Topic 2: Mercury in Bass

Mercury contamination of edible freshwater fish poses a direct threat to the health of those who catch and eat fish. Largemouth bass were studied in 53 Florida lakes. The goal is to develop a model to predict fish mercury concentration from lake water chemistry measures. Surface water samples were collected from the middle of each lake. The pH level, the alkalinity, the amount of chlorophyll and the amount of calcium were measured in each sample. Next, four (or more) largemouth bass were sampled from each lake. The age of each fish and mercury concentration in the muscle tissue was measured. Fish age is important because bass accumulate mercury, so older fish tend to have higher mercury concentrations. The measured age and mercury concentration were used to estimate mercury in a standardized 3 year-old fish. The mercury value for each lake in the data set is the average mercury concentration in 3 year-old fish. Florida has set the unsafe concentration of mercury in edible foods as 0.5 part per million.

The data set has one row for each of the 53 lakes in the study. The variables are:

Id: a unique id number for each lake

Lake: Lake name

Alkalinity: lake alkalinity as Calcium Carbonate equivalent, units are mg/L

pH: lake pH

Calcium: lake Calcium concentration, units are mg/l

Chlorophyll: lake Chlorophyll concentration, units are mg/l

Hg: average fish mercury concentration, standardized to 3 year-old fish.

units are parts-per-million (ppm), which is mg Hg / kg fish muscle

Specific questions:

Hg values for 3 lakes are missing. Please predict the Hg values for these lakes and include those predictions and appropriate intervals in your report.