

Average Tmin

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Project outlook

This project looks into the history of 1991 to 2020 for analyzing the minimum daily average temperature. Using `netCDF` files, I will pull daily data from a monthly grid to provide for the result. What will be important to note for the following data analysis is to create a loop that will show all of the months, years, and the daily average temp for them.

Set working directory

This will be my working directory and the following libraries that I will be using.

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```
knitr::opts_chunk$set(echo = TRUE)
setwd("D:/NOAA_Internship/NERTO/NetCDF_files_tmin/")
```

Warning: The working directory was changed to D:/NOAA_Internship/NERTO/NetCDF_files_tmin inside a notebook chunk. The working directory will be reset when the chunk is finished running. Use the `knitr root.dir` option in the setup chunk to change the working directory for notebook chunks.

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```
library(ncdf4) # package for the netcdf manipulation
library(raster) # package for the raster manipulation
library(rgdal) # package for geospatial analysis
library(ggplot2) # package for plotting
library(Thermimage)
library(maptools)
library(maps)
library(sp)
library(dplyr)
library(ncdfgeom)
library(reshape)
library(lattice)
library(RColorBrewer)
library(weathermetrics)
library(devtools)
library(lubridate)
library(percentiles)
```

Loop for days!

We are going to do a loop in the chunk so that way we can account for all days of the month for 30 years. Note: Leap year or the 29th day will not be included in this script as it is not relevant right now. This will print out `tifs` as well for further analysis. For further analysis, I will be using the package called `percentiles` for determining the 95% value of max temperatures. Eventually this will be needed to conduct a vulnerability index and will be mapped in `Qgis` later on.

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```

for (input_month in 1:12) { #for this we want our months to be 1-12 since all of this data is im
portant
  regex <- paste("*.sprintf("%02i",input_month),"-grd-scaled.nc",sep = "")
  print(regex)

  flist=list.files(path = "D:/NOAA_Internship/NERTO/NetCDF_files_tmin/",pattern=regex)

  file_counter=0
  for (file in flist) {
    infile=paste(path = "D:/NOAA_Internship/NERTO/NetCDF_files_tmin/",file,sep = "")
    print(infile)
    nc <- nc_open(infile)
    tmin <- ncvar_get(nc, "tmin")
    if (input_month==2){
      tmip_slice <- tmin[, ,1:28] #here we want to make a for statment because Feb has only 28 d
ays. Since it is different and the dims are 31 we want to slice it.
    }
    else{
      tmip_slice <- tmin[, ,]
    }

    if (file_counter==0) {
      lat <- ncvar_get (nc, "lat")
      lon <- ncvar_get (nc, "lon")
      sum <- tmip_slice
    } else {
      sum=sum+tmip_slice
    }
    #print(as.vector(sum[300,300]))
    #image(lon,lat,tmp_slice, col=rev(brewer.pal(10,"RdBu")))
    #print(file_counter)
    #nc_close(file)
    file_counter=file_counter+1
  }
  num_days <- dim(sum)[3]
  for (input_day in 1:num_days) {
    #print(input_day)
    sum_slice <- sum[, ,input_day]

    avg=sum_slice/30
    #image(lon,lat,avg, col=rev(brewer.pal(10,"RdBu")))
    #print(min(lon))
    tmin_raster <- raster((avg), xmn=min(lat), xmx=max(lat), ymn=min(lon), ymx=max(lon), crs=CRS
("+proj=longlat +ellps=WGS84 +datum=WGS84 +no_defs+ towgs84=0,0,0"))
    tmin_raster <- t(flip(tmin_raster,1))
    #plot(tmax_raster)
    outfile=paste("D:/NOAA_Internship/NERTO/Average Min Temps Tifs/tmin_1991-2020_avg_",sprintf
("%02i",input_month),sprintf("%02i",input_day),".tif",sep = "")
    print(outfile)
    writeRaster(tmin_raster, outfile, "GTiff", overwrite=TRUE)
  }
}

```

	}
	}

[illegible]

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file:///D:/NOAA_Internship/NERTO/Mini Projects/Average_Min_Temps.nb.html

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```
[1] "D:/NOAA_Internship/NERTO/Average Min Temps Tifs/tmin_1991-2020_avg_1223.tif"
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[1] "D:/NOAA_Internship/NERTO/Average Min Temps Tifs/tmin_1991-2020_avg_1225.tif"
[1] "D:/NOAA_Internship/NERTO/Average Min Temps Tifs/tmin_1991-2020_avg_1226.tif"
[1] "D:/NOAA_Internship/NERTO/Average Min Temps Tifs/tmin_1991-2020_avg_1227.tif"
[1] "D:/NOAA_Internship/NERTO/Average Min Temps Tifs/tmin_1991-2020_avg_1228.tif"
[1] "D:/NOAA_Internship/NERTO/Average Min Temps Tifs/tmin_1991-2020_avg_1229.tif"
[1] "D:/NOAA_Internship/NERTO/Average Min Temps Tifs/tmin_1991-2020_avg_1230.tif"
[1] "D:/NOAA_Internship/NERTO/Average Min Temps Tifs/tmin_1991-2020_avg_1231.tif"
```