MATLAB code for edited met\_em files:

% Script to Change NAM initialization fields to reduce RH.

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% This code is being used to modify the NAM analysis files to decrease the

% RH of the lowest model level by 20%.

clear all

close all

clc

% Define file path to the files to be changed. Path must equal a string.

% I'll be modifying all hours for d01 since it forces the model every 6 hrs

% Only the initial hour will be modified for d02 & d03

path1 = '/uufs/chpc.utah.edu/common/home/horel\_data/eneemann/matlab/met\_em.d01.2013-02';

path2 = '/uufs/chpc.utah.edu/common/home/horel\_data/eneemann/matlab/met\_em.d02.2013-02-01\_00:00:00.nc';

path3 = '/uufs/chpc.utah.edu/common/home/horel\_data/eneemann/matlab/met\_em.d03.2013-02-01\_00:00:00.nc';

% In order to use output paths, the files from the matlab directory must be

% copied into the output directory. Otherwise new files will be created

% that contain only the changed variables.

path1out = '/uufs/chpc.utah.edu/common/home/horel\_data/eneemann/matlab/output/met\_em.d01.2013-02';

path2out = '/uufs/chpc.utah.edu/common/home/horel\_data/eneemann/matlab/output/met\_em.d02.2013-02-01\_00:00:00.nc';

path3out = '/uufs/chpc.utah.edu/common/home/horel\_data/eneemann/matlab/output/met\_em.d03.2013-02-01\_00:00:00.nc';

% Define an array of strings with the times to be changed. When the loop below

% concatenates path and times it must result in a string.

% The loop below will read and manipulate a variable from the wrfout netcdf

% at each time included in the array.

% times for d01 (d02 & d03 will not require this step)

times1 = ['-01\_00:00:00.nc'; '-01\_06:00:00.nc'; '-01\_12:00:00.nc';...

'-01\_18:00:00.nc';...

'-02\_00:00:00.nc'; '-02\_06:00:00.nc'; '-02\_12:00:00.nc';...

'-02\_18:00:00.nc';...

'-03\_00:00:00.nc'; '-03\_06:00:00.nc'; '-03\_12:00:00.nc';...

'-03\_18:00:00.nc';...

'-04\_00:00:00.nc'; '-04\_06:00:00.nc'; '-04\_12:00:00.nc';...

'-04\_18:00:00.nc';...

'-05\_00:00:00.nc'; '-05\_06:00:00.nc'; '-05\_12:00:00.nc';...

'-05\_18:00:00.nc';...

'-06\_00:00:00.nc'; '-06\_06:00:00.nc'; '-06\_12:00:00.nc';...

'-06\_18:00:00.nc'; '-07\_00:00:00.nc'];

% Lines below generate the loop indices for d01

numtimes = size(times1);

numtimes = numtimes(:,1);

% Loop through each time to complete edits for d01

for i = 1:numtimes;

% Generate complete data file path/filename

string1 = [path1 times1(i,:)];

string1out = [path1out times1(i,:)];

% ncread uses the string from above to read a wrfout 3d array for each

% time and variable

RH = double(ncread(string1,'RH'));

%replicate RH array and place in adjusted RH array

RHadj = RH;

%on the bottom 9 model levels (~200m), for locations where RH >= 20%, subtract 20%

%and place in adjusted RH array

for i = 1:length(RH(:,1,:));

for j = 1:length(RH(1,:,:));

for k = 1:9;

if RH(i,j,k) >= 20;

RHadj(i,j,k) = RH(i,j,k)-20;

end

end

end

end

% write the changed variables back into the netcdf file

ncwrite(string1out,'RH',RHadj);

end

%% test to see which points were changed by the operation above

%create difference array

Diff = RH-RHadj;

%creating 2D difference arrays for each model level

D1 = Diff(:,:,1);

D2 = Diff(:,:,2);

D3 = Diff(:,:,3);

D4 = Diff(:,:,4);

D5 = Diff(:,:,5);

D6 = Diff(:,:,6);

D7 = Diff(:,:,7);

D8 = Diff(:,:,8);

D9 = Diff(:,:,9);

%% Complete edits for d02

% read in RH for d02 file

RH2 = double(ncread(path2,'RH'));

% replicate RH array and place in adjusted RH array

RHadj2 = RH2;

%on the bottom 9 model levels (~200m), for locations where RH >= 20%, subtract 20%

%and place in adjusted RH array

for m = 1:9;

if RH2(:,:,m) >= 20;

RHadj2(:,:,m) = RH2(:,:,m)-20;

end

end

% write the changed variables back into the netcdf file

ncwrite(path2out,'RH',RHadj2);

%% Complete edits for d03

% read in RH for d03 file

RH3 = double(ncread(path3,'RH'));

% replicate RH array and place in adjusted RH array

RHadj3 = RH3;

%on the bottom 9 model levels (~200m), for locations where RH >= 20%, subtract 20%

%and place in adjusted RH array

for n = 1:9;

if RH3(:,:,n) >= 20;

RHadj3(:,:,n) = RH3(:,:,n)-20;

end

end

% write the changed variables back into the netcdf file

ncwrite(path3out,'RH',RHadj3);