**Assessment Pre-/Post-Test for**

**“*Do Riparian Buffers Improve Stream Temperatures*?”**

**Instructions:** Your Instructor may ask you to take this test twice (before and after conducting the lab exercise). Read each question carefully and place an X in the box next to the one best answer. Answer all of the questions; if you don’t know the answer, take your best guess. When you have completed the test, please email it as an attachment to [simmons@msmary.edu](mailto:simmons@msmary.edu) with the subject line “Assess1”.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Your name: | | |  | Date: |  |
| Name of your Institution: | | |  | Pre- or Post-test?: |  |
|  | | | | | |
| 1. How does water temperature in a stream change during a typical, sunny 24-hr day? | | | | | |
|  |  | * + 1. Temperature is basically constant because of the high heat capacity of water | | | |
|  |  | * + 1. Temperature is lowest at midnight, increases to a maximum at noon, and decreases again to the next midnight | | | |
|  |  | * + 1. Temperature is lowest in early morning, increases to a maximum in mid-afternoon, and then decreases to the next morning | | | |
|  |  | * + 1. Temperature is basically constant at night but rises and falls during daylight hours | | | |
|  |  | * + 1. Temperature rises and falls erratically as environmental factors like ground temperature and wind speed change throughout the day. | | | |
|  |  |  | | | |
| 1. Stream temperature can potentially affect aquatic organisms in all of the following ways EXCEPT | | | | | |
|  |  | 1. By shortening or extending the length of the growing season | | | |
|  |  | 1. By causing mutations in DNA within aquatic organisms, many of which can be lethal | | | |
|  |  | 1. Temperatures near the high end of the range of tolerance over a long period of time could inhibit the growth of organisms | | | |
|  |  | 1. Daily spikes in high temperatures can be lethal if they exceed the range of tolerance of the species | | | |
|  |  | 1. Temperature effects on net primary productivity can affect the amount of food available for herbivores | | | |
|  |  |  | | | |
| 1. Which of the following stream temperature parameters is most important for determining if a species could survive in a stream? | | | | | |
|  |  | 1. Daily maximum temperature | | | |
|  |  | 1. Daily minimum temperature | | | |
|  |  | 1. Daily mean temperature | | | |
|  |  | 1. Daily range | | | |
|  |  | 1. Mean annual temperature | | | |
|  |  |  | | | |
| 1. How does mean summer stream temperature vary with latitude? | | | | | |
|  |  | 1. Mean summer stream temperature increases as latitude increases but only in large rivers, not in small streams | | | |
|  |  | 1. Mean summer stream temperature increases as latitude increases | | | |
|  |  | 1. Mean summer stream temperature decreases as latitude increases | | | |
|  |  | 1. Mean summer stream temperature is not affected by latitude | | | |
|  |  |  | | | |
| 1. A linear regression equation can be represented by | | | | | |
|  |  | 1. Y = e-kt | | | |
|  |  | 1. Y = r2 + bx + m | | | |
|  |  | 1. Y = x2 + 2xy + y2 | | | |
|  |  | 1. Y = x \* ln(b) | | | |
|  |  | 1. Y = mx + b | | | |
|  | | | | | |
| 1. Compared to a stream flowing through a forest, a stream flowing through an open field will have | | | | | |
|  |  | 1. a greater daily fluctuation in temperature | | | |
|  |  | 1. a greater daily mean temperature | | | |
|  |  | 1. less direct solar radiation inputs | | | |
|  |  | 1. a lower daily fluctuation in temperature | | | |
|  |  | 1. a higher daily minimum temperature | | | |
|  |  |  | | | |
|  |  | |  |  |  | | --- | --- | --- | |  | A | B | | 1 | **Time** | **Windspeed (km/hr)** | | 2 | 12:00 | 0.3 | | 3 | 2:00 | 0.2 | | 4 | 4:00 | 0 | | 5 | 6:00 | 0 | | 6 | 8:00 | 0.5 | | 7 | 10:00 | 0.7 | | 8 | 12:00 | 1.1 | | 9 | 14:00 | 1.7 | | 10 | 16:00 | 0.8 | | 11 | 18:00 | 1.2 | | 12 | 20:00 | 0.7 | | 13 | 22:00 | 0.5 | | | | |
| 1. Examine the Excel spreadsheet above. You are trying to calculate the daily mean wind speed. Which of the following equations would give you the correct answer? | | | | | |
|  |  | 1. “average(column B)” | | | |
|  |  | 1. “=average(B2:B13)” | | | |
|  |  | 1. “=mean(B2:B13)” | | | |
|  |  | 1. “=mean(A2-B13)” | | | |
|  |  | 1. “=average(windspeed, max)” | | | |
|  | | | | | |
| 1. Which factor is most likely to have the greatest influence on stream temperature at the daily/stream segment scale? | | | | | |
|  |  | 1. Latitude | | | |
|  |  | 1. Mean annual temperature | | | |
|  |  | 1. Evapotranspiration | | | |
|  |  | 1. Daily solar radiation | | | |
|  |  |  | | | |
| *Answer the following 2 questions only AFTER conducting the lab exercise.* | | | | | |
| 1. In your opinion, what was the difficulty level of this lab exercise? | | | | | |
|  |  | 1. very easy | | | |
|  |  | 1. somewhat easy | | | |
|  |  | 1. just right | | | |
|  |  | 1. a little too difficult | | | |
|  |  | 1. very difficult | | | |
|  |  |  | | | |
| 1. What was your interest level during this exercise? | | | | | |
|  |  | 1. Not at all interested | | | |
|  |  | 1. Somewhat interested | | | |
|  |  | 1. Interested | | | |
|  |  | 1. Very interested | | | |