CDEMA CARIBBEAN DISASTER EMERGENCY MANAGEMENT AGENCY
Resilient States · Safer Lives

MAP ACTION

October 2023 - Saint Kitts and Nevis

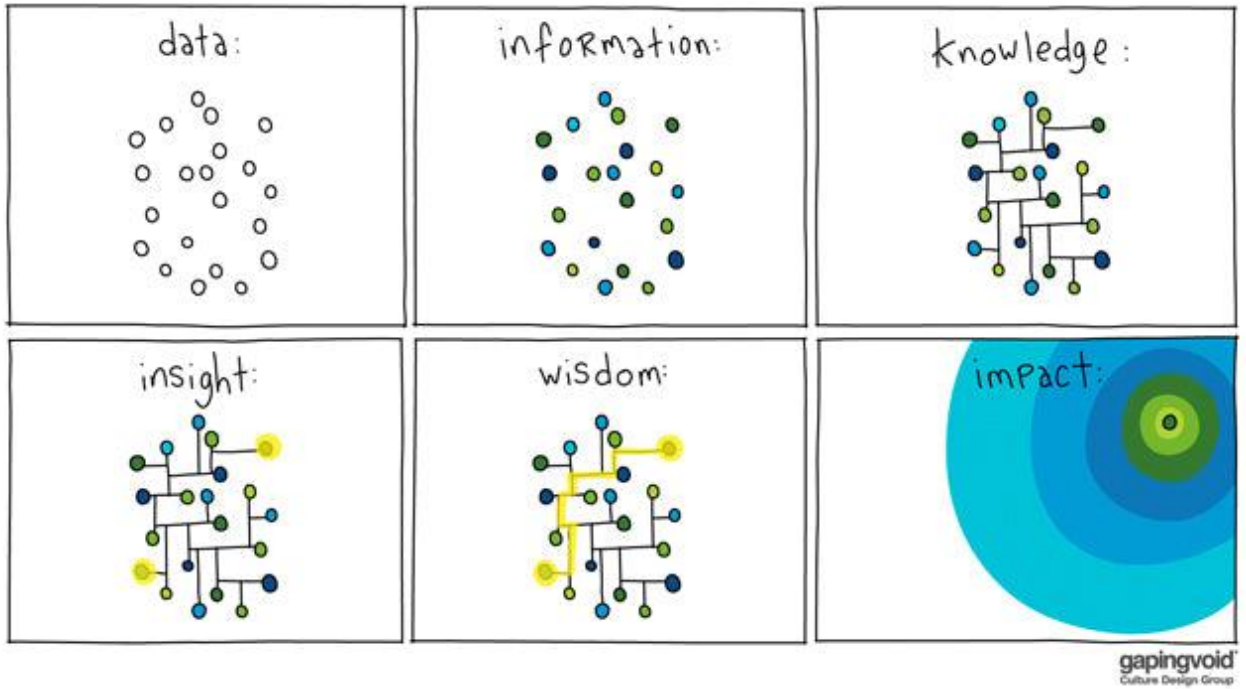
Geospatial processing and analysis

USAID FROM THE AMERICAN PEOPLE

Natural Disaster Facility in the CARIFORUM Programme
Building Resilience in the Caribbean

What's this about?

- So far, we have only really seen the visualisation of data.
- But data can also be processed and analysed.
- Data alone can tell part of the story, but through processing and analysis, it is possible to create actual insights that answer questions that aid decision making.

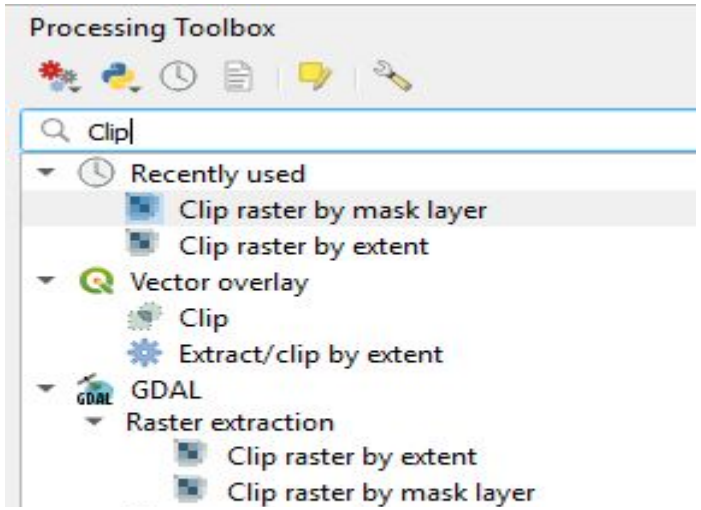


Geospatial Processing

- Processing tools allow us to interact with the data and create new datasets on the basis of the initial input.
- There are many processing tools. Some of the most common (note that some are only for vector or raster layers):
  - **Union** - to merge datasets together
  - **Clip** - to extract a zone in a dataset on the basis of an area in another dataset
  - **Intersect** - extracts the overlay between two datasets
  - **Buffer** - applies a buffer of a certain distance to a vector layer, making the area of the layer larger
  - **Zonal Statistics** - calculates a set of statistics for each zone of a polygon layer on the basis of the intersecting area of a raster layer

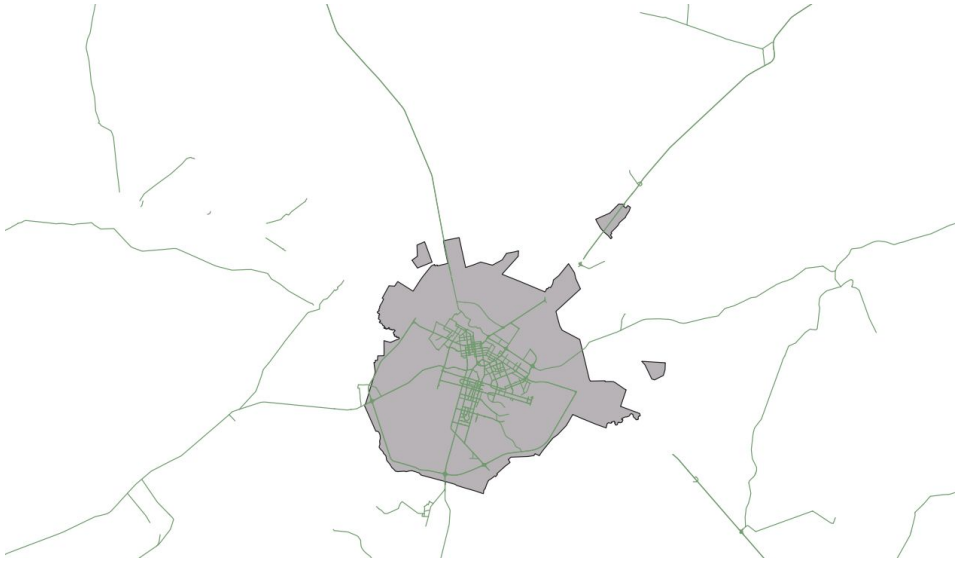
Some processing tools: Clip

- Clip is useful for reducing the spatial extent of a dataset to within a defined boundary
- This can make map presentation better and also reduced file size



Some processing tools: Clip

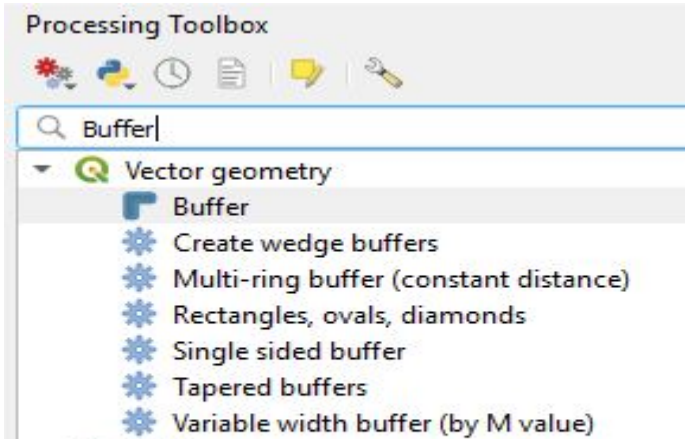
Main roads before clip



Main roads after they are clipped to the administrative boundary

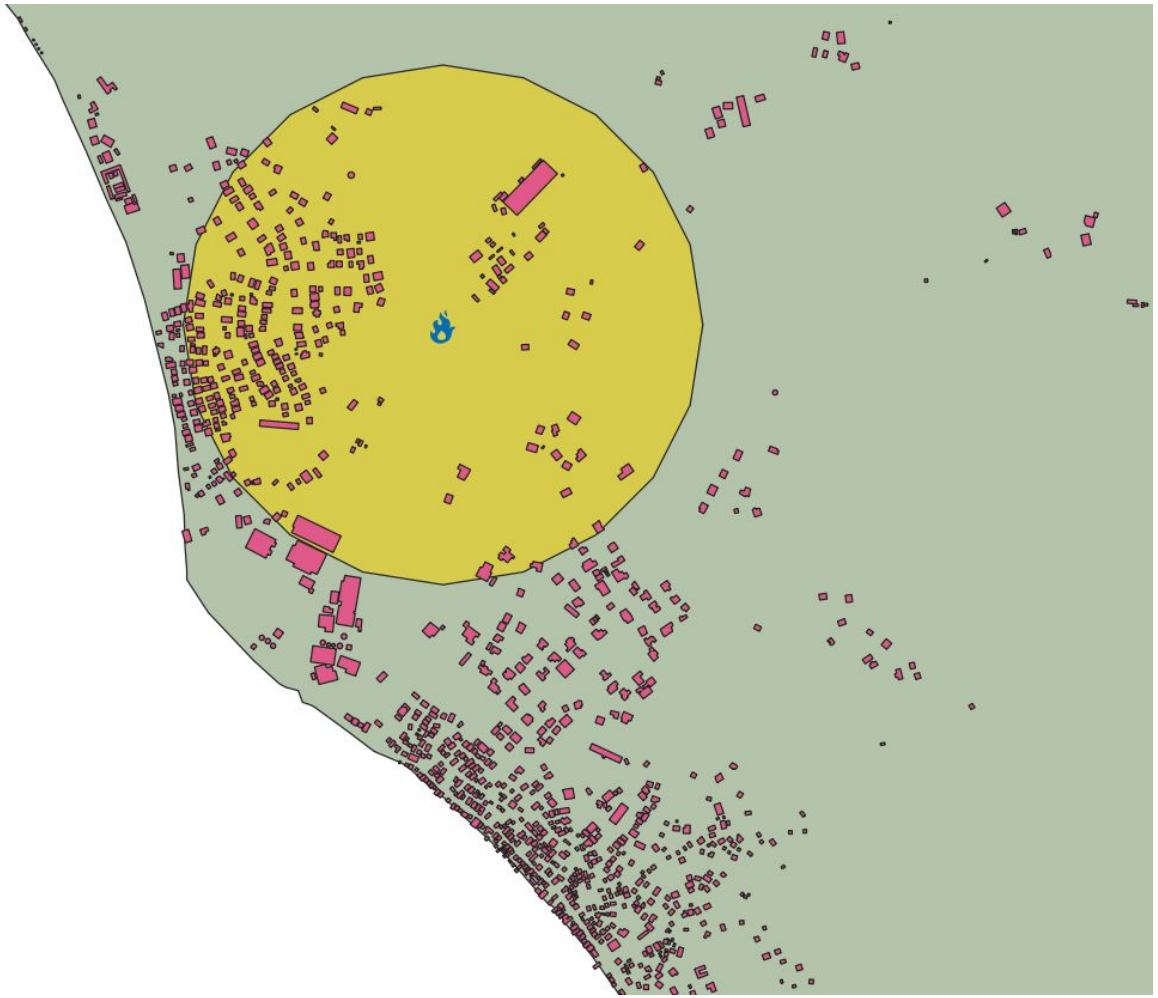
Some processing tools: Buffer

- The buffer tool draws a defined area of a given distance around a feature
- This might be useful for identifying:
  - Population or infrastructure at risk from an incident
  - Simple assessment of who has access to facilities



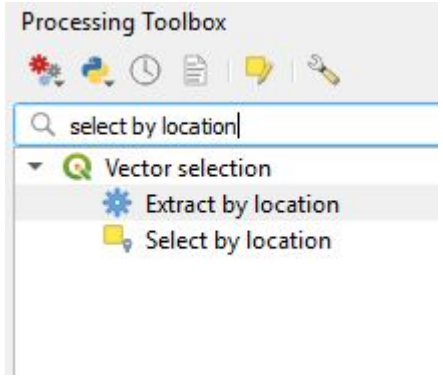
Some processing tools: Buffer

500m buffer around the location of a fire



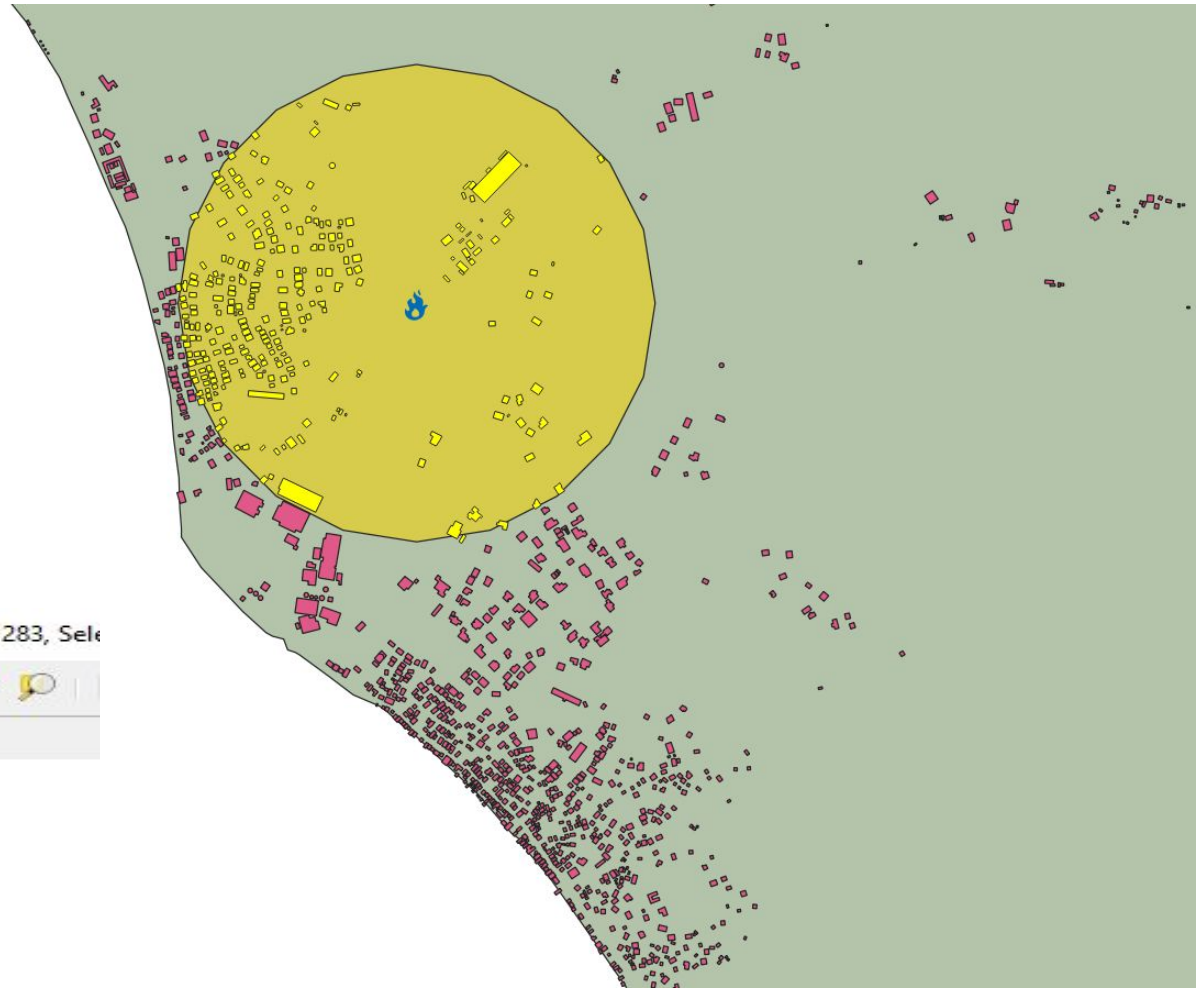
Some processing tools: Select by Location

- Select by Location identifies features relative to features in another layer
- This is useful for quantifying or identifying population or services within a particular administrative area or within zones of risk such as those identified by a buffer



Some processing tools: Select by Location

283 buildings found to be within the 500m buffer around the fire location



dma_bldg_bdg_py_s0_osm_pp_buildings :: Features Total: 38700, Filtered: 283, Sele

	osm_id	name	fclass
1	128290893	NULL	industrial
2	142344539	NULL	NULL
3	199488667	NULL	NULL
4	199488671	NULL	NULL

Geospatial Analysis

Geospatial analysis starts with a **research question**, for example:

- How many people live in areas of high landslide susceptibility?
- Where can I build an evacuation centre, considering it needs to be accessible by large vehicles and the population, and on a flat surface that is not at risk of flooding or landslides?
- What is the shortest path to a destination, considering the access constraints?
- What settlements are most likely to be isolated if the road network is impacted?
- Where and when is crime most likely to occur?
- Are pollution values in this area statistically significantly higher than neighboring areas?

Starting from the research question, getting to an analytical product that answers often involved **passing through several processing stages.**

This programme is gratefully supported by

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