



ArcGIS PRO

DRH Advanced Tutorial

Add Data | Explore Analysis Tools | 3D Map on Local Scene

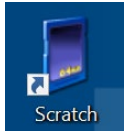
March 2023

Data Acquisition


The dataset used in this tutorial:

- Hawke's Bay Regional Council - <https://hbrcopendata-hbrc.opendata.arcgis.com/>
- Koordinates - <https://koordinates.com/>

Dataset folder is available in **Scratch** on lab computers



Note: Copy the whole data folder from Scratch into your ArcGIS project folder.

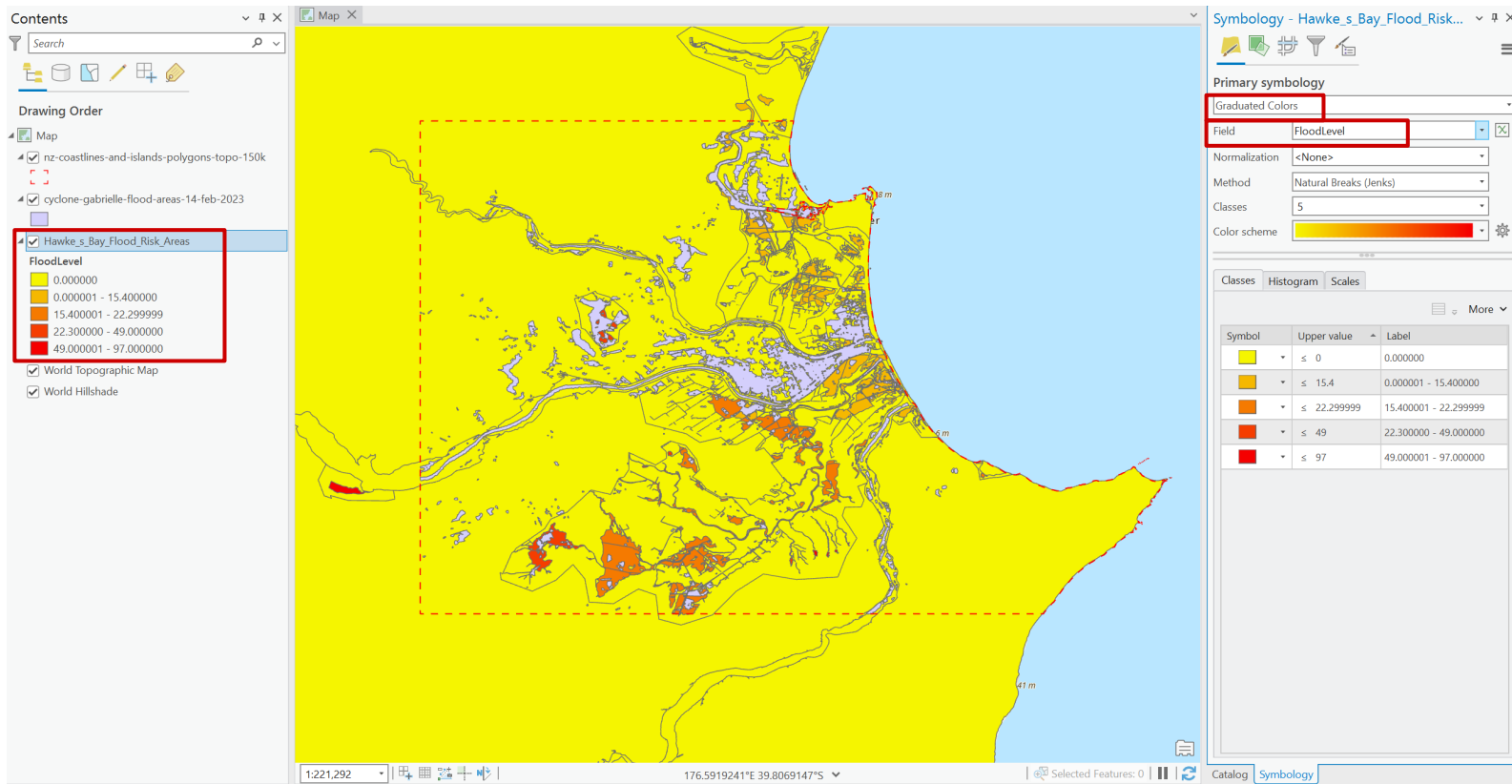
- Coastline
- cyclone-gabrielle-flood-areas-14-feb-2023
- DEM
- Hawke_s_Bay_Bus_Routes
- Hawke_s_Bay_Flood_Risk_Areas
- kx-nz-road-centrelines-topo-150k-SHP
- lcdb-v50-land-cover-database-version-50-main...
- nz-building-outlines-all-sources
- nz-building-points-topo-150k
- nz-river-polygons-topo-1500k
- vegetative-cover-map-of-new-zealand
-  Hawke's Bay Regional Council Open Data Site

Add Data and Change Symbology



Change the Primary Symbolology for the *Hawkes Bay Flood Risk Areas* layer

Symbology – Graduated Colors – Select “FloodLevel” in Field



Contents

Search

Drawing Order

- Map
 - nz-coastlines-and-islands-polygons-topo-150k
 - cyclone-gabrielle-flood-areas-14-feb-2023
 - Hawke_s_Bay_Flood_Risk_Areas**
 - FloodLevel**
 - 0.000000
 - 0.000001 - 15.400000
 - 15.400001 - 22.299999
 - 22.300000 - 49.000000
 - 49.000001 - 97.000000
 - World Topographic Map
 - World Hillshade

Symbology - Hawke_s_Bay_Flood_Risk...

Primary symbology

Graduated Colors

Field: FloodLevel

Normalization: <None>

Method: Natural Breaks (Jenks)

Classes: 5

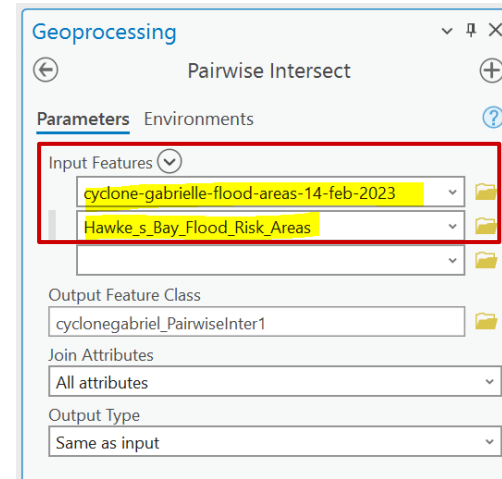
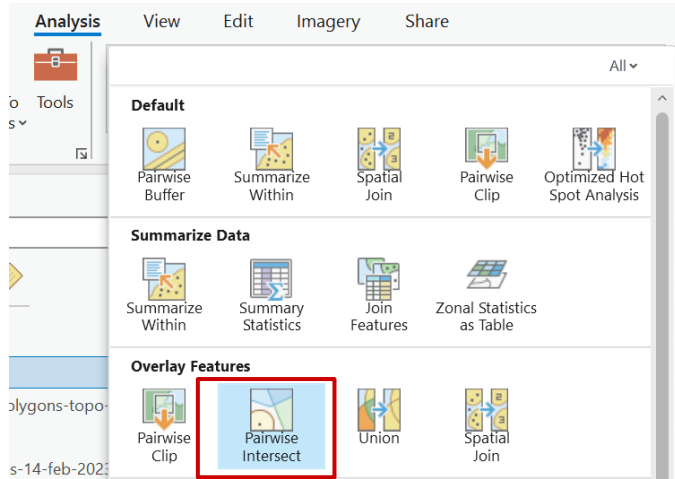
Color scheme

Classes Histogram Scales

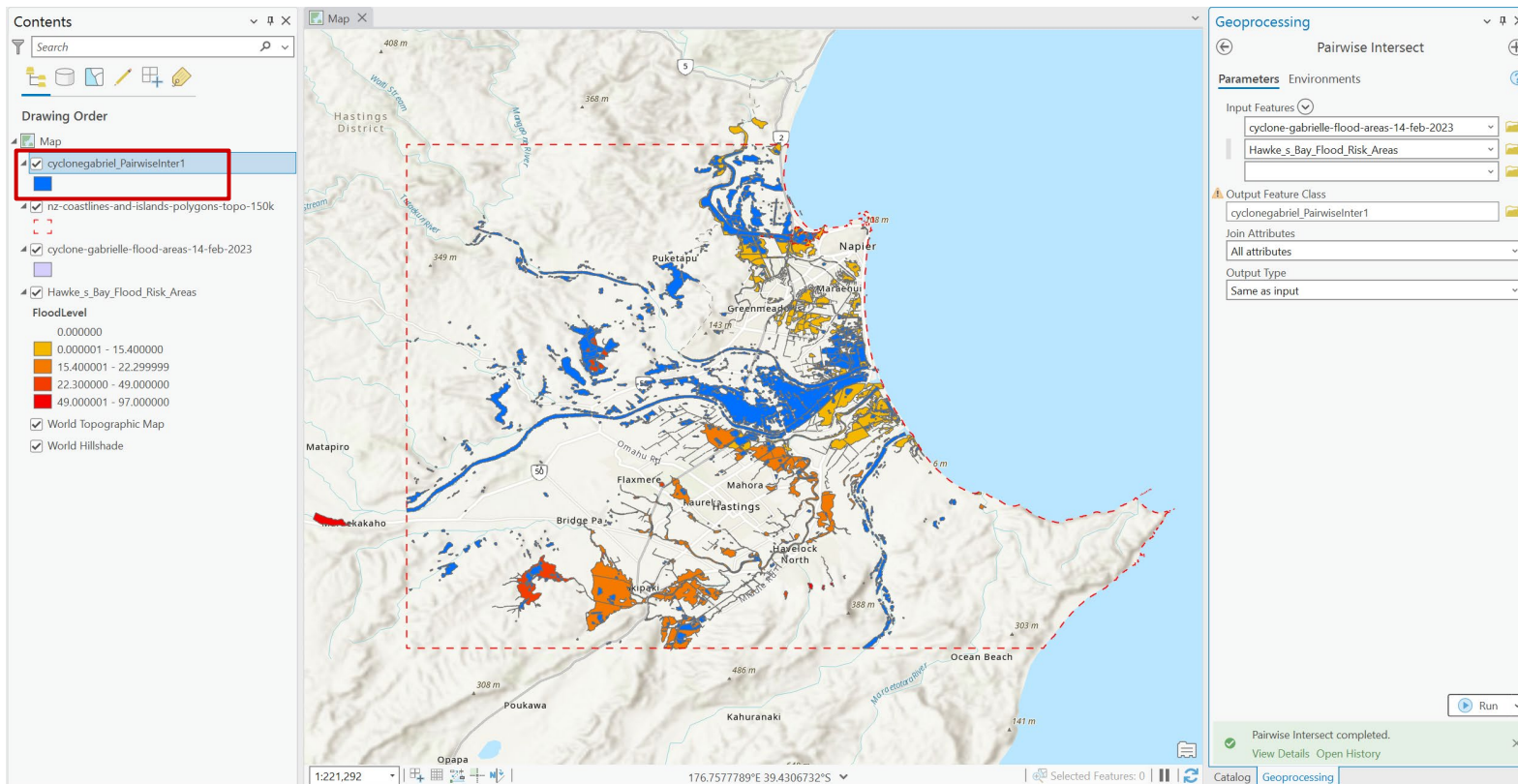
Symbol	Upper value	Label
Yellow	≤ 0	0.000000
Light Orange	≤ 15.4	0.000001 - 15.400000
Orange	≤ 22.299999	15.400001 - 22.299999
Red-Orange	≤ 49	22.300000 - 49.000000
Red	≤ 97	49.000001 - 97.000000

Compare the area that was predicted and actually flooded in the January flood event

- Click **Analysis** on the top ribbon
- Find **Pairwise Intersect** tool
- Select the **Input Feature** layers as below
- Click **Run**



Outcome Layer – Open **Attribute Table** for further analysis



Contents

Search

Drawing Order

- Map
- ☒ cyclonegabriel_PairwiseInter1
- ☒ nz-coastlines-and-islands-polygons-topo-150k
- ☒ cyclone-gabrielle-flood-areas-14-feb-2023
- ☒ Hawke_s_Bay_Flood_Risk_Areas

FloodLevel

- 0.000000
- 0.000001 - 15.400000
- 15.400001 - 22.299999
- 22.300000 - 49.000000
- 49.000001 - 97.000000

☒ World Topographic Map

☒ World Hillshade

Geoprocessing

Pairwise Intersect

Parameters Environments

Input Features

- cyclone-gabrielle-flood-areas-14-feb-2023
- Hawke_s_Bay_Flood_Risk_Areas

Output Feature Class

cyclonegabriel_PairwiseInter1

Join Attributes

All attributes

Output Type

Same as input

Run

Pairwise Intersect completed.
View Details Open History

Selected Features: 0

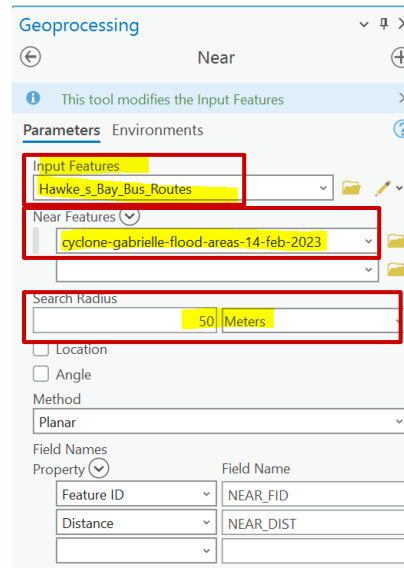
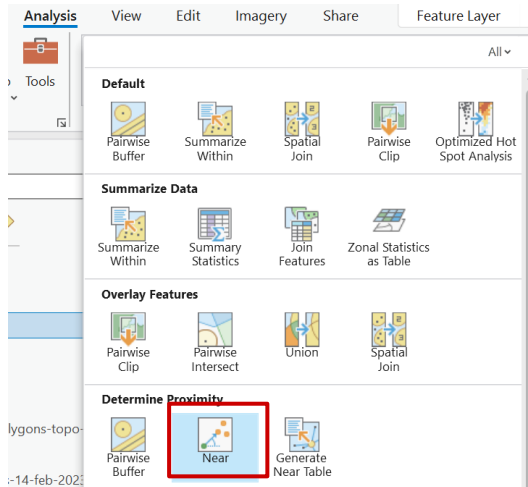
2. Find out bus routes that affected by the flood

- Add Hawkes Bay Bus Routes Data onto the map
- Click **Analysis** on the top ribbon
- Find **Near** tool

To find the bus routes that were affected:

- **Parameters** as below – search area 50m near the bus routes
- Click **Run**

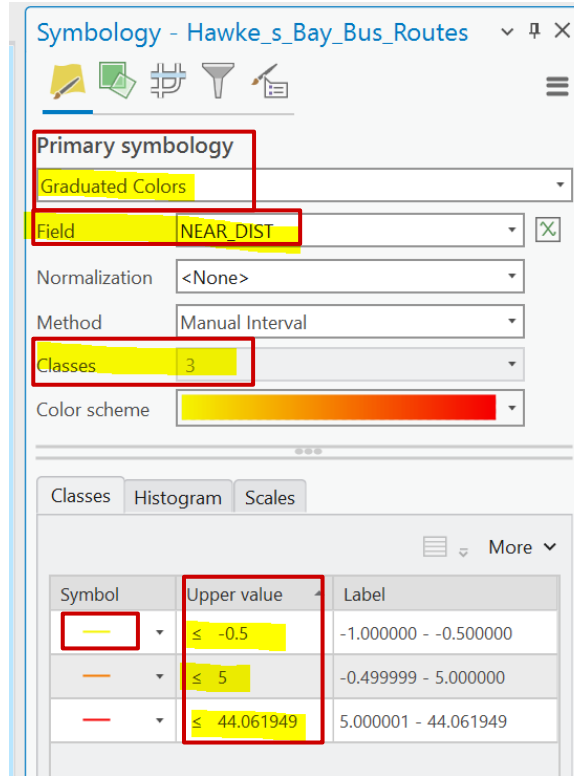
Note: the Near tool will be only shown as Fields in the attribute table



Hawke's Bay Bus Routes														
Fields: Add Select Selections: Select By Attributes Zoom In Switch Clear Delete Copy														
	FID	SHAPE	OBJECTID	Route	GlobalID	created_us	created_da	last_edit	last_edl_1	Bus_Route	Assigned_N	SHAPE_Length	NEAR_FID	NEAR_DIST
1	0	Polyline	3105	1662	(70287CA2-FF62-4352-...	GISP	3/03/2023	GISP	3/03/2023	1662	33	11652.6019	-1	-1
2	1	Polyline	3106	15A	(10877543-AA4E-44E7-...	GISP	3/03/2023	GISP	3/03/2023	15A	7	10802.1621	76	23.870997
3	2	Polyline	3107	20A	(888F780D-1106-4866-...	GISP	3/03/2023	GISP	3/03/2023	20A	24	12366.4044	-1	-1
4	3	Polyline	3108	11H	(EC687DFC-40E7-4CC9-...	GISP	3/03/2023	GISP	3/03/2023	11H	1	25138.8333	209	0
5	4	Polyline	3109	20L	(DCC25784-405C-4384-...	GISP	3/03/2023	GISP	3/03/2023	20L	29	14676.1214	-1	-1
6	5	Polyline	3110	21B	(D9A8A419-83C9-4487-...	GISP	3/03/2023	GISP	3/03/2023	21B	29	6903.5473	376	16.276816
7	6	Polyline	3111	20D	(C847C72C-0358-43A4-...	GISP	3/03/2023	GISP	3/03/2023	20D	27	13648.2291	-1	-1
8	7	Polyline	3112	12B	(1E8E9877-D3D9-4C34-...	GISP	3/03/2023	GISP	3/03/2023	12B	18	9414.2452	-1	-1
9	8	Polyline	3113	16B3	(20277DCC-8655-4D64-...	GISP	3/03/2023	GISP	3/03/2023	16B3	45	8522.8892	-1	-1
10	9	Polyline	3114	15A	(D07F0168-07D1-4E81-...	GISP	3/03/2023	GISP	3/03/2023	15A	22	25709.6629	341	44.081940
11	10	Polyline	3115	10N	(C788476C-464D-473B-...	GISP	3/03/2023	GISP	3/03/2023	10N	13	24750.4191	20	0
12	11	Polyline	3116	16B	(58F02031-42CC-470B-...	GISP	3/03/2023	GISP	3/03/2023	16B1	9	9123.7702	-1	-1
13	12	Polyline	3117	12H	(8761472B-C86E-41A5-...	GISP	3/03/2023	GISP	3/03/2023	12H	17	27495.7797	20	0
14	13	Polyline	3118	14	(D3A767D0-5A58-4B36-...	GISP	3/03/2023	GISP	3/03/2023	14	6	13176.6982	-1	-1

Find out bus routes that affected by the flood

- Change the bus routes
Symbology to **Graduated Colors**
- Make sure select “**NEAR_DIST**” in **Field**
- Change **Classes** to **3**
- Double click the numbers to change the **Upper values**
- Click icons for each class under **Symbol** to change the properties



Symbology - Hawke_s_Bay_Bus_Routes

Primary symbology: Graduated Colors

Field: NEAR_DIST

Normalization: <None>

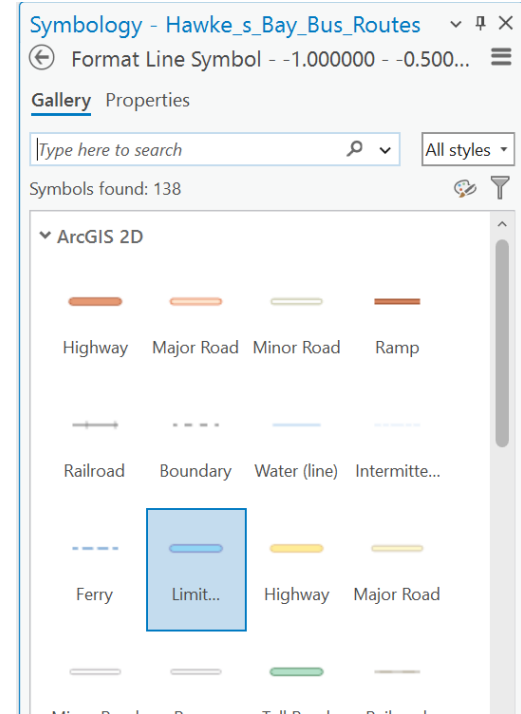
Method: Manual Interval

Classes: 3

Color scheme: [Red to Yellow Gradient]

Classes

Symbol	Upper value	Label
[Yellow Line]	≤ -0.5	-1.000000 - -0.500000
[Orange Line]	≤ 5	-0.499999 - 5.000000
[Red Line]	≤ 44.061949	5.000001 - 44.061949



Symbology - Hawke_s_Bay_Bus_Routes

Format Line Symbol - -1.000000 - -0.500000

Gallery Properties

Type here to search

Symbols found: 138

ArcGIS 2D

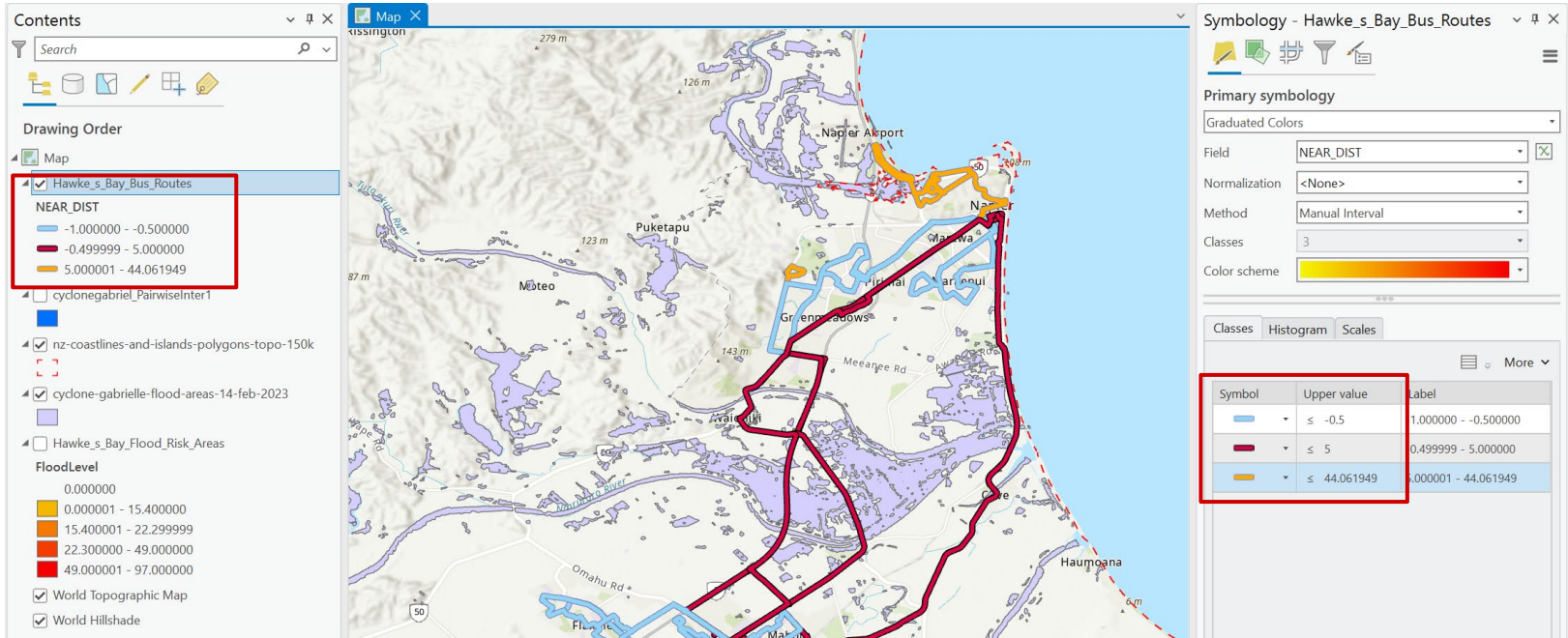
Highway Major Road Minor Road Ramp

Railroad Boundary Water (line) Intermitte...

Ferry Limit... Highway Major Road

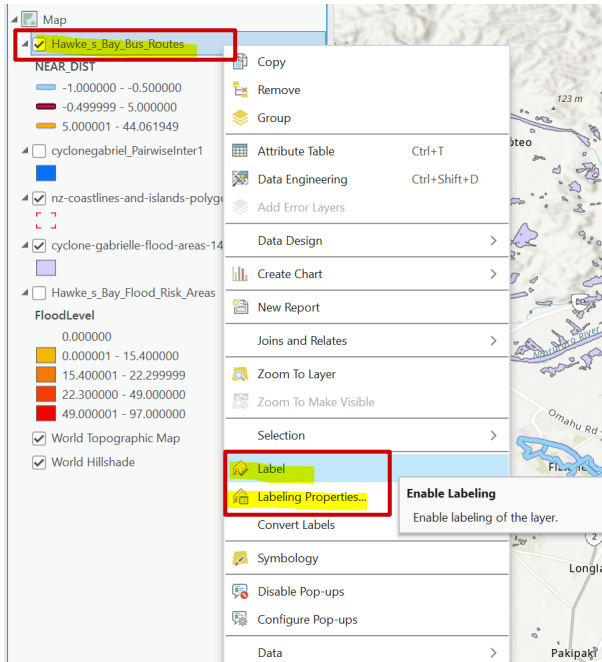
Find out bus routes that affected by the flood

- Change **Symbol** to make the map more legible
- Upper value **less than -0.5m** to show bus routes that were **not affected**
- Upper Value **up to 5m** shows the bus routes that were **seriously affected**

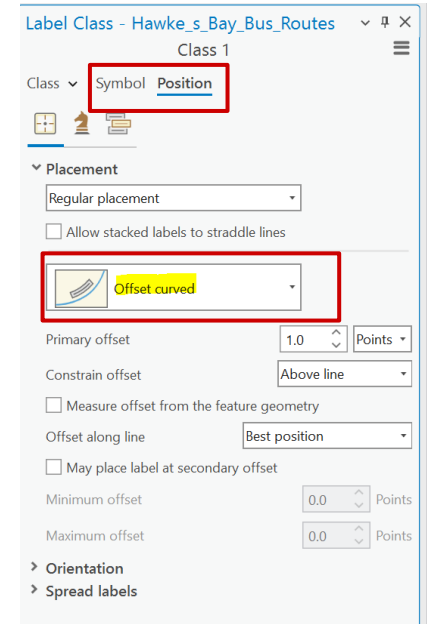
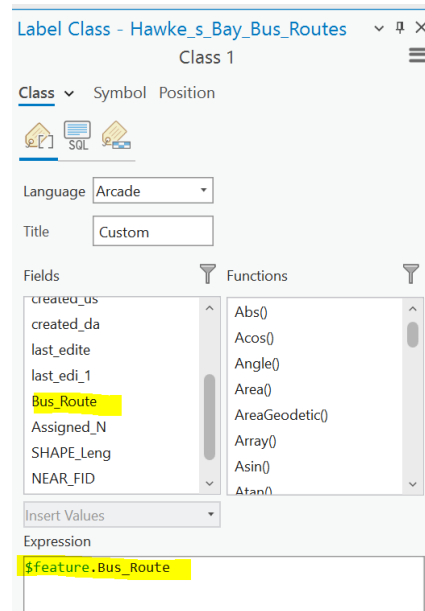


Label the bus routes

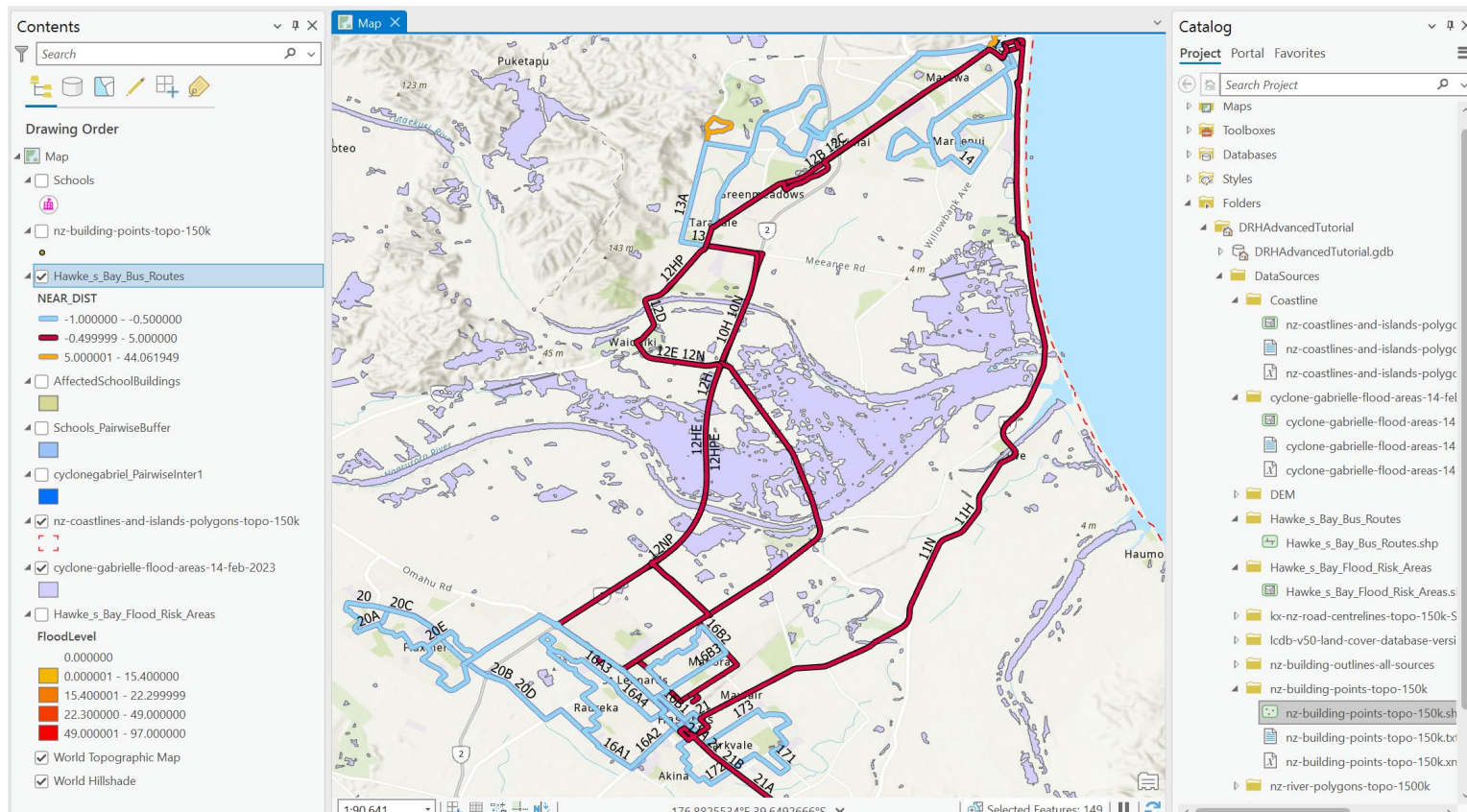
- **Right Click** the Hawkes Bay Bus Routes layer
- Click **Label** to enable labelling
- Click **Labelling Properties**



- Select the **Bus_Route** field
- Click **Apply**
- Customize the label appearances by changing its **Symbol** and **Position**



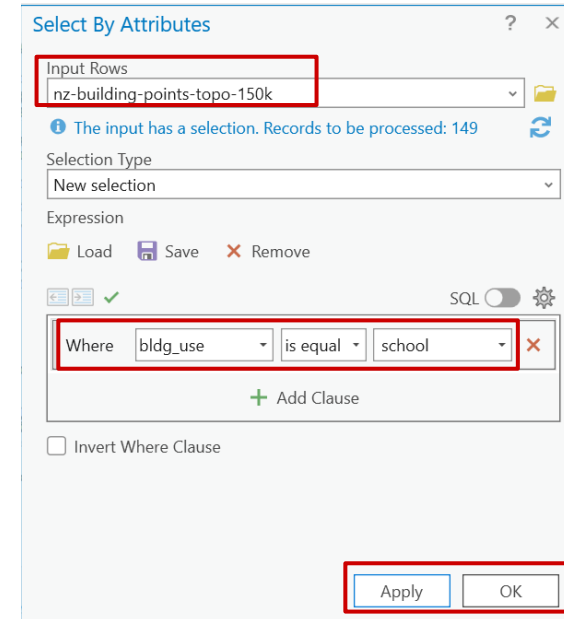
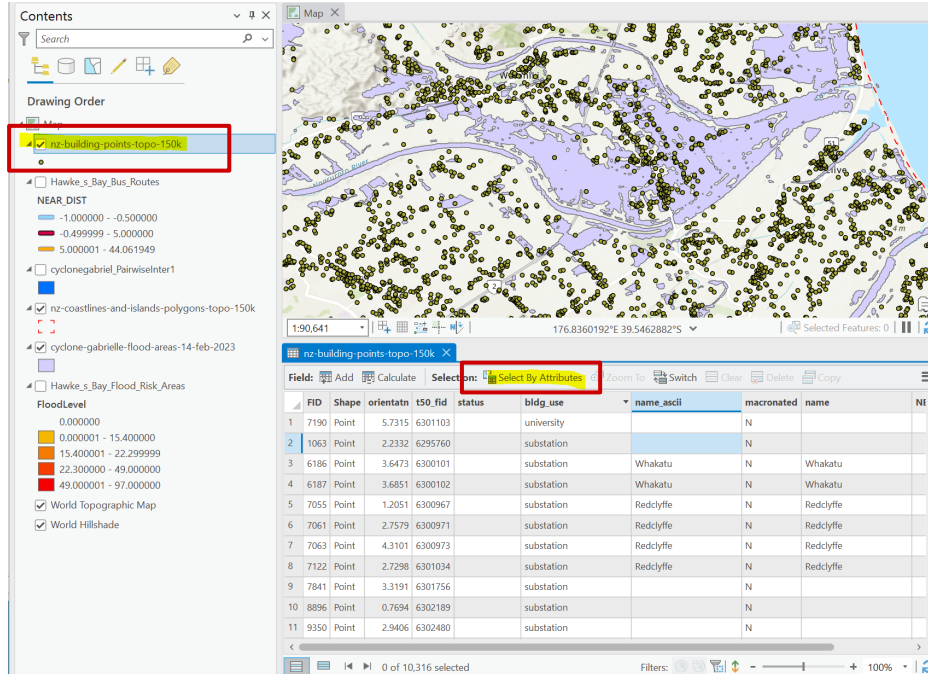
Outcome map of bus routes that affected by the flood



3. Find out Schools and the surrounding areas that affected by the flood

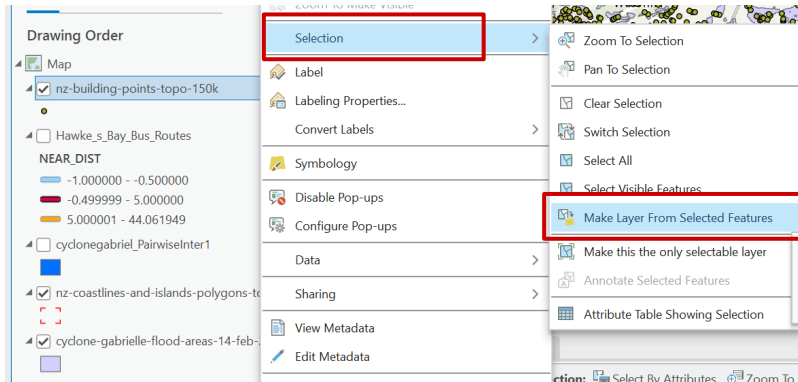
- Add **building points data** onto the map
- Open Attribute Table
- Click Select By Attributes

- Select **building points layer** as **Input Rows**
- Filter out the building use as **school** by entering the following expression
- Click **Apply** and **OK**

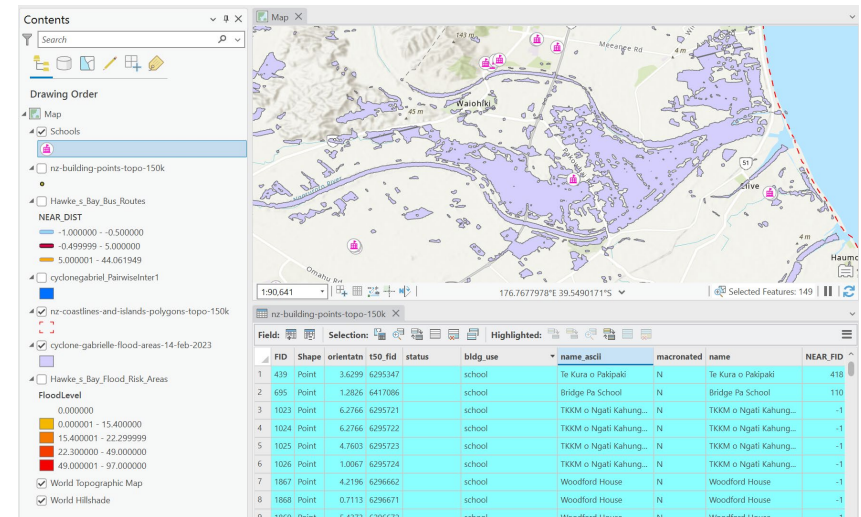


Create a School layer

- **Right click** the layer
- Click **Selection – Make Layer From Selected Features**
- A new layer with Schools point data only will be created



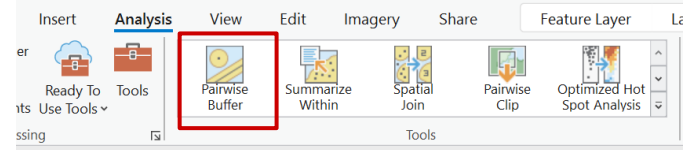
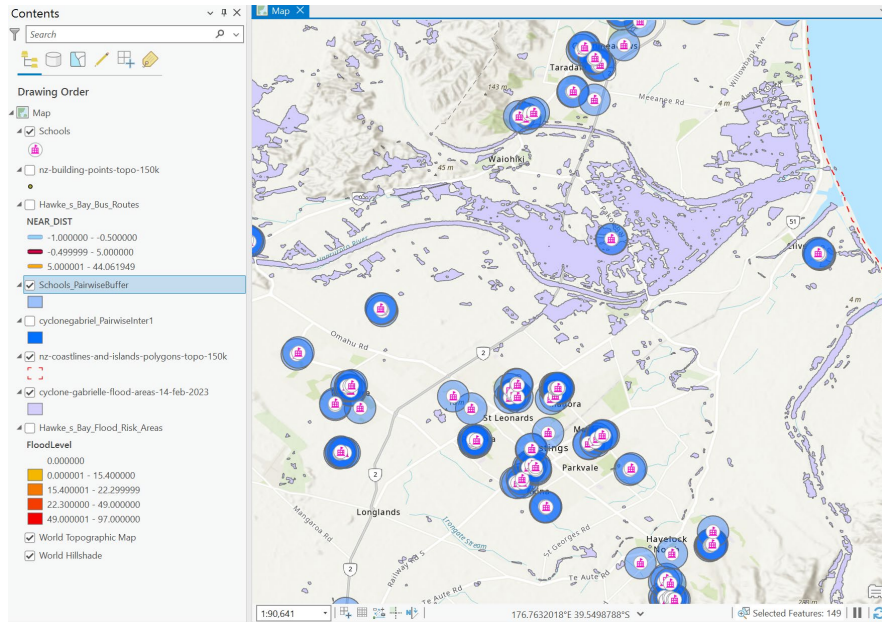
- **Rename** the layer to **Schools**
- Change its appearances by selecting **Symbology**



Create a 500m buffer around Schools

- Find the **Pairwise Buffer** tool under **Analysis**
- Enter the **Parameters** as shown at right
- Click **Run**

Outcome map:



Geoprocessing

Pairwise Buffer

Parameters Environments

Input Features
Schools

Output Feature Class
Schools_PairwiseBuffer

Distance [value or field] **Linear Unit**
500 Meters

Method
Planar

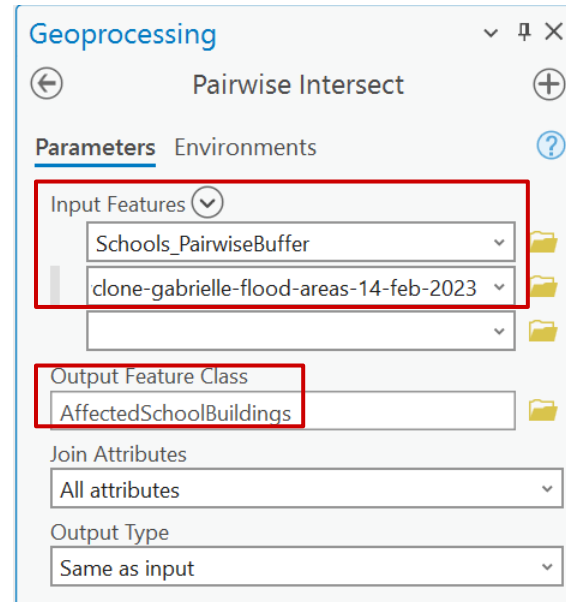
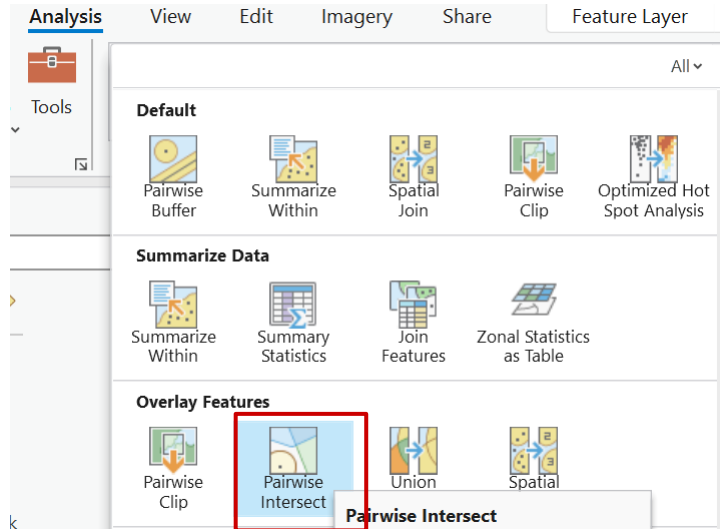
Dissolve Type
No Dissolve

Maximum Offset Deviation
0 Meters

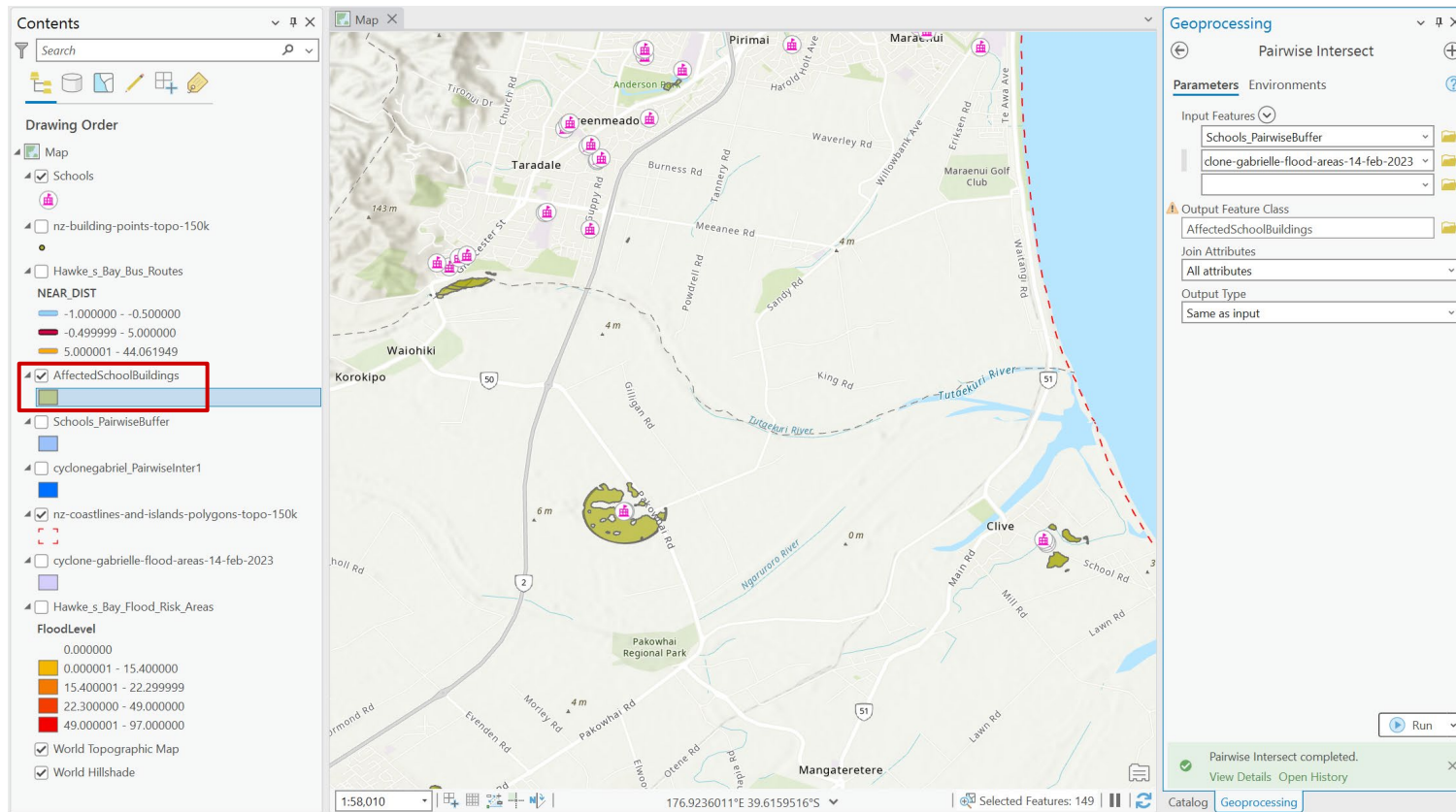
Run

Find out the area within 500m distance from school buildings that were affected by the flood

- Find the **Pairwise Intersect** tool under **Analysis**
- Enter the **Parameters** as shown at right
- Click **Run**

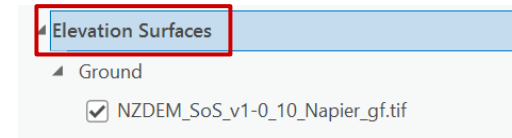
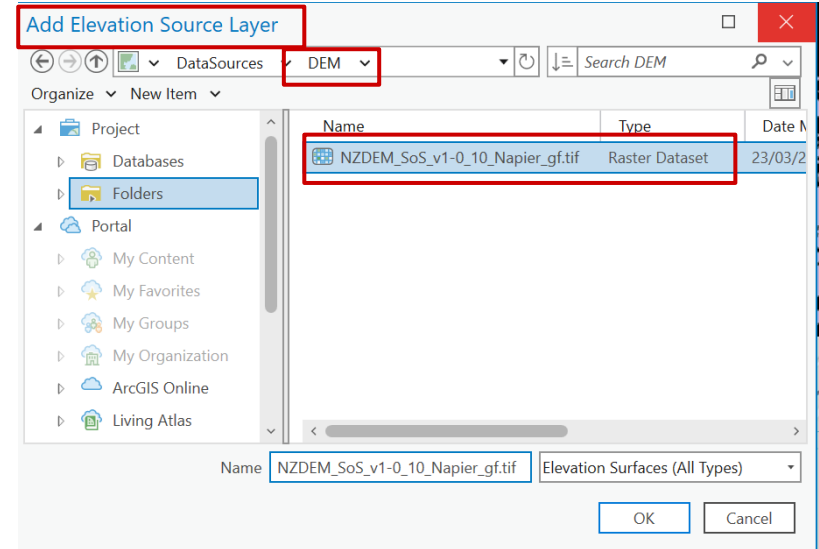
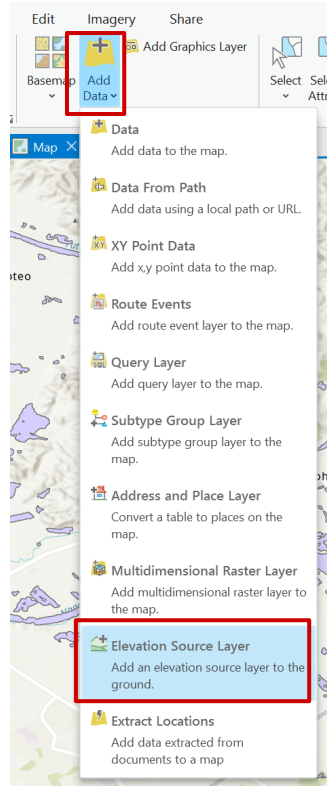


Outcome map of school buildings and the surrounding areas that affected by the flood

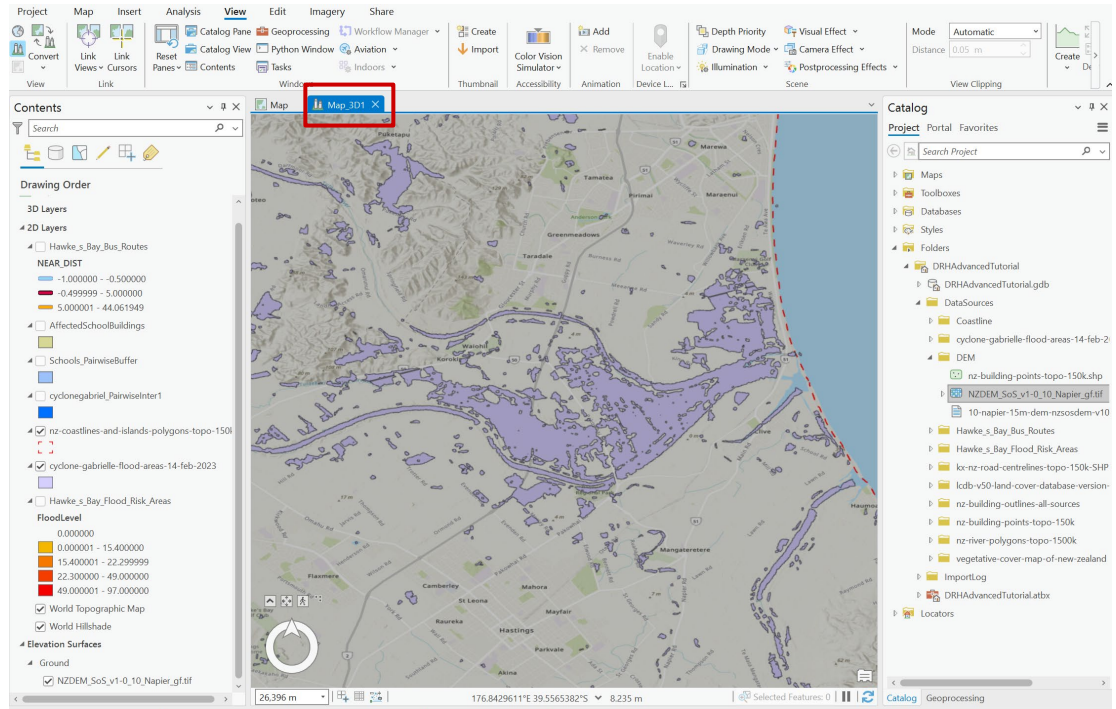
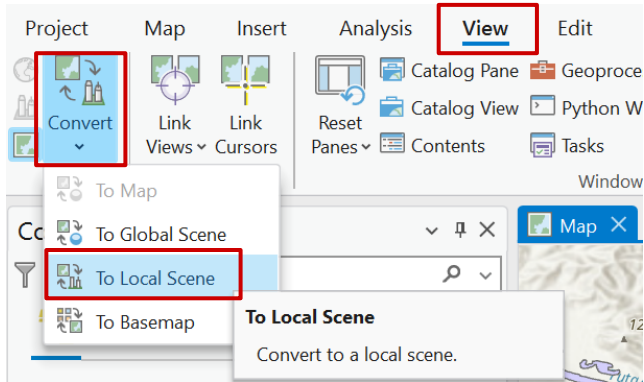


4. Create a 3D Map on Local Scene

- On the **Map** tab, click the **Add Data** arrow
- Click **Elevation Source Layer**
- On the Add Elevation Source Layer dialog box, browse to the elevation source – **DEM Folder** and click **OK**.
- The source is added to the ground.
- A new **Elevation Surfaces** layer will be created under Contents pane

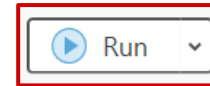
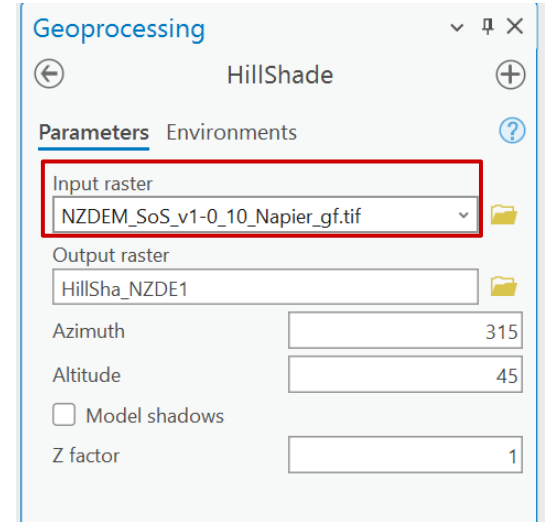
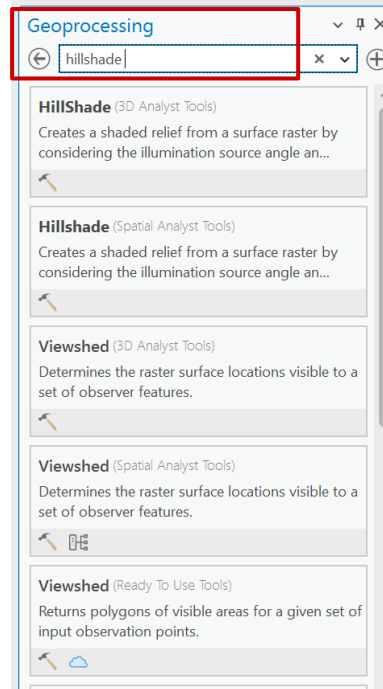
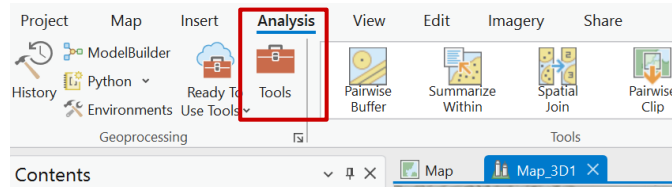


- Under the **View** tab, click the **Convert**
- Select **To Local Scene**
- A new **Map_3D** tab will be created

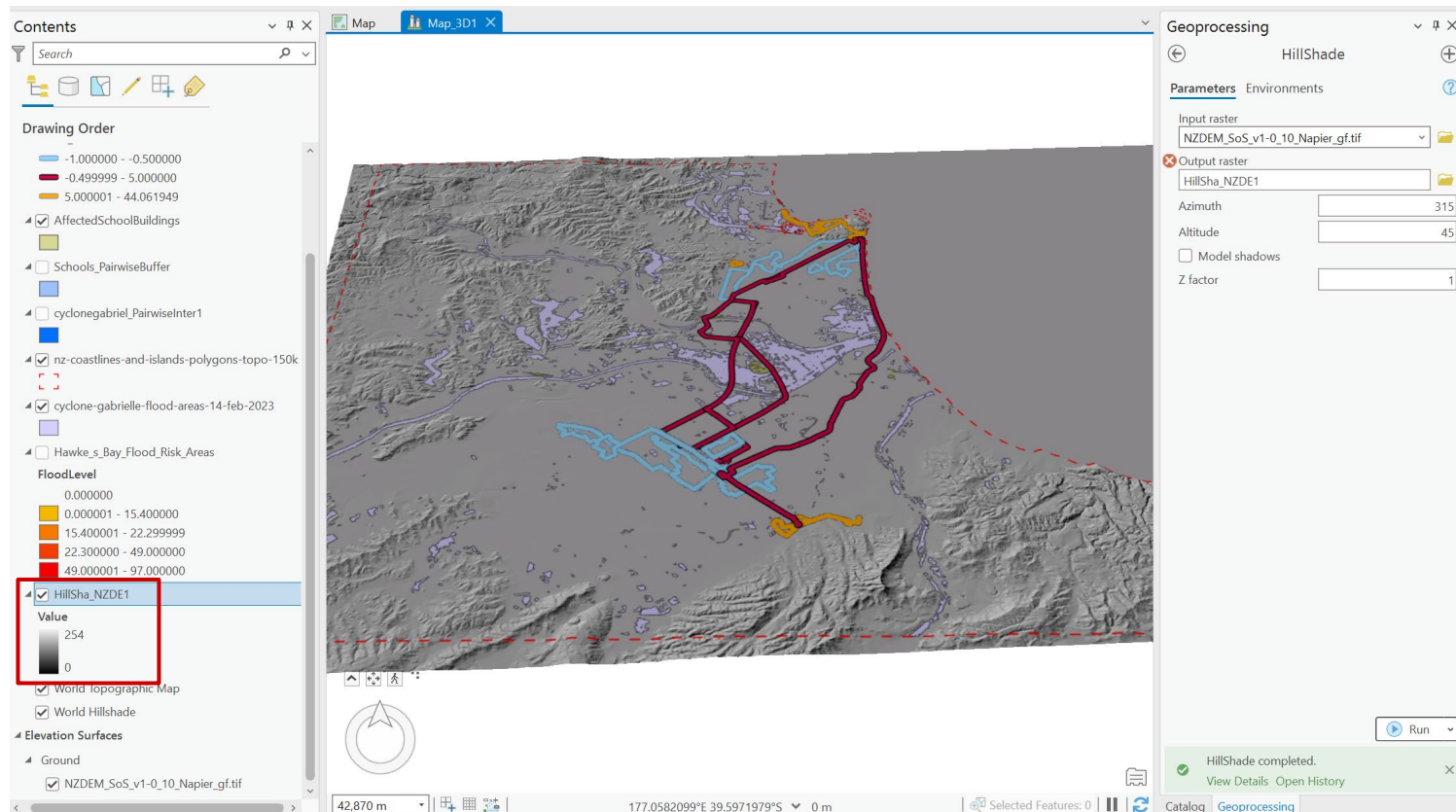


Generate 3D elements by using Analysis Tools

- In the **Map_3D** viewport
- Click **Analysis – Tools**
- Search **Hillshade** under Geoprocessing pane
- Select the **NZDEM Napier** data as Input raster
- Click **Run**



Outcome map of the 3D map



Helpdesk

Architecture Building Level 4, Room 423 (421-423).

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Opening Hours:

Mon-Fri: 9:30am-4:30pm

We do not open during public holiday

Appointments only during school breaks

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