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

**“*What Factors Affect Stream Temperature?*”**

**Instructions:** Your Instructor may ask you to take this test twice (before and after conducting the lab exercise). Read each multiple choice 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 “Assess2”.

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| Your name: | | |  | Date: |  |
| Name of your Institution: | | |  | Pre- or Post-test?: |  |
|  | | | | | |
| 1. Which of the following heat fluxes can act either as an input or an output of energy to a stream? | | | | | |
|  |  | * + 1. Direct solar radiation | | | |
|  |  | * + 1. Atmosphere Radiation (IR) | | | |
|  |  | * + 1. Conduction | | | |
|  |  | * + 1. Friction | | | |
|  |  | * + 1. Back radiation (IR) | | | |
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| 1. Which of the following heat fluxes is likely to be affected by changes in wind speed? | | | | | |
|  |  | 1. Atmosphere radiation (IR) | | | |
|  |  | 1. Friction | | | |
|  |  | 1. Vegetation radiation (IR) | | | |
|  |  | 1. Direct solar radiation | | | |
|  |  | 1. Evaporation | | | |
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| 1. If the sum of all of the heat inputs to a stream is 245 j m-2 s-1 and the sum of all of the outputs is 130 j m-2 s-1, what is the net heat flux? | | | | | |
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| 1. In the stream from the previous question, will stream temperature increase, decrease or stay the same? | | | | | |
|  |  | 1. Increase | | | |
|  |  | 1. Decrease | | | |
|  |  | 1. Stay the same | | | |
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| 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 | | | |
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| 1. As a follow-up to the previous question, what is the main cause for the observed differences in the stream temperature regime between forested and open field streams? | | | | | |
|  |  | 1. One stream segment was longer than the other so there was more time for heat to be absorbed by the stream. | | | |
|  |  | 1. Greater windspeed and lower humidity in the open field stream leading to greater evaporation | | | |
|  |  | 1. The forest canopy which prevents most of the direct solar radiation from reaching the stream | | | |
|  |  | 1. A greater discharge and slope | | | |
|  |  | 1. Greater vegetation radiation in the open field stream | | | |
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| 1. If global climate change caused the daily mean, daily maximum and daily minimum air temperatures to increase by 4ºC, which of the heat fluxes in the model would be directly or indirectly affected by it? Explain how. | | | | | |
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| 1. Stream A and stream B are identical in all ways except that stream B is deeper and therefore has greater discharge than stream A (although width is identical). Both streams are located in open fields. Which stream will likely have greater daily maximum temperatures and why? | | | | | |
|  |  | 1. Stream A because there is a smaller volume of water to heat, so the temperature increase during the day will be greater | | | |
|  |  | 1. Stream A because its lower discharge means that water will be flowing more slowly, allowing more time to absorb solar radiation | | | |
|  |  | 1. Stream B because the deeper water will prevent thorough mixing | | | |
|  |  | 1. Stream B because friction effects should be less in a deeper channel. | | | |
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| *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 | | | |