**Thoughts:**

* Work for future include comparing to carbon in areas with tree planting

**To do overall:**

* Finish setting up environmental layers
* Export env variables for sample sites
* Read through the spatial analysis textbook
* Read through ecological forecasting again
* Start drafting sections
* finalize environmental variables

**Things to do to environmental layers:**

* Bioclim: get summary stats for each comparison
* Get wind data

Explore which environmental variable correlates best with the kind of disturbance, intensity, time since, etc...

Ideally, we could just use a measure of disturbance itself, but that doesn’t exist (or at least not reliably)

Overall think more about how to include disturbance in the model

\*\* could comparing how we include disturbance be a chapter?

* A gap is a gap (insect vs wind vs fire; to keep model more simple) so canopy cover could be used as proxy for disturbance w moose effects)
* But what about areas that have recovered?
  + Plus osme have dense trees so high canopy cover, but are very short
    - Index using canopy and height
* Does this relate to stand age?
  + This could tell us if a disturbance happened and when
    - And if the system is recovering

\*check out height data – first need to actually download it

* Maybe best way forward is to get the data extracted for sample sites and see which metrics line up well with known gaps?

**Analysis:**

Set up RStudio workflow:

For environmental data:

Bring in data:

If uploading straight to R - separate for locations of each sample

or upload already extracted info from QGIS

make single data set

remove NA’s

Correlation analysis

Do I approach it the same way as the budworm?

Combination of correlation factor, clustering with dendrogram and VIF?

Explore data structure

\*will need to check if linear\*

Which model? Likely poisson?

Carbon ~ poisson(?)

Carbon = logit? (µ)

µ = ∑ßenvx\*Envx

fit to carbon estimates

predict() function for new environmental variables

what spatial extent?

\* for spatial analysis see Heckford et al 2021 Statistical analysis:

1. Extracted the value of each remotely sensed covariate
   1. Elevation (and landcover type?)
      1. combined DEM images together to create a seamless raster
      2. ‘Clip’ function we limited our DEM raster to our AOI (what is R equivalent?)
      3. normalized our aspect raster by replacing any value > 180 by subtracting -180
      4. ‘subs’ to normalize using legend of corresponding values
      5. ‘raster.transformation’ from ‘spatialEco’ to standardize
   2. Forest inventory – stand info
      1. Using unique forest polygon identifiers, we attributed spatial covariates to the FRI datasets
      2. Unoverlap using clip, erase, and merge in ArcGIS (R equivalent?)
      3. Subset to variables of interest
      4. Remove ‘white-space’ (non intentional ones)
      5. Text values to integers
      6. Create raster ‘rasterize’ in ‘raster’ for each covariate
   3. Tree type
      1. Create codes (represent different dominant tree species) for vector mask of polygons?\*\* confused by this part
2. General Linear Models (GLM) with the response variables against explanatory spatial predictors
3. ranked models based on Akaike Information
4. removed models with uninformative parameters
5. If more than one model was within a\2 DAICc we averaged model coefficients and extracted full coefficient estimates for use in the construction of distribution models
6. Constructed spatial surfaces of foliar ESP traits by summing top model or the averaged coefficients estimates for top competing models, multiplied against their corresponding spatial covariate -> create predictive spatial surfaces of plant trait variability

**Writing:**

Create reference document

Start drafting methods

Think more about chapters