

The Port's Environmental Education Program (EEP) was created as an engaging and pro-active measure to foster environmental stewardship through innovative youth education programs and community outreach. The EEP supports a diverse portfolio of hands-on environmental curriculum addressing environmental protection and natural resources themes connected to the San Diego Bay.

- **1 million** students reached since inception (1995)
- **24,500+** students reached in 2016-17
- **Consistent increase** in student knowledge
- Currently supporting **eleven** unique and innovative programs
- Universally **positive** teacher evaluations



Benefits to Environmental Quality: An avenue to pro-actively engage youth and their communities in a healthy San Diego Bay and, in doing so, nurture the next generation of environmental stewards.

Level of Independent Involvement: Through the EEP, the Port of San Diego currently funds 11 educational programs for a cumulative total of \$300,000 per year through 2022.

The Creativity of the Program: Rich portfolio of unique, innovative programs that highlight environmental awareness through hands-on lessons including outdoor classrooms, living labs, eco-tours, educational hikes, field trips and boat tours, in addition to in-class lessons utilizing watershed models and scientific experimentation. All programs regularly reach students attending Title I schools within the San Diego Bay watershed.

Program Results are Apparent: Over 1 million students reached since 1995. 24,500+ students reached in 2016-17 school year and 2017-18 school year is expected to match or exceed that number. Universally positive feedback and consistent increase in student awareness and understanding after participation.

Cost Effectiveness: By engaging in the education of youth today, the Port is investing in the environmental vitality of tomorrow.

Transferability of the Program: Demonstrates the value of pro-active engagement with stakeholders.



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2018 AAPA Environmental Awards Competition Stakeholder Awareness, Education & Involvement



Port of San Diego Environmental Education Program



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I. Introduction

The Port of San Diego (the Port) champions Maritime, Water Development, Public Safety, Experiences and Environment, all focused on enriching the relationship that people and businesses have with our dynamic waterfront. As an environmental steward for the San Diego Bay and surrounding tidelands, the Port is responsible for contributing to the region's prosperity while protecting and enhancing the Bay's natural resources. In order to do so in a pro-active manner, the Port created its Environmental Education Program (EEP) as a way to foster environmental stewardship through innovative youth education programs and community outreach. Since 1995, the EEP has supported a diverse portfolio of education programs that provide hands-on environmental curriculum addressing environmental protection and natural resources management themes related to the San Diego Bay.

Through annual funding, the EEP supports local non-profit organizations that educate students, teachers and the general public throughout the San Diego Bay watershed about pollution prevention, environmental stewardship, healthy ecosystems, and natural resources connected with the bay. The Port currently supports eleven local environmental education programs through the EEP, with agreements in place for a cumulative total of \$300,000 per year through 2022. Each supported program has developed its own unique approach to implementing curriculum directly connected to the environmental health and protection of the San Diego Bay and its watershed.

Since its inception, the EEP has provided innovative environmental curriculum to over one million kindergarten through high school students in schools throughout the San

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Diego Bay watershed, and has regularly targeted underserved audiences by reaching students attending Title I schools. Programs supported by the EEP have activated environmental awareness and learning through in-class and field exercises, laboratory experiments, informative field trips and boat tours, and engaging online curriculum. Through participation in EEP programs, students have learned about the value and diversity of natural resources connected to their watersheds, the importance of pollution prevention and watershed protection, and how to act as environmental stewards moving forward. The Port EEP reached over 24,500 students during the 2016-17 school year, and the 2017-18 school year is on track to match or exceed that number. Student evaluations provided by each of the programs are universally positive, and indicate that there is a measured increase in student awareness and understanding of pollution prevention and environmental stewardship upon completion of the curriculum.

II. Goals and Objectives

The goal of the EEP is to actively educate students, teachers and community members throughout the San Diego Bay watershed about pollution prevention, environmental stewardship, and natural resources connected with the San Diego Bay. The EEP supports environmental protection education and outreach goals established by the Municipal Stormwater Permit as outlined in the Port's Jurisdictional Runoff Management Program (JRMP). Similarly, it supports education and outreach goals identified in the Chula Vista Bayfront Master Plan Natural Resource Management Plan (CVBNRMP).

In unique and innovative ways, each of the eleven programs supported by the EEP addresses pollution prevention, proper waste disposal, and impacts of urban runoff on

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receiving waters. Many of the programs also provide additional environmental protection content through lessons on good housekeeping, recycling, best management practices, integrated pest management, benefits of native vegetation, and water conservation. All of the programs address natural resources connected to San Diego Bay through lessons on the ecology and history of the area, habitat conservation, sensitive and endangered species, and how humans have impacted San Diego Bay over time.

Programs supported by the EEP are encouraged to address core environmental conservation and protection curriculum, in addition to new and emerging environmental themes. Curriculum content may include, but is not limited to, any learning focused on the environmental health or sustainability of the San Diego Bay and its resources including, but not limited to, the following general themes:

- *Environmental Conservation:* including natural resources, habitat restoration, and endangered or sensitive species
- *Environmental Protection:* including pollution prevention, storm water management and watershed protection, water quality improvements, water conservation and reuse, integrated pest management, waste reduction and recycling
- *Energy & Sustainability:* including energy conservation and energy efficiency, renewable and alternative energy, carbon sequestration, climate change & sea level rise, and aquaculture
- *Health & Community:* including community gardens, urban agriculture and local produce, food waste and food deserts, and art in connection with the San Diego Bay and its natural resources

III. Discussion

A. Background

The Port EEP was originally created in 1995 as the Environmental Education Outreach Program under the guidance of the Port's Educational Committee. In addition to supporting environmental education and student achievement, the program was designed to provide a deeper understanding of the Bay's natural resources, elucidate upon the need for the protection of these resources, and explain the role the Port plays in maximizing the beneficial uses of these resources. Through a number of iterations, the EEP has grown to currently support eleven local non-profit environmental education organizations, with individual agreements in place for up to 5 years. These programs are described below:

Living Coast Discovery Center

The Living Coast Discovery Center (LCDC) *Watershed Discovery: Connecting and Protecting San Diego Bay* program takes advantage of the center's unique location within the San Diego Bay National Wildlife Refuge along the shores of south San Diego Bay to provide environmental conservation and environmental stewardship education to students and guests. The program consists of three components: 1) a field trip that utilizes docent-led tours and educator-led lab activities to address conservation, watershed protection, pollution prevention, native plants and animals, and responsible outdoor recreation; 2) public education utilizing instructor-led hands-on activities and interpretive signage designed to educate the general public on pollutant prevention and watershed protection related to the San Diego Bay; and 3) habitat restoration and clean-

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up that engages volunteers as well as the general public. This program will provide hands-on lessons to over 31,000 kindergarten through twelfth grade students as well as families, volunteers, and general public over the next five years.

Chula Vista Elementary School District

Through its partnership with the Living Coast Discovery Center (LCDC), which includes a full-time teacher onsite, the Chula Vista Elementary School District (CVESD) *Coastal Education Program* provides standards-based lessons and hands-on curriculum focusing on environmental protection and conservation themes, including pollution prevention, stormwater management, watershed protection, habitat restoration, and endangered and sensitive species connected to the San Diego Bay. This program will provide bus transportation and admission to the LCDC for an estimated 20,800 preschool through eighth grade students over the next 5 years.

I Love A Clean San Diego

Through its *Connecting Kids and Communities to Conservation* program, I Love a Clean San Diego (ILACSD) provides environmental protection and pollution prevention education to students throughout the San Diego Bay watershed. Using interactive classroom presentations, hands-on post-presentation cleanup events, and community workshops and cleanups, the program will reach approximately 3,500 kindergarten through eighth grade students over the next five years. Lessons cover the importance of water and watersheds, key pollutants and their effects, and how students can become environmental stewards to prevent pollution in local waterways.

Maritime Museum of San Diego

The Maritime Museum of San Diego *Ecology and Economy of the Bay* program addresses the role of the San Diego Bay in the regional economy, and the fragility of the San Diego Bay's ecology specifically related to human impacts. Students initially board the Museum's steam ferryboat Berkeley, and then take a trip around the Bay aboard the Museum's boat Pilot. Students participate in a series of marine science experiments to learn about the Bay's history, its flora and fauna, pollution prevention, sediment and water quality, and the manner in which humans have impacted the San Diego Bay. This program will provide environmental education to approximately 4,500 fourth and fifth grade students over five years.

Ocean Discovery Institute

Through its *Student Initiative Program* and the new Living Lab facility, Ocean Discovery Institute will provide approximately 17,500 kindergarten through eighth grade students with science and environmental education experiences over the next five years. This program provides classroom, hands-on laboratory, and field-based programming connecting students to the San Diego Bay watershed. Lessons address coastal ecosystems, watershed management and protection, and conservation of natural resources while simultaneously introducing students to a wide range of science professions.

Outdoor Outreach

Outdoor Outreach's *YES: Youth Environmental Stewardship Project* program utilizes recreational learning and hands-on environmental education and stewardship to educate, train and mobilize students from environmental justice communities within the

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San Diego Bay watershed. The program engages and connects students with San Diego Bay's natural resources by incorporating environmental lessons on watershed dynamics, pollution prevention, and local ecology with recreational activities including hiking, biking, and kayaking, as well as participation in local trash clean ups and restoration events. This program will provide environmental education and stewardship lessons to approximately 1,650 fourth through twelfth grade students over two years, while supporting additional leadership and environmental stewardship career training.

Resource Conservation District of Greater San Diego

The Resource Conservation District (RCD) of Greater San Diego *Watershed Connection* program is an interactive classroom lesson connecting students to their local watershed. Lessons focus on water pollution issues including non- point source pollutants such as petroleum products, detergents, fertilizers, and pet waste, and introduces students and educators to appropriate best management practices. Using hands-on lessons to demonstrate watershed modeling, students learn where common pollutants are typically generated, how these pollutants travel from streets to waterways, and how to best manage and prevent further impacts to their watershed. This program will provide environmental education to over 12,000 second through sixth grade students over the next five years.

San Diego Audubon Society

The San Diego Audubon Society *Outdoor Explore!* program provides after-school outdoor environmental education to students through physical activity, exploration and exposure to natural spaces in their community. Focusing on the Otay River watershed, this program combines naturalist-led lessons with student-led self-exploration to provide

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students with an understanding of the function of floodplains and human impacts on habitat and water quality specific to the San Diego Bay. This program will provide environmental education and stewardship lessons to over 2,500 kindergarten through sixth grade students over five years.

San Diego Coastkeeper

The San Diego Coastkeeper *Water & Climate Stewards of San Diego Bay* program is an enhancement of the existing District-funded online Water Education for All curriculum, which continues to provide environmental education to students and teachers within the San Diego Bay watershed. This program supports the development and pilot testing of a climate science lesson and a climate science stewardship project. Content includes an overview on climate science, the influence of natural processes and/or human activities on climate, and ways to measure carbon and water footprints. San Diego Coastkeeper is partnering with six local schools within the San Diego Bay watershed to pilot this curriculum, and feedback is used to refine and complete the program content. Once it has been finalized, the lesson will be made available free online to all educators. The pilot phase of this program provided environmental education to over 250 students, while the completed online curriculum has the potential to reach a much larger audience.

The Ocean Foundation - Ocean Connectors

The Ocean Foundation *Ocean Connectors* program provides hands-on environmental education through field trips, in-class lectures, and land and water-based eco-tours. The program provides instruction on the ecosystems of San Diego Bay and cultivates an understanding of coastal environments, the connection between terrestrial and aquatic

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ecosystems, and the health, cultural and economic value of San Diego Bay. As a component of the program, students use a “knowledge exchange” with student peers in Mexico to further their understanding of natural resources, recording and presenting information collected and learned from program participation. The program will provide education to over 13,500 fourth through seventh grade students from National City over the next five years, with the majority attending Title I schools.

Zoological Society of San Diego

The Zoological Society of San Diego *Guardians of the Bay* program provides intensive week-long project-based environmental education lessons for sixth through eighth grade students through a combination of in-classroom learning and outdoor investigations around San Diego Bay. The program creates an opportunity for students to generate change in local communities and watersheds, thereby supporting the overall health of the San Diego Bay. Each student grade level studies a different subject that fits into an overarching theme of environmental health specific to the San Diego Bay. The program introduces students to climate change and its impacts on local watersheds, pollution prevention, and natural resources through an all-school assembly. Specific grade level studies are then introduced, including data collection and scientific observation in the field, data analysis and interpretation of results in the classroom, and field application of the learned scientific skillset. This program will provide environmental education for approximately 4,480 students over four years.

B. Methodology

Each program supported by the EEP is required to provide specific deliverables that help to define program-specific objectives and performance metrics, and identify a methodology for how the curriculum is to be delivered. Port staff works with each of the eleven programs to provide the following deliverables:

- A detailed work plan describing the program to be supported by the EEP, how it provides environmental education for students specifically connected with the San Diego Bay and its diverse resources, what grade level(s) and school(s) are targeted, anticipated communities reached, and number of students anticipated to be reached within the San Diego Bay watershed.
- Quarterly progress reports and an annual summary report detailing the work completed to date, the number of students participating in the program, how effective the education program is), and costs incurred. Metrics include: number of students that participated; number of volunteers, parents or additional stakeholders that participated; percent knowledge increase in students following completion of the curriculum; number of buses providing transportation; number of eco-tours completed; pounds of trash, recycling and/or additional debris removed during clean-up events.
- An effectiveness assessment which uses pre- and post-tests (typically questionnaires) to substantiate any increase in student knowledge following participation in a program's education content.
- Final presentation to the Port Environmental Advisory Committee, which was created to advise the Board of Port Commissioners on projects and policies

moving forward that ensure the environmental health and vitality of the San Diego Bay and surrounding tidelands.

C. How The Project Meets Award Criteria:

1. *The level and nature of benefits to environmental quality, beautification or community involvement:*

Through support and funding of innovative environmental education programs, the EEP pro-actively engages youth and their communities in hands-on curriculum addressing environmental protection and natural resources management connected to the San Diego Bay. The EEP provides an avenue to valuable environmental lessons that many students would not be exposed to otherwise. The EEP relies on active student engagement through in-class and field courses, laboratory experiments, field trips, boat tours, and online modeling, among others. Regular performance evaluations from all participating programs indicate that the EEP has consistently improved environmental awareness in youth and their communities throughout the San Diego Bay watershed and, in doing so, nurtured the next generation of environmental stewards.

2. *The level of independent involvement and effort by the Port:*

Through the EEP, the Port currently funds eleven educational programs for a cumulative total of \$300,000 per year through 2022. While the core curriculum of any program supported by the EEP must relate to environmental protection and natural resources management, each program is able to develop its own content and method of learning. This flexibility allows for innovation and unique approaches to curriculum, including lessons using in-classroom resources, outdoor living labs, educational hikes,

and kayaking eco-tours, among many others. Each program supported by the EEP was developed independently by the respective organization and catered specifically to meet the educational goals and objectives of the EEP. Port staff oversee the coordination and implementation of each program, and track performance criteria and budget on a quarterly basis to ensure the program is maximizing its opportunities for stakeholder awareness and involvement.

3. The creativity of the solution or programs:

The Port EEP is a rich portfolio of unique, innovative environmental education programs that provide hands-on learning in a number of exciting ways. Participating programs offer curriculum that highlights the importance of a healthy San Diego Bay through active, real-world exposure including outdoor classrooms, living labs, eco-tours, educational hikes and bike rides, field trips and boat tours, in addition to valuable in-class lessons utilizing watershed models and scientific experimentation. A number of the programs link in-class lessons with monitoring and sampling field work and expose students to potential careers in the field of science. In doing so, these programs plant the seed for the next generation of environmental professionals.

4. Whether the project or program results are apparent:

Since its inception, the EEP has provided valuable environmental education to over 1,000,000 students ranging from kindergarten through high school. Over 24,500 students were reached during the 2016-17 school year, and performance metrics indicate the 2017-18 school year is on track to match or exceed that number. Participating programs regularly target students attending Title I schools that may not

have access to similar programs otherwise. Teacher evaluations and student feedback for all programs is consistently and universally positive, and performance evaluations regularly indicate an increase in environmental understanding and awareness following the completion of curriculum. All performance metrics indicate that the EEP has consistently improved environmental awareness in youth and their communities throughout the San Diego Bay watershed and, in doing so, nurtured the next generation of environmental stewards.

5. *The cost effectiveness of the activity or the program:*

By investing in programs that educate the youth of today, the EEP is investing in the environmental vitality of tomorrow. While it is hard to put a cost on the value of knowledge, it is easy to see how much of an influence the EEP has had historically on youth and their communities within the San Diego Bay watershed. Many of the programs currently supported by the EEP provide exposure and insight into future environmental careers. Lessons taught today can mold the environmental professionals, political figures and community leaders of tomorrow. Indeed, quite a few of the programs supported by the EEP currently employ staff that were educated through the same school system they are now educating and reaching out to. The Port is a proud supporter of each of the eleven environmental education programs currently funded through the EEP, and is excited to continue working with these partner organizations to provide active, engaging learning experiences that highlight the significance of a healthy San Diego Bay.

6. *The transferability of the technology or idea to the port industry:*

The EEP acts as a supporting mechanism for local educational programs to develop, test and implement new and innovative ways to provide engaging environmental lessons to youth and their communities throughout the San Diego Bay watershed. Through presentation of curriculum and community outreach, the program demonstrates the value of pro-active engagement with stakeholders.

IV. Conclusion

As a steward of the San Diego Bay and a champion for the environment, the Port actively supports stakeholder awareness, education and involvement through the EEP. Each of the eleven environmental education programs currently supported by the EEP provides a unique approach to lessons on environmental protection, pollution prevention, watershed management, habitat value and natural resources connected with the San Diego Bay and its watershed. By participating in these programs, the youth of today become engaged and aware of their environment and how their actions can impact it. The EEP generates interest in the health of the San Diego Bay and nurtures the next generation of environmental stewards.