Connolly_Lab 2_Part1_Exercise2

November 1, 2023

```python
[14]: import zipfile
```

```python
[10]: #First we perform a curl request for the curl data
      !curl -o prismdata.zip https://ftp.prism.oregonstate.edu/normals_4km/ppt/
       ↪PRISM_ppt_30yr_normal_4kmM4_all_bil.zip
```

% Total		% Received % Xferd		Average Speed		Time	Time		Time	Current
				Dload	Upload	Total	Spent		Left	Speed
0	0	0	0	0	0	0	0	--:--:-- --:--:-- --:--:--		0
0	21.1M	0	32768	0	0	72029	0	0:05:07 --:--:--	0:05:07	72495
59	21.1M	59	12.6M	0	0	9151k	0	0:00:02 0:00:01	0:00:01	9168k
100	21.1M	100	21.1M	0	0	11.7M	0	0:00:01 0:00:01	--:--:--	11.7M

```python
[17]: #Next we must unzip the files and save them to a file in our work environment
      zip_file_path = 'prismdata.zip'
      extracted_folder = r"C:\Users\conno\OneDrive\Documents\ArcGIS\Projects\GIS 5571␣
       ↪Lab2_2\PRISM"

      with zipfile.ZipFile(zip_file_path, 'r') as zip_ref:
          zip_ref.extractall(extracted_folder)

      print(f'All files have been extracted to {extracted_folder}')
```

```
All files have been extracted to
C:\Users\conno\OneDrive\Documents\ArcGIS\Projects\GIS 5571 Lab2_2\PRISM
```

```python
[16]: #Now we create a Mosaic dataset
      arcpy.management.CreateMosaicDataset(
          in_workspace=r"C:\Users\conno\OneDrive\Documents\ArcGIS\Projects\GIS 5571␣
       ↪Lab2_2\GIS 5571 Lab2_2.gdb",
          in_mosaicdataset_name="Mosaic",
           ␣
       ↪coordinate_system='GEOGCS["GCS_North_American_1983",DATUM["D_North_American_1983",SPHEROID[
       ↪0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.
       ↪0174532925199433]]',
          num_bands=None,
          pixel_type="",
```

```
        product_definition="NONE",
        product_band_definitions=None
)
```

[16]: `<Result 'C:\\Users\\conno\\OneDrive\\Documents\\ArcGIS\\Projects\\GIS 5571 Lab2_2\\GIS 5571 Lab2_2.gdb\\Mosaic'>`

[18]:
```
#Then, we add the PRISM data to the mosaic
arcpy.management.AddRastersToMosaicDataset(
    in_mosaic_dataset="Mosaic",
    raster_type="Raster Dataset",
    input_path=r"'C:\Users\conno\OneDrive\Documents\ArcGIS\Projects\GIS 5571
 ↪Lab2_2\PRISM'",
    update_cellsize_ranges="UPDATE_CELL_SIZES",
    update_boundary="UPDATE_BOUNDARY",
    update_overviews="NO_OVERVIEWS",
    maximum_pyramid_levels=None,
    maximum_cell_size=0,
    minimum_dimension=1500,
    spatial_reference=None,
    filter="",
    sub_folder="SUBFOLDERS",
    duplicate_items_action="ALLOW_DUPLICATES",
    build_pyramids="NO_PYRAMIDS",
    calculate_statistics="NO_STATISTICS",
    build_thumbnails="NO_THUMBNAILS",
    operation_description="",
    force_spatial_reference="NO_FORCE_SPATIAL_REFERENCE",
    estimate_statistics="NO_STATISTICS",
    aux_inputs=None,
    enable_pixel_cache="NO_PIXEL_CACHE",
    cache_location=r"C:\Users\conno\AppData\Local\ESRI\rasterproxies\Mosaic"
)
```

[18]: `<Result 'Mosaic'>`

[19]:
```
#Next, we calculate a couple fields
arcpy.management.CalculateField(
    in_table=r"Mosaic\Footprint",
    field="Variable",
    expression='"Mosaic"',
    expression_type="PYTHON3",
    code_block="",
    field_type="TEXT",
    enforce_domains="NO_ENFORCE_DOMAINS"
)
arcpy.management.CalculateField(
```

```
        in_table=r"Mosaic\Footprint",
        field="Timestamp",
        expression="DateAdd(Date(1991,0,1), $feature.OBJECTID-1, 'year')",
        expression_type="ARCADE",
        code_block="",
        field_type="DATE",
        enforce_domains="NO_ENFORCE_DOMAINS"
)
```

[19]: `<Result 'Mosaic\\Footprint'>`

```
[21]: #Now after that prep work, we can use the adjusted mosaic to create
      →multidimensional info
      arcpy.md.BuildMultidimensionalInfo(
          in_mosaic_dataset="Mosaic",
          variable_field="Variable",
          dimension_fields="Timestamp # #",
          variable_desc_units=None,
          delete_multidimensional_info="NO_DELETE_MULTIDIMENSIONAL_INFO"
      )
```

[21]: `<Result 'Mosaic'>`

```
[22]: #That multidimensional data can then be used to construct a multidimensional
      →raster
      arcpy.md.MakeMultidimensionalRasterLayer(
          in_multidimensional_raster="Mosaic",
          out_multidimensional_raster_layer="Mosaic_MultidimLayer",
          variables="'Mosaic'",
          dimension_def="ALL",
          dimension_ranges=None,
          dimension_values=None,
          dimension="",
          start_of_first_iteration="",
          end_of_first_iteration="",
          iteration_step=None,
          iteration_unit="",
          template='-125.020833333333 24.0624999997935 -66.4791666661985 49.
      →9375000000005
      →GEOGCS["GCS_North_American_1983",DATUM["D_North_American_1983",SPHEROID["GRS_1980",6378137.
      →0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.
      →0174532925199433]]',
          dimensionless="DIMENSIONS",
          spatial_reference=None
      )
```

[22]: `<Result 'Mosaic_MultidimLayer'>`

```
[7]: #And finally, we use the multidimensional raster to construct a space time cube
     arcpy.stpm.CreateSpaceTimeCubeMDRasterLayer(
         in_md_raster="Mosaic_MultidimLayer",
         output_cube=r"C:\Users\conno\OneDrive\Documents\ArcGIS\Projects\GIS 5571␣
     ↪Lab2_2\PRISM_SPT.nc",
         fill_empty_bins="ZEROS"
     )
```

[7]: <Result 'C:\\Users\\conno\\OneDrive\\Documents\\ArcGIS\\Projects\\GIS 5571
     Lab2_2\\PRISM_SPT.nc'>