

# Can short term environmental education programs make a difference?

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## Introduction

Short-term water festivals and field days are a common tool for non-formal educators from watershed groups and non-profit organizations. **The purpose of this study was to determine if these water quality education programs are effective and to what degree they increase knowledge and promote a more positive attitude towards water and water quality.** We also looked at 2 different approaches to enhancing a short program.



## Background

Cache County Natural Resource Field Days (NR Field Days) is a program in northern Utah that provides fourth grade students with hands-on educational experiences. Students and their teachers spend the day at a Forest Service campground, rotating through 4 stations covering wildlife, soils, plants and water quality. This program reaches over 50 classrooms during a 2 week period each fall.

This study focused on the water quality activities, which are designed around sampling and exploration of aquatic macroinvertebrates. Activities are led by trained volunteers and staff from USU Water Quality Extension (WQE).



Students study living macroinvertebrates from nearby river.

## Methods

- 3 study groups (Table 1)
- Classroom teachers conducted a pre-test within a week before NR Field Days
- Classroom teachers conducted a post-test 2 weeks after NR Field Days and again 8 months after NR Field Days

Group	Treatment
Group 1 • 32 classrooms (769 students) • randomly selected	• NR Field Days program only
Group 2 • 19 classrooms (482 students) • randomly selected	• NR Field Days program • 2 pre Field Days activities taught by WQE staff • 1 post Field Days activity taught by WQE staff
Group 3 • 7 classrooms (154 students) • self-identified	• NR Field Days program • Bear River Bird Refuge field trip in the spring • Teacher training on watershed concepts and water quality • Teachers have access to lesson plans and materials for use in the classroom

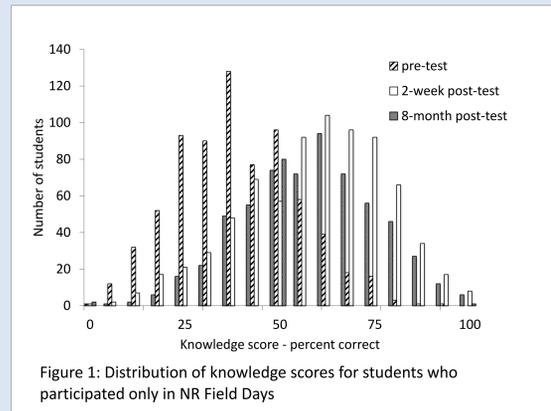


Figure 1: Distribution of knowledge scores for students who participated only in NR Field Days

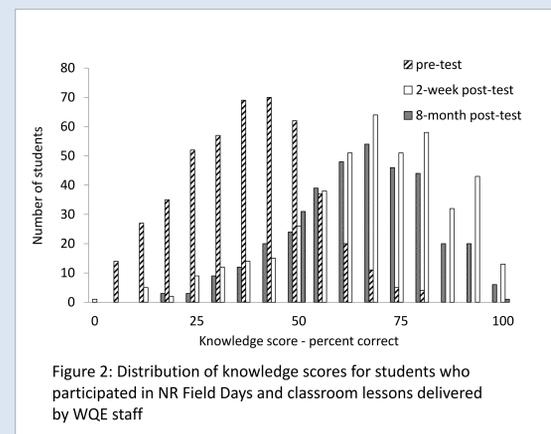


Figure 2: Distribution of knowledge scores for students who participated in NR Field Days and classroom lessons delivered by WQE staff

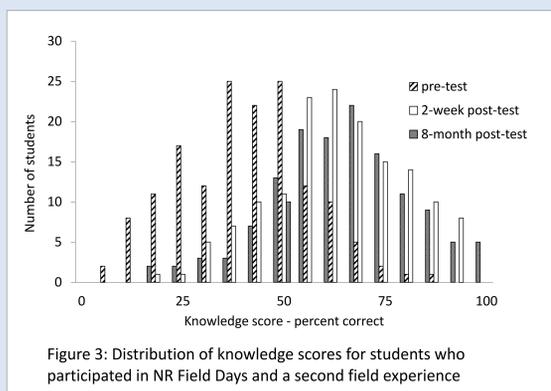


Figure 3: Distribution of knowledge scores for students who participated in NR Field Days and a second field experience

## Results

### Knowledge

- Participating in NR Field Days only (Group 1) led to a significant increase in knowledge on both the 2-week and the 8-month post-test.
- Participating in NR Field Days enhanced with classroom lessons taught by water quality professionals (Group 2) led to a significantly higher increase in test scores on both the 2-week and the 8-month post-test.
- Participating in NR Field Days enhanced with a second field experience 7 months later (Group 3) led to a significantly higher increase in test scores on the 8-month post-test.
- Providing lesson plans to classroom teachers to enhance NR Field Days (Group 3) did not lead to a significantly higher increase in test scores on the 2-week post test.



Students collect macroinvertebrates and learn about different river habitats

### Attitude

- We found evidence that students did gain a more positive attitude based on responses to open-ended questions on the pre and post-test

TABLE 2. Attitude responses to the question: If you could tell a good friend one or two things about rivers or streams what would you tell them?

Pre-test responses	Post-test responses
<ul style="list-style-type: none"> <li>• I would tell them to keep them clean</li> <li>• that they are cool</li> <li>• do not litter in the water</li> </ul>	<ul style="list-style-type: none"> <li>• I would say try not to make rivers dirty because clean water mean more bugs</li> <li>• I would tell my friend that it is not good to pollute the water. And that the little water bugs are cool</li> <li>• that it's really cool and they built their homes with rocks and they live in water wow!!</li> <li>• that they should go to the Logan canyon river to explore the different exciting stuff there are</li> </ul>

## Conclusion

- Field day experiences that provide students with hands-on activities and opportunities to interact with and explore nature can increase student knowledge and promote a more positive attitude.
- When these experiences are combined with classroom experiences or with a second field experience student learning and retention is enhanced.



"Build a Bug" activity – a 4<sup>th</sup> grader is given the necessary adaptations to live in a stream

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