

Supplementary information for MYRIAD-SIM code

The MYRIAD-SIM code and files will be made available on GitHub and archived on Zenodo upon acceptance of the paper. Throughout the review process, the code is shared as a supplementary file. The following sections describe the content of the supplementary materials

The Python code

MYRIAD-SIM has been coded in python. The *code* folder includes several codes needed to fit and run the model. Table 1. shows the different code files and their purpose.

Table 1

File name	Purpose
bestfitdist.py	Fits the distributions for each variable in each grid for each month.
converttouniform.py	Converts the original data to uniform margins using their best fit distribution.
fitmodel.py	Fits the vine copula model to the different variables for each month.
runmodel.py	Runs the model to generate the synthetic data.
converttouniformoutput.py	Converts the synthetic data from the uniform margins to the original data space using the best fit distributions.

In order to run the codes a Python environment that includes all the needed packages and dependencies can be installed using the *myriadsim_env.yml* file which can be installed using the following instructions:

- 1) Open Anaconda Prompt
- 2) Locate the MYRIAD-SIM folder by typing `cd 'insert part to your folder here'`
- 3) Install the environment using this command: `conda env create -f myriadsim_env.yml`

Training data

The training data used for this model can be found in the *data* folder. This is also where the outputs of the *converttouniform.py* are stored.

Model files

The outputs of the *bestfitdist.py* code, the distributions for each variable, are stored in the *varpar* folder. The outputs of the *fitmodel.py* code, the different vine copula structures that were fit to the data, are stored in the *modelpar* folder.

Output files

The output files generated by the *runmodel.py* code are stored in the *outputall* folder. Here there is just an example of three days. The full dataset described in the paper is already publicly available on Zenodo (<https://doi.org/10.5281/zenodo.14979282>).