**Tools of the Trade: WRF**

**Brief Overview**

The Weather, Research, and Forecasting (WRF) model is a numerical weather prediction model. There are two main features of WRF: WRF Preprocessing System (WPS) and the main WRF program. In order to install WRF and WPS, the following programs are required on your system:

* netcdf
* mpich
* JasPer
* Libpng
* zlib

WPS is where the simulation domain is defined. The terrain information does have to be installed separately, but is available from the WRF download site. After installation of WPS, three executables will appear:

1. geogrid.exe: Introduce terrain, landuse, soil type onto the domain
2. ungrib.exe: “de-grib” files that have initial conditions
3. metgrid.exe: Interpolate initial condition data to simulation domain

The last executable, metgrid.exe, will produce met\_em\* files.

After successful installation of WRF, two executables will appear:

1. real.exe
2. wrf.exe

The met\_em\* files produced in WPS will be used for real.exe, which produces two files that are used for wrf.exe. After wrf.exe is successfully run, netcdf files with data from the model run will be produced (wrfout\*). These should be run through a post-processor to align all parameters on the same grid, as wrf.exe produces a staggered grid.

The best resources to guide you through the installation and process is the online tutorial. There is also an in-person tutorial that is provided twice a year in Boulder, provided by the scientists that have developed and supported WRF.

**Resources and Helpful Links**

**Download WRF, WPS, UPP, and terrain data**

Must register, afterwards you will always be able to access WRF downloads (for annual upgrades, putting on a new system, etc.) using your email address: <http://www2.mmm.ucar.edu/wrf/users/download/get_source.html>

**Guides for installation**

User manual: <http://www2.mmm.ucar.edu/wrf/users/docs/user_guide_V3/contents.html>

User tutorial: <http://www2.mmm.ucar.edu/wrf/OnLineTut>orial/Introduction/start.htm

Developmental Testbed Center: <https://dtcenter.org>

**WRF Help**

WRF User forum: <http://forum.wrfforum.com>

**The WRF in-person user tutorial**

This site also hosts all presentations from every tutorial given: <http://www2.mmm.ucar.edu/wrf/users/supports/tutorial.html>

**Stay informed!**

Subscribe to wrf-news: <http://mailman.ucar.edu/mailman/listinfo/wrf-news>

Subscribe to wrf-users: <http://mailman.ucar.edu/mailman/listinfo/wrf-users>

**Models for initial conditions**

HRRR: http://www.nco.ncep.noaa.gov/pmb/products/hrrr/

GFS: http://www.nco.ncep.noaa.gov/pmb/products/gfs/

**Post Processors:**

Unified Post-Processor (<http://www2.mmm.ucar.edu/wrf/users/download/get_source.html>)

RIP4 (<http://www2.mmm.ucar.edu/wrf/users/docs/ripug.htm>)

NCAR Graphics Command Language (<http://www.ncl.ucar.edu>)

VAPOR (<https://www.vapor.ucar.edu/gallery/weather>)

IDV (<https://www.unidata.ucar.edu/software/idv/)>