servir-vic-training processing scripts guide

Purpose:

The purpose of this document is to highlight how to use the processing scripts for the servir-vic-training. An emphasis is placed on explaining what processes the scripts perform on the back-end and explaining the script command arguments for execution.

Script Documentation:

- create_aoi_grid.py
  - This script creates a raster grid over an input shapefile with a user specified cell size
  - Usage: python create_aoi_grid.py <input shapefile> <output raster file> <output cell size>

- snap_raster.py
  - This script aligns the grid cells of two rasters and does resampling if needed
  - Usage: python snap_raster.py <input raster> <output raster> <template raster> <sub grid boolean> <resampling method>

- format_soil_params.py
  - This script takes geotiff data for soil parameterization and coverts it to the needed text format for the VIC model
  - Usage: python format_soil_params.py <template raster> <oil classification raster> <elevation raster> <annual precip raster> <slope raster> <ouput soil parameter file>

- format_snow_params.py
  - This script takes geotiff data for snow band parameterization and converts it to the needed text format for the VIC model
  - Usage: python format_snow_params.py <template raster> <elevation raster> <output snow band file> <interval for snow bands>

- format_veg_params.py
  - This script takes geotiff data for vegetation parameterization and converts it to the needed text format for the VIC model
  - Usage: python format_veg_params.py <template raster> <land cover raster> <output veg parameter file> <land cover classification scheme>

- make_veg_lib.py
  - This script takes geotiff data for the vegetation library file and converts it to the needed text format for the VIC model
  - Usage: python make_veg_lib.py <land cover raster> <LAI data folder> <albedo data folder> <output veg lib file> <land cover classification scheme>

- format_meteo_forcing.py
  - This script takes meteorological data from ERA-Interim and PERSIANN and writes a time series of precip, tmax, tmin, and wind for each grid cell to run VIC for
  - Usage: python format_meteo_forcing.py <template raster> <met data input path> <forcing file outpath> <start year> <end year>
  - * Notes: this script will need to be updated for your specific application, particularly reading in the meteorological data depending on formatting

- flux2nc.py
  - Program to convert VIC fluxes files to gridded netCDF file
  - Usage flux2cdf.py <vic flux dir> <out netcdf dir>
  - * Notes: assumes there is data for the entire time period, from 1-jan to 31-dec and that the input flux data is daily

- rout_vic.py
  - This script runoff and baseflow outputs from the VIC model formatted as a gridded netCDF and calculates streamflow at an outlet based on the Lohmann et al. (1996) routing model
  - Usage: python rout_vic.py <gauge unit hydrograph> <fraction file> <runoff data> <baseflow data> <output streamflow file> <start time> <end time> <boolean out daily data>

- calibrate_vic.py
  - This script performs a simplified calibration process by inserting random parameterization into the VIC model for n iterations
  - Usage: python calibrate_vic.py <number of iterations>

- calibrate_vic_sceua.py
  - This script performs a calibration process for the VIC model using the Shuffled Complex Evolution (SCE-UA) algorithm
  - Usage: python calibrate_vic_sceua.py

- format_flux_climo.py
  - This script takes grided daily flux data from the VIC and calculates the monthly and yearly climatological and accummulation
  - Usage: python format_flux_climo.py <vic flux netcdf file>