# U.S. Rocky Mountain GLORIA Project

Final Code

Project completed Fall 2024

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## Scripts

### 1\_DataPrep

#### VegetationData

##### 1x1VegData.R

Takes raw species-level data from 1x1m quadrat surveys from 5 parks, combines it into one dataset, aggregates to the park-summit-aspect level, and fills in meaningful 0-value data.

##### speciesRanges\_Final.R

Takes herbarium records with spatial data downloaded from iDigBio, selects relevant attributes, and finds various latitudinal summaries at that species level. Requires an intermediate step in where species’ points are cropped to an outline of North America. We performed this in QGIS rather an R for ease of visualization of points before and after being cropped.

##### surfaceCoverfromSpecCover\_final.R

Generates data for total plant cover from 1x1-m species-level quadrat survey data.

#### TemperatureData

##### 1\_CompileRawTemp\_FindGaps.R

Compiles all raw temperature data and finds missing data/data gaps.

##### 2\_WaterBalanceModel\_Thoma.R

Uses David Thoma’s water balance model to generate water stress estimates at the summit level.

##### 3\_AggregateDailyClimate.R

Compiles daily climate data from PRISM, raw temperature data, and water balance model output.

##### 4\_FillMissingTempData

Summit-aspect level linear models to fill in missing climate data, using PRISM and other summit-aspect data as possible predictors.

#### AnalysisData

##### SpeciesLevel\_AnalysisDataPrep.Rmd

Compiles climate and 1x1-m species-level vegetation data into a table format ready for model input.

##### PlantCover\_AnalysisDataPrep.Rmd

Compiles climate and total plant cover vegetation data into a table format ready for model input.

### 2\_ModelSelection

##### ModelSelection\_1x1m\_SpeciesLevel.Rmd

Finds best supported mixed effects model predicting changes in species cover using climate PCA axes 1 & 2 and then explicit climate variables.

##### ModelSelection\_SpeciesofInterest.Rmd

Finds best supported mixed effects model predicting changes in species cover for individual species of special interest (with adequate data) using explicit climate variables.

##### ModelSelection\_VascPlantCover.Rmd

Finds best supported mixed effects model predicting changes in total plant cover at the summit-aspect level for using climate PCA axes 1 & 2 and then explicit climate variables.

### 3\_Results