Jessica Bonin
Analysis of Environmental Data
Week 9 Reading Questions
October 31, 2021
Worked with Julia Vineyard

1. Briefly (1 - 2 short paragraphs) describe at least two tradeoffs between the customized ML methods and the canned methods.

   Customized MLE functions run more quickly in R and are less likely to run into numerical problems. However, building a model using already built/canned functions in R makes it much easier to compare different model types. Canned methods also allow for a simpler explanation in your methodology. Even if you built a custom function that is much simpler than a standard (canned) function, you would have to go into much more detail in the explanation of the statistics and model for your custom MLE. In summary, custom functions may be better for computing reasons, while canned functions may be better for sharing methodology and models.

2. Briefly (1 - 2 sentences) describe each of the four key assumptions of the general linear modeling approach.

   - Independent observations: Sampling is randomized and knowing something about one observation gives us no information about the next.
   - Constant variance: Constant variance along entire range of predictor values and the variability does not depend on the x value.
   - Fixed x: There is no measurement error in our predictor variables
   - Normality in the residuals: The residuals of the model are normally distributed.

3. Explain how the normality assumption can be met in a general linear model, even if the response variable is not normally-distributed. (1 - 2 paragraphs)

   The normality assumption describes linearity of the residuals, not that the data are normally distributed. The residuals are the difference between the predicted and observed values. Because the spread parameter is constant (constant variance along entire range of predictor values), the residuals are often heterogeneous.