**12/29/2020 Clustering with GAMs**

**-Results:** Generalized Additive Models were trained in order to cluster the fish stocks based on fish length at age 4 through an iterative process. The stocks that produced the best mean-squared-error when a GAM was trained were grouped together in the same cluster.

-Process:

1. Each fish stock was initially assigned to a random cluster (3 clusters were used) numbered 0,1,or 2.
2. A GAM was trained for each cluster. Each GAM was stored in a list.
3. Each stock was used to determine the mean-squared-error between the predictions of each GAM (from the list mentioned above) and the values in each stock. The mean-squared-errors were then stored in a list.
4. The mean-squared-errors were used to determine the best-fitting GAM for each stock. Each stock was re-assigned to the cluster associated with the GAM that yielded the lowest mean-squared-error for that particular stock.

-This process of training GAMs and re-assigning clusters was repeated for several times (15) when it was observed that the cluster re-assignments would not change (based on the graphs of each GAM after each reassignment).

Final Graphs:

