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| **Protocol**  Meeting Bachelor Thesis, FS 2024 | | | | | | | | | | | |
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| **Protocol-No.:** | 06 | | | | | **Project name:** | Bachelor Thesis | | | | |
| **Meeting type:** | Discussion | | | | | **Location:** | GIUB, Bern | | | | |
| **Date / Time:** | 21.05.2024 / 15:00 | | | | |  |  | | | | |
| **Topic / Goals:** | Global Modelling | | | | | | | | | | |
| **Lead:** | Benjamin Stocker | | | | | **Logger:** | Patricia Gribi | | | | |
|  | | | | | | | | | | | |
| **Participants** | |  |  | | **E-mail** | | | **Present** | **Excused** | **Distribution** |
| Prof. Benjamin Stocker | |  | GECO-Group | | benjamin.stocker@unibe.ch | | | x |  |  |
| Patricia Gribi | |  | Unibe | | patricia.gribi@students.unibe.ch | | | x |  |  |
|  | | | | | | | | | | | |
| **Items discussed:** | | | | | | | | | | | |
| 1 global Modelling | | | | | | | | | | | |
| **Next meeting:** | | | | **Attachments:** | | | | | | | |
| * xx.05.22/15.00 | | | |  | | | | | | | |

| *(Legend for type: D = Decision, P = Pending, I = Information)* | Typ | Resp.: | Date: |
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| Modelling |  |  |  |
| * **Potential Evapotranspiration Calculation:** An alternative methodology involving the conversion of PET values into mass units was employed. This alternative approach utilizes the cwd::pet() function, as opposed to employing the function cwd::convert\_et(). * **pet():** | I |  | 14.05 |
| * A parameter for the pet() function is **surface pressure**. Since the NetCDF files of the CMIP6ng data do not contain information about elevation or altitude, the pressure value cannot be provided as a parameter. To address this issue, the ETOPO1 digital elevation model was regridded to the model's grid, allowing the determination of height above sea level for each grid cell. Steps taken:   + copied etopo\_NA\_NA to own folder. Tried to run proc\_etopo.sh but cdo not installed. Tried to run proc\_etopo.R but library(rbeni) not able to install. | P |  |  |
| * Installed all required packages and forked cwd\_global. | I |  | 14.05 |
| * **cwd\_global:** forked repo for the global cwd data and cloned it locally.   + **1.** **map2tidy:** The 'map2tidy' function is utilized to extract longitude "stripes" across the entire time-series dataset. It writes data to .rds files for each longitude index. Map2tidy returns the complete time series as nested data frames in column `data`. In the repository's 'analysis\_folder', the 'make\_tidy\_cmip6' function was updated to work for all variables. This way, tidy data frames are created for each longitude, covering the full time-series data.   + **2. apply\_cwd\_global:** Creates a tibble containing the indices of longitudinal points to be processed. Partitions this tibble across multiple cores for parallel processing using the multidplyr package. Applies the cwd\_byilon function to each longitudinal index in parallel, reading data from the input directory, processing it, and saving the results to the output directory with a specified file prefix.   + **3. cwd\_byilon:** adjusted function for all the needed variables. Adjusted file paths. CWD and pcwd are applied separately and written in specific directory.   + **2. cwd/pcwd function:** returns the cwd and pcwd timeseries as a dataframe. | I |  | 14.05 |
| * **ilon:** is the longitude index | I |  | 1.05 |
| * **chunks:** chunks of the data are written to separate files, placed in a directory as specified by the argument **outdir** with file names specified by argument **fileprefix**. The chunks will be along longitudinal bands (single index in longitude, all indices in latitude). | I |  | 1.05 |
| * **ncores:** To parallelize the computation of the canopy water deficit (CWD) across different longitudes, each core will be assigned the task of processing a specific file. This concurrent processing strategy ensures that computations for each longitude are performed independently and simultaneously across multiple cores, optimizing computational efficiency. Specifically, one core will be allocated to process one file, while subsequent files will be assigned to additional cores in parallel. | I |  | 1.05 |
| Workflow |  |  |  |
| * **Paths:** data still in my own folder under data\_download. What do with the cmip6 data it is not in scratch. Should I change it but I can’t…. | P |  | 14.05 |
| * I have two different functions for cwd and pcwd | I |  | 19.05 |
| * I would like to run a test with smaller ‘test’ data but in the same data-formats in order to see wether the code works. | P |  | 19.05 |
| Questions |  |  |  |
| * We started by estimating S0 as the CWD at which vegetation ‘activity’ ceases. Why? In paper global patterns of water storage in the rooting zones of vegetation |  |  |  |