

PROJECT WISE:

WATERSHEDS INSPIRING STUDENT EDUCATION



An Environmental Science Program
of the Crissy Field Center and
Urban Watershed Project
with Galileo Academy of Science and Technology

EXECUTIVE SUMMARY ONLY

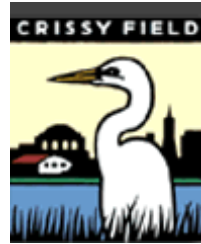
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July 2007



“PROJECT WISE: WATERSHEDS INSPIRING STUDENT EDUCATION”

AN ENVIRONMENTAL SCIENCE PROGRAM OF THE CRISSY FIELD CENTER AND URBAN WATERSHED PROJECT WITH GALILEO ACADEMY OF SCIENCE AND TECHNOLOGY

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EXECUTIVE SUMMARY

This report was prepared by San Francisco State University for the Crissy Field Center and the Golden Gate National Parks Conservancy. This study was funded in part by NOAA with additional support by the Crissy Field Center. The purpose of this report is to communicate the results of this study including addressing the following sample objectives: 1) Determine if and how students acquire technical skills relating to scientific inquiry; 2) Verify and substantiate whether students build personal self-confidence and civic awareness; about the environment, and 3) Explore whether students’ increase their ability and gain knowledge about the scientific process, and if this contributes to personal empowerment and critical thinking.

This first of its kind evaluation employed multiple methods to assess student experiences and measure desired outcomes with Project WISE. That is, a mid-semester questionnaire, end-of-year survey, viewing of videos from previous years, program and presentation observations, review of testimonials from previous years, and intermittent (brief) interview procedures occurred with three instructors from February through July 2007. This allowed the research team to obtain as much varied information as possible given the small number of students participating in the 2006-2007 academic program ($n=35$). This multi-layered approach offered a more robust assessment of the project significance, broadly, as well as determining student challenges.

- ✓ Overall results show student involvement in the Environmental Science Pathways course definitely stimulates curiosity and cognitive learning.
- ✓ For these students, progress can also be measured by their personal interactions with nature and their growing knowledge of why it’s important to protect it.
- ✓ Results show the core of student learning is not so much in the information, but in the interaction between these youth and the natural environment.

- ✓ In the case of Project WISE, while science taught contributes to meeting school standards, the imagination being developed in these young minds through involvement at the Crissy Center and their national park visits may, in fact, be more important than technical precision.
- ✓ An area of experiential learning that was noticeably of high significance to students in all aspects evaluated consisted of regular field trips. Results show the integral role of field trips in the students' learning experience.
- ✓ It can be inferred from this evaluation of students' learning that they experienced an increased awareness and heightened interactions with the Presidio, National parks, and the natural environment, in general.
- ✓ Results show that program participation contributes to an enhanced level of consciousness about how their behavior (and that of others) effects the environment. Similarly, expressions of "desire" to change behavior were evident.
- ✓ Through a variety of course requirements, such as field work, experience in the lab, and their final group presentations, Project WISE helps students increase their interpersonal communication and public speaking abilities.
- ✓ Findings clearly indicate Project WISE offers students a significant amount of hands-on experience through the use of scientific tools and equipment; this facilitates an increase in learning and comprehension.
- ✓ Through their participation, students strengthen their problem solving capabilities; this is particularly relevant within an environmental context.
- ✓ Results show Project WISE offers students opportunities to try new things in a variety of areas including environmental exploration (e.g., watersheds, wildlife habitat) and the exploration of scientific methodology.

Survey Highlights (n=31 respondents out of 35 completing the program)

Science-Based Enrichment

- ✓ 71% (n=22) of the 31 student respondents agreed their perspectives about science, in general, changed due to their WISE program experiences. This highly correlates with the 23 students who agreed, in some capacity, that their ability to learn science improved through their participation as opposed to traditional, fully in-class courses.
- ✓ Two-thirds of these students also indicated an *increased comfort of being in the Presidio and enjoyment of being at the Crissy Center*. 60% indicated they developed an overall "new interest in science".

- ✓ Out of 25 responses, 92% agreed or strongly agreed they gained a greater understanding of the natural history of the Presidio; 88% (n=22) agreed in some capacity to gaining a basic understanding of the watershed process in the Tennessee Hollow watershed from their participation in Project WISE.
- ✓ Over 90% of students completing the survey indicated the field experience helped prepare them to develop their project hypothesis.
- ✓ Although not that strong, there is a positive correlation between students who agreed or strongly agreed they learned about reviewing and analyzing data before working on their project (88%) in relation to an increased confidence in academics at school as a result of participation ($p < .05$, $r^2 = .40$).
- ✓ Of all the tools, equipment and technology students learned to use throughout the year, 100% of students learned to use “Google Docs”. The next top 10 items reported with highest ratings of use/learning: GPS, Digital Camera, Compass, and Google Earth (93%); Power Point (90 %); MS Word and Maps (83%); PH Meter (80%). The dissolved oxygen meter and video camera followed with 74% of students learning to use these items.

Personal/Social

- ✓ Twenty students (66% out of 30 responses) agreed that their participation in Project WISE has increased their comfort of being in the Presidio. Similarly, 63% (n=19) reported that they enjoyed being at the Crissy Center.
- ✓ Nearly 81% of the 31 students who completed the end of the year survey stated that their program participation has changed their perspectives on national parks.
- ✓ 80% (n=24) of 30 student respondents indicated their experiences with Project WISE has helped them to communicate better.
- ✓ 74% of students agreed, in some capacity, that their participation in WISE has empowered them to make better life decisions impacting the environment.
- ✓ A growing body of literature reflects the health benefits of being involved in environment-based activities or outdoor recreation opportunities. This program, with science focus did not have this as an intended outcome. Only half of these students reported any perceived changes relating to their own healthy lifestyle choices. 52% (n=16) reported that their perspectives on *healthy life choices* did not change as a result of their program participation while 15 (48%) indicated a positive response.
- ✓ Out of all 31 students completing the survey, more than $\frac{3}{4}$ indicated they have an *improved ability to work in a team* and have experienced a *new connection with nature*.
- ✓ The majority of students (86%, n=25) completing the end-of-year survey indicated they would recommend for other students to sign up for this course in the future.



Project WISE “connects urban youth with meaningful watershed experiences by enabling active, constructive participation in stewardship and restoration activities combined with small group, hands-on, investigative projects presented to peers, land managers and others. Students will learn of the significance of watersheds, the importance of biodiversity and practice scientific methodology in the field, lab and classroom partners” (Project Summary, 2006). There are many complex and interrelated factors that contribute to student learning and overall experiences with this program. Students involved come from diverse ethnic and socio-economic backgrounds; hence, the interplay between culture, the environment, and leadership and competency of staff/instructors, all affect the way in which these teenagers learn science, perceive nature and consequently what they ultimately learn about stewardship. Although not without its challenges, this project has proved to provide transformative experiences, a perceived increase in educational attainment, and increased comfort with this unique urban national park.



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For a copy of the full final technical report: <http://online.sfsu.edu/~nroberts/research.htm>