- This solution does not require any equipment beyond a smart device (phone or tablet) for data collection.
- It is important to note the position of the object is not always the position of the detector, especially for vegetation.
- Another useful tool might be a measurement program on a smart device.

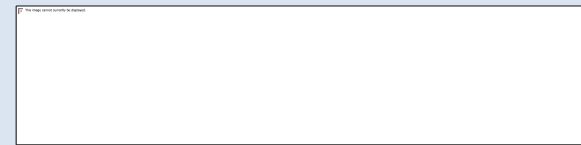
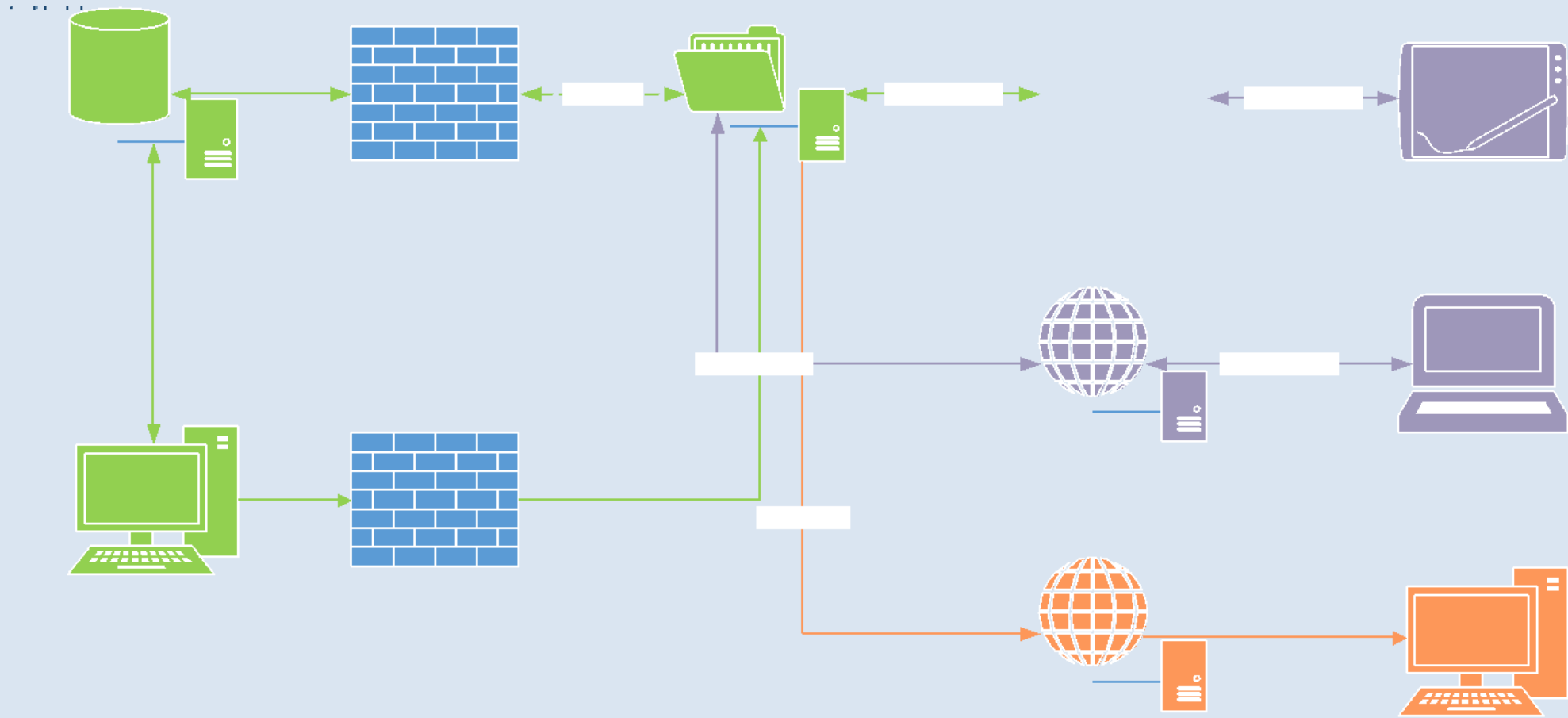


Paper Version of Data Collection

- Using Field Paper (<http://fieldpapers.org>)
- Design a region and print.
- A QR code is generated for how this map fits back on the grid.
- Take page of paper outside and mark the location of objects.
- Photograph the map with the QR code with a smart device.
- Upload image to Field Paper
- Manually place the objects onto Open Street Map, some options did not properly function. Those that worked placed the data appropriately.
- When downloading a GeoTIFF and loading into ArcGIS Desktop did not create proper data set to align to the grid. Did not make a difference if it was loaded first or after a basemap.
- Maps can be scanned and Georeferenced.

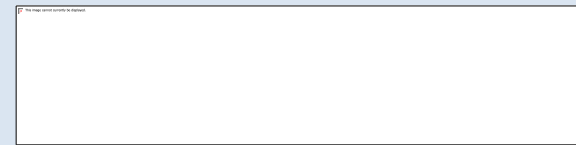


Enterprise Network



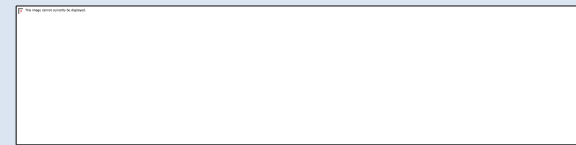
Enterprise Network – Technician/Designer Side (Green Items)

- A Relational Database (DB) Server is required so that we can have multiple simultaneous editors. DB Server **should** always be placed behind a firewall and have a private IP address. An understanding of the differences between a feature service and map service is required. A relational DB is required to create a feature service.
- The designer workstation is normally behind the firewall but could be in public space, but caution should be taken if placed in public space. I strongly suggested to connect to the desktop computer through a VPN.
- The ArcGIS Server can be a physical or virtual box and should have a public IP and must have web capabilities such as Apache or Microsoft Internet Information Server (IIS). We are a Microsoft shop so therefore we use IIS.
- ArcGIS Online is an external connection in the cloud, ArcGIS Portal could also be used as a local option instead.
- Note: Blue items would be developed and maintained by the IT department, they are communication technologies and not functional components.



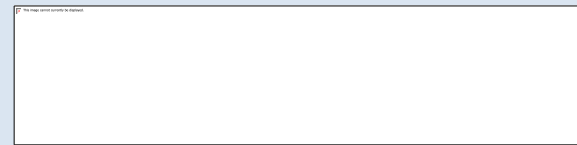
Enterprise Network – Field Data Collector (Purple Items)

- A Smart Device such as a tablet or phone (Apple or Android) can be used to collect field data using the built-in GPS and the camera feature. Note not all tablets have a true GPS, which is needed for accurate positioning. Users must recognize the resolution differences between a smart device and a professional grade GPS. Window based phones and tablets do not have a version of the Collector App, but they could use the web interface, listed in the diagram as the Laptop/Desktop.
- The Map Server can be used to edit the **feature data** set through a web interface. This needs to be secure and not a general population site since data can be modified, therefore a specific login should be required.



Enterprise Network – General Public (Orange)

- The Map Server will utilize the map service, not the feature service so that this is only a viewable stream and not editable.
- The Viewer can be a desktop, laptop or smart device.



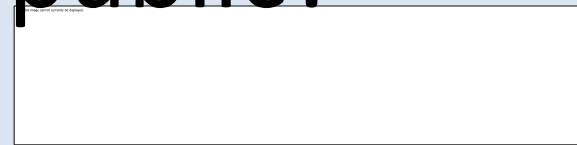
Other Solutions

- While not everyone will have an enterprise solution available to them; including an ArcGIS Server and a relational database (required for feature class creation, which is required for Collector).
- Therefore, users which have ArcMap Desktop, can create a solution by building it on their desktop and then sharing it as a feature class service via ArcGIS Online. The data will reside in ArcGIS Online and not on a local server, which can raise security concerns, but might actually be more secure.
- For those without ArcMap on their desktop everything can be created in ArcGIS Online.



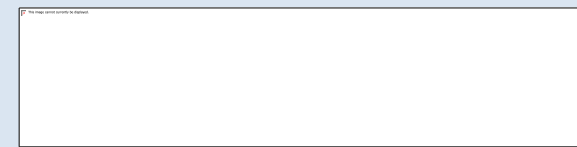
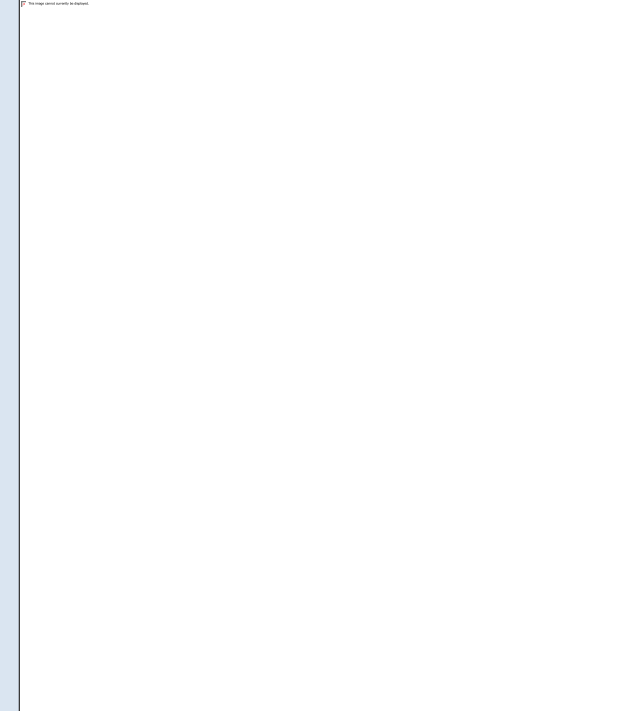
Initial Information

- What is going to be collected? **For this example it will be trees**
 - What parameters will be collected? You should use domains which are critical for field data collection.
 - What items will be collected multiple times?
 - Are photographs going to be taken?
- How is the information shared to the public?



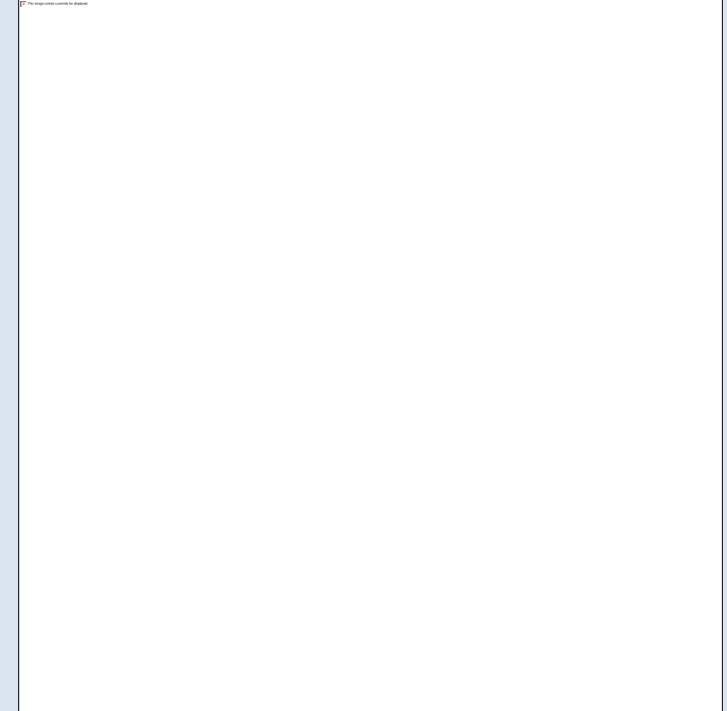
Steps to creation of the file - page 1

- This example will be for Desktop creation without a Relational DB.
- Process:
 - Open ArcMap
 - Open the ArcCatalog tab and select the storage location of the new file, in our case it will be the default.gdb (Not a relational Database)
 - Right click and select New
 - Select Feature Class
 - Name the file
 - This example will be a point file
 - Select Next
 - Select a Coordinate System, note not all coordinate systems are supported.
 - XY Tolerance, use the default.
 - Use the default database storage.



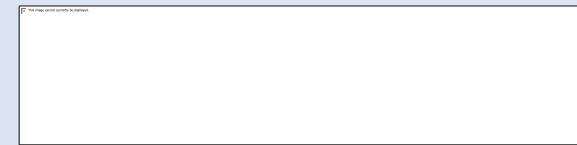
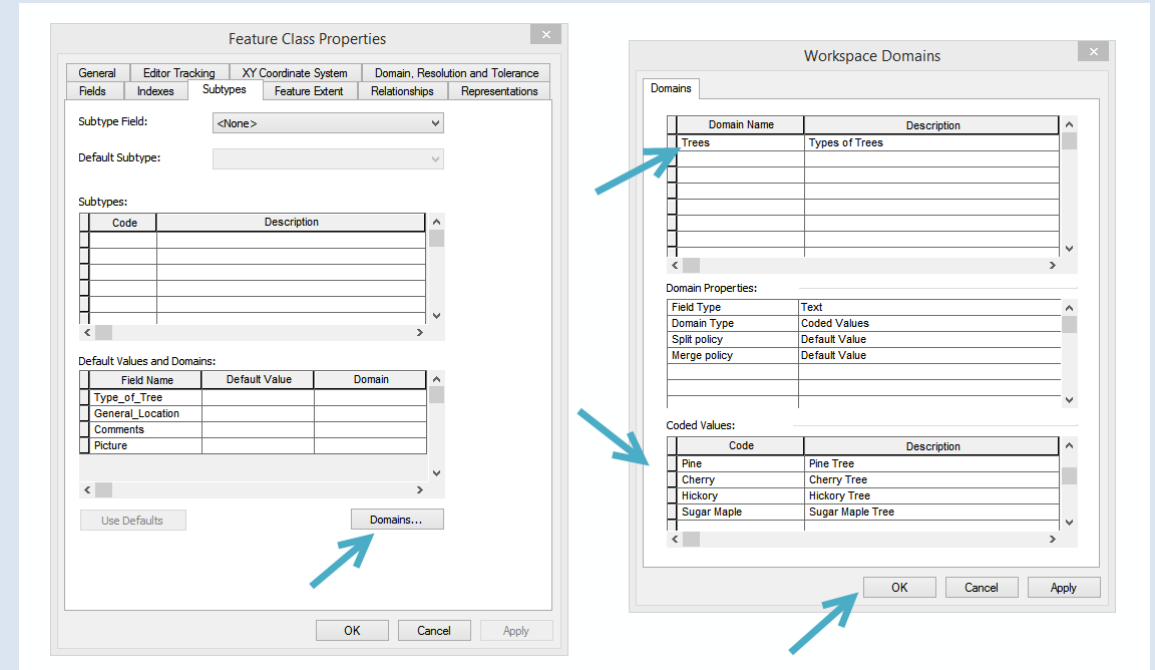
Steps to creation of the file – page 2

- Field names (no spaces in names)
 - Type_of_Tree (Text – 25 characters)
 - General_Location (Text – 50 characters)
 - Comments (Text – 200 characters)
 - Picture (Raster)
- Click Finish



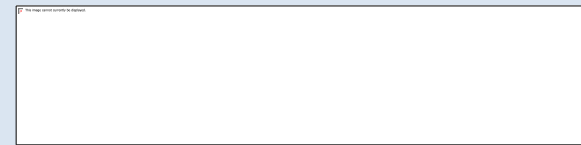
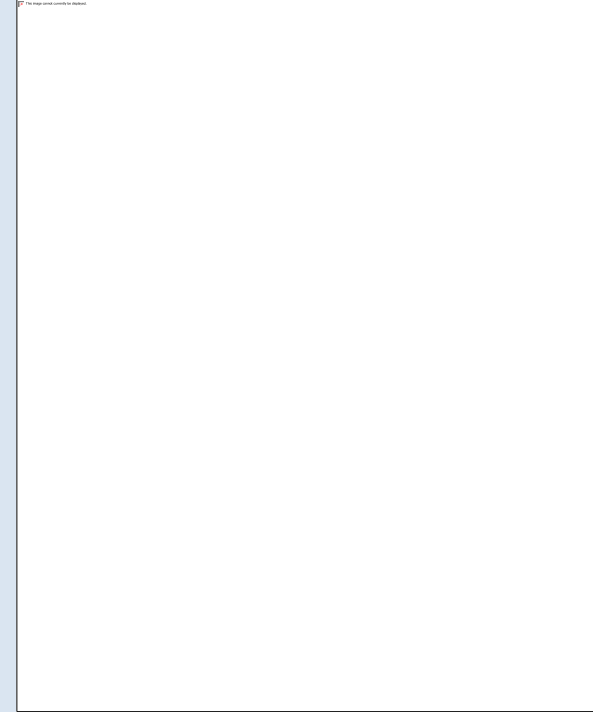
Steps to creation of the file – page 3

- In ArcCatalog open the Feature Class Properties and select Subtypes
- Press the Domains button
- A new window will open
 - Input the Domain Name and Description
 - Input data in the coded values area
 - Oak, Hickory, Maple, Cherry, Pine, Apple
 - Click Ok
 - Additional data can be added later.



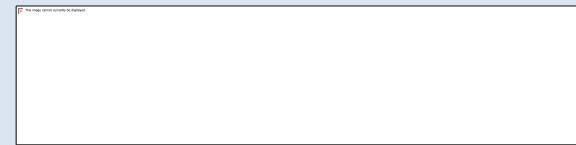
Steps to creation of the file – page 4

- In the Feature Class Properties go to the Fields tab.
- Highlight the attribute you want to use the domain with.
- In the lower box click on Domain and the pull down arrow will appear and select your domain.
- Click OK to finish.
- An empty point feature class has been created.



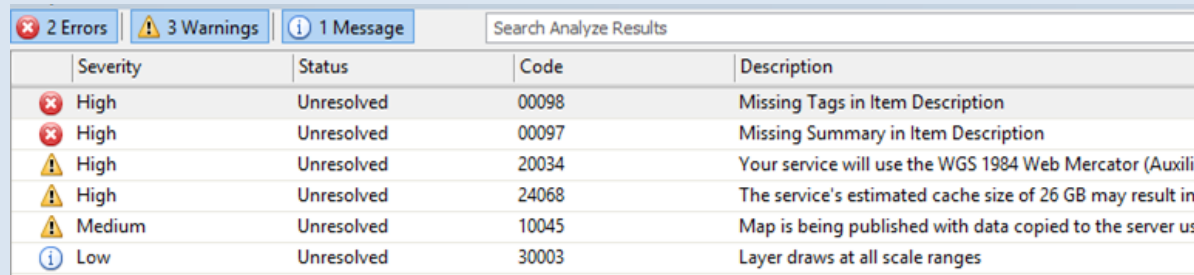
Exporting to ArcGIS Online – page 1

- The next step will be the exporting of the feature class to ArcGIS Online (AGO).
- Make sure you are signed into AGO. Located under the File menu.
- Go to the File menu and select Share As and Select Service.
 - Select a service will be published.
 - Select a Hosted Service (KCTCS).
 - Input a service name, no spaces.



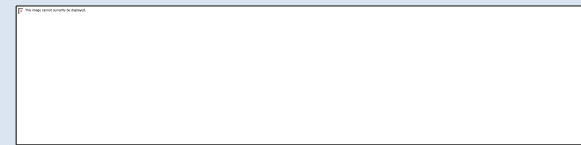
Exporting to ArcGIS Online – page 2

- The Service Editor window will open, click Analyze.
 - Since no metadata was created, a couple errors must be correct, it also does not like the projection and it will convert to WGS 1984 or it can be changed by the designer which is a better way.



Severity	Status	Code	Description
High	Unresolved	00098	Missing Tags in Item Description
High	Unresolved	00097	Missing Summary in Item Description
High	Unresolved	20034	Your service will use the WGS 1984 Web Mercator (Auxiliary)
High	Unresolved	24068	The service's estimated cache size of 26 GB may result in
Medium	Unresolved	10045	Map is being published with data copied to the server using
Low	Unresolved	30003	Layer draws at all scale ranges

- Click on the missing metadata error and a set of dialog boxes will open. After inputting the metadata click Analyze.
- In capabilities you must check: Feature Access, uncheck **Tile Mapping** and check all parameters under Feature Access or it will not work properly
- Publish, this will take a few minutes, even though there is no data moving across.



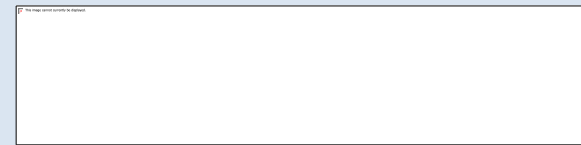
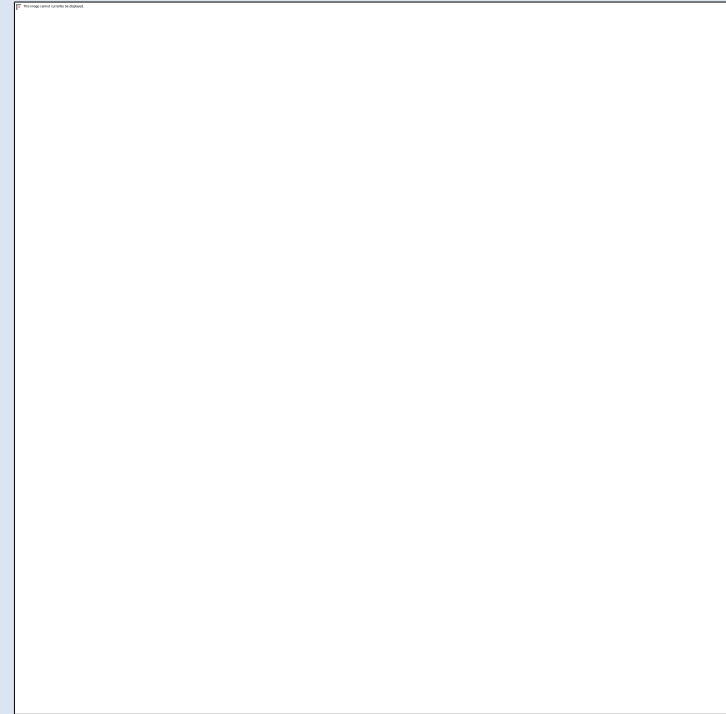
ArcGIS Online – page 1

- <http://arcgis.com> and login, any browser should work.
- Find the file.
- Select the Feature Layer, use the pull down and Add Layer to New Map.
- Select basemap I used Open Street Map for many of my projects.
- Must be careful when you are editing the map and when the layer.
- Select Save As (layer)
- Must select editing levels (under Edit) and enable editing
 - Edit, create, delete
 - Edit, create
- Must enable and configure pop-ups
- Share it with your group.
- Always save after any modifications!
- Go back to your Group and the Map should be there.
- Open your smart device and the Collector Application, under map, select the **Tree Map**.
- You will see that taking a picture **does not work**.
- This part must be done in AGO.



ArcGIS Online – page 2

- Adding a picture/attachment
 - Return to descriptive screen about your layer.
 - Click on the small arrow to enable attachments.
 - Save your layer.
- Now you should be ready to add data.

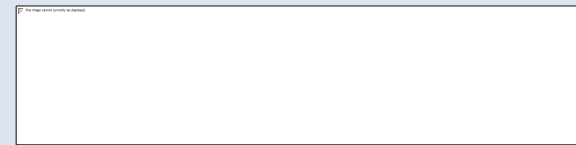


Collecting Data

- Go outside to take data.
- You need to have a connection to the Internet.
- Take 10 data points.
- When you return to the lab
 - Login to AGO and refresh your map
 - You should see your data points and attachments.

<http://kctcs.maps.arcgis.com/home/webmap/viewer.html?webmap=6c997837a73744dbbbadbd02e400b8bf>

<http://kctcs.maps.arcgis.com/apps/Editor/index.html?appid=d0ba0768ab034bf2912631294b45f726>



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Under presentations at the bottom of the page.

