Trying to download the PRISM data via bs4

- having issues identifying the link that is used to extract said PRISM zip file

In [1]:
```
import arcpy
import requests
import zipfile
#SUCCESSFULLY installed beautiful Soup!
from bs4 import BeautifulSoup #don't need it
```

Attempt 2: extracting PRISM data via ETL

In [23]:
```
#successfully downloaded all the PRISM data via ETL BUT I had to make a list and extract each file one at a tim
list_of_values= ['01','02','03','04','05','06','07','08','09','10','11','12','14']

#I made a list but had to use a for loop to iterate and extract each file
for value in list_of_values:
    page = requests.get(f"http://services.nacse.org/prism/data/public/normals/4km/ppt/{value}")
    #i know the file name based on previously downloaded prism data (hope this isn't a )
    filename = 'PRISM_ppt_30yr_normal_4kmM2_'+value+'_bil.zip'
    print(filename)
    open(filename, 'wb').write(page.content)
    print("extracting the content...")

    #unzipping and saving the files to a folder within my current working directory
    with zipfile.ZipFile(filename, 'r') as zip_ref:
        zip_ref.extractall('C:/Users/runac/Downloads/Fall_2021/ArcGIS1/Labs/Lab02/Prism_data')
```

```
PRISM_ppt_30yr_normal_4kmM2_01_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_02_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_03_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_04_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_05_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_06_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_07_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_08_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_09_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_10_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_11_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_12_bil.zip
extracting the content...
PRISM_ppt_30yr_normal_4kmM2_14_bil.zip
extracting the content...
```

Making Space Time Cubes

following steps from: https://www.esri.com/arcgis-blog/products/arcgis-pro/analytics/explore-your-raster-data-with-space-time-pattern-mining/

In [6]:
```
#converted 'Raster to Other Format' (bil to tif)-successful
arcpy.conversion.RasterToOtherFormat(r"'C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_
                                     r"C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_da
                                     "TIFF")
```

Out[6]:

Output

Messages

Start Time: Saturday, October 16, 2021 11:43:09 AM
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_01_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_01_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_02_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_02_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_03_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_03_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_04_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_04_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_05_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_05_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_06_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_06_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_07_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_07_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_08_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_08_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_09_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_09_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_10_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_10_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_11_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_11_bil.tif
Successfully converted: C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Prism_data\PRISM_ppt_30yr_normal_4kmM2_12_bil.bil
To C:\Users\runac\Downloads\Fall_2021\ArcGIS1\Labs\Lab02\Converted_Prism_data\PRISM_ppt_30yr_normal_4kmM2_12_bil.tif
Succeeded at Saturday, October 16, 2021 11:43:14 AM (Elapsed Time: 5.59 seconds)

In [10]:
```
#Create a Mosaic Dataset named 'm_12_Precip'
arcpy.management.CreateMosaicDataset(r"D:\Fall 2021\ArcGIS1\Labs\Lab02\Lab02_DNR_lidar\Scratch_Space_lab02\Scra
```

Out[10]:

Output

D:\Fall 2021\ArcGIS1\Labs\Lab02\Lab02_DNR_lidar\Scratch_Space_lab02\Scratch_Space_lab02.gdb\m_12_Precip

Messages

Start Time: Saturday, October 16, 2021 1:22:45 PM
Succeeded at Saturday, October 16, 2021 1:22:51 PM (Elapsed Time: 5.73 seconds)

In [11]:
```
#Add rasters (tifs) to mosaic Dataset 'm_12_Precip'
arcpy.management.AddRastersToMosaicDataset("m_12_Precip", "Raster Dataset", r"'C:\Users\runac\Downloads\Fall_20
```

Out[11]:

Output

a Layer object

Messages

Start Time: Saturday, October 16, 2021 1:23:20 PM
2021-10-16T13:23:22.634: Loading raster datasets
2021-10-16T13:23:22.680: Completed crawling 12 data source items. Added 12 mosaic dataset items.
2021-10-16T13:23:22.682: Synchronizing crawled data source items
2021-10-16T13:23:22.703: Synchronizing items associated with raster type instance 'Raster Dataset' [ID: 1].
2021-10-16T13:23:22.884: Completed synchronization: 12 items selected, 12 items synchronized.
2021-10-16T13:23:23.214: Computing cell size levels
2021-10-16T13:23:23.214: Computing unique cell size values
2021-10-16T13:23:23.292: Computing maximum cell size values
2021-10-16T13:23:23.303: Computing minimum cell size values
2021-10-16T13:23:23.310: Updating visibility values of selected items
2021-10-16T13:23:23.376: Computing maximum cell size for mosaic dataset
2021-10-16T13:23:23.405: Completed computing cell size ranges.
2021-10-16T13:23:23.562: Completed building boundary.
Succeeded at Saturday, October 16, 2021 1:23:24 PM (Elapsed Time: 3.28 seconds)

In [12]:
```
#made a new variable/column named "Random_Variable" ---not sure its necessary ?
#still need to alter code:
arcpy.management.CalculateField(r"m_12_Precip\Footprint", "Variable", '"Random_Variable"', "PYTHON3", '', "TEXT
```

Out[12]:

Output

a Layer object

Messages

Start Time: Saturday, October 16, 2021 1:23:54 PM
Adding Variable to AMD_m_12_Precip_CAT...
Succeeded at Saturday, October 16, 2021 1:23:56 PM (Elapsed Time: 1.55 seconds)

In [13]:
```
#made a new variable/column named "Timestamp_1" ---may alter dates by year instead of month?
#still need to alter code?:
arcpy.management.CalculateField(r"m_12_Precip\Footprint", "Timestamp_1", "DateAdd(Date(1980,0,1), $feature.OBJE
```

Out[13]:

Output

a Layer object

Messages

Start Time: Saturday, October 16, 2021 1:24:20 PM
Adding Timestamp_1 to AMD_m_12_Precip_CAT...
Succeeded at Saturday, October 16, 2021 1:24:21 PM (Elapsed Time: 1.32 seconds)

In [14]:
```
#Build Multidimensional Info
arcpy.md.BuildMultidimensionalInfo("m_12_Precip", "Variable", "Timestamp_1 # #", None)
#arcpy.md.BuildMultidimensionalInfo("m_10_Precip", "Variable", "Timestamp_1 # #", None)
```

Out[14]:

Output

a Layer object

Messages

Start Time: Saturday, October 16, 2021 1:25:20 PM
Succeeded at Saturday, October 16, 2021 1:25:32 PM (Elapsed Time: 11.77 seconds)

Manual Step:

I need to manually Turn Off the 'Layer Time' to 'No Time' (don't know how to do so via code)

In [19]:
```
#convert time enabled data to a Single Time enabled layer
#make sure current Coordinate systme matches "m_12_Precip_MultidimLayer"
arcpy.md.MakeMultidimensionalRasterLayer("m_12_Precip", "m_12_Precip_MultidimLayer", '"Random_Variable"', "ALL'
```

Out[19]:

Output

a Layer object

Messages

Start Time: Saturday, October 16, 2021 2:03:39 PM
Succeeded at Saturday, October 16, 2021 2:03:44 PM (Elapsed Time: 4.94 seconds)

In [2]:
```
#converting the single layer to a SPACE CUBE
arcpy.stpm.CreateSpaceTimeCubeMDRasterLayer("m_12_Precip_MultidimLayer", r"D:\Fall 2021\ArcGIS1\Labs\Lab02\Lab0
```

Out[2]:

Output

D:\Fall 2021\ArcGIS1\Labs\Lab02\Lab02_DNR_lidar\Scratch_Space_lab02\Spacecube_percip_12.nc

Messages

Start Time: Saturday, October 16, 2021 10:20:09 PM
WARNING 110290: This tool requires projected data to accurately measure distances. The Input Multidimensional Raster Layer will be projected to the WGS 1984 World Equidistant Cylindrical projection (WKID 4087).
WARNING 110296: The Input Multidimensional Raster Layer contains irregular time intervals. The data has been binned into regular intervals of 2505600 seconds.
WARNING 110013: The default Time Step Interval is 29 days.
WARNING 110067: Your spatial reference is not compatible with CF Conventions. You may experience difficulties using the resulting space-time cube with other NetCDF tools and software.

---------- Space Time Cube Characteristics -----------
Input feature time extent 1980-01-01 06:00:00
to 1980-12-01 06:00:00

Number of time steps 12
Time step interval 29 days
Time step alignment End

First time step temporal bias 44.83%
First time step interval after
1979-12-19 06:00:00
to on or before
1980-01-17 06:00:00

Last time step temporal bias 0.00%
Last time step interval after
1980-11-02 06:00:00
to on or before
1980-12-01 06:00:00

Cube extent across space (coordinates in meters)
Min X -13894065.6611
Min Y 2708362.4449
Max X -7451448.3422
Max Y 5478284.6852

Locations 481631
Total observations 5779572

-- Overall Data Trend - RANDOM_VARIABLE_NONE_ZEROS ---
Trend direction Not Significant
Trend statistic -0.0686
Trend p-value 0.9453

Succeeded at Saturday, October 16, 2021 11:23:29 PM (Elapsed Time: 1 hours 3 minutes 20 seconds)

In [ ]: