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Web Service using GeoPackage (I)

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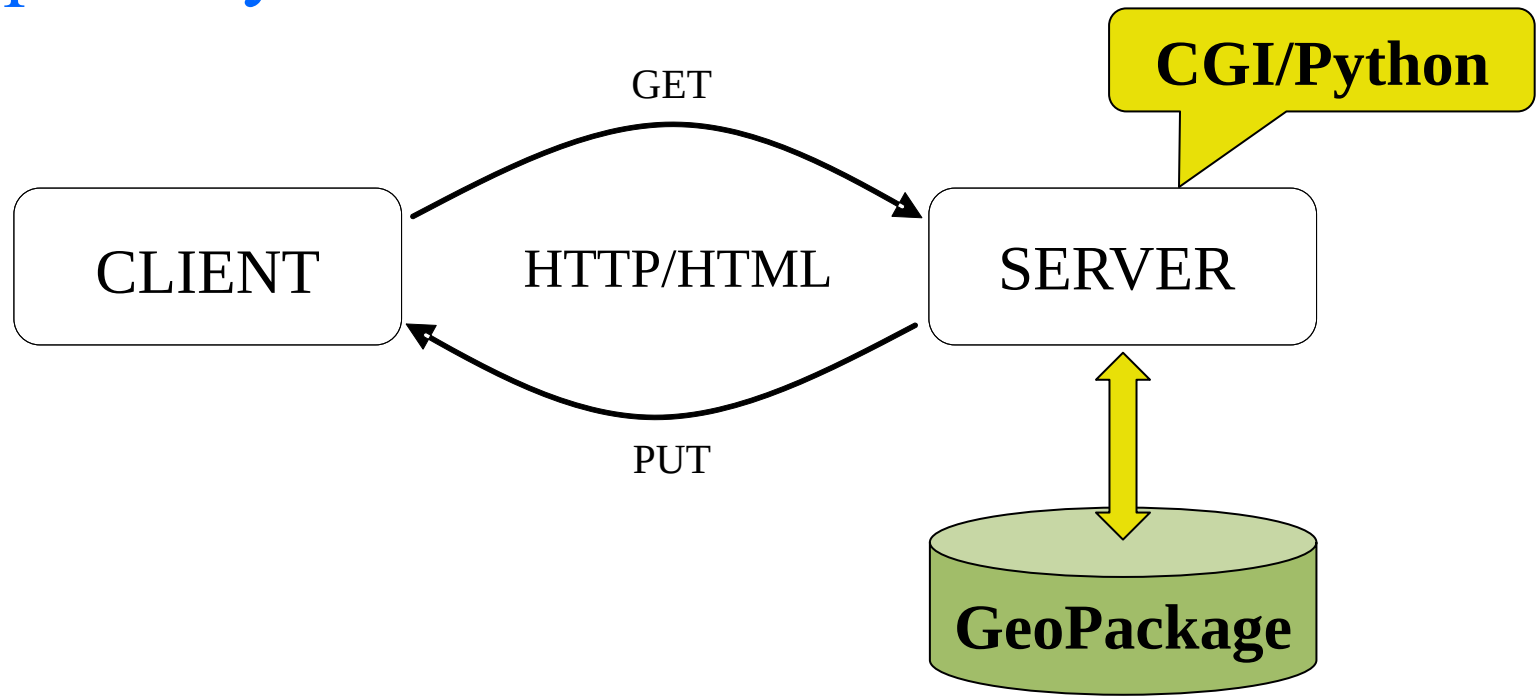
Introduction

- This presentation is about…
  - Creation of a **GeoPackage** using the **Geospatial Data Extraction Tool** of Natural Resources Canada
  - Development of a **Web Service** using the GeoPackage as a data repository on the Server

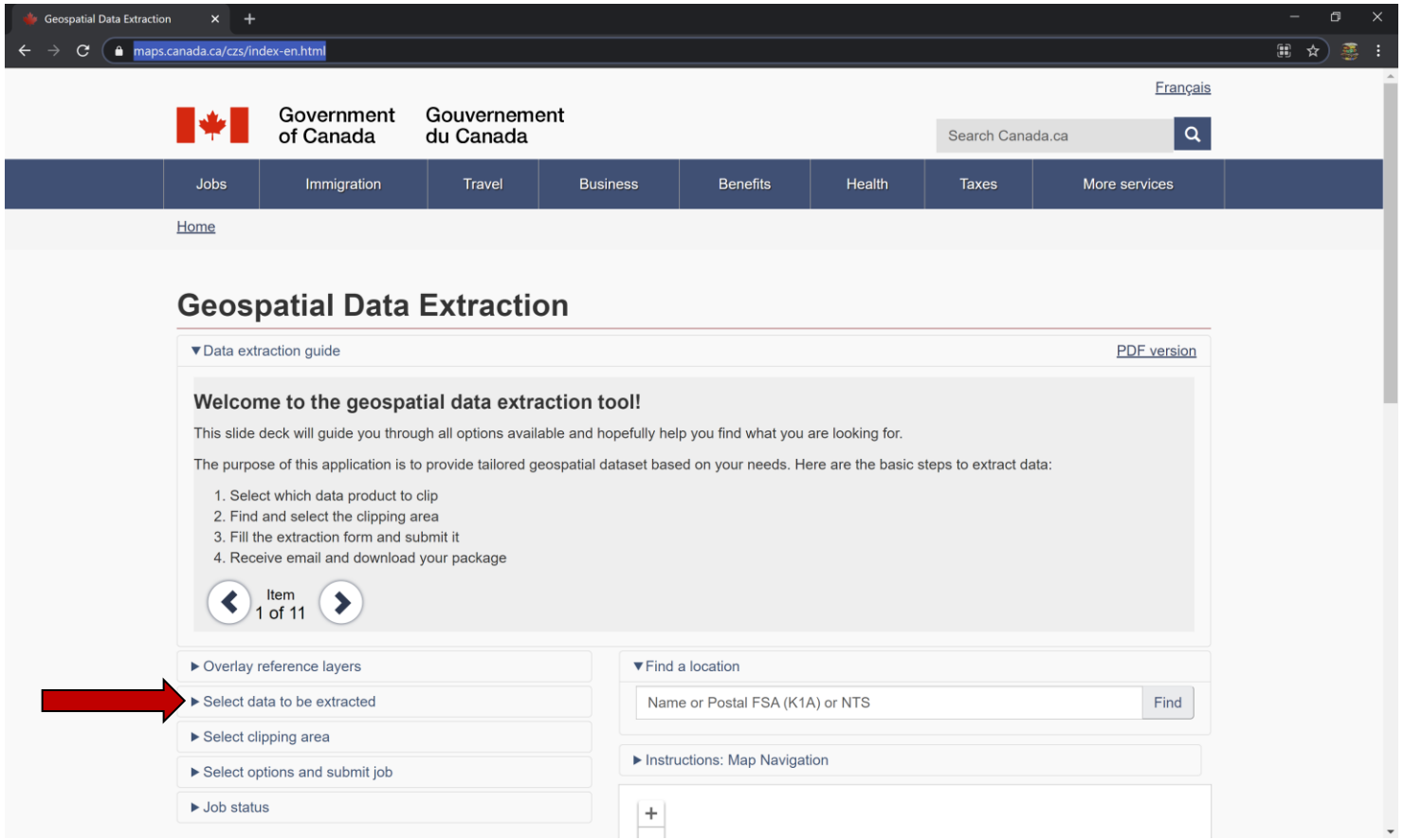
Web Service…

- GeoPackage in the role of the data repository…

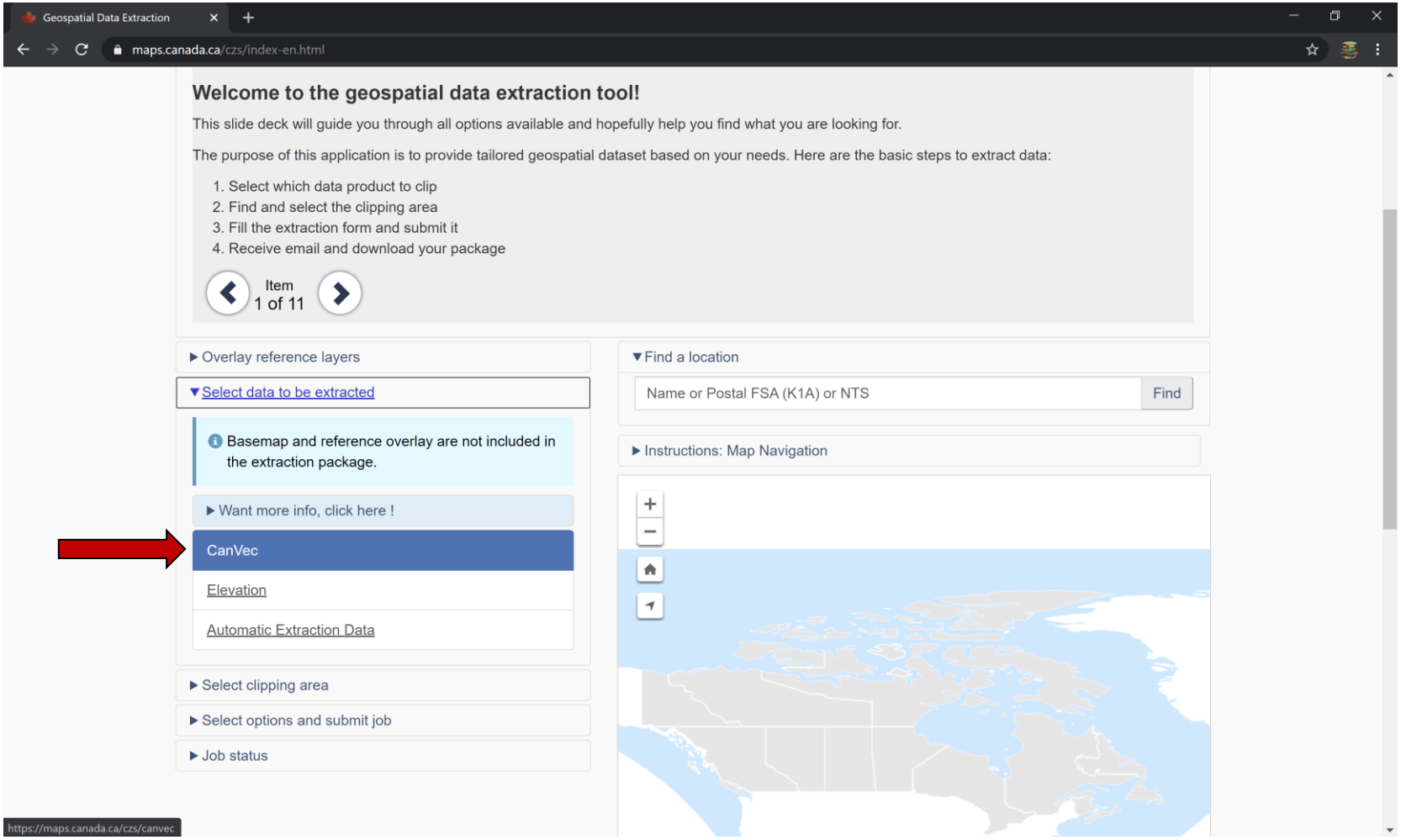


Geospatial Data Extraction Tool

https://maps.canada.ca/czs/index-en.html



Geospatial Data Extraction Tool



Geospatial Data Extraction Tool

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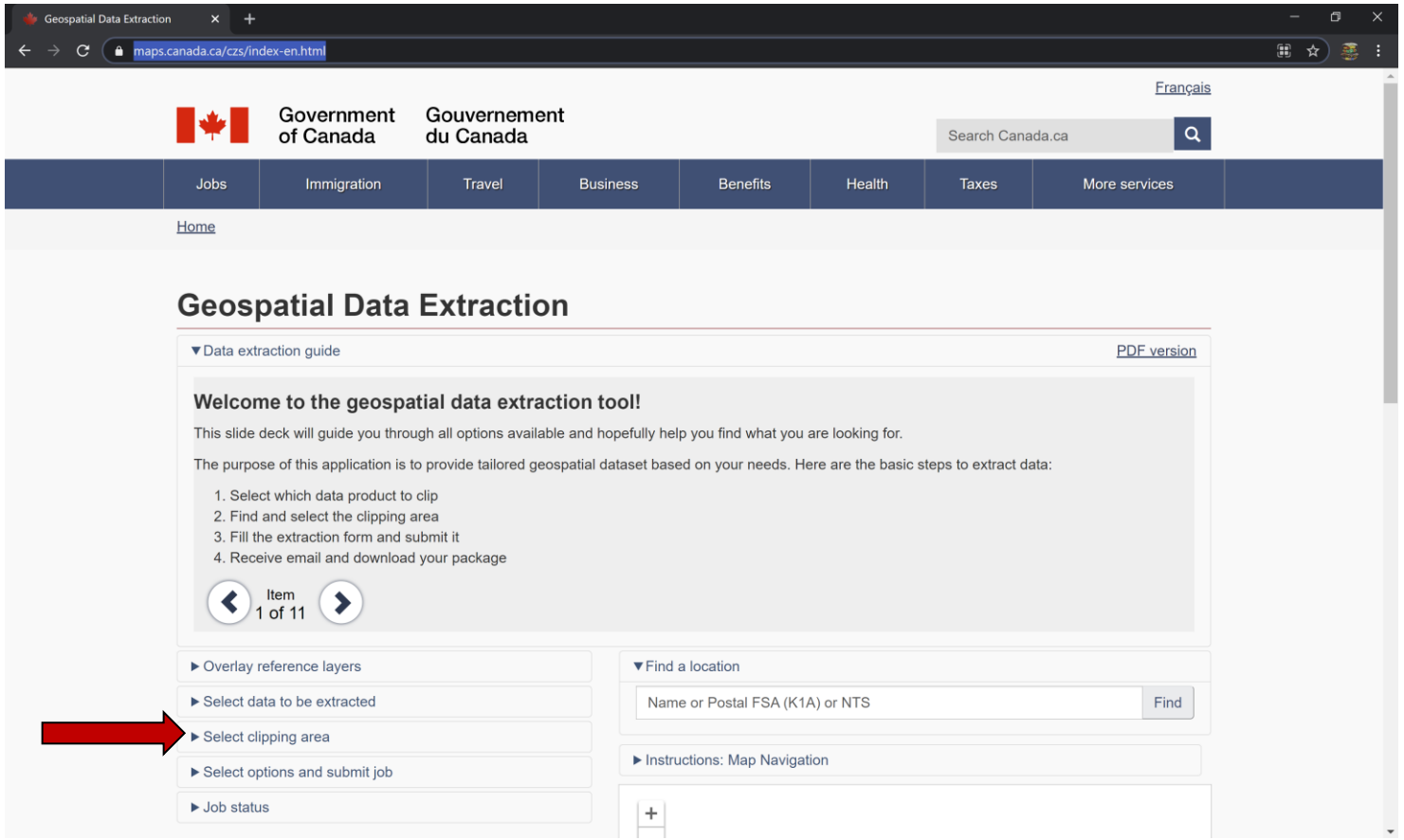
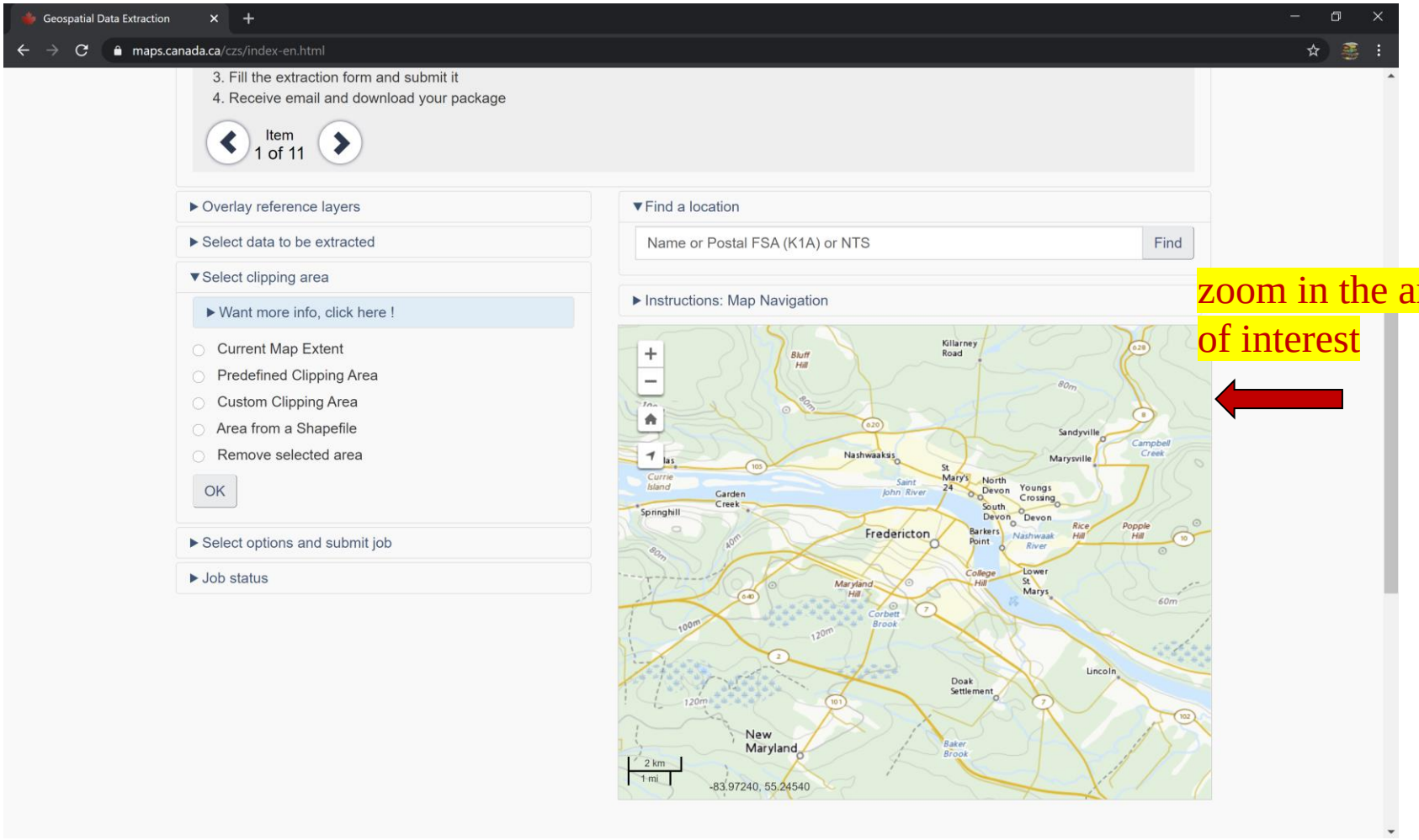
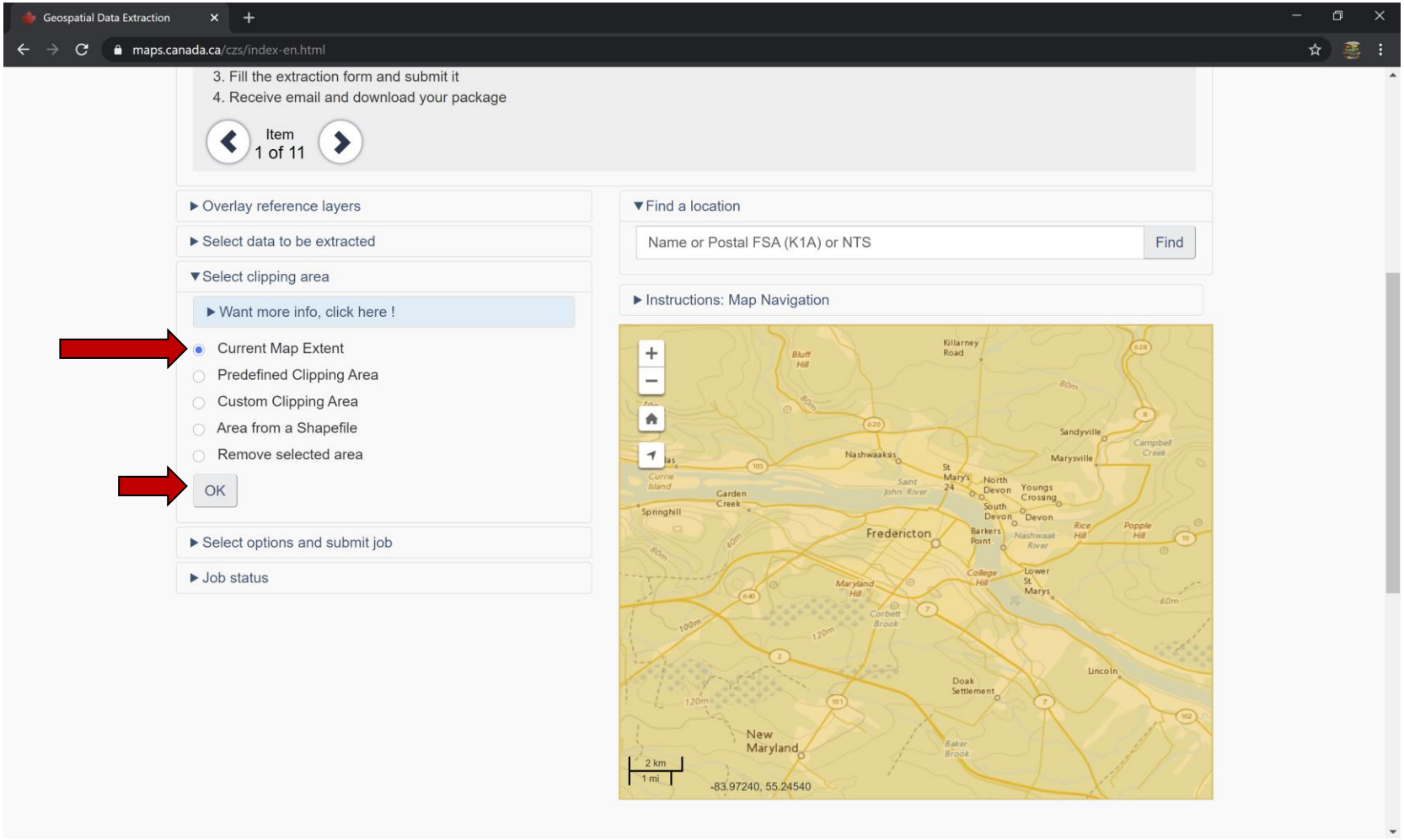


Geospatial Data Extraction Tool



zoom in the area of interest

Geospatial Data Extraction Tool



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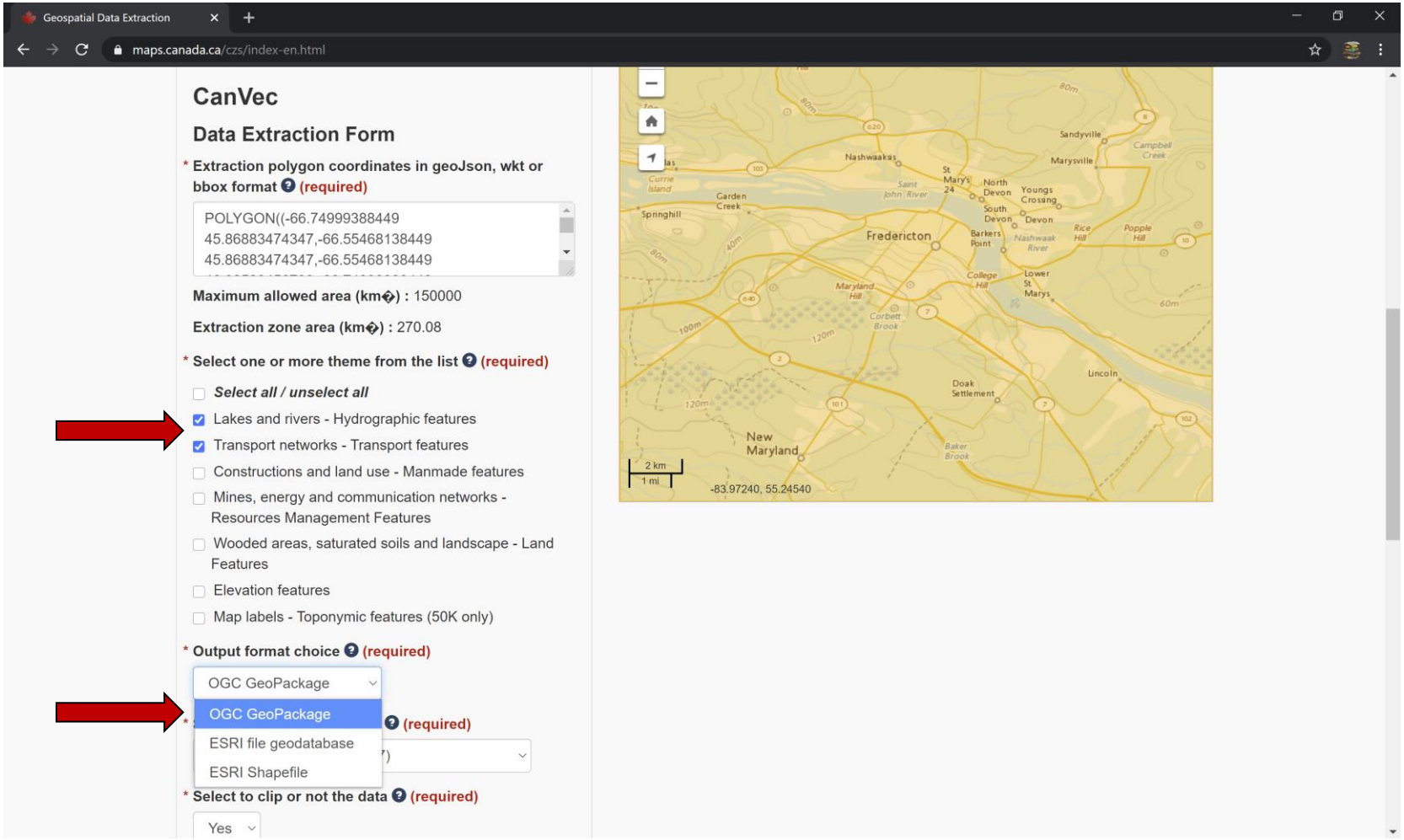

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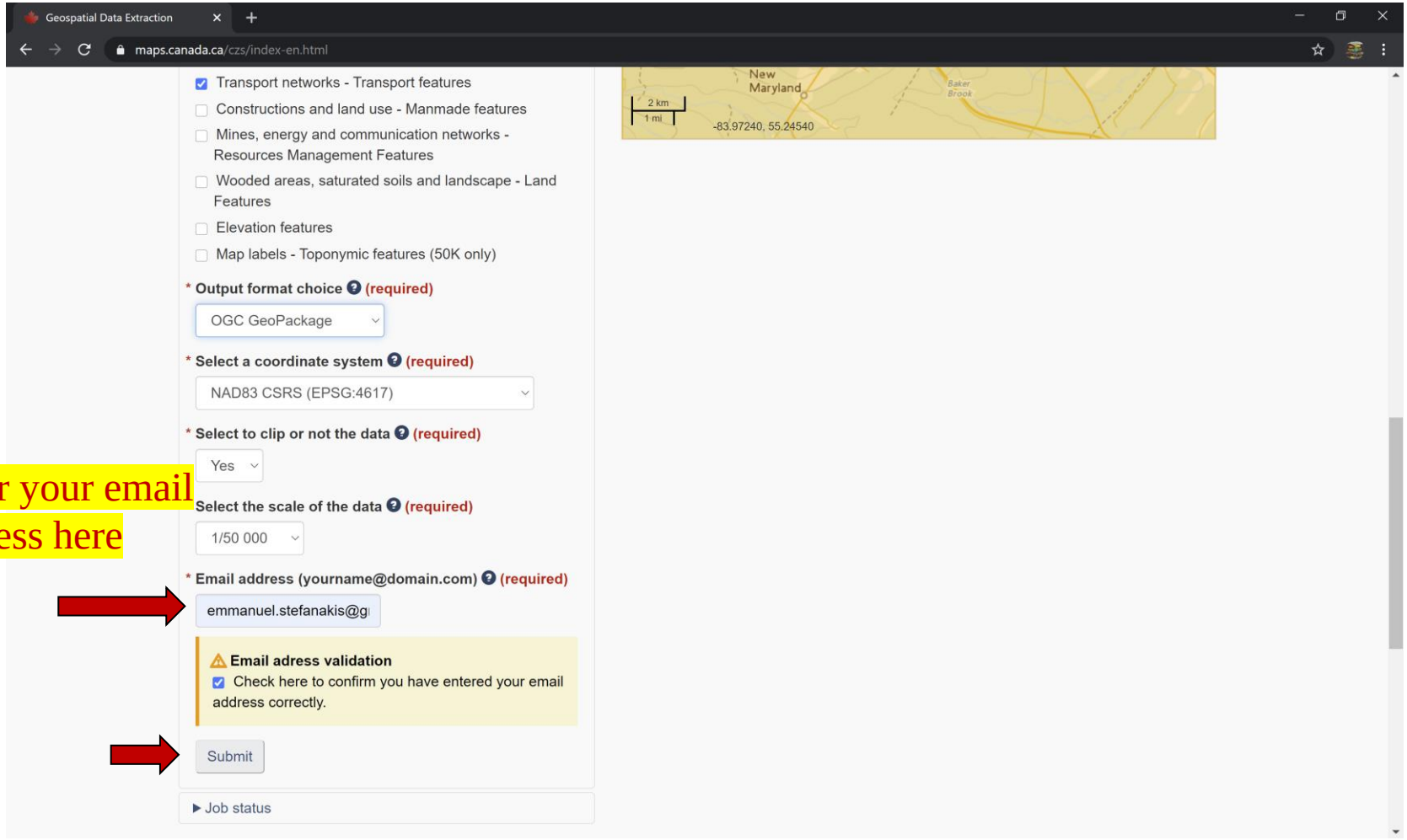
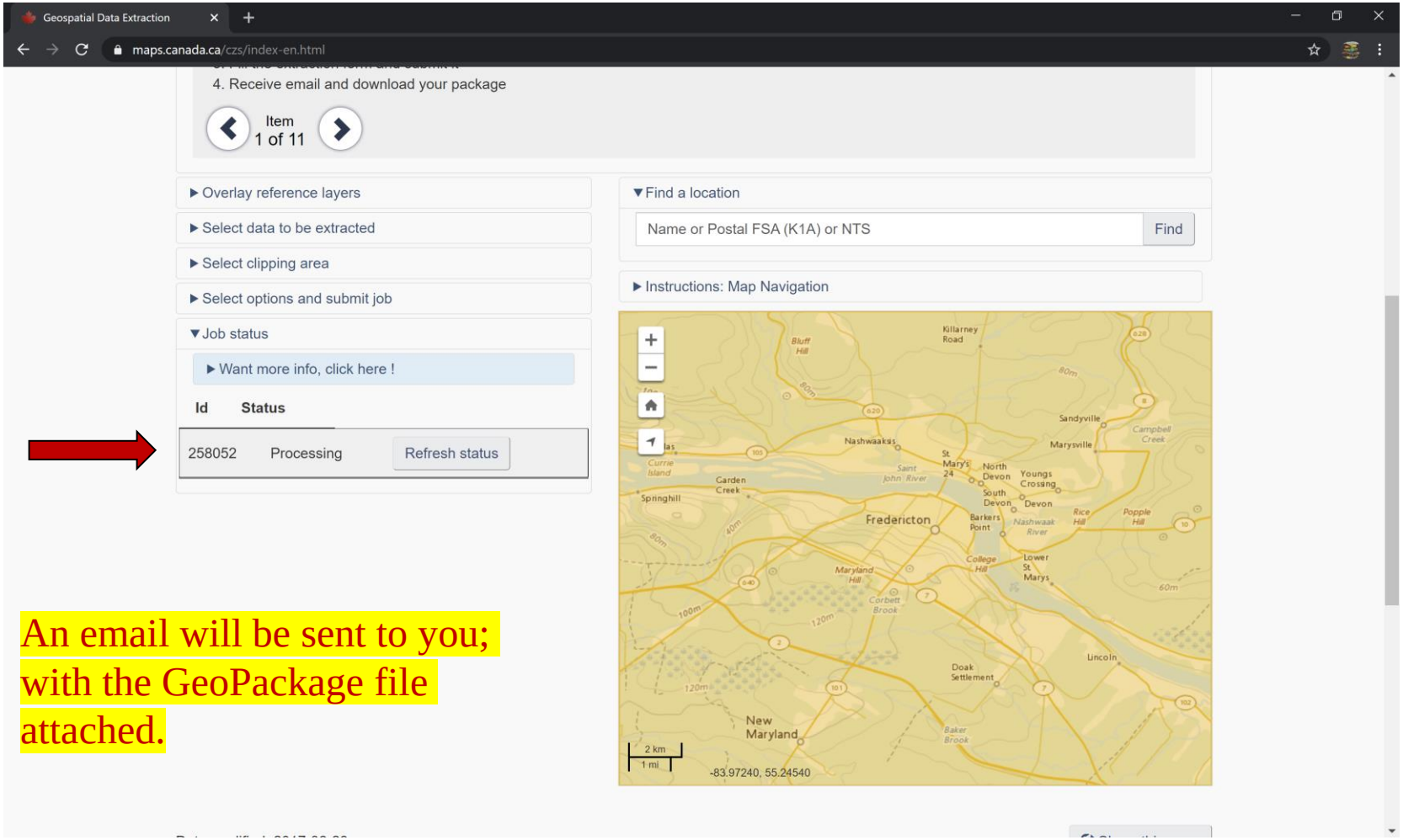


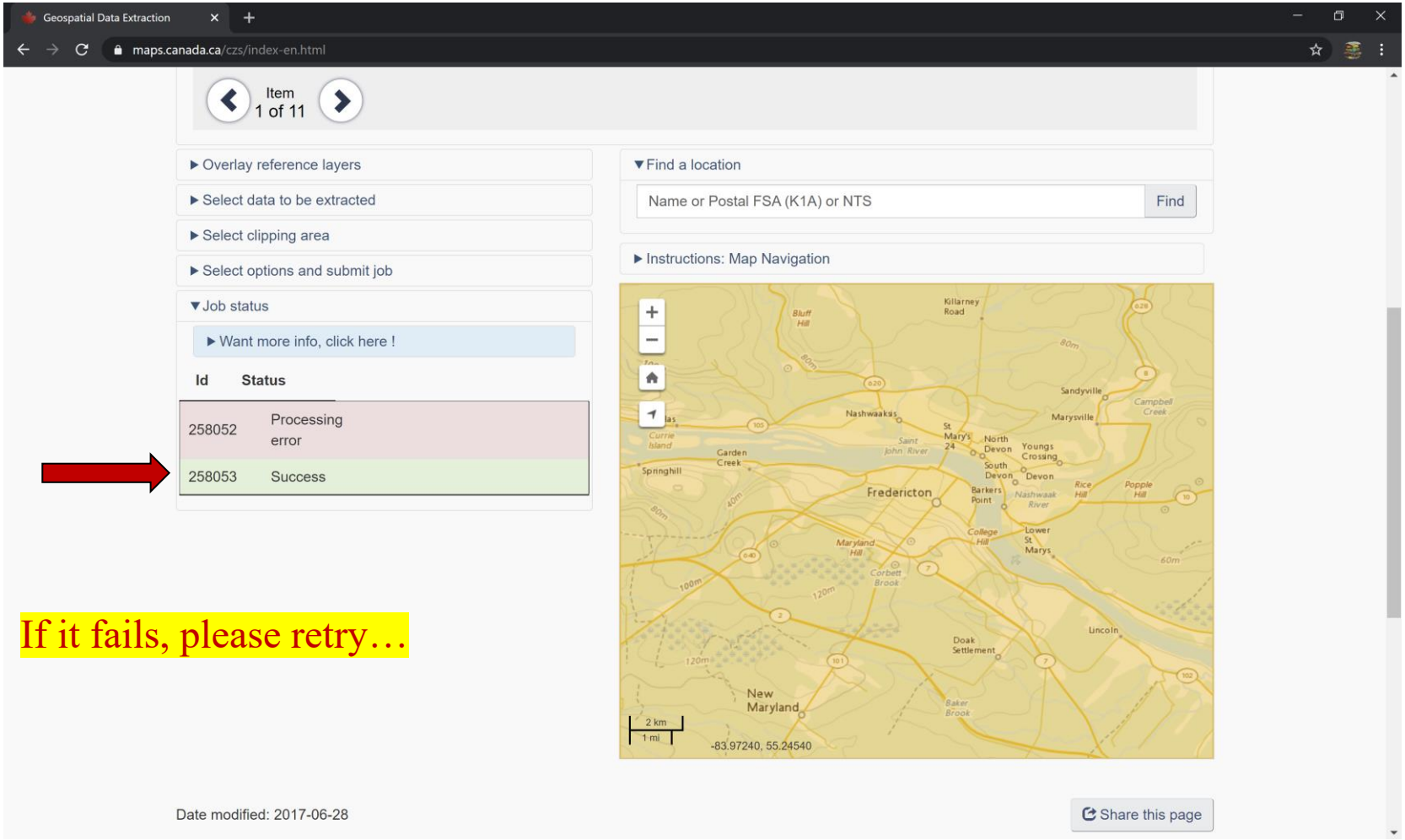
Enter your email address here

Geospatial Data Extraction Tool



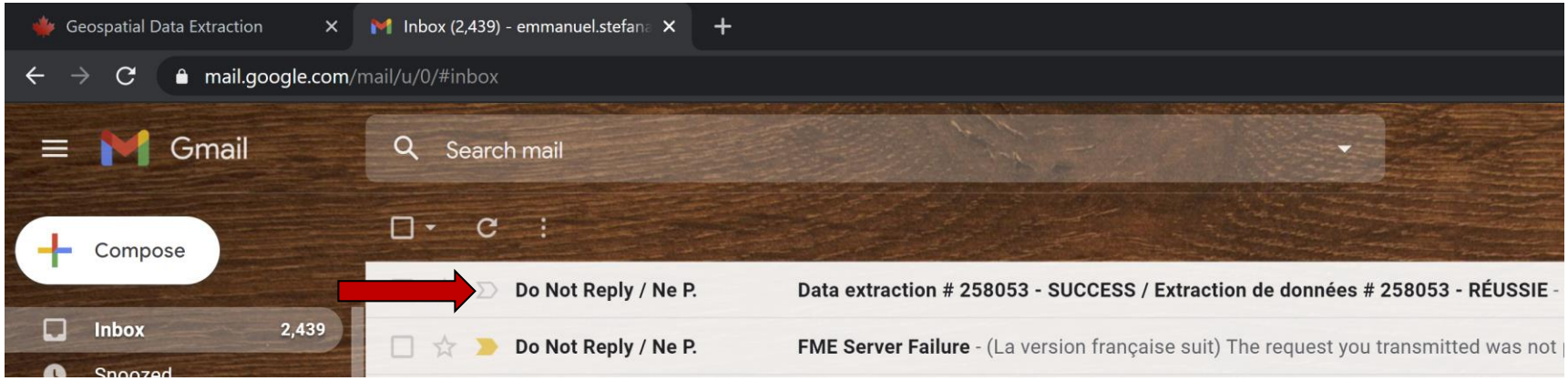
An email will be sent to you; with the GeoPackage file attached.

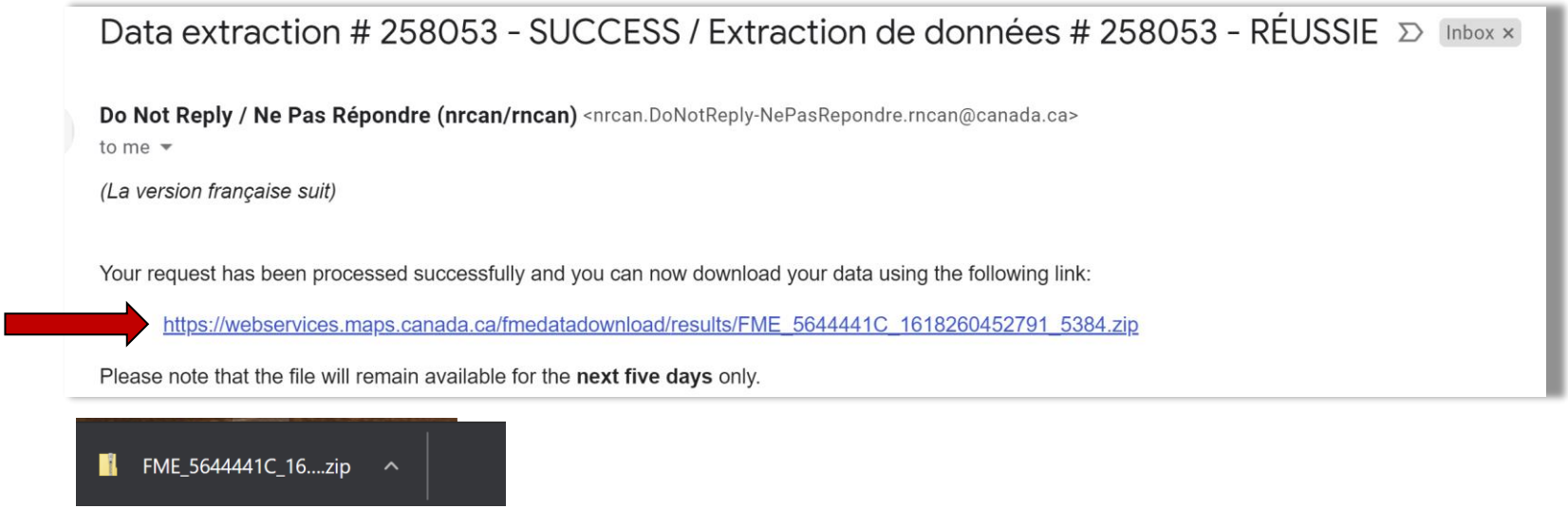
Geospatial Data Extraction Tool



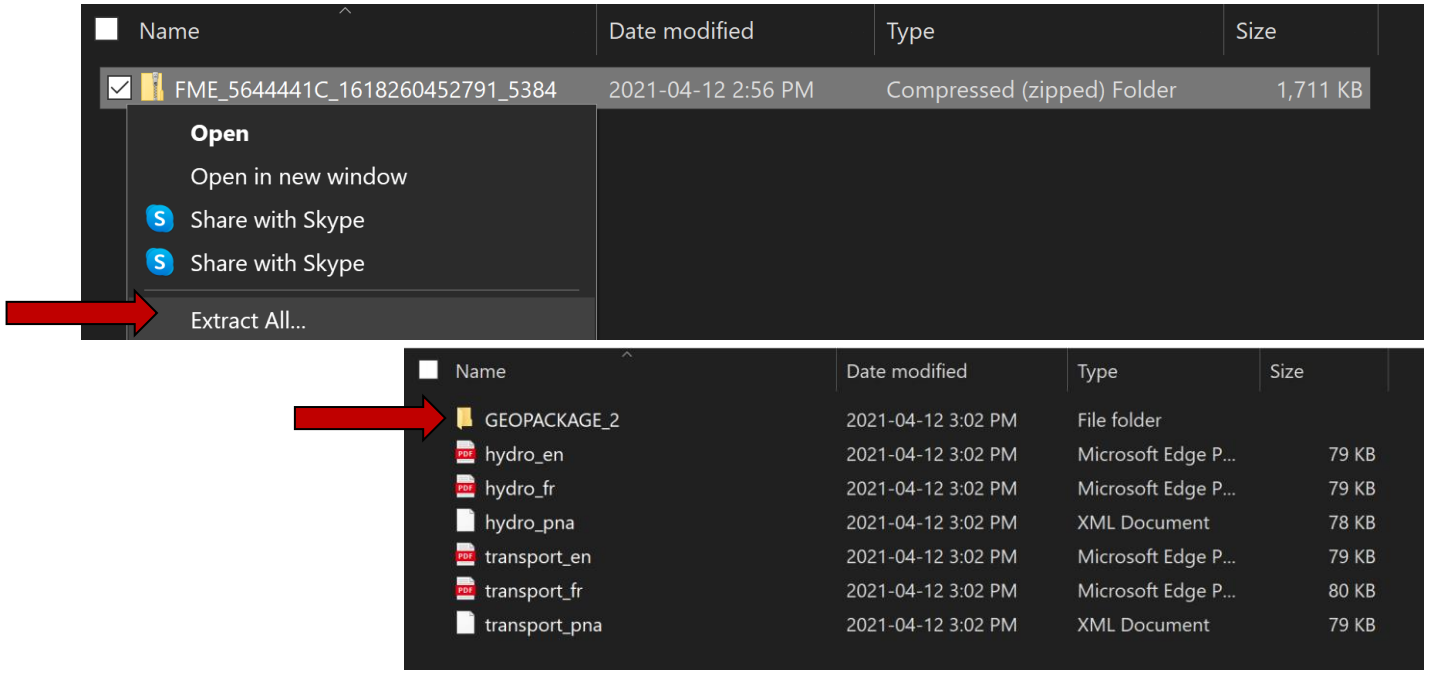
If it fails, please retry…

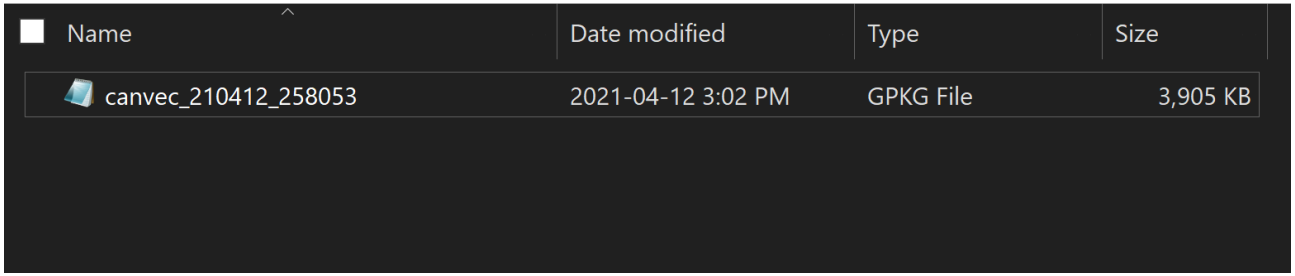
Geospatial Data Extraction Tool





Geospatial Data Extraction Tool

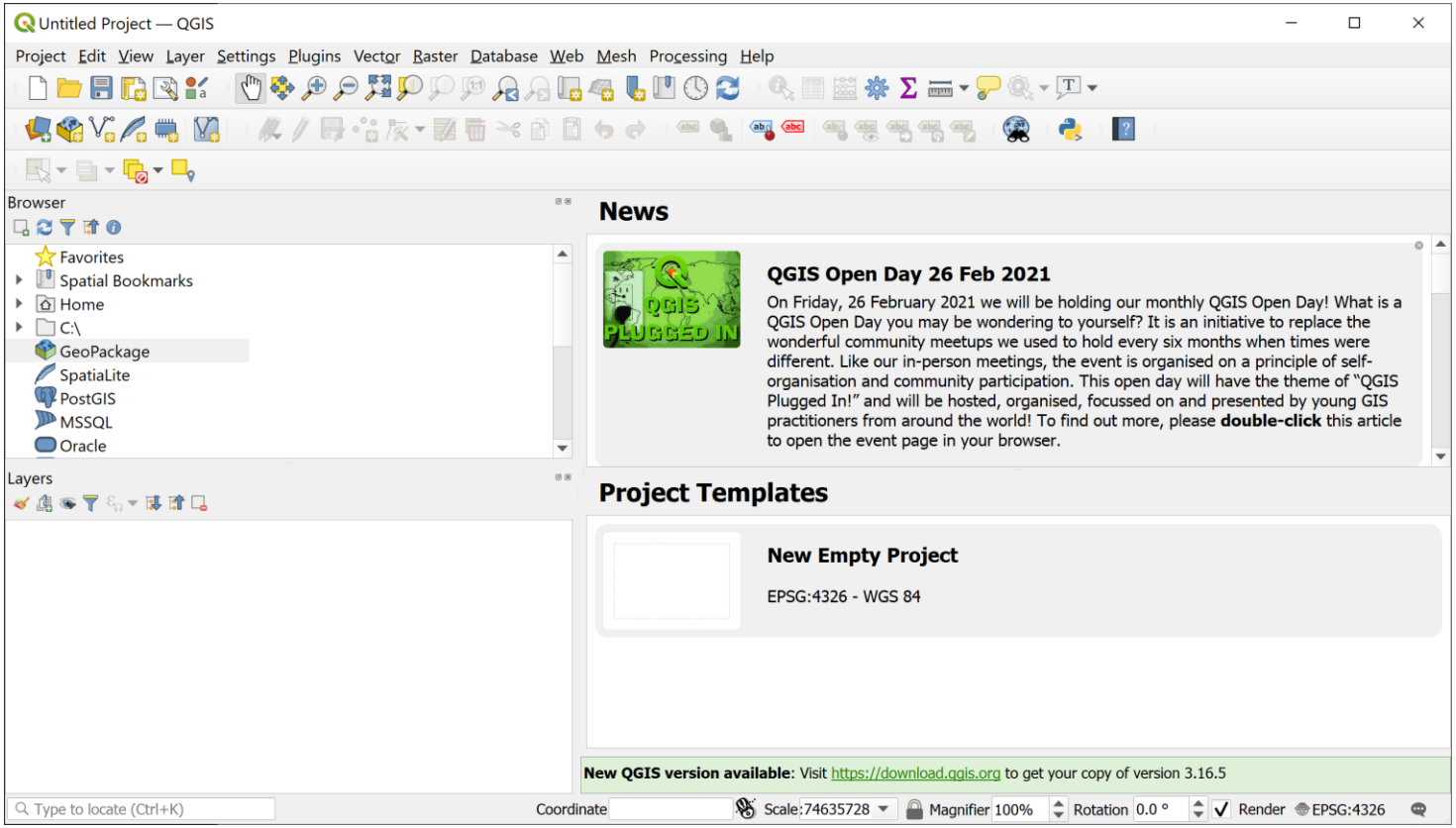




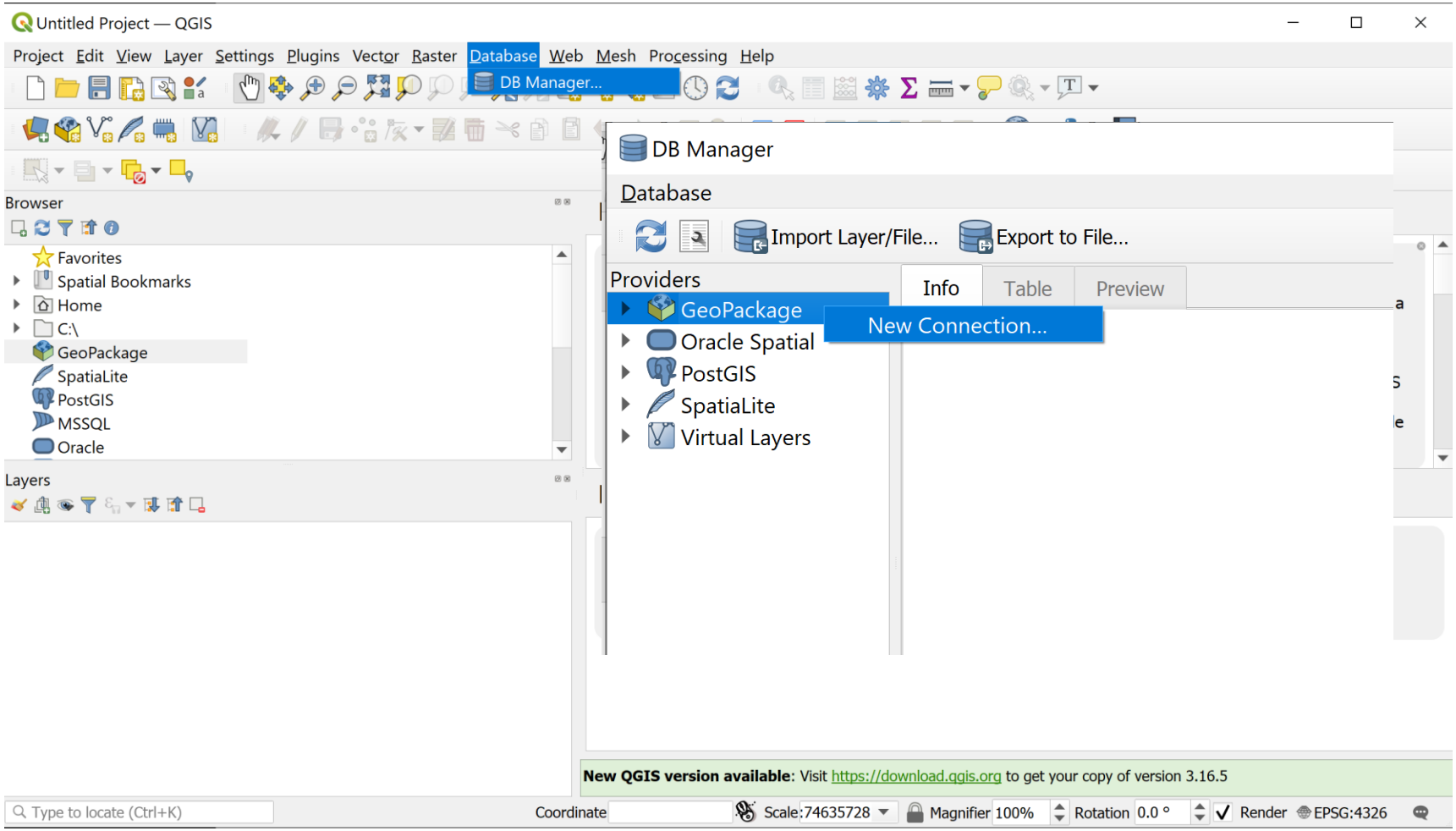
This is the GeoPackage file -- upload to server

Explore GeoPackage

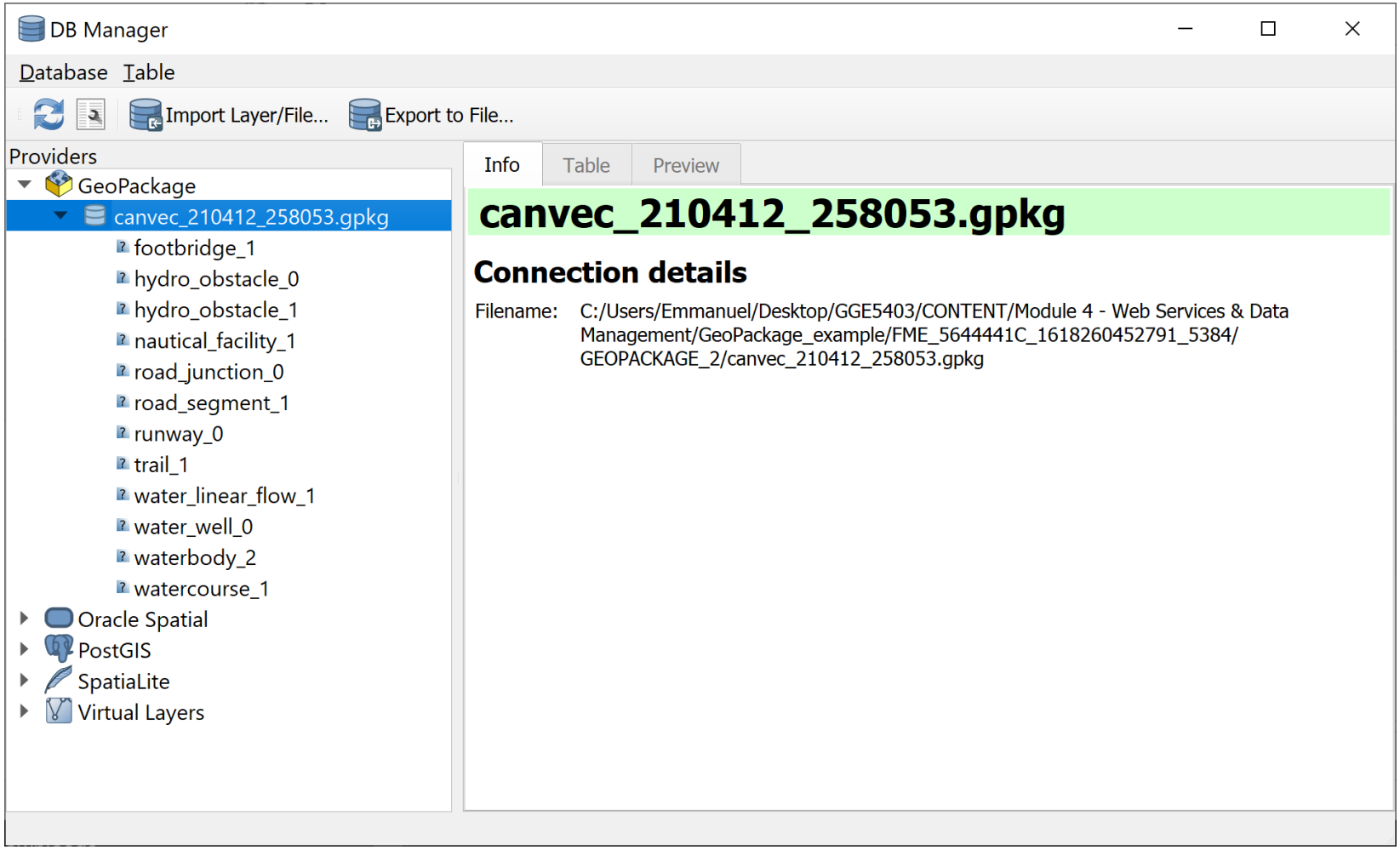
- Open GeoPackage file using QGIS



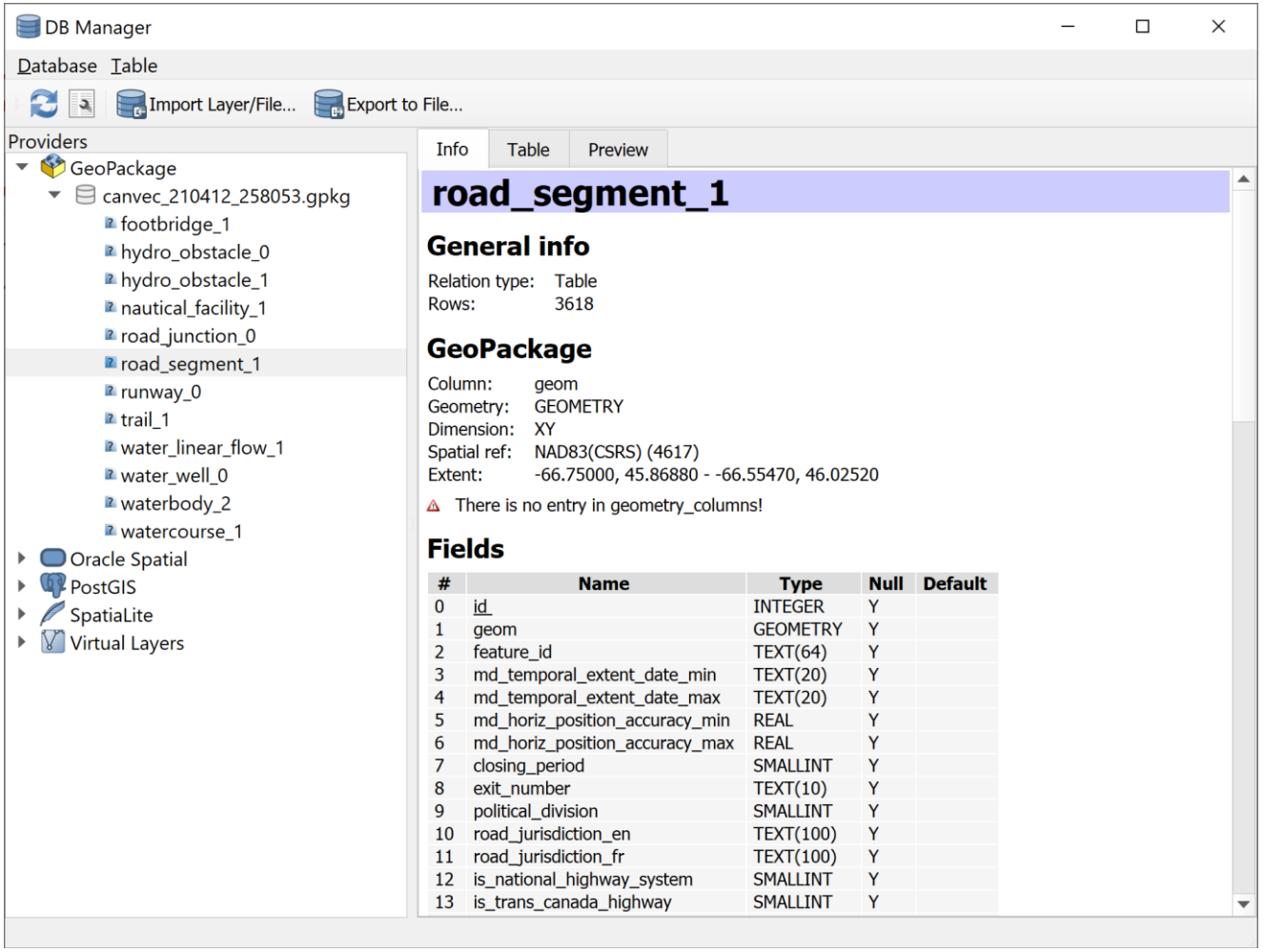
Explore GeoPackage



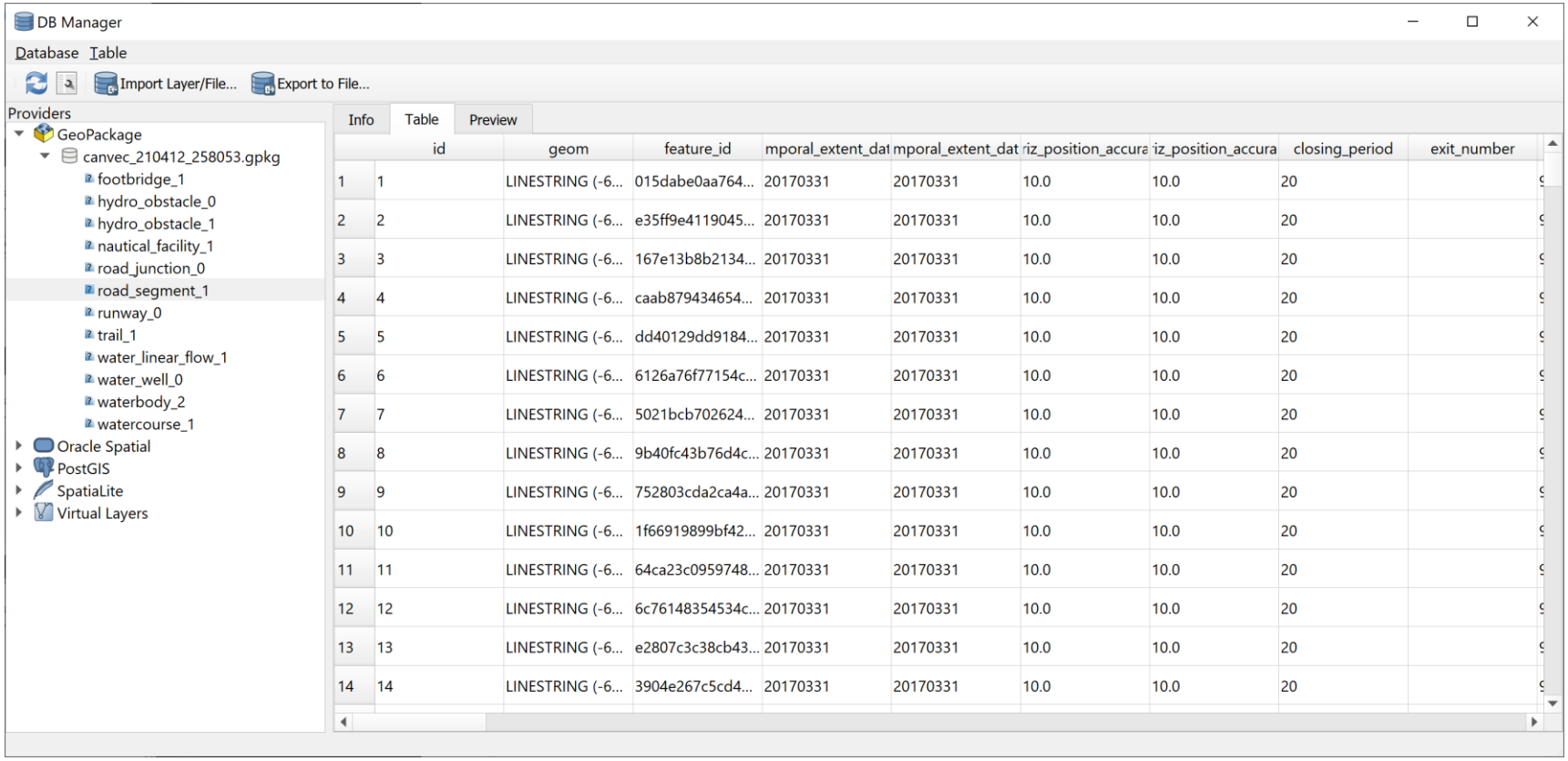
Explore GeoPackage



Explore GeoPackage



Explore GeoPackage



	id	geom	feature_id	mporal_extent_dat	mporal_extent_dat	riz_position_accura	iz_position_accura	closing_period	exit_number
1	1	LINESTRING (-6...	015dabe0aa764...	20170331	20170331	10.0	10.0	20	
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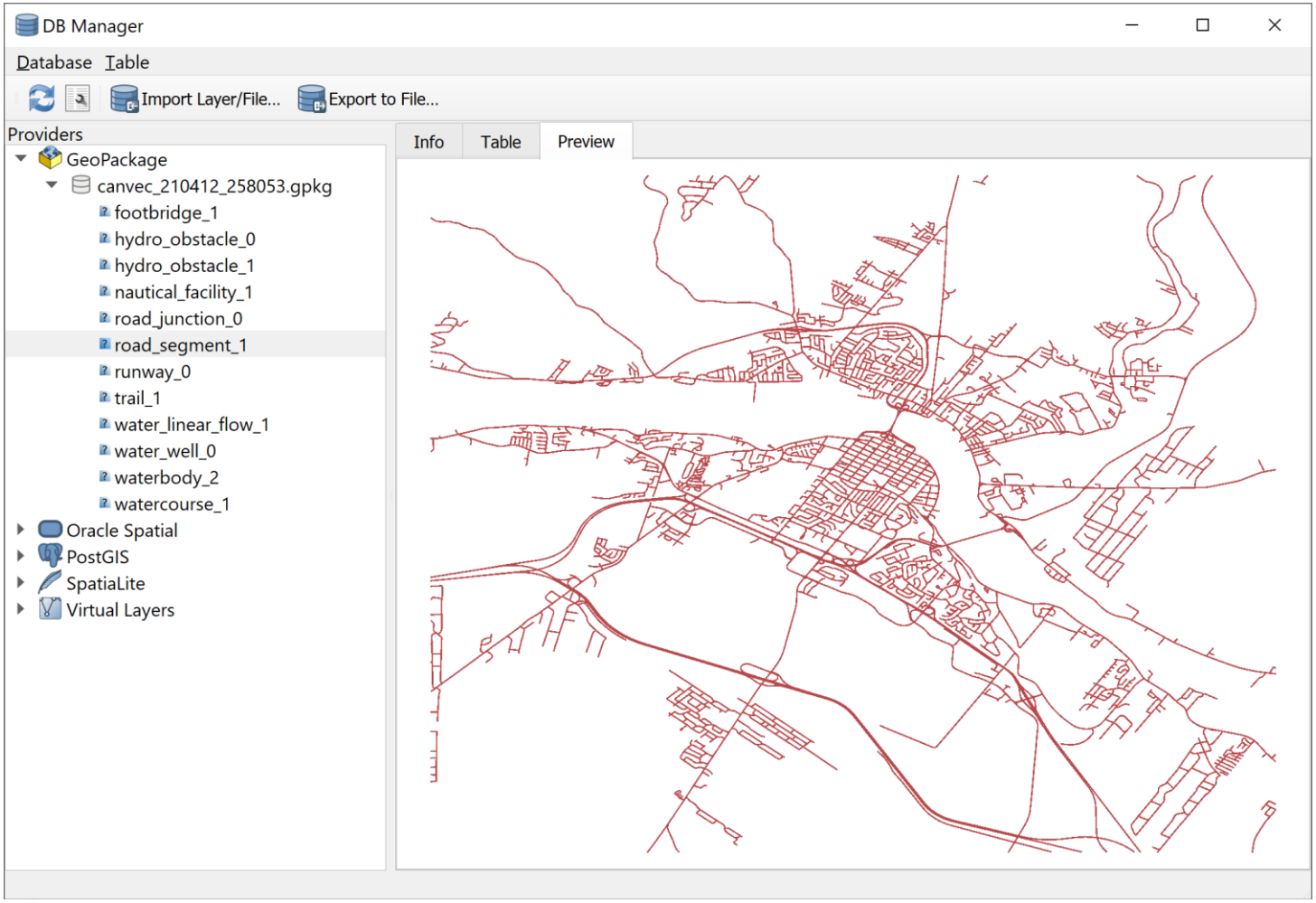
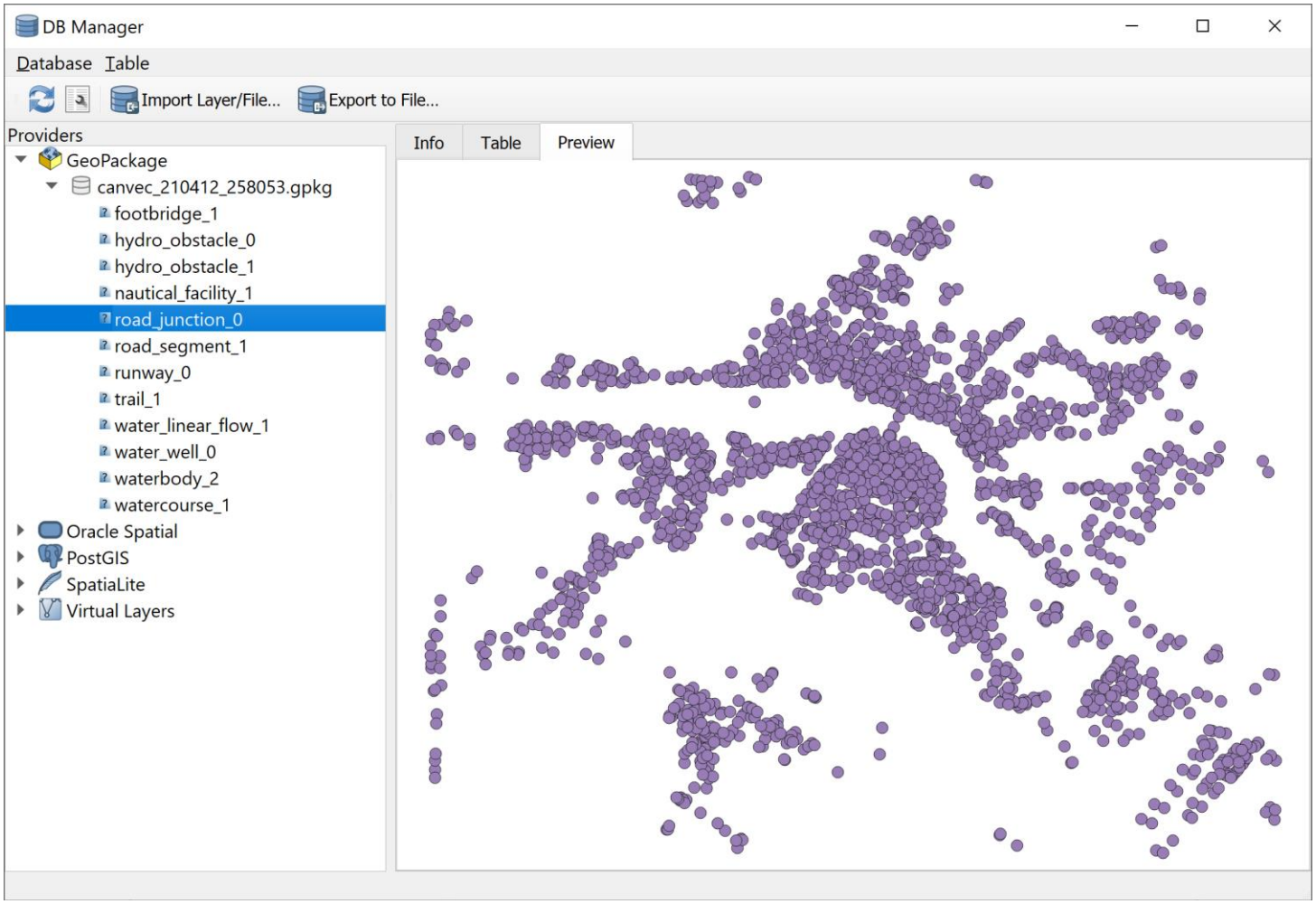
3	3	LINESTRING (-6...	167e13b8b2134...	20170331	20170331	10.0	10.0	20	
4	4	LINESTRING (-6...	caab879434654...	20170331	20170331	10.0	10.0	20	
5	5	LINESTRING (-6...	dd40129dd9184...	20170331	20170331	10.0	10.0	20	
6	6	LINESTRING (-6...	6126a76f77154c...	20170331	20170331	10.0	10.0	20	
7	7	LINESTRING (-6...	5021bcb702624...	20170331	20170331	10.0	10.0	20	
8	8	LINESTRING (-6...	9b40fc43b76d4c...	20170331	20170331	10.0	10.0	20	
9	9	LINESTRING (-6...	752803cda2ca4a...	20170331	20170331	10.0	10.0	20	
10	10	LINESTRING (-6...	1f66919899bf42...	20170331	20170331	10.0	10.0	20	
11	11	LINESTRING (-6...	64ca23c0959748...	20170331	20170331	10.0	10.0	20	
12	12	LINESTRING (-6...	6c76148354534c...	20170331	20170331	10.0	10.0	20	
13	13	LINESTRING (-6...	e2807c3c38cb43...	20170331	20170331	10.0	10.0	20	
14	14	LINESTRING (-6...	3904e267c5cd4...	20170331	20170331	10.0	10.0	20	

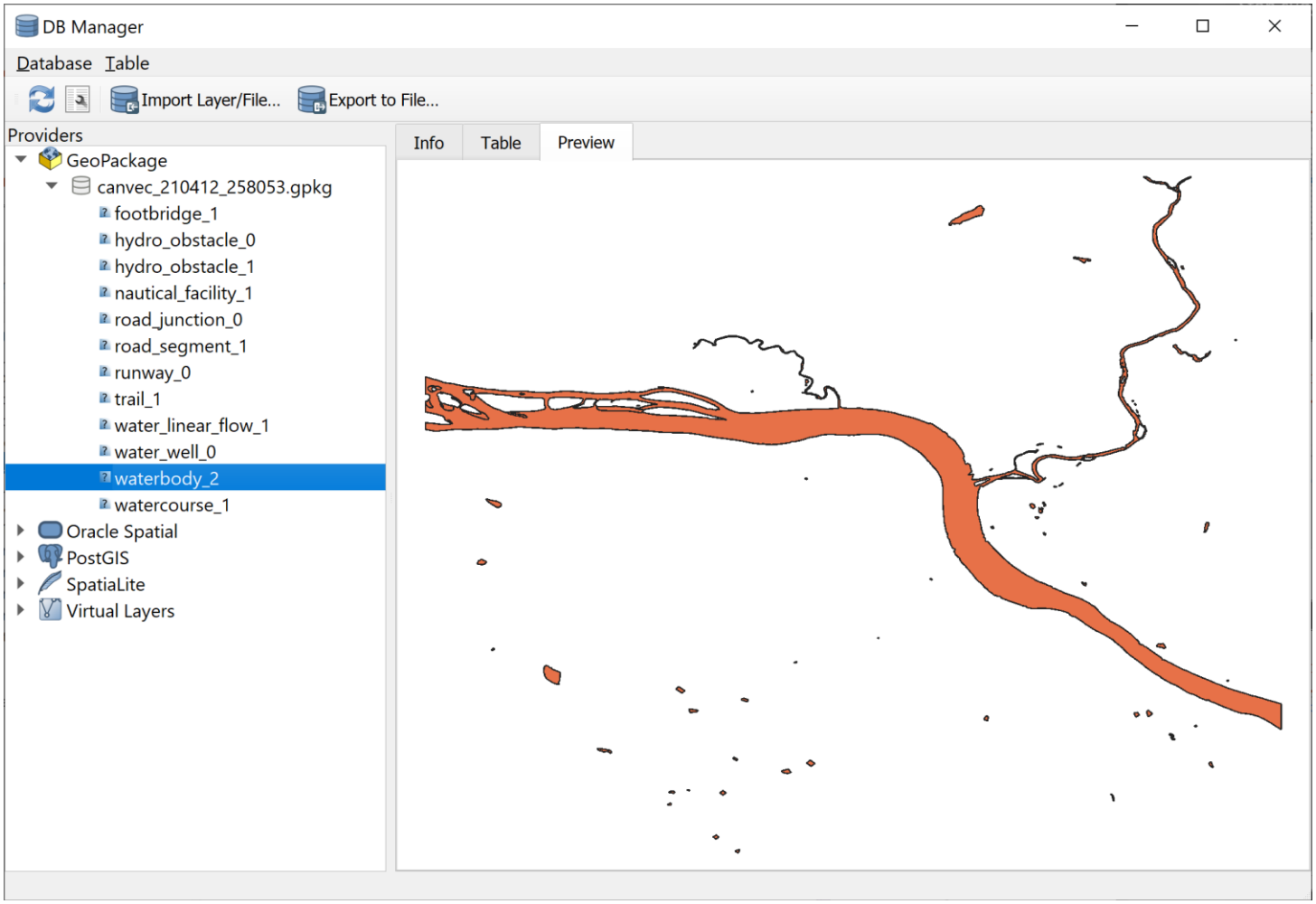
Explore GeoPackage



Explore GeoPackage



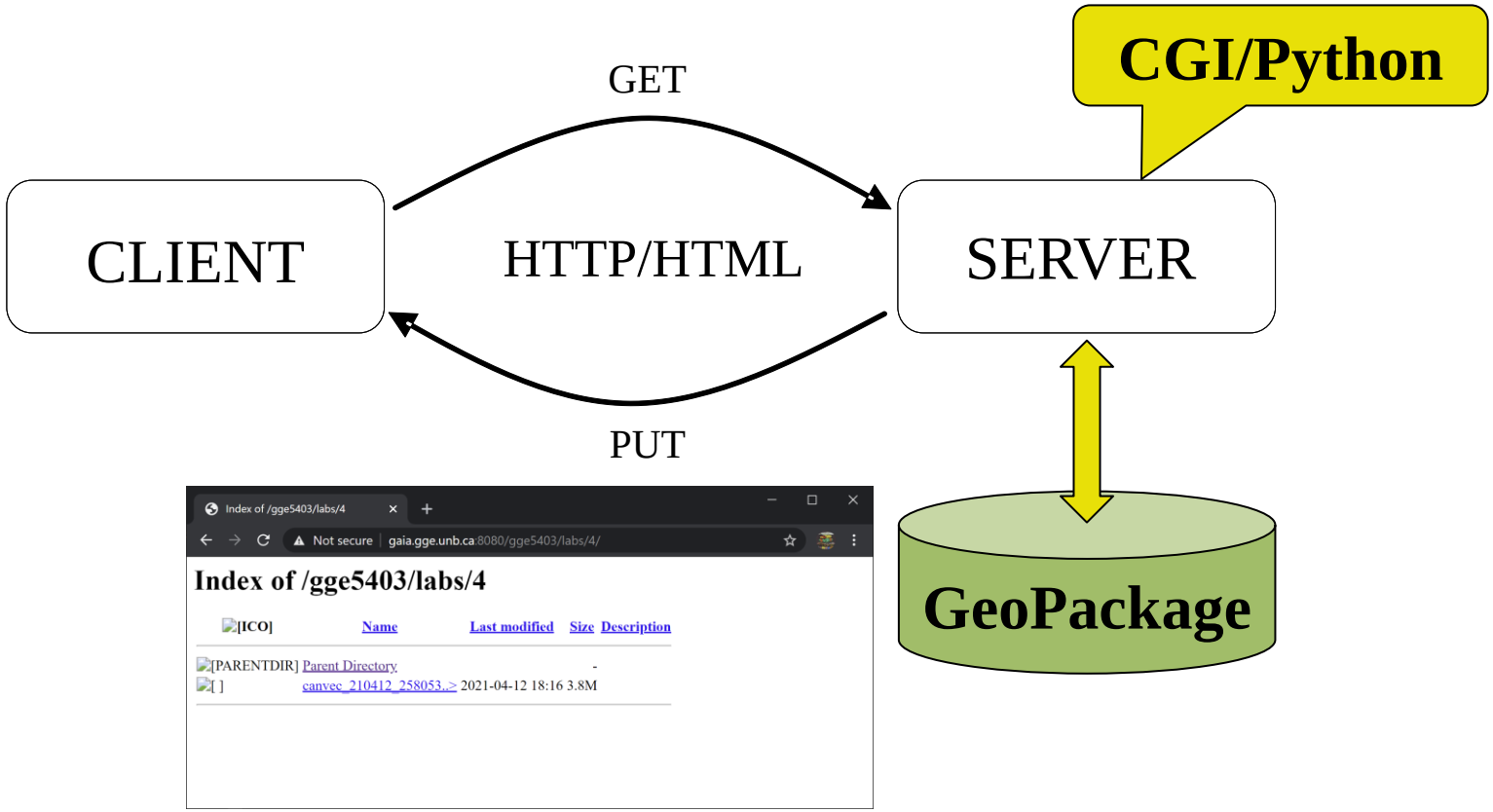
Explore GeoPackage



Development of the Web Service…

- GeoPackage uploaded to the server…

http://gaia.gge.unb.ca:8080/gge5403/labs/4/



Development of the Web Service…

- GeoPackage is an SQLite file

  - SQLite is a self-contained, high-reliability, embedded, full-featured, public-domain, SQL database engine. SQLite is the most used database engine in the world. https://www.sqlite.org/

  - SQLite python library is available in the course server; hence CGI/Python scripts can be called from the client

The concept of cursor

Cursors are what contain the result set of a query made against a **database**. Database queries return multiple records. The **Cursor** class has an API that allows an app to read the columns that were returned from the query as well as iterate over the rows of the result set.

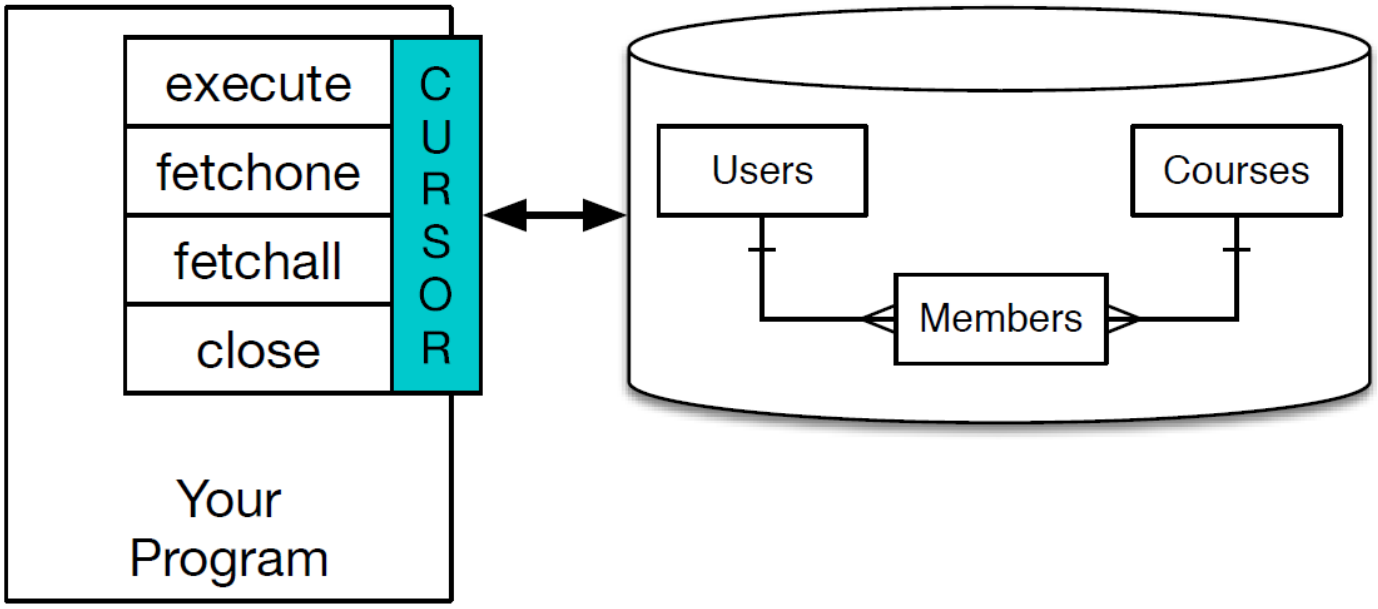
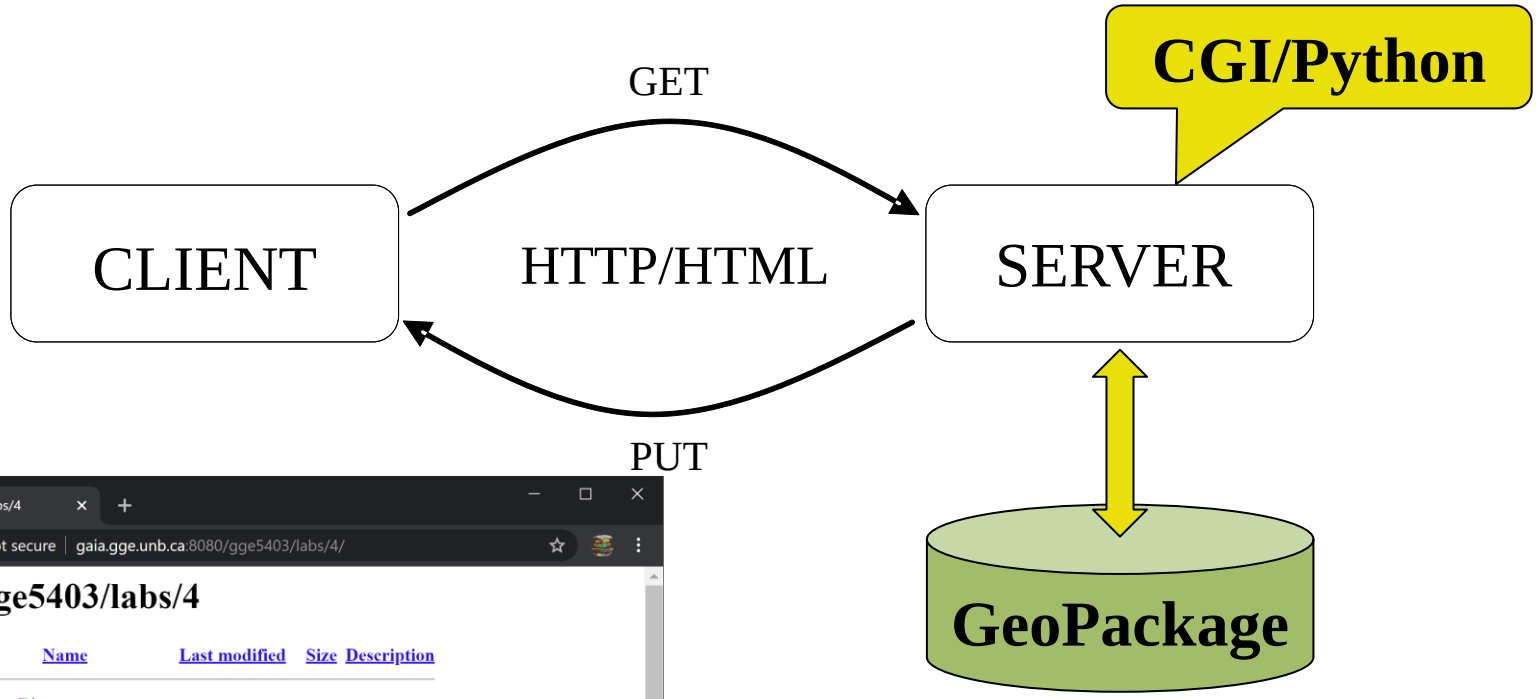


Figure 15.2: A Database Cursor

Development of the Web Service…

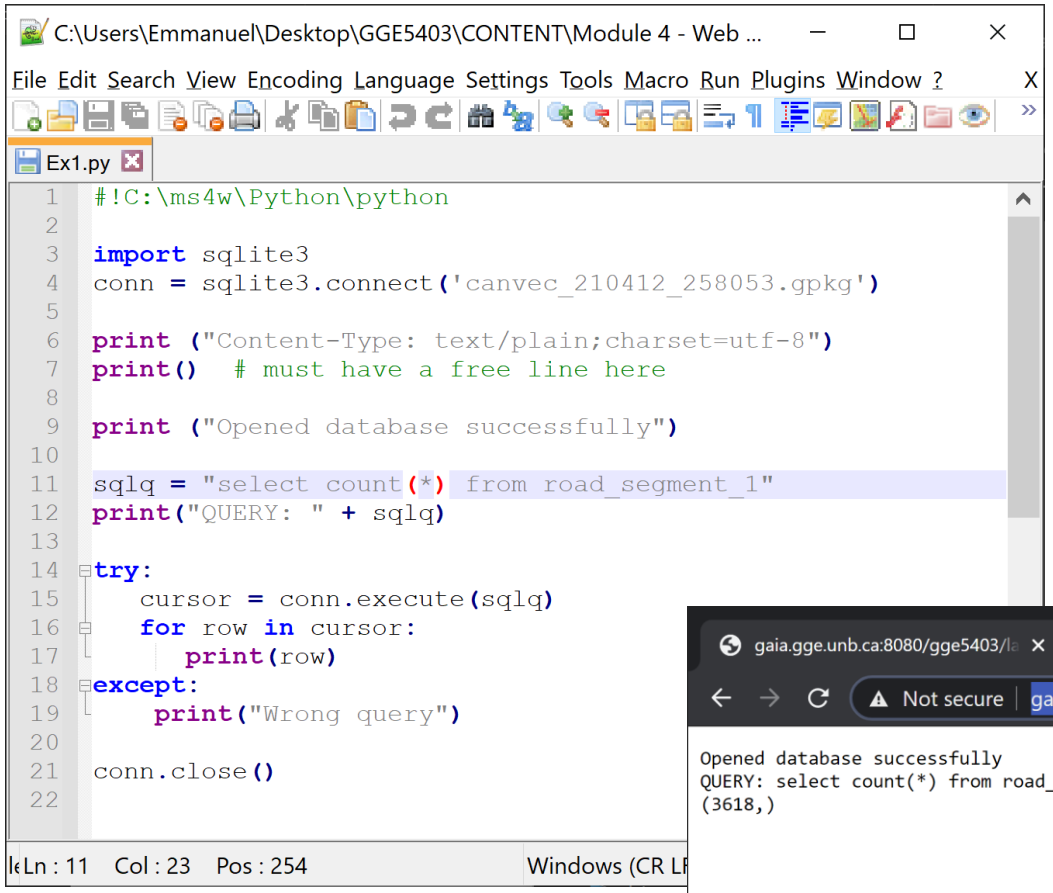
- Example Services…

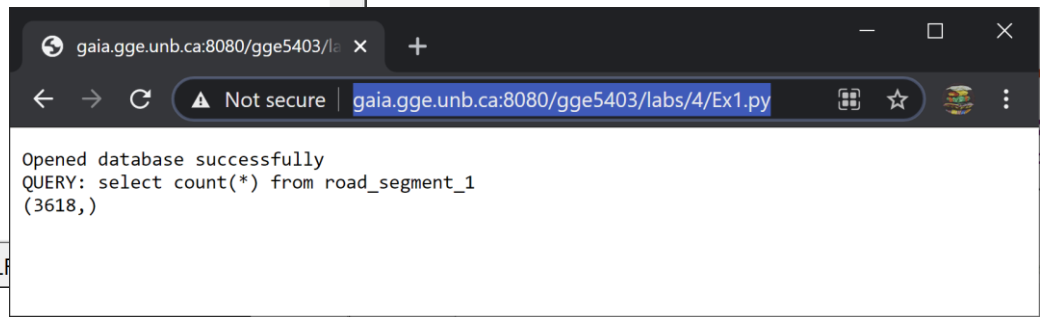
http://gaia.gge.unb.ca:8080/gge5403/labs/4/



Development of the Web Service…

http://gaia.gge.unb.ca:8080/gge5403/labs/4/Ex1.py





This service reports the number of records in 'road_segment_1'

Development of the Web Service…

http://gaia.gge.unb.ca:8080/gge5403/labs/4/Ex2.py

C:\Users\Emmanuel\Desktop\GGE5403\CONTENT\Module 4 - Web Services & Data Management\Ex2.py - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

Ex2.py

```
1  #!C:\ms4w\Python\python
2
3  import sqlite3
4  conn = sqlite3.connect('canvec_210412_258053.gpkg')
5
6  print ("Content-Type: text/plain;charset=utf-8")
7  print()  # must have a free line here
8
9  print ("Opened database successfully")
10
11 sqlq = "select speed_restriction from road_segment_1 where road_segment_name_en = 'Capital Manor'"
12 print("QUERY: " + sqlq)
13
14 try:
15     cursor = conn.execute(sqlq)
16     for row in cursor:
17         print(row)
18 except:
19     print("Wrong query")
20
21 conn.close()
22
```

Python file length : 492 lines : 22

This service reports the speed limit on ‘Capital Manor’ street

gaia.gge.unb.ca:8080/gge5403/la

Not secure | gaia.gge.unb.ca:8080/gge5403/labs/4/Ex2.py

```
Opened database successfully
QUERY: select speed_restriction from road_segment_1 where road_segment_name_en = 'Capital Manor'
(50,)
```