GIS-2: DIGITIZING AND EDITING

GOALS

- Learn simple digitizing and editing in ArcGIS Pro
- Learn how to create a new shapefile
- Learn how to connect to map servers in ArcGIS Pro
- Digitize some data of your own choice (for example; glaciers, parks in Oslo, types of vegetation etc.)

DATA - WMS AND MAP SERVICES

- NIBIO (Skog og landskap) WMS services:
    - https://www.nibio.no/tjenester/wms-tjenester (a list)
        - E.g. vegetation types: https://wms.nibio.no/cgi-bin/vegetasjon?
- NGU (geologi) WMS services:
    - https://www.ngu.no/emne/api-og-wms-tjenester (a list)
        - E.g. BergrgrunnWMS3: https://geo.ngu.no/mapserver/BerggrunnWMS3
- Geonorge catalog:
    - https://kartkatalog.geonorge.no/?DistributionProtocols=WMS-tjeneste
        - E.g. a Sentinel-2 (satellite) mosaic over Norway: https://openwms.statkart.no/skwms1/wms.sentinel2?request=GetCapabilities&service=WMS
        - Toporaster 4: http://openwms.statkart.no/skwms1/wms.toporaster4?version=1.3.0&service=wms&request=getcapabilities

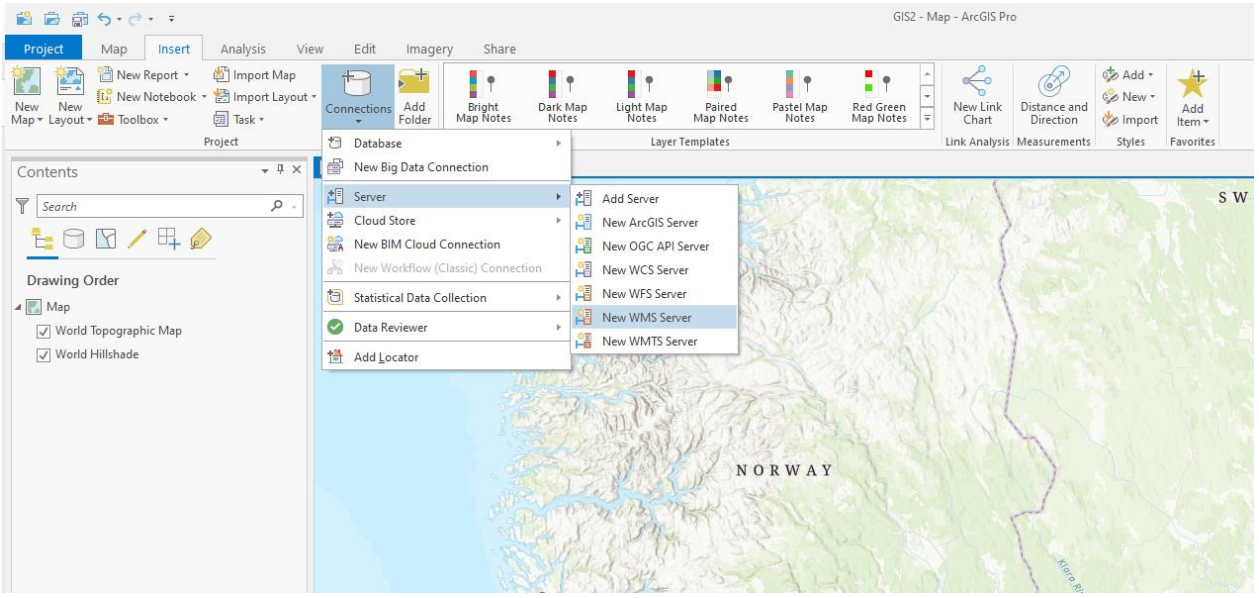
Just some examples – feel free to find your own!

METHOD

Create a new ArcGIS Pro project named “GIS2” in K : \ *”your username”* (or in a local folder if you’re working from your own machine).

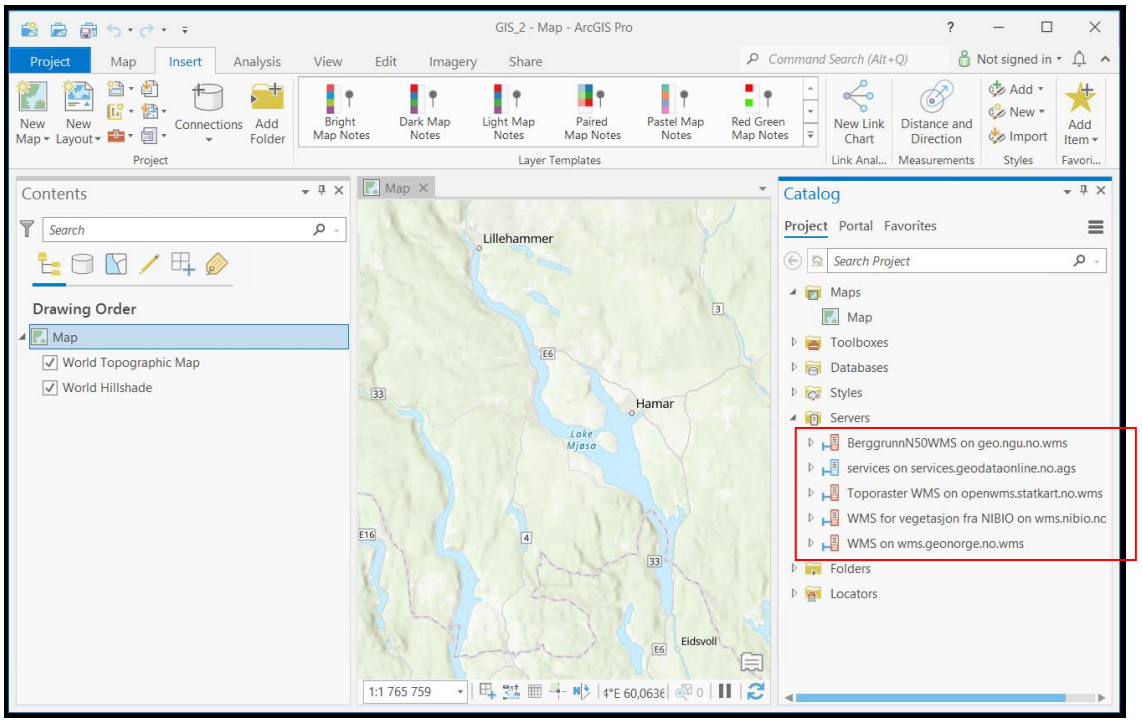
CONNECT TO MAP SERVERS - WMS:

1. Go to “Insert” tab and select “Connections” → “Server” → “New WMS Server”.

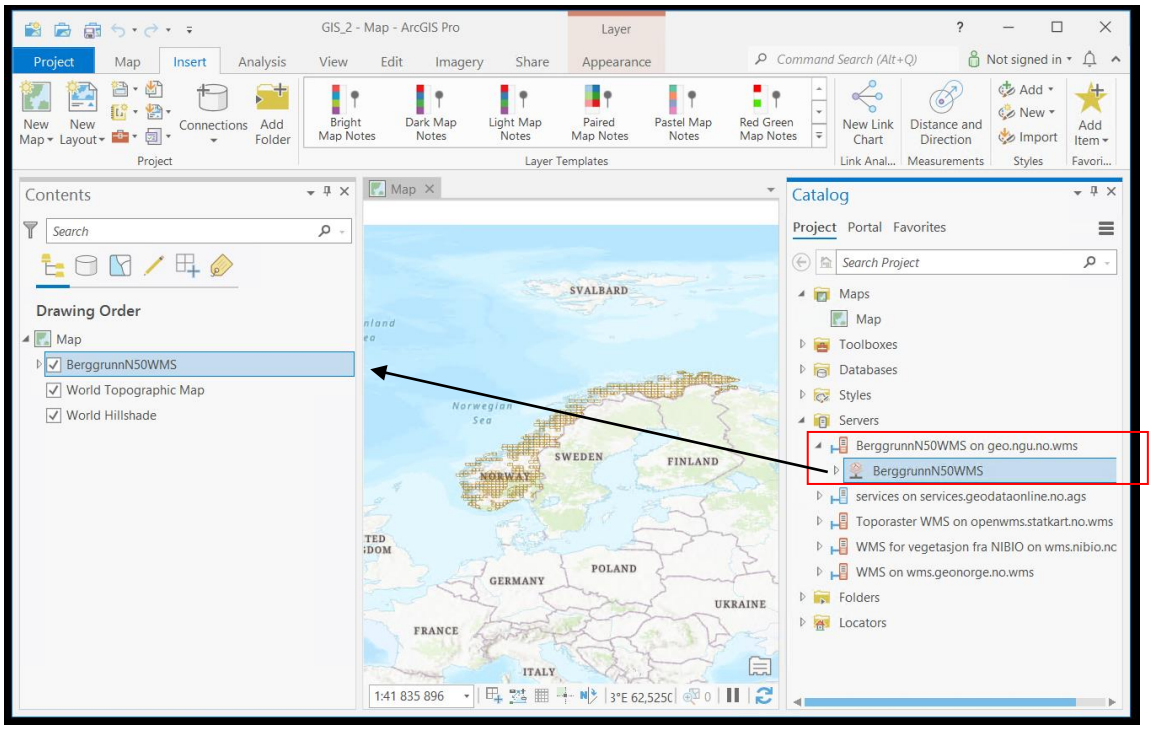


2. Copy a URL to the WMS you want to connect to and paste it in the URL- field.

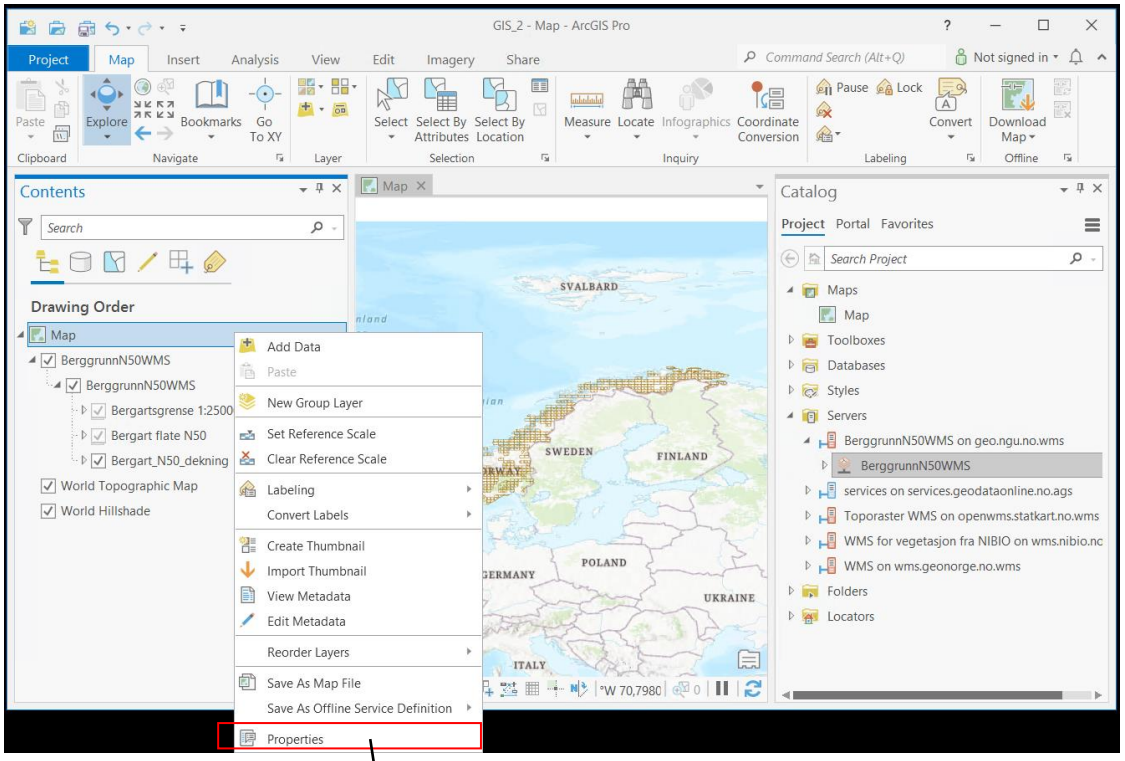
3. You can see the different WMS layers you have access to in the “Catalog” pane under “Servers”.

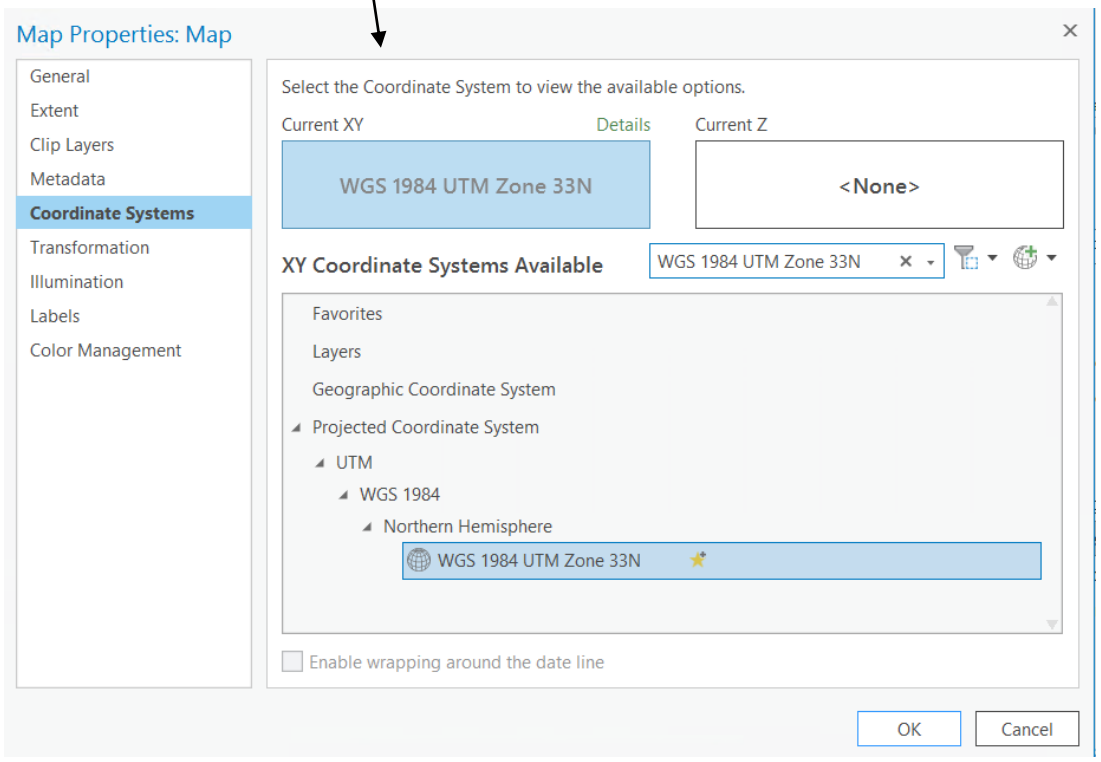


4. To add data from a given server: double-click on the server name and drag the layer below to the “Contents” pane.



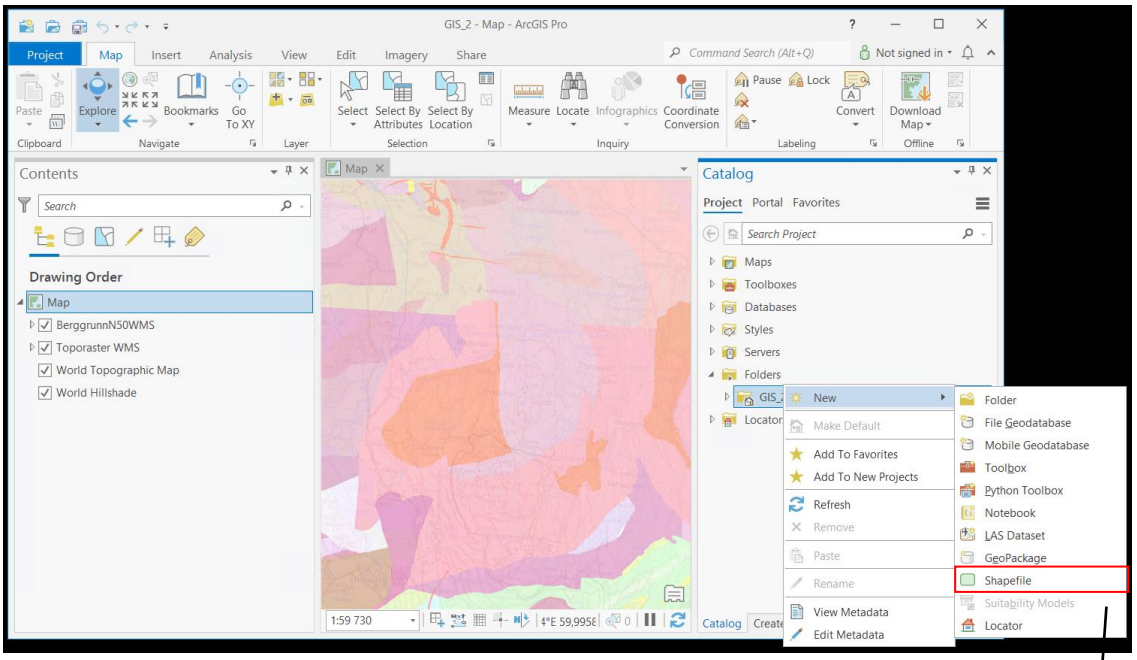
5. Now you can see some new data. Coordinate system has changed after adding the data. To change coordinate system to the projected coordinate system, right-click on the “Map” in the “Contents” pane. Choose “Properties”. In “Map Properties” go to “Coordinate system”. Next to “XY Coordinate Systems Available” type “WGS 1984 UTM Zone 33N” and find it under “Projected Coordinate System”. Click “OK”.





CREATE A NEW SHAPEFILE:

To create a new vector dataset you need to create a new empty shapefile. In the “Catalog” pane, go to your home folder under “Folders”. Right-click on its name, choose “New” -> “Shapefile”. Find a suitable name for the “Feature Class Name” referring to what you want to digitize, and select polygon as the Geometry type. (For later, if you want to digitize point features like mountain names, buildings etc., select points here). Give your map a spatial reference: You can choose “Current map” or find a suitable coordinate system. The UTM zone will vary with the area you work on in Norway or what you will use your map for later. Norway is covered by UTM zone 32 – 36, but 33 is the official UTM-zone for all of Norway. Press “Run”. The new shapefile should be automatically added to the “Contents” pane.


GIS_2 - Map - ArcGIS Pro
Project
Map
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Imagery
Share
Contents
Drawing Order
Map
BerggrunnN50WMS
Toporaster WMS
World Topographic Map
World Hillshade
Catalog
Project
Portal
Favorites
Search Project
Maps
Toolboxes
Databases
Styles
Servers
Folders
New
Make Default
Add To Favorites
Add To New Projects
Refresh
Remove
Paste
Rename
View Metadata
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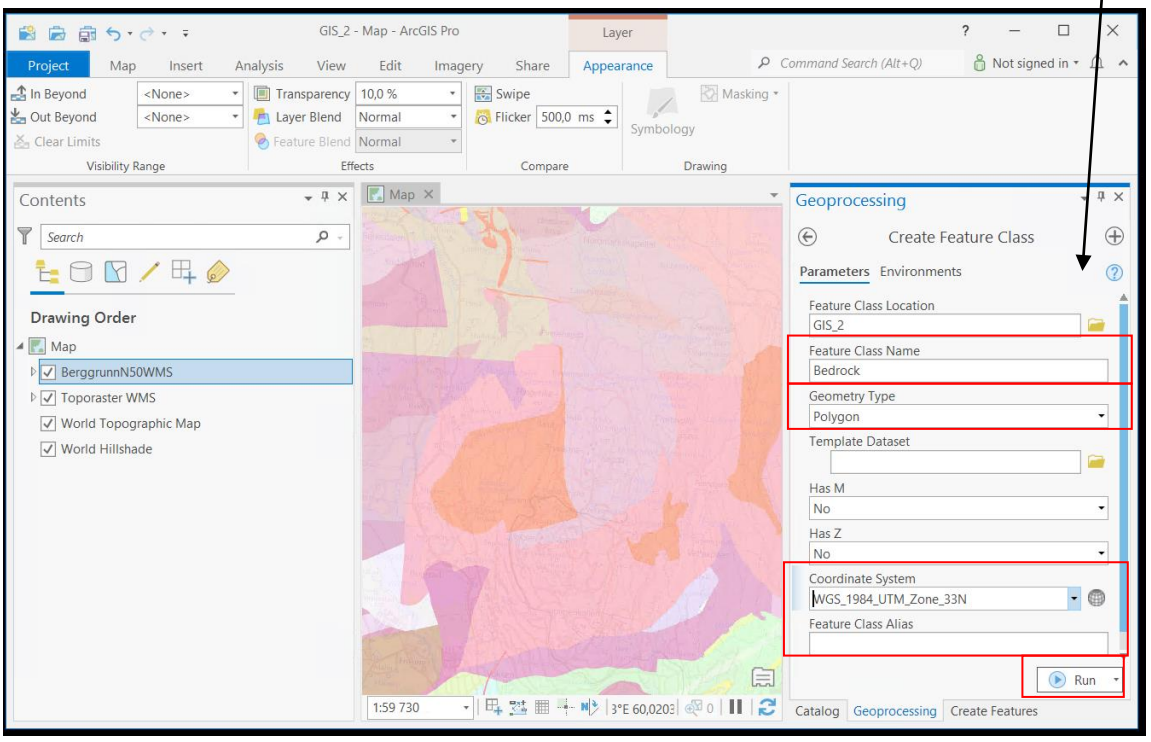
File Geodatabase
Mobile Geodatabase
Toolbox
Python Toolbox
Notebook
LAS Dataset
GeoPackage
Shapefile
Suitability Models
Locator


GIS_2 - Map - ArcGIS Pro
Layer
Project
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Contents
Drawing Order
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BerggrunnN50WMS
Toporaster WMS
World Topographic Map
World Hillshade
Geoprocessing
Create Feature Class
Parameters
Environments
Feature Class Location
GIS_2
Feature Class Name
Bedrock
Geometry Type
Polygon
Template Dataset
Has M
No
Has Z
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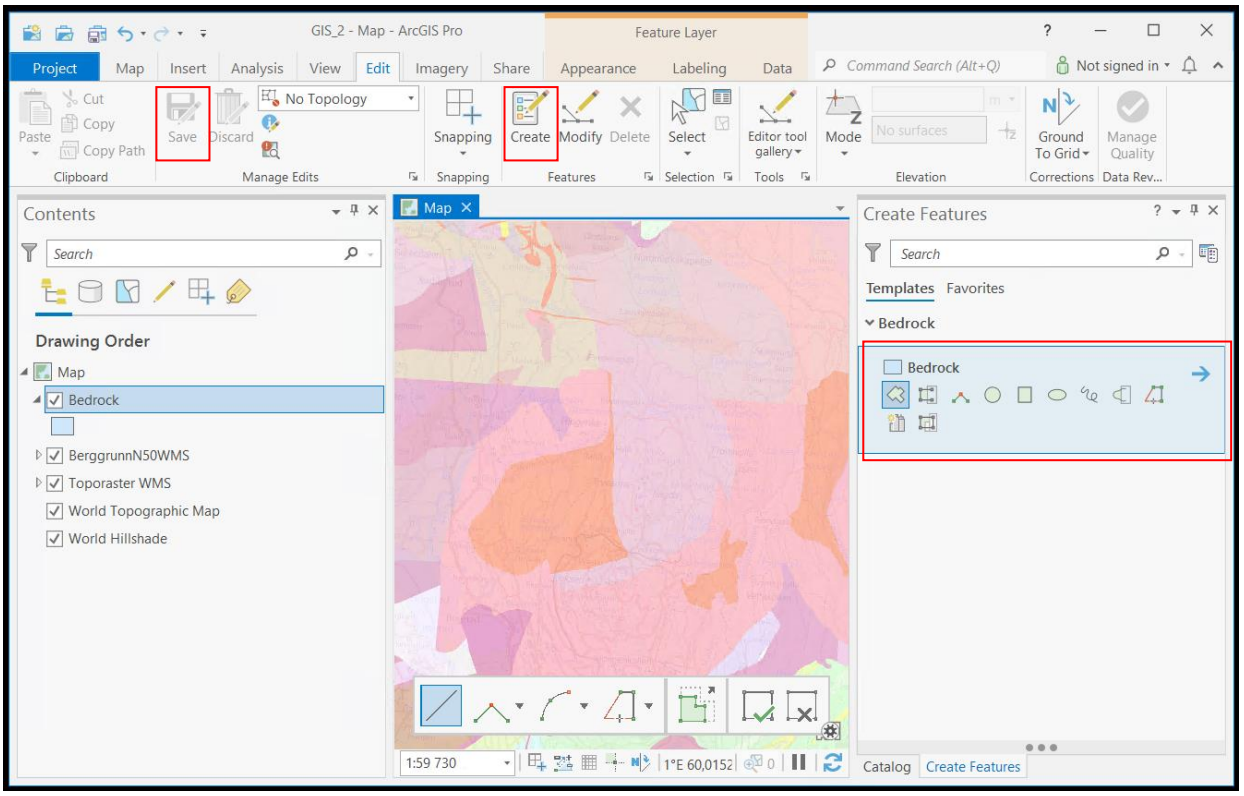
Coordinate System
WGS_1984_UTM_Zone_33N
Feature Class Alias
Run
Catalog
Geoprocessing
Create Features

START DIGITIZING

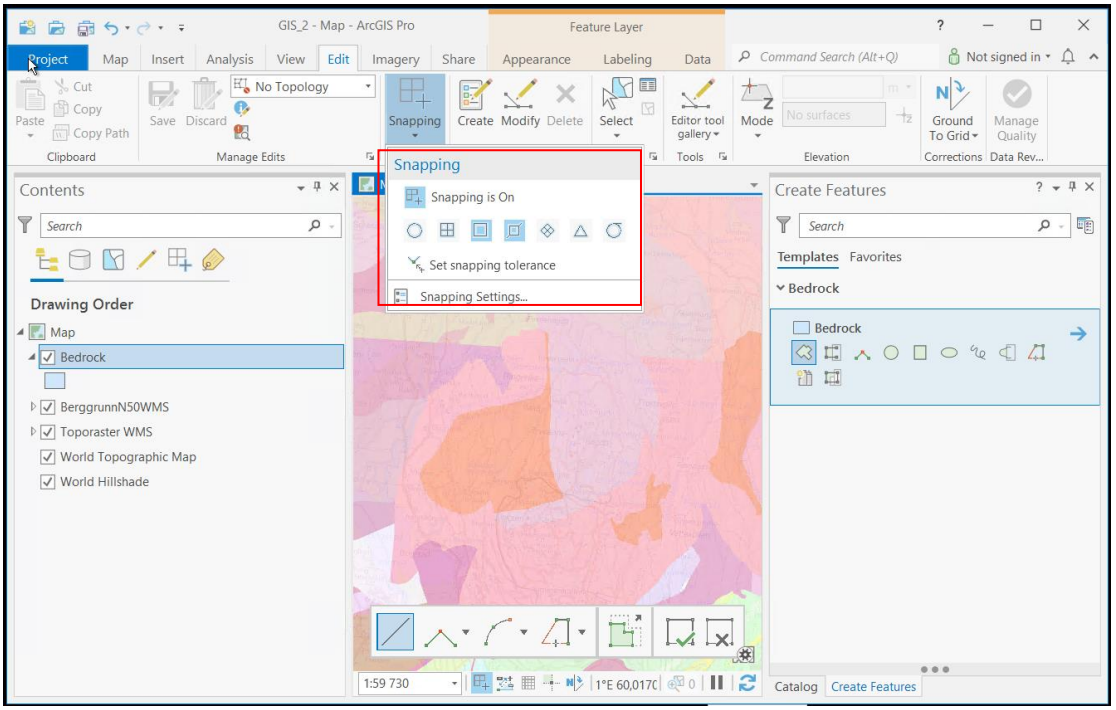
1. Find an area in the WMS-maps you want to digitize, e.g. a lake, a glacier or vegetation types.

2. Under the "Edit" tab choose “Create”. Draw around the chosen feature. Click on “Save” when you are done. Explore various ways of drawing in the “Create Features” pane, e.g. Polygon or Freehand.



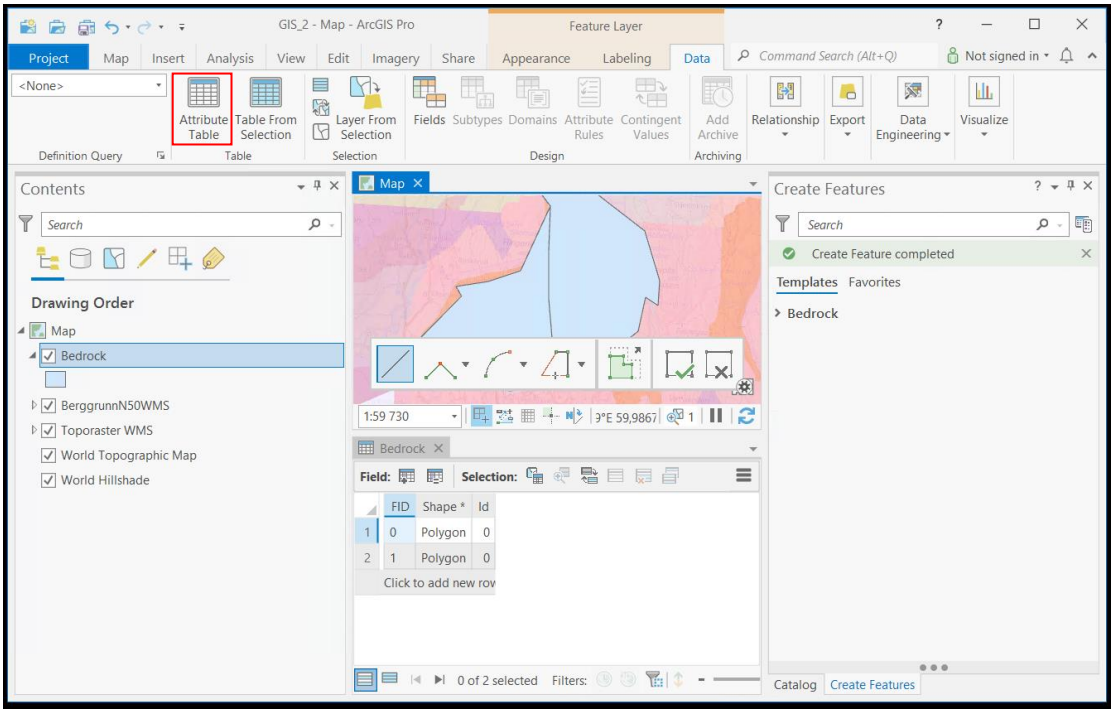
3. You have the ability to undo your digitizing by using the Ctrl- and Z-key’s simultaneously or by using the short cut tabs  for "Undo" and "Redo".

4. Under "Edit" tab we can set some defaults for editing. For example under "Edit → snapping" you can turn on snapping between polygons.

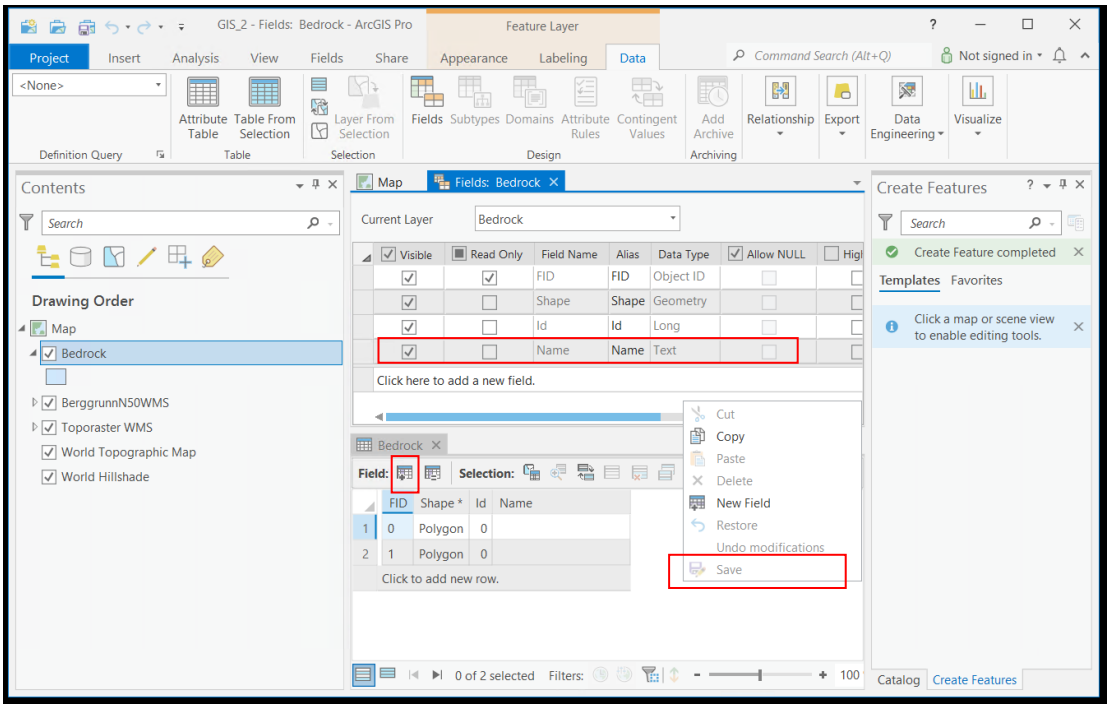


5. After drawing each polygon, double-click the last vertex to finish. Remember to save with “Save”.

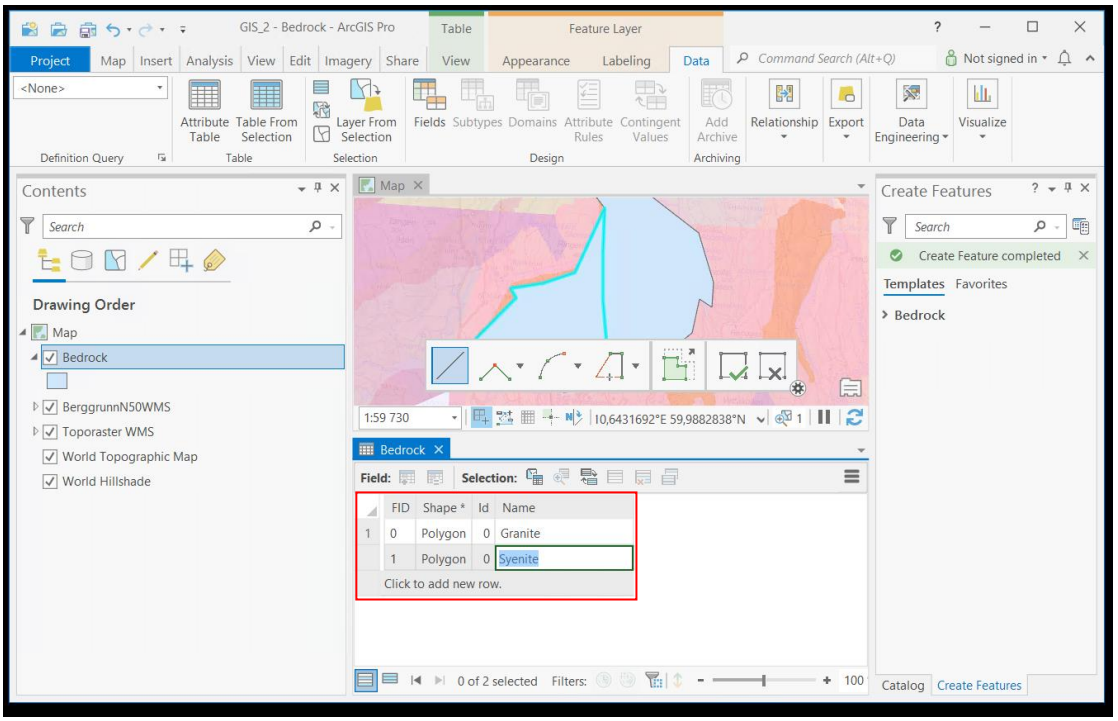
6. To give the polygon attributes, go to the “Data” tab and select “Attribute Table”. You will now get the attribute list with FID, Shape and Id. It can be useful to classify the features with numbers if you classify different bedrock types (e.g. Granite and Syenite). In “Id” you can change the number to the code you decide to use for the respective land cover type.



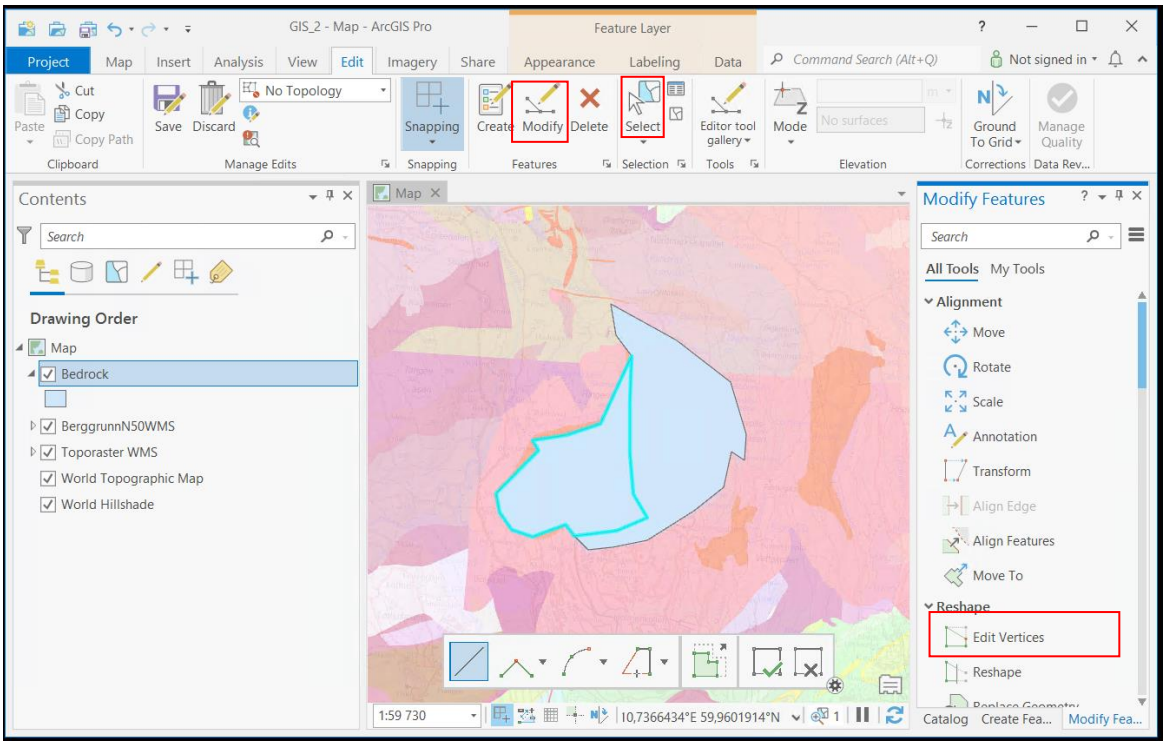
7. If you want to add more information to the polygon; select Add field. Give the field an appropriate name (e.g. Name) and select the type of information you want to add (e.g. Text). Right-click on the empty white space below the table with field names and choose “Save”.



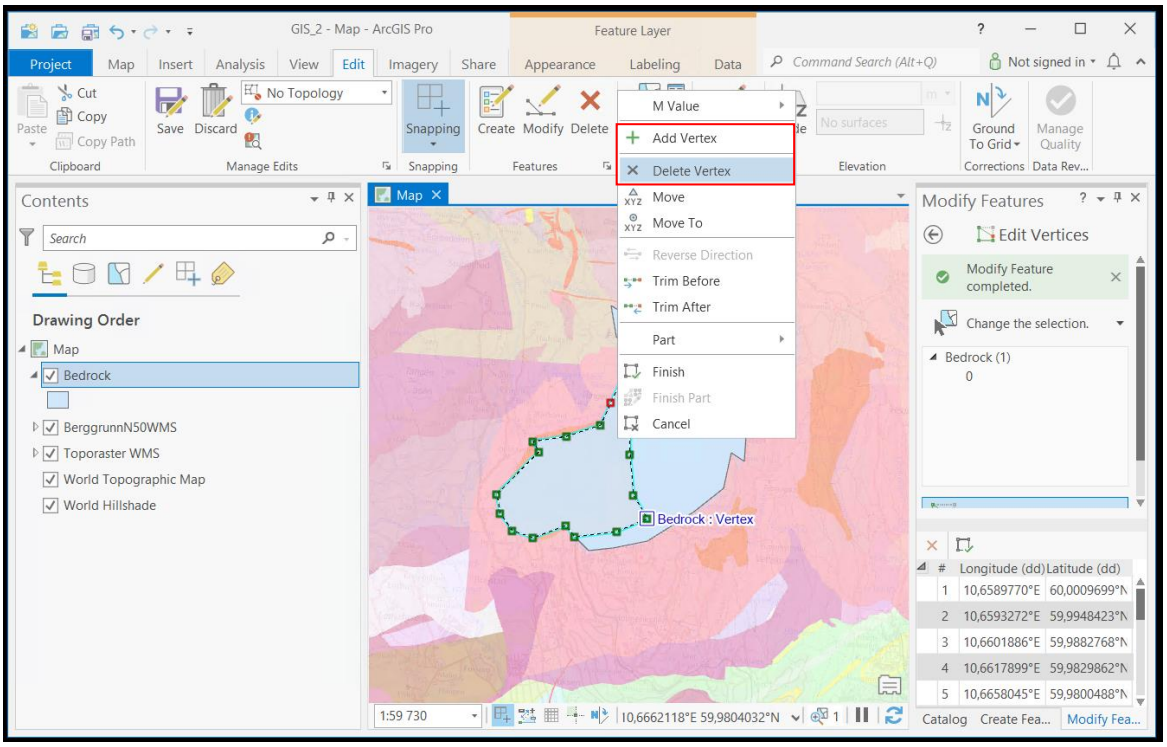
Now you can close “Fields:Bedrock” and edit your polygon by adding more attribute information.



8. To modify a polygon select e.g. "Edit Vertices"  in the “Edit->Modify” tab. Select a polygon you want to edit using “Select” (see below).



The polygon nodes should appear. You can grasp and move a point by clicking and dragging. To delete a node, you place the mouse over it, right click and select "Delete Vertex". You can also insert new nodes by holding the mouse over the polygon line, right click and select "Add Vertex".



9. If you want to have two neighboring polygons, without small holes in between or overlaps of polygons it is wise to use "snapping". Snapping means that the node you move will connect automatically with the closest polygon node within a certain radius, e.g. 10 pixels (or the tolerance you selected for editing!). When snapping is applicable (distance < tolerance), the node will automatically snap to the nearest node when you unleash the node. To avoid snapping, you can override it by pressing the space-key while you drag the node, or you can turn down your tolerance value (circumference) for the snapping function. Try to connect the polygon boundaries exact by intercept to each polygon node in the field you work on. Note that you can also use “Autocomplete Polygon” to draw a new polygon next to another one.

10. Digitize your features and remember to save edits when you’re finished!

REPORT

Make a nice map of your digitized dataset. Adjust also symbology. Insert legend, an appropriate title, north arrow, scale bar and a grid. It might be a good idea to use satellite or the map as background, and add some additional information like names in the attribute fields. Save your map as a pdf- file and show it to the teacher.