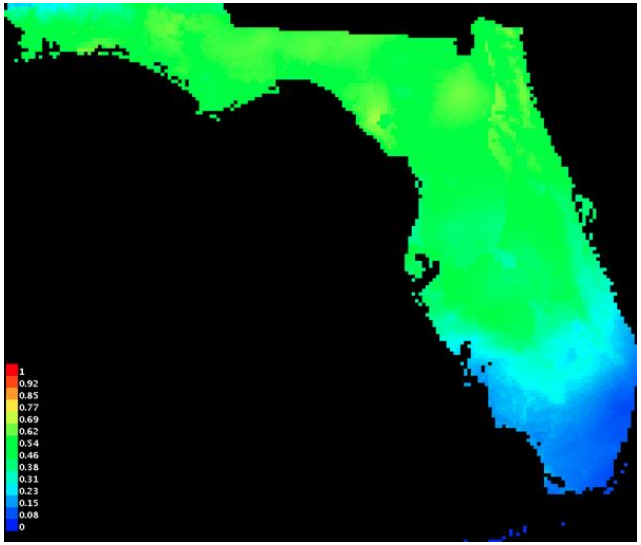
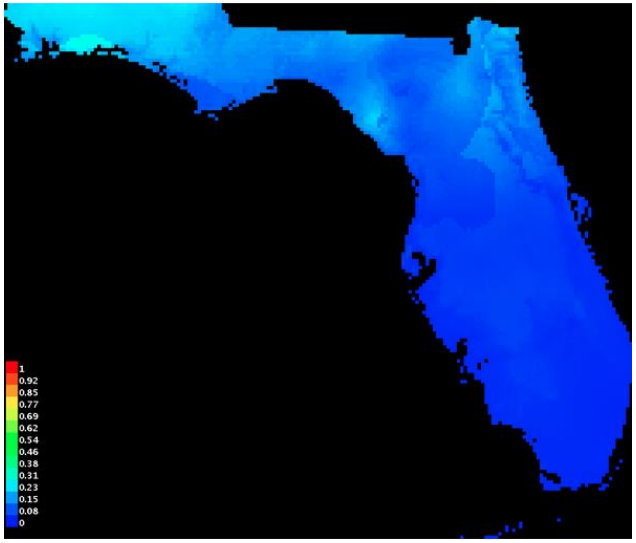


NOW



2070

Projections with Maxent

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Free climate data for ecological modeling and GIS

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You can download climate data for:

- Current conditions (interpolations of observed data, representative of 1950-2000)
- Future conditions: downscaled global climate model (GCM) data from CMIP5 (IPPC Fifth Assessment)
- Past conditions (downscaled global climate model output)

http://www.worldclim.org/download

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CMIP5

Downscaled IPPC5 (CMIP5) data

The data available here are climate projections from global climate models (GCMs) for four representative concentration pathways (RCPs). These are the most recent GCM climate projections that are used in the Fifth Assessment IPCC report. The GCM output was downscaled and calibrated (bias corrected) using WorldClim 1.4 as baseline 'current' climate.

The data are available at different spatial resolutions (expressed as minutes or seconds of a degree of longitude and latitude): **10 minutes, 5 minutes, 2.5 minutes, 30 seconds**. The variables included are monthly minimum and maximum temperature, precipitation, and 'bioclimatic' variables.

CMIP 2.5-minutes

Downscaled IPPC5 (CMIP5) data at 2.5 minutes spatial resolution

This page has the data at 2.5-minute (of a longitude/latitude degree) spatial resolution (this is about 4.5 km at the equator). Other spatial resolutions are available.

The data available here are climate projections from GCMs that were downscaled and calibrated (bias corrected) using WorldClim 1.4 as baseline 'current' climate. The file format is GeoTIFF.

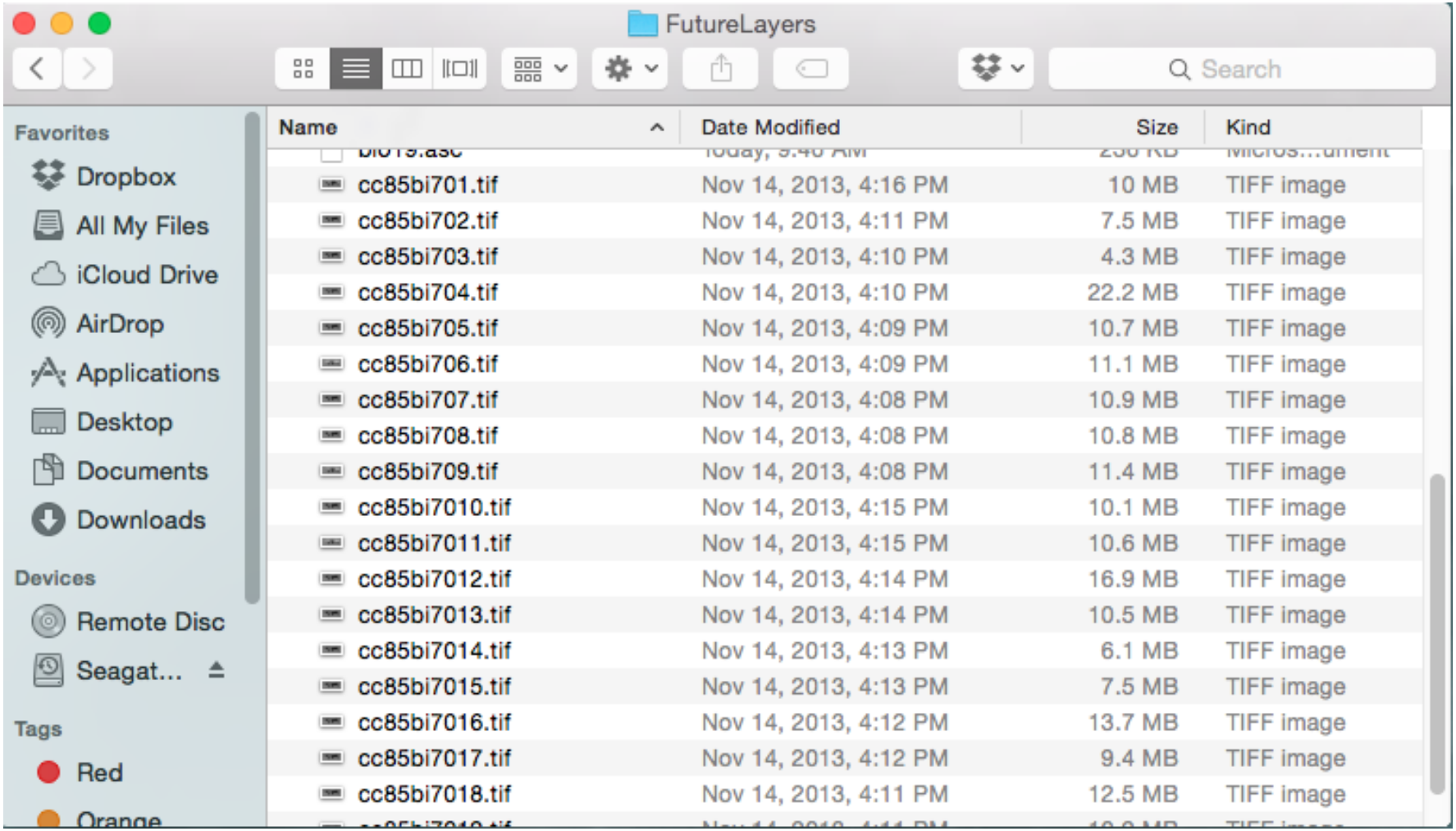
Greenhouse gas scenarios: four representative concentration pathways (RCPs)
Time periods: 2050 (average for 2041-2060) and 2070 (average for 2061-2080)
Variables:
tn - monthly average minimum temperature (degrees C * 10)
tx - monthly average maximum temperature (degrees C * 10)
pr - monthly total precipitation (mm)
bi - 'bioclimatic' variables

Lots of options!

2050

GCM	code	rcp26	rcp45	rcp60	rcp85
ACCESS1-0 (#)	AC		tn, tx, pr, bi		tn, tx, pr, bi
BCC-CSM1-1	BC	tn, tx, pr, bi	tn, tx, pr, bi	tn, tx, pr, bi	tn, tx, pr, bi
CCSM4	CC	tn, tx, pr, bi	tn, tx, pr, bi	tn, tx, pr, bi	tn, tx, pr, bi
CESM1-CAM5-1-FV2	CE		tn, tx, pr, bi		

Unzip and put new files in your working directory



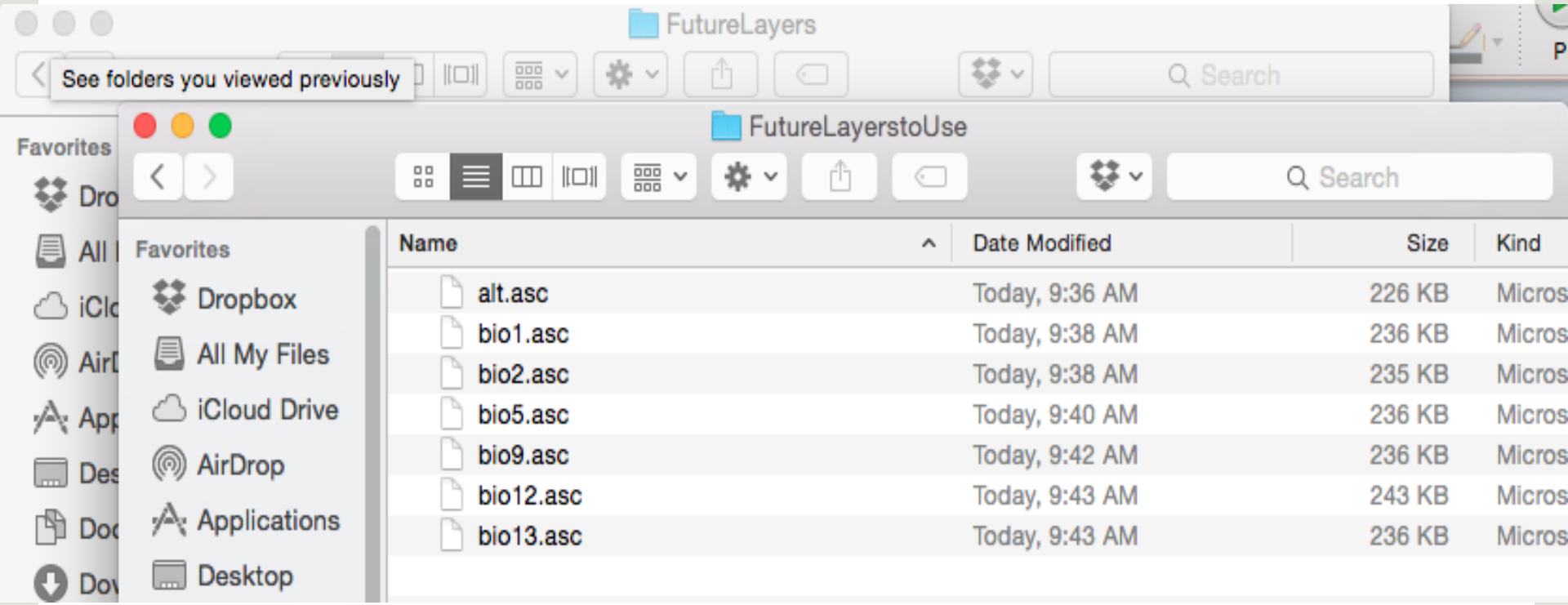
FutureLayerProcessing.R

Source on Save

```
20
21  #set the working directory
22  setwd("~/Desktop/NicheModelingWorkshop/Charlotte/“)
23
24        #load the maps
25
26        alt_lF <- raster("Bioclim/alt.bil")
27        geo_lF <- raster("Bioclim/geo.asc")
28        bio1_lF <- raster("FutureLayers/cc85bi701.tif")
29        bio2_lF <- raster("FutureLayers/cc85bi702.tif")
30        bio3_lF <- raster("FutureLayers/cc85bi703.tif")
31        bio4_lF <- raster("FutureLayers/cc85bi704.tif")
32        bio5_lF <- raster("FutureLayers/cc85bi705.tif")
33        bio6_lF <- raster("FutureLayers/cc85bi706.tif")
34        bio7_lF <- raster("FutureLayers/cc85bi707.tif")
35        bio8_lF <- raster("FutureLayers/cc85bi708.tif")
36        bio9_lF <- raster("FutureLayers/cc85bi709.tif")
37        bio10_lF <- raster("FutureLayers/cc85bi7010.tif")
38        bio11_lF <- raster("FutureLayers/cc85bi7011.tif")
39        bio12_lF <- raster("FutureLayers/cc85bi7012.tif")
40        bio13_lF <- raster("FutureLayers/cc85bi7013.tif")
41        bio14_lF <- raster("FutureLayers/cc85bi7014.tif")
```

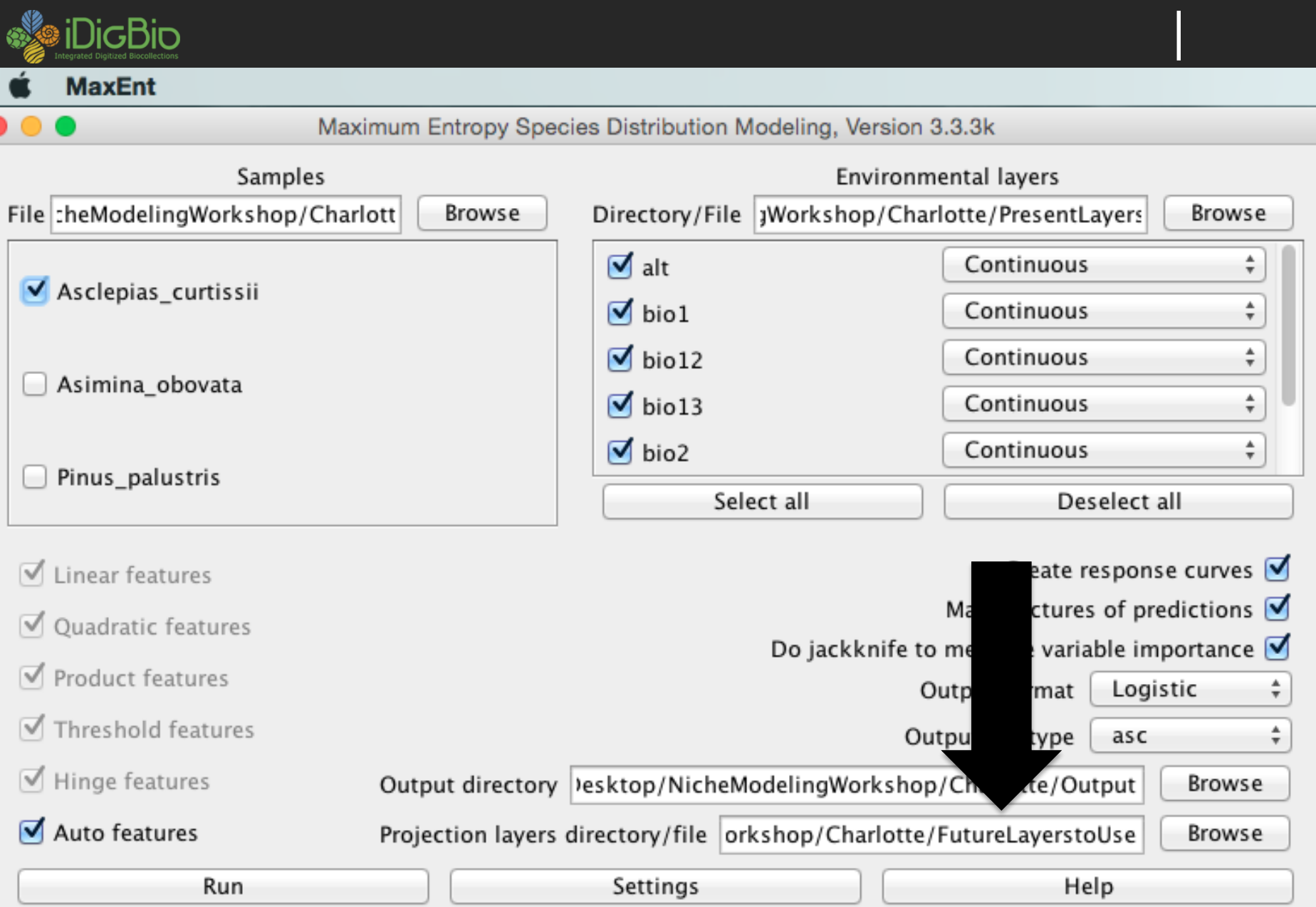
- Make sure the projection file names match those in the script

- Run the script

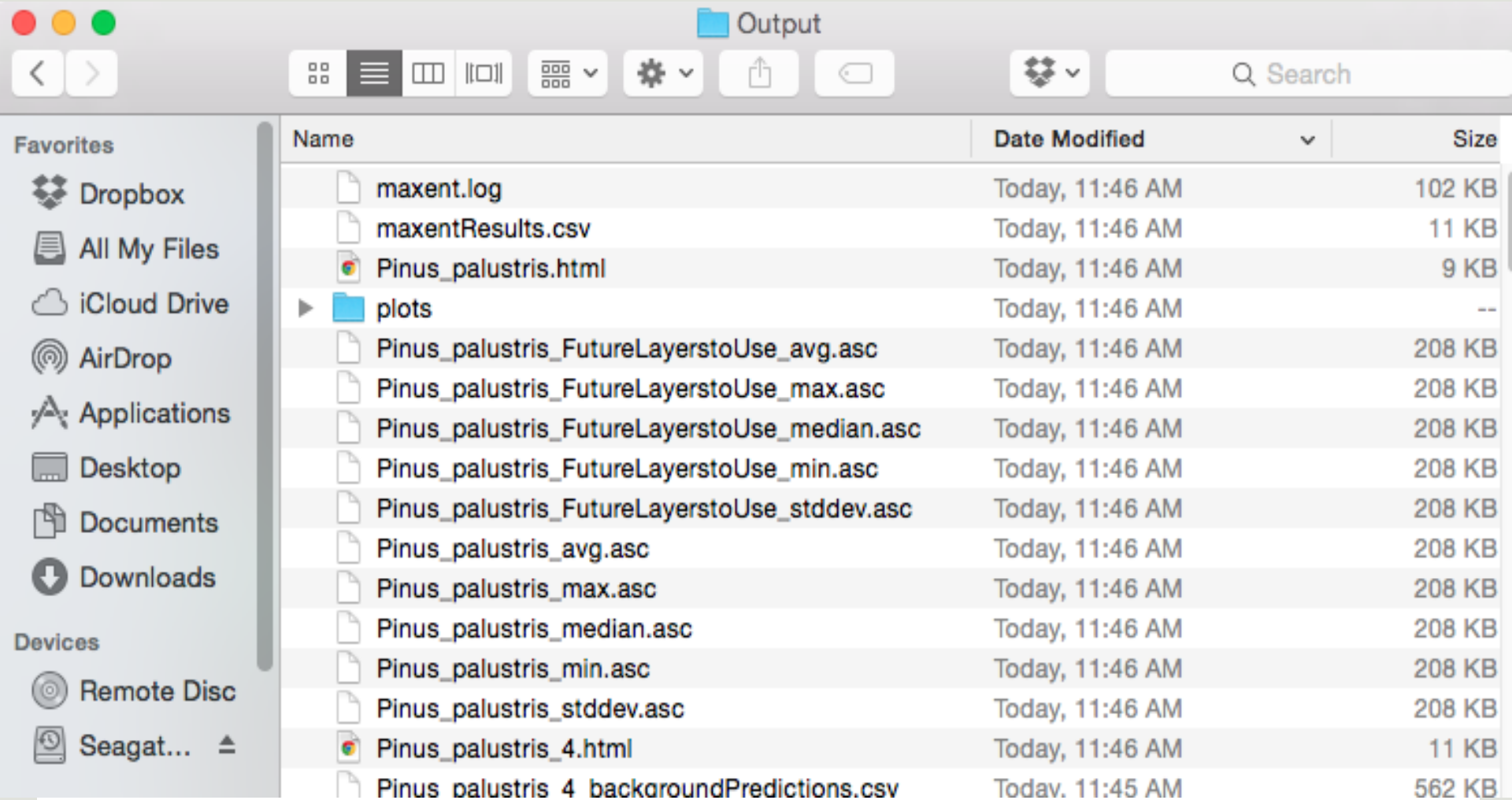


- Make a separate directory with the layers you wish to use

- Use the same layer variables (bio1, bio4, etc) that you used for your original models



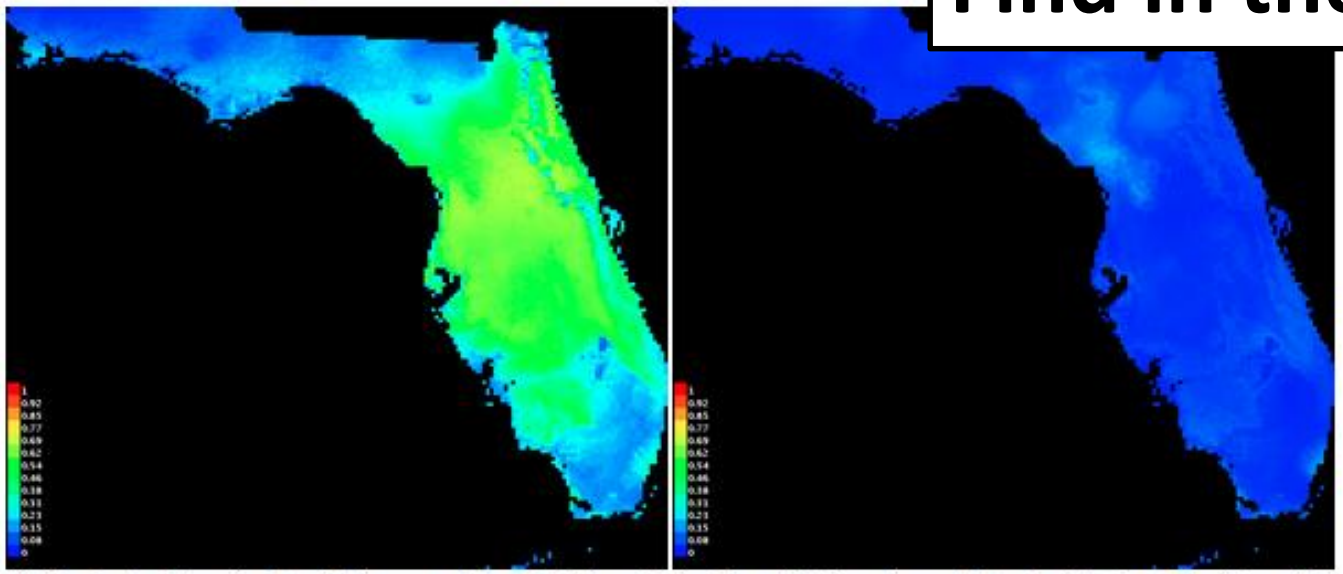
ALL EXACTLY THE SAME SETTINGS BUT WITH “PROJECTION LAYERS DIRECTORY” FILLED


Output
Search
Favorites
Dropbox
All My Files
iCloud Drive
AirDrop
Applications
Desktop
Documents
Downloads
Devices
Remote Disc
Seagat...
Name
Date Modified
Size
maxent.log Today, 11:46 AM 102 KB
maxentResults.csv Today, 11:46 AM 11 KB
Pinus_palustris.html Today, 11:46 AM 9 KB
plots Today, 11:46 AM --
Pinus_palustris_FutureLayerstoUse_avg.asc Today, 11:46 AM 208 KB
Pinus_palustris_FutureLayerstoUse_max.asc Today, 11:46 AM 208 KB
Pinus_palustris_FutureLayerstoUse_median.asc Today, 11:46 AM 208 KB
Pinus_palustris_FutureLayerstoUse_min.asc Today, 11:46 AM 208 KB
Pinus_palustris_FutureLayerstoUse_stddev.asc Today, 11:46 AM 208 KB
Pinus_palustris_avg.asc Today, 11:46 AM 208 KB
Pinus_palustris_max.asc Today, 11:46 AM 208 KB
Pinus_palustris_median.asc Today, 11:46 AM 208 KB
Pinus_palustris_min.asc Today, 11:46 AM 208 KB
Pinus_palustris_stddev.asc Today, 11:46 AM 208 KB
Pinus_palustris_4.html Today, 11:46 AM 11 KB
Pinus_palustris_4_backgroundPredictions.csv Today, 11:45 AM 562 KB

Pictures of the model

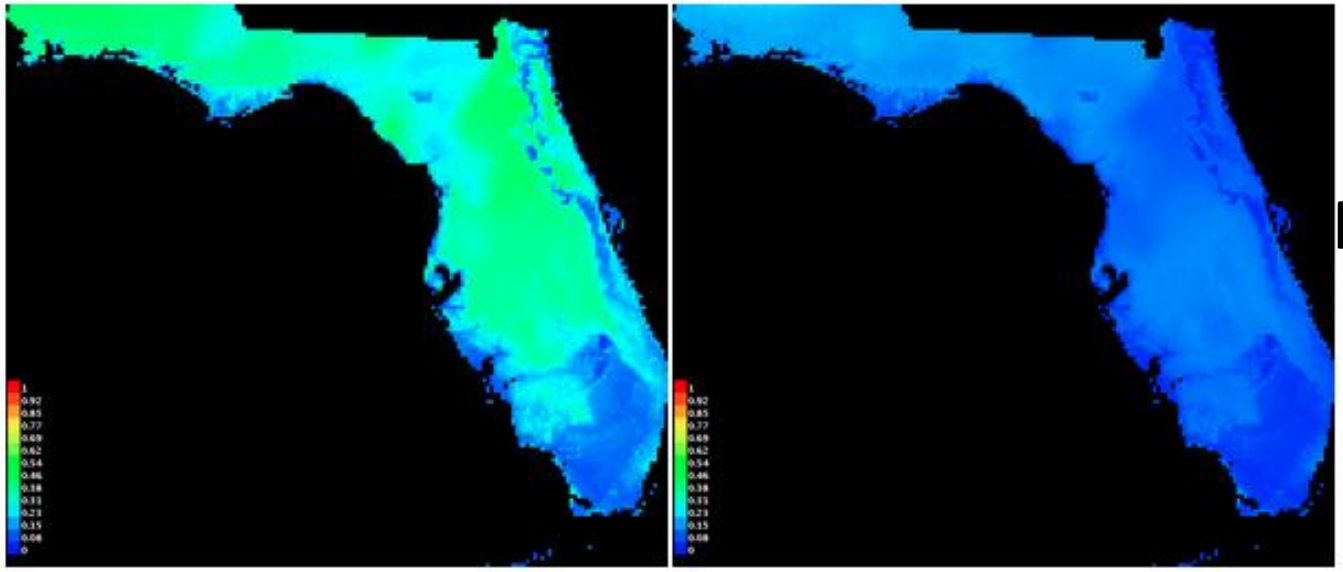
The following two pictures show the point-wise mean and standard deviation of the 5 output grids. Other available

Find in the results .html



ORIGINAL MODEL

The following two pictures show the point-wise mean and standard deviation of the 5 models applied to the environmental layers in FutureLayerstoUse. Other available summary grids are min, max and median.



PROJECTED MODEL

Things to be careful of:

- Projection layers are same resolution as original layers
- File names and locations in script
- Used same layer variables in projection and original