README.md

GB Beaver Tools ArcToolbox

A Repository Containing an Arc Toolbox (>Arc10 and ArcPro compatible) to help investigate the results of the Beaver Habitat Index Model and Beaver Dam Capacity Model (Graham, et al. (in review) and Macfarlane, et al. (2015). These tools were developed for the Environment Agency and Natural England as part of a national beaver habitat and regional dam capacity modelling project.

Model Descriptions

The Beaver Habitat index (BHI):

A raster dataset which provides an integer value between 0-5, at a resolution of 5m, which describes the suitability of the vegetaion/landuse type for beaver forage.

Beaver Dam Capacity Model (BDC)

A vector dataset of a river network that describes the reach scale (~130m) capacity to support dams. Dam capacity is provided as 0-30 dams/km.

Arc Tool Box *(BeaverMod_ToolBox.pyt)*

This repository contains an Arc tool (*BeaverMod_ToolBox.pyt*) box which contains 3 tools:

1) Beaver Dam Capacity Toolbox (*BDC_Interp_Script.py*)

Returns summary statistics, for defined search areas, of BDC model results

2) Beaver Habitat Toolbox (*BHI_Interp_Script.py*)

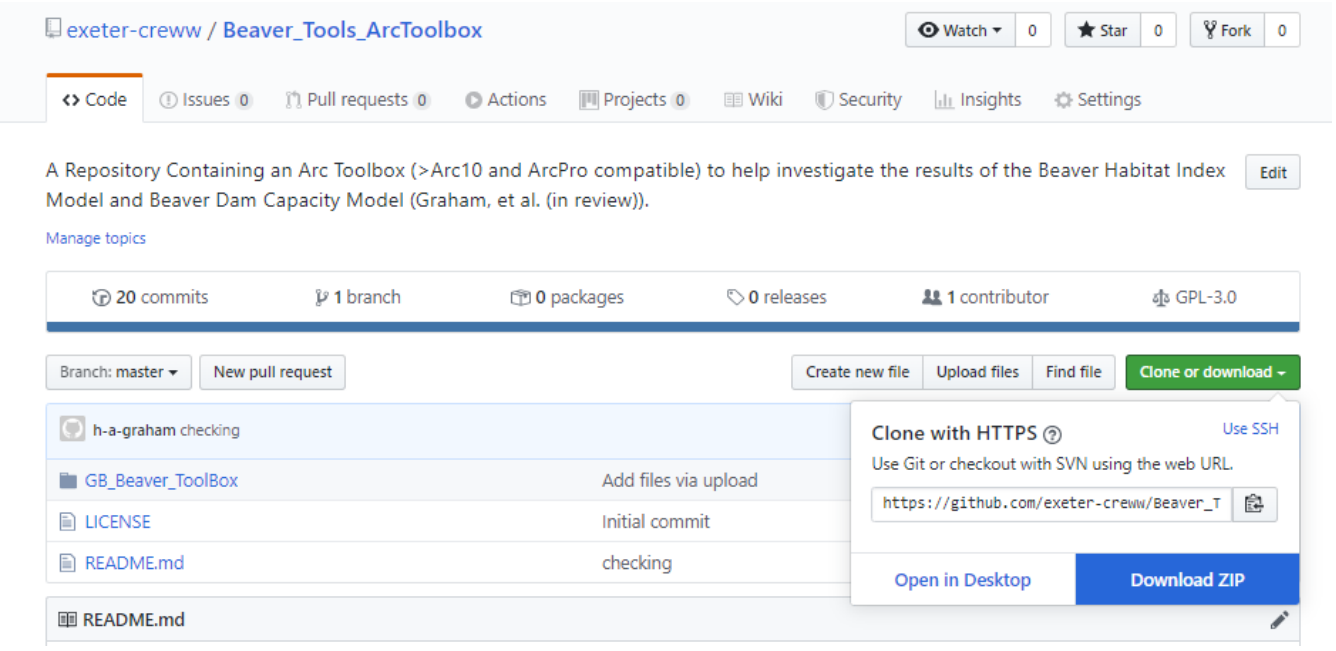
Returns summary statistics, for defined search areas, of BHI model results.

3) Beaver Habitat Stand Alone Toolbox (*BHI_StAl_Script.py*)

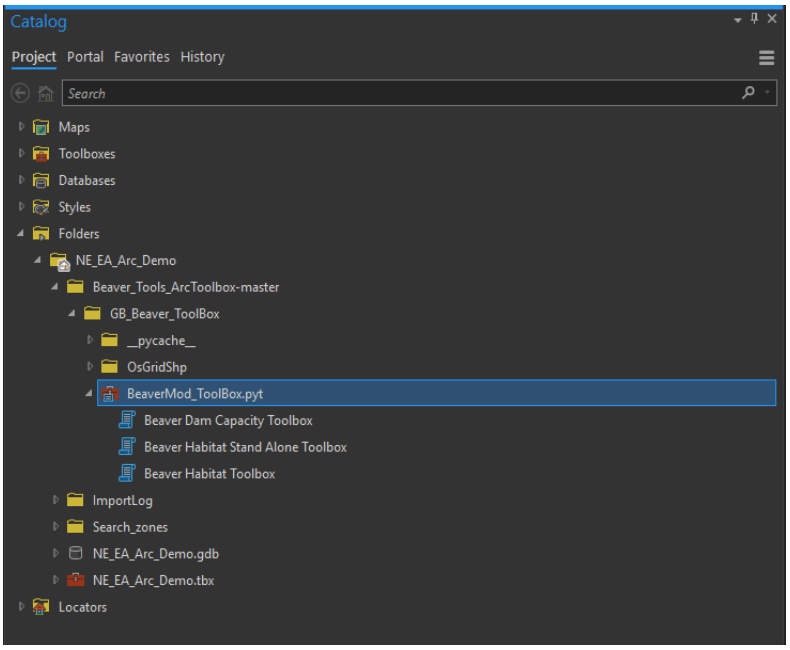
Returns summary statistics, for defined search areas, of BHI model results as in te Beaver Habitat Toolbox. However, this tool requires the full England BHI dataset to be loaded to disk. it then automatically locates the required raster tiles to analyse. Gives the same results as the Beaver Habitat Toolbox but requires no pre-processing of raster data. Slightly slower than Beaver Habitat Toolbox.

Tool Box Demo...

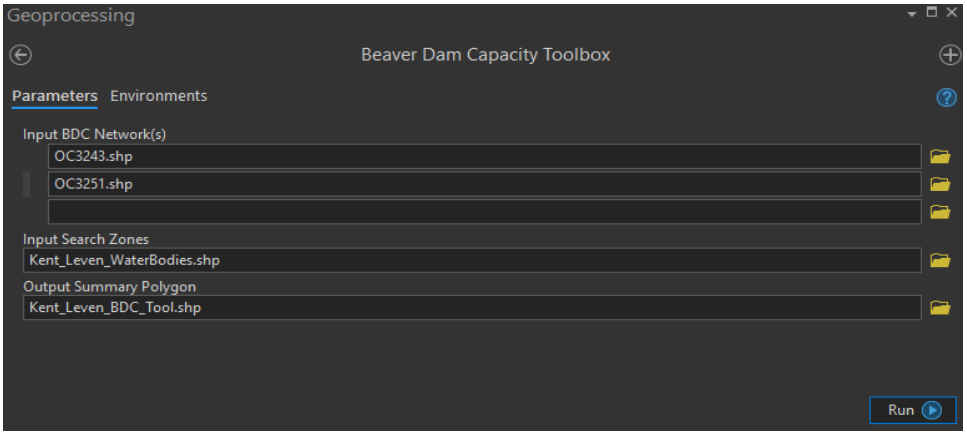
- Download This Repo (*https://github.com/exeter-creww/Beaver_Tools_ArcToolbox*):



- Unzip files in your desired install location.
- Open Arc Pro or Arc GIS 10+, Navigate to Arc Catalogue, Open Toolbox.



- To run the **Beaver Dam Capacity Toolbox**, Select the tool from the Catalogue menu. Enter the 3 required inputs and click Run:
  - **Input BDC Networks(s)** - select the file path(s) for the BDC networks of interest.
  - **Input Search Zones** - select a path to a user-created polygon feature which defines the areas of interest. The polygon file (.shp for example) may contain multiple features which will all be evaluated individually.
  - **Outout Summary Polygon** The desired save path for the resulting Polygon which contains the BDC summary statistics for each feature/AOI.

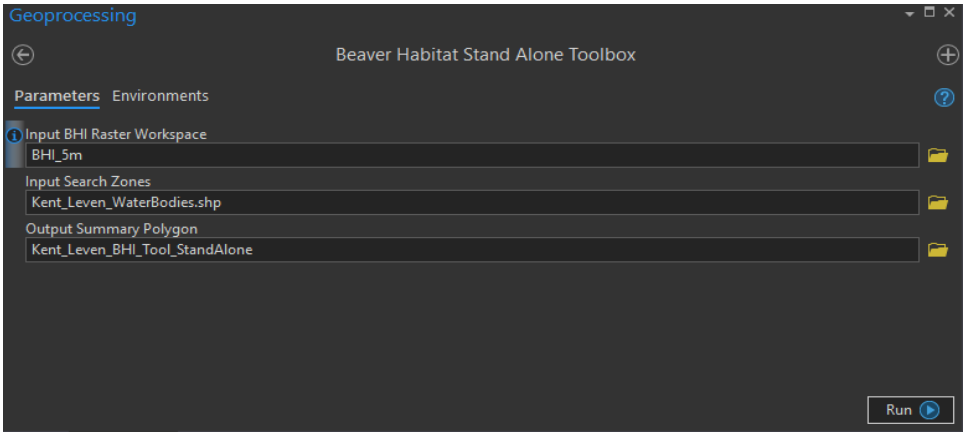


- The **Beaver Dam Capacity Toolbox** summary statistics include the following stats shown here as (**Name** - meaning):
  - (**BDC_MEAN** - Mean BDC value), (**BDC_W_AVG** - the average BDC value weighted by reach length), (**BDC_TOT** - The total dam capacity), (**BDC_MIN** - Minimum BDC value), (**BDC_MAX** - Maximum BDC value), (**BDC_STD** - the standard deviation of BDC), (**BDC_W_STD** - standard deviation of BDC weighted by reach length), (**BDC_P_<>** - The % of channel within a BDC category; either None, Rare, Occasional, Frequent or Pervasive), (**BDC_km_<>** - The length (km) of channel within a BDC category; either None, Rare, Occasional, Frequent or Pervasive), (**TOT_km** - The total channel length (km))

- To run the **Beaver Habitat Toolbox**, Select the tool from the Catalogue menu. Enter the 3 required inputs and click Run:
  - **Input BHI Raster** - select the file path for a BHI Raster which covers the extent of your chosen search areas. If your search areas cross >1 OSGB 100km grid you will need to mosaic (and clip if desired) multiple BHI tiles.
  - **Input Search Zones** - select a path to a user-created polygon feature which defines the areas of interest. The polygon file (.shp for example) may contain multiple features which will all be evaluated individually.

- **Outout Summary Polygon** The desired save path for the resulting Polygon which contains the BHI summary statistics for each feature/AOI.

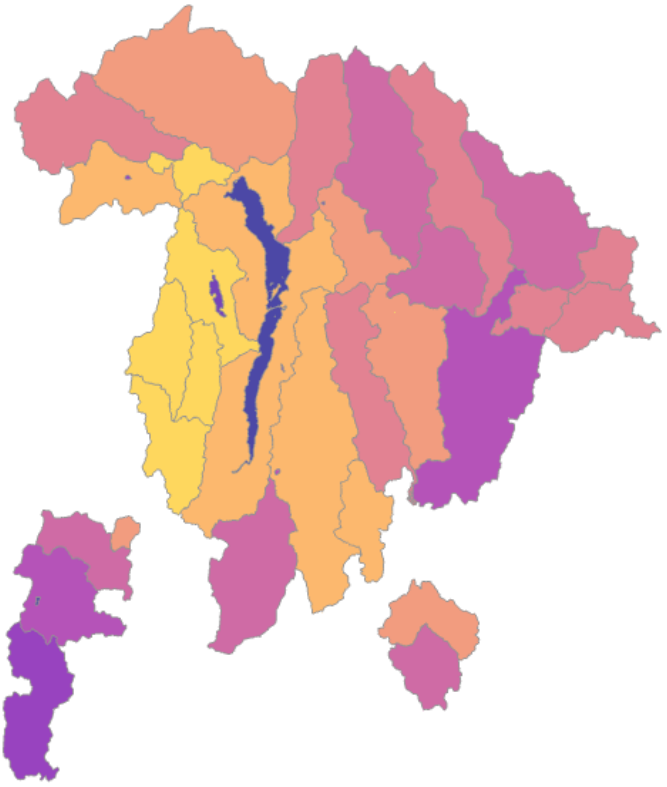
- To run the **Beaver Habitat Stand Alone Toolbox**, Select the tool from the Catalogue menu. Enter the 3 required inputs and click Run. (We recommend using this tool if you do not wish to preprocess rasters, as required in the Beaver Habitat Toolbox - this tool does the pre-processing for the user but requires all BHI tiles to be available.):
  - **Input BHI Raster Workspace** - select the folder path for all BHI rasters.
  - **Input Search Zones** - select a path to a user-created polygon feature which defines the areas of interest. The polygon file (.shp for example) may contain multiple features which will all be evaluated individually.
  - **Outout Summary Polygon** The desired save path for the resulting Polygon which contains the BHI summary statistics for each feature/AOI.



- The **Beaver Habitat Toolbox** and the **Beaver Habitat Stand Alone Toolbox** summary statistics include the following stats shown here as (**Name** - meaning):

  - (**BHI_MEAN** - Mean BHI value), (**BHI_MIN** - Minimum BHI value), (**BHI_MAX** - Maximum BHI value), (**BHI_STD** - the standard deviation of BHI), (**BHI_PERC_<>** - The % of land within a BHI category; 0-5), (**BHI_AREA_<>** - The Area (km^2) of land within a BHI category; 0-5))

- Finally, Visualise your search areas with the desired stats to produce a map like this:



For a pdf version of this README please see: (*https://github.com/exeter-creww/Beaver_Tools_ArcToolbox/blob/master/demo_files/Beaver_ToolBox_README.pdf*)