

# MNGEO API

This notebook will display the MNGEO API. First, I will import the necessary packages and get variables from CKAN. Next, I will perform an inquiry using a package and a tag. Finally, I will iterate to a shapefile and download it.

## Start

The packages needed are requests, json, and pprint. Requests will get the url, json will allow me to view it as a dictionary, and pprint will allow me to see results.

```
In [1]: import requests
import json
import pprint
```

The API used for MNGEO is CKAN. They have three main ways to categorize data. Packages, have the main data, group is a specified category, and tags are a keyword search.

```
In [2]: packages = "https://gisdata.mn.gov/api/3/action/package_list" ## This is how CKAN works, it has packages, groups and tags.
groups = "https://gisdata.mn.gov/api/3/action/group_list"
tags = "https://gisdata.mn.gov/api/3/action/tag_list"
```

```
In [3]: response = requests.get(tags, auth=('user', 'pass'), verify=False) ##testing to see if I can retrieve the tags. For some reason, I could only really get it if I added credentials to it.
```

```
D:\Program Files\ArcGIS\Pro\bin\Python\envs\arcgispro-py3\lib\site-packages\urllib3\connectionpool.py:988: InsecureRequestWarning: Unverified HTTPS request is being made to host 'gisdata.mn.gov'. Adding certificate verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
InsecureRequestWarning,
```

```
In [4]: response.content ##This shows all the tags
```

```
Out[4]: b'{"help": "https://gisdata.mn.gov/api/3/action/help_show?name=tag_list", "success": true, "result": ["100k index", "103e", "15 minute", "1994", "1-meter orthophoto", "1 water supply planning working groups", "2000 census", "2002", "2010", "2010 census", "2012", "2015", "2016", "2020", "2020 musa", "2030", "2030 framework", "2030 framework planning areas", "2030 musa", "2040", "2040 musa", "2050", "24k index", "24k streams", "250k index", "2 primary drinking water supply sources", "303d", "3 municipal wells per community in 1980 and 2040", "4 average daily municipal demand in 1980 and 2040", "5 2015 master water supply plan community profiles", "62500", "911", "9-1-1", "9-1-1 address validation", "aadt", "abandoned sewer interceptors", "abrt", "ac", "aca", "access", "access trails", "acp", "acp50", "acquisition", "acquisitions", "active living", "activities", "activity", "activity center", "activity level", "addin", "address", "addresses", "addressing", "address points", "address ranges", "admin", "administration", "administrative", "administrative boundaries", "aerial", "aerial imagery", "aerial photo", "aerial photograph", "aerial photography", "aerial photos", "aerials", "aeromagnetic", "affluence", "affordable", "ag chem", "aggregate mapping program", "aggregate potential", "aggregate quality", "aggregate resource mapping program", "aggregate resources", "aggregate source information system asis", "agricultural", "agricultural chemicals", "agricultural chemical spill inspection", "agricultural preserves", "agriculture", "airphoto", "air photo", "air photography", "air photos", "airport", "ais", "alewife", "alighting", "aline", "all-terrain vehicles", "altered streams", "altered watercourse", "amenities", "american community survey", "amphibian", "am radio", "am towers", "and access", "and building", "and control section", "and drivers", "and government unit boundary", "and heliports", "and median", "and mpa", "and regional development", "and reservations", "and road", "and roads", "and strahnet", "and tolls", "and traffic counts", "and traffic volumes", "and tribal lands", "and width", "anhydrous ammonia inspection", "animal", "animal disease", "animal health", "animals", "animal units", "annexation", "annual estimates", "anoka", "antennas", "antenna structure registration", "antimycin", "aoc", "apc", "aphis", "api", "app", "application pipe", "apps", "aquatic invasive species", "aquatic plant", "aquatic plant survey", "aquatic vegetation", "arcgis", "archaeology", "archery", "archive", "area code", "area of concern", "areas", "areas of concentrated poverty", "areas of concentrated poverty where 50 or more are people of color", "arsenic", "arterial bus rapid transit", "arterial street corridors", "arts cultural heritage", "arts cultural heritage", "asr", "assessed", "assessment", "assessment units", "asset", "asthma", "atis", "atp districts and state patrol", "attendance area", "attendance boundary", "attorney general", "atv", "automatic passenger counter", "avl", "backpacking", "badger", "bank", "bankfull", "banking", "basemap", "base map", "basemaps", "base maps", "basic", "basins", "bathymetry", "battalion", "battery", "bdry", "beaches", "bear", "bear harvest", "bearing trees", "beaver", "becker", "bedrock", "bedrock aggregate resources", "bedrock geology", "bedrock outcrops", "bedrock sources", "bedrock surface", "bedrock topography", "benchmark", "beneficial use impairment", "benefitcost", "best management practices", "bicycle", "bicycle facility", "bicycling", "big game", "bighead carp", "big stone", "bike", "bikepath", "bike paths", "bike route", "bike routes", "bike trails", "bikeway", "bikeways", "biking", "biodiversity", "biological monitoring"]
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## Perfoming a search inquiry.

These next few cells will be used to find a search. I will do this by adding a tag (in this case ecological) to the base search url. Once I have it, I can request the url.

```
In [5]: tag = "ecological" ##here is one of the tags I found in the tag list. I  
        can add it to a search inquiry
```

```
In [6]: base_url = "https://gisdata.mn.gov/api/3/action/package_search?q=" ##Th  
        is does a search inquiry.
```

```
In [7]: package_information_url = base_url + tag ##Add them together and I get  
        a result.
```

```
In [8]: package_information = requests.get(package_information_url, auth=('user', 'pass'), verify= False) ##Requesting the result from the search inquiry.
```

```
D:\Program Files\ArcGIS\Pro\bin\Python\envs\arcgispro-py3\lib\site-packages\urllib3\connectionpool.py:988: InsecureRequestWarning: Unverified HTTPS request is being made to host 'gisdata.mn.gov'. Adding certificate verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
InsecureRequestWarning,
```

## Getting to the shapefile

Now that I have the request, I can get to the url. First, I will view the json as a dictionary. Then, I will go to the metadata. Finally, I will iterate to the shapefile url.

The json.loads allows me to manipulate it as a dictionary and a list.

```
In [9]: package_dict = json.loads(package_information.content) ##This creates a dictionary.
```

```
package_dict1 = package_dict['result'] ##Since what I want is in the result, I need to iterate a dictionary within a dictionary.
```

```
In [10]: package_list = package_dict1['results'] ##This is the metadata. Now it is a list.
```

After getting into one nested dictionary, creating a variable for the meta data gets me to the url. Each number in the list is a different result. On a side note. Why is there "results" nested in "result"? That is confusing and just bad scripting.

Anyway, from the package\_list, I can use "resources" to get to the datatypes. Admittedly, I had to use trial and error to get to a shapefile (which is why I printed out name to display the datatype).

```
In [11]: print(package_list[0]["resources"][3]['url'], package_list[0]["resources"][3]['name']) ##here is the shapefile. It is in a different number for each result under resources.
```

```
https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_dnr/geos_ecological_class_system/shp_geos_ecological_class_system.zip Shape file
```

```
In [12]: r = requests.get(package_list[0]["resources"][3]['url'])  ##getting the
         Shapfile

         open('shp_geos_ecological_class_system.zip', 'wb').write(r.content)
```

Out[12]: 6820503

```
In [13]: import zipfile
         with zipfile.ZipFile('shp_geos_ecological_class_system.zip', 'r') as zi
         p_ref: ##unzipping it and puting it into a dir.
             zip_ref.extractall('d:/git/GIS5572/Lab1/shapefiles')
```

And now the shapefile is in the Lab 1 dir. This concludes the notebook.