DIGITAL ELEVATION MODEL SERVICE

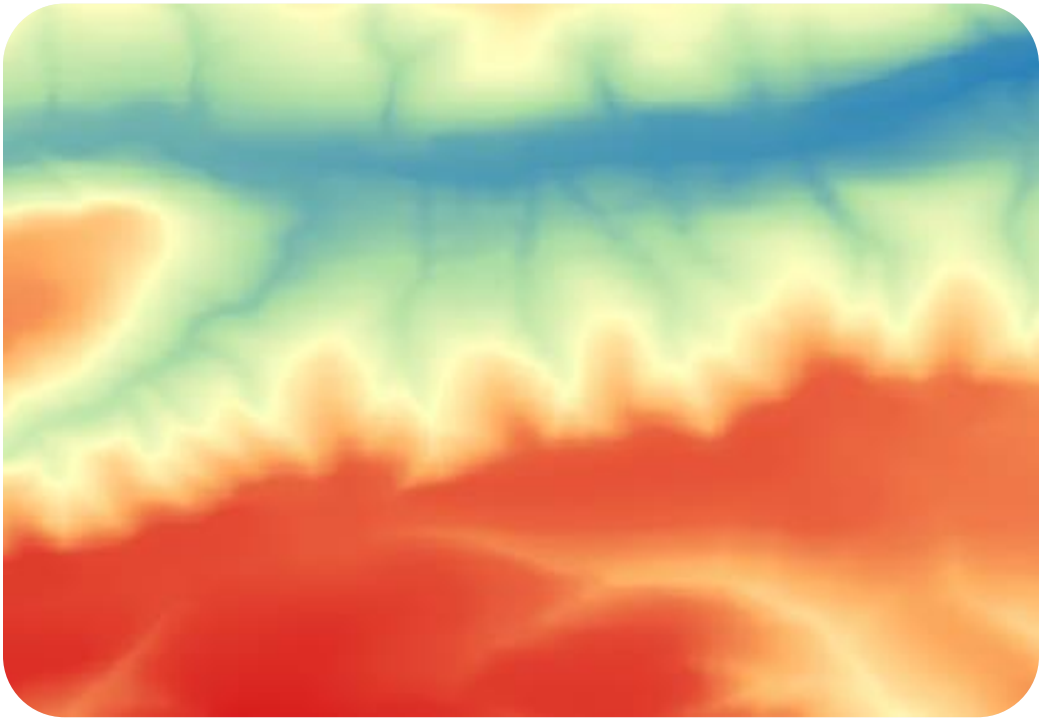
API Documentation 2020

API Portal | GitHub Repo | Jupyter Notebook | Purchase

Service Overview

The Ag-Analytics® Digital Elevation Model (DEM) Service API allows for clipping boundaries to the 10-meter USGS DEM map of the United States. The service consists of a POST request where the user can pass a GeoJSON boundary, desired output projection as an EPSG code, and a resolution in degrees lat/long. After clipping, reprojecting, and resampling, the post request outputs a file name. The file name can be used as the parameter in a GET request to the same endpoint. Doing so will download the file to the specified local path.

Along with our DEM API, we also offer the Elevation Index API, which computes four elevation indices for a given elevation raster. These indices can be used to predict and gauge water flow.



Sample DEM raster output

POST Request

POST Request Example – application/json

```
{
"aoi":"{\"type\":\"Feature\",\"geometry\":{\"type\":\"Polygon\",\"coordinates\":[[
[-121.2475204, 45.4668127],[-121.2484646, 45.4418262],[-121.2119007,
45.4417660],[-121.2115574, 45.4665117],[-121.2475204, 45.4668127]]]}}",

"Elevation_Index": "False"
}
```

Header Parameters

content-type:"application/json"

Request Parameters

Parameter	Data Type	Required?	Default	Options	Description
aoi	GeoJSON String, .shp file, GeoTIFF	Yes	--	--	Area of interest to return.
Projection	String	No	See Request Handling Table	EPSG code ("EPSG:4326") WKT	Output projection of result DEM GeoTIFF.
Resolution	Float	No	See Request Handling Table	--	Output GeoTIFF resolution.
Elevation_Index	String	No	"False"	"True", "False"	Call will return elevation indices from the elevation index service. These are relative elevation, slope, topographic position index, and terrain ruggedness index.
Legend_Ranges	Integer as string	No	3	0 < Legend_ Ranges	Number of ranges to display in png of output image

Request Handling – Default Projections and Resolutions

AOI Type	Projection Specified?	Resolution Specified?	Output Projection	Output Resolution
Any	Yes	Yes	Request projection	Request resolution
GeoTIFF	Yes	No	Request projection	GeoTIFF resolution
GeoTIFF	No	Yes	GeoTIFF projection	Request resolution
GeoTIFF	No	No	GeoTIFF projection	GeoTIFF resolution
Shapefile	Yes	No	Request projection	Native tile resolution
Shapefile	No	Yes	Shapefile projection	Request resolution
Shapefile	No	No	Shapefile projection	Native tile resolution
GeoJSON	Yes	No	Request projection	Native tile resolution
GeoJSON	No	Yes	GeoJSON projection	Request resolution
GeoJSON	No	No	GeoJSON projection	Native tile resolution

POST Response

POST Response Example – application/json


```
{'Features': [
   {'attributes':
      {'CellSize': [9.259259269220297e-05, -9.259259269220297e-05],
      'CoordinateSystem': 'GEOGCS["WGS 84",DATUM["WGS_1984",SPHEROID["WGS
      84",6378137,298.257223563,AUTHORITY["EPSG","7030"]],AUTHORITY["EPSG","6326"
      ]],PRIMEM["Greenwich",0],UNIT["degree",0.0174532925199433],AUTHORITY["EPSG"
      ,"4326"]]',
      'Extent': '-76.4984894, 42.44091207776192, -76.47552643701233,
      42.455634299999986',
      'Legend': [
         {'Area': '100.0 %',
          'Count': 7727,
          'CountAllPixels': 38633,
          'Max': 135.21997985839846,
          'Mean': 125.7345054626465,
          'Min': 116.24903106689453,
          'color': '#ff0000'}, ...
      'Variety': 'NoVariety',
     'pngb64': ' iVBORw0KGgoAAAANSUhEUgAAAP
       gAAACfCAYAAADUIBTpAAAIcUlEQVR4nO3dQXKc=='}}],
'FileName': 'result_raster_dem_20200227133137179747.tif'}
```


Response Parameters

Parameter	Data Type	Description
Features	List	Container for all of the features of the DEM raster.
Features.attributes (F.a)	Dictionary	Each feature in Features has an associated attributes dictionary.
F.a.CellSize	List	Resolution as x,y cell size. In units of projection.
F.a.CoordinateSystem	String	Projection in WKT
F.a.Extent	String	Extent of result geotiff.
F.a.Legend (F.a.L)	List	Each range in the output PNG is represented by a separate dictionary.
F.a.L.Area	String	Percent of total image that the particular range of values covers.
F.a.L.Count	Int	Number of pixels that a particular range takes up in the png.
F.a.L.CountAllPixels	Int	Total number of pixels in the png image.
F.a.L.Max	Float	Maximum value in the range.
F.a.L.Mean	Float	Mean value of the range.
F.a.L.Min	Float	Min value of the range.
F.a.L.color	String	Hex value that is used to display the png image.
F.a.Matrix	List	Dimensions of output image.
F.a.Max	Float	Maximum value of entire raster.
F.a.Mean	Float	Mean value of entire raster.
F.a.Min	Float	Min value of entire raster.
F.a.OID	Int	Deprecated
F.a.Percentile5	Float	5th percentile value.
F.a.Percentile95	Float	95th percentile value.
F.a.Std	Float	Standard deviation of raster values.
F.a.Variet	String	Either Variety or NoVariety. Flag for category or continuous data.
F.a.pngb64	String	The png image returned in base64 encoding.
FileName	String	Name of result raster that was generated in POST request. Used in GET request to retrieve GeoTiff file.
Index_Files	List	List of elevation index files that can be used in GET request to return the GeoTiffs.

GET Request

Request Example

The GET request to retrieve the image using the 'FileName' from the POST response.

```
https://ag-analytics.azure-api.net/dem-service?FileName= result_raster_dem_2020022
7133137179747.tif
```

Request Parameters

Parameter	Data Type	Required?	Default	Options	Description
FileName	text	Yes	--	.tif file	file name returned by POST request

Response Parameters

Parameter	Data Type	Description
file	.tif	Tiff file will be download to the computer of the caller with the name that was used to call the API.

Citations:

- USGS 10 meter DEM Metadata: **U.S. Geological Survey EROS Data Center, 1999, 7.5-minute Digital Elevation Model (10 meter resolution): U. S. Geological Survey, Sioux Falls, SD.**

- Spatial Reference Information: World Geodetic System (WGS 84) - National Geospatial-Intelligence Agency – 1984

Powered By Ag-Analytics

Please contact **support@analytics.ag** or **josh@ag-analytics.org** with any comments or questions.

Terms of Use and Privacy