

DO RIPARIAN BUFFERS IMPROVE STREAM TEMPERATURES?

A Laboratory Exercise for Undergraduate Ecology Courses

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Instructor's Planning and Tips

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<http://erenweb.org/project/stream-temperature-project/>. Accessed xx/xx/20xx.

Learning Outcomes

1. Students will be able to describe daily and seasonal temperature cycles in streams
2. Students will be able to explain how and why stream temperature regimes vary among locations at different latitudes.
3. Students will be able to explain how and why stream temperature is affected by solar radiation.
4. Students will be able to explain how changes in the stream temperature regime can potentially affect the stream's biota and ecosystem functions.

Timing and Scheduling

- Number of labs/classes required for minimum implementation: 1
- Number of labs/classes required for optimal implementation: 2
- Faculty time needed for pre-lab preparation and trips to field: 3-4 hrs., 0-2 trips to the field

Students' Skills

- What biological background is needed for students to participate in this activity?
 - none

What analytical, instrumental, etc. skills are needed for students to participate in this activity?

Existing – basic spreadsheet use (e.g., Excel)

Acquired - ?

Challenges to anticipate and solve:

- Students can use the data sets provided or you can collect your own stream temperature data and compare it to these data sets.

Assessment type

Skills and learning

- Content quiz administered after the lab exercise is completed. This could be set up as an online quiz with responses tabulated automatically.
- Skills evaluation – Instructors can determine, based on completed worksheets, what specific skills in using Excel were employed correctly.

Transferability (Links between research and teaching).

Sample datasets will be available online that will contain stream temperature data from several institutions. The lab exercise can be completed with access to this data set without the need to collect any new data. Instructors may opt to collect their own data that can then be combined with or compared to the online data set.

Materials

Required

- Internet access in the lab room
-

For Optional Procedures

- HOBO Water Temp Pro v2 data logger (www.onsetcomp.com) or comparable device
- Paving Stone (12" x 12")
- ¼' nylon rope
- 2" diameter PVC pipe
- 4" eye bolt with 2 nuts

Pre-Lab Set Up

- Each student or student group will need a computer with Excel or comparable spreadsheet program and internet access.
- The dataset (Stream Temp Lab Workbook 1-3.xlsx) should be made available to each student before or during lab.
- If you will be collecting your own stream temperature data, you will need to deploy the dataloggers in advance. Students can help collect them and download them as part of the lab experience or the Instructor can do it and just present the completed data set to the students.