ECOL 596W
Week 10: Group Project #2

Focus: LM/GLM/LMM, modeling choices

All datasets are in the datasets folder here:
https://github.com/smcnew/ECOL_596W_2024

1. Euc_data.csv
Main question: How does grass cover influence *Eucalyptus* spp. seedling recruitment?
Experimental design: Researchers surveyed 18 sites 3 times each. During each survey, they quantified vegetation in 15 x 15m quadrats.

Note: Eucalyptus_metadata is a file explaining the columns
2. tit_clean.csv
Main question: To what extent is the growth of nestling blue tits influenced by competition with siblings?

Experimental design: Researchers studied a population of blue tits nesting in boxes at Wytham Wood. To test whether competition among siblings affects growth, researchers experimentally manipulated brood size. Some nests were experimentally enlarged by ~25%, some were experimentally reduced by ~25% and others were unmanipulated.

Note: tit_metadata.csv is a metadata file explaining the columns.

By Thursday at 10:15 AM

1. Choose a dataset/question
2. Create a group of 2-3 people
    1. Don't work with the same people you worked with in Project #1, or the person you sit next to daily.
3. Draw DAGS to represent your hypotheses
    1. identify potential confounders
4. Plot your data
5. Analyze your data
6. Come up with something to present (3 – 5 min).

Extended methods for Data Set #1.
Researchers conducted three rounds of surveys at 18 sites across the Goulburn Broken catchment in northern Victoria, Australia in winter and spring 2006 and autumn 2007. In each survey period, a different set of 15 x 15 m quadrats were randomly allocated across each site within 60 m of existing tree canopies. The number of quadrats at each site depended on the size of the site, ranging from four at smaller sites to 11 at larger sites. The

total number of quadrats surveyed across all sites and seasons was 351. The number of Eucalyptus spp. seedlings was recorded in each quadrat along with information on the GPS location, aspect, tree canopy cover, distance to tree canopy, and position in the landscape. Ground layer plant species composition was recorded in three 0.5 x 0.5 m sub-quadrats within each quadrat. Subjective cover estimates of each species as well as bare ground, litter, rock and moss/lichen/soil crusts were recorded. Subsequently, this was augmented with information about the precipitation and solar radiation at each GPS location. The full list of variables included in the dataset is publicly available (https://osf.io/r5gbn), along with the data
(https://osf.io/qz5cu).

Extended methods for Data Set #2.

Researchers conducted brood size manipulations and population monitoring of blue tits (Cyanistes caeruleus) at Wytham Wood, a 380 ha woodland in Oxfordshire, U.K (1º 20'W, 51º 47'N). Researchers regularly checked approximately 1100 artificial nest boxes at the site and monitored the 330 to 450 blue tit pairs occupying those boxes in 2001-2003 during the experiments. Nearly all birds made only one breeding attempt during the April to June study period in a given year. At each blue tit nest, researchers recorded the date the first egg appeared, clutch size, and hatching date. For all chicks alive at age 14 days, researchers measured mass and tarsus length and fitted a uniquely numbered, British Trust for Ornithology (BTO) aluminium leg ring. Researchers attempted to capture all adults at their nests between day 6 and day 14 of the chick-rearing period. For these captured adults, researchers measured mass, tarsus length, and wing length and fitted a uniquely numbered BTO (British Trust for Ornithology) leg ring. During the 2001-2003 breeding seasons, researchers manipulated brood sizes using cross fostering. They matched broods for hatching date and brood size and moved chicks between these paired nests one or two days after hatching. They sought to either enlarge or reduce all manipulated broods by approximately one fourth. To control for effects of being moved, each reduced brood had a portion of its brood replaced by chicks from the paired increased brood, and vice versa. Net manipulations varied from plus or minus four chicks in broods of 12 to 16 to plus or minus one chick in broods of 4 or 5. Researchers left approximately one third of all broods unmanipulated. These unmanipulated broods were not selected systematically to match manipulated broods in clutch size or laying date. We have mass and tarsus length data from 3720 individual chicks divided among 167 experimentally enlarged broods, 165 experimentally reduced broods, and 120 unmanipulated broods.