



Landcare Research
Manaaki Whenua

Guidelines for Monitoring Land Fragmentation

Geo-Processing in Preparation for Calculating Metrics

Daniel Rutledge, Georgina Hart and Robbie Price
Landcare Research SLT Presentation

21 July 2014



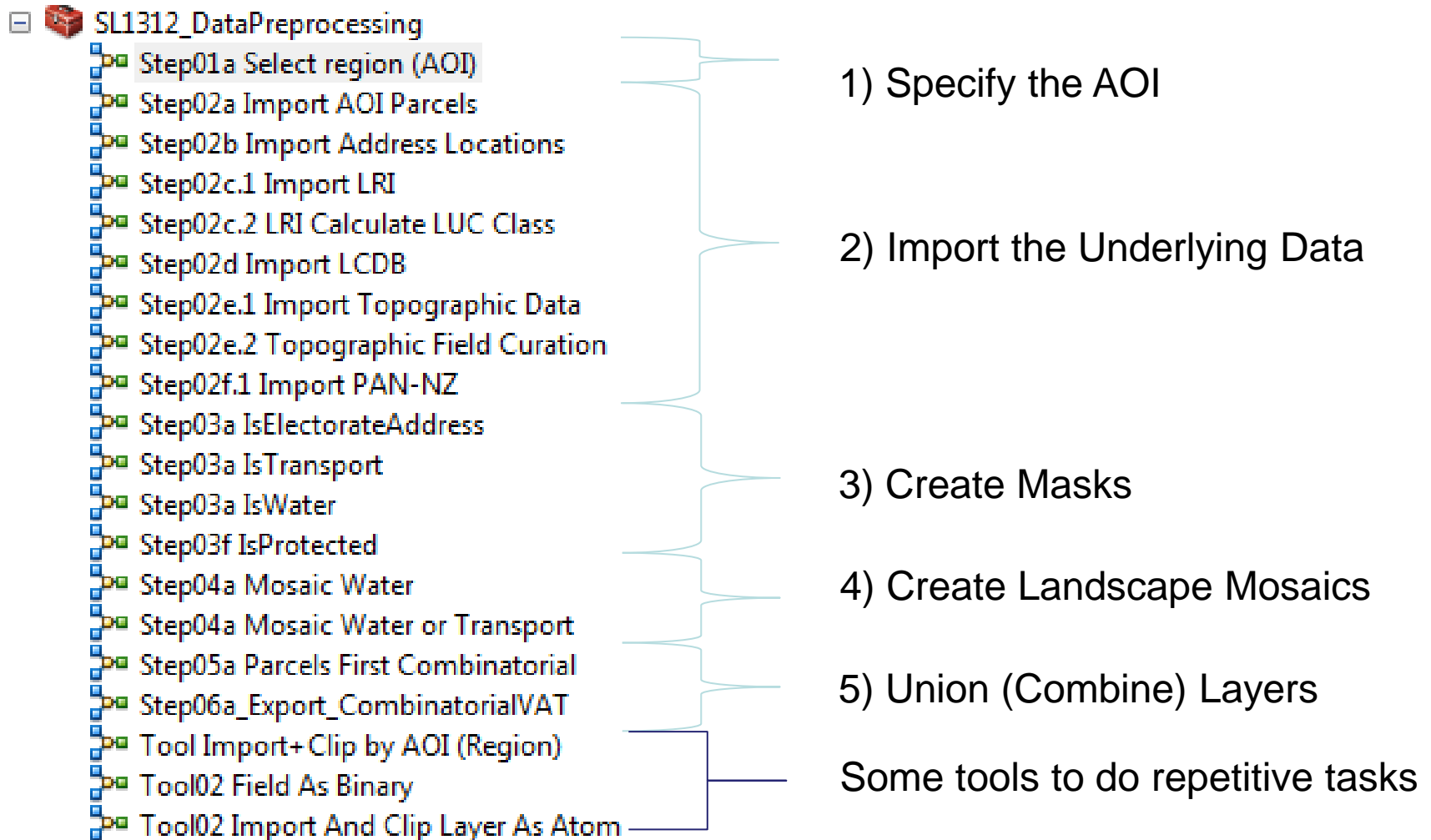
The GIS processing Steps

- Take the input layers and create a single layer to use for the metrics
- Underlying Data for Analysis
 - Parcels
 - LRI
 - LCDB
 - Topo Data
 - PAN-NZ (Protected Areas)
- Specify the AOI (one region)

Technologies

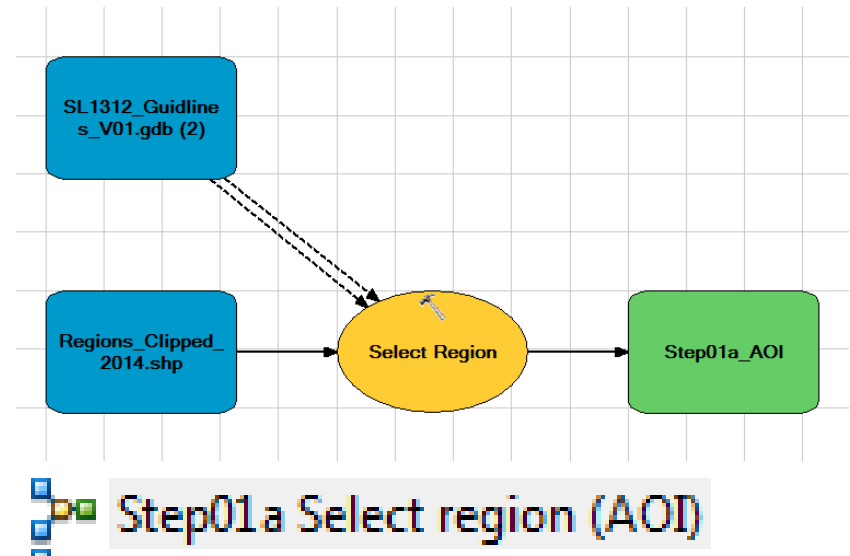
- **ArcGIS 10.2.1**
 - **ESRI File Geodatabase format**
 - **Model builder**
 - runs Python in background with ArcPy
- **Not Locked in: Other options**
 - Might be done in other commercial GIS packages
 - Spatial databases with SQL
 - <http://postgis.net>
 - GDAL + python
 - “R” statistical programming language (maybe)?

A series of models to run



1. Specify the AOI

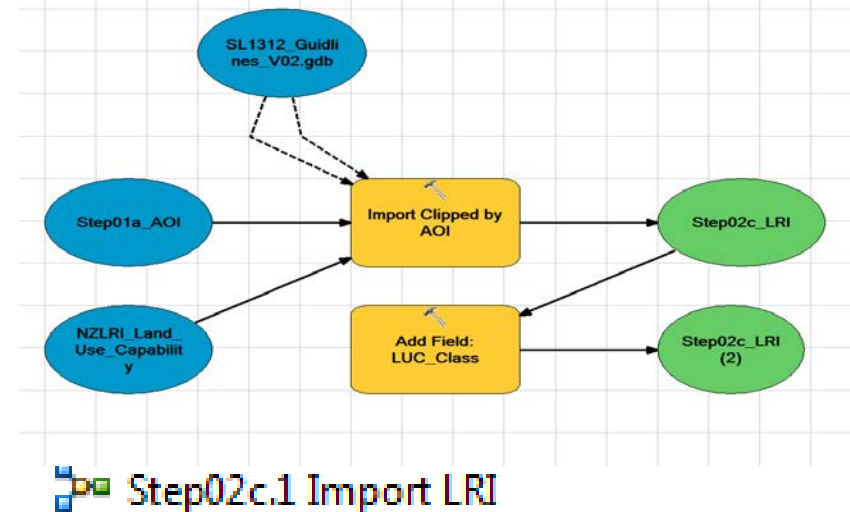
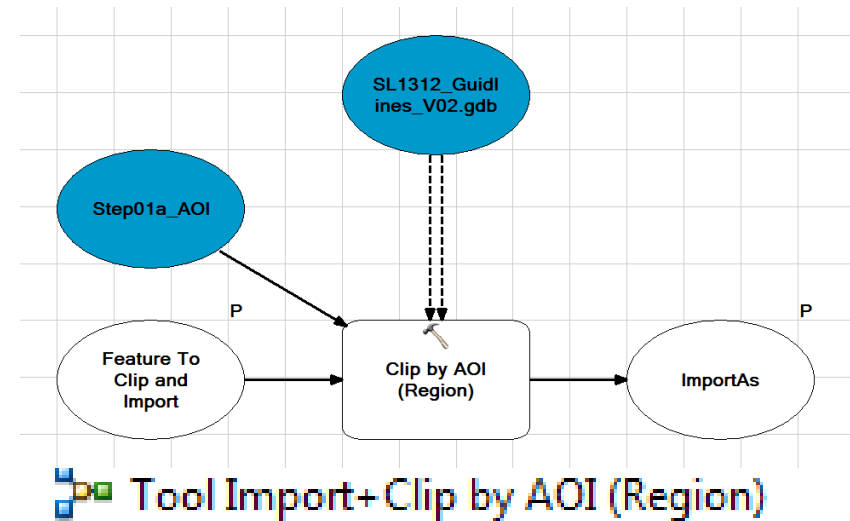
- Define the Area Of Interest
- Used for subsequent Imports



2.) Import the Underlying Data

- Parcels
- LRI
- LCDB
- PAN-NZ

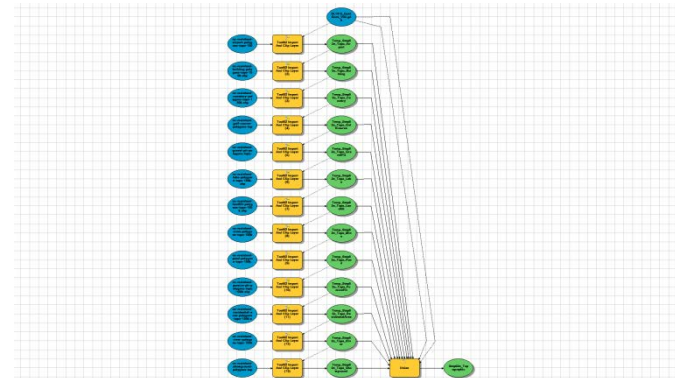
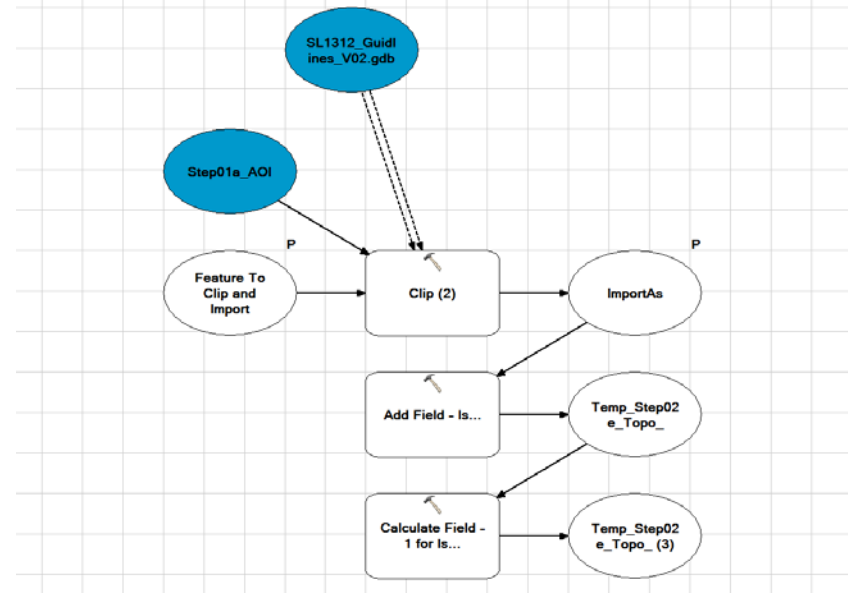
- ▶ Step02a Import AOI Parcels
- ▶ Step02b Import Address Locations
- ▶ Step02c.1 Import LRI
- ▶ Step02c.2 LRI Calculate LUC Class
- ▶ Step02d Import LCDB
- ▶ Step02e.1 Import Topographic Data
- ▶ Step02e.2 Topographic Field Curation
- ▶ Step02f.1 Import PAN-NZ



2.) Import the Underlying Data

- Topographic Data
 - Water
 - River
 - Lake
 - Pond
- Features/Uses of interest
 - Airport, Building, Cemetery, Golf Course, Gravel Pit, Landfill, Mine, Pumice Pit, Residential Area, Show-grounds
- Not entirely necessary, but reduces clutter...

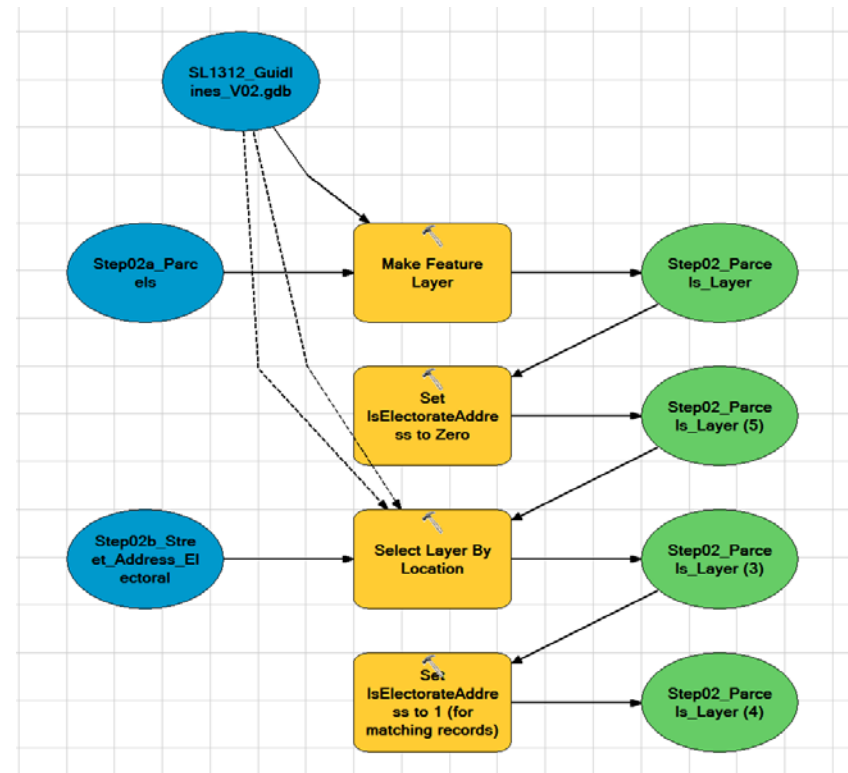
Tool02 Import And Clip Layer As Atom



3. Create Masks

- Is Electoral Address
 - Tied to parcel boundaries
 - Process inside the Parcel layer
 - Flags (with 1) any parcel that contains an electoral address

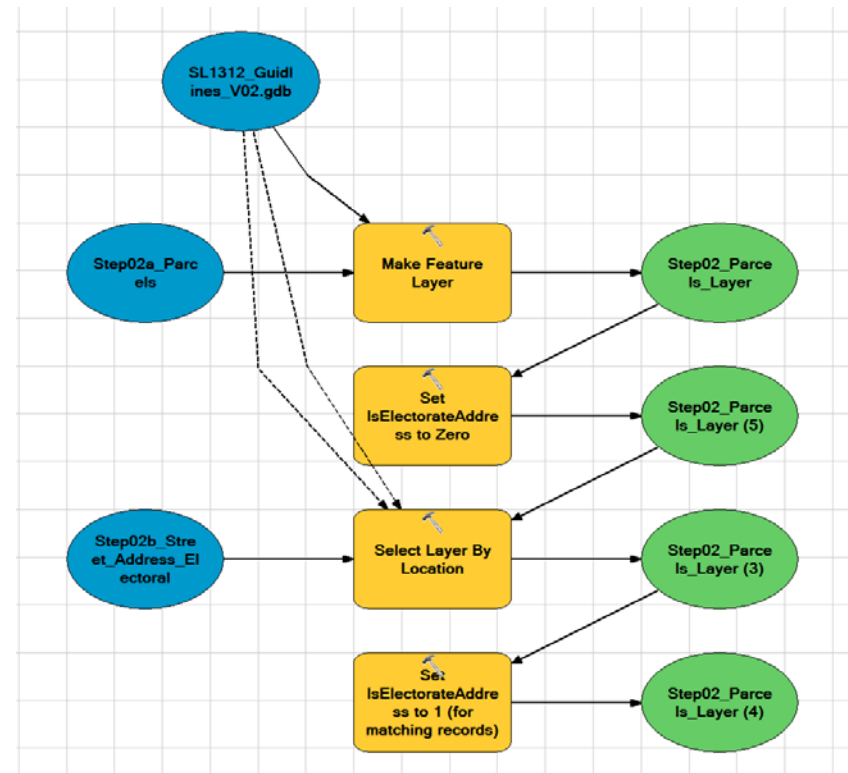
- ▶ Step03a IsElectorateAddress
- ▶ Step03a IsTransport
- ▶ Step03a IsWater
- ▶ Step03f IsProtected



3. Create Masks

Is Electorate Address

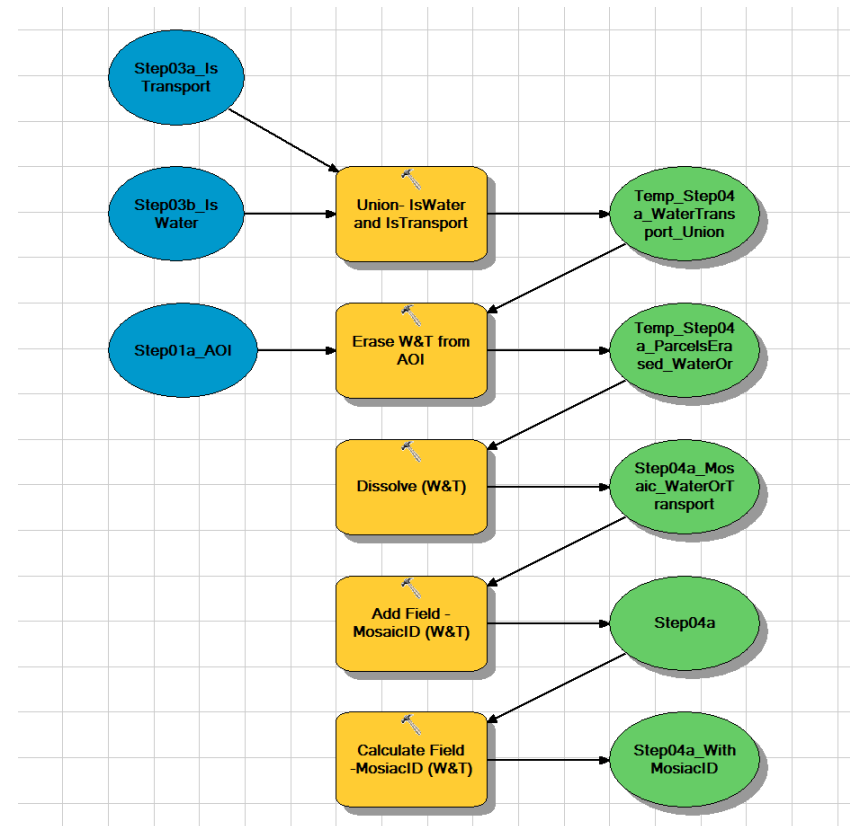
- Based on parcel boundaries
- Flags each Parcel 1/0
- Used to determine if probably a residential address
- Best indicator we could determine
 - not perfect



Step03a IsElectorateAddress

Landscape Mosaic

- Think City Blocks
- Removes corridors to create a tiled AOI
- Give each Tile a Unique Id
- Used for generating Zone level statistics

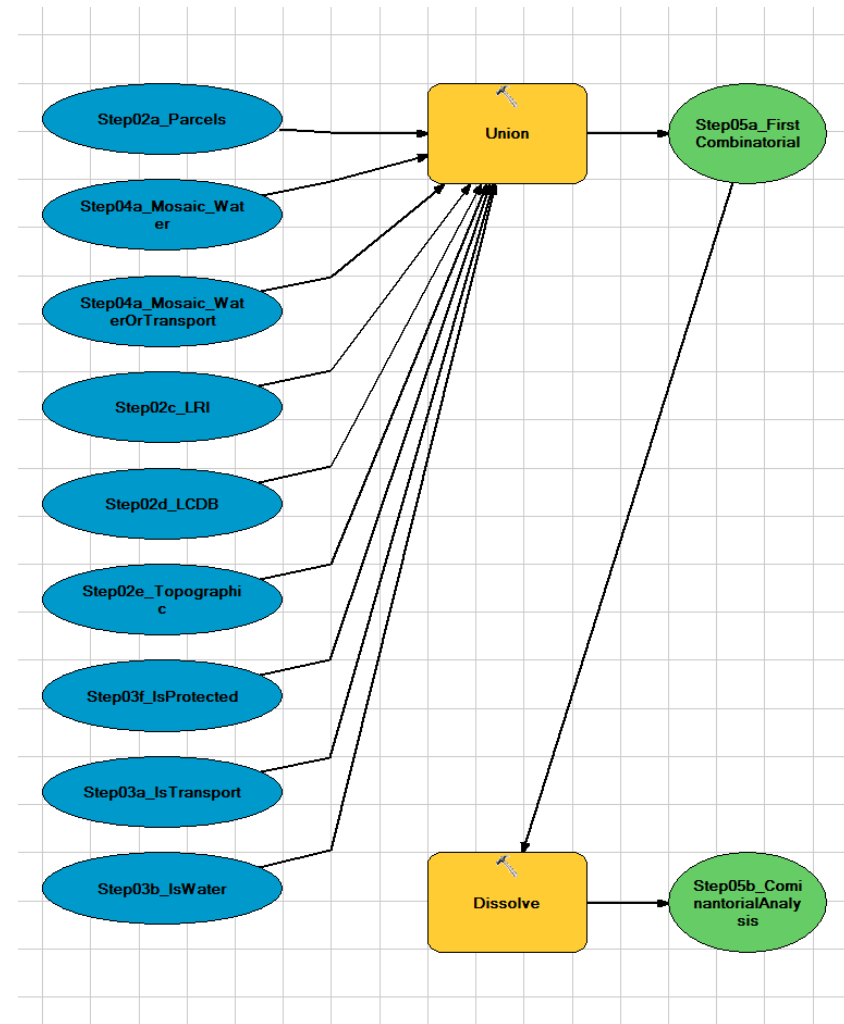


- Step04a Mosaic Water
- Step04a Mosaic Water or Transport

5. Union (Combine) Layers

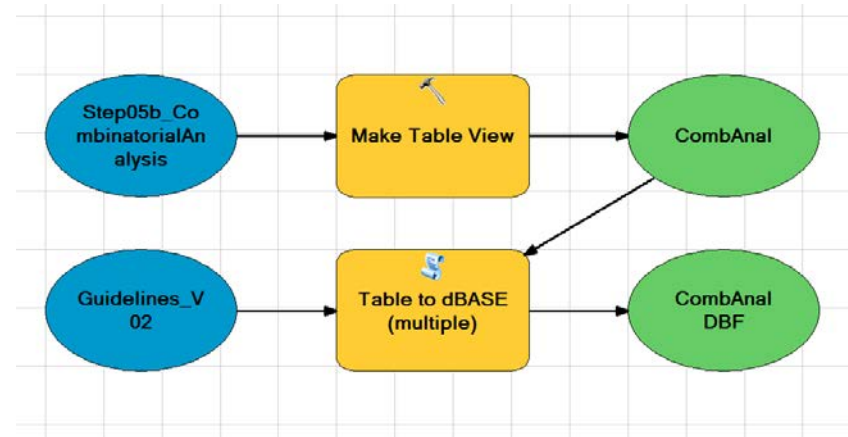
- Each spatially distinct set of unique attributes becomes a polygon
- All possible a-spatial questions on the combination of input layers can be asked
- Can now process in a wider range of tools

 Step05a Parcels First Combinatorial

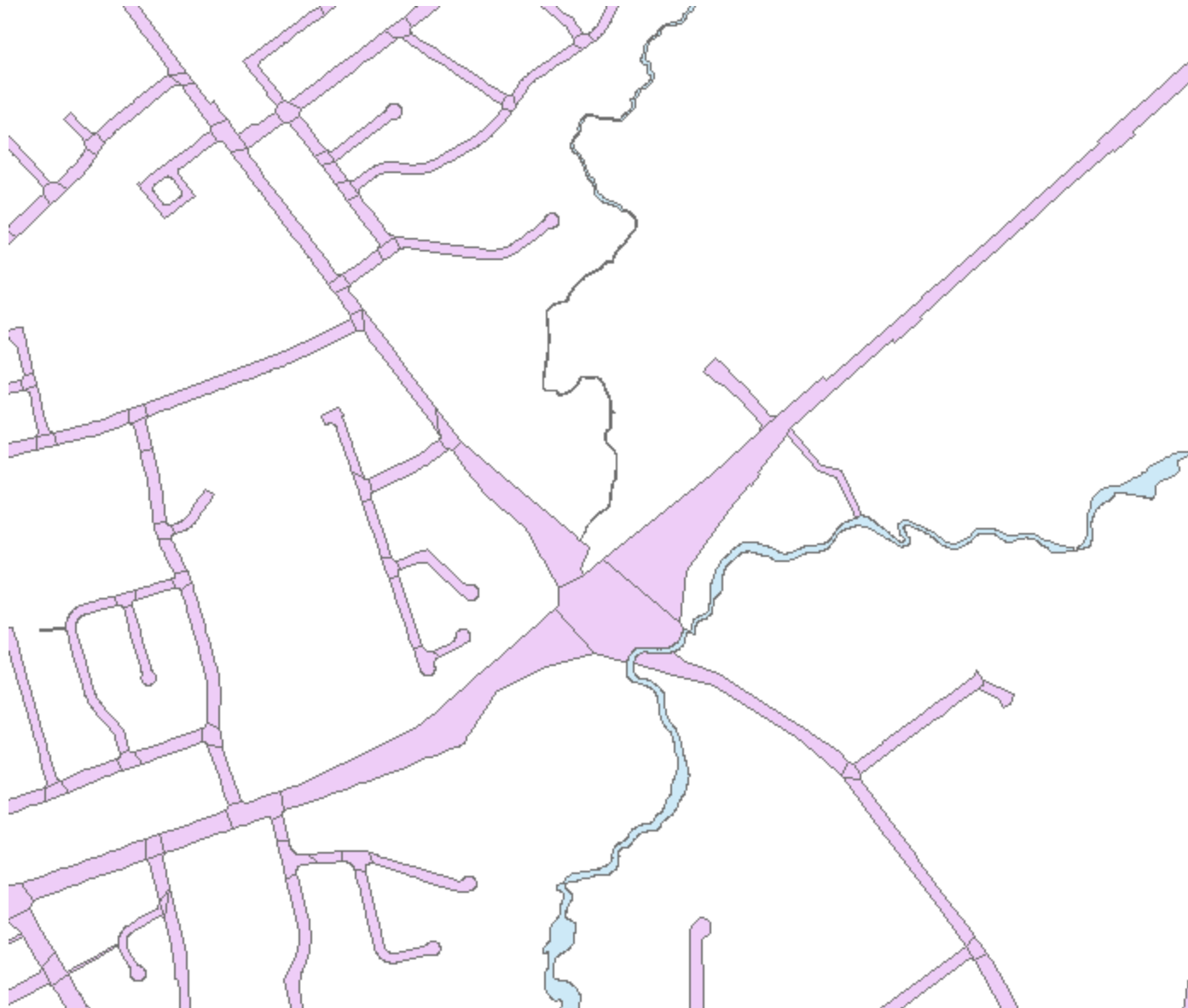


6. Export Result

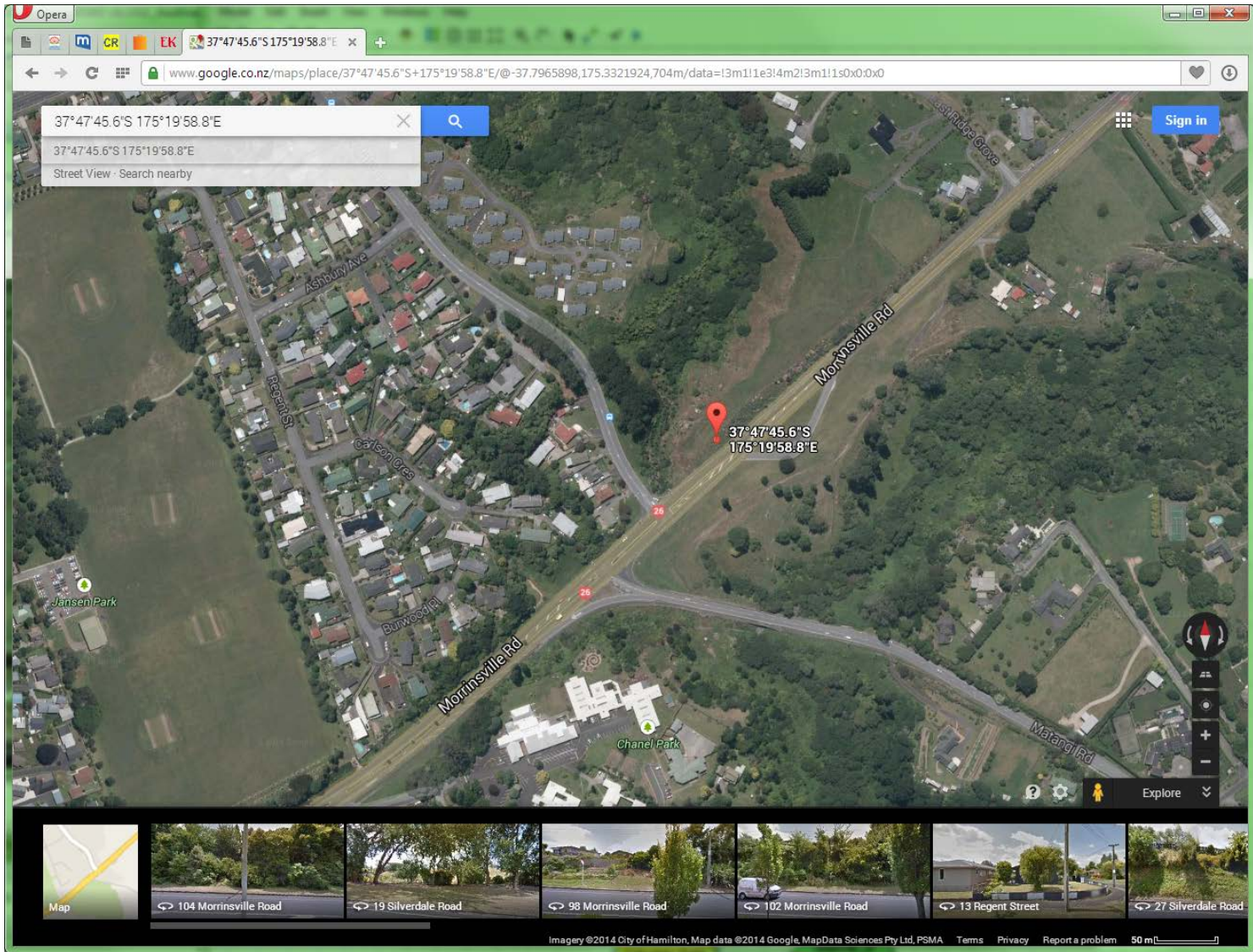
- Export the attribute table to a format useable in whatever stats package will be used to calculate metrics
- Check all rows are exported (manually)



 Step06a_Export_CombinatorialVAT



Checking IsWater



Checking IsWater