Terrestrial Ecosystem Model in R (TEMIR) version 1.1 Manual

§1 – Setup

## Step 1 – Downloading TEMIR

Download the master version (v1.1) of TEMIR which is the up to date and tested version from github link consisting of directories, R scripts and files as follows:

* parent directory (*TEMIR*)
  + code subdirectory (*code\_ v1.0*)
    - *initialize\_TEMIR\_v1.0.R*
    - *execution\_v1.0.R*
    - *input\_TEMIR\_ecophysiol.R*
    - *PFT\_surf\_data.R*
    - *Farquhar\_Ball\_Berry.R*
    - *FLUXNET\_functions.R*
    - *drydep\_toolbox.R*
    - *Monin\_Obukhov.R*
    - *radiative\_transfer.R*
    - *simulate\_ij.R*
    - *tools.R*
    - *geophys\_const.R*
    - *find\_hist\_stat.R*
    - *TEMIR\_manual\_v1.0.docx*
* starter data directory (*TEMIR\_inputs*)
  + directory that contains sample data for test run of TEMIR after installation for days 20090601 and 20090602

The default settings of TEMIR is fully functional using the starter data directory (*TEMIR\_inputs*) so testing is possible without completing the remaining steps §1:2-4 in.

## Step 2 – Downloading surface data

1. Download surface data from TGABI (<https://www.dropbox.com/sh/f2hhhhsu9a9g7ec/AABeHlMbZGYwEL4hiOI61KjCa?dl=0>) or CESM data repository directly

## Step 3 – Downloading meteorological data

1. Download meteorological data from TGABI (<https://www.dropbox.com/sh/dqqs4g8lhdu2z27/AAB9WkkzPYSElD2ouur-yz3ba?dl=0>) or GEOS-Chem MERRA-2 repository

## Step 4 (Optional) – Downloading Fluxnet data

1. Download data for the particular Fluxnet site

§2 – Initialization

Note: All directory paths must end with a forward slash “/”

## Step 1 – Set directories

1. Open the script *execution\_v1.0.R* in the code subdirectory *code\_v1.0* in the parent directory *TEMIR*
2. Set the paths to the relevant directories listed at the top of the script *execution\_v1.0.R* and create any of these directories if they do not exist yet
3. Also make sure you have installed all the packages needed for TEMIR specified at the top of *execution\_v1.0.R*.

## Step 2 – Initialize TEMIR

1. Go to the code subdirectory *code\_v1.0* in the *TEMIR* parent directory
2. Open script *initialize\_TEMIR\_v1.0.R*
3. Set the path to the *TEMIR* parent directory at the top of the script *initialize\_TEMIR\_v1.0.R*, which has to be exactly the same as the path set in the script *execution\_v1.0.R*
4. Set the simulation name according to your own choice, e.g., *my\_simulation*
5. Set the relevant simulation flags to TRUE as needed
6. Run the script *initialize\_TEMIR\_v1.0.R*
7. Doing the above would create a simulation directory *my\_simulation* within the *TEMIR* parent directory, which would contain the copies of the files:
   * execution script *execution\_v1.0.R*
   * input scripts (eg. *input\_TEMIR\_ecophysiol.R*)
   * data analysis script *find\_hist\_stat.R*

and subdirectories:

* + *hist\_data* to contain simulated outputs
  + *temp­\_data* to contain temperature files

§3 – Execution

## Step 1 – Set inputs

1. Open the simulation directory *my\_simulation* within the *TEMIR* parent directory
2. Open the input script *input\_TEMIR\_ecophysiol.*R within *my\_simulation* and set options and variables according to your desired configuration

## Step 2 – Run simulation

1. Run the script *execution\_v1.0.R* within *my\_simulation*

## Step 3 – Output results

1. Find simulated results and possible errors in the *hist\_data* directory within *my\_simulation*