Supplementing data with WorldClim

Seascape Genomics of North Pacific Forage Fishes RCN Group

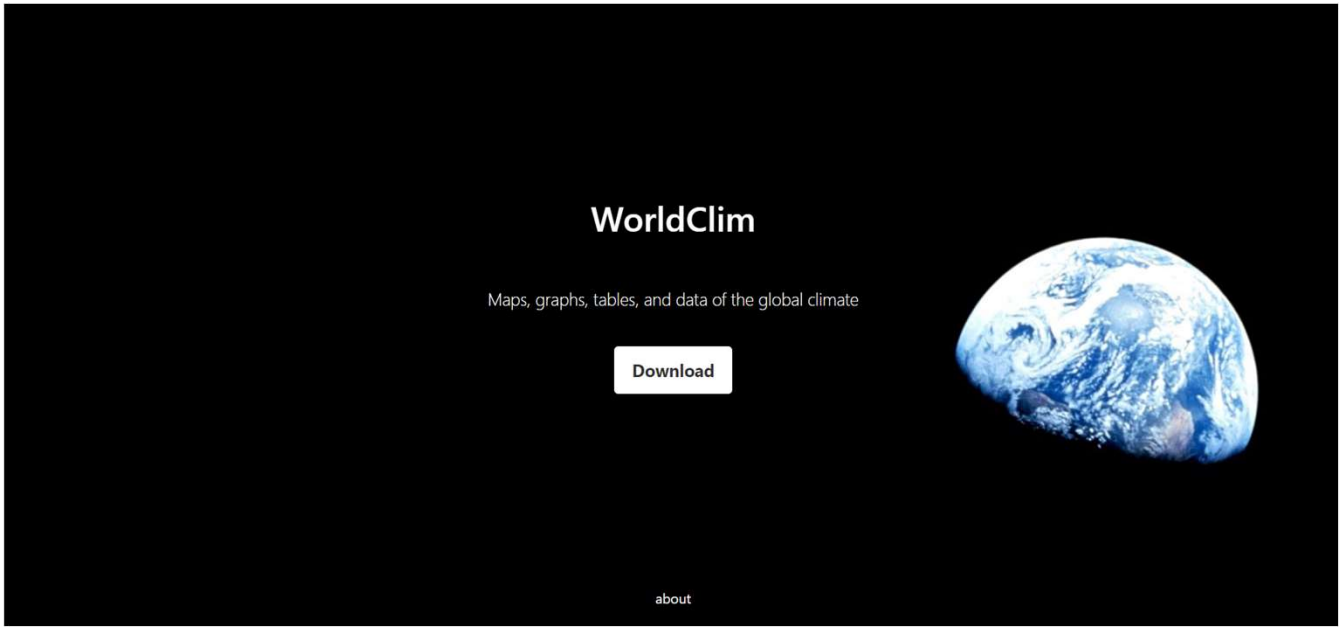
Timm LE, Tucker N, Rix A, LaBua S

Data you have in hand

- Collection site coordinates are preferred, general localities are usable
- Collection dates are preferred, seasons are usable
- Depth is optional

How to supplement climatic variables

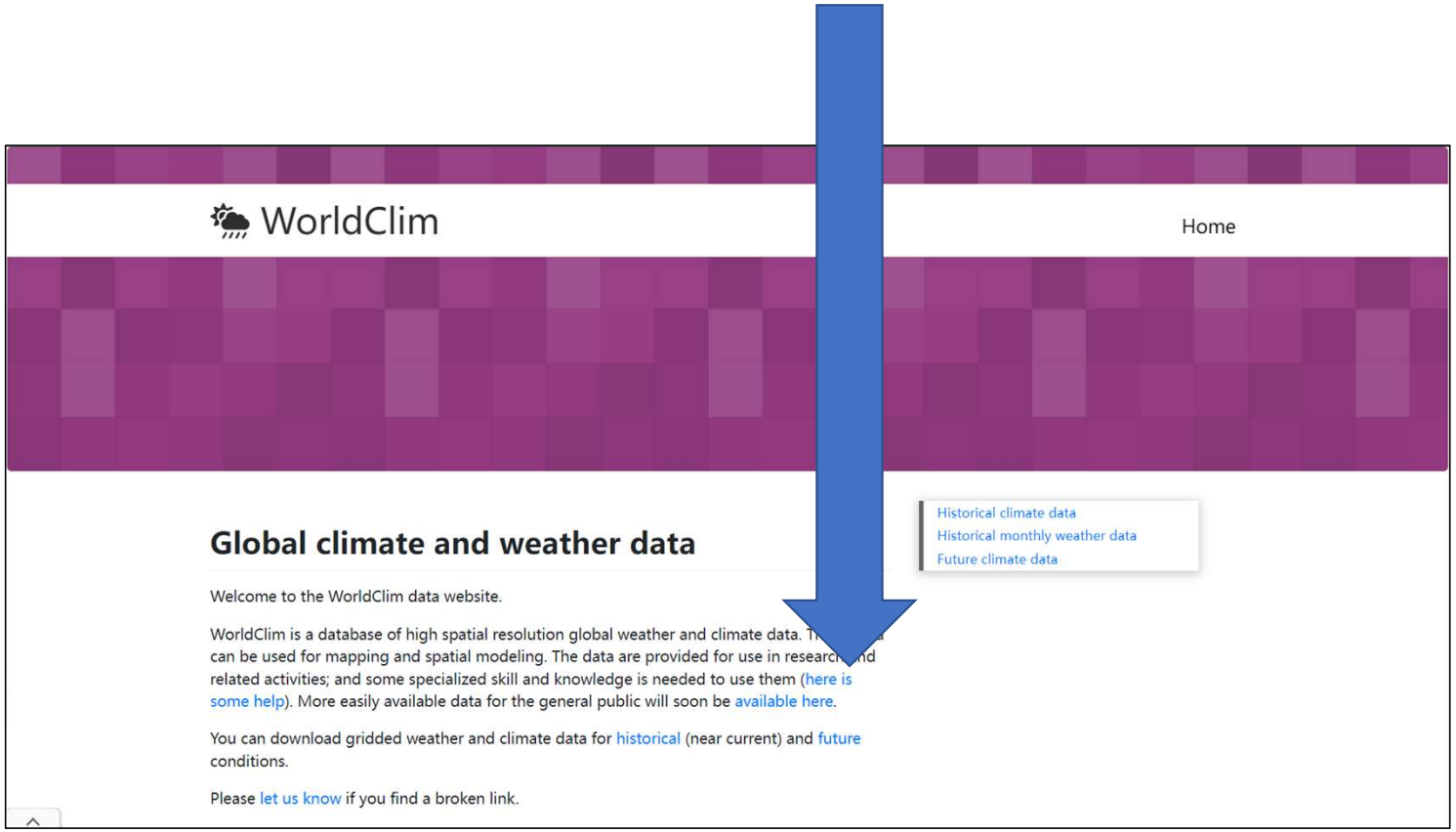
Navigate to the WorldClim Database (https://worldclim.org/)



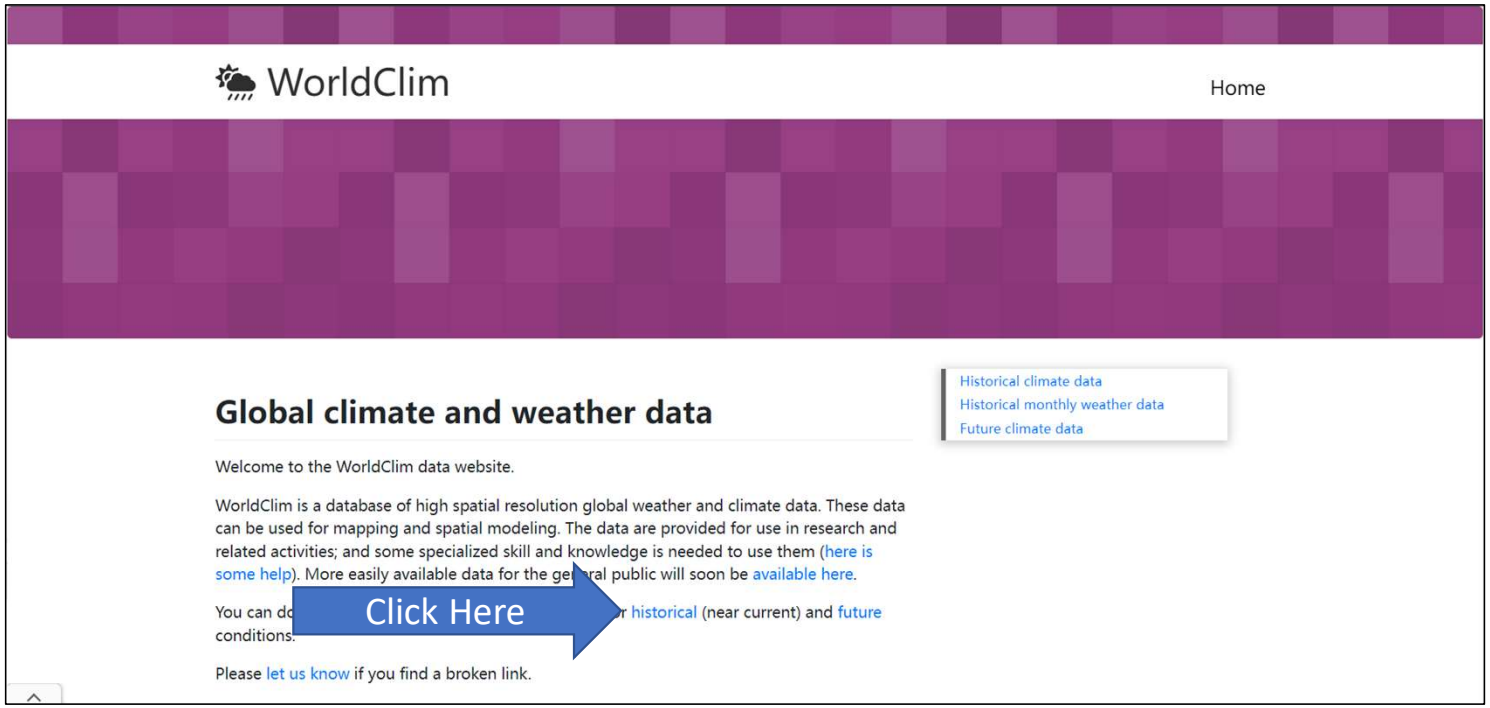
How to supplement historical climatic variables

Navigate to the WorldClim Database (https://worldclim.org/)

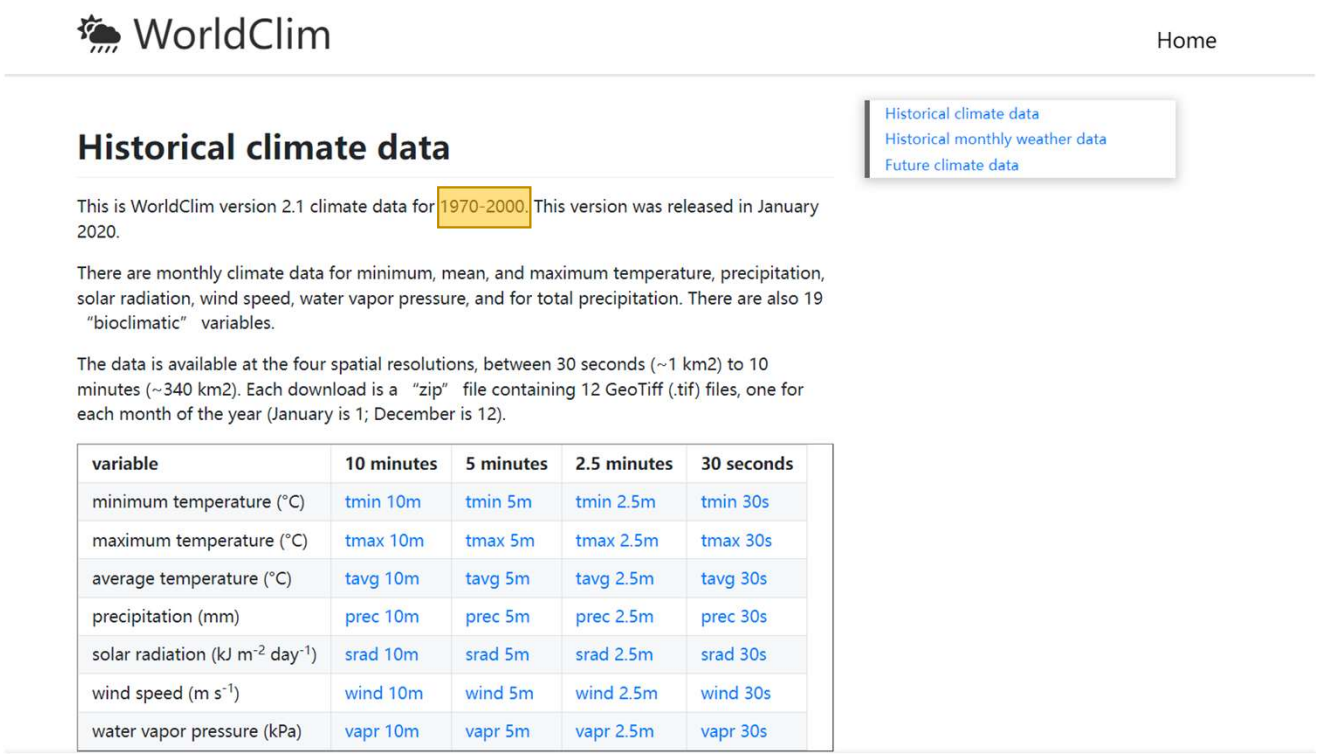
The website offers their own use guide to navigate the site



Investigate the historical datasets



Investigate the historical datasets



WorldClim

Home

Historical climate data
Historical monthly weather data
Future climate data

Historical climate data

This is WorldClim version 2.1 climate data for 1970-2000. This version was released in January 2020.

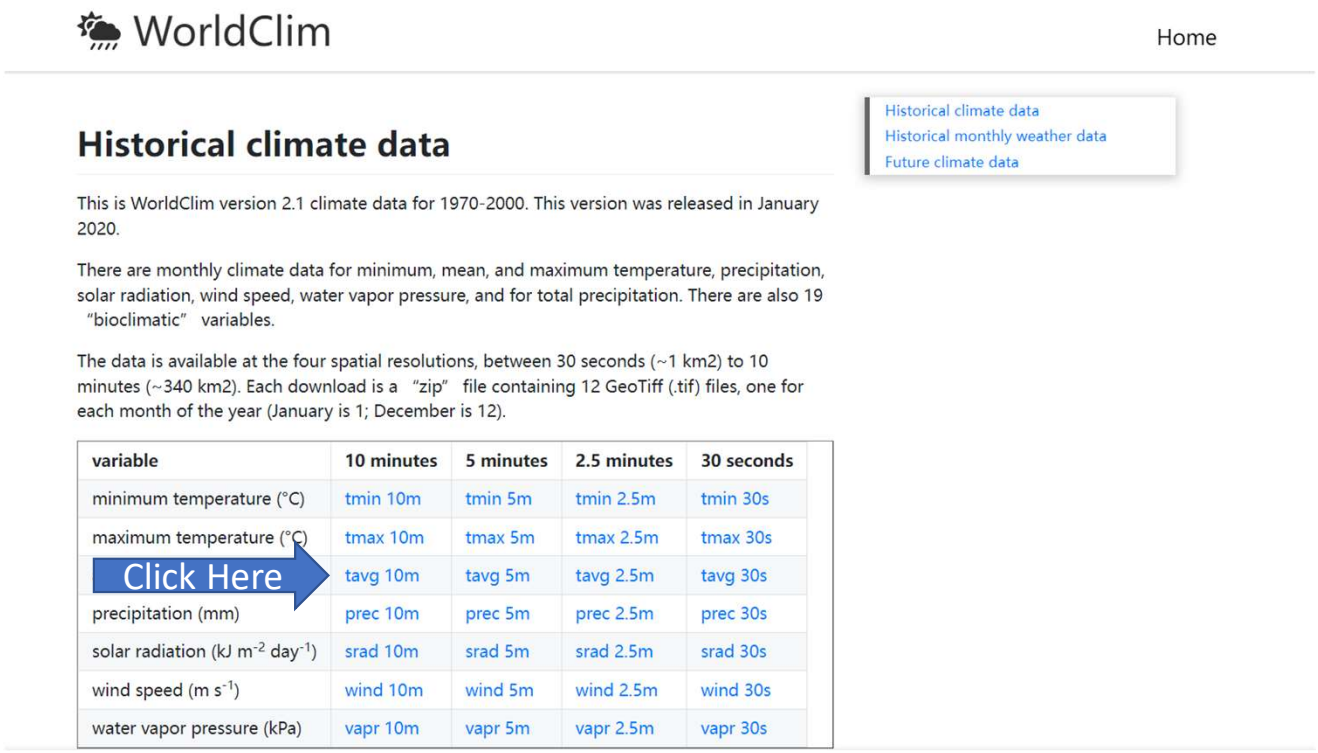
There are monthly climate data for minimum, mean, and maximum temperature, precipitation, solar radiation, wind speed, water vapor pressure, and for total precipitation. There are also 19 "bioclimatic" variables.

The data is available at the four spatial resolutions, between 30 seconds (~1 km2) to 10 minutes (~340 km2). Each download is a "zip" file containing 12 GeoTiff (.tif) files, one for each month of the year (January is 1; December is 12).

variable	10 minutes	5 minutes	2.5 minutes	30 seconds
minimum temperature (°C)	tmin 10m	tmin 5m	tmin 2.5m	tmin 30s
maximum temperature (°C)	tmax 10m	tmax 5m	tmax 2.5m	tmax 30s
average temperature (°C)	tavg 10m	tavg 5m	tavg 2.5m	tavg 30s
precipitation (mm)	prec 10m	prec 5m	prec 2.5m	prec 30s
solar radiation (kJ m^{-2} day^{-1})	srad 10m	srad 5m	srad 2.5m	srad 30s
wind speed (m s^{-1})	wind 10m	wind 5m	wind 2.5m	wind 30s
water vapor pressure (kPa)	vapr 10m	vapr 5m	vapr 2.5m	vapr 30s

An example with average temperature.

This is a 10 minute spatial resolution which will be downloaded as a .tif file



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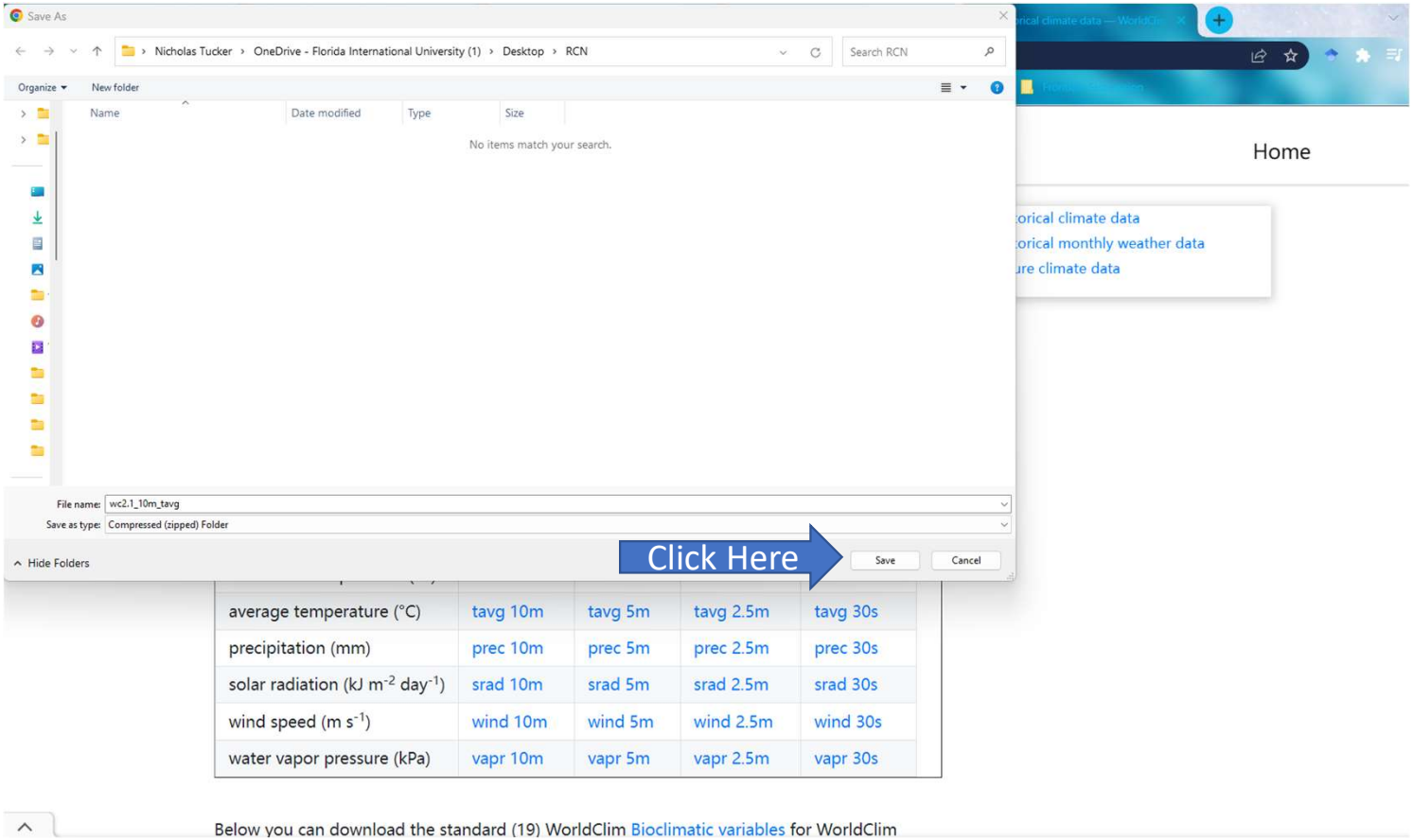

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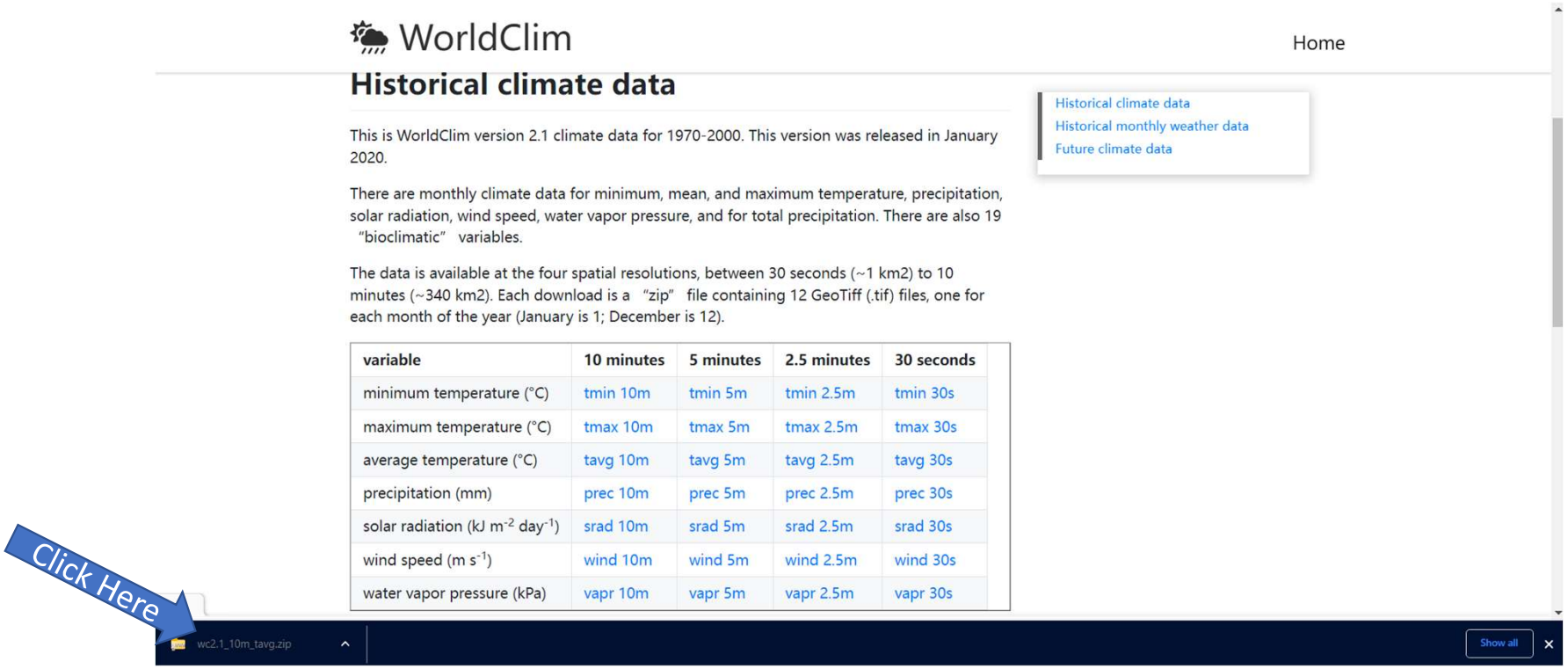
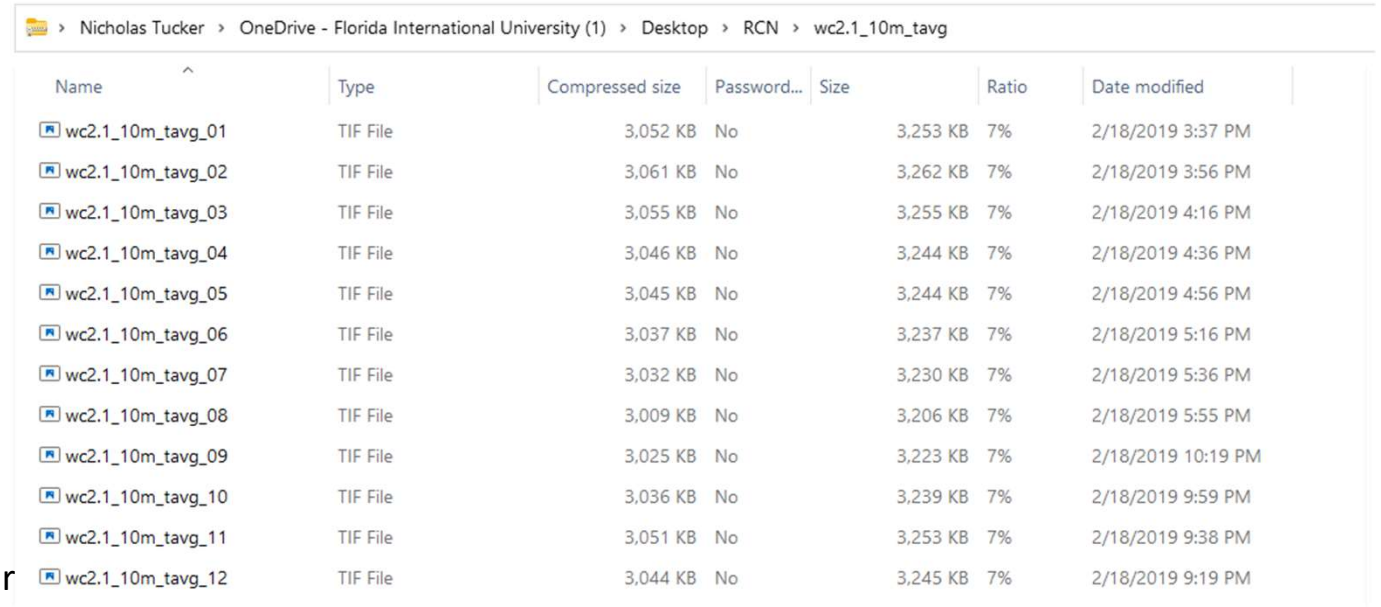


An example with average temperature.

This is a 10 minute spatial resolution which will be downloaded as a .tif file

January

December



› Nicholas Tucker › OneDrive - Florida International University (1) › Desktop › RCN › wc2.1_10m_tavg

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wc2.1_10m_tavg_02	TIF File	3,061 KB	No	3,262 KB	7%	2/18/2019 3:56 PM
wc2.1_10m_tavg_03	TIF File	3,055 KB	No	3,255 KB	7%	2/18/2019 4:16 PM
wc2.1_10m_tavg_04	TIF File	3,046 KB	No	3,244 KB	7%	2/18/2019 4:36 PM
wc2.1_10m_tavg_05	TIF File	3,045 KB	No	3,244 KB	7%	2/18/2019 4:56 PM
wc2.1_10m_tavg_06	TIF File	3,037 KB	No	3,237 KB	7%	2/18/2019 5:16 PM
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wc2.1_10m_tavg_10	TIF File	3,036 KB	No	3,239 KB	7%	2/18/2019 9:59 PM
wc2.1_10m_tavg_11	TIF File	3,051 KB	No	3,253 KB	7%	2/18/2019 9:38 PM
wc2.1_10m_tavg_12	TIF File	3,044 KB	No	3,245 KB	7%	2/18/2019 9:19 PM

Next Steps…

In order to use these data you will need to export them from the zipped folder that they are downloaded in.

You can do this using an unzip program on your computer or just drag and drop your folders into an unzipped folder.

Then depending on your application, you can begin processing directly using your .tif file or convert it to a format more compatible with your intended program.

Caveats

These are climatic variables and therefore *may not* be well linked to the distribution or movement patterns of marine organisms.

“Filling in” data can be useful and informative, but always remember this process inherently introduces error. Keep this in mind when interpreting results, especially when the climatic variables are derived or inferred from elevation.

The site authors request to be cited as:

Fick, S.E. and R.J. Hijmans, 2017. WorldClim 2: new 1km spatial resolution climate surfaces for global land areas. International Journal of Climatology 37 (12): 4302-4315.

If you try this guide, let us know!