

CMSC 6950 Final Project - pymagicc

Behnam Farhadi

June 2021

1 Introduction

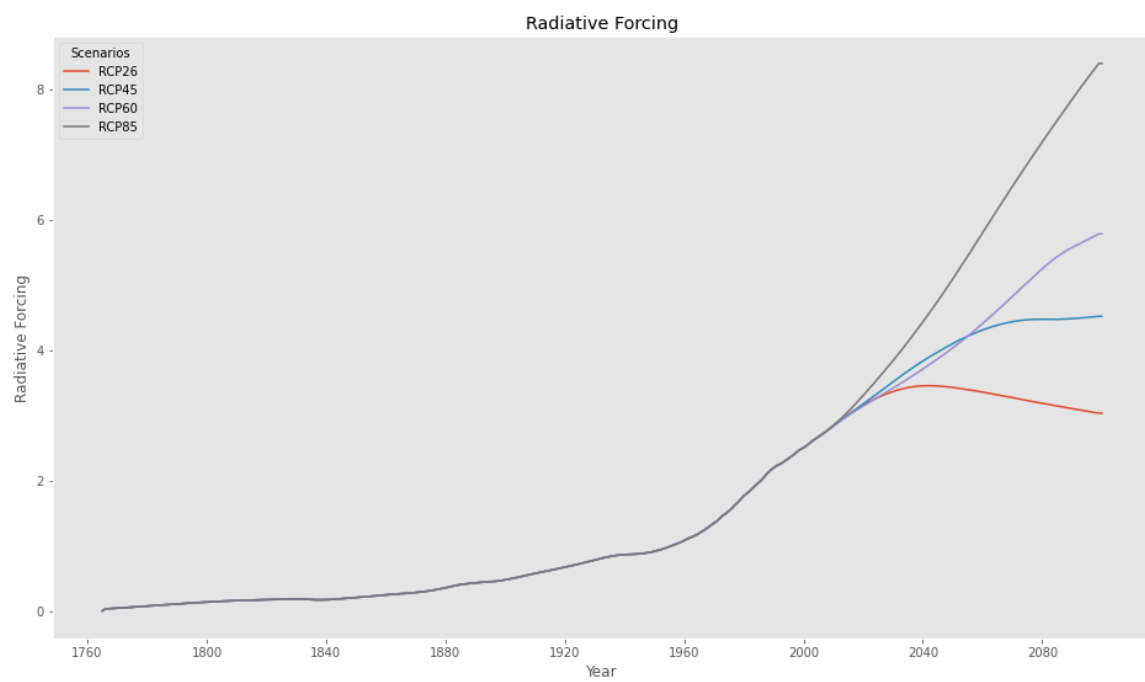
Pymagicc[1] is a Python interface for the Fortran-based reduced-complexity climate carbon cycle model MAGICC (Meinshausen, Raper, and Wigley 2011). Aiming at broadening the user base of MAGICC1, Pymagicc provides a wrapper around the MAGICC binary, which runs on Windows and has been published under a Creative Commons Attribution. NonCommercial-ShareAlike 3.0 Unported License. Pymagicc itself is licensed under the GNU Affero General Public License v3.0.

2 Tasks

This project utilises the Pymagicc module to achieve the below computational tasks and visualizations.

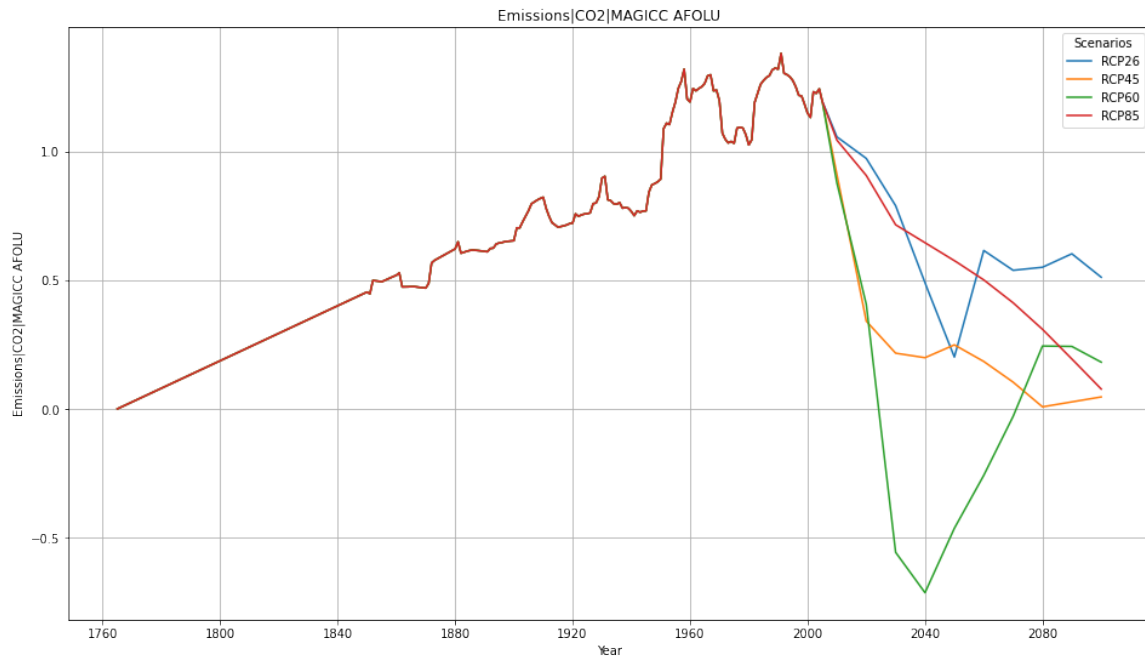
2.1 Task 1- Generate Radiative Forcing—Greenhouse Gases vs year

In this task, we read data from RCP26, RCP45, RCP60, RCP,85 scenario files, convert the data in MAGICData format to a pandas DataFrame, and then build visualizations to show Radiative Forcing—Greenhouse Gases for RCP26, RCP45, RCP60 and RCP 85 scenarios based on each year.



2.2 Task 2- Generate Emissions—CO₂—MAGICC AFOLU vs Year

In this task, we run the MAGICC model on RCP26, RCP45, RCP60 and RCP85 scenarios and visualize the Emissions—CO₂—MAGICC AFOLU projections for each of the given projections from 1765 to 2100.



3 Install

First, we have to download the Miniforge3-Linux-x86_64 from below link:

https://github.com/conda-forge/miniforge/releases/latest/download/Miniforge3-Linux-x86_64.sh

Then, we install it by this command: `bash Miniforge3-Linux-x86_64.sh`

and then:

```
conda install matplotlib pandas seaborn notebook pymagicc
```

then:

```
sudo apt-get update
```

```
and:sudo dpkg --add-architecture i386
```

last:

```
sudo apt-get install wine
```

Our environment for run pymagicc is ready know.

References

- [1] Robert Gieseke, Sven N. Willner, and Matthias Mengel. Pymagicc: A python wrapper for the simple climate model magicc. *Journal of Open Source Software*, 3(22):516, 2018.