Eagle Hills – BEC Site Series

In BC, we have biogeoclimatic zones which are broken down into various subzones according to local climatic conditions and dominant vegetation. Within a subzone, further classifications may be made at the site level based on topography and plant community composition that may be experienced at a very small scale, and this is called “site series”. Site series can tell a lot about your site, things like if you’re along tops or bottoms of hills, where moisture flows, etc.

The Eagle Hills site near Savona, BC has had intensive field data collections for site series over the course of 2018-2020. You will be working with LiDAR data covering the IDFdk1 subzone to model site series within this subzone. The LAS file for this project is about 23.3 GB in size. Here are some broad first steps with this file:

1. Tile the LAS file into smaller pieces (e.g.: 500m × 500m).
2. Perform ground point classification (use the CSF algorithm, specify “sloop\_smooth = TRUE”)
3. Develop a DEM raster image that is a 5m pixel resolution.
4. Produce various terrain-based layers from the DEM.
5. Extract the raster data where the polygons are located. You will want to use a similar setup to this function:

# Read in polygons, assign unique ID to each row of data in sf dataframe

poly <- st\_read(<path\_to\_shape.gpkg>) %>%

mutate(ID = row\_number())

# convert to SpatVect

vectors <- vect(poly)

# perform extraction

e <- extract(rasters, vectors, ID = TRUE, raw = TRUE) %>%

as.data.frame()

# Join the sf dataframe with the extracted data to identify the polygons that these points originated from

e\_join <- left\_join(poly, e, by = “ID”)

1. The material from question 5 becomes the data needed for modelling. Create a tuned ranger classification model using the mlr3 package, employing spatial cross validation in order to eliminate the effects of spatial autocorrelation.

Your predicted map should be saved as a .tif file, where you can load it into QGIS to get the look of your final map to include in your report. Provide details on how this map should be interpreted in your report.