



School Wide Watershed Action Program Evaluation Report

Award Number: NA12NOS4290038

Project Title: School-Wide Watershed Action Program

Funded Institution: KIDS for the BAY

Reporting Period: 08/01/2012 to 07/31/2015

EXECUTIVE SUMMARY

Introduction

The evaluation of the School Wide Watershed Action Program (SW WAP) was conducted to assist the KIDS for the BAY (KftB) staff and the National Oceanic and Atmospheric Administration's Bay-Watershed Education and Training Program (NOAA B-WET Program) in determining the impact and effectiveness of KftB's in-depth school-wide watershed education and action program on teacher and student participants. The evaluation also serves as an invaluable tool that can be used to inform future programming and program evaluation.

Twenty elementary school teachers and 480 students participated in the SW WAP at Mira Vista School in Richmond, CA during the 2012-2015 school years. KftB collected pre- and post-program evaluation data from eight teacher participants. This executive summary focuses on highlights of and conclusions from the evaluation results; a full report follows the summary.

The objectives for SW WAP participant teachers are that the teachers will:

- Increase their confidence level in using the local watershed environment and the National Marine Sanctuaries as a learning resource;
- Increase their confidence level in teaching an environmental science unit in the classroom and in the outdoors;
- Increase their confidence level in facilitating an environmental Action Project with their students, with a specific focus on reducing plastic marine debris; and
- At least 80% of teachers will report that they feel prepared to teach SW WAP to new classes in subsequent years.

In addition to the program objectives, the evaluation process focused on assessing whether a few questions within the Evaluation Goals section were achieved. Questions within the Evaluation Goals section apply to the impact of the program on students and teachers and on the evaluation process itself.

To gather the data needed to assess whether these objectives were met, KftB administered a pre- and post-program survey to all teacher participants. Seven teachers who participated in the SW WAP completed all of the surveys, and the results are included in this report.

Results: Highlights and Conclusions

In comparing the pre- and post-survey results, the majority of teachers increased their confidence levels for five out of the six statements. While some teachers reported no change in confidence level for some statements, these teachers often had a high level of confidence in those areas prior to participating in the SW WAP and maintained their same high level of confidence after participating in the program.

For all statements in the post-survey, the majority of teachers chose “Agree” as their response to the statements. These results indicated that the teachers had increased their confidence level in delivering environmental science curriculum and that participating in SW WAP prepared them to teach the program in subsequent years.

Summary

Evaluation results show that the specific program objectives KftB measured for the 2012 – 2015 evaluation process were met. KftB should consider employing new strategies, such as using the online survey tool SurveyMonkey, to obtain evaluation data from a greater number of participating teachers.

PROJECT OVERVIEW

Project Summary

KIDS for the BAY’s School Wide Watershed Action Program (SW WAP) is an Exemplary Project that combines Teacher Professional Development with long-term, kindergarten through fifth grade classroom-integrated Meaningful Watershed Education Experiences for students. The specific program objectives for the SW WAP are as follows:

Student Objectives: Provide meaningful watershed education for 360 kindergarten - fifth grade students at Mira Vista School in Richmond, CA. Students will:

- Increase their understanding of how their school neighborhood connects with the local creeks, the San Francisco Bay, the Pacific Ocean, and the three National Marine Sanctuaries;
- Increase their knowledge of the animals and plants that live in creek, bay, and ocean/marine sanctuary habitats within their watershed;
- Increase their understanding of the ways in which human activities can positively or negatively impact the local watershed and the Marine Sanctuaries, with a specific focus on plastic marine debris; and
- Take action to improve the health of creek, bay, and ocean habitats within their watershed, with a specific focus on reducing plastic marine debris.

Students will also feel more connected to and responsible for keeping their local bodies of water – including three National Marine Sanctuaries – clean and healthy.

Teacher Objectives: Provide professional development environmental education opportunities related to watersheds for 14 classroom teachers at Mira Vista School in Richmond, CA. Teachers will:

- Increase their confidence level in using the local watershed environment and the National Marine Sanctuaries as a learning resource;
- Increase their confidence level in teaching an environmental science unit in the classroom and in the outdoors; and
- Increase their confidence level in facilitating an environmental action project with their students, with a specific focus on reducing plastic marine debris.
- At least 80% of teachers report that they feel prepared to teach SW WAP to new classes in the subsequent years.

Program Description

The SW WAP provided three years of in-depth, hands-on programming to Mira Vista Elementary School, a low-income, urban elementary school in Richmond, CA. The program engaged the entire elementary school - the principal, the teachers, the students at every grade level, and the parents - in connecting with their local watershed, inspiring the protection and restoration of their watershed, and increasing academic achievement.

For each class, the SW WAP consisted of:

- Two one to one-and-a-half hour-long hands-on Classroom Lessons during which students learn about their local watershed and its connection to the larger San Francisco Bay and Pacific Ocean watersheds, including three local National Marine Sanctuaries.
- An all-day Field Trip to a creek, bay, or ocean habitat where students learn the ecology of the habitat.
- An environmental Action Project relating to their watershed habitat, which gives students an opportunity to clean up, restore, and teach others about their local environment.
- A Share-Out presentation for students to inform their “buddy class” at another grade level about what they have learned about their watershed.

A special focus of the SW WAP at Mira Vista School was on plastic marine debris and its impact on coastal habitats and wildlife. Each class conducted a neighborhood survey and clean-up where they collected and analyzed garbage they found around their school. The school also engaged in a school-wide Action Project to reduce the amount of plastic debris flowing into their watershed and the ocean environment.

In the SW WAP, each grade level focused on a specific watershed habitat within the local creek-San Francisco Bay-Pacific Ocean watershed. One or more central questions relating to their habitat was posed to the students at the beginning of the program. The students participated in various hands-on program activities and engaged in the process of scientific inquiry to develop answers to their habitat focus questions.

EVALUATION GOALS

KIDS for the BAY's program evaluation process is both summative and formative. The evaluation data collected from student and teacher participants during the course of the three year SW WAP enabled us to assess 1) the impact of the program on students, teachers, and the school community, 2) the effectiveness of the program content and delivery, and 3) how we can improve our teaching methods and curricula for future programming. An added benefit to the evaluation process is being able to assess the effectiveness of the evaluation tools themselves in gathering the desired data from program participants. Information on the types of responses we received, the quality of the responses, and the amount of data we collected will allow us to improve the tools themselves as well as the overall evaluation plan.

The 2012 – 2015 evaluation plan focused on assessing whether specific teacher objectives were achieved. The objectives that were measured are as follows:

Teacher Objectives Measured

- At least 80% of teachers report that they feel prepared to teach SW WAP to new classes in the subsequent years
- 14 teachers increase their confidence level in using the local watershed environment and the National Marine Sanctuaries as a learning resource
- 14 teachers increase their confidence level in teaching an environmental science unit in the classroom and in the outdoors
- 14 teachers increase their confidence level in facilitating an Environmental Action Project with their students

The SW WAP evaluation plan also sought to answer additional questions that are identified in this Evaluation Goals section.

Program Effectiveness and Improvement

- Are we reaching our stated program goals and objectives for teacher participants?

Student Participants

- Has students' participation in the program increased their concern about the local environment?
- Has students' participation in the program increased their interest in learning?

Teacher Participants

- Were there any increases in teachers' comfort level and perceived ability in:
 - leading hands-on environmental science lessons?
 - facilitating the process of scientific inquiry with their students?
- How useful were the various program components (e.g. in-class modeling, curriculum guide) in providing teachers with what they need to teach the program?
- How prepared do teachers feel in teaching their SW WAP grade-level unit themselves?

Mira Vista School teachers provided survey data and written feedback to KftB that gave insight on the experience of the program for themselves, their students, and the school community.

METHODS

Quantitative and qualitative evaluation tools were administered to teacher participants between January 2012 and June 2015. Useable evaluation data was collected from a total of seven of the twenty teacher participants. For the purpose of this evaluation report, only the teacher pre- and post-program survey data was analyzed. Written evaluation feedback was collected from the same classroom teachers, but the written data was not formally analyzed. Written feedback which supports the survey results is included in the “Discussions and Conclusions” section of this report.

Teacher Pre- and Post-Program Surveys:

Each of the twenty teachers participating in the SW WAP was given a pre-program survey (Appendix A) in January 2012, before the program began, that contained six statements. Teachers were then given a longer post-program evaluation form and survey (Appendix B) in June 2015 that contained the same six statements in the pre-program survey, plus six additional statements and nine short-answer questions. This survey was administered at the completion of all program activities, including the Field Trip, Environmental Action Project, and Share-Out to a buddy class. The pre- and post-survey statements contained standard Likert-scale response options and asked teachers to mark the response that best matched their feelings about the program-related statements. The additional statements included in the post-survey asked teachers about the impact of the program on their students and how well the program structure prepares teachers to teach the program themselves. The response options were: “strongly disagree,” “disagree,” “neutral,” “agree,” and “strongly agree.”

DATA ANALYSIS

The pre-survey and post-survey responses from each teacher were put into a spreadsheet and each item was compared to see what, if any, changes occurred as a result of the SW WAP. The changes in responses for seven teachers are displayed in Table 1 in the “Results” section. The responses to statements that were only posed to teachers in the post-program survey were compiled into a separate table, Table 2. Survey results from eight teacher participants are included in Table 2.

RESULTS

Teacher Pre- and Post-Program Survey Results

Table 1. Pre- and Post-Program Survey Results, N = 7

| Statement | Change (increase or decrease) in Response from Pre- to Post-Program Survey | | |
|--|--|------------------------|------------------------|
| | Decreased | No Change | Increased |
| 1. I feel confident <i>using the local watershed environment as a learning resource.</i> | 0 0% | 3 43% | 4 57% |
| 2. I feel confident <i>leading hands-on environmental science lessons.</i> | 0 0% | 3 43% | 4 57% |
| 3. I feel confident <i>leading an outdoor environmental field trip with my class.</i> | 1 14% | 2 29% | 4 57% |
| 4. I feel confident <i>facilitating an environmental action project with my class.</i> | 0 0% | 1 14% | 6 86% |
| 5. I feel confident <i>facilitating the process of scientific inquiry with my class.</i> | 1 14% | 3 43% | 3 43% |
| 6. I feel confident <i>using the [grade level habitat] as a learning resource.</i> | 0 0% | 1 14% | 6 86% |

Note: Percentages were rounded to the nearest "1."

Table 1. Pre- and Post-Program Survey Results Summary

The majority of teachers increased their confidence levels in using the local environment and their grade level habitat as a learning resource, leading hands-on environmental science lessons, and facilitating an Environmental Action Project with their classes of students after the intervention. Four teachers increased their confidence in leading an outdoor environmental Field Trip with their class, two teachers had no change in confidence level in this area, and one teacher decreased their level of confidence in this area after the intervention. Three teachers increased their confidence in facilitating the process of scientific inquiry with their class and one teacher reported decreased confidence. While three teachers reported no change in confidence level in facilitating the scientific inquiry process, these teachers had a high level of confidence in this area prior to participating in the SW WAP and maintained their same high level of confidence after participating in the program.

Table 2. Post-Program Survey Results, N = 8

| Statement | Post-Program Survey Response | | | | |
|---|------------------------------|--------------|-------------|-------------------------|------------------------|
| | Strongly Disagree (1) | Disagree (2) | Neutral (3) | Agree (4) | Strongly Agree (5) |
| 7. Participation in the School Wide Watershed Action Program has <i>increased my students' concern about the local environment.</i> | 0 | 0 | 0 | 4 50% | 4 50% |
| 8. Participation in the School Wide Watershed Action Program has <i>increased my students' interest in learning.</i> | 0 | 0 | 2 25% | 6 75% | 0 |
| 9. The School Wide Watershed Action Program <i>helped me to teach required CA State Science Standards to my students.</i> | 0 | 0 | 2 25% | 6 75% | 0 |
| 10. The <i>curriculum guide</i> provided to me is helpful in teaching the School Wide Watershed Action Program myself. | 0 | 0 | 0 | 7 87% | 1 13% |
| 11. The <i>in-class modeling</i> of the lessons and activities increases my confidence in teaching the program myself. | 0 | 0 | 0 | 5 62% | 3 38% |
| 12. I feel <i>prepared to teach the School-Wide Watershed Action Program</i> unit to my class next year with support from KftB. | 0 | 0 | 0 | 8 100% | 0 |

Note: Percentages were rounded to the nearest "1."

Table 2. Post-Program Survey Results Summary

Results from the post-program surveys were positive in all areas. All teachers felt that the program increased their students' concern about the local environment. The majority of teachers also felt that the program increased their students' interest in learning and that the SW WAP helped teach required grade-level CA State Science Standards to their students. Every teacher agreed that the SW WAP curriculum guide, given to teachers at the beginning of the program, helped them to feel able to teach the program themselves and that observing in-class modeling increased their confidence in teaching the program themselves. All teachers reported feeling prepared to teach their SW WAP grade-level unit to future classes of students.

DISCUSSION AND CONCLUSIONS

Results from the 2012 – 2015 school years evaluation process indicate that the goals of the SW WAP and those of the NOAA B-WET Program were achieved. The SW WAP provided meaningful watershed education experiences for elementary school students and professional development focused on watershed and environmental education to classroom teachers.

It should be noted that the number of teachers who submitted evaluation data that was then analyzed is low (n = 7). Because of the small sample size, it is challenging to make definitive statements as to whether program goals and objectives have been achieved. However, the evaluation data that we did receive from the seven teacher participants was positive in all areas. We can conclude that these seven teachers felt that the program was enjoyable, valuable, and beneficial to both the teachers and the students. We can also surmise that we would receive similar feedback and results from the remaining participant teachers at Mira Vista School.

KftB arrived at the following conclusions based on the collected evaluation data. We included excerpts from teachers' written evaluation forms within this section as anecdotal evidence.

Program Impact on Teachers

- The SW WAP increased the majority of teachers' confidence level in using the local environment and their specific grade-level habitat (creek, bay, or ocean/National Marine Sanctuaries) as learning resources.
- The SW WAP enabled the majority of teachers to feel confident in leading hands-on environmental science lessons and in facilitating Environmental Action Projects with their classes.
- Teachers' level of confidence in leading an outdoor environmental Field Trip with their classes of students was mixed, with four increasing their confidence, two reporting no change in their confidence, and one reporting decreased confidence. We also received specific written feedback from teachers about the Field Trip component of the SW WAP, showing a high level of enjoyment and value:
 - "The students, teachers, and parents all agreed that this was one of the best Field Trips we have been on."
 - "The field trip worked out well with highly interesting and engaging activities."
- The SW WAP helped teach required grade-level CA State Science Standards to students at Mira Vista School. KftB's environmental education programs are often the only science being taught in our partner elementary schools, and it is important that our programs address the required and appropriate science content for each grade level.
- Teachers felt that the resources provided to them in the SW WAP, as well as our program model and structure, enabled them to feel confident and prepared to teach the program themselves to future classes of students.
- Teachers' level of confidence facilitating the process of scientific inquiry with their class was also mixed. Three teachers reported increased confidence, three reported no change, and one reported decreased confidence. However, the three teachers who reported no change in confidence level in facilitating the scientific inquiry process had a high level of confidence in this area prior to participating in the SW WAP and maintained their same high level of confidence after participating in the program.
- The collective evaluation results point towards an overall satisfaction with the SW WAP from teachers. This is supported by the following quotes from teachers:
 - "[SW WAP] encouraged me to emphasize the environment on a daily basis."
 - "The Field Trip was awesome. No additions necessary."
 - "[SW WAP] has helped me to realize how important teaching about the environment is. How impactful for students to know they have an impact on their surroundings."
 - "Realized that a nearby park is a good destination for a natural sciences trip."
 - "[The Action Project] lent a sense of accountability and responsibility which students can carry with them into the future."

- Mr. Gabriel Chilcott, the Mira Vista School principal, also enthusiastically supported the SW WAP:
 - “Science is the lost subject in elementary schools because we are so focused on math and reading. It is very valuable to have KIDS for the BAY come in and help us not only teach science but take it to another level by giving students meaningful hands-on experiences with their local environment and ensuring that they become part of the preservation efforts.”
 - “We have been very impressed with the SW WAP.”

Program Impact on Students

- The SW WAP increased students’ concern about the local watershed environment. Teachers wrote the following in their written evaluation forms that supports this conclusion:
 - “Students are much more aware of how to dispose of their lunch trash. They voluntarily pick up other trash when they see it.”
 - “Many students wanted to help pick up trash at recess.”
- The SW WAP increased students’ interest in learning. Many teachers wrote about how engaging the program activities and content were for their students in their written evaluation forms:
 - “[The students] feel more connected to the [Mira Vista] field and make connections to our social studies curriculum.”
 - “Our students were engaged in all classroom activities presented by Mr. John Greiling. They enjoyed the lessons learning about how water travels from the home to the bay.”

RECOMMENDATIONS

Overall, we received encouraging results regarding the impact of the SW WAP on Mira Vista School teachers and students from the 2012 – 2015 evaluation process. Through this evaluation process, we do have recommendations to help future SW WAP meet its goals and objectives in other schools. We also have recommendations to improve the program evaluation process itself in order to strengthen the process and to better assess whether we are achieving our objectives.

- Employ different strategies to collect evaluation data from a higher number of teachers. Consider offering an incentive for completing and submitting program evaluation tools. By collecting evaluation data from all of the teachers at Mira Vista School, KftB would be able to have a better picture of whether the goals and objectives of the program were met. The convenience of offering the evaluation via the online survey tool SurveyMonkey may increase the number of evaluations submitted by participating teachers.

Appendix A. Teacher Pre-Program Survey

School-Wide Watershed Action Pre-Program Survey

Name _____ Grade Level _____ Date _____

Respond to each statement by checking the response that best reflects your feelings:

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|-------------------|----------|---------|-------|----------------|
| I feel confident <u>using the local watershed environment as a learning resource.</u> | | | | | |
| I feel confident <u>leading hands-on environmental science lessons.</u> | | | | | |
| I feel confident <u>leading an outdoor environmental field trip with my class.</u> | | | | | |
| I feel confident <u>facilitating an environmental action project with my class.</u> | | | | | |
| I feel confident <u>facilitating the process of scientific inquiry with my class.</u> | | | | | |

1) Do you currently teach science? If so, what curriculum, activities, and/or programs do you use?

2) What support do you feel you need to incorporate science in your school-year curriculum?

3) Any other comments?

Thank you for your commitment to environmental science education!

Appendix B. Teacher Evaluation Form and Post-Program Survey

**School Wide Watershed Action Program
Teacher Evaluation Form**

Classroom Lessons, Field Trip, Action Project

- 1) Please describe the overall experience of the School Wide Watershed Action Program (SW WAP) for you and your students.
- 2) Please describe a specific Classroom Lesson or activity that worked well with your class and you feel comfortable teaching next year.
- 3) Was the Action Project beneficial for you and your students?
- 4) Please provide any feedback from the Field Trip. Any additions to be made?
- 5) Please suggest any improvements to the SW WAP.

Program Impact

- 1) How has the SW WAP helped you as a classroom teacher?
- 2) Please share the impact that the SW WAP has had on your students. Have you noticed a change in attitude or behavior in your students as a result of the program?
- 3) How has the program impacted the school community and/or students' families?
- 4) How can we support you for next year?

School Wide Watershed Action Post-Program Survey

Name _____ Grade Level _____ Date _____

Respond to each statement by checking the response that best reflects your feelings:

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|-------------------|----------|---------|-------|----------------|
| I feel confident <u>using the local watershed environment as a learning resource.</u> | | | | | |
| I feel confident <u>leading hands-on environmental science lessons.</u> | | | | | |
| I feel confident <u>leading an outdoor environmental field trip with my class.</u> | | | | | |
| I feel confident <u>facilitating an environmental action project with my class.</u> | | | | | |
| I feel confident <u>facilitating the process of scientific inquiry with my class.</u> | | | | | |

| | | | | | |
|--|--|--|--|--|--|
| Participation in the School Wide Watershed Action Program has <u>increased my students' concern about the local environment.</u> | | | | | |
| Participation in the School Wide Watershed Action Program has <u>increased my students' interest in learning.</u> | | | | | |

| | | | | | |
|--|--|--|--|--|--|
| The School Wide Watershed Action Program <u>helped me to teach required CA State Science Standards to my students.</u> | | | | | |
| The <u>curriculum guide</u> provided to me is helpful in teaching the School Wide Watershed Action Program myself. | | | | | |
| The <u>in-class modeling</u> of the lessons and activities increases my confidence in teaching the program myself. | | | | | |
| I feel prepared to <u>teach the SCHOOL WIDE WAP [grade level unit]</u> to future classes of students. | | | | | |

Thank you for your commitment to environmental science education!