PRACTICE INSTRUCTIONS

Familiarizing with the

WRF & WPS Programs

TUTORIAL AGENDA

Ratings: *basic, moderate, advanced*

Practice Sessions

Coffee Breaks & Lunch

Information Exchange

Monday, July 17

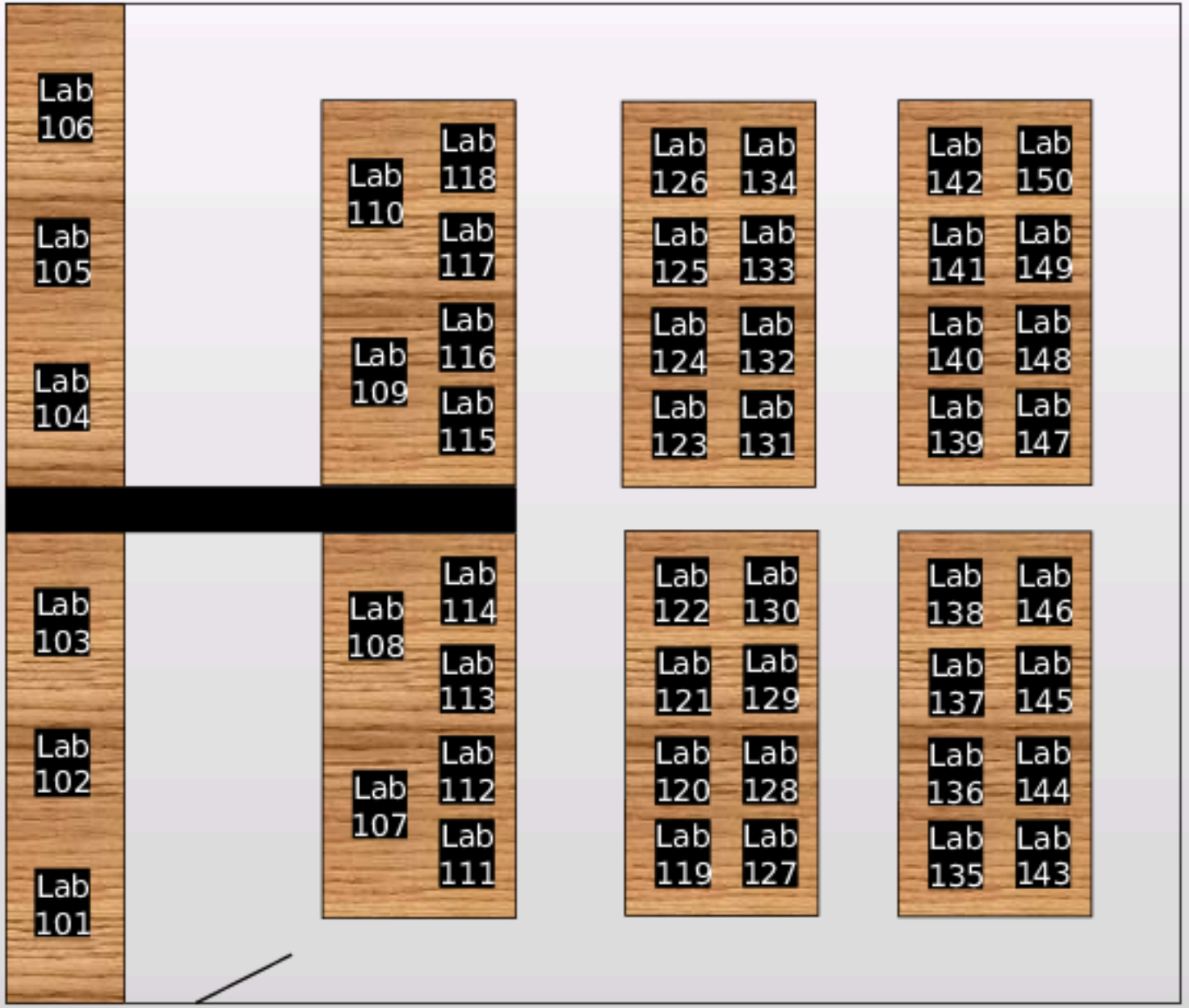
		Instructor
8:00 – 8:30	**Registration and Coffee**	
8:30 – 9:00	Welcome and Introductions	Joe Klemp
9:00 – 9:30	WRF Modeling System Overview (basic)	Wei Wang
9:30 – 9:40	Practice Instructions: Familiarizing with the WRF/WPS Programs	Kelly Werner
9:40 – 10:00	*Coffee Break*	
10:00 – 11:15	****/PRACTICE SESSION****	
11:15 – 11:30	WPS: Fundamental Capabilities (basic)	Michael Duda
11:30 – 1:00	*Lunch Break*	
1:00 – 1:45	Program Real (basic)	Wei Wang
1:45 – 2:30	Running WPS and WRF (basic)	Kelly Werner
2:30 – 2:40	Practice Instructions: Configure and Run WPS/WRF Using a Single Domain	Kelly Werner
2:40 – 3:00	*Coffee Break*	
3:00 – 5:00	****/PRACTICE SESSION****	

Tuesday, July 18

		Instructor
8:30 – 9:30	Nested Domains (basic)	Kelly Werner
9:30 – 9:50	*Coffee Break*	
9:50 – 11:00	****/PRACTICE SESSION****	

11:00 – 12:30	WRF-Python Post-processing Tool	Abby Jaye
12:00 – 1:00	*Lunch Break*	
1:00 – 1:40	Compiling WRF and WPS (basic)	Kelly Werner
1:40 – 2:00	*Coffee Break*	
2:00 – 3:30	WPS/WRF Set up and Run Demo	Michael Duda
3:30 – 5:00	****/PRACTICE SESSION****	
5:00 – 6:30	***Information Exchange*** *(appetizers and drinks will be served)*	

CLASSROOM LAYOUT

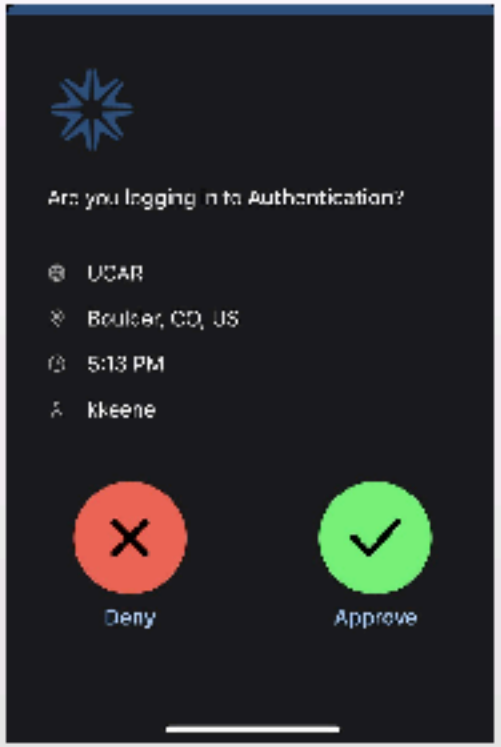


m your laptop, open a terminal (Unix) window

m the command line, log-in to the Cheyenne system
-X *user_name*@cheyenne.ucar.edu

the password provided by NCAR/CISL (via email)

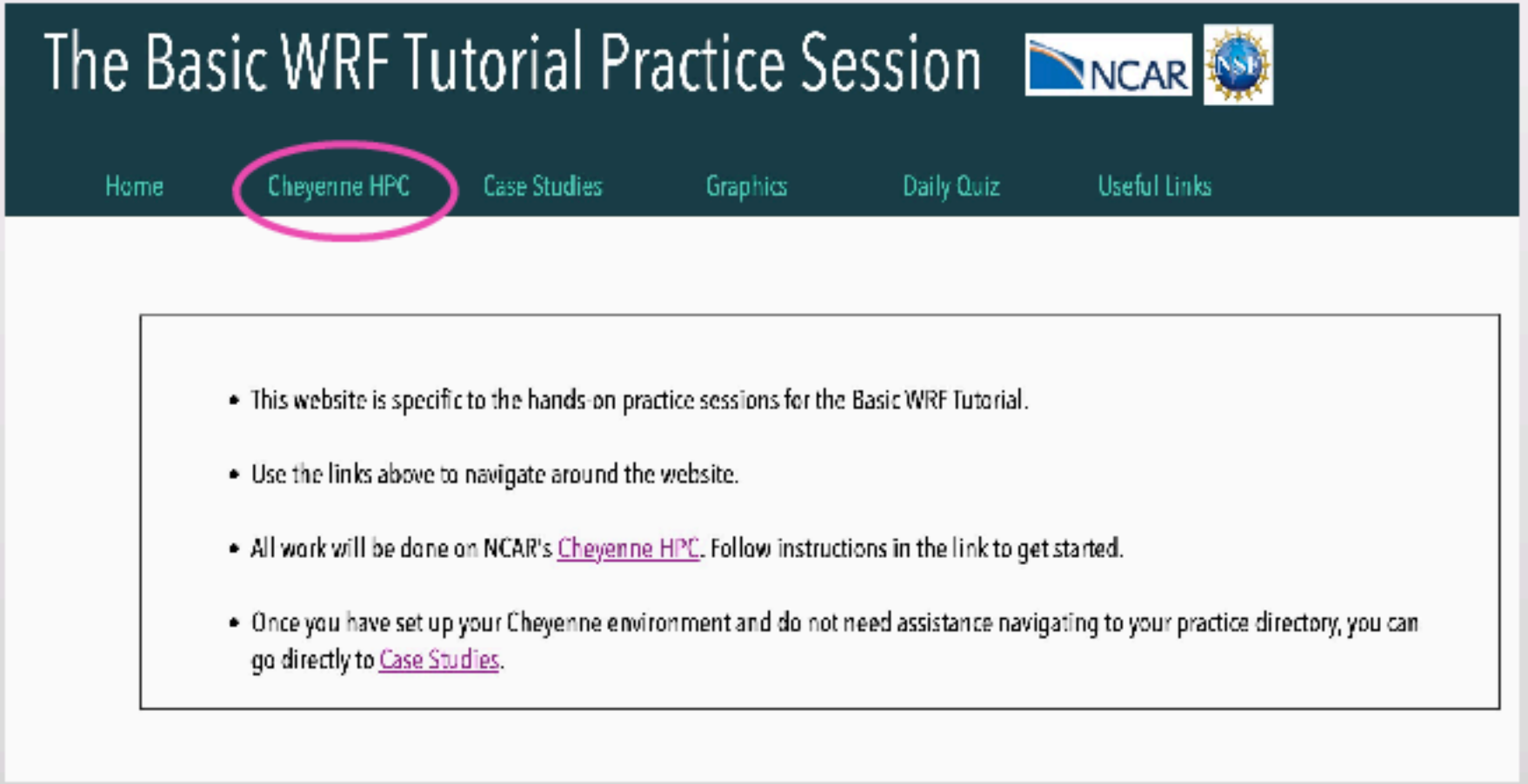
should receive a DUO app notification on your smart
ck the notification
oose “Approve”



LOGGING-IN TO NCAR’S CHEYENNE HPC

TUTORIAL PRACTICE WEBSITE

www2.mmm.ucar.edu/wrf/OnLineTutorial/tutorial_practice_in-person/in



CHEYENNE ENVIRONMENT SET-UP

Cheyenne Environment Set-up

The practical exercises in this tutorial are tailored to work on the NCAR's Cheyenne system. Cheyenne is an HPC cluster that provides the libraries needed by WRF and its pre- and post-processing tools through modules. When you first log-in to Cheyenne, you will be placed in your home directory (`/glade/u/home/$USER`).

Setting-up Your Environment

Before going through any of the exercises in subsequent sections, you will need to run several commands to prepare your environment.

1. First purge all loaded modules to begin from a known starting point (with no modules loaded).

```
> module purge
```

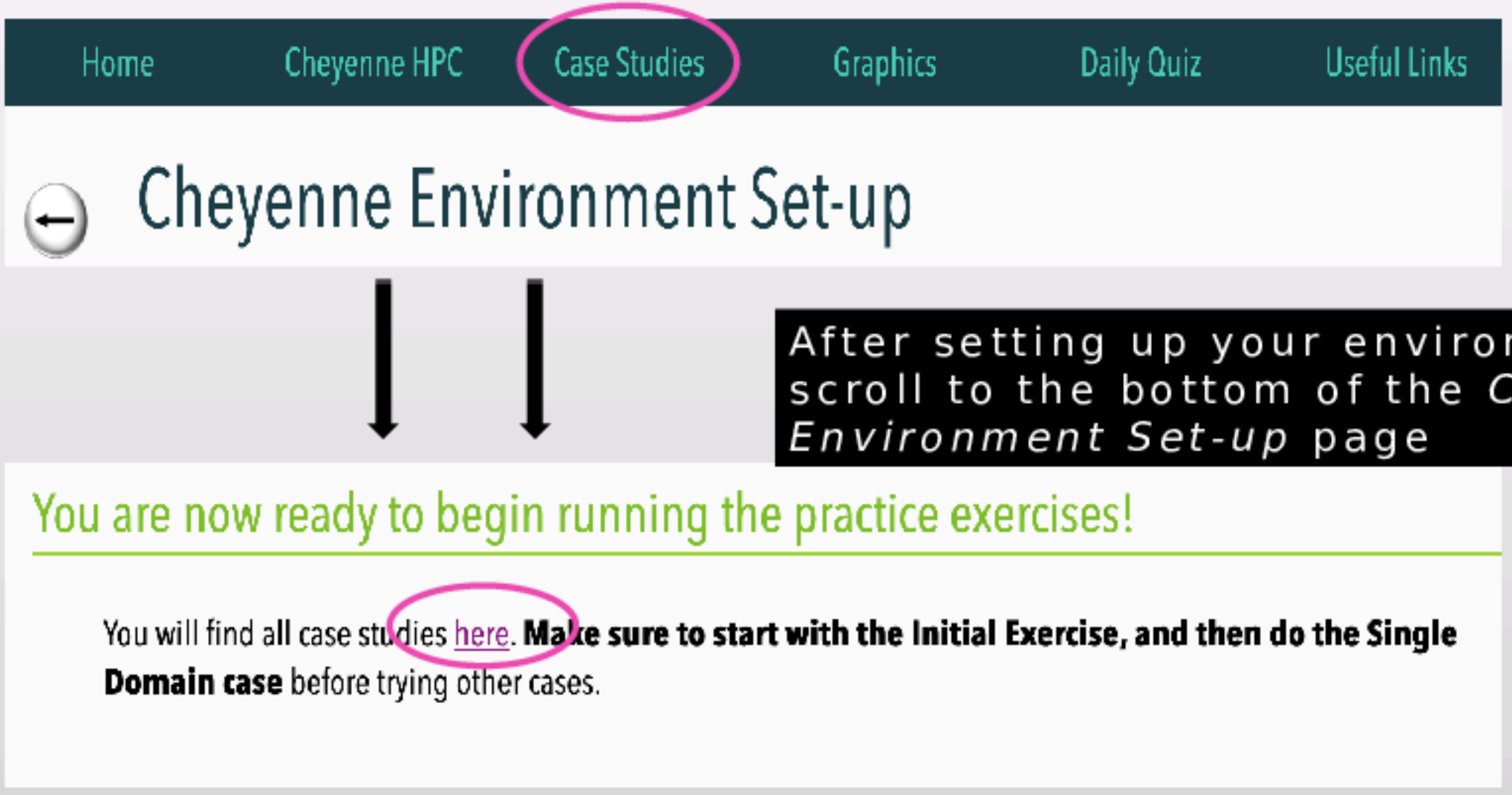
2. Now you will need to load several modules to give access to the Intel compilers as well as an MPI implementation.

```
> module load ncarenv/1.3
> module load intel/19.1.1
> module load ncarcompilers/0.5.0
> module load mpt/2.25
> module load netcdf/4.8.1
```

3. You will also need to load a few modules that can be used for visualizing output and editing files. You may not use them all, but it does not hurt to have them loaded.

```
> module load ncview/2.1.7
> module load ncl/6.6.2
> module load nco/5.1.4
> module load xxdiff/4.0.1
```

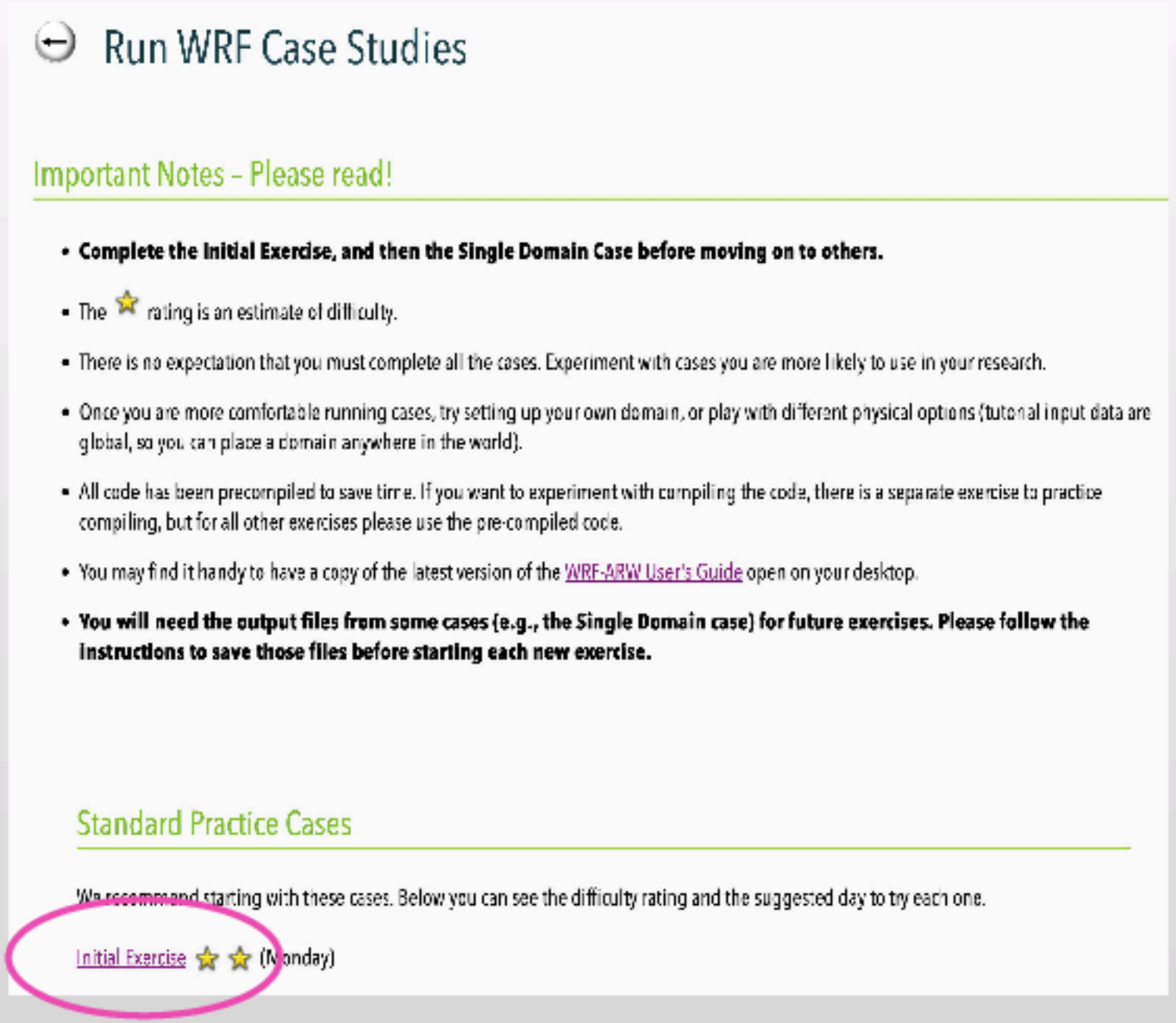
GO TO CASE STUDIES



After setting up your environment, scroll to the bottom of the *Cheyenne Environment Set-up* page

START WITH THE INITIAL EXERCISE

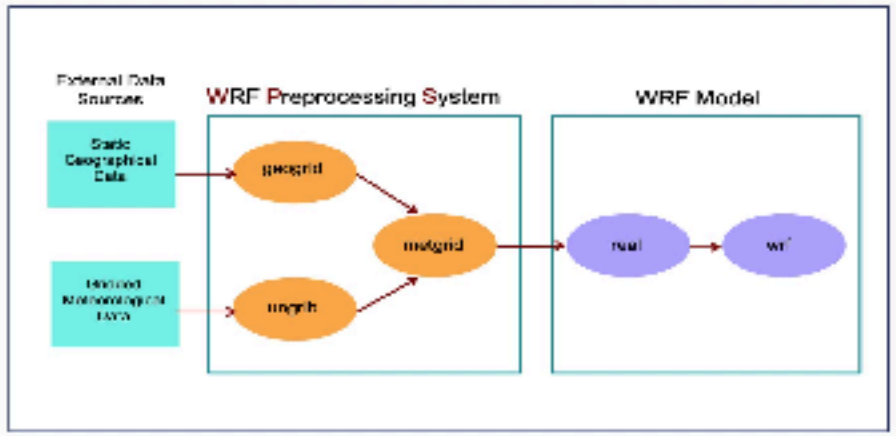
Scroll down to *Standard Practice Cases* and choose the ***Initial Exercise***



Initial Exercise

The purpose of this exercise is to familiarize yourself with the basic process of running WRF. For this case, the namelists have alread
you should not need to make any modifications.

There are 5 steps to running WRF, broken down into 2 major programs. The WRF Preprocessing System (WPS), and the WRF model



The **WPS** is a set of three programs that prepare input for the WRF program:

geogrid: defines the model domain and interpolates static geographical data to the grids
ungrib: extracts meteorological fields from GRIB-formatted input data files
metgrid: horizontally interpolates the meteorological fields extracted by ungrib to the model domain defined by geogrid

The **WRF** model is broken into 2 programs:

real: vertically interpolates the meteorological fields (from WPS) to WRF eta levels
wrf: simulates the model run, using all previously-defined settings for the domain, input data, vertical interpolation, physics settings

****Click on the buttons below to expand or collapse each section.****

1. Run Geogrid +

2. Run Ungrib +

TIAL EXERCISE

Includes basic information on WPS and WRF processes

Pre-configured namelists

Simply issue commands for processing

QUESTIONS?