



# WRF Domain Wizard

A GUI for the WRF Preprocessing System

## WRF Portal

A GUI for running WRF

Presented by Jeff Smith

Developed by: Mark Govett, Paula McCaslin, Craig Mattocks, Jeff Smith

July 17, 2009



NOAA's Earth System Research Lab in Boulder, CO



# What is WRF Domain Wizard?

- The graphical user interface for WPS
- Used to
  - ☐ Define the region and projection of a domain on map
  - ☐ Define any nests
  - ☐ Write information to namelist.wps
  - ☐ Write information to namelist.input
  - ☐ Run the WPS programs
  - ☐ Visualize the netCDF output files
- Version 1.41 released on July 8, 2009



# WRF Domain Wizard Technical Info -1

## ■ Software is written in Java

- ☐ Minimum (Java) JRE 1.5
- ☐ JRE 1.6 recommended for best performance
- ☐ Runs on local computer or remote computer
- ☐ Uses SFTP/SSH-2 to connect to remote computers
- ☐ Can be run “locally” on a remote computer with X display forwarding
- ☐ Can be run from web page as a Java Web Start app or download .zip file and run from the command line
- ☐ 390 MB of RAM (memory) available
- ☐ 1024 x 768 (or better) video display

## ■ Does not include WPS (must download/compile that separately)



# WRF Domain Wizard Technical Info -2

## ■ WDW supports

- ☐ WPS/WRF 2.x
- ☐ WPS/WRF 3.x
- ☐ ARW
- ☐ NMM
- ☐ HWRF (Hurricane WRF)
- ☐ Nests
- ☐ Projections
  - Lambert Conformal
  - Polar Stereographic
  - Mercator
  - Lat-Lon Regional (WPS 3.x)
  - Lat-Lon Global (WPS 3.x)
  - Rotated Lat-Lon for NMM

# <http://www.wrfportal.org/DomainWizard.html>

WRF Domain Wizard - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://wrfportal.org/DomainWizard.html

Google

WRF Portal

Home | Contact Us

## WRF Domain Wizard

Home

WRF Portal

Domain Wizard

Tutorials (HTML)

Tutorials (Video)

F.A.Q.

About

NOAA

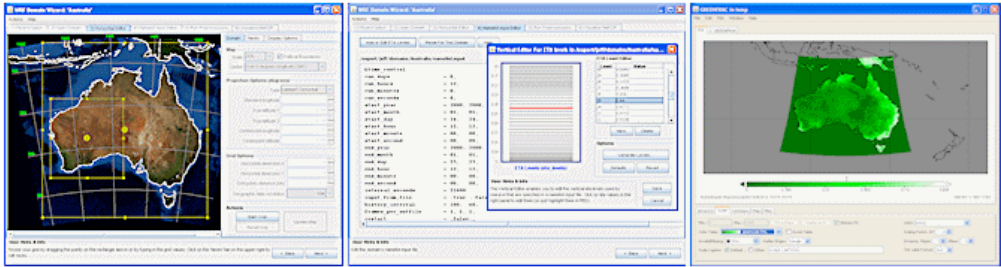
Disclaimer  
Privacy Policy

NOAA website  
ESRL website  
FSL website

Accessibility  
statement

### WRF Domain Wizard

GUI for the WRF Preprocessor System (WPS) and namelist.input  
Version 1.41 for Linux, AIX, Mac, and Windows - released July 8, 2009



WRF Domain Wizard is the successor to the [WRFSL GUI](#) and is a graphical user interface (GUI) for the new [WRF](#) Preprocessing System ([WPS](#)). It enables users to easily define and localize domains (cases) by selecting a region of the Earth and choosing a map projection. Users can also define nests using the nests editor, edit `namelist.input`, run the WPS programs (`geogrid`, `ungrib`, and `metgrid`) through the GUI, and visualize the NetCDF output. WRF Domain Wizard is also a built-in component of [WRF Portal](#). WRF Domain Wizard stores its information in the standard WPS file, `namelist.wps`.

WRF Domain Wizard can be run as a stand-alone application or it can be run from inside the [WRF Portal](#) application. There are two ways to launch the standalone version of WRF Domain Wizard: by downloading the application and unzipping it, or by launching it with Java Web Start. The advantages of running the Java Web Start version include being able to run it without doing an installation, and automatically receiving program updates. Having trouble running Domain Wizard? Please read the [FAQ](#) or [troubleshooting tips](#).

Source Code is available [here](#). Looking for the special version for LEAD? Go [here](#).  
What's [new in version 1.41](#)

#### Run WRF Domain Wizard using Java Web Start

[Click here to launch WRF Domain Wizard version 1.41](#)  
Requires Java 5 or later (go [here](#) if you can only run Java 1.4).

Done



# WRF Domain Wizard – How to Run

## ■ Run using Java Web Start (JWS)

- JWS automatically downloads your software then runs it. No need to set up directories, run installation programs, or configure anything. Just click the link and the program runs.
  - The first time you click on the link, there is a delay while the software downloads
  - When you click the link in the future, if the software has been updated, you automatically received the updated portion
- Java and Java Web Start (javaws) come standard with Linux and Mac. If you don't have Java on your system, download a Java Runtime Edition (JRE) from Sun

# WRF Domain Wizard – How to Run

WRF Domain Wizard - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://wrfportal.org/DomainWizard.html

WRF Portal Home | Contact Us

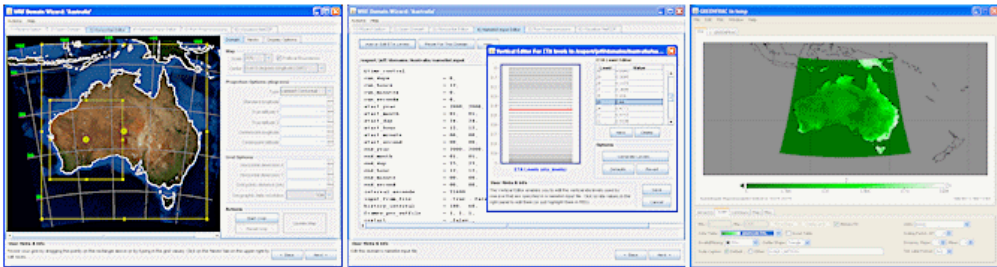
## WRF Domain Wizard

Home  
WRF Portal  
Domain Wizard  
Tutorials (HTML)  
Tutorials (Video)  
F.A.Q.  
About

NOAA  
Disclaimer  
Privacy Policy  
NOAA website  
ESRL website  
FSL website  
Accessibility statement

### WRF Domain Wizard

GUI for the WRF Preprocessor System (WPS) and namelist.input  
Version 1.41 for Linux, AIX, Mac, and Windows - released July 8, 2009



WRF Domain Wizard is the successor to the [WRFSL GUI](#) and is a graphical user interface (GUI) for the new [WRF](#) Preprocessing System ([WPS](#)). It enables users to easily define and localize domains (cases) by selecting a region of the Earth and choosing a map projection. Users can also define nests using the nests editor, edit `namelist.input`, run the WPS programs (`geogrid`, `ungrib`, and `metgrid`) through the GUI, and visualize the NetCDF output. WRF Domain Wizard is also a built-in component of [WRF Portal](#). WRF Domain Wizard stores its information in the standard WPS file, `namelist.wps`.

WRF Domain Wizard can be run as a stand-alone application or it can be run from inside the [WRF Portal](#) application. There are two ways to launch the standalone version of WRF Domain Wizard: by downloading the application and unzipping it, or by launching it with Java Web Start. The advantages of running the Java Web Start version include being able to run it without doing an installation, and automatically receiving program updates. Having trouble running Domain Wizard? Please read the [FAQ](#) or [troubleshooting tips](#).

Source Code is available [here](#). Looking for the special version for LEAD? Go [here](#).  
What's [new in version 1.41](#)

**Run WRF Domain Wizard using Java Web Start**

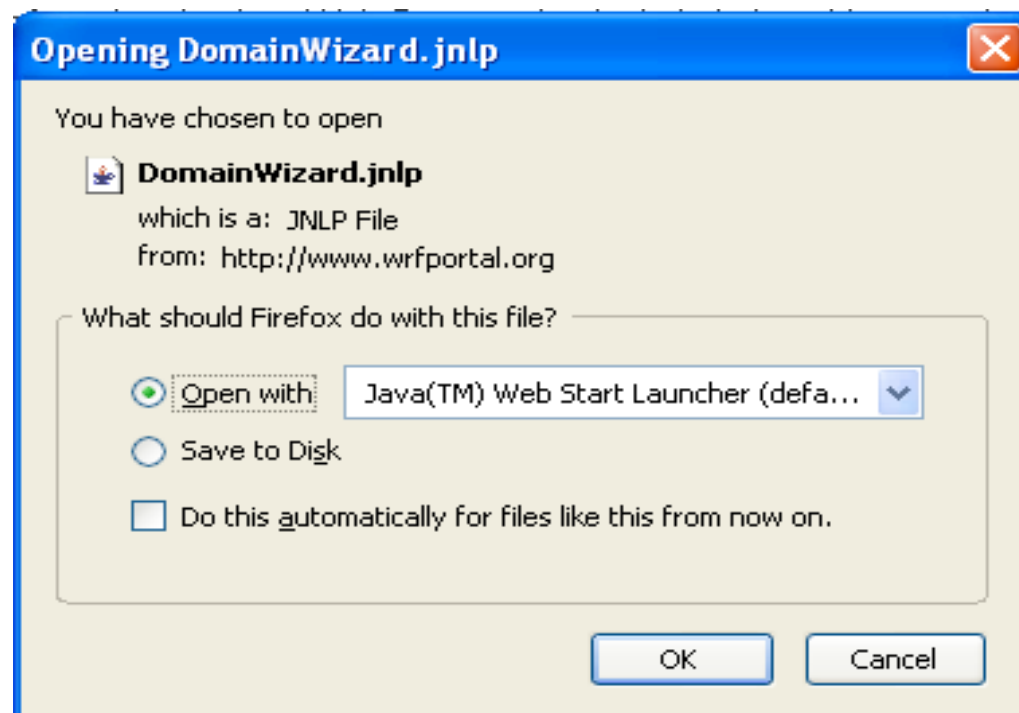
[Click here to launch WRF Domain Wizard version 1.41](#)  
Requires Java 5 or later (go [here](#) if you can only run Java 1.4).

Click Here

Done

# WRF Domain Wizard – How to Run

- Run using Java Web Start





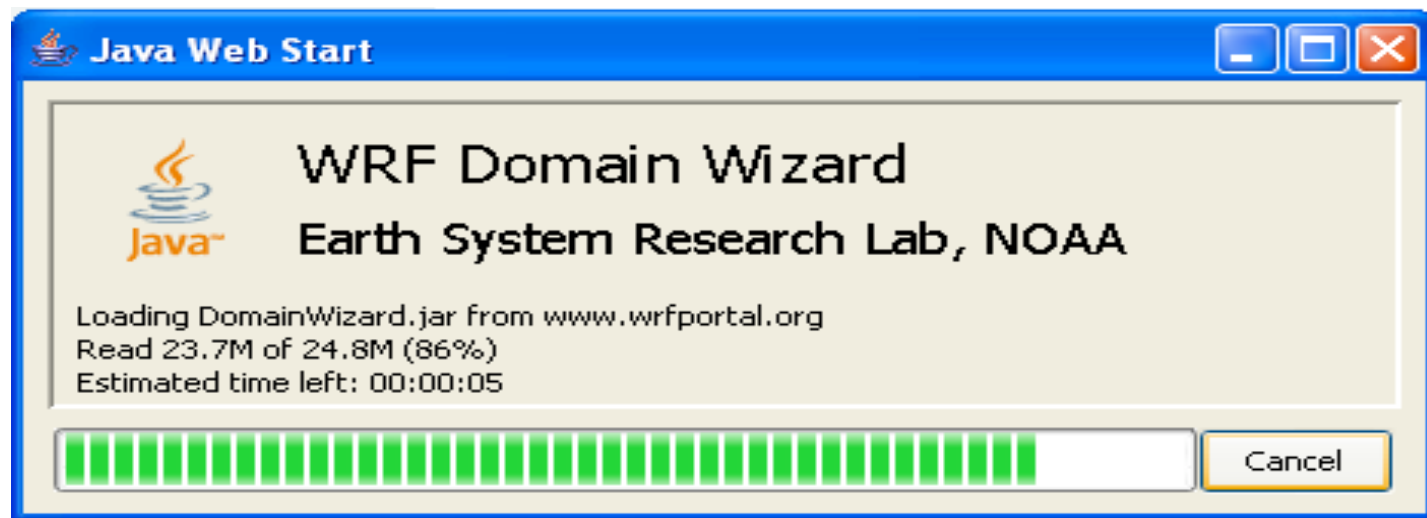
# WRF Domain Wizard – How to Run

- Run using Java Web Start



# WRF Domain Wizard – How to Run

- Run using Java Web Start



# WRF Domain Wizard – How to Run

- Run using Java Web Start



Trust us, we're the United States Government.

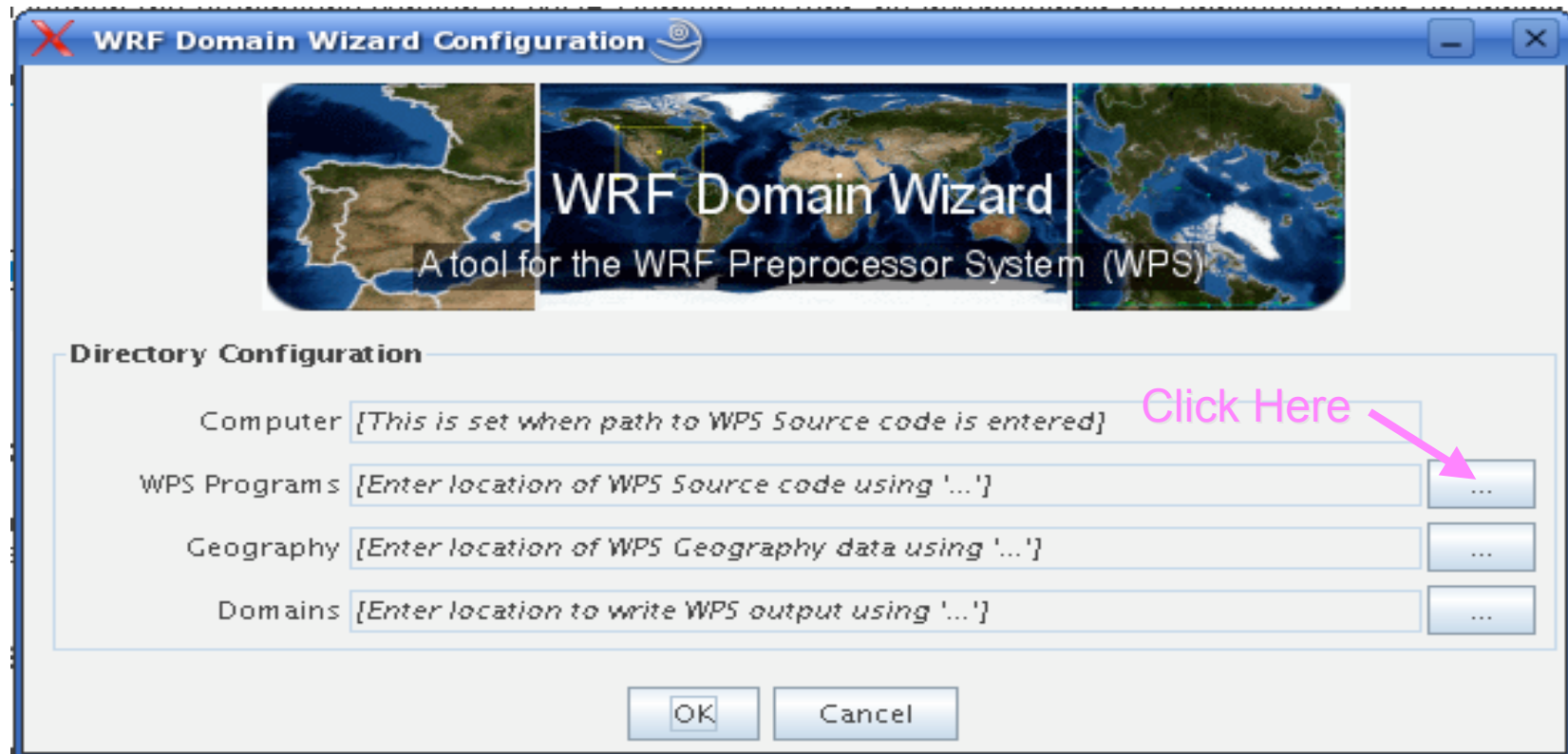
# WRF Domain Wizard – How to Run (from Zip)



- Download zip file from web link and run
  - ☐ Download the **WRFDomainWizard.zip** to e.g. c:\WRFDomainWizard or /home/WRFDomainWizard
  - ☐ unzip **WRFDomainWizard.zip**
  - ☐ Run "run\_DomainWizard.bat" (Windows) or "run\_DomainWizard" (Linux)
- java -Xmx384m -jar DomainWizard.jar**
- ☐ You can place a shortcut icon on your desktop

# WRF Domain Wizard Configuration Window

- This window pops up when you start WDW



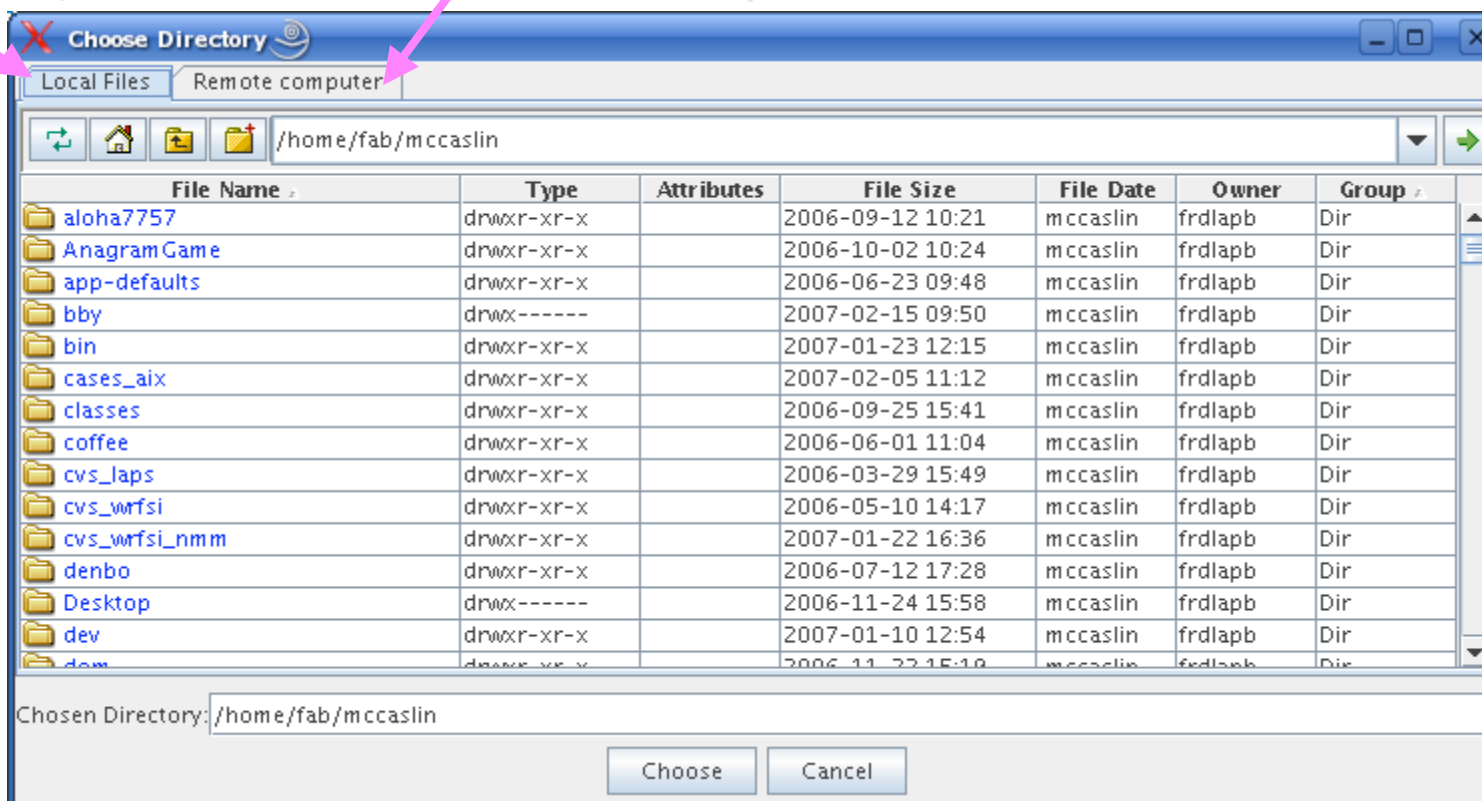
# WRF Domain Wizard – How to Run

## ■ Configuration Directory Chooser

- ☐ Choose the computer and dir that WPS is installed on

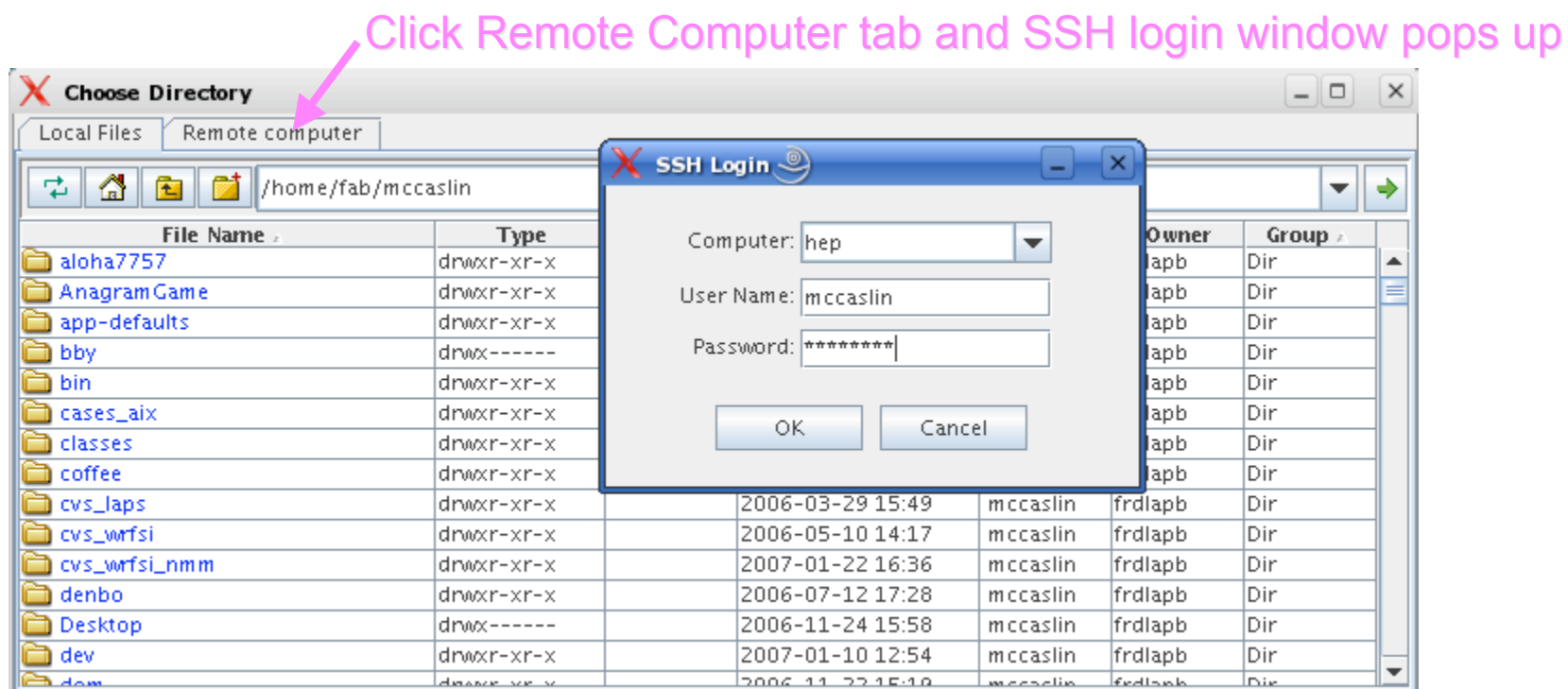
Local Computer

Remote Computer



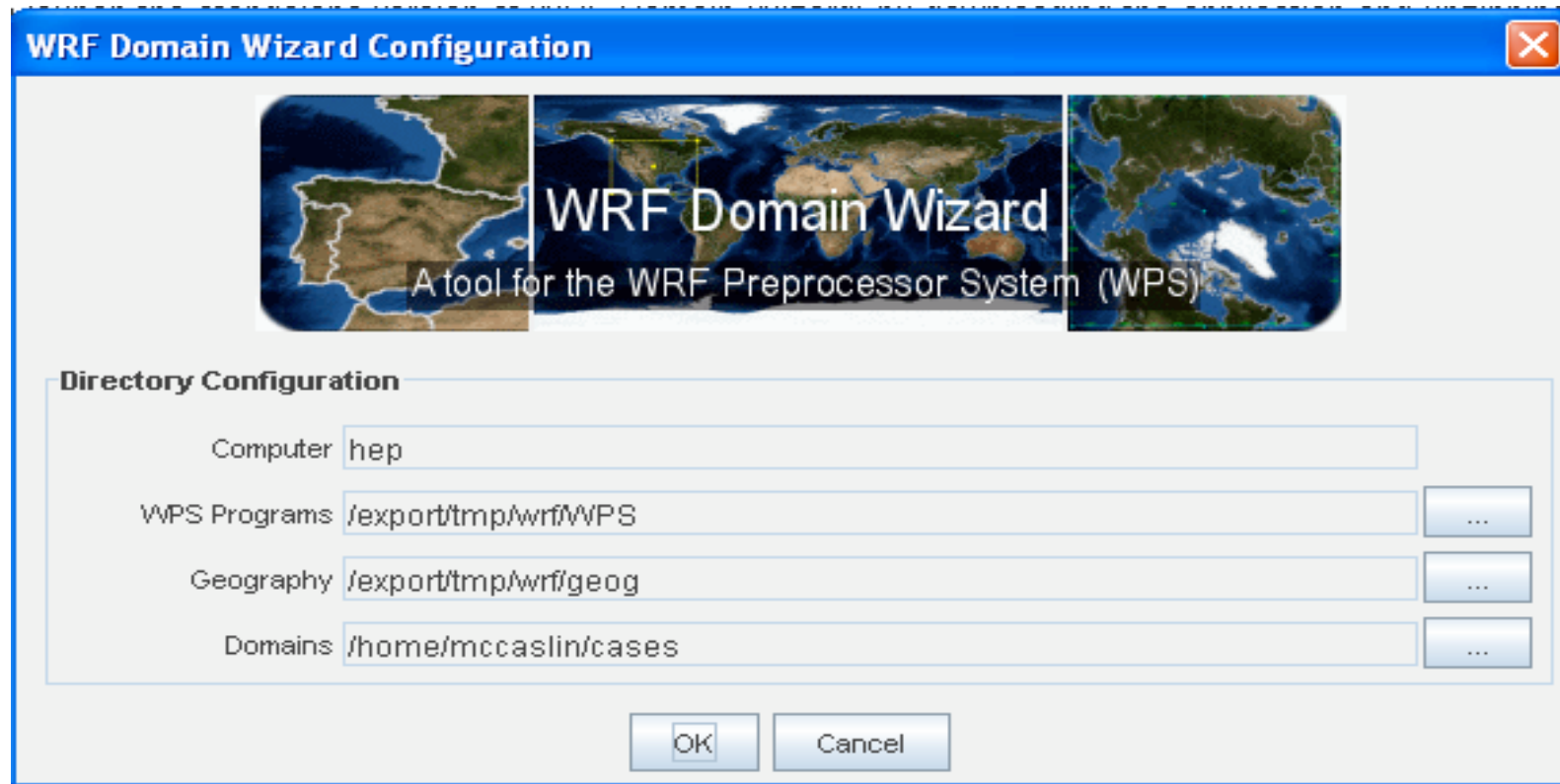
## A decorative graphic consisting of a grid of colored squares in shades of blue, purple, and white, arranged in a pattern that suggests a stylized letter or logo.

- ## ■ Configuration selecting remote system



# WRF Domain Wizard – How to Run

- Configuration complete







# WRF Domain Wizard – How to Run

- WDW writes configuration info to DomainWizard.cfg

- Located in your home directory

- Sample file:

- hep.fsl.noaa.gov

- /export/tmp/wrf/WPS

- /export/tmp/wrf/geog

- /export/jeff/domains

- /data/public/data/grib/ftp/7/0/84/211

(last line indicates the last grib files dir you selected)

# WRF Domain Wizard Tutorial -1

WRF Domain Wizard

Actions Help

1) Wizard Option 2) New Domain 3) Horizontal Editor 4) Namelist.input Editor 5) Run Preprocessors 6) Visualize NetCDF

**New Domain**

Type in a name for your domain (e.g. NorthWestUSA)

Name

Description

☐ Hurricane WRF domain

Clear

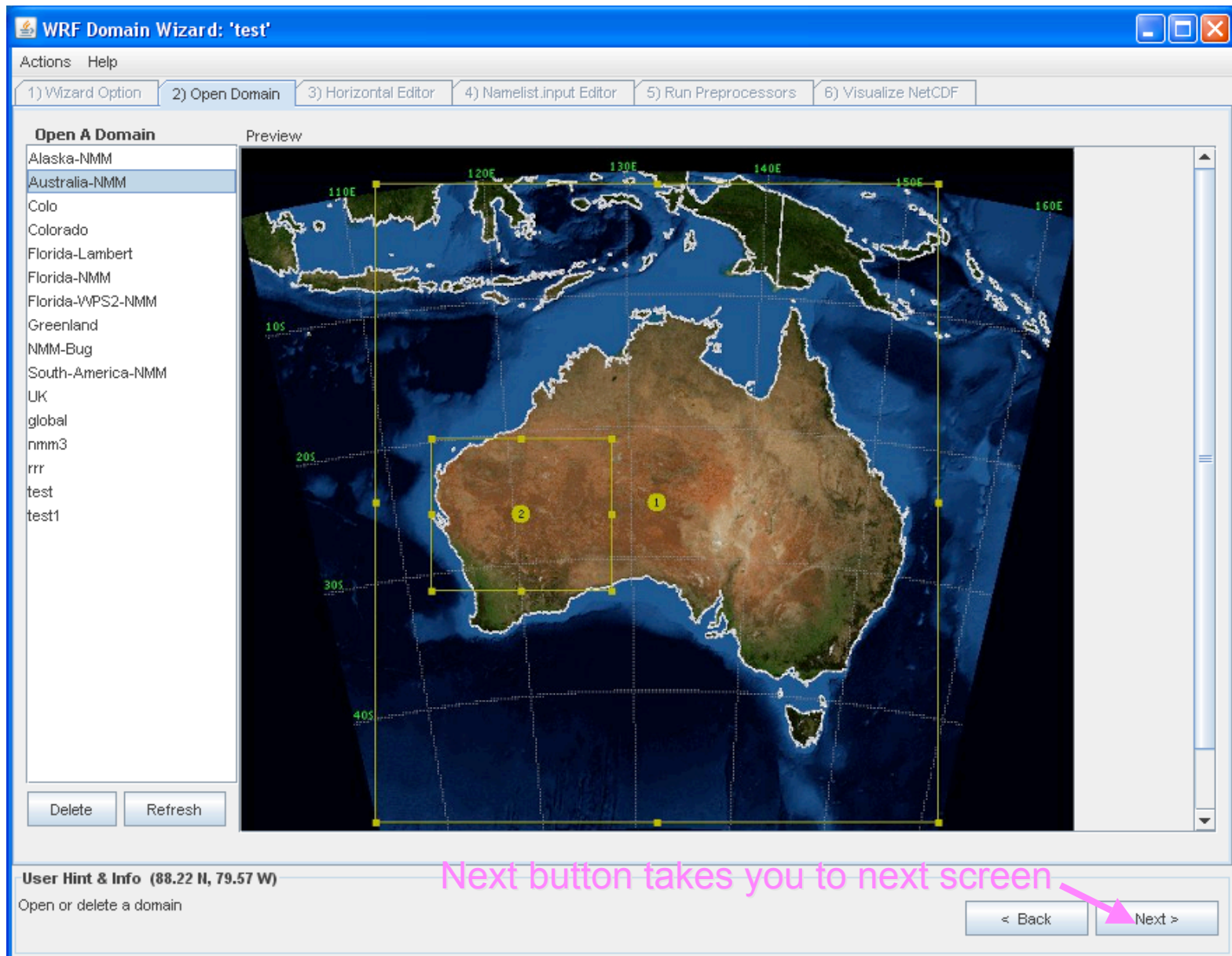
**User Hints & Info**

Create a new domain

< Back Next >

Back button takes you to previous screen

# WRF Domain Wizard Tutorial -2



# WRF Domain Wizard Tutorial -3

Tutorial - WRF Domain Wizard (Visualization) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.wrfportal.org/tutorial-flash/tutorial-DW-LatLonGlobal.html

Home  
WRF Portal  
Domain Wizard  
Tutorials (HTML)  
Tutorials (Video)  
F.A.Q.  
About

NOAA  
Disclaimer  
Privacy Policy  
NOAA website  
ESRL website  
FSL website  
Accessibility statement

WRF Domain Wizard: 'Lat-Lon-Global-USA'

Actions Help

1) Wizard Option 2) New Domain 3) Horizontal Editor 4) Namelist Input Editor 5) Run Preprocessors 6) Visualize NetCDF

Domain Nests Display Options

Note the new WPS 3 projections in this list: "Lat-Lon Region" and "Lat-Lon Global". These options are only available if the WPS directory that I selected in the initial configuration window points to a WPS 3 installation.

For this tutorial, I'll select "Lat-Lon Global"

Continue

Map

Political Boundaries

0 degrees longitude (GMT)

Projections (degrees)

Type

Lambert Conformal  
Polar Stereographic  
Mercator  
Lat-Lon Region WRF3  
Lat-Lon Global WRF3  
Rot Lat-Lon (NMM)

Centerpoint longitude

Centerpoint latitude 37.383

Grid Options

Horizontal dimension X 0

Horizontal dimension Y 0

Grid points distance (km) 0

Geographic data resolution 10m

Actions

Start Over

Reset Grid

Update Map

User Hint & Info (53.2 N, 45.26 W)

Draw a rectangle around your domain, choose a projection, then click the Update Map button

< Back Next >

Done

# WRF Domain Wizard Tutorial -4

Tutorial - WRF Domain Wizard (Open Domain, Add Nests) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.wrfportal.org/tutorial-flash/tutorial-DW-OpenDomainAddNests.html

Home  
WRF Portal  
Domain Wizard  
Tutorials (HTML)  
Tutorials (Video)  
F.A.Q.  
About

NOAA  
Disclaimer  
Privacy Policy  
NOAA website  
ESRL website  
FSL website  
Accessibility statement

WRF Domain Wizard: 'Australia'

Actions Help

1) Wizard Option 2) Open Domain 3) Horizontal Editor 4) Namelist Input Editor 5) Run Preprocessors 6) Visualize NetCDF

Domain Nests Display Options

**Nested Domain Properties**

ID	PID	Ratio	Left	Right	Top	Bot	IX	NY	Res
1	1	1	1	101	86	1	100	85	10m
2	1	3	61	96	38	6	106	97	5m
3	1	3	6	37	61	29	94	97	5m

When you click on a nest data row here, the nest box becomes highlighted.

Domain Nests Display Options

**Nested Domain Properties**

Pts	dx-deg	dy-deg	CenLat	CenLon
11300	0.085398	0.085109	44.49344	-117.784
19800	0.02847	0.02837	41.3382	-114.85096

New: scroll bar to the right to see more nest information (e.g. dx-deg and CenLat)

User Hint & Info

Select a nest by clicking on its number, or by clicking on a row in the table on the right. You can't edit/resize a nest if it has a child nest (you must delete the child first).

Done

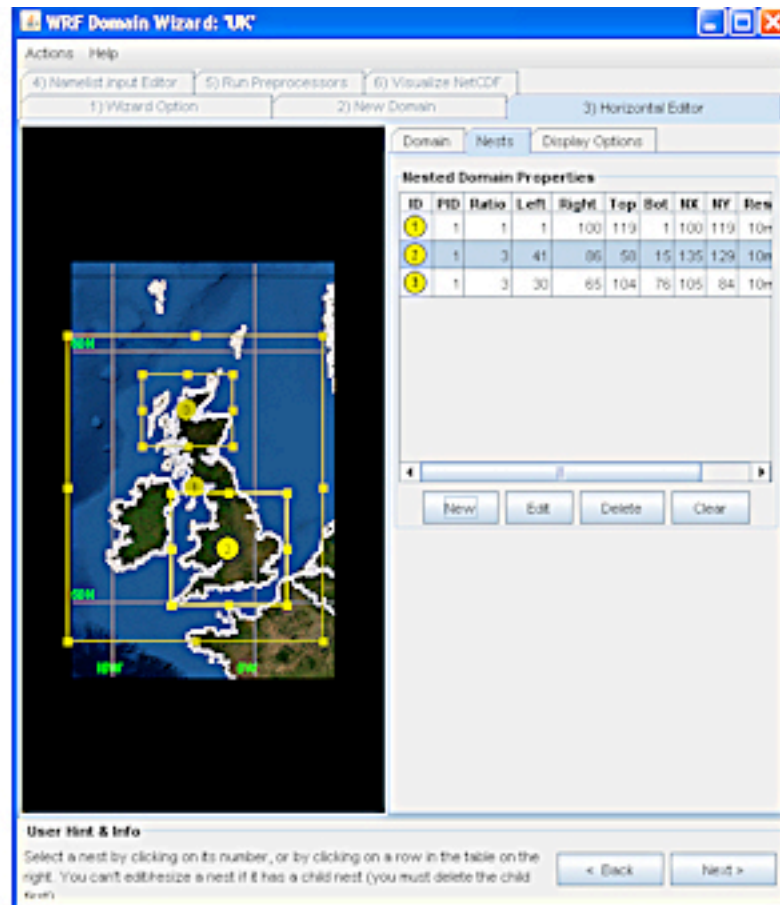


# WRF Domain Wizard Tutorial -5

## namelist.wps file

```
interval_seconds = 10800,  
io_form_geogrid = 2,  
opt_output_from_geogrid_path = '/wrf-data/domains/UK',  
debug_level = 0,  
/
```

```
&geogrid  
parent_id      = 1,1,1,  
parent_grid_ratio = 1,3,3,  
i_parent_start = 1,41,30,  
j_parent_start = 1,15,76,  
e_we          = 100,136,106,  
e_sn          = 119,130,85,  
geog_data_res = '10m','10m','10m',  
dx = 11400,  
dy = 11400,  
map_proj = 'mercator',  
ref_lat  = 54.804,  
ref_lon  = -4.195,  
truelat1 = 54.804,  
truelat2 = 0,  
stand_lon = -4.195,  
geog_data_path = '/wrf-data/geog10m',  
opt_geogrid_tbl_path = '/wrf-data/domains/UK',  
ref_x = 50.0,  
ref_y = 59.5,  
/
```



# WRF Domain Wizard Tutorial -6

WRF Domain Wizard: 'Colo'

Actions Help

1) Wizard Option 2) Open Domain 3) Horizontal Editor 4) Namelist.input Editor 5) Run Preprocessors 6) Visualize NetCDF

Add or Edit ETA Levels Reset For This Domain Validate Help /wrf-data/domains/Colo/namelist.input

GUI Editor Text Editor *Can edit plain text, if you prefer*

Number of Domains (max\_dom): 2

Parameter	Master Domain	Nest 1
j_parent_start	1	22
parent_grid_ratio	1	3
parent_time_step_ratio	1	3
feedback	1	
smooth_option	0	
&physics		
mp_physics	2	0
ra_lw_physics	1	0
ra_sw_physics	1	0
radt	10	1
sf_sfclay_physics	1	3
sf_surface_physics	2	99

*Legitimate options for parameter*

*Explanation of parameter*

ra\_lw\_physics (max\_dom)

0	longwave radiation option
1	no longwave radiation
2	RRTM scheme: Rapid Radiative Transfer Model. An accurate scheme using look-up tables for efficiency. Accounts for multiple bands, trace gases, and microphysics species. This scheme has been preliminarily tested for WRF-NMM.
3	CAM scheme

User Hints & Info

Edit this domain's namelist.input file. The following parameters have been defaulted for this domain: max\_dom, s\_we, e\_we, s\_sn, e\_sn, dx, dy, i\_parent\_start, j\_parent\_start, time\_step. Right click in the window to Copy, Paste, or Find.

< Back Next >

# WRF Domain Wizard Tutorial -7

## namelist.input file

```
&dynamics
w_damping      = 0,
diff_opt       = 1,
km_opt         = 4,
base_temp      = 290.,
damp_opt       = 0,
zdamp          = 5000., 5000., 5000.,
dampcoef       = 0.01, 0.01, 0.01,
khdif          = 0, 0, 0,
kvdif          = 0, 0, 0,
smdiv          = 0.1, 0.1, 0.1,
emdiv          = 0.01, 0.01, 0.01,
epssm         = 0.1, 0.1, 0.1,
time_step_sound = 4, 4, 4,
h_mom_adv_order = 5, 5, 5,
v_mom_adv_order = 3, 3, 3,
h_sca_adv_order = 5, 5, 5,
v_sca_adv_order = 3, 3, 3,
non_hydrostatic = .true., .true., .true.,
pd_moist       = .true., .true., .true.,
pd_scalar      = .true., .true., .true.,
pd_chem        = .true., .true., .true.,
pd_tke         = .true., .true., .true.,
/
```

WRF Domain Wizard: UK

Actions: Help

1) Wizard Option 2) New Domain 3) Horizontal Editor 4) Namelist Input Editor 5) Run Preprocessors 6) Visualize NetCDF

Add or Edit ETA Levels Reset For This Domain Help /wrf-data/domains/UK/namelist.input

GUI Editor Text Editor

Number of Domains (max\_dom): 3

Parameter	Master Domain	Nest 1	Nest 2
time_step_sound	4	4	4
h_mom_adv_order	5	5	5
v_mom_adv_order	3	3	3
h_sca_adv_order	5	5	5
v_sca_adv_order	3	3	3
non_hydrostatic	true	true	true
pd_moist	true	true	true
pd_scalar	true	true	false
pd_chem	true	true	true
pd_tke	true	true	true

&adv\_control

non_hydrostatic (max_dom)	true	whether running the model in hydrostatic or non-hydro mode
prt_coriolis (max_dom)	false	Coriolis only acts on wind perturbation (idealized)
max_full_fields	false	For diff_opt=2 only, vertical diffusion acts on full fields (not just on perturbation from 1D base_profile) (idealized)
h_mom_adv_order (max_dom)	5	horizontal momentum advection order (5=5th, etc.)
v_mom_adv_order (max_dom)	3	vertical momentum advection order

User Hint & Info

Edit this domain's namelist input file. The following parameters have been defaulted for this domain: max\_dom, s\_we, e\_we, s\_sn, e\_sn, dx, dy, l\_parent\_start, l\_parent\_start, time\_step. Right click in the window to Copy, Paste, or Find.

< Back Next >



# WRF Domain Wizard Tutorial -8

**WRF Domain Wizard: 'Colo'**

Actions Help

1) Wizard Option 2) Open Domain 3) Horizontal Editor 4) Namelist.input Editor 5) Run Preprocessors 6) Visualize NetCDF

Add or Edit ETA Levels Reset For This Domain Validate Help /wrf-data/domains/Colo/namelist.input

GUI Editor Text Editor

Number of Domains (max\_dom): 2

GUI editor for ETA levels

Parameter	Master Domain	Nest 1
j_parent_start	1	22
parent_grid_ratio	1	3
parent_time_step_ratio	1	3
feedback	1	
smooth_option	0	
&physics		
mp_physics	2	0
ra_lw_physics	1	0
ra_sw_physics	1	0
radt	10	1
sf_sfclay_physics	1	3
sf_surface_physics	2	99

ra\_lw\_physics (max\_dom)

- 0 longwave radiation option
- 1 no longwave radiation
- 2 RRIM scheme: Rapid Radiative Transfer Model. An accurate scheme using look-up tables for efficiency. Accounts for multiple bands, trace gases, and microphysics species. This scheme has been preliminarily tested for WRF-NMM.
- 3 CAM scheme

**User Hints & Info**

Edit this domain's namelist.input file. The following parameters have been defaulted for this domain: max\_dom, s\_we, e\_we, s\_sn, e\_sn, dx, dy, i\_parent\_start, j\_parent\_start, time\_step. Right click in the window to Copy, Paste, or Find.

< Back Next >

# WRF Domain Wizard Tutorial -9

Vertical Editor For ETA levels in /home/fab/mccaslin/WPS+WRFV2/WRFV2/test/em\_real

ETA Level Editor

Level	Value
35	0.0
34	0.013
33	0.026
32	0.04
31	0.055
30	0.07
29	0.088
28	0.106
27	0.127
26	0.15
25	0.175
24	0.202
23	0.231
22	0.263
21	0.298
20	0.335
19	0.376
18	0.42
17	0.468
16	0.52

When you select a level in this editor, the level is highlighted as a red band in the diagram on the left. To change a level's value, just type in a new number.

Add or delete levels by clicking these buttons.

New Delete

Options

Generate Levels...

Defaults Revert

Save Cancel

ETA Levels (eta\_levels)

User Hints & Info

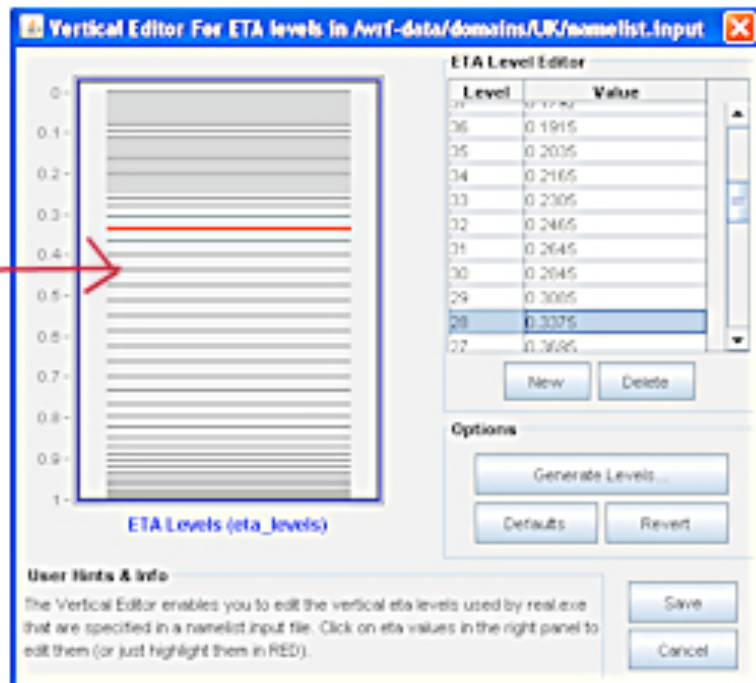
The Vertical Editor enables you to edit the vertical eta levels used by real.exe that are specified in a namelist.input file. Click on eta values in the right panel to edit them (or just highlight them in RED).

# WRF Domain Wizard Tutorial -10

## GUI editor for ETA levels

namelist.wps file

```
&domains  
eta_levels = 1.000, 0.994, 0.987, 0.979, 0.97,  
0.96, 0.949, 0.937, 0.924, 0.909,  
0.892, 0.873, 0.851, 0.826, 0.798,  
0.768, 0.736, 0.702, 0.666, 0.629,  
0.5915, 0.5536, 0.5153, 0.4773, 0.44,  
0.404, 0.3695, 0.3375, 0.3085, 0.2845,  
0.2645, 0.2465, 0.2305, 0.2165, 0.2035,  
0.1915, 0.1792, 0.1667, 0.1539, 0.1407,  
0.1272, 0.1134, 0.0995, 0.0855, 0.0713,  
0.0571, 0.0429, 0.0287, 0.0145, 0.000,  
time_step = 68,  
time_step_fract_num = 0,  
time_step_fract_den = 1,  
max_dom = 3,  
s_we = 1, 1, 1,  
e_we = 100, 136, 106,
```



# WRF Domain Wizard Tutorial -11

WRF Portal Demo - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://www.wrfportal.org/flash/DWiz\_RunWPS\_demo.html

WRF Domain Wizard: 'Alaska'

Actions Help

1) Wizard Option 2) Open Domain 3) Horizontal Editor 4) Namelist.input Editor 5) Run Preprocessors 6) Visualize NetCDF

**Configure Preprocessor Variables for Ungrib and Metgrid**

Grib Vtable Name:

Grib Files Dir:

Grib Files:

Grib Start Date:   hh:mm:ss:

Grib End Date:   hh:mm:ss:

Grib Interval (hr):

**Run Preprocessors to Generate Input Data Fields Required for WRF**

Step	Run	View	
1	geogrid	Output	Log
2	ungrib	Output	Log
	metgrid	Output	Log

**Progress Status running System Commands**

Case Name is /export/jeff/domains/Alaska

List Vtable found  
Vtable-> /export/tmp/wrf/WPS/ungrib/Variable

Path to GRIB data: /data/public/data/grib/ftp/7/0/84/211

0%

**User Hints & Info**

< Back Next >

Done

Click the "Select Files" button to list and choose the time specific GRIB files necessary to initialize WRF. GRIB files tend to have unique names that correspond to the date of the file.

For example, an ESRL file named "0700912000018" signifies a date of 2007, Julian day 009 (the ninth day into the year), 12Z (UTC) model run, for the 18 hour forecast.

Files from NCEP tend to have file name patterns like:  
^nam.t??z.awp211(00|06|12|18|24|30|36|42|48...)\$.tm00  
For example, an NCEP file named "nam.t12z.awp21148.tm00.grib2" signifies NAM model output data for a 12Z (UTC) run, for CONUS 211, 48 hour forecast, grib2 format.

# WRF Domain Wizard Tutorial -12

**WRF Domain Wizard: 'Ireland'**

Actions Help

1) Wizard Option 2) Open Domain 3) Horizontal Editor 4) Run Preprocessors 5) Visualize NetCDF

**Important:** after clicking the Visualize button, you must 'Quit' the map window before visualizing another netCDF file.

NetCDF Files in /home/fab/mccaslin/WPS+WRFV2/WPS/case1/Ireland

geo\_em.d01.nc  
geo\_em.d02.nc

First select one of the netCDF (.nc) files that was generated by running the WPS preprocessors.

Then, when the Datasets Browser appears, double-click the mouse over the variable you want to visualize on a map (e.g. GREENFRAC).

Second, click this button to visualize your netCDF file on a map. The Datasets Browser window on the right will then appear.

Visualize On Map

**Datasets Browser**

File Edit Plot Window Help

<new plot window>

Create Plot

**Datasets & Variables**

Name	Type
temp.nc	Local File
ALBEDO12M	Alt-[lon][lat]
COSALPHA	Alt-[lon][lat]
E	Alt-[lon][lat]
F	Alt-[lon][lat]
GREENFRAC	Alt-[lon][lat]
HGT_M	Alt-[lon][lat]
HGT_U	Alt-[lon][lat]
HGT_V	Alt-[lon][lat]
LANDMASK	Alt-[lon][lat]

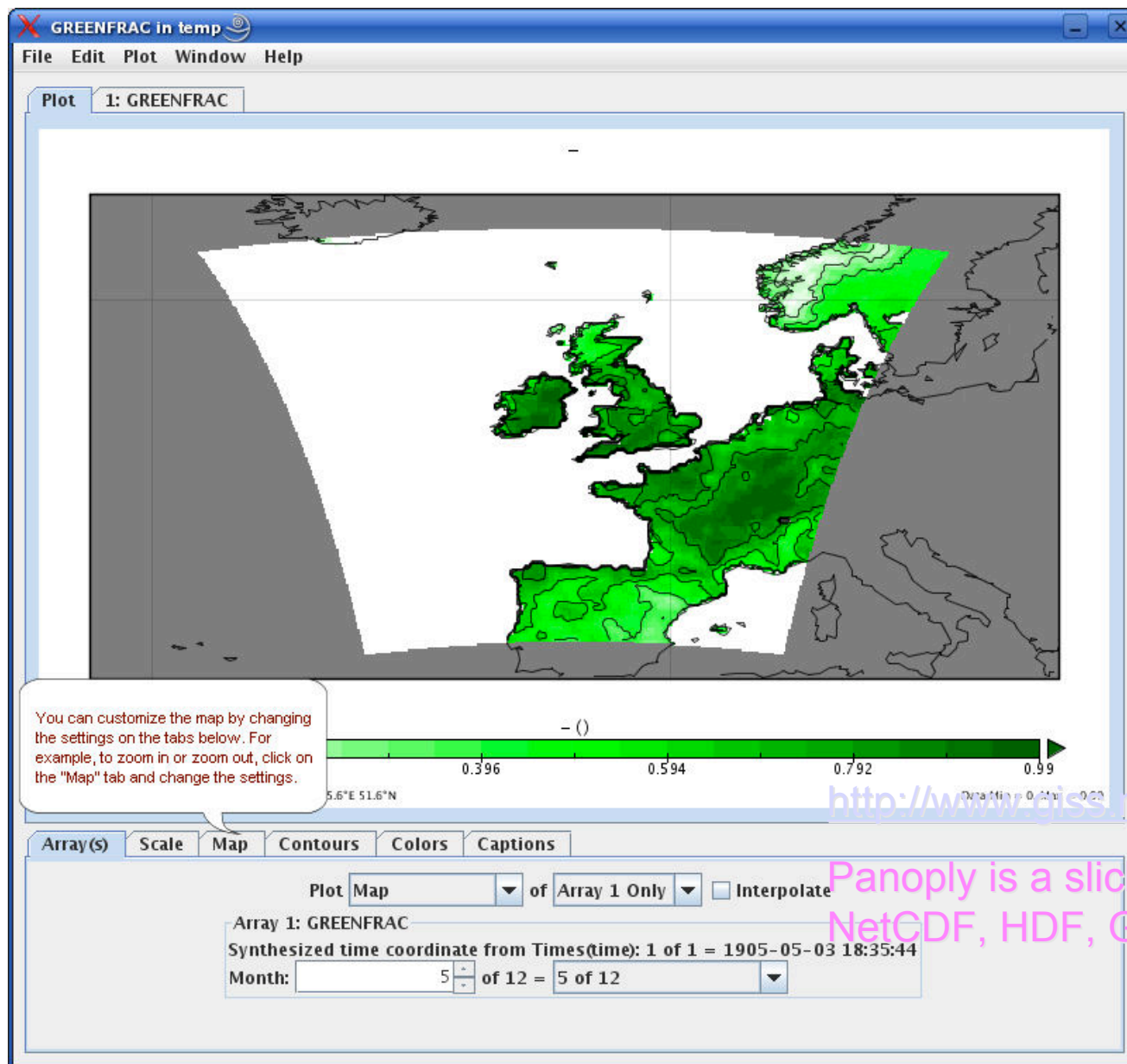
List: Only Plottable Variables

**User Hint & Info**

Choose a netCDF file and click the 'Visualize On Map' button. When the 'Datasets Browser' (list of variables) pops up, simply double-click on a field of interest (e.g. GREENFRAC) to view your map.

< Back Next >

# WRF Domain Wizard Tutorial -13



<http://www.giss.nasa.gov/tools/panoply>

Panoply is a slick tool/library for viewing NetCDF, HDF, Grib1, Grib2 files





# WRF Domain Wizard

A GUI for the WRF Preprocessing System

## WRF Portal

A GUI for running WRF

Presented by Jeff Smith

Developed by: Mark Govett, Paula McCaslin, Craig Mattocks, Jeff Smith

July 17, 2009



NOAA's Earth System Research Lab in Boulder, CO



# What is WRF Portal? -1

- A graphical user interface for running WRF
  - Also being used to run FIM (as FIM Portal)
- This application runs on all platforms and can be launched from a standard web browser as a Java Web Start program
- It simplifies and automates:
  - configuring and running of model workflows
  - launching and monitoring runs
  - Halting or canceling runs/jobs
  - visualization of your model's output
  - Includes WDW (you can just download WRF Portal and you'll also have the domain wizard)
- Version 1.41 released on July 8, 2009





# What is WRF Portal? -1

- Does not include WRF (you must download and compile that separately)
- Includes an internal workflow manager that works “out of the box” and supports SGE, LSF, and PBS
- Optional external workflow manager (written by Chris Harrop at ESRL) must be installed separately and is more powerful and robust. It supports SGE and LSF
- More info here: <http://www.wrfportal.org>



# Why Use WRF Portal?

- Saves user's time by automating tedious and repetitive tasks and providing time saving features
- Portal Wizard that walks the user through the steps of configuring computers, user preferences, and tasks



# Why Use WRF Portal?

- Saves user's time by automating tedious and repetitive tasks and providing time saving features
- Portal Wizard that walks the user through the steps of configuring computers, user preferences, and tasks
- "Diff" tool for comparing different workflows and runs
- Graphical file browsers to quickly locate files
- Robust job managers for running and managing tasks
- Progress monitor for tracking the progress of runs



# Why Use WRF Portal?

- Saves user's time by automating tedious and repetitive tasks and providing time saving features
- Portal Wizard that walks the user through the steps of configuring computers, user preferences, and tasks
- "Diff" tool for comparing different workflows and runs
- Graphical file browsers to quickly locate files
- Robust job managers for running and managing tasks
- Progress monitor for tracking the progress of runs
- Graphical netcdf/grib viewers to visualize model input/output
- Stores its information in a database so you can easily search and retrieve your information without the tedium of hunting through a myriad of files in directories directories



## Two Main Categories of WRF Portal Users

- **“Black box” users** who want an quick and easy way to run their model without having to master long and complex instruction manuals or tutorials.



## Two Main Categories of WRF Portal Users

- **“Black box” users** who want an quick and easy way to run their model without having to master long and complex instruction manuals or tutorials.
- **Model developers and testers** who, while familiar with WRF, want a tool to simplify the process. Managing and making dozens or hundreds of model runs can be tedious, time-consuming, and prone to error. The portal automates many tedious tasks, freeing the developer or tester to focus on the science of their model runs

- **Portal Wizard** walks you through the process of configuring your computers and the tasks in your workflows

The screenshot shows the 'WRF Portal' application window with the 'Portal Wizard' tab active. The wizard is at step 1, 'Computer(s)', which includes instructions on setting up computers and workflow managers. A table lists two computers: 'tornado.fsl.noaa.gov' and 'hep.fsl.noaa.gov'. The 'Batch/Queue' dropdown menu is open, showing options: NONE, SGE, PBS, and LSF. The status bar at the bottom indicates 'Connected to local computer: Jeff-M2400'.

WRF Portal [Database=C:\Documents and Settings\Jeff\portal-files\portal] [User=portal]

File Tools Window Help

Portal Wizard

1) Computer(s) 2) User Information 3) WRF Domain Wizard 4) Task Manager 5) Define Workflow 6) Run Workflow

**About Setting Up Computers And Workflow Managers**

Enter one or more LINUX, UNIX, or Mac computers on which you'll run portal tasks. Enter your computer's network name (e.g. wopr.norad.mil) to use your local computer.

To use the External Workflow Manager to execute your model tasks (jobs), you must install it separately from wrfportal.org, and then enter the path to this program here. The External Workflow Manager requires that you select a batch queue system (job scheduler)--either SGE, PBS or LSF

Computer	Aliases	External Workflow Mgr Path	Ruby Path	Batch/Queue
tornado.fsl.noaa.gov		/workflowmgr101/workflowmgr.rb	/usr/bin/ruby	NONE
hep.fsl.noaa.gov			/usr/bin/ruby	NONE

New Delete Help Save

**User Hints & Info**

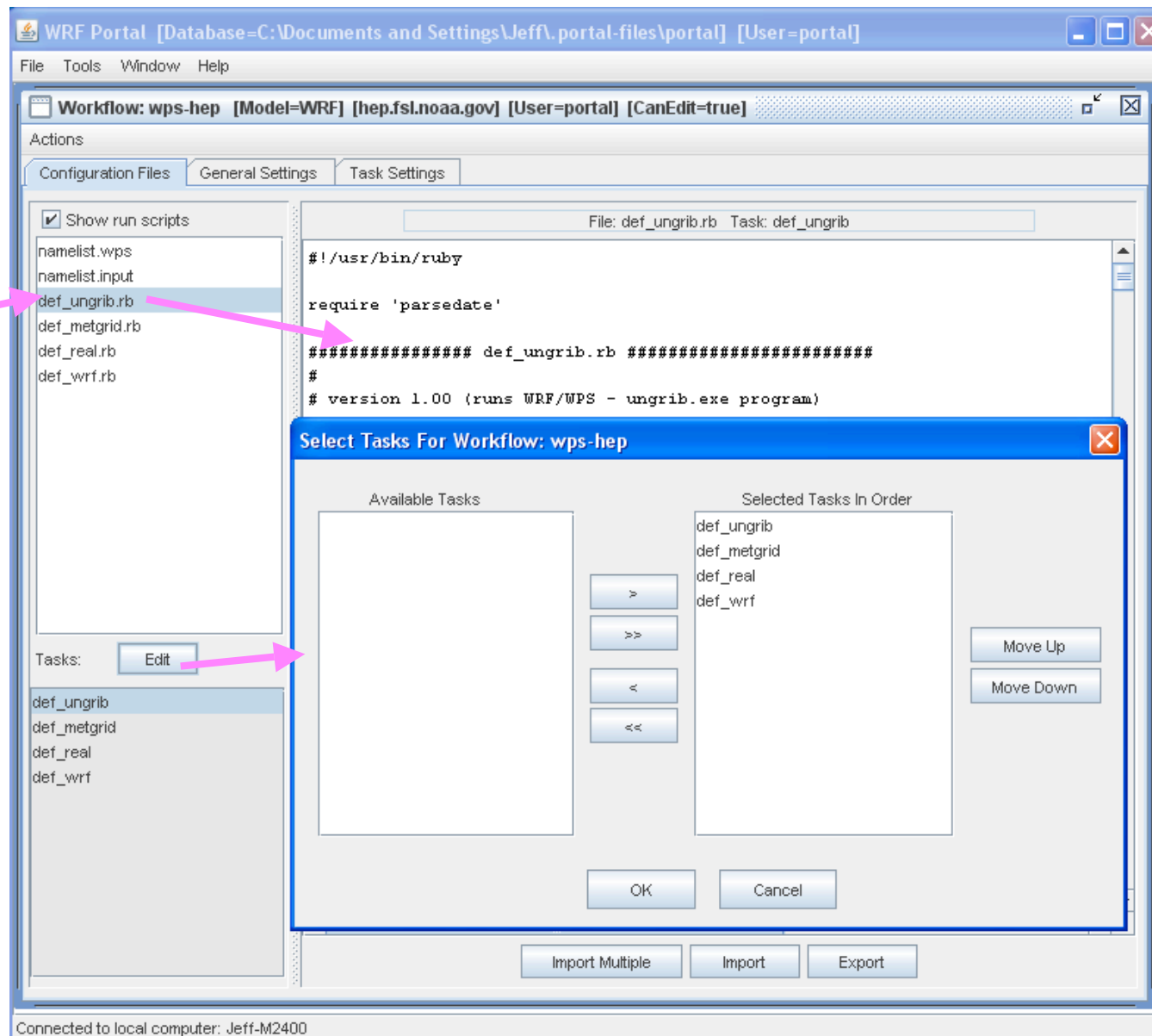
You must configure at least one computer that will be used to run your models. Instead of deleting the first computer in the list, just rename it to the network name of the computer you will use (e.g. elmo.esrl.noaa.gov)

< Back Next >

Connected to local computer: Jeff-M2400

- **Workflow Window** is where you add tasks (scripts) to your workflow, configure any required env vars, etc.

List of tasks





- **Run Workflow** window is where a user selects the workflow, computer, tasks, nbr of procs allocated to each task, & dates

WRF Portal [Database=C:\Documents and Settings\Jeff/.portal-files/portal] [User=p...]

File Tools Window Help

**Run Workflow: wrf-run [User:portal]**

Actions

Run Name: wrf-run

Note:

Computer: tornado.fsl.noaa.gov Status: NOT\_RUN

Workflow: wrf

Workflow Mgr: Internal-SGE Acct: mapp Flow Rate:

Task	Procs	MaxTime	Queue
def_ungrib	1	06:00	make
def_metgrid	1	06:00	make
def_real	1	06:00	make
def_wrf	64	06:00	make

Edit or Reorder Tasks

Input Data

Type: ☒ NameList ☐ Directory Name ☐ W...

Use existing namelist settings to find the input data.

Output Data Directory (Data Root)

Location: /wrf-data/wrfportal-runs

2008-10-16 12:00:00

Add D...

Del D...

Del All...

Dates/Times

To Run:

Connected to local computer: Jeff-M2400

**Enter A Date/Time**

From Date: 2008-10-16

To Date: 2008-10-16

Initial Time(s): 12 hours (HH format in GMT)

Interval: 24 hours (HH format)

OK Cancel

**Choose A Date**

October 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

OK Cancel

# Run Monitor enables a user to follow the progress of runs

The screenshot displays the WRF Portal Run Monitor interface. The main window shows a list of runs with columns for Run Config, Run Date, Status, Run Time, Date Started, Elapsed Time, and Model. Below this, a detailed view for the 'wrf-run1' workflow on 2005-07-11 00:00:00.0 is shown, listing tasks like def\_ungrib, def\_metgrid, def\_real, and def\_wrf with their respective Job IDs, start times, and statuses.

**List of runs** →

Run Config	Run Date	Status	Run Time	Date Started	Elapsed Time	Model
wrf-run1	2005-07-11 00:00:00.0	RUNNING	00:02	2008-10-16 15:25:16.0	00:02	wrf
hello-test-run1	2008-10-09 12:00:00.0	DONE	00:00	2008-10-09 17:36:21.0	00:00	hello-test
wrf-run	2008-10-16 12:00:00.0	ERROR	00:00			wrf

**Tasks in run** →

Details for Run Workflow: 'wrf-run1' on 2005-07-11 00:00:00.0

Task	Job ID	Job Started	Run Time	Est. Time	Status
def_ungrib	186	2008-10-16 15:25 MDT	00:01		done
def_metgrid	187	2008-10-16 15:26 MDT	00:01		done
def_real	188	2008-10-16 15:26 MDT	00:02		running
def_wrf					

**Log files** →

File Browser window showing the directory /wrf-data/wrfportal-runs/wrf-run1/2005071100logs/ with the following files:

File Name	Attr	File Size	File Date	Owner
def_metgrid_200507110000.log	-rw-r--r--	1 KB	2008-10-16 15:26:46	smith
def_real_200507110000.log	-rw-r--r--	7 KB	2008-10-16 15:27:30	smith
def_ungrib_200507110000.log	-rw-r--r--	92 KB	2008-10-16 15:25:36	smith
workflow.log	-rw-r--r--	1 KB	2008-10-16 15:28:17	smith

Connected to remote computer: tornado.fsl.noaa.gov

# NetCDF and GRIB Viewer

WRF Portal [Database=C:\Documents and Settings\Jeff\portal-files\portal] [User=portal]

File Tools Window Help

File Browser

Local Files (Jeff-M2400) tornado.fsl.noaa.gov

/wrf-data/wrfportal-runs/wrf-run1/2005071100/wps-output/

File Name	Attr	File Size	File Date	Owner
namelist.wps	-rw-rw-r--	2 KB	2008-10-16 15:26:29	smith
geo_em.d01.nc	-rw-r--r--	3,146 KB	2008-10-10 16:26:25	smith
geo_em.d02.nc	-rw-r--r--	5,508 KB	2008-10-10 16:26:27	smith
NAM:2005-07-11_00	-rw-rw-r--	20,187 KB	2008-10-16 15:25:32	smith
NAM:2005-07-11_03	-rw-rw-r--	20,187 KB	2008-10-16 15:25:33	smith

View as Text View NetCDF Close

Datasets Browser

File Edit Plot Window Help

Create Plot Target

Datasets & Variables

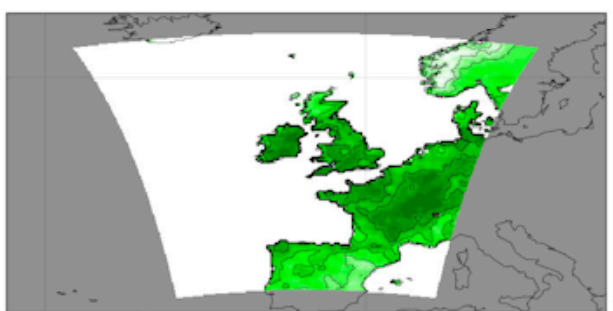
Name	Long Name	Type
temp.nc	temp.nc	Local File
ALBEDO12M	-	[lon][lat]
CLAT	-	[lon][lat]
CLONG	-	[lon][lat]
COSALPHA	-	[lon][lat]
E	-	[lon][lat]
F	-	[lon][lat]
GREENFRAC	-	[lon][lat]
HGT_M	-	[lon][lat]
HGT_U	-	[lon][lat]

List: Only Plottable Variables

GREENFRAC in temp

File Edit Plot Window Help

Plot 1: GREENFRAC



Equidistant (Regional) projection centered on 100°E 0.00°N

Array(s) Scale Map Contours Colors Captions

Plot Map of Array 1 Only Interpolate

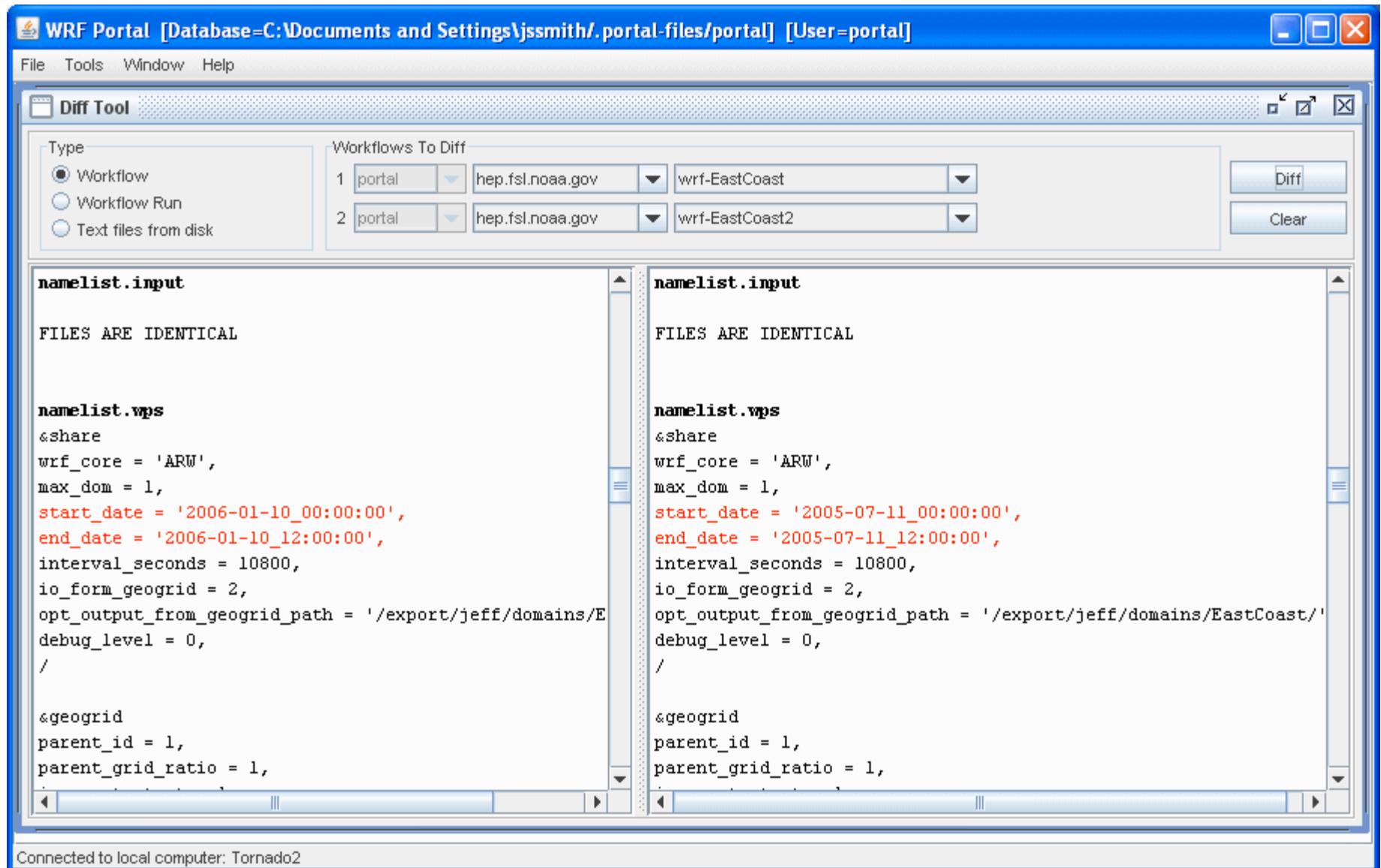
Array 1: GREENFRAC

Synthesized time coordinate from Timesdim0: 1 of 1 = 1905-05-03 18:35:44

Month: 5 of 12 = 5 of 12

Connected to remote computer: tornado.fsl.noaa.gov

**Diff Tool** compares workflows, runs, text files (e.g. namelists)



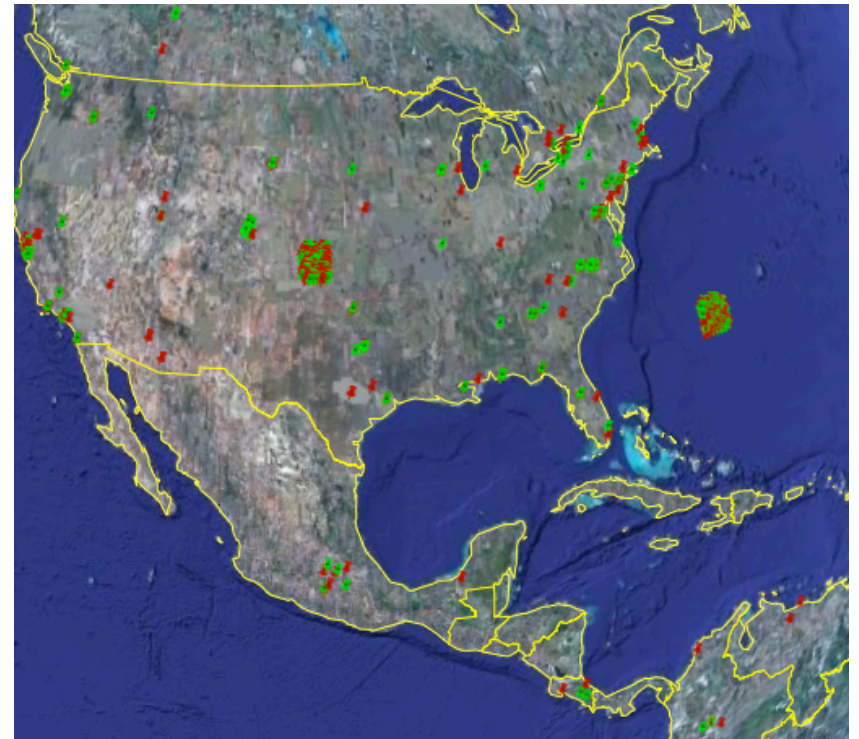
# Worldwide Users Of This Software -1

Software	Est. Users	Countries	Google Earth
WRF Portal	827	64	<a href="#">open in Google Earth</a>
WRF Domain Wizard	1221	67	<a href="#">open in Google Earth</a>
Ext. Workflow Mgr	71	18	<a href="#">open in Google Earth</a>



These users have downloaded the software from unique IP addresses during these time spans in 2008: May 4 - July 15, Sep 14 - Oct 20, Nov 9 - Dec 11.

<http://wrfportal.org/about.html>



# WRF Portal and WDW Support

- Web form for submitting bug reports or to ask questions:  
<http://wrfportal.org/RequestInfoOrBugReport.html>

Link  
on About Page

The screenshot shows a Mozilla Firefox browser window with the title "Request Information or Submit Bug Report - Mozilla Firefox". The address bar shows the URL <http://www.wrfportal.org/RequestInfoOrBugReport.html>. The page content includes a sidebar with navigation links: Home, WRF Portal, Domain Wizard, Tutorials (HTML), Tutorials (Video), F.A.Q., and About. Below these links is the NOAA logo and links to Disclaimer, Privacy Policy, NOAA website, ESRL website, FSL website, and Accessibility statement. The main content area is titled "Request Information or Submit Bug Report" and contains a form with the following fields: "Your Name:" (required), "Your Email:" (required), "Submission:" (dropdown menu with "General question" selected), "Java version:" (text input), "OS:" (text input with example "(e.g. Windows, Linux, MacOS, etc.)"), "Workflow Mgr:" (dropdown menu with "Internal (default)" selected, note "(only applicable to WRF Portal)"), "Batch System:" (dropdown menu with "None or N/A" selected, note "(only applicable to WRF Portal)"), and "Question or Bug Report:" (large text area, required). Below the form is an "Important" note: "if this is a bug report, please include the error information from the console window (or Java Webstart window). This information is very helpful in determining the cause of the problem." At the bottom are "Submit" and "Reset" buttons. The status bar at the bottom left shows "Done".

Request Information or Submit Bug Report - Mozilla Firefox

File Edit View History Bookmarks Tools Help

[http://www.wrfportal.org/RequestInfoOrBugReport.html](#) Google

## Request Information or Submit Bug Report

Home  
WRF Portal  
Domain Wizard  
Tutorials (HTML)  
Tutorials (Video)  
F.A.Q.  
About

NOAA

[Disclaimer](#)  
[Privacy Policy](#)  
[NOAA website](#)  
[ESRL website](#)  
[FSL website](#)  
[Accessibility statement](#)

Your Name:  \* required

Your Email:  \* required

Submission:

Java version:

OS:  (e.g. Windows, Linux, MacOS, etc.)

Workflow Mgr:  (only applicable to WRF Portal)

Batch System:  (only applicable to WRF Portal)

Question or Bug Report:

\* required

**Important:** if this is a bug report, please include the error information from the console window (or Java Webstart window). This information is very helpful in determining the cause of the problem.

Done



# Tutorials on wrfportal.org

WRF Portal - Demos / Tutorials - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.wrfportal.org/flash-tutorial.html

Google

HOME

WRF Portal

Domain Wizard

Tutorials (HTML)

Tutorials (Video) ← Tutorial Web Page

F.A.Q.

About

NOAA

Disclaimer  
Privacy Policy

NOAA website  
ESRL website  
FSL website

Accessibility  
statement

## How To Launch Software

- 1) [How to launch WRF Portal or WRF Domain Wizard from Firefox browser](#)

### WRF Portal Tutorials

These Flash tutorials demonstrate how to use WRF Portal.

- 1) [Portal Wizard \(configures WRF Portal\)](#)
- 2) [Define a workflow](#)
- 3) [Run a workflow, Diagnose and Fix Errors](#)
- 4) [Diff tool](#)
- 5) [Visualize NetCDF output files \(maps\)](#)
- 6) [Download Jan 2000 test data, and run real and wrf](#)
- 7) [Run WRF Portal "locally" on a remote machine using X forwarding](#)  
You might do this if WRF Portal's built-in SSH support doesn't work with the token card security of the computer that WRF is installed on.
- 8) [How to determine which run date to use \(using File Browser and Julian Day Calc Tool\)](#)
- 9) [How to create custom tasks \(scripts\), add them to a workflow, run them, view the log files and output.](#)

### WRF Domain Wizard Tutorials

These Flash tutorials demonstrate how to use WRF Domain Wizard.

- 1) [Configuring WRF Domain Wizard](#)
- 2) [Create a new domain](#)
- 3) [Open a domain, create nests](#)
- 4) [Editing namelist.wps, namelist.input, Vertical Editor](#)
- 5) [Run WPS programs after creating Lat-Lon global domain with a nest](#)
- 6) [Setting a Job Command \(for running WPS\)](#)
- 7) [Visualizing NetCDF output files](#)
- 8) [Run WRF Domain Wizard "locally" on a remote machine using X forwarding](#)  
You might do this if WRF Domain Wizard's built-in SSH support doesn't work with the token card security of the computer that WPS is installed on.

### About The Tutorial Videos

These video tutorials require the Macromedia Flash player in order to run. If the Flash plugin isn't already part of your browser, you can download it from [here](#).

Most of the videos are reasonably small (around 2-3 Mb in size) and run a few minutes long.

Done



# Future Work

- WRF Domain Wizard
  - Support Rotated Lat-Lon ARW projection
  - Support creating domains from LAPS namelists
- Portal
  - Improved support for running FIM (global) model





# Thank you!

You can contact me at [wrfportal.org](http://wrfportal.org)  
[jeff.s.smith@noaa.gov](mailto:jeff.s.smith@noaa.gov)