Istanbul Technical University

Edirne Water Balance

Course Code: INS354E

Course Name: Hydrology

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Final Report: Analysis of Climate Data for Edirne Province

1 Introduction

Climate change poses significant challenges globally, with cities like Edirne experiencing its impacts. This report presents an analysis of climate data for Edirne province, focusing on precipitation and potential evaporation.

2 Methodology

2.1 Downloading Required Applications

- QGIS 3.16 was obtained from `https://download.osgeo.org/qgis/windows/`.
- NASA Panoply version 5.3.3 was downloaded from `https://www.giss.nasa.gov/tools/panoply/download/` as a zip file.
- Ubuntu 20.04.6 LTS was acquired from the Microsoft Store. Installation was done following instructions from `https://stackoverflow.com/questions/73232593/ubuntu-20-04-lts-wslregisterdistribution-`

2.2 Finding Coordinates and Data

- City-district borders map was downloaded from Turkey General Directorate of Mapping and opened in QGIS.
- Coordinate reference system was changed to WGS 84 EPSG:4326.
- Borders were converted into points using ”Extract vertices” from the toolbox.
- Coordinates were obtained from the endpoints of the map and rounded. Minimum and maximum lag lengths and latitudes were calculated.

2.3 Capturing and Processing Data via CDO

2.3.1 Potential Evaporation Values

1. Obtained path using ”wslpath ’C:\ITU\INS 354E\project\Potential evaporation’”.
2. Navigated to the directory using ”cd ’/mnt/c/ITU/INS 354E/project/Potential evaporation’”.
3. Defined the region of interest using ”cdo sellonlatbox,26.00,27.00,41.50,42.00 pet_TR.nc edirne_pet.nc”.
4. Calculated monthly sums using ”cdo monsum edirne_pet.nc monsum_pet.nc”.
5. Calculated field mean using ”cdo fldmean monsum_pet.nc petTimeSeries.nc”.
6. Obtained yearly sums using ”cdo ymonsum edirne_pre.nc ymonsum_pre.nc”.

2.3.2 Total Precipitation Values

1. Navigated to the directory using ”cd ’/mnt/c/ITU/INS 354E/project/Total precipitation’”.
2. Defined the region of interest using ”cdo sellonlatbox,26.00,27.00,41.50,42.00 pre_TR.nc edirne_pre.nc”.
3. Calculated monthly sums using ”cdo monsum edirne_pre.nc monsum_pre.nc”.
4. Calculated field mean using ”cdo fldmean monsum_pre.nc preTimeSeries.nc”.
5. Obtained yearly sums using ”cdo ymonsum edirne_pre.nc ymonsum_pre.nc”.

2.4 Viewing in Panoply and Making a Table in Excel

- Data obtained from CDO were visualized using NASA Panoply.
- Excel was used to create a table summarizing the obtained data.

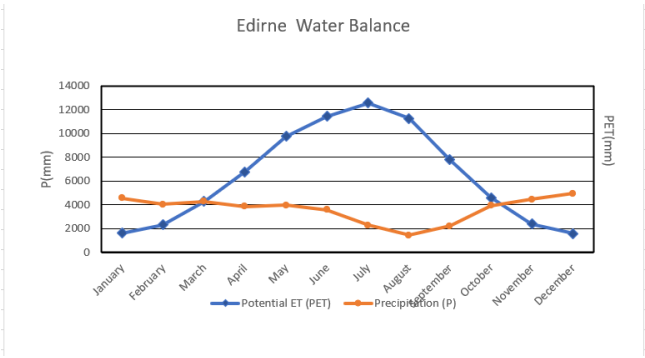

Figure 1: Enter Caption

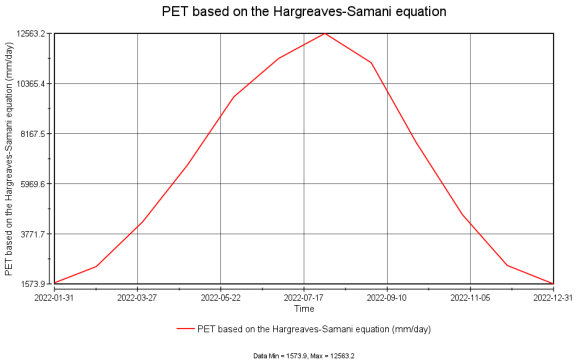

Figure 2: Enter Caption

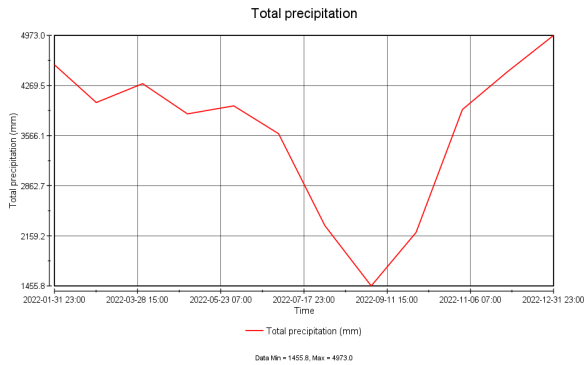

Figure 3: Enter Caption