Truckee River Lab

By Philip Sevcsik, Madison Bible, Joseph Dailey, and Stalin Vasaquez

Introduction

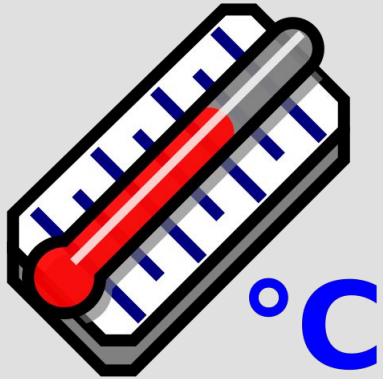
-Aim: To determine if a relationship exists between certain factors and the amount of bug life.

-Measured pH levels, temperature, dissolved oxygen content, and total dissolved solids trying to discover relationship with amount of bug life.

-It is critically important to measure/understand these factors, because they influence all life in every body of water around the world.

Questions

1. What is the relationship between dissolved oxygen and the amount of macroinvertebrates?
2. What is the relationship between pH level and the amount of macroinvertebrates?
3. What is the relationship between temperature and the amount of macroinvertebrates?



Hypothesis

1. If there is a higher amount of dissolved oxygen, then there will be a larger amount of macroinvertebrates compared to a lower amount of dissolved oxygen.
2. If the pH level is closer to 7.0, then there will be a larger amount of macroinvertebrates compared to the pH level further from seven.
3. If the temperature is lower, then there will be a larger amount of macroinvertebrates compared to when the temperature is higher.

Materials

Materials (Purpose)

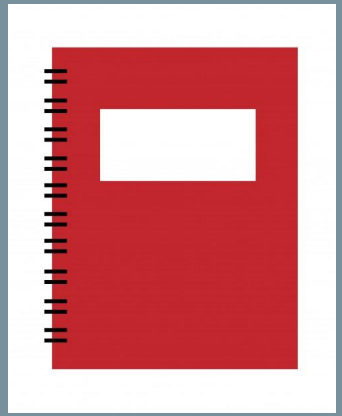
-1 net (catch macroinvertebrates)

-1 Vernier Probe (to measure dissolved oxygen)

-1 thermometer (to measure temperature)

-1 notebook (to record notes) macroinvertebrates)

-1 ice cube tray (container for MI)



-1 bucket (container for MI)

-1 device to measure pH

-1 pencil (to record notes)

-1 spoon (used to transport

-1 clipboard (to record notes)

Methods

1. Selected six different sites along river and five sample locations per site.
2. Acquired necessary materials
3. Put net in water/disturb river bottom upstream of net to catch macroinvertebrates at each sample location. Pour contents of net into bucket and count total number of macroinvertebrates.
4. Measure pH level, temperature, and dissolved oxygen content at each sample location.
5. Pour contents of bucket into river once total number of macroinvertebrates has been recorded.
6. After completing this process at five sample locations per site, move on to the next site.

Results

-Results varied depending upon the variables that were being measured

-Results were limited by the amount of data available

-Results were limited by the amount of data collected

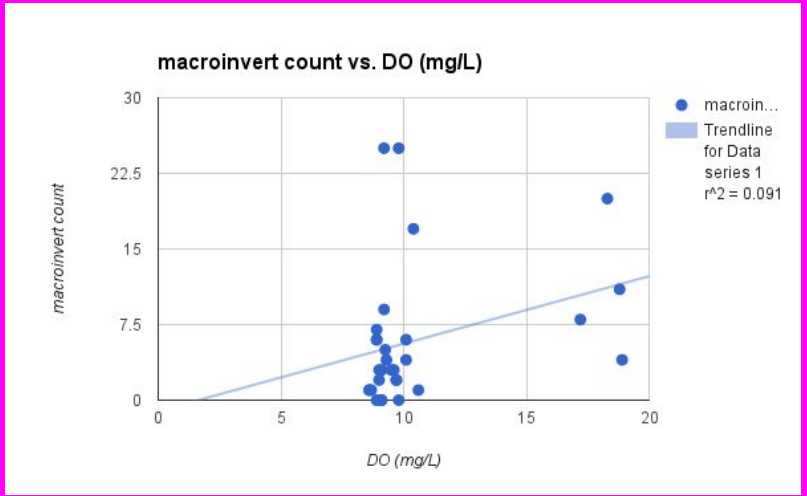
Results

-Graph displays Amount of Macroinvertebrates at Different Dissolved Oxygen Concentrations

-Linear Regression lacks correlation and makes grouping necessary

-Low DO group has lower amount of

Macroinvertebrates compared to High DO group



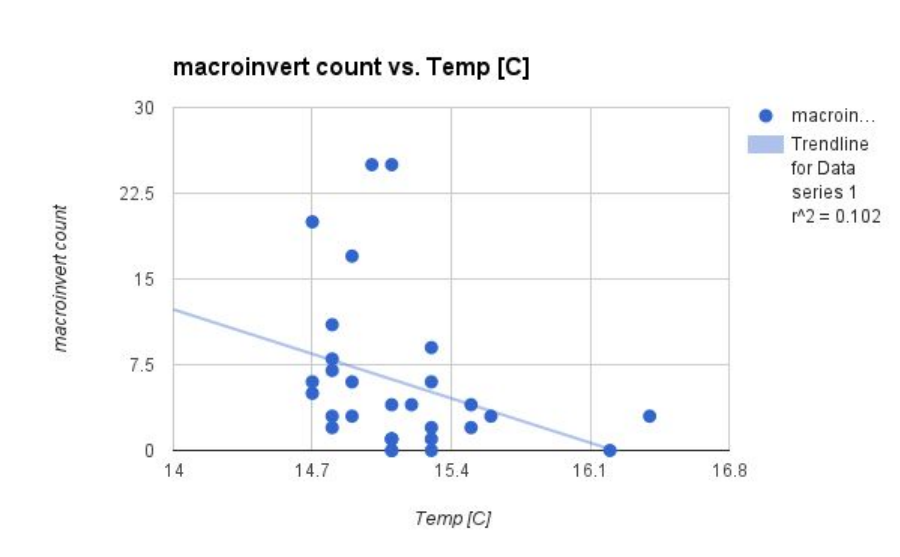
Results

-Graph displays Amount of Macroinvertebrates at Different Temperatures

-Linear Regression

-In general, there is a larger amount of Macroinvertebrates at a lower temperature.

-At temperatures above 15.6 degrees Celsius, There are very few macroinvertebrates.



Results

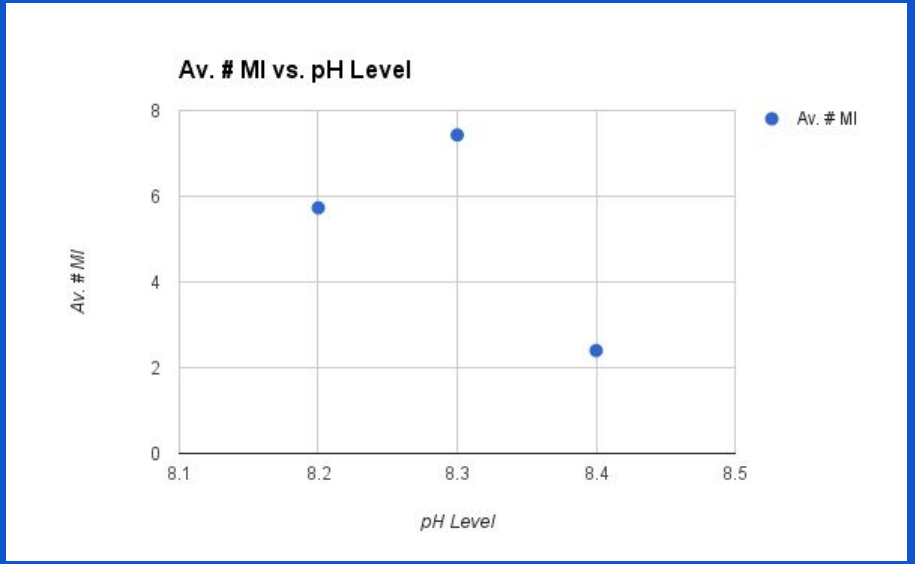
-Graph displays Average Amount of Macroinvertebrates at Different pH Levels

-Linear Regression lacked correlation/was difficult to understand, so a T-Test was conducted to produce graph

-Average amount of macroinvertebrates

Does not increase as pH level gets closer

To 7.0



Discussion/Conclusion

-True that if there is a higher concentration of dissolved oxygen, then there will be a higher amount of macroinvertebrates. With available data, only applies to groups of dissolved oxygen (Low DO=9 to 12 mg/L while High DO=16 to 19 mg/L).

-True that if the water temperature is lower, then there will be a larger amount of macroinvertebrates. With available data, this only applies to temperatures between 14 degrees Celsius and 16 degrees Celsius.

-False that if the pH level is closer to 7.0, then there will be a larger amount of macroinvertebrates. With available data, this conclusion only applies to pH levels between 8.2 and 8.4