



NOW





2070

Projections with Maxent



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WorldClim - Global Climate Data

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, precidentia, 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 precipitatio (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			
CCSM4	CC	tn, tx, pr, bi			
CESM1-CAM5-1-FV2	CE		tn, tx, pr, bi		



Unzip and put new files in your working directory

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20	the statute of the st
21	#set the working directory
22	<pre>setwd("~/Desktop/NicheModelingWorkshop/Charlotte/")</pre>
23	
24	#load the maps
25	
26	alt_lF <- raster("Bioclim/alt.bil")
27	geo_lF <- raster("Bioclim/geo.asc")
28	<pre>bio1_lF &lt;- raster("FutureLayers/cc85bi701.tif")</pre>
29	<pre>bio2_lF &lt;- raster("FutureLayers/cc85bi702.tif")</pre>
30	<pre>bio3_lF &lt;- raster("FutureLayers/cc85bi703.tif")</pre>
31	<pre>bio4_lF &lt;- raster("FutureLayers/cc85bi704.tif")</pre>
32	<pre>bio5_lF &lt;- raster("FutureLayers/cc85bi705.tif")</pre>
33	<pre>bio6_lF &lt;- raster("FutureLayers/cc85bi706.tif")</pre>
34	<pre>bio7_lF &lt;- raster("FutureLayers/cc85bi707.tif")</pre>
35	<pre>bio8_lF &lt;- raster("FutureLayers/cc85bi708.tif")</pre>
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39	<pre>bio12_lF &lt;- raster("FutureLayers/cc85bi7012.tif")</pre>
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41	<pre>hio14 lF &lt;- raster("FutureLovers/cc85hi7014 tif")</pre>

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

- Run the script





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- 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



### MaxEnt

Maximum Entropy Species Distribution Modeling, Version 3.3.3k



![](_page_8_Picture_0.jpeg)

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😻 Dropbox	maxent.log	Today, 11:46 AM	102 KB
	maxentResults.csv	Today, 11:46 AM	11 KB
All My Files	Pinus_palustris.html	Today, 11:46 AM	9 KB
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![](_page_9_Picture_0.jpeg)

#### 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

![](_page_9_Picture_4.jpeg)

### 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.

![](_page_9_Picture_7.jpeg)

## PROJECTED MODEL

![](_page_10_Picture_0.jpeg)

# 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