Python Script Presentation:

16/03/2024,
Sir Ian Wood House,
Aberdeen

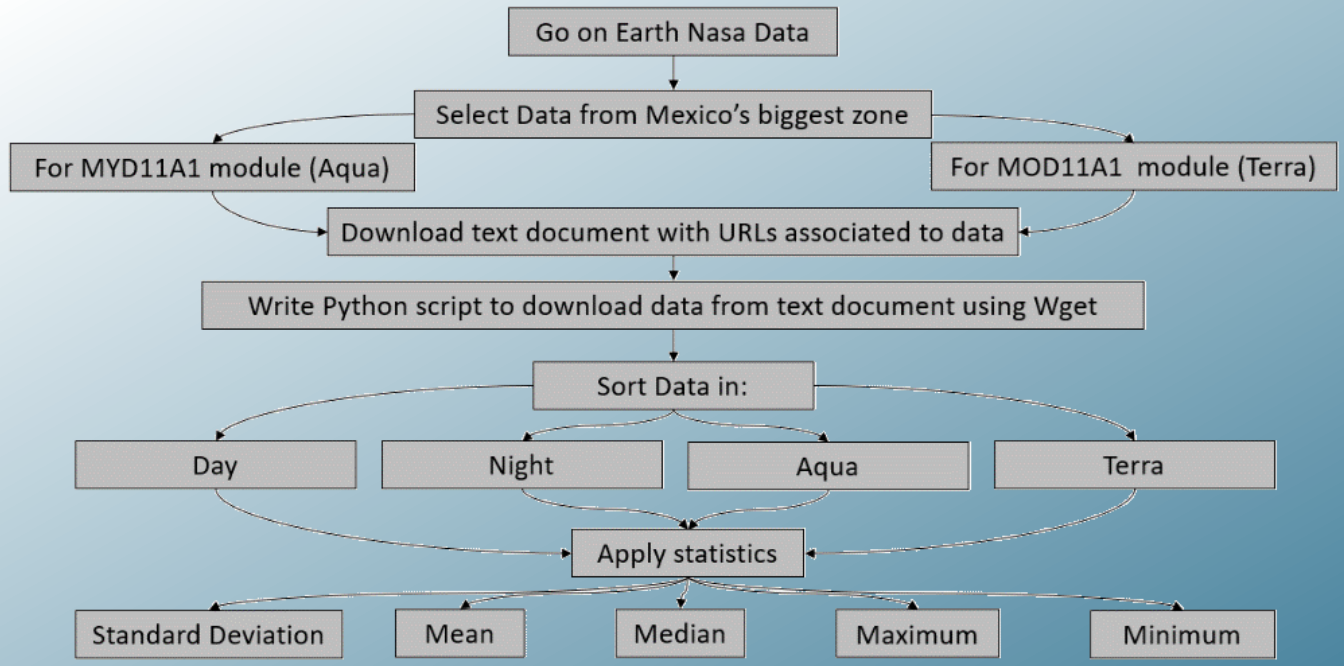
Using ArcPy for Advanced Map Algebra applications

Spectrophotometer data from Mexico

Presenter:
Nicolas Lopez
Interviewers:
Annie Barclay
Kirsty Langdon
Andrew Mills

wood.

Aim of the code:



Packages

```
##Import librairies
import arcpy
import os
from arcpy.sa import *
```

ArcPy

Arcpy.sa – Spatial Analyst Module

Os – Miscellaneous operating system interfaces

Wget

Script Part 1

```
#download and sort the Data from Earth Data
os.system('D:/wget.exe -P D:/Terra --user "username" --password
"password" -i D:/Terra.txt')
os.system('D:/wget.exe -P D:/Aqua --user "username" --password
"password" -i D:/Aqua.txt')
print("Download completed")

##Enlist the HDF files from the raw data folder for Terra
arcpy.env.workspace ="D:/Terra/"
hdfList = arcpy.ListRasters()

##Extract the day time temperature layers for Terra
os.mkdir("D:/Terra_Day/")
rootPath = "D:/Terra/"
outputPath = "D:/Terra_Day/"
for filename in hdfList:
    arcpy.ExtractSubDataset_management(in_raster=rootPath+filename,
out_raster=outputPath+filename[8:-29]+".tif", subdataset_index="0")
```

Repeated for Aqua

Repeated for Night

Script Part 2

```
##Create a mean of day time and night time raster files for Terra
arcpy.env.workspace = "D:/Terra_Day/"
Terra_Day = arcpy.ListRasters("*", "TIF")
arcpy.env.workspace = "D:/Night/"
Terra_Night = arcpy.ListRasters("*", "TIF")
os.mkdir("D:/Terra_mean/")
arcpy.env.workspace = "D:/Terra_mean/"
for (i,j) in zip(Terra_Day,Terra_Night):
    outCellStats = CellStatistics([f'D:/Terra_Day/{i}', f'D:/Terra_Night/{j}'], "MEAN",
"NODATA")
    outCellStats.save(f"D:/Terra_mean/{i}")
##Apply the scale factor to convert the pixel values to celcius for Terra
arcpy.env.workspace = "D:/Terra_mean/"
rootPath = "D:/Terra_mean/"
os.mkdir('D:/Terra_celcius/')
outPath = ("D:/Terra_celcius/")
rasterList = arcpy.ListRasters("*", "TIF")
for filename in rasterList:
    output_raster = (arcpy.sa.Raster(filename)*0.02)-273.15
    output_raster.save(outPath+filename)
##Create a new raster with pixelwise stdv for Aqua mean
arcpy.env.workspace =
"D:/Python_GIS/GG5569/Assesment_1/Assesment1_Data/Aqua_celcius/"
Kel_rasterList = arcpy.ListRasters("*", "TIF")
Outcellstats = CellStatistics(Kel_rasterList, "STD", "DATA")
Outcellstats.save("D:/Python_GIS/GG5569/Assesment_1/Assesment1_Data/Aqua_celcius/
STD.tif")
```

Repeated for Aqua, Aqua-terra combination, Day and Night

Repeated for Aqua, Daily combined, Day and Night

Repeated for Aqua, Daily combined, Day and Night And MAXIMUM, MINIMUM, Annual MEAN, MEDIAN, PERCENTILE,

Results

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Thank you

Slides and Script available at nicolaslopez.me

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