

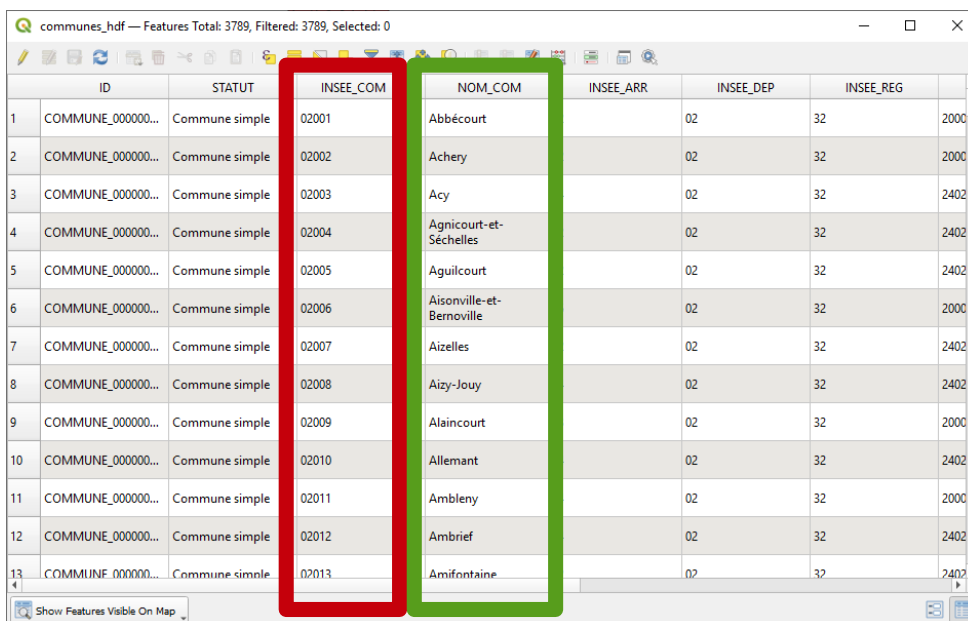
Mobility areas

Methodology

Mobility areas are drawn up on the basis of data on flows between origins and destinations. These data can come, for example, from home-work or home-study data from the population census, household travel surveys or other data sources such as mobile trace data (FCD, FMD)

For a rendering through a cartographic visualization, an animation or videos, it is necessary to have a layer of geographical objects corresponding to the zones (origins and destinations of flows) and to have a common zone/origin/destination identifier in the two data sources.

The strongest link in % of flows between two zones is recursively taken from the set of flows. The area of origin is aggregated with the pole area and forms a pool. Migration between zones or areas is then updated and the process is repeated until only one area remains.



The screenshot shows a QGIS window titled 'communes_hdf' with a table view of 13 rows. The columns are: ID, STATUT, INSEE_COM, NOM_COM, INSEE_ARR, INSEE_DEP, INSEE_REG, and an unlabeled column with values like 2000, 2402. The 'INSEE_COM' column is highlighted with a red box, and the 'NOM_COM' column is highlighted with a green box. The data rows show various communes such as Abbécourt, Achery, Acy, Agnicourt-et-Séchelles, Aguilcourt, Aisonville-et-Bernoville, Aizelles, Aizy-Jouy, Alaincourt, Allemant, Ambleny, Ambrief, and Amifontaine.

ID	STATUT	INSEE_COM	NOM_COM	INSEE_ARR	INSEE_DEP	INSEE_REG	
1	Commune simple	02001	Abbécourt		02	32	2000
2	Commune simple	02002	Achery		02	32	2000
3	Commune simple	02003	Acy		02	32	2402
4	Commune simple	02004	Agnicourt-et-Séchelles		02	32	2402
5	Commune simple	02005	Aguilcourt		02	32	2402
6	Commune simple	02006	Aisonville-et-Bernoville		02	32	2000
7	Commune simple	02007	Aizelles		02	32	2402
8	Commune simple	02008	Aizy-Jouy		02	32	2402
9	Commune simple	02009	Alaincourt		02	32	2000
10	Commune simple	02010	Allemant		02	32	2402
11	Commune simple	02011	Ambleny		02	32	2000
12	Commune simple	02012	Ambrief		02	32	2402
13	Commune simple	02013	Amifontaine		02	32	2402

INSEE_COM : zone Id

NOM_COM : zone label

FD_MOBPRO_2017_HDF — Features Total: 42...

	COMMUNE	DCLT	IPONDI	
128888	59350	59009	4,5958396049373	ZZZ
128889	59350	59009	3,7532271982963	ZZZ
128890	59350	59009	3,3359731205273	ZZZ
128891	59350	59009	3,4435878600769	ZZZ
128892	59350	59009	3,63029514739	ZZZ
128893	59350	59009	1,0829849954672	ZZZ
128894	59350	59009	4,3779044806577	ZZZ
128895	59350	59009	1,065112988909	ZZZ
128896	59350	59009	1,2989410287496	ZZZ
128897	59350	59009	3,3814316137765	ZZZ
128898	59350	59009	4,3098650083190	ZZZ
128899	59350	59009	0,96197725026158	ZZZ
128900	59350	59009	3,3941462721210	ZZZ

Show All Features

COMMUNE : origin

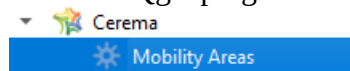
DCLT : destination

IPONDI : value (number of trips)

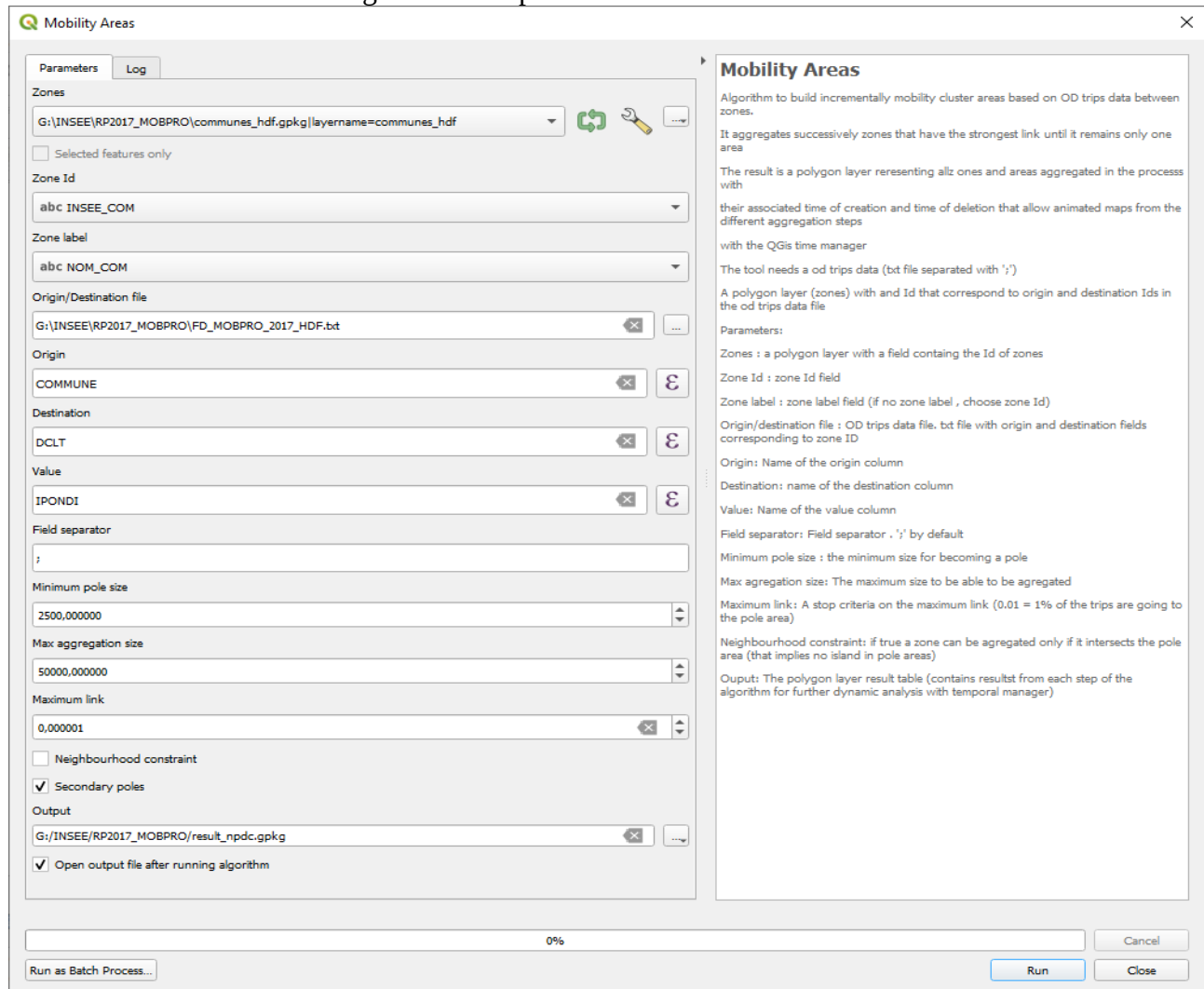
The zone identifier in the zone table (Communes HDF) corresponds to the zone identifiers of the origins and destinations in the flows table (FD_MOBPRO_2017_HDF)

Calculation of mobility areas

Once the Qgis plugin is installed, it appears in the processing box as below



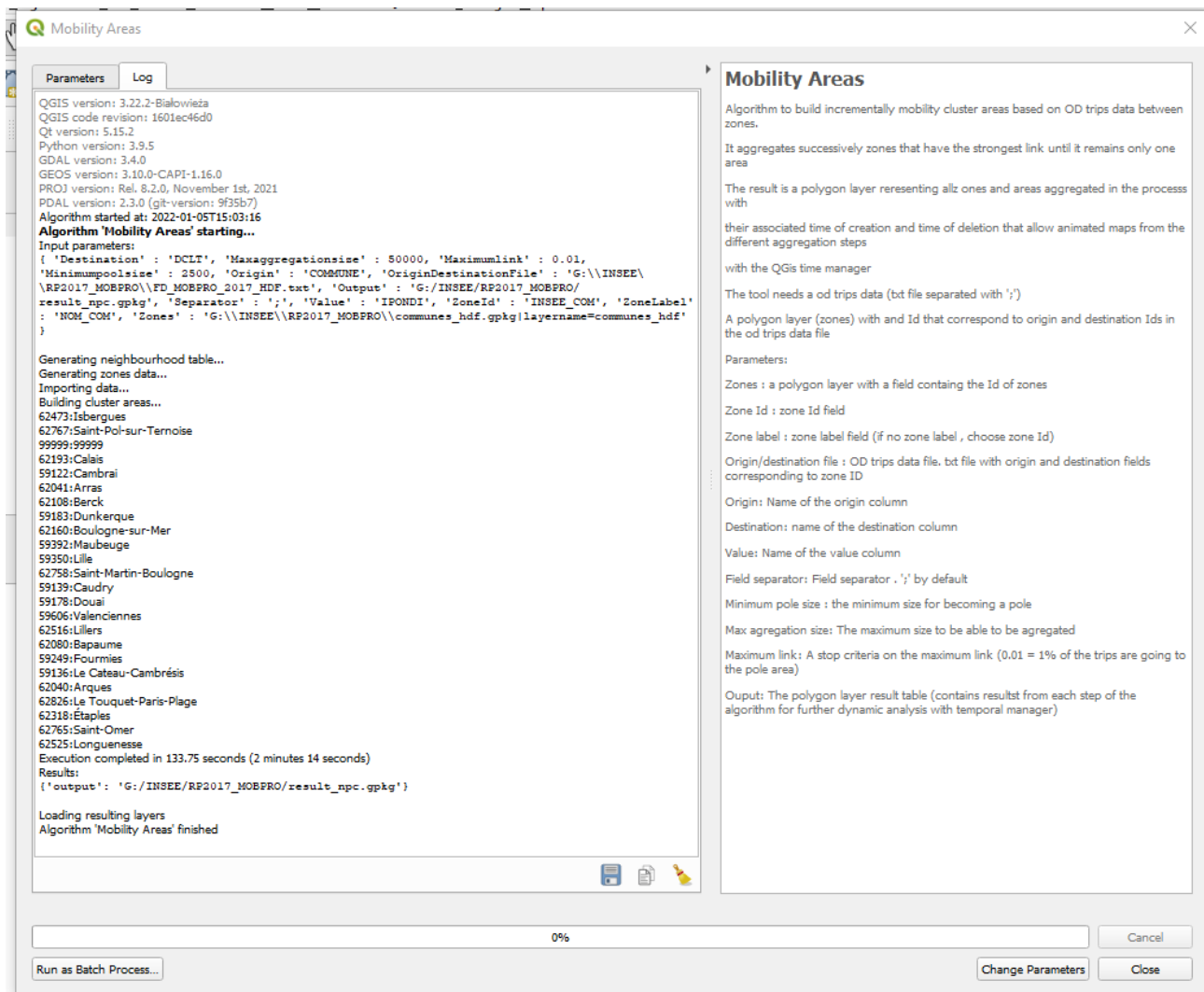
With the above data the setting is for example

A screenshot of the 'Mobility Areas' processing tool dialog box in QGIS. The dialog has a 'Parameters' tab and a 'Log' tab. The 'Parameters' tab is active, showing various input fields and checkboxes. The 'Zones' field is set to 'G:\INSEE\RP2017_MOBPRO\communes_hdf.gpkg|layername=communes_hdf'. The 'Zone Id' field is set to 'abc INSEE_COM'. The 'Zone label' field is set to 'abc NOM_COM'. The 'Origin/Destination file' field is set to 'G:\INSEE\RP2017_MOBPRO\FD_MOBPRO_2017_HDF.bt'. The 'Origin' field is set to 'COMMUNE'. The 'Destination' field is set to 'DCLT'. The 'Value' field is set to 'IPONDI'. The 'Field separator' field is set to ';'. The 'Minimum pole size' field is set to '2500,000000'. The 'Max aggregation size' field is set to '50000,000000'. The 'Maximum link' field is set to '0,000001'. The 'Neighbourhood constraint' checkbox is unchecked. The 'Secondary poles' checkbox is checked. The 'Output' field is set to 'G:\INSEE\RP2017_MOBPRO\result_npd.c.gpkg'. The 'Open output file after running algorithm' checkbox is checked. The 'Log' tab is empty. The 'Run' button is highlighted. The 'Cancel' and 'Close' buttons are also visible. The progress bar at the bottom shows 0%.

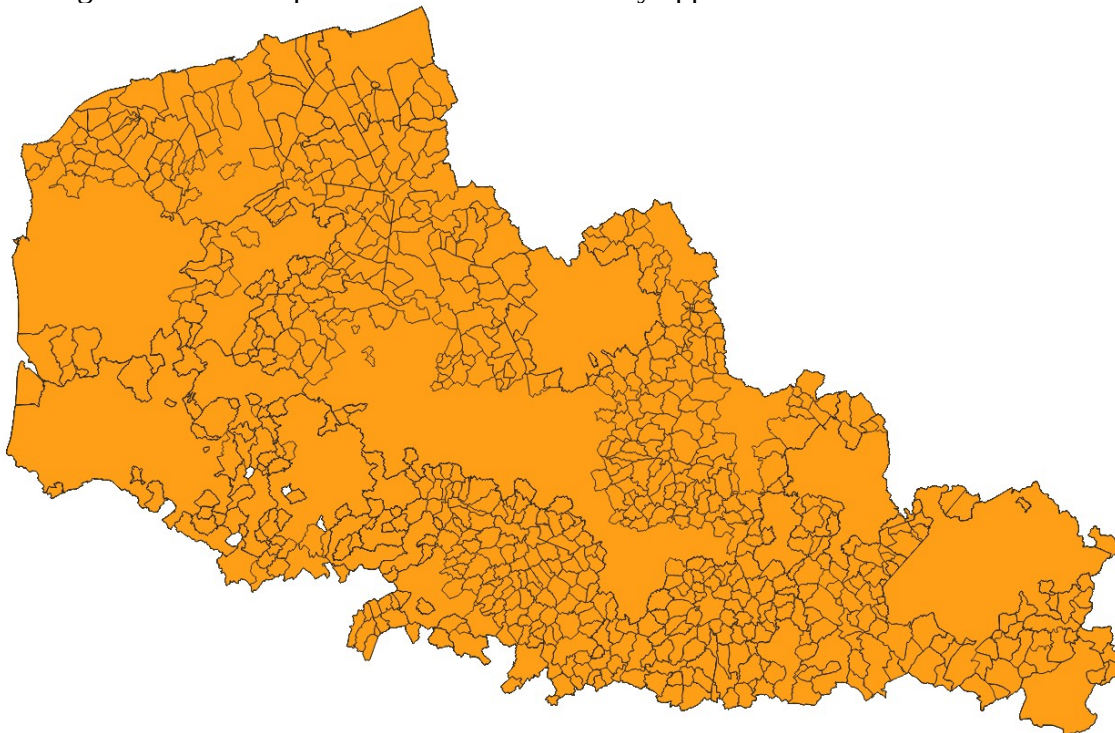
To be a cluster, an area must have more than 2,500 trips or migrations and if the cluster is greater than 50,000 it cannot be aggregated with another cluster in subsequent stages.

When the neighbourhood constraint is checked, in order to be aggregated, zones must intersect geographically the pole area.

Activating secondary poles enables to let appearing smaller poles that could be masked by the main attracting poles for a second level analysis.

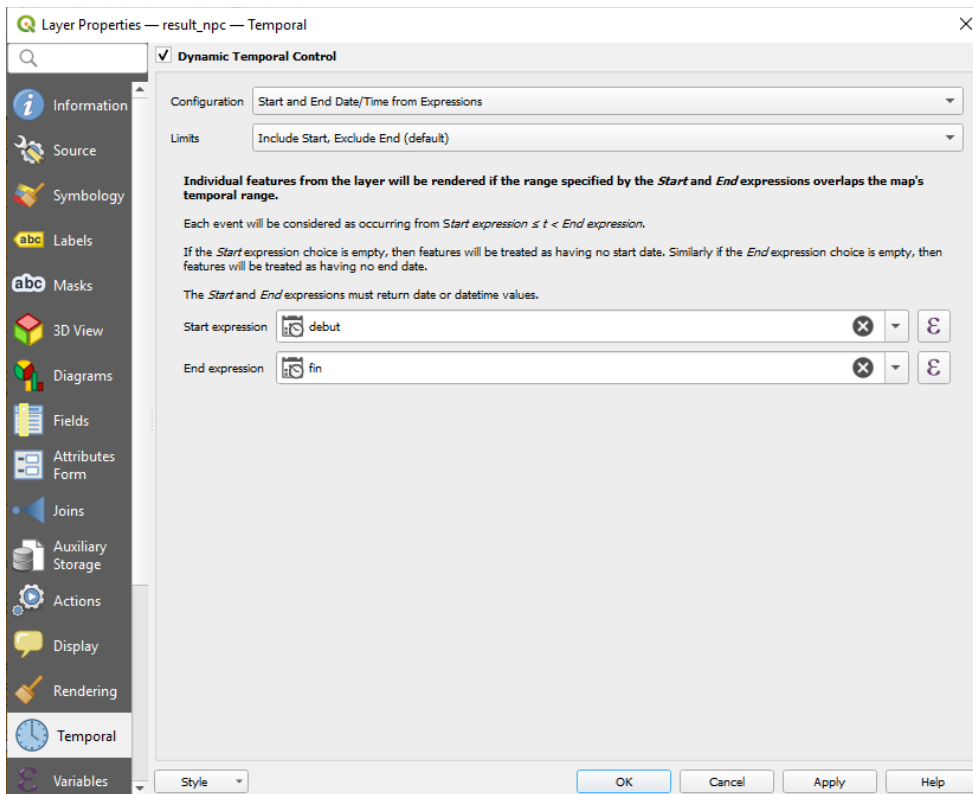


The algorithm lists the poles that have successively appeared and loads the result table

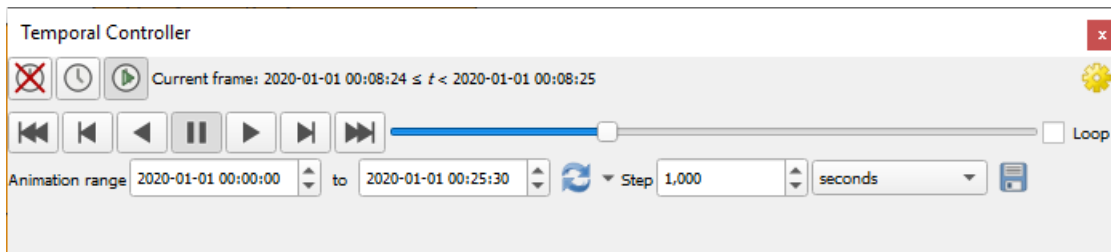


Making the animated map

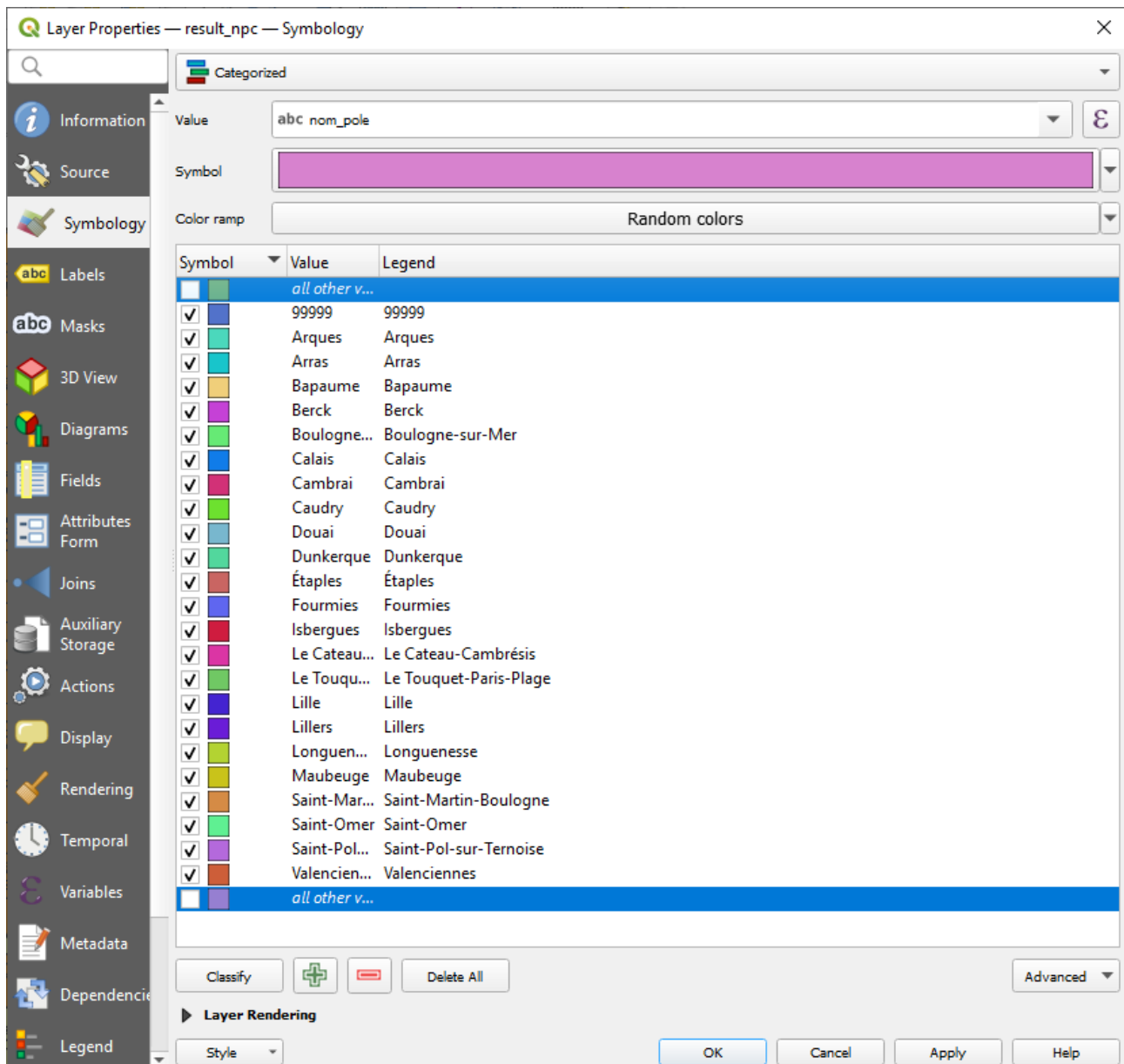
The result layer must first be set up: :



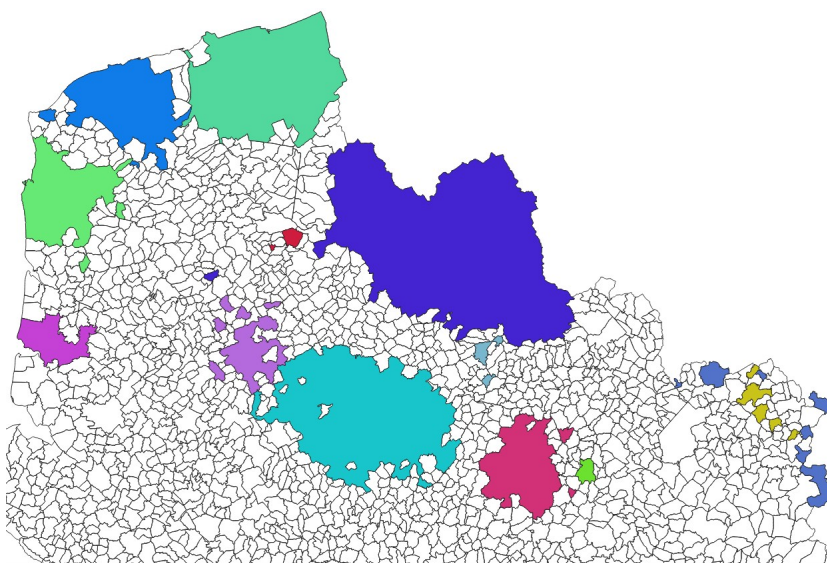
Then set the time controller with a step of 1s on the result layer



You can then perform a categorized thematic analysis on the column "city_name" and deactivate the values without labels



With the time controller, we can see the generation of mobility pools as a function of steps (seconds in the time controller)



The labels can then be set up to display the names of the pools and the percentage of autonomy, for example, by defining labels based on rules

Edit Rule

Description:

☒ Filter:

☐ Else: Catch-all for other features

☐ Scale Range

Minimum (exclusive): Maximum (inclusive):

☒ Labels

Value:

Text Sample

Lorem Ipsum

Lorem Ipsum

abc Text

+ab Formatting

abc Buffer

abc Mask

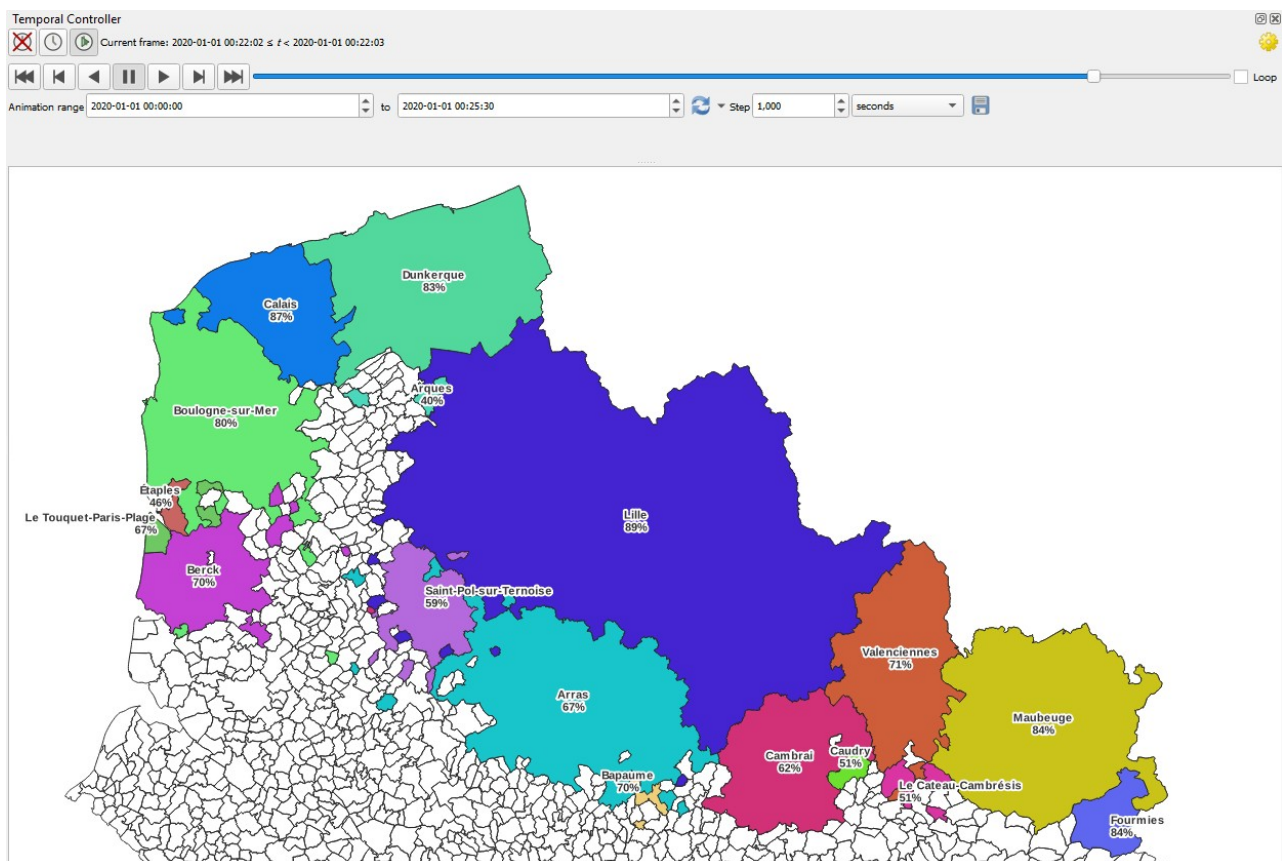
Background

Text

Font:

Style:

And the result below in animated map



Generating a video

To generate a video there are several solutions.

The principle is to export a frame of each step from the time controller and then from an external tool to assemble each frame to make a video, for example with the open source tool ffmpeg

To do this, you just need to use the export of the animation from the time controller. The images will be called commuters_0001.png, commuters_0002.png, ...

Export Map Animation

Template: commuters_###.png

Output directory: G:\Etudes\mira\Grand-Est\EPCI_externe\animation

Map Settings

▼ Extent (current: map view)

North: 7113909,4949

West: 573586,4544 East: 809467,9412

South: 6982294,4624

Calculate from Layer Map Canvas Extent Draw on Canvas

Output width: 1242 px

Output height: 693 px

☒ Draw active decorations: none

Temporal Settings

Range: 2020-01-01 00:00:00 to 2020-01-01 00:25:30

Step (frame length): 1,000 seconds

Save Cancel Help

Example of a command with ffmpeg to combine the images into a video "mobility_areas.mp4"

```
ffmpeg -r 1 -i b commuters_%04d.png -vcodec mpeg4 -y mobility_areas_hdf.mp4
```