

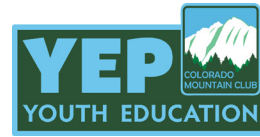
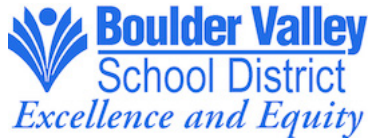
The State of Informal Environmental Education in Boulder County Schools 2014

Assessment Compiled by the Boulder County EE Collaborative
BCEECollaborative.org



Participating Organizations

Steering Committee



UCAR



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What is the Boulder County EE Collaborative?

The Boulder County EE Collaborative is a working group that consists of representatives from most informal environmental education (EE) providers that serve youth in Boulder County schools. The Collaborative was first established when Thorne Nature Experience (Thorne) convened six of Boulder County's largest informal environmental education providers and representatives from Boulder Valley (BVSD) and St. Vrain Valley (SVVSD) School Districts, and the Colorado Alliance for Environmental Education (CAEE) in the Spring of 2012 to discuss how collectively they could support the development of environmentally literate graduates in Boulder County. Together, the nine organizations established a common goal that members of the Collaborative could work towards together, and that most organizations were already independently helping to achieve through their existing programming.

Boulder County EE Collaborative Goal:

Ensure a continuum of environmental education and service learning opportunities with multiple contacts for preschool through high school for Boulder County youth

In the Fall of 2012, additional informal EE providers were invited to join the Collaborative and an expanded group of individuals representing more than 25 organizations that provide EE programs in Boulder County affirmed the Collaborative's goal. In partnership with the Colorado Alliance for Environmental Education (CAEE), Thorne and the two school districts have maintained the Boulder County EE Collaborative by hosting bi-annual meetings where all informal Boulder County EE providers can gather and discuss their programs and the potential for collaborations to achieve the Collaborative's goal.

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In addition, a Steering Committee for the Collaborative was formed and meets three to four times a year. The Steering Committee consists of representatives from CAEE, Thorne, SVVSD, BVSD, and representatives from some of the larger informal EE providers in Boulder County, including Cal-Wood Environmental Education Center (Cal-Wood), Eco-Cycle, City of Boulder Open Space and Mountain Parks (OSMP), Boulder County Parks and Open Space, and the Keep it Clean Partnership.

What is the Boulder County Informal EE Assessment?

After establishing a common goal, the Collaborative realized the need to better understand the current state of informal EE programming within Boulder County schools prior to discussing potential collaborations to achieve the Collaborative's goal. Thus was born the Boulder County Informal EE Assessment Project (Assessment). The objectives and tasks for the Assessment are outlined below:

Objective 1. Complete detailed assessment of gaps, linkages, and overlaps for existing Boulder County informal environmental education programs.

Task 1. The Colorado Alliance for Environmental Education (CAEE) and Thorne Nature Experience (Thorne) build a database to record what informal EE programs are being delivered at Boulder County schools and to report the quantity of informal EE delivered by district, school, and grade level as well as demographics served and topics and school district standards taught.

Task 2. All Boulder County informal EE providers enter all programs delivered in 2013 into the database (twenty-three out of twenty-seven EE providers participated in the study, capturing data for approximately 90% of the EE delivered at Boulder County schools).

Objective 2. To create a report of the informal EE programs being provided to Boulder County schools.

Task 1. Thorne and Cal-Wood analyze the data collected.

Task 2. Thorne designs and publishes The State of Boulder County Informal Environmental Education in Boulder County Schools Report and the website, www.bceecollaborative.org, which includes this report and an interactive map that was designed to display data pertaining to what informal EE is being delivered at individual schools in Boulder County.

Summary of When, Where, and Who was Involved in the Assessment:

When:

- The Assessment covers programs delivered during the entire 2013 calendar year as a snapshot of what EE is being delivered at Boulder County schools.

Where:

- The Assessment covers all schools within BVSD and SVVSD which include all public schools within Boulder County limits as well as several schools within surrounding Broomfield and Weld Counties.

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Who:

- Twenty-three out of twenty-seven organizations known to provide informal EE programming to Boulder County schools participated in the study, capturing approximately 90% of the EE student interactions occurring at Boulder County schools. The total number of informal EE providers was determined by asking both SVVSD and BVSD for the names and contacts of all of the informal EE providers serving schools within their district. Thorne then contacted each organization who was not already participating in the Collaborative or the Assessment to confirm that they provided EE programs to Boulder County schools during 2013 and how many students they reached. From these interviews, Thorne could determine that 85% of all informal EE providers participated in the Assessment and that 90% of all student interactions were captured during the Assessment. The Total Impact numbers cited in this report include all data collected in the Assessment, plus an estimation of the number of students reached by the informal EE providers that did not participate in the Assessment. All other numbers within this report are based only on the data captured during the Assessment and do not include estimates of the impact of the four organizations that did not participate in the Assessment.
- The Assessment covers EE provided to schools by informal EE providers and does not include the EE programming that is delivered by faculty within schools in Boulder County.
- The Assessment covers the informal EE provided to schools and does not cover EE provided to non-school groups (ie. summer camps, families, and non-school clubs). NOTE: The majority of EE that occurs in Boulder County takes place in schools as it is the easiest way for informal EE providers to reach youth.

What is The State of Informal Environmental Education in Boulder County Schools Report

The State of Informal Environmental Education in Boulder County Schools Report (Report) is designed to communicate the findings of the Boulder County Informal EE Assessment- a study completed in 2013 to determine the quantity of environmental education (EE) delivered to Boulder County schools by informal EE providers. The Report highlights the total impact of informal EE in Boulder County schools and compares the amount of informal EE delivered across districts, schools, and grades as well as the informal EE provided to various demographics including low income and students of color. Furthermore, the Report looks at the topics and standards that are being taught by informal EE providers. The Report is not intended to be a call for action, but rather to provide the data that will help informal EE providers determine strengths, weaknesses, gaps, and overlaps of the collective EE efforts within Boulder County and provide a starting point for discussions on how to collaborate to further enhance and expand EE in Boulder County schools. It is the intention of the Boulder County EE collaborative to undertake a new Assessment every two to three years to assess progress made towards its goal and additional opportunities to further expand informal EE in Boulder County.

Report written by Thorne Nature Experience as of May 22, 2014.

For more information on the Collaborative, Assessment or Report

Contact: Erin Saunders at erin@thornenature.org or 303-499-3647 ext 101

Key Findings

Total Impact

- 103,000 informal EE student interactions
- Estimated 32,750 individual students served, which is 55% of a total of all 59,979 youth attending BVSD and SVVSD schools (doesn't include home school or online students)
- 2,800 informal EE visits to schools
- 4,400 program hours of informal EE delivered
- An average of 3.1 hours of informal EE per Boulder County student (Pre-K to 12th grade).

NOTE: The above total impact numbers include all data collected in the Assessment, plus an estimation of the number of students reached by the four informal EE providers that did not participate in the Assessment. The four informal EE providers that did not participate in the Assessment are estimated to represent 10% of all informal EE student interactions at Boulder County schools.

Informal EE Providers - There are 23 organizations providing informal EE to Boulder County schools and 3 organizations are delivering 80% of total informal EE hours (Eco-Cycle, Thorne, and Cal-Wood).

Grade Discrepancy - Boulder County preschool, middle school, and high school students are receiving noticeably less informal EE than elementary school students. At the elementary level, 4th and 5th grades are receiving almost as much informal EE as all other grades combined as a result of grade specific programs offered by Cal-Wood and Thorne.

Socioeconomic and Demographic Equity - Elementary schools with the highest percentage of students participating in the Free and Reduced Lunch Program (an indicator of poverty) are receiving less informal EE as compared to all other elementary students; however, there is no inequality in informal EE delivery to students of color as compared to Caucasian students.

School Discrepancy - The 10 schools (11% of schools) receiving the most informal EE in Boulder County are all elementary schools and are receiving about a third of the total informal EE hours, while 18 schools (16% of schools), most of which are middle and high schools, are not receiving any informal EE. When considering only elementary schools, there is a great divide between the schools receiving the most and least informal EE.

District Discrepancy - BVSD students are receiving more informal EE than SVVSD students.

Correlation to Testing - Students at elementary schools receiving the most informal EE are scoring marginally better on 5th grade TCAP science tests than elementary students at schools receiving the least informal EE.

Topics Covered - The top 3 informal EE topics being taught are: Recycling, Waste Prevention, and Adaptation, followed by Insects and Green Schools, while Environmental Action, Climate (excluding Climate Change), and Wildlife are broad areas that aren't being covered as extensively.

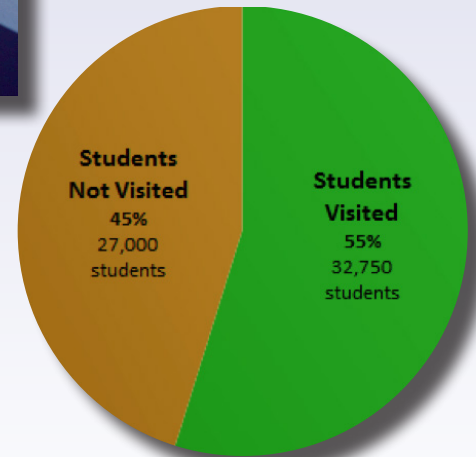
Standards Covered - Life Science standards are being addressed far more than Earth Science or Physical Science Standards through informal EE providers. The standards being addressed the most are the elementary level Life Science standards, while the standards being addressed the least are high school Life Science standards and Physical Science standards at all levels.



Total Impact



Figure 1: Percentage of students receiving informal EE and not receiving informal EE in Boulder County



Total Impact in Boulder County Schools is:

- 103,000 informal EE student interactions
- Estimated 32,750 individual students served, which is 55% of a total of all 59,979 youth attending BVSD and SVVSD schools (doesn't include home school or online students)
- 2,800 informal EE visits to schools
- 4,400 program hours of informal EE delivered
- An average of 3.1 hours of informal EE per Boulder County student (Pre-K to 12th grade).

Additional Notes:

- The total impact of informal EE delivered in 2013 is estimated to be approximately 10% lower than the most recent preceding years due to the following factors:
 - A major flood occurred in Boulder County during September of 2013 causing many informal EE organizations to deliver fewer programs.
 - During the 2013-14 school year, teachers were required to implement new district standards which caused less participation with informal EE programs.
 - During the 2013-14 school year, new state testing and extended testing time frames caused less participation with informal EE programs due to less classroom time for special projects and programs.
 - During the 2013-14 school year, a new teacher evaluation system was implemented which caused less participation with informal EE programs.
- It is impossible to determine the exact number of individual students visited due to possible duplication. For example, at many schools, some or all students in the same grade may have received programs from more than one informal EE provider. The estimate of 32,750 was adopted because it is the mid-range between a minimum estimate of 30,000 determined assuming maximum duplication, and 35,000 determined by assuming no duplication of students.
- The above total impact numbers include all data collected in the Assessment, plus an estimation of the number of students reached by the four informal EE providers that did not participate in the Assessment. The four informal EE providers that did not participate in the Assessment are estimated to represent 10% of all EE student interactions at Boulder County schools.

Informal EE Providers



There are 23 organizations providing informal EE to Boulder County schools and 3 organizations are delivering 80% of total informal EE hours (Eco-Cycle, Thorne, and Cal-Wood).

Figure 2: Percentage of informal EE hours delivered by top 3 EE organizations



Additional Notes:

- **Total hours from top three informal EE providers:**
 - Eco-Cycle- 1674 EE hours
 - Thorne- 989 EE hours
 - Cal-Wood- 480 EE hours
- **Total hours from all other participating informal EE providers: 793 EE hours**
 - Alliance for Climate Education
 - Boulder County Open Space
 - Butterfly Pavilion
 - City of Boulder Open Space and Mountain Parks
 - City of Boulder Keep it Clean Partnership
 - Cottonwood Institute
 - Colorado Mountain Club
 - CU Museum of Natural History
 - CU Science Discovery
 - Experiential Learning Associates
 - Feet on the Earth
 - Grove Foundation
 - Growing Gardens
 - Hawk Quest
 - Longmont and Boulder Valley Conservation Districts
 - Rocky Mountain Bird Observatory
 - Sierra Club Inner City Outings
 - The Kitchen Community
 - UCAR
 - Wild Bear

Grade Discrepancy

Boulder County preschool, middle school, and high school students are receiving noticeably less informal EE than elementary school students. At the elementary level, 4th and 5th grades are receiving almost as much informal EE as all other grades combined as a result of grade specific programs offered by Cal-Wood and Thorne. On average:

- preschool is receiving 1.8 informal EE hours/student
- elementary school students are receiving 5.8 informal EE hours/student
- middle school students are receiving 0.7 informal EE hours/student
- high school students are receiving 0.3 informal EE hours/student

Figure 3: Average number of informal EE hours per student at various grade levels (PreK- 12th)

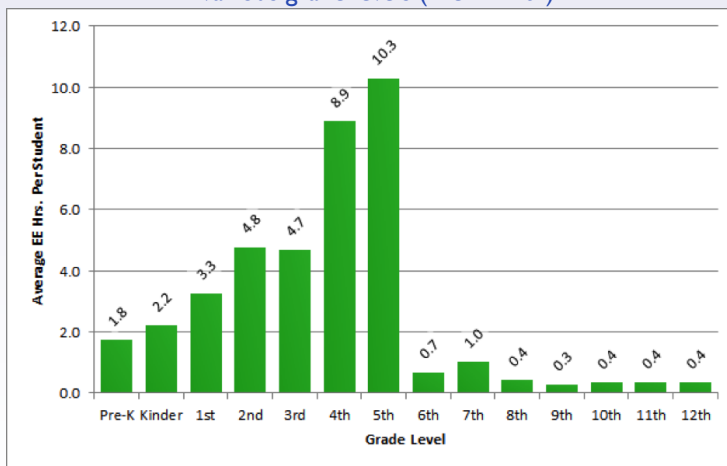
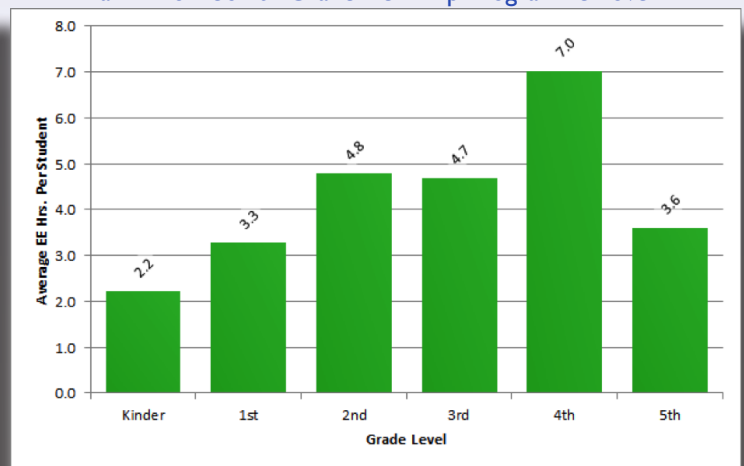


Figure 4: Average number of informal EE hours per student for elementary grades with Cal-Wood's 5th Grade program and Thorne's 4th Grade Field Trip Program removed



Additional Notes:

- For K-8 schools or K-12 schools, the data was separated by grade level and K-5 was entered as elementary level, 6-8 as middle school level, and 9-12 as high school level.
- Preschool received 219 total hours of informal EE, elementary grades received 4,193 total hours, middle school received 288 total hours, and high school grades received 393.
- 4th and 5th grades receive 47% of all informal EE hours delivered within the elementary grades of Kindergarten through 5th grade.
- Cal-Wood's primary program is for 5th graders and in most instances consists of a two night stay at Cal-Wood and 24 hours of EE programming per student. Thorne's Field Trip Program for 4th graders is 6 hours long. Both of these programs are longer in duration than most programming offered by other informal EE providers and both programs also reach a large number of students. Cal-Wood's 5th grade program reaches 1,301 students and Thorne's 4th grade Field Trip Program reaches 1,700 students. As such, these programs have a significant impact on the Grade Discrepancy identified above. When Thorne and Cal-Wood's targeted programs are taken out of the Assessment, the total number of informal EE hours is more evenly distributed with 4th and 5th grade receiving only 38% of the total informal EE hours; however, 4th graders still receive a disproportionate amount of informal EE (45% greater than any other grade level).

Socioeconomic & Demographic Equity

Elementary schools with the highest percentage of students participating in the Free and Reduced Lunch Program (an indicator of poverty) are receiving less informal EE as compared to all other elementary students; however, there is no inequality in informal EE delivery to students of color as compared to Caucasian students.

- Students at the lowest income elementary schools in Boulder County are receiving 14% fewer, or 5.1 hours of informal EE, as compared to 5.9 hours of informal EE for the remainder of the elementary student population.
- Students at the most diverse elementary schools in Boulder County are receiving 5.8 hours of informal EE which is the same as the remainder of the elementary student population.

Figure 5: Average number of hours of informal EE per student at lowest income elementary schools (by % of Free and Reduced Lunch) compared to all other elementary students

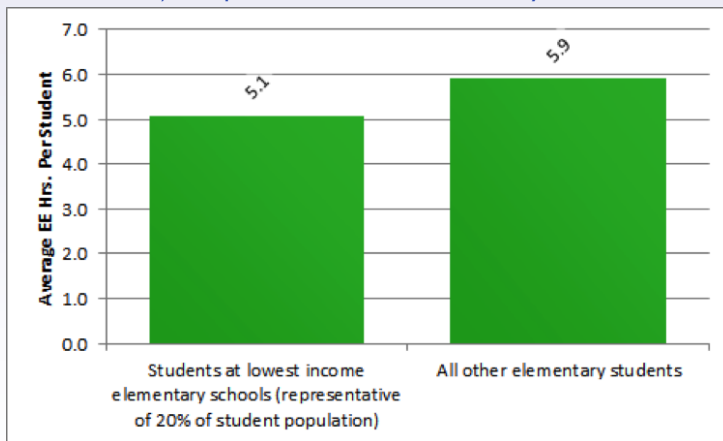
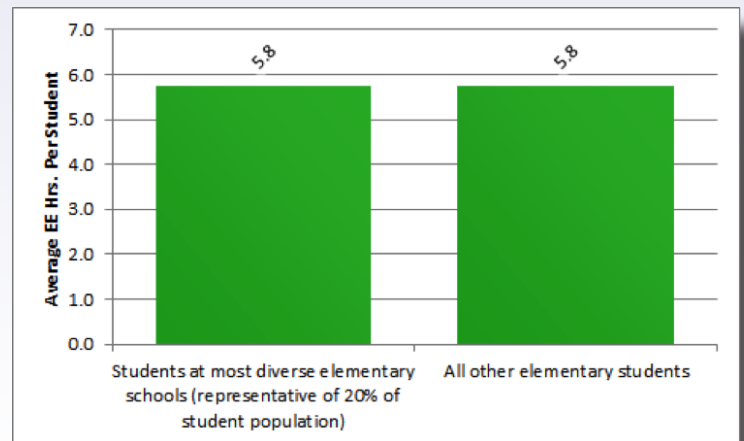


Figure 6: Average number of hours of informal EE per student at most diverse elementary schools compared to all other elementary students



Additional Notes:

- Socioeconomic and demographic equity were difficult to measure due to various factors: 1. the small number of Boulder County schools with very high percentages of students on the Free and Reduced Lunch Program and students of color and the high number of schools with very few low income students and little diversity; 2. significant variances in the amount of informal EE programming delivered at schools within each category; and 3. significant variances in the amount of informal EE at elementary versus middle and high school grade levels. Regardless of how the data was analyzed, the one consistent finding was that students at the lowest income schools received a lesser amount of informal EE programming.
- The discrepancy in informal EE hours delivered for lower income students and equity for students of color suggests that there may be some increased willingness or effort on behalf of informal EE providers to partner with schools with greater diversity as compared to schools with higher percentages of low-income students. Looking closely at the data, three of the fourteen lowest income schools that are not among the most diverse schools, are receiving only an average of 1.27 hours of informal EE per student.
- For reporting purposes, the fourteen lowest income elementary schools and twelve most diverse elementary schools each represent 20% of all Boulder County elementary students (including the elementary level students at K-8 schools) were compared against all other schools.
- Only elementary schools (including the elementary level at K-8 schools) were considered when assessing socioeconomic and demographic equity because there is very little informal EE programming being delivered at the middle and high school levels and including these schools significantly biased the data.

School Discrepancy

The 10 schools (11% of schools) receiving the most informal EE in Boulder County are all elementary (or elementary level at K-8) schools and are receiving about a third of the total informal EE hours, while 18 schools (16% of schools) most of which are middle and high schools are not receiving any informal EE. When considering only elementary schools, there is a great divide between the schools receiving the most and least EE.

Figure 7. Average number of informal EE hours per student for 10 elementary or K-8 schools receiving the most informal EE (15% of all elementary schools).

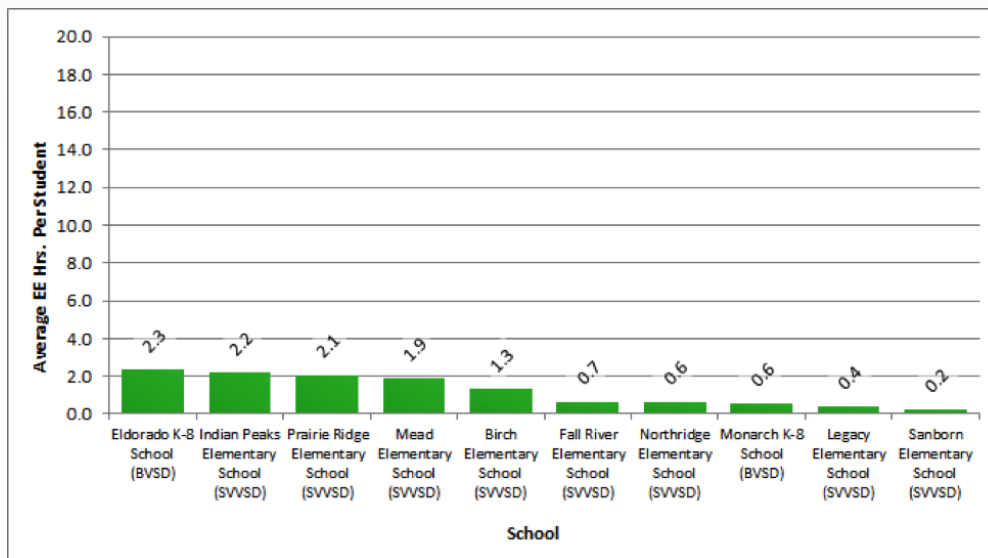
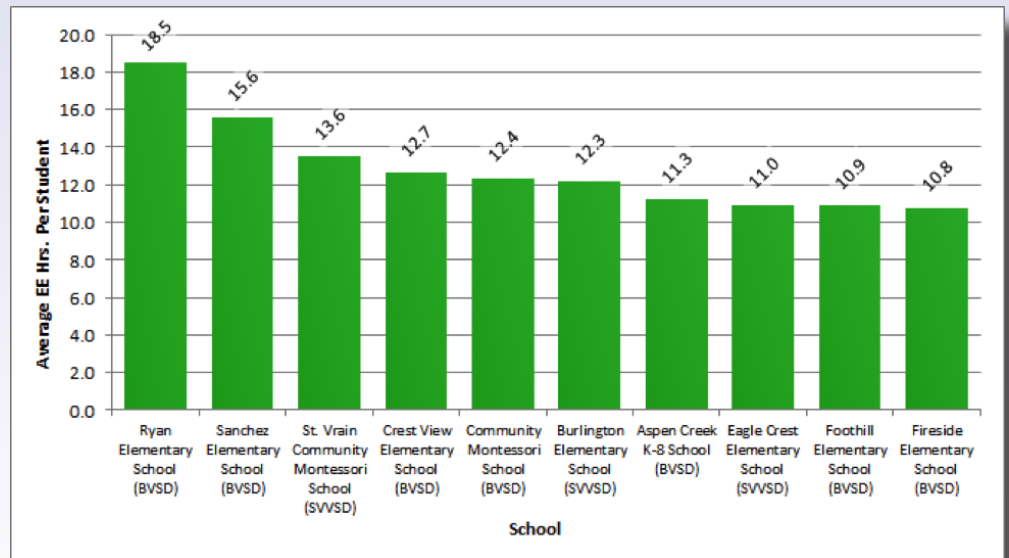


Figure 8. Average number of informal EE hours per student for 10 elementary or K-8 schools receiving the least EE (15% of all elementary schools).

Additional Notes:

- Schools not receiving informal EE are primarily middle schools, high schools, and/or alternative or charter schools. There are two elementary schools not receiving informal EE, but they are very small in comparison to other BVSD and SVVSD schools and are likely to have been disproportionately affected by the 2013 floods given their location.

District Discrepancy

BVSD students are receiving more informal EE than SVVSD students.

- Comparatively, the average number of hours of informal EE per student is 3.5 in BVSD and 2.0 in SVVSD (SVVSD students on average are receiving 40% fewer informal EE hours than BVSD students).
- SVVSD students are receiving more informal EE than BVSD students at the middle and high school levels.

Figure 9: Percentage of total informal EE hours delivered in BVSD and SVVSD.

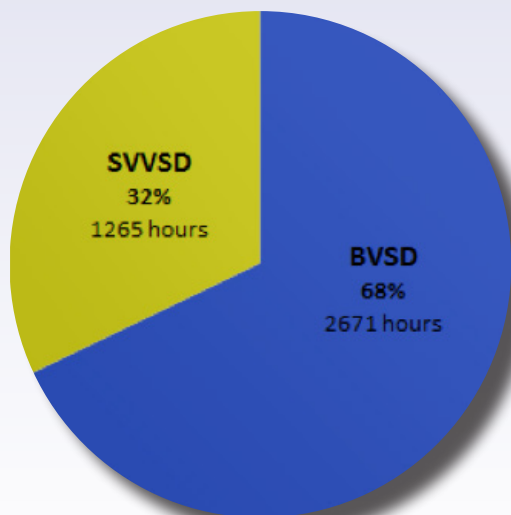


Figure 10: Average number of informal EE hours per student in BVSD compared to SVVSD at elementary grade levels.

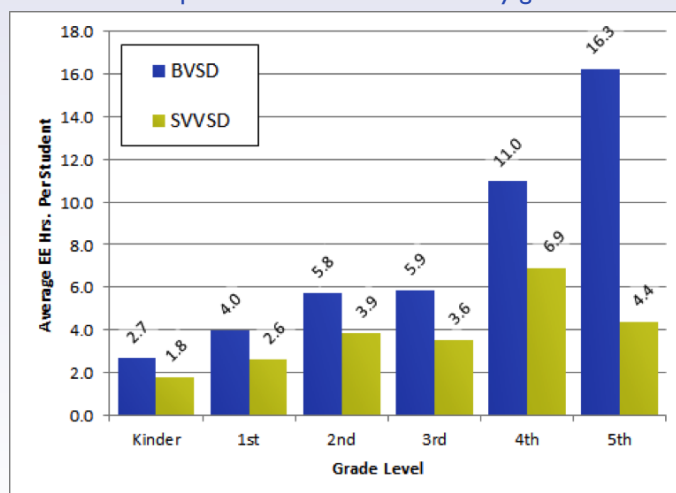


Figure 11: Average number of informal EE hours per student in BVSD compared to SVVSD at middle school grade levels.

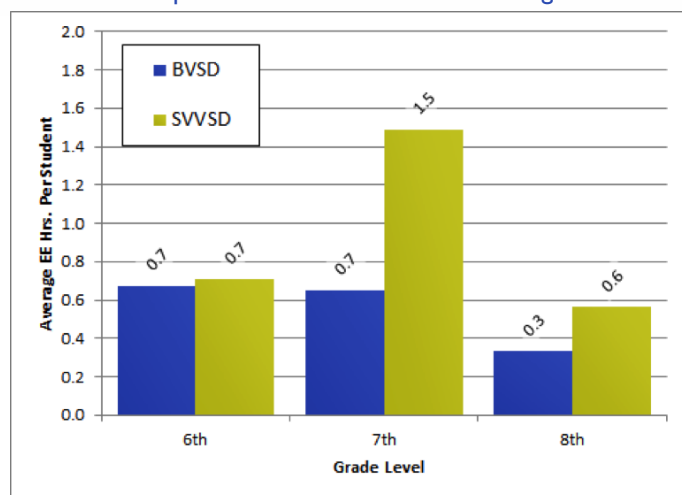
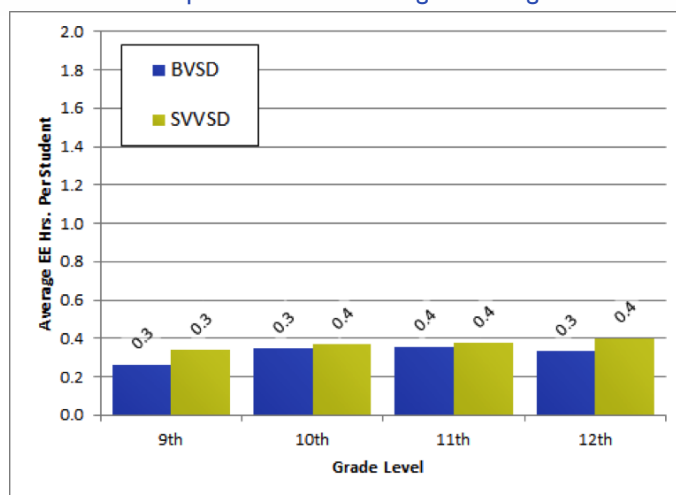
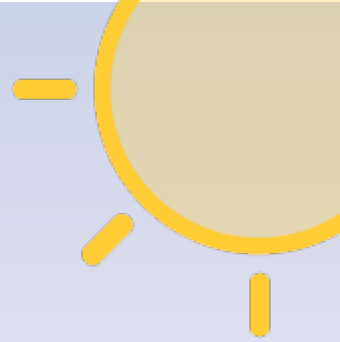
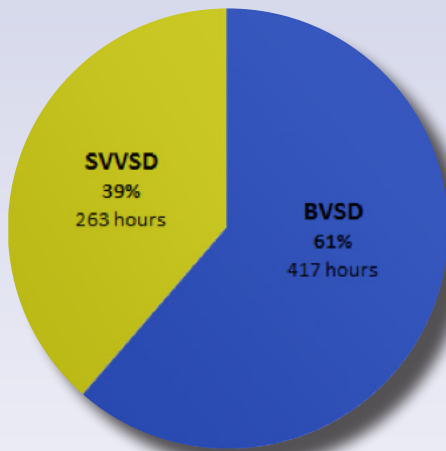


Figure 12: Average number of informal EE hours per student in BVSD compared to SVVSD at high school grade levels.



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Figure 13. Percentage of total informal EE hours delivered in BVSD and SVVSD with BVSD earmarked programs from Thorne and Eco-Cycle excluded.



Additional Notes:

- BVSD and SVVSD are similar in size with 51% of all Boulder County public school students enrolled at BVSD schools as compared to 49% for SVVSD.
- Eco-Cycle and Thorne, two of the three largest informal EE providers in Boulder County, have more funding from and/or special contracts with BVSD at the district level and/or with Boulder City and County municipalities. When the EE hours delivered by these organizations (earmarked for BVSD) are removed from the results, the distribution of informal EE programming across districts becomes somewhat more equitable (See Figure 13); however, BVSD still receives the bulk of the informal EE hours even after this adjustment.
- BVSD has many programs in place that are not reflected in this report, but offers environmental education opportunities for their students. Some of these programs specifically target High Schools (Green Graduation Pledge and Alliance for Climate Education) and others target all grade levels, including BVSD's energy challenges (partnership with Renew Our Schools and Green Schools Alliance) and alternative transportation programs. Most of these programs are run internally, which is why they are not captured in this report. Furthermore, BVSD has a Sustainability Management System and Board of Education Policy in place, supporting the work to incorporate sustainability into operations and curriculum district-wide. BVSD was selected as a 2014 U.S. Department of Education Green Ribbon Schools District Awardee! For more information go to www.bvsd.org/green.
- SVVSD takes part in numerous initiatives and environmental education opportunities not covered by this report. In the past year, 26 of SVVSD's schools participated in the Center for Resource Conservation's ReNew Our Schools energy conservation competition. Schools earned points by reducing electricity consumption, completing home energy action pledges, and submitting creative activities such as energy lesson plans, videos about conservation, poster contests depicting energy saving tips and more. With the help of external energy professionals, 'Energy Saving Mentors', students conducted energy audits, identified energy efficiency upgrades and motivated their peers to reduce electricity usage. In addition, about a dozen schools participated in the Green Schools Alliance Green Cup Recycle Challenge. The schools strived to recycle properly and minimize contamination. Additionally, SVVSD schools participated in the Trip Tracker program, a collaboration with Boulder County and BVSD to incentivize students to commute to school in an eco-friendly way. Furthermore, given the significant STEM presence, our schools have established Earth Day events, Innovation Academies, Science Fairs and much more. To learn about the Energy & Sustainability Program, visit www.svvsd.org/green.



Correlation to Testing



Students at elementary schools receiving the most informal EE are scoring marginally better on 5th grade TCAP science tests than elementary students at schools receiving the least informal EE.

- The 10 elementary schools receiving the most informal EE had an average of 63% of students scoring at proficient or advanced on TCAPs, while the average for the 10 elementary schools receiving the least informal EE was 57%. Looking at these percentages in a different way, 14% fewer students are scoring below academic proficiency at the schools receiving the most informal EE.
- When considering only Boulder County's eleven Title I schools, the three schools where students received the least informal EE also had the lowest scores on TCAPs. These schools all averaged fewer than 3.5 of informal EE hours per students and had fewer than 15% of students score proficient or advanced on the Science TCAP test.

Figure 14. Percentage of students scoring proficient or advanced in TCAP Science test for 10 elementary schools receiving the most informal EE (> 10 EE hrs. per student).

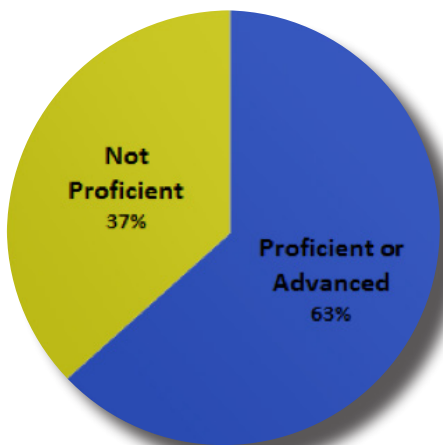
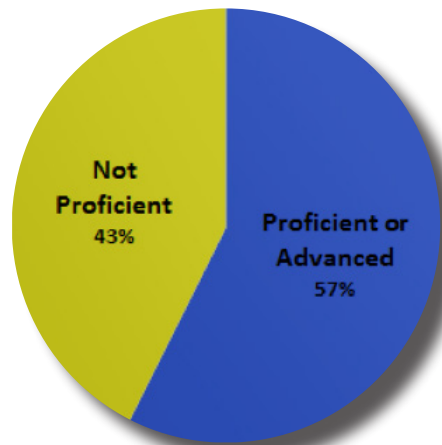
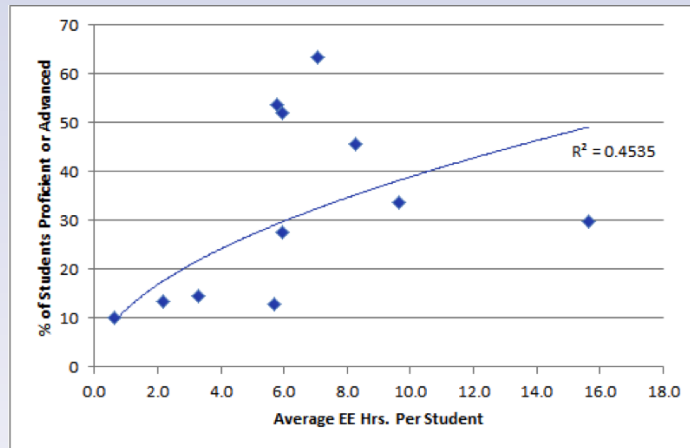


Figure 15. Percentage of students scoring proficient or advanced in TCAP Science test for 10 elementary schools receiving the least informal EE (< 1 EE hrs. per student).



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Figure 16. Percentage of students at Title I schools scoring proficient or advanced on the TCAP Science Test plotted against the number of hours of informal EE received at the school.



Additional Notes:

- It must be noted that there was a great variation in TCAP scores as compared to hours of informal EE across the sample sets utilized when assessing correlation to testing. Sample sizes were also small. For these reasons, there is a low level of statistical certainty that informal EE is positively effecting TCAP testing.
- Across the sample sets utilized for assessing correlation to testing, there were numerous other significant variables that could have skewed the results which point to EE hours marginally impacting TCAP scores. These variables include school district and demographics. For example, seven of the ten elementary schools that receive the most EE are in BVSD while only two of the schools that receive the least are BVSD schools. Also, while the ten schools that receive the most EE include a range demographics, including several schools that have high percentages of low income and students of color and several that are largely made up of upper income and Caucasian youth, most of the schools that receive the least EE have student populations with higher percentages of lower income and students of color. These variables could each have greater impact on TCAP testing than EE hours, which leads to a low level of certainty that informal EE is positively effecting TCAP testing.
- Data for Title I schools was analyzed separately to control for income level, which typically has a significant impact on TCAP testing scores. The schools with the highest average informal EE hours per student do have a higher percentage of proficient or advanced students than the schools with the lowest informal EE hours; however, due to the small sample size, these results cannot be said to be statistically significant.

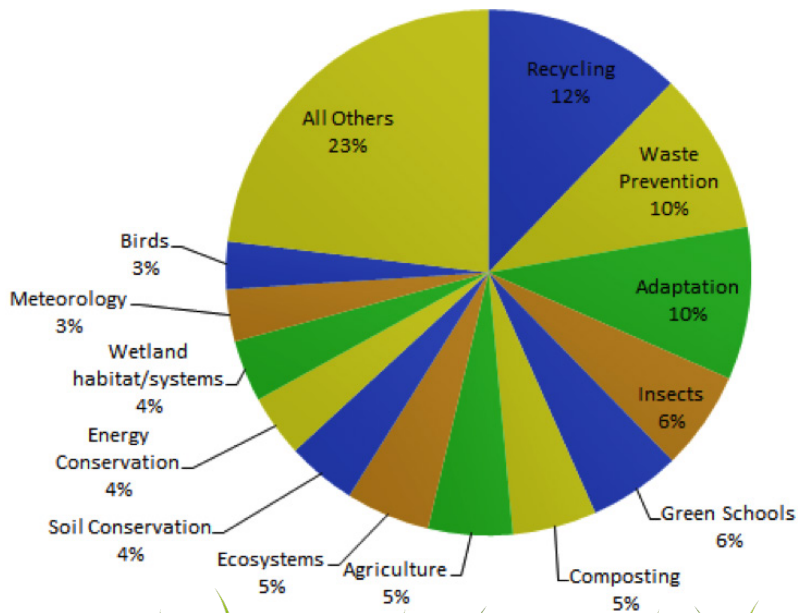


Topics Covered



The top 3 informal EE topics being taught are: **Recycling, Waste Prevention, and Adaptation**, followed by **Insects** and **Green Schools** while **Environmental Action, Climate (excluding Climate Change), and Wildlife** are broad areas that are not being covered as extensively.

Figure 17. Total informal EE hours delivered by topic as a percentage of all informal EE hours delivered.



Additional Notes:

- Eco-Cycle reaches more students than any other informal EE provider in Boulder County and they cover topics like, Recycling, Waste Prevention, and Green Schools which results in these topics being some of the most frequently delivered.

Science Standards Covered

Life Science standards are being addressed far more than Earth Science or Physical Science standards by informal EE providers.

- The standards being addressed the most are the elementary level Life Science standards, while the standards being addressed the least are high school Life Science standards and Physical Science standards at all levels.

Figure 18. Percentage of informal EE hours being devoted to each science standard across all grade levels

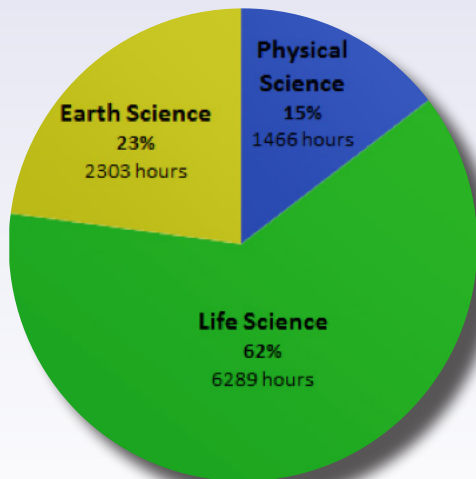


Figure 19. Total number of informal EE hours being devoted to each science standard across at the elementary school level (excluding preschool).

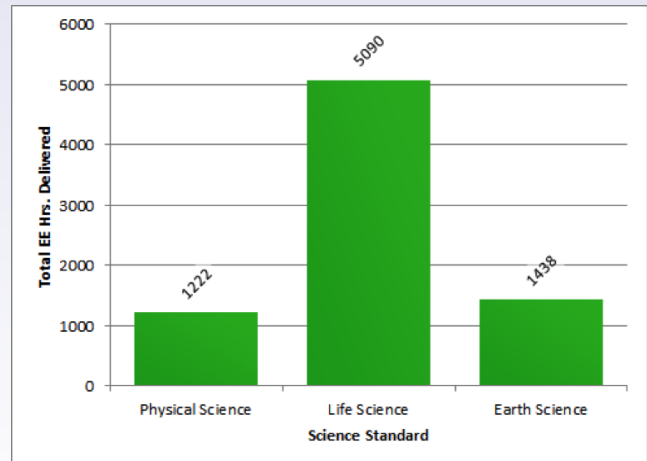


Figure 20. Total number of informal EE hours being devoted to each science standard across at the middle school level.

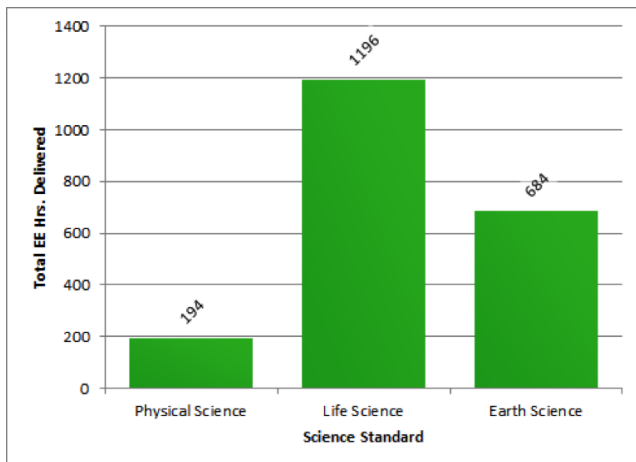
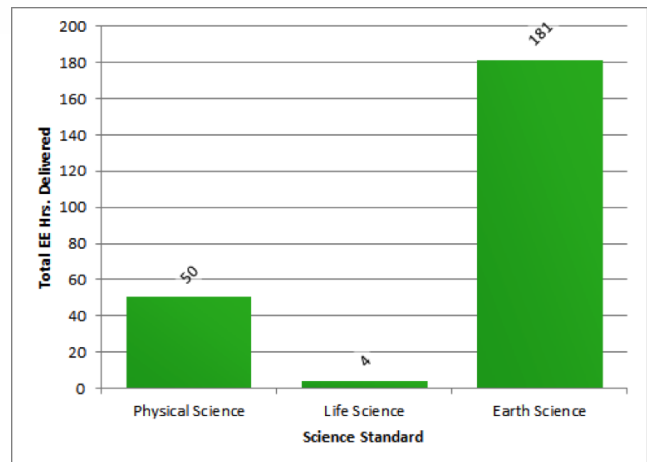


Figure 21. Total number of informal EE hours being devoted to each science standard across at the high school level.



Additional Notes:

- Many informal EE providers that participated in the Assessment did not report standards taught. As such, the data for Standards Covered is incomplete and may be inaccurate.
- Since the majority of programs delivered focused on Science standards (86% of total informal EE hrs. delivered) we chose to focus on the distribution of programming within this topic.

