Instructions to Prepare and Run Mountainous KBA-Protected Area Overlap Calculator

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Clone the following mountain biodiversity GitHub repository to your machine: **https://github.com/aminaly/mountain\_biodiversity**

-------------------------------- Part 1: Data Preparation --------------------------------

Option 1: Replicate 2021 Run

* Ensure you have the following files in the subsequent folders:
  + KBA class file as a CSV that includes information on each KBA’s cover type classification (identified by Birdlife): **./data/KBA/kba\_class\_2020.csv**
  + ISO Country codes with country name and ISO3 codes: **./data/iso\_country\_codes.csv**
  + November 2020 WDPA Pre-filtered dataset (either as geodatabase or shapefile): **./data/WDPA/WDPA\_Nov2020\_Public\_shp/WDPA\_poly\_Nov2020\_filtered.gdb**
  + September 2020 KBA file: **./data/KBA/KBA2020/KBAsGlobal\_2020\_September\_02\_POL.shp**
  + GMBA Mountain Inventory **/data/GMBA/Gmba\_Mountain\_Inventory\_v2\_broad\_20210630/Gmba\_Mountain\_Inventory\_v2\_broad\_20210630.shp**
* Create the final directories where results will be stored: .**/results/files\_mt\_2020\***
  + \* or whatever year you’d like to run
* Optional: If you would like to run on only a subset of the data you can:
  + Either open **create\_clipped\_&\_intersections.ipynb** using jupyter notebook or **create\_clipped\_&\_intersections.py** using the terminal
  + Update the variable wrld\_cntries with the ISO3 codes of the countries you’d like to include
  + Run the python code and it will output a version of each file with “clipped” in front of it.

Option 2: Use Most Recent Publicly Available WDPA Data

* Ensure you have the following files in the subsequent folders:
  + ISO Country codes with country name and ISO3 codes: **./data/iso\_country\_codes.csv**
  + KBA class file as a CSV that includes information on each KBA’s cover type classification (identified by Birdlife): **./data/KBA/kba\_class\_2020.csv**
  + September 2020 KBA file: **./data/KBA/KBA2020/KBAsGlobal\_2020\_September\_02\_POL.shp**
  + GMBA Mountain Inventory **/data/GMBA/Gmba\_Mountain\_Inventory\_v2\_broad\_20210630/Gmba\_Mountain\_Inventory\_v2\_broad\_20210630.shp**
* Prepare the WDPA data according to directions on calculating protected area coverage
  + Download the most recent version of the WDPA data from protected planet: <https://www.protectedplanet.net/en/resources/calculating-protected-area-coverage> and save the folder in **./data/WDPA**
  + Either open **wdpa\_cleaning.ipynb** using jupyter notebook or **wdpa\_cleaning.py** using the terminal
  + Update your working directory to the location of the GitHub repo
  + Run the cells in jupyter notebook or set the .py file to run. It will output a new WDPA file with the same name but “flattened” in front of it

----------------------- Part 2: Run Calculator KBA\_PA\_MT\_overlap\_2020.R -----------------------

Open **KBA\_PA\_MT\_overlap\_2020.R**

* Make sure you have the listed libraries installed on your machine:
  + sf; dplyr; tidyverse; lwgeom
* Update the universal variables to reflect your desired run (part 1.1):
  + CLIPPED: set to TRUE if you want to use the python clipped versions
  + YEAR\_RUN: update with the year of the input files
  + PLOTIT: if you are running by hand (to debug or look into examples) set to TRUE if you’d like to see them. Not recommended for full runs as it will slow down your calculations significantly
  + OVERWRITE: If you are re-running either a failed run or partial run from before, and have already output some results, you can set this to FALSE to prevent recalculations. Not recommended if you’re switching up aggregations.
* Update your working directory (part 1.2)
* Update the names of the shapefiles to match yours if there were any adjustments/name changes (part 1.3)
* Run the full script (either locally on RStudio, or using remote computers)

-------------------------------- Part 3: Generate Figures: results\_mt\_kba\_pa.R -------------------------------

* Once you have run and output the full results of KBA\_PA\_MT\_overlap\_2020.R, you can use this file to output a PDF of visual results
* Create a ./visuals/ directory for the results
* Update the working directory to your git repository location
* Run the full file