Week 12 Reading Questions

Q1

Although one may be able to describe a certain phenomenon, say changes in the sizes adult delta smelt fish, by many different factors there is a trade-off between certainty and interpretability. The more explanatory factors we may include when trying to understand the mechanisms that drive differences in fish size can become overwhelming especially when trying to piece out the relative and magnitude of the effect for each factor. For instance we find that by looking at the temperature, fish sex, site coordinates, date, watch salinity, water turbidity, water pH, average ambient climate, solar radiation, type of diet consumed, microbial community associated to the fish's digestive system, if it was swimming with or against the current, physiological capacities, etc., all together all of these factors effect fish size, but, expressing this in the context of a specific question would be very challenging. Instead the it is best to choose the factors that are of primary interest according to a specific question like, how does temperature effect delta smelt fish size, and add a limited number of factors that in combination with temperature provides interesting and robust results.

Q2: Significant Slopes

Which of the following predictor variables had slope coefficients that were significantly different from zero at a 95% confidence level? Select the correct answer(s):

A. water , p val=0.021
B. nitrogen , p val= 0.007
C. phosphorus
D. None

Q3: Biomass Calculation 1

Y = 0.043(water ml) + 0.192(nitrogen mg) – 0.027(phosphorus mg) – 1.7
Y = 0.043(0) + 0.192(0) – 0.027(0) – 1.7
Y = - 1.7 gram of plant mass

Q4: Biomass Calculation 2

Using the information in the model coefficient table above, what is the expected biomass for a plant given:

Y = 0.043(water ml) + 0.192(nitrogen mg) – 0.027(phosphorus mg) – 1.7
Y = 0.043(10) + 0.192(30) – 0.027(20) – 1.7
Y = 0.43 + 5.76 – 0.27 – 1.7
Y = 4.22 gram of plant mass

Q5

The key difference between a simple linear regression and a 1-way analysis of variance is that a simple linear regression is a relationship between a continuous dependent and independent

variable where as a 1-way analysis of variance is the relationship between a continuous dependent variable and a categorical independent variable.

Q6

$\alpha+\beta 1xi$ = deterministic

Q7

ϵ = stochastic