

Using Regression Trees to Model Mercury Concentrations in Spurdog

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The bioaccumulation of persistent pollutants in fish species may result in adverse health effects on the consumer of fish produce and can additionally have detrimental effects on the health status of the species itself. The Spurdog (*Squalus acanthias*) is a member of the shark family whose numbers are in rapid decline in recent years. This predatory species can have long lifetimes in both deep and coastal waters and can often accumulate relatively high levels of total mercury within its tissues. Modeling the mercury concentration, while adjusting for other covariates (e.g age, length, weight), is of primary interest to further develop our understanding of the factors influencing accumulation of the pollutant in the species. In this poster we use two different approaches for this purpose. Initially, Linear Models [1] were fitted, using a Box Cox Transformation (as necessary) for the response and Best Subsets for variable selection. As an alternative to the Linear Model we used Regression Trees [2] [3] which provided us with a simpler and more intuitive method to detect useful interactions as well as ease of interpretation of the structure of the data. The optimal tree was obtained using Least Squares as the splitting criterion and other alternative models were explored using surrogate trees in order to include in the model variables of specific interest to the marine community that did not appear in the optimal tree.

References

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