Monterey Bay National Marine Sanctuary Exploration Center

Education and Outreach Plan

December 2012

http://montereybay.noaa.gov

National Marine Sanctuaries
Monterey Bay

Monterey Bay
Sanctuary Foundation

National Oceanic and Atmospheric Administration
U.S. Department of Commerce
NOAA

Acknowledgments

The Monterey Bay National Marine Sanctuary gratefully acknowledges the S.D. Bechtel, Jr. Foundation and the Monterey Bay Sanctuary Foundation for their support in the development of this plan.

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Executive Summary

Monterey Bay National Marine Sanctuary, designated in 1992, is a federally protected marine area offshore of California's central coast. The mission of the Monterey Bay National Marine Sanctuary (MBNMS) is to understand and protect the coastal ecosystem and submerged cultural resources of central California.

The Office of National Marine Sanctuaries (ONMS) and the City of Santa Cruz, with support from the Monterey Bay Sanctuary Foundation and the National Marine Sanctuary Foundation, formed partnerships to design, build and successfully operate a new interpretive facility in downtown Santa Cruz known as the Monterey Bay National Marine Sanctuary Exploration Center. The Sanctuary Exploration Center opened its doors to the public for the first time on July 23, 2012. Located just steps from the ocean, the Sanctuary Exploration Center offers bilingual interactive interpretive exhibits to visitors, a classroom with saltwater aquaria, a deck for ocean viewing, and a multimedia theater. Designed and built to meet green building standards, and earning a gold rating for Leadership in Energy and Environmental Design (LEED), the Sanctuary Exploration Center is a model for environmentally sustainable design, construction and operation methods.

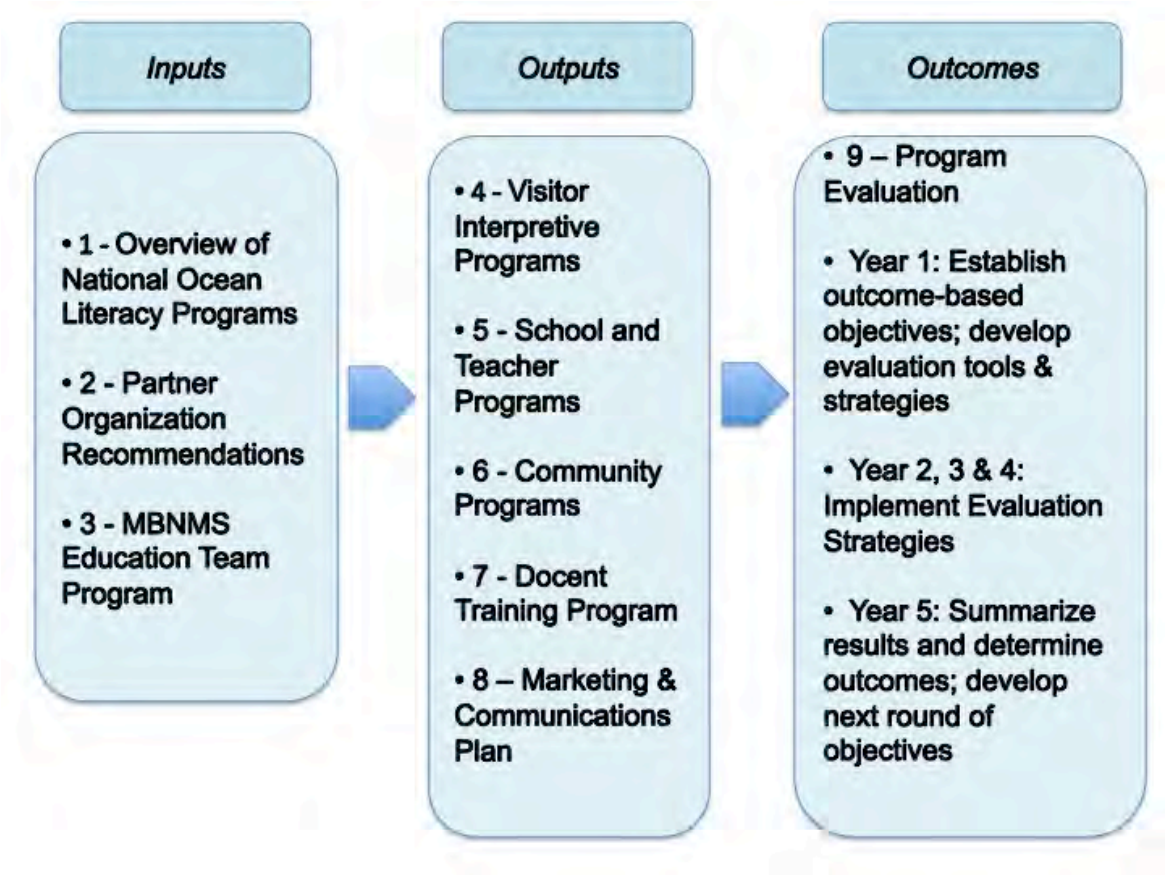
As a gateway to California's stunning and historic Monterey Bay, the Sanctuary Exploration Center will serve the entire Central California region and beyond, informing visitors about the geology, oceanography and ecology of the coast's extraordinarily diverse waters. Exhibits in the Sanctuary Exploration Center encourage visitors to learn more about what makes the coastal and ocean environment so productive. They also will learn about issues impacting the marine ecosystem, and consider the personal roles people have in becoming stewards of America's underwater treasures.

Education and Outreach Plan For the Sanctuary Exploration Center

The Sanctuary Exploration Center is expected to serve as a "jumping-off point" to explore the many other ocean-related organizations and activities in the region. The state of the art facility includes bilingual interactive exhibits, visitor activities and tours, classroom and field programs, teacher trainings, and special event evening and weekend programming for community groups.

The Sanctuary Exploration Center Education and Outreach Plan is designed to be used as a blueprint or strategic plan for the Sanctuary Exploration Center and can be adapted for other interpretive facilities and education programs in the west coast region and beyond. Figure 1 illustrates how the plan is organized in an outcomes-based format with Chapters 1, 2 and 3 providing "inputs" in the form of historic context, recommendations from partner organizations, and MBNMS staff input on plan development. Chapters 4 through 8 are the "outputs" of the Education and Outreach Plan. Chapter 9, Program Evaluation, offers suggestions on outcome-based evaluation strategies that can be developed in Year 1, and implemented in Years 2, 3 and 4. In Year 5, "output" programs are evaluated for effectiveness in achieving ocean literacy goals.

Figure ES.1. Organization of the Sanctuary Exploration Center Education and Outreach Plan.



The Sanctuary Exploration Center Education and Outreach Plan is organized by chapters dedicated to important stakeholder groups.

NOAA and the Office of National Marine Sanctuaries

Chapter 1 begins with an overview of the historic roles of the National Oceanic and Atmospheric Administration (NOAA) and the Office of National Marine Sanctuaries (ONMS) as leaders in ocean literacy education. Their mandates define the education and outreach objectives for all national marine sanctuaries. Each national marine sanctuary meets its education and outreach challenges with the support of clearly defined guidelines established by national mandates, in coordination with local, regional and national ocean literacy organizations. These are briefly discussed, leading up to and including grant support for the development of the Sanctuary Exploration Center Education and Outreach Plan from the S.D. Bechtel Jr. Foundation.

Partner Organizations

MBNMS recognizes the significance of partners in fulfilling national marine sanctuary mandates and objectives. In developing the Outreach and Education Plan for the Sanctuary Exploration Center, MBNMS reached out to partner organizations in the Santa Cruz area, including those that have worked with MBNMS in the past on mutually beneficial grants, educational projects or outreach programs. A total of 26 organizations were interviewed, composing a mix of government agencies, formal education institutions, informal environmental education providers, environmental non-profit organizations, and business and tourism organizations. Partner interviews and recommendations are summarized in Chapter 2, and revealed many opportunities to further advance education and outreach partnerships.

Monterey Bay National Marine Sanctuary Education and Outreach Team

Since 2006, the Monterey Bay National Marine Sanctuary Education and Outreach team has invested considerable visioning and team building efforts to clarify their goals and intended outcomes for the Exploration Center. The results of these efforts form the foundation of education and outreach programming for the Exploration Center, establishing goals and starting points for Year 1 through Year 4. These are reviewed in detail in Chapter 3.

Visitors to the Sanctuary Exploration Center

Interpretive facilities provide a physical location, which serves as a hub to attract visitors, who interact with exhibits, docents, staff and each other, for the purpose of learning about the ocean and national marine sanctuaries. More than 150,000 visitors are expected to come to the Sanctuary Exploration Center every year. Chapter 4, Visitor Interpretive Programs, identifies specific audience and visitor needs. General interpretive themes and messages are presented, highlighting their role in offering opportunities for visitors to develop greater awareness of the ocean and national marine sanctuaries.

School-based Learners and Educators

The Sanctuary Exploration Center actively pursues opportunities to provide education opportunities aligned with ocean literacy principles as well as STEM education objectives (Science, Technology, Engineering and Mathematics). Chapter 5, School and Teacher Programs, identifies education audiences and offers education programs to meet those needs. Ocean literacy education resources are included to assist in development of Exploration Center education programs.

Community Members

The Sanctuary Exploration Center will serve as a hub for the local Santa Cruz community and the greater Monterey Bay community through on-site trainings, lectures, and other education and outreach programs for individuals, organizations and agencies. The facility may be used as a gathering place for those who support and benefit from the Sanctuary Exploration Center. Chapter 6, Community Programs, looks at audiences within the greater Santa Cruz community, and how the Sanctuary Exploration Center can interact with and partner with community members.

Volunteers and Docents

The Sanctuary Exploration Center volunteers join more than 3,000 volunteers serving all national marine sanctuaries. Docent training programs are developed with trained staff and management supervision in order to ensure the desired outcome of informed, enthusiastic volunteers who are also ocean literacy educators and ambassadors for national marine sanctuaries. Chapter 7, Docent Training Program, provides an outline for developing a site-specific docent training program at the Sanctuary Exploration Center. This guide can be readily adapted for other docent training programs.

Audience Outreach

A communications plan forms the foundation for communications strategies as well as other objectives including marketing and fundraising. Chapter 8, Communications and Marketing Plan for the Sanctuary Exploration Center, is consistent with the ONMS *Best Practices* guidebook. It includes communications objectives, targeted audiences; examples of story ideas, key messages and talking points, communications strategies, a communications worksheet (with examples) that can be used in developing strategies for reaching target audiences, a Communications Plan Spreadsheet, which summarizes communications objectives, audiences, tools, strategies and resource ideas, and a tracking and evaluation spreadsheet that can serve as a log of communications efforts, expectations and personal assessments of effectiveness.

Evaluation

Publicly funded organizations and programs are required to assess whether their education and outreach programs are achieving the desired outcomes, and to consider areas for improvement. The intended outcome for all national marine sanctuary education programs is the national mandate of achieving a documentable rise in awareness and understanding of ocean literacy principles and the role of national marine sanctuaries. The Sanctuary Exploration Center is in a unique position of establishing baseline awareness in Year 1 of operation. Development of front-end assessment and short-term evaluation is an important component of the Exploration Center's evaluation objectives.

Chapter 9, Program Evaluation, lays out suggestions for evaluation strategies that can be initiated in the first four years of operation to assist the Exploration Center in establishing short and long-term assessments of program effectiveness. All evaluation efforts will be performed in cooperation with the Office of National Marine Sanctuaries as part of its ongoing efforts as the leader in ocean literacy education.

In summary, the Sanctuary Exploration Center Outreach and Education Plan serves as an all-in-one guide for developing interpretive facility programs within national marine sanctuaries and beyond. This guide can be modified and made specific for individual sites as new program developments and funding opportunities arise.

1.0 Overview of National Ocean Literacy Programs

In 1972, the U.S. Congress enacted The Marine Protection, Research, and Sanctuaries Act (MPRSA). Title III of that Act created what was then known as the National Marine Sanctuaries Program, a framework for the protection of oceanic parks… "for the purpose of preserving or restoring such areas for their conservation, recreational, ecological, or esthetic values." [1] The MPRSA was amended several times until 1992, when it was renamed the National Marine Sanctuaries Act (NMSA), which cited monitoring and education as priorities within sanctuaries "to enhance public awareness, understanding and appreciation of national marine sanctuaries, emphasizing their conservation goals and sustainable public uses." A 2000 amendment directs national marine sanctuaries to provide educational activities including "education of general public, teachers, students, national marine sanctuary users, and ocean and coastal resource managers." Interpretive facilities were added with the mandate that they "must emphasize the conservation goals and sustainable public uses of national marine sanctuaries by providing the public with information about the conservation, recreational, ecological, historical, cultural, archeological, scientific, education or aesthetic qualities of the national marine sanctuary." [2]

In 2004, the U.S. Commission on Ocean Policy produced *An Ocean Blueprint For the 21st Century*. Using existing national education standards for science literacy and environmental stewardship, the plan outlined steps to apply these in the development of concepts for ocean literacy and ocean stewardship. "Strengthening the nation's awareness of the importance of the oceans requires a heightened focus on the marine environment, through both formal and informal education efforts. School curricula, starting in kindergarten, should expose students to ocean issues, preparing the next generation of ocean scientists, managers, educators, and leaders through diverse educational opportunities. In addition, because formal curricula only reach students for a limited time, informal education aimed at the entire population is needed to foster lifelong learning.[3]" In December 2004, President George W. Bush submitted the *U.S. Ocean Action Plan* to Congress in response to the recommendation made by the U.S. Commission on Ocean Policy. The activities outlined in the Administration's mandate are intended to help assure that the benefits derived from U.S. oceans, coasts, and Great Lakes will be available to future generations.

The *Ocean Blueprint* expands its statement of desired outcomes, "The public should be armed not only with the knowledge and skills needed to make informed choices, but also with a sense of excitement. Individuals need to understand the importance of the ocean to their lives and realize how their individual actions affect the marine environment. Public understanding of human impacts on the marine environment will engender recognition of the benefits to be derived from well-managed ocean resources. Because of the connection among the oceans, the atmosphere, and the land, inland communities need to be as informed and involved as seaside communities."

In 2007, NOAA was designated as lead agency for ocean education, with a broad mandate to support educational activities at all levels to increase public awareness and understanding of ocean science and stewardship. The NOAA Office of Education developed an Education

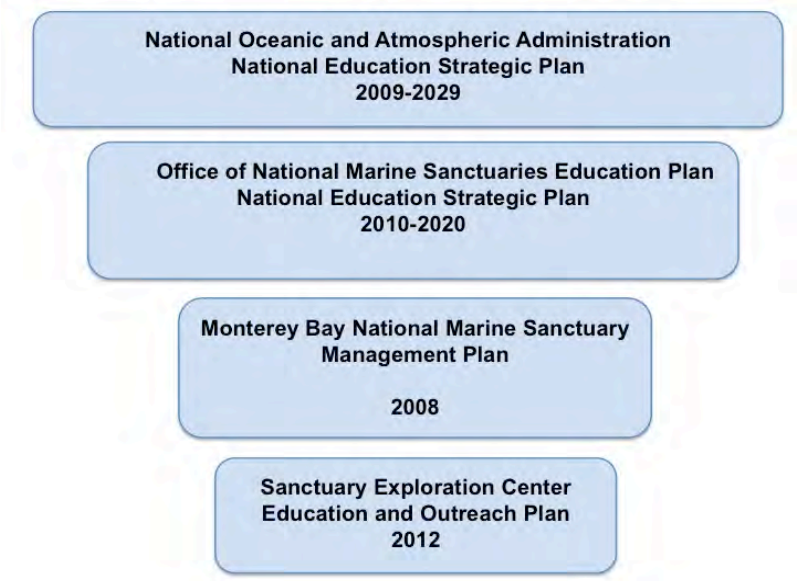
Strategic Plan with the overall vision of "an informed society that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions," and the mission "to advance environmental literacy and promote a diverse workforce in ocean, coastal, Great Lakes, weather, and climate sciences encouraging stewardship and increasing informed decision-making for the Nation."

In 2009, NOAA released its Education Strategic Plan 2009-2029, with the vision "to educate the public about ocean, coastal, Great Lakes, and atmospheric science and stewardship." The strategic plan identified two desired outcomes:

> 1) An environmentally literate public supported by a continuum of lifelong formal and informal education and outreach opportunities in ocean, coastal, Great Lakes, weather, and climate sciences.
>
> 2) A future workforce, reflecting the diversity of the Nation, skilled in science, technology, engineering, mathematics, and other disciplines critical to NOAA's mission.[4]"

In 2010, The NOAA Office of National Marine Sanctuaries (ONMS) released its National Education Strategic Plan (2010 - 2020). The Office of National Marine Sanctuaries education vision is "to create an ocean-literate public making informed environmental decisions. The mission is to inspire ocean and climate literacy and conservation through national marine sanctuaries.[5]" The Education Plan suggests ways to achieve the vision and mission through the development and use of Curricular Materials and Lesson Plans, Professional Development for Educators, Field Studies, Multicultural Programs, and High-Tech Learning.

Figure 1.1 Educational Mandates in National Marine Sanctuaries



1.1 National Ocean and Science Education Programs

National Marine Sanctuaries Education

NOAA's Office of Education and the Office of National Marine Sanctuaries offers a number of resources designed to complement and coordinate with site-based education programs, including teacher training programs, multicultural ocean literacy, school programs, and public awareness campaigns. B-WET (Bay Watershed Education and Training), a competitive funding program, supports locally relevant, experiential learning for K-12 education programs, including several MBNMS partner organizations and programs. For more information visit sanctuaries.noaa.gov.

STEM Education

In 2006, federal government initiatives increased support of educational development and progress for all academic levels in the fields of Science, Technology, Engineering and Mathematics (STEM). The initiatives called for advanced research in the physical sciences and an increase in U.S. higher education graduates within STEM disciplines. The National Science Foundation has developed numerous programs in STEM education, designed to implement higher cognitive skills for students, enabling them to inquire and explore techniques used by professionals in the Science, Technology, Engineering and Mathematical fields. For more information, visit http://www.stemeducation.com

1.2 S.D. Bechtel, Jr. Foundation Grants Program

STEM Education is a primary interest of the S. D. Bechtel, Jr. Foundation, and the Board of Directors believes strongly in nurturing the scientific and design power of the young mind. Advancing STEM education is considered critical for preparing students to address national and global challenges, and to ensure that future generations have the basic STEM literacy necessary to participate in a productive economy and successful democracy.

The S.D. Bechtel, Jr. Foundation Board of Directors created the Environmental Literacy Program in 2010 to act as a linking strategy that supports goals across the Foundation's other program areas. "Environmentally literate Californians must be able to weigh various sides of an environmental issue and make responsible decisions as individuals and members of the local and statewide community. Quality environmental education improves everyday life and economic prosperity by strengthening hands-on, inquiry-based opportunities that engage children in STEM education, providing quality character development and citizenship opportunities for youth and communities, and advancing health through healthy eating and environmental stewardship. [6]"

The S.D. Bechtel, Jr. Foundation took an early interest in the Sanctuary Exploration Center, investing in its capital and construction campaign. It also invested in the development of this Education and Outreach Plan for the Sanctuary Exploration Center with the expectation that it would offer programs consistent with ocean literacy, environmental literacy and STEM education objectives. In 2011, MBNMS received a grant, sponsored by the S.D. Bechtel, Jr. Foundation, to develop an outreach and education plan that would consolidate goals for the Sanctuary Exploration Center into a single document and serve as a guide for its education and outreach programming.

1.3 Education, Outreach and Volunteer Programs in the Monterey Bay National Marine Sanctuary

MBNMS Management Plan

In 2008, MBNMS completed its management plan review process and produced an updated Management Plan. MBNMS hosted 20 scoping meetings with stakeholders in the management plan review process. Stakeholder comments for education programs echoed the call for national ocean literacy and stewardship. Ideas on how to achieve these desired outcomes informed the development of two Action Plans: *Ocean Literacy and Constituent Building Action Plan*, and *Interpretive Facilities Action Plan*. Stakeholder recommendations form the foundation for the Sanctuary Exploration Center's education and outreach goals. [7]

MBNMS has an extensive Education and Outreach Program offering a diverse array of programs, including formal and informal education programs for schools, students and teachers, as well as community outreach programs using trained volunteers. The programs are well established and popular, and are referred to frequently throughout the Education and Outreach Plan. Education programming for the Exploration Center will build upon the foundation established by these programs. For reference purposes, a brief description of MBNMS Education, Outreach and Volunteer programs, and their acronyms, is provided here, in alphabetical order.

Bay Net

Started in 1995, Bay Net is an informal volunteer-based shoreline naturalist program in Monterey, Pacific Grove, Moss Landing and Santa Cruz. Bay Net volunteer naturalists engage visitors by introducing them to Monterey Bay National Marine Sanctuary and local wildlife that can be easily seen from shore with binoculars and spotting scopes. Bay Net volunteers promote understanding and appreciation of sanctuary resources while fostering stewardship of the sanctuary and oceans worldwide.

Beach COMBERS

The primary goal of Beach COMBERS (Coastal Ocean Mammal / Bird Education and Research Surveys) is to obtain information on species of stranded marine birds and mammals on MBNMS beaches. Beach COMBERS uses trained volunteers to regularly survey assigned beach segments for dead marine birds and mammals during the low tide in first week of each month. The long-term objectives of the program are to provide baseline information on the average presence of beachcast marine organisms, and to assist the Sanctuary in the early detection of mortality events triggered by natural and anthropogenic environmental perturbations such as harmful algal blooms (HABs) and oil spills.

Citizen Watershed Monitoring Network

The Monterey Bay National Marine Sanctuary Citizen Watershed Monitoring Network (CWMN) arose out of the sanctuary's objective for comprehensive monitoring of the health of the sanctuary and its watersheds. The goal of the CWMN is to develop and maintain integrated, long-term, volunteer-based water quality and watershed monitoring programs. The CWMN provides guidance, training, equipment and support to volunteer monitoring groups, and

increases the amount and quality of citizen monitoring data, while establishing communications between citizen monitors and government agencies to ensure that the collected information is useful and meaningful. The CWMN coordinates and promotes two annual regional monitoring events, First Flush in the fall and Snapshot Day in the spring, and the Urban Watch program.

- **First Flush**
  First Flush program is a wet-weather monitoring program focused on storm drain outfalls that flow into the ocean. Since 2000, teams of volunteers have collected water samples from outfalls during the first major rainstorm of the winter season. Samples are tested for metals, nutrients and bacteria. *First Flush* informs local cities with about the quality of water flowing from streets into the MBNMS, fulfilling part of their National Pollution Discharge Elimination System (NPDES) storm water permit requirements.

- **Snapshot Day**
  On the first Saturday in May, volunteers from San Mateo to San Luis Obispo collect water samples and take field measurements from streams and rivers that flow into the sanctuary. Samples are collected for lab analysis of bacteria and nutrients that flow from watersheds. This one-day monitoring program provides a "snapshot" of water quality along the central coast of California while creating partnerships and fostering stewardship of watersheds.

- **Urban Watch**

  Urban Watch is a dry-weather monitoring program where citizens collect samples of water from storm drain outfalls. Since its inception in 1997, *Urban Watch* volunteers and staff have collected data to fulfill two objectives: to collect reliable data that can be used for management decisions by local jurisdictions, and to educate the public on human impacts to water quality. Samples are tested for common urban pollutants: detergents, ammonia, chlorine and phosphates. *Urban Watch* data assists Pacific Grove in fulfilling education, outreach, and monitoring requirements of Phase II National Pollution Discharge Elimination System (NPDES) storm water permits.

Coastal Discovery Center and Sanctuary Scenic Trail

The Sanctuary Exploration Center in Santa Cruz joins two other existing interpretive facilities, as well as a comprehensive signage plan along several sections of the California Coastal Trail. The Coastal Discovery Center at San Simeon Bay opened its doors in 2006 and is cooperatively run by Monterey Bay National Marine Sanctuary and California State Parks. Located at historic William R. Hearst Memorial Beach in San Simeon, the Coastal Discovery Center offers information on natural and cultural resources along the central California coast. The MBNMS Southern Region Program Office is housed and staffed in the same facility. A permanent non-staffed interpretive exhibit was completed in 2006 at the Pigeon Point Lighthouse. Sanctuary interpretive signage is installed in numerous locations along the coast. The scenic trail encourages visitors to explore and enjoy the scenic coastline, while enhancing appreciation of the sanctuary through engaging interpretative signage.

LiMPETS

Long-term Monitoring Program and Experiential Training for Students is an education program for students, educators, and volunteer groups. LiMPETS was developed to increase the volume of monitoring data in California's National Marine Sanctuaries and to increase awareness and stewardship of these important areas. Two distinct monitoring programs make up the core of the LiMPETS network: the Rocky Intertidal Monitoring Program and the Sandy Beach Monitoring Program. Both programs offer participants opportunities to experience the scientific process firsthand. Through research-based monitoring and standardized protocols, students and volunteers develop problem-solving skills, use data collection tools and methods employed by field scientists, and learn to analyze data. An online data entry system allows participants to archive their data and view and analyze their results over time. The program began as a college and high school monitoring program and has expanded to include trained volunteers in the community, encouraging them to collect real scientific data and serve as ocean stewards.

MERITO

MERITO (Multicultural Education for Resource Issues Threatening Oceans) is a bilingual English-Spanish marine conservation outreach effort comprising approximately twenty-five regional groups that participate in ocean and watershed education programs serving students, teachers, adults and families living near the Monterey Bay National Marine Sanctuary. MERITO was launched after extensive research and development in 2002 to provide classroom support, field trips, training and resources, college internships, event support and a forum for expanding bilingual outreach programs within Sanctuaries. MERITO was developed by MBNMS Education staff and community members and was so successful it expanded to Channel Islands National Marine Sanctuary (CINMS). Due to limited funding, MERITO at MBNMS and CINMS sites now operates at a low level to continue its core school based program, the MERITO Academy.

Team OCEAN

Since 2000, Team Ocean Conservation Education Action Network (Team OCEAN) has put trained volunteer naturalists out on the water in sanctuary kayaks to greet and interact with fellow kayakers. Team OCEAN volunteers can be found in Elkhorn Slough and along the kelp beds off Cannery Row in Monterey. Visiting kayakers may be unaware of the sanctuary's existence and laws protecting wildlife. Team OCEAN naturalists serve as MBNMS representatives, educating visitors about wildlife viewing etiquette. Team OCEAN has proven to be a successful interpretive wildlife protection program with thousands of contacts per year.

Voices of the Bay

Voices of the Bay fisheries education curriculum introduces 8th-12th grade and community college students to commercial fisheries and the rich cultural fishing tradition of Monterey Bay. The first of the three modules, *Balance in the Bay*, introduces students to sustainable fishing concepts and resource management issues through a simulated squid fishing activity. The second module, *From Ocean to Table,* is a socio-economic study tracking the costs involved in bringing seafood from the ocean to the dinner plate. In the third module, *Capturing the Voices of the Bay*, students interview members of the local fishing community to capture their unique stories and knowledge. All modules may be adapted for other coastal communities.

2.0 Partner Organization Recommendations

Partner organizations to national marine sanctuaries are described as organizations that share the common vision of an ocean-literate society. In many cases, partner organizations have participated on funding proposals, event planning, coordinated outreach activities, and long-term strategic planning efforts with MBNMS in the past. Input from partner recommendations is essential in developing program ideas for the Exploration Center, and when compiled, create a sort of "feedback" for the MBNMS Education Program and all its education, outreach, volunteer and partner programs.

MBNMS and Sanctuary Exploration Center management and staff formed a list of 26 partner organizations (page 24) for personal interviews and recommendations in the development of the Exploration Center Education and Outreach Plan. These partner organizations compose a mix of government agencies, formal education institutions, informal education providers, environmental non-profit organizations (NGOs), businesses, and tourism organizations. They possess varying roles in reaching out to diverse audiences and advancing opportunities to enhance ocean literacy. These partner interviews provided useful recommendations, and revealed many opportunities to create mutually beneficial alliances for enhancing ocean literacy.

Partner organization recommendations fell into five basic categories, listed here:

2.1 Reaching and expanding audiences, including website upgrades, social media, reciprocal web postings, and marketing techniques

2.2 Partner networking, including regular contact with partners, developing and maintaining relationships with tourism organizations and businesses, and outreach to the Spanish-speaking community

2.3 Education programming, especially national marine sanctuary education, citizen science education, bilingual Spanish education, and reaching out to unfilled education niches

2.4 Docent education and volunteer programs, focusing on consistent sanctuary education for all volunteers, and expanding existing MBNMS volunteer programs to Santa Cruz

2.5 Potential for collaborative funding efforts, including identifying funding needs, ideas and strategies.

Table 2.1 summarizes partner recommendations and assigns recommendations to the appropriate relevant chapters in the Sanctuary Exploration Center Outreach and Education Plan. Further discussion provides more detail to partner suggestions, and offers insights on implementation. Partner recommendations may also be developed into evaluation strategies. These ideas are included in Chapter 9, Program Evaluation.

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Table 2.1. Partner Organization Recommendations for Sanctuary Exploration Center Education and Outreach Plan

Suggestion Topic	Partner Suggestion	How will ocean literacy be enhanced?	Appropriate SEC Education and Outreach Plan
2.1 Reaching and expanding audiences	*Upgrade website for easy access to information requests, on-line reservations for education programs & presentations*	*Expands outreach to all audiences. User tracking identifies new audiences and provides user information which can be used to more effective outreach*	*Communications & Marketing*
	Expand social media and networking	*Social media users are considered a "new" ocean literacy audience*	*Communications & Marketing*
	Reciprocal web postings with partners.	*Multiple cross-postings amplify audience outreach*	*Communications & Marketing*
	Advertizing & marketing Sanctuary Exploration Center	*Increased visibility and exposure to more audiences; may increase fundraising & donor interest*	*Communications & Marketing*
2.2 Partner Networking	*Regular contact & updates with partner organizations*	*Collaborative idea generation enhances outreach possibilities; cooperative partner planning increases exposure to ocean literacy messages*	*Community Programs*
	Active relationships with tourism organizations and businesses	*Maximizes existing information outlets for greater exposure to tourist audiences*	*Communications & Marketing*
	Outreach to Spanish-speaking businesses, media and tourists	*Ocean literacy and sanctuary messages reach this important stakeholder audience.*	*Communications & Marketing; Community Programs;*

Table 2.1 (continued) Partner Organization Recommendations for Sanctuary Exploration Center Education and Outreach Plan

Suggestion Topic	Partner Suggestion	How will ocean literacy be enhanced?	Appropriate SEC Education and Outreach Plan
2.3 Education Programming	*Be the authority for national marine sanctuary education*	*Consistent messaging about national marine sanctuaries enhances ocean literacy overall*	*School & Teacher Programs, Community Programs, Docent Training Program*
	Promote and expand citizen science education programs	*High-quality hands-on STEM education*	*School and Teacher Programs*
	Offer bilingual education programs for all school audiences (MERITO-based)	*MERITO programs are already tested and found effective*	*School & Teacher Programs*
	Identify and develop unfilled education niches	*Enhances ocean literacy in unfilled education audiences*	*School & Teacher Programs*
2.4 Docent education and volunteer programs	*Offer consistent sanctuary education for MBNMS docents, volunteers and other organization's volunteers*	*Accurate, consistent messaging about sanctuaries enhances ocean literacy through volunteer voices*	*Docent Training Program, Community Outreach, Partner Relationships*
	Expand MBNMS volunteer programs to Santa Cruz	*Expands audiences and outreach to specific user groups*	*Volunteer and Docent Training; Community Programs*
	Offer citizen science monitoring programs for adult volunteers	*Increase in usable monitoring data, high-quality hands-on community education, increase in sanctuary education & messages*	*Volunteer and Docent Training; Community programs,*
2.5 Potential for collaborative funding efforts	*Identify funding needs*	*First steps to achieving added funds for ocean literacy*	*All SEC Education & Outreach Programs, SEC Funding Plan*
	Develop collaborative funding ideas with partners	*Greater funding for ocean literacy outreach*	*All SEC programs or specific programs*
	Develop cooperative funding strategies with partners	*Combined partners efforts may result in more effective proposals & success*	*May apply to all SEC Programs*

2.1 Reaching and Expanding Audiences

Identifying audiences and developing outreach strategies to target them is a significant component of ocean literacy education. Social media networking has offered new ways to expand audience outreach. Partner organizations have embraced these electronic outreach tools and strategies and have benefitted with greater exposure to new and existing audiences.

Website upgrades

All partner organizations reported upgrading or completely revamping their websites within the last two years. Revisions and upgrades included search engine optimization, easy drop-down menus, on-line requests for information and on-line field trip and classroom reservations. Tracking and reporting of web visitors, web inquiries, reservations and email update requests were considered useful ways to gather information that could be used for identifying audiences and expanding outreach.

Social media and networking

Social networking offers ways to reach out and bring ocean literacy concepts to new audiences, including people in other countries. All partner organizations reported significantly expanding social media networking. Staff responsibilities have expanded to include development of content for posting web announcements, e-alerts, photographs and video clips. Efforts are made to turn them rapidly – several times per week.

Reciprocal web postings

Partners offered to share web postings, updates and content. In this regard, MBNMS and the Exploration Center have a great opportunity to generate and initiate the spread of factual, interesting key messages about ocean literacy, research, resource protection, education and current events. By sharing them with other partner organizations, the messaging impact and exposure is significantly multiplied. Reciprocation is desired but may not always be feasible. MBNMS staff would need to review incoming messages from partners to be sure they are factual and consistent with MBNMS policies before posting.

Use marketing techniques to increase program participation and funding

Standard marketing techniques are traditionally used by businesses to reach and attract customers. Businesses, including the Seaside Company and Roaring Camp Railroads successfully use marketing techniques to attract visitors and students to their fee-based environmental education programs. Businesses use their discretion to offer reduced fees or sliding fee scales for qualifying groups.

Recently, as public and private grant dollars have dwindled, non-profit organizations have adapted traditional marketing techniques to attract financial support in the form of individual donors, memberships, private funding sources, and sponsors. Some efforts have been successful. Save Our Shores, an environmental non-profit organization, rented a billboard on a major transportation conduit for Santa Cruz commuters, reminding drivers to bring their own reusable

bags to the grocery store (a recent state bill banned the distribution of free disposable shopping bags). An unanticipated result was an increase in memberships and donations, which more than compensated for the cost of the billboard.

2.2 Partner Networking

Regular contact with partners

There are a number of ways ocean literacy providers in the Santa Cruz area stay informed. A regular coffee gathering of informal education providers maintains a calendar of activities such as annual fundraising efforts, weekly or monthly education programs, upcoming new programs and themes. This helps prevent other partners from offering equally important events on the same dates and times. Environmental non-profit organizations keep in touch with "blue drinks" gatherings. Executive directors from non-profits meet for lunch periodically to discuss their organizational goals and programming. The Sanctuary Education Panel (SEP) provides a means for formal and informal education providers to meet, share information, and collaborate on ocean literacy development opportunities. Reciprocal e-mail updates keep partners informed and amplify the ability to relay information to larger constituent audiences.

Relationships with tourism organizations and businesses

In June of 2010 Santa Cruz County joined many other tourism destinations throughout California in establishing a Tourism Marketing District (TMD), sometimes referred to as a Tourism Business Improvement District. The TMD includes the unincorporated areas of Santa Cruz County as well as the cities of Scotts Valley, Capitola, Santa Cruz and Watsonville. The countywide TMD benefits local Santa Cruz County residents, businesses and government by generating locally collected taxes related to tourism spending. The focus of the district is specifically to increase overnight visitation, particularly during the non-summer months. The Santa Cruz County Conference and Visitors Council has been identified as the implementing agency for the TMD marketing program: SCCVC http://www.santacruzca.org/partners.

The Sanctuary Exploration Center is a draw for ocean lovers, who may also visit businesses associated with beach and ocean activities as well as other businesses who attract customers interested in sunbathing, ocean recreating, surfing, kayaking, fishing and whale watching. These businesses help MBNMS fulfill its mandate to encourage people to get out into the coast and ocean and learn about the sanctuary.

Other businesses may not directly target beach and ocean-goers, but they can direct tourists and visitors to the Sanctuary Exploration Center to learn about the ocean and marine sanctuaries. Keeping these businesses informed of efforts and activities benefits the Exploration Center. These businesses include hotels, motels, restaurants and retail stores, and can be reached through tourism organizations and through targeted outreach efforts. All businesses have the capacity to develop into potential funders for student scholarships and other types of sponsorships.

Outreach to Spanish-speaking businesses, media and tourists

Partner organizations observed the development of the MBNMS MERITO program when it was fully funded, which conducted comprehensive ocean literacy-based outreach to Spanish-speaking students. MERITO is essentially an ocean literacy program for schools and after-school programs, but the MERITO program also recognized the importance of families in Spanish-speaking communities. MERITO targeted families as well as schools, and developed family-based ocean literacy programs. Partner organizations benefitted, including greater Spanish-speaker involvement in coastal cleanup days, increased enrollments of Spanish-speaking students in informal environmental education programs, and increased interest in on-the-water businesses by the Spanish-speaking community.

One of the Sanctuary Exploration Center's primary objectives is extending opportunities to enhance ocean literacy in Spanish-speaking constituents. These include Spanish-language web postings, bilingual event announcements, and media announcements for Spanish-speaking media, outreach to Spanish-speaking businesses, and businesses who attract Spanish-speaking tourists and customers.

2.3 Education Programs

National marine sanctuary education

Developing education programs that help others understand sanctuaries is considered the primary role of MBNMS staff by partner organizations. Partner organizations include information about MBNMS and national marine sanctuaries in their education programs, but they also emphasize that sanctuary representatives themselves are best equipped for educating audiences about national marine sanctuaries. The Sanctuary Exploration Center is recognized by partner organizations as the authority for communicating the role of national marine sanctuaries in ocean protection and stewardship.

Citizen Science education programs

Citizen science is a term used for ongoing programs of scientific work in which individual volunteers, or networks of volunteers, perform research-related tasks such as observation, measurement or computation. The fundamental basis for citizen science is that some scientific skills, such as simple data collection, can be taught to people who have no formal science education background. Early observations have shown that the process increases science and ocean literacy and a love for the ocean in the individual, while providing useful data that can be analyzed by research experts. While traditional science education programs may use the same methods and techniques and come up with similar data, citizen science programs input data into databases publicly available to resource managers and other education organizations. In some cases, resource protection decisions are stymied by "lack of data." Trained volunteers or students may be able add volume to data sets so that meaningful resource protection and policy decisions can be made.

LiMPETS is a citizen science education program that works with elementary (grades 4-6), middle (grades 7-8) and high school (grades 9-12) students to collect data about intertidal organisms for input into a statewide database. The database reveals patterns and trends for easy-to-identify organisms including sand crabs, sea stars, barnacles, and certain seaweeds. LiMPETS

was developed and promoted by MBNMS; in the Monterey and Santa Cruz region and it is now funded and maintained by a grant through the Pacific Grove Museum of Natural History. Implementation of LiMPETS is discussed in Chapter 5, School and Teacher Programs. Citizen science education programs have also been adapted for adult volunteers. These are discussed in Chapter 6, Community Programs.

Bilingual education programs for all school audiences

Formal and informal education partners are familiar with the MERITO bilingual watershed and ocean education program developed by MBNMS. MERITO is one of the few programs comprehensively developed to teach ocean literacy to first-language Spanish speakers, including curriculum materials, teacher training workshops, multiple grade-level targeted programs, after school programs, field trips, ESL programs and student internships. In recent years, funding opportunities for MERITO have diminished and the program has reduced its scope and number of students reached in the Monterey and Santa Cruz areas. All formal and informal partner education organizations identified bilingual Spanish ocean literacy education as a significant educational gap, and strongly expressed the importance of funding and expanding MERITO.

Identify and develop unfilled education niches

Informal marine science education programs in Santa Cruz are funded primarily through fee-based programs and grants. Grant funding is focused on elementary students identified by federal and state education mandates as under-served or at-risk students. Competition for grants is intense, and grant awards can affect the sustainability of education programs and organizations.

A conservative estimate, based on partner interviews for this report, indicates that more than 50,000 students receive grant-funded marine science education in the Santa Cruz area each year. These grant-funded school programs are the bread and butter of many informal ocean literacy education programs in the Santa Cruz area. Informal science education partner organizations have stated the desire to avoid or reduce competition for programs funded from these federal and state education grants. Santa Cruz State Parks states, “We can fill to capacity any funded school program.” O’Neill Sea Odyssey reports that reservations for funded school education programs are filled within the first few days they become available. Existing marine science education programs have reached and exceeded the capacity of available federal and state funding and are supplementing their programs with income from paid programs (such as summer camp), private donors and short-term grants.

Grant-funded school programs are targeted towards Grades 2-8. Younger students and older students may have more complex scheduling needs and therefore have less access to grant-funded programs. Home school programs are unlikely to leverage the same constituent impact as public schools and are often overlooked for science education funding. After-school programs serve an important component of childhood education and are also often overlooked for state and federal funding. Youth groups and youth clubs are another overlooked venue for science-based ocean literacy education programs. Internships for high school students, often fulfilling a public service requirement for graduation, are other venues for offering ocean literacy, public service, and leadership development programs. Weekend and school vacation programs offer shorter opportunities to provide ocean literacy programs to students. Bilingual ocean and science literacy programs are rare for all grade levels.

The overwhelming message from existing marine science education providers is for the Sanctuary Exploration Center to seek out and exploit these unfilled education niches and to develop or expand funding sources that target student audiences and needs that are different from previously identified underserved student populations.

2.4 Docent Education And Volunteer Programs

Consistent sanctuary education for all docents and volunteers

Volunteers play a critical role in the sanctuary system by contributing time, skills and dedication to national marine sanctuaries. *Docents* are defined as volunteers who have undergone extensive training and education for the purpose of providing interpretive information to the public.

Docents at the Exploration Center may also be volunteers or docents for other organizations including state and county parks, educational institutions, and non-profits. Currently, each organization offers its own volunteer and docent training programs. Partner organizations identified a need for consistent information about sanctuaries for their docent trainings. This need could be met by offering curriculum packets about sanctuaries for partner organizations to add to their volunteer training manuals, having MBNMS staff provide lectures and presentations at partner volunteer trainings, or offering presentations and tours at the Exploration Center specifically for docents in other organizations.

The benefit to MBNMS and the Exploration Center in offering volunteer and docent training about national marine sanctuaries for partner organizations is that accurate information is dispersed through docents and volunteers throughout the Santa Cruz area, expanding opportunities to achieve the desired outcome of informed volunteers who are also ambassadors for national marine sanctuaries.

Expand MBNMS volunteer programs to Santa Cruz

MBNMS has developed a number of volunteer programs that offer meaningful experiences for volunteers, provide useful information for sanctuary managers and/or fulfill resource protection objectives. Bay Net volunteers offer information about marine birds and mammals to visitors walking along coastal trails and bluffs. Team OCEAN docents provide education about wildlife viewing etiquette to on-the-water kayakers and recreationists.

Volunteer citizen science or citizen monitoring programs have attracted increasing interest in recent years. These programs train volunteers to collect data that can be used to indicate patterns and trends by resource managers. The experience of collecting real data that will be analyzed by experts is effective at opening the door to ocean literacy for non-students, as well as inspiring a love for the ocean and a desire to protect ocean resources.

The Citizens' Watershed Monitoring Network includes MBNMS volunteer programs, First Flush and Snapshot Day. Beach COMBERS volunteers collect information about beachcast marine birds and mammals. Additional programs are being developed based upon school-based monitoring programs, LiMPETS and MERITO. LiMPETS has been successfully modified into a

citizen monitoring program in San Simeon. Coastal Discovery Center docents also collect plankton samples for the California Department of Public Health Phytoplankton Monitoring Program.

Partner organizations in Santa Cruz named these MBNMS programs with clear requests to expand them further north into the Santa Cruz area. They consider the Sanctuary Exploration Center to be the ideal hub for offering training, supervision and database management for these volunteer programs.

2.5 Potential For Collaborative Funding Efforts

Identifying funding needs

Partner agencies and non-profit organizations share the common goal of enhancing ocean literacy among their stakeholder audiences. This common goal can and often does lead to collaborative funding opportunities. MBNMS has partnered with NGOs on many grants funded through the California Coastal Commission, federal funding through NOAA's Office of Education B-WET Grant (Bay Watershed Education and Training), and private foundation grants. All partners expressed willingness to work collaboratively on grant projects, and some mentioned doing so through the Sanctuary Education Panel (SEP).

Funding needs expressed by education providers included the need to fund transportation for students and classes to get to the Exploration Center. Collaborative efforts to provide bus funding would benefit the Exploration Center and partners. Watsonville Wetlands Watch works closely with high school interns in Watsonville and Pajaro Valley, including taking them to other watershed education facilities. Funding for transportation is the limiting factor in bringing their interns to the Exploration Center. This concern was repeated many times.

Many education providers emphasized the need to find funding to support and expand MERITO programs. MERITO is a fully developed bilingual watershed education program that has shown documented increases in ocean literacy among student participants. Partners voiced agreement that MERITO needs funding and expansion in the Watsonville and Santa Cruz areas.

Collaborative funding ideas

Several partners described the need for a map showing visitors to the area where they can get to the coast and ocean. They referred to the MBNMS brochure, *50 Ways To Get Wet In The Monterey Bay National Marine Sanctuary* as the prototype for developing a similar, updated brochure as well as an interactive map that could be available for posting on all partner websites. Information about access points would offer live links to partner websites (For example: Elkhorn Slough NERR, Twin Lakes State Park). A comprehensive map would include links to nearby on-the-water businesses including fishing, kayaking and whale watching.

Getting people out into and onto the sanctuary is a priority for MBNMS. There are very few vessel-based education programs for students and they are at maximum financial capacity. Funding for vessel-based on-the-water education programs for students, and potentially

expanding them to adult and citizen monitoring groups, was supported by multiple partner organizations.

Another idea put forward was a trolley that brought visitors to a number of environmental and marine-based interpretive facilities including the Santa Cruz Museum of Natural History, the Exploration Center, the Surf Museum (Santa Cruz Parks and Recreation), and the Seymour Marine Discovery Center. Rationales for the trolley included bringing visitors to facilities that are too far apart to walk, reducing traffic and minimizing parking congestion.

Large scale, regional funding including multiple school districts, audiences and providers was proposed by several partners as the most effective way to support partner programs.

Funding strategies

Non-profit partner organizations indicated that grant funding has significantly diminished in recent years to the point that it is no longer a reliable funding model. Seeking further afield for additional grant opportunities is an ongoing process but is primarily focused on supporting existing programming and staff.

Several non-profit partners indicated a recent move redirecting their efforts from seeking grant funding to developing a marketing strategy to raise awareness about their programs and develop support for them through memberships, donations and private funders. Some organizations are already doing this and have indicated success.

Business partners indicate a willingness to invest funds to support programs that have a mutual interest, similar audiences, and may result in greater visibility for the business. These include cooperative outreach and marketing activities, event sponsorships, cooperative signage, brochures and websites.

Some agency partners suggested working with institutional partners to leverage region-wide, multi-year grants from national or multi-national funders who reveal a willingness to offer long-term investment in staff and programming.

2.6 List of Partner Organizations

Interviews with partner organizations provided clear, direct and useful ideas for Sanctuary Exploration Center staff to pursue in development of its education and community programs. The list of partner organizations is included here, with appreciation for their insights and time.

Government Affiliated Organizations

Elkhorn Slough National Estuarine Research Reserve
www.elkhornslough.org

Santa Cruz Parks & Recreation Department
amacbird@cityofsantacruz.com

Santa Cruz State Parks
lhitchcock@parks.ca.gov

School Education Providers

California State University Monterey Bay
Camp SEA Lab
www.campsealab.org

CREEC Network, Region 5
Santa Cruz County Office of Education
http://www.creec.org/region5

Exploring New Horizons Outdoor Schools
exploringnewhorizons.org

Monterey Bay Aquarium
Education Program
www.mbyaq.org

Monterey Bay Aquarium Research Institute
Education Programs
www.mbari.org

Moss Landing Marine Laboratories
http://teach.mlml.calstate.edu

O'Neill Sea Odyssey
http://oneillseaodyssey.org

Pacific Grove Museum of Natural History
LiMPETS Program
http://limpetsmonitoring.org

Santa Cruz Museum of Art and History
www.santacruzmah.org

Santa Cruz Museum of Natural History
www.santacruzmuseums.org

Seymour Marine Discovery Center
http://seymourcenter.ucsc.edu

Save Our Shores
http://www.saveourshores.org

Watsonville Wetlands Watch
http://www.watsonvillewetlandswatch.org

Non-governmental, non-profit organizations

Ecology Action
http://www.ecoact.org

FishWise
http://www.fishwise.org

Ocean Conservancy
www.oceanconservancy.org

Friends of Santa Cruz State Parks
www.thatsmypark.org

Businesses

Roaring Camp Railroads
www.roaringcamp.com

Seaside Company Youth Programs
www.scseaside.com

Stagnaro Whale Watching
& Fishing Tours
www.stagnaros.com

Venture Quest Kayaking
www.kayaksantacruz.com

Whole Foods Market
melissa.mcconville@wholefoods

Tourism Organizations

Santa Cruz County Conference and Visitors Council
http://www.santacruzca.org

Santa Cruz Chamber of Commerce
http://www.santacruzchamber.org

3.0 MBNMS Goals for the Sanctuary Exploration Center

The Mission of Monterey Bay National Marine Sanctuary Exploration Center is
"to foster stewardship of Monterey Bay National Marine Sanctuary by connecting visitors to the water, geology, and life within it; to engender appreciation for maritime and cultural resources protected by the sanctuary; and to highlight the role of technology in understanding sanctuary resources."

As a gateway to California's historic Monterey Bay, the Sanctuary Exploration Center serves the entire Central California region, informing visitors about the geology, oceanography and ecology of natural and cultural underwater resources. Exhibits in the Sanctuary Exploration Center are intended to encourage visitors to learn more about what makes the coastal and ocean environment so productive. The exhibits inform visitors about the Monterey Bay National Marine Sanctuary, including where it is and why it is so special. The Sanctuary Exploration Center provides information about maritime and cultural history, conservation issues impacting marine ecosystems, and highlights the personal roles individuals have in becoming stewards of America's underwater treasures.

MBNMS Management Plan Desired Outcomes

During 2006 and 2007, MBNMS hosted 20 scoping meetings with stakeholders in the process of its management plan review, which was completed in 2008. Stakeholder comments for education and community outreach programs echoed the call for national ocean literacy and stewardship and informed the development of two Action Plans within the 2008 Final Management Plan: *Ocean Literacy and Constituent Building Action Plan*, and *Interpretive Facilities Action Plan*. Stakeholder recommendations form the foundation for the Sanctuary Exploration Center's desired outcomes.

As a result of visiting the Sanctuary Exploration Center, visitors will:

- Be more aware of Monterey Bay and its watershed, coastal and marine resources
- Feel a personal connection to the ocean and a sense of stewardship for it
- Understand what national marine sanctuaries are and their role in protecting ocean resources, especially Monterey Bay National Marine Sanctuary
- Be encouraged to get outside and enjoy the sanctuary in responsible and sustainable ways.

3.1 Sanctuary Exploration Center Program Priorities

Since 2006, MBNMS staff have invested considerable visioning and team building efforts in planning for the Sanctuary Exploration Center. While led by the education team, input was provided by the research, resource protection and operations teams as well. The MBNMS Education and Outreach Team is composed of science educators committed to creating an ocean-literate public, inspiring a lifelong, meaningful relationship to the ocean. They embrace their role in educating the public about national marine sanctuaries, interpreting scientific research, and helping people understand that data collection and monitoring provide necessary information for resource managers to make informed policy decisions. Partner recommendations (Chapter 2) reinforced MBNMS program priorities, and are echoed in the priorities outlined here.

Identify unfilled education niches

Since 2000, MBNMS Education programming has sought to reach beyond standard marine science education programs and to seek out educational audiences who may be overlooked or underserved. This vision has resulted in the development of programs unique to MBNMS, and will be highlighted in Exploration Center programs.

The most significant program is MERITO, a bilingual Spanish-English outreach and education program. MERITO has made effective inroads into the extensive Spanish-speaking communities located within 44 miles of the Monterey Bay National Marine Sanctuary, which have populations or sub-populations composed of primarily Spanish speakers. These include Gonzales, Soledad, Salinas, Greenfield, Seaside, Monterey, Marina, King City, Pacific Grove, Hollister, Watsonville, Gilroy, Aptos, Capitola and Soquel. MERITO uses a combination of community outreach, collaboration with other science education providers, and a bilingual watershed education program to connect with this significant stakeholder group.

Other education audiences that may have needs for ocean literacy education include home school programs, which are often overlooked for science education funding. After-school programs. youth groups and youth clubs are another area in which to expand programming. High school internships for offer combined opportunities for ocean literacy, public service, and leadership development programs. Short, focused citizen monitoring training programs can be modified for school vacations and weekend events. All of these options can be offered in both English and Spanish, or in bilingual programs, thereby expanding outreach to presently unfilled education niches.

Citizen monitoring programs

"I hear and I forget. I see and I remember. I do and I understand." ---- Confucius

Educators know that active engagement leads to learning. One of the foundations underlying the need for interpretive facilities, including the Sanctuary Exploration Center, is to create opportunities for visitors to learn about marine resources using the same or similar technologies and protocols used by marine scientists. Exploration Center exhibits simulate and highlight

current research topics and invite visitors to participate in simulated data collection, monitoring activities, and technologies.

Beyond the role of interpretive facilities, MBNMS education programs strive to get people to go out to ocean and coastal environments to learn first-hand about their living and non-living components. MBNMS Education programs provide these opportunities for students and volunteers. Grouped under an overarching term, Citizen Monitoring, the programs were developed in collaboration with other agencies and organizations. Some were first developed primarily for classroom programs (like LiMPETS and MERITO). All of them can be modified or applied to a variety of age groups, classroom programs or volunteer programs. Citizen Monitoring has been identified as a flagship of MBNMS Education Programs.

Science training is essential for correct data analysis and conclusions. However, properly trained and supervised volunteers and students can collect and record meaningful data for some natural conditions in ways that can be used by data monitoring agencies to inform policy decisions. In many situations, data collection is the limiting factor for resource managers to make informed decisions about the status of protected resources. Citizen science programs train non-scientists to collect data that can support resource management decisions.

Collaboration with partner organizations

The MBNMS Education Team collaborates with partner organizations in the Santa Cruz area via regular networking meetings, including the Sanctuary Education Panel (SEP). Many MBNMS partners also offer formal education programs and non-formal marine science education programs for K-12 students, as well as community programs for adults and families. Sanctuary Exploration Center education programs will be developed to "complement, not compete" with other marine science education programs in the area. Exploration Center programs will be focused on the Exploration Center and its exhibits, targeted for specific audiences, and limited to the capacities of the budget and staff. Continued communication with partners will be achieved toward the common goal of expanding understanding of ocean literacy among greater audiences and exploring potential funding and grant opportunities.

Apply existing evaluation programs to new programs

Both *MERITO* and *Voices of the Bay* were developed with extensive needs assessment components and evaluation elements, which were developed on cooperation with ONMS. Both programs have shown documentable effectiveness in long-term behavioral and attitude change in students. Education Team staff agreed to adapting these program evaluation elements to all Exploration Center Programs.

Work within realistic funding and staffing capacity

Exploration Center education and outreach programs will be focused on the Exploration Center and its exhibits, targeted for specific audiences, and limited to the capacities of the budget and staff. Core programs can be covered within existing staff and budgets, while additional programs will be developed with the intention to implement them when secure, consistent funding becomes available. Program expansion requires appropriate staffing and funding, through public or private sources.

3.2 Sanctuary Exploration Center Programs, Year 1 through Year 4

Year 1: October 2012 – 2013

Some Year 1 programs have already been developed and implemented, including the Exploration Center's first docent training program. Group tour reservations are available on the Exploration Center's website, encouraging large, organized groups to establish pre-visit contact with staff to avoid scheduling conflicts. A school group reservation form has also been completed, allowing school groups to arrange times for independent visits to the Exploration Center. Facility events and rental policies have also been established and implemented.

Current funding includes the following programs and is prioritized as follows:

1) Docent Training Program

Includes recruitment, application review, interviews, selection, training, scheduling, reporting, supervision, and enrichments

2) Group Tours

Includes group tour reservations and scheduling for all organized groups including community groups, service organizations, specialized tours, and school groups. Non-guided tours allow visitors groups to explore the exhibits at their own pace. Docent-led guided tours may be focused on the particular interest of the group (geology, technology, sustainable design, etc).

3) New Education Program: This Is Your Sanctuary

Includes development of a school field trip education program aligned with ocean literacy principles that highlights Sanctuary Exploration Center exhibits, classroom and exterior educational components.

4) Partner Relationships

Includes staff participation in maintaining and expanding relationships with ocean literacy partners, businesses and tourism organizations as well as exploring potential fundraising and grant development opportunities.

5) Facility Use

Includes development of facility operations and use plans, scheduling, staffing and coordination of outside users for group events, community programs and fundraisers.

6) Evaluation and Tracking

Includes keeping track of daily, weekly and monthly visitor numbers, patterns, trends and demographics as well as docent hours, on-line group reservations, web visitors and inquiries, facility use requests, and educational offerings. These will be used in development of effective evaluation of program success.

Table 3.1. Exploration Center Program Priorities, Year 1

	Year 1 Programs: October 2012 – October 2013
Core Program	**Description**
Docent Program	Includes recruitment, application review, interviews, selection, training, scheduling, reporting, supervision, and enrichments. The Exploration Center will hold at least one docent training per year.
Visitor Programs Group Tours	Includes group tour reservations and scheduling for all organized groups desiring self-guided tours and docent-led guided tours. Group tour reservations will be documented and used in program assessment.
School & Teacher Education: ***This Is Your Sanctuary***	Development of a new school field trip education program aligned with ocean literacy principles that highlights Sanctuary Exploration Center exhibits, classroom and exterior educational components. See Chapter 5 for more information.
Partnerships	Maintaining and expanding relationships with ocean literacy partners, businesses and tourism organizations, as well as exploring potential fundraising and grant development opportunities.
Facility Use	Development of facility operations and use plans, scheduling, staffing and coordination of outside users for group events, community programs and fundraisers. Facility use will be tracked and used for program assessment.
Evaluation and Tracking	Keeping track of daily, weekly and monthly visitor numbers, patterns, trends and demographics as well as docent hours, on-line group reservations, web visitors and inquiries, facility use requests, and educational offerings. These will be used in development of effective evaluation of program success.

Additional Programs

Additional programs will be based upon MBNMS education and outreach priorities described in this chapter, including reaching bilingual Spanish audiences and other unfilled education niches, citizen science monitoring programs, opportunities to collaborate with partner organizations, adequate program evaluation, and realistic funding and staffing capacity. Table 3.2 summarizes Exploration Center programs for Years 2, 3 and 4.

Table 3.2. Exploration Center Program Priorities, Year 2, 3 and 4

	Year 2 Programs: October 2013 – October 2014
Core Programs	**See Year 1 Programs**
New, Funded Programs	
School Education LiMPETS	See Ch 1.3 (MBNMS Programs) for a description
Community Programs	Offer training for citizen monitoring programs:
Marine Debris	Work with Save Our Shores
Watershed Education Snapshot Day	See Ch 1.3 (MBNMS Programs) for a description
Watershed Education Urban Watch	See Ch 1.3 (MBNMS Programs) for a description
Other Citizen Science Programs	Depends on funding

	Year 3 Programs: October 2014 – October 2015
Core Programs	**See Year 1 Programs**
	See Year 2 Programs
Additional Funded Programs	
Technology Program	See Student & Teacher Programs, Ch 5
Vessel-based education	See Student & Teacher Programs, Ch 5

	Year 4 Programs: October 2015 – October 2016
Core Programs	**Evaluate Year 1, 2 and 3 Programs**
	Review/evaluate current funded programs and make recommendations for continued funding of existing programs, including expanding existing programs to additional audiences
Additional Funded Programs	Assess funding potential for Year 5 and beyond. Establish new program goals based on realistic funding expectations.

4.0 Visitor Interpretive Programs

Interpretive facilities provide a physical location, attracting visitors, who interact with exhibits, docents, staff and each other, for the purpose of learning about the ocean and national marine sanctuaries. Interpretive facilities are considered important vehicles for achieving ocean literacy objectives.

Interpretation is an educational activity aimed at revealing the meaning of natural and cultural resources in interpretive facilities such as national parks, zoos, wildlife refuges, museums and historic cultural sites. Interpretation enhances the visitor's understanding and appreciation of natural areas, historic places and artifacts. As understanding and appreciation rises (meaningfulness), studies have shown that there is a similar rise in awareness and feelings of stewardship, which leads to the desired outcome of long-term behavior change. [8]

The purpose of interpretation is to translate the technical language of science into a non-technical form for lay audiences in order to inspire them [9]. Interpreters give meaning to exhibits, taking them beyond their appearances to reach visitors in ways that have relevance in their own lives. Park rangers, environmental educators and museum guides take classes or pursue degrees or certificates in interpretation. Today, in the face of limited budgets for interpretive facilities, volunteers often fill the niche of interpreters. Volunteer training programs spend training time providing volunteers with opportunities to develop interpretive skills through practice and mock dialogues. As volunteers develop interpretive skills, they graduate to "docents," a term used for volunteers who have undergone extensive education and skills development.

Defining Science Education and Outreach

Science education is concerned with developing an understanding of science concepts through classroom education. Traditional subjects include physical, life, earth and space sciences, as well as environmental education, environmental literacy and outdoor education. Classroom education programs must meet science and environmental education literacy requirements, as defined by national and state education boards. As a rule, science education is taught by people with college degrees in science fields. Chapter 5, School and Teacher programs, describes science education programs offered at the Sanctuary Exploration Center.

Science outreach is aimed at promoting awareness and appreciation for the natural world, based on a general understanding of science concepts. Outreach can be taught to and practiced by people who do not have formal science backgrounds. As part of docent training, science educators teach docents basic concepts and themes, which docents can refer to when engaging with visitors. The key to providing memorable experiences, thereby increasing understanding and awareness, leading to long-term behavior change, is visitor engagement. The role of interpretation is inviting the visitor to become engaged with Sanctuary Exploration Center docents, exhibits and activities.

The Sanctuary Exploration Center will offer a variety of docent-visitor encounters that offer opportunities for interpretation. These include:

- Entry Area Greeter
- Docent "stations" at specific exhibits
- "Floating" docents inside and outside Exploration Center
- Guided Group Tours
- Community Events
- Training and Volunteer Classes
- Private Events

As docents become more adept at engaging and interacting with visitors, they may find that they excel at certain kinds of interactions more than others and may specialize their activities there.

4.1 Interpretive Audiences

The people who visit the Center and enjoy its facilities, exhibits and programs are the Exploration Center's main audience and are often referred to as "general public." However, visitor interpretive programs are more effective when interpretive messages are provided in ways that offer meaning and relevance in the life of the individual, and should also consider the following factors. This is not a complete list, but is comprehensive enough to make the point that docents must develop a variety of interpretive skills for engaging visitors.

Age

- Children under age 5
- Children age 5-11
- Teens aged 12-17
- Young adults (Age 18-21)
- Adults (Ages 20 – 65, and various social subgroups within this category)
- Senior Adults (age 65+)

Language

- Native English speakers
- Native Spanish speakers
- Non-English speakers
- Sign Language speakers

Education

- Pre-school
- Public School
- Private School
- Alternative/Home School
- Community College
- College/ University

Motivation

Motivation is often a forgotten factor when dealing with general audiences. Visitors may not be interested in learning from the exhibits when they arrive. Here is where docent engagement can make a significant difference in the amount of time a visitor remains, and what he or she does after they have become engaged in conversation with the docent. Typical motivations include:

- Getting directions or information/Waiting for someone/Shopping (First-floor visitors)
- Interacting with/learning from exhibits & docents
- Interest in Center's design, construction, and features

4.2 Interpretive Themes and Messages

Successful interpretative programs begin with overarching *interpretive themes* -- unifying statements that capture, organize, and sustain the attention of the audience. They provide opportunities for audiences to apply their own connections to the meaning of an exhibit, concept or activity. Individual exhibits reflect and reinforce interpretive themes. *Interpretive messages* are shorter, more specific phrases that can be used by docents to engage in dialogue with visitors, prolonging their visit, stimulating thoughtful discussion and further inquiry. Interpretive messages may also take the form of talking points – key messages that are flexible enough to be applied to multiple situations.

Outcome-based interpretive planning is based on behavioral and emotional objectives associated with the learning process. People learn more and become more engaged when they have an emotional or behavioral connection. Outcome-based interpretive objectives provide a structure for development of all interpretive programs. They can be built into tour programs, lessons, activities, field trip programs, and impromptu conversations. Docents and staff can use them to assess whether the message is being received and how well it connects with the visitor's own values. Interpretive objectives are cumulative and hierarchical, building on previous objectives, to engage visitors at varying levels of comprehension, while opening the door to the next level.

MBNMS education and outreach themes, aligned with national science literacy mandates, form the foundation of the Sanctuary Exploration Center's exhibit messages. These themes are then condensed into short interpretive messages. Examples of how docents may use these interpretive messages, or talking points are included in three mock dialogues. Section 4.3, Interpretive Objectives, offers a hierarchical list of objectives for docents to use in establishing meaningful dialogue with visitors. The Sanctuary Exploration Center's interpretive messages for each exhibit are referenced in Section 4.4 and provided in full in Appendix A (page 95).

MBNMS Education and Outreach Themes

The foundation of national marine sanctuary education is to increase awareness, understanding and appreciation of sanctuary resources. The exhibits and programs of the Exploration Center are aligned with MBNMS core programs, which fit under the ONMS mandates and priorities for ocean literacy. The role of the education team is interpreting these exhibit and program themes into language non-scientists can understand, and creating environments ripe for learning.

- ***Research and Monitoring***

  Scientists learn about the ocean in a marine sanctuary by studying it, which is called research. Research and data collection provides scientists with information so they can learn how abiotic factors, like geologic features, water temperature, and ocean currents affect the living things in sanctuary waters, and the people that harvest and use their resources. Long term monitoring is used to observe changes in ocean conditions, habitats and species over time.

- ***Technology***

  Scientists gain knowledge and understanding of sanctuary resources through the application of data collection tools. New technologies, sensors and tools are expanding NOAA's ability to explore the ocean. Ocean scientists are relying more and more on technologies including side scan and multi-beam sonar, satellites, drifters, buoys, subsea observatories and remotely operated vehicles (ROVs). The exploration of the deep Monterey submarine canyon stimulated the Monterey Bay area to become a world leader in marine science research, and its protection as a national marine sanctuary. New technologies lead the way towards better understanding and management of all marine resources. The Sanctuary Exploration Center highlights emerging technologies and their application to ocean exploration.

- ***Resource Protection***

  The Monterey Bay National Marine Sanctuary has a mandate to protect sanctuary resources, including the living and non-living components of the ocean and coastal environment. There are a variety of resource protection issues within the Sanctuary region due to the sensitivity of habitats and species in the region, the long stretch of adjacent populated coastline, and the multiple uses of the marine environment. The Sanctuary addresses these issues through a variety of means to reduce or prevent detrimental human impacts. These include working with stakeholders to identify and reduce detrimental human activities, issuing conditional permits to minimize impacts, and where necessary, enforcement of sanctuary regulations. Monitoring sensitive habitats to identify negative impacts, and educating people about human activities that negatively impact the ocean, is also considered resource protection.

- ***Policy and Management***

  Resource managers use a combination of research, technology, regulations, stakeholder input, and education to develop courses of action that will ensure achievement to protect the sanctuary's marine resources while encouraging human use, enjoyment, and appreciation for the ocean. These policies are developed and codified in the Monterey Bay National Marine Sanctuary's management plan.

Sanctuary Exploration Center's Interpretive Messages

Sanctuary Exploration Center's interpretive messages are built upon the MBNMS education themes, above, but have been condensed into simple concept statements that apply to the entire visitor experience, not to any particular exhibit, place, or area. Interpretive programs and docents rely on underlying themes on which to build messaging for specific audiences or exhibits. These thematic statements are aligned with national science and ocean literacy standards, and can be used with most audiences and ages.

- The ocean is composed of non-living things, like water and minerals, and living things like plants, animals and algae. Together, they form diverse ecosystems.
- Human activities affect the ocean and its ecosystems. Some human activities can harm ocean ecosystems. This is why the ocean needs protection.
- A sanctuary is a place of refuge, or a protected place. Marine sanctuaries are places where the ocean is protected. These places are America's underwater treasures.
- Scientists learn about the ocean by studying it, which is called research. They use technology to learn about what goes on beneath the ocean's surface.
- Understanding the ocean is essential for protecting it wisely. Many organizations and research centers monitor ocean ecosystems. Marine sanctuaries use this knowledge to make informed decisions to protect the ocean.
- With protection, some harmful activities can be limited or stopped, and the ocean may recover. Everyone can participate in protecting the ocean.

Working with interpretive messages

The following mock dialogues offer examples illustrating how docents may use the interpretive messages listed above to engage with visitors. These may also be used during docent training to encourage docents to have confidence when interacting with visitors. They also reveal opportunities for docents to invite visitors to explore other exhibits, try new technologies or consider new ways to explore the sanctuary.

Working with Interpretive Messages ***Mock Dialogue 1***

Docent: Hi, How are you doing today?

Visitor (A mother and young child): Hi, we're just here to look at your pictures. My daughter loves to look at the dolphins.

Docent: I don't know if you are aware that **the ocean is composed of non-living things, like water and minerals, and living things like plants, animals and algae. Together, they form diverse ecosystems.**

Visitor: No, we weren't really aware of that. We just like looking at your photos and videos.

Docent: **Scientists learn about the ocean by studying it, which is called research. They use technology to learn about what goes on beneath the ocean's surface.** That's why they take so many photographs, and we get to enjoy them. There are some other images of dolphins in this exhibit over here *(docent leads visitors to another exhibit)*.

Visitor: Why do scientists want to learn about the ocean? Why don't they just enjoy it, like me and my daughter do?

Docent: **Understanding the ocean is essential for protecting it wisely. Many organizations and research centers monitor ocean ecosystems. Marine sanctuaries use this knowledge to make informed decisions to protect the ocean.**

Visitor: Really? You mean the ocean needs protecting? Like I protect my daughter? What possible threats could affect the ocean?

Docent: **Human activities affect the ocean and its ecosystems. Some human activities can harm ocean ecosystems. This is why the ocean needs protection.**

Visitor: Is there a way to protect the ocean from harmful human activities?

Docent: **A sanctuary is a place of refuge, or a protected place. Marine sanctuaries are places where the ocean is protected. These places are America's underwater treasures.**

Visitor: I want the ocean to be just like this when my daughter is my age. What is being done to protect it from being destroyed?

Docent: **With protection, some harmful activities can be limited or stopped, and the ocean may recover. Everyone can participate in protecting the ocean.**

Visitor: That's reassuring. What can we do?

Working with Interpretive Messages ***Mock Dialogue 2***

Docent: Hi there, how's it going today? Is there anything you have questions about?

Visitor: What the heck am I supposed to learn from all this modern technology? All these video things. When I was your age a joystick meant something else entirely.

Docent: **Scientists learn about the ocean by studying it, which is called research. They use technology to learn about what goes on beneath the ocean's surface.** Let me show you the geology exhibit, where you can touch and handle the rocks *(docent leads visitor to a low tech exhibit he may find more comfortable)*.

Visitor: Well, why do scientists need to learn so much? I thought they knew everything already.

Docent: **Understanding the ocean is essential for protecting it wisely. Many organizations and research centers monitor ocean ecosystems. Marine sanctuaries use this knowledge to make informed decisions to protect the ocean.**

Visitor: Why does the *ocean* need protection? I thought it was too large and vast for that.

Docent: **Human activities affect the ocean and its ecosystems. Some human activities can harm ocean ecosystems. This is why the ocean needs protection.**

Visitor: My dear so-and-so, how do you think scientists are going to protect the ocean?

Docent: **A sanctuary is a place of refuge, or a protected place. Marine sanctuaries are places where the ocean is protected. These places are America's underwater treasures.**

Visitor: If the ocean is in so much trouble, what can be done?

Docent: **With protection, some harmful activities can be limited or stopped, and the ocean may recover. Everyone can participate in protecting the ocean.**

Visitor: Well, why do we want to protect ocean anyway?

Docent: **The ocean is composed of non-living things, like water and minerals, and living things like plants, animals and algae. Together, they form diverse ecosystems** like this kelp forest exhibit. Let me show you how this video kiosk works so you can try it for yourself *(teaches visitor how to use technology and learn from exhibit)*.

Visitor: Well, I have to say I'm impressed. You don't know everything but you do know something. I'm going to leave now but I'll be back.

Working with Interpretive Messages **Mock Dialogue 3**

Docent: Hi, how are you doing today? Do you have any questions?

Visitor: I'm fine. I have no questions because I know everything already.

Docent: That is so great, so cool. **And that is really important because human activities affect the ocean and its ecosystems. Some human activities can harm ocean ecosystems.** Any ideas you have about helping humanity change its ways to start helping the oceans would be great.

Visitor: You are delusional. The ocean and everything else is about to tank.

Docent: I believe that **with protection, some harmful activities can be limited or stopped, and the ocean may recover.**

Visitor: Good for you, but I'm telling you that you don't know what you are talking about.

Docent: **Understanding the ocean is essential for protecting it wisely. Many organizations and research centers monitor ocean ecosystems. Marine sanctuaries use this knowledge to make informed decisions to protect the ocean.**

Visitor: Too little, too late, if you ask me.

Docent: **A sanctuary is a place of refuge, or a protected place. Marine sanctuaries are places where the ocean is protected. These places are America's underwater treasures. With protection, harmful activities can be limited or stopped, and the ocean may recover.** I know you already know this, but **the ocean is composed of non-living things, like water and minerals, and living things like plants, animals and algae. Together, they form diverse ecosystems.** These are dynamic systems and they are changing every day. Let me show you this exhibit that talks about how some things are getting better a little bit each year *(docent invites visitor to an exhibit he hadn't seen and shows him how to read the data)*.

Visitor: So you think it's not too late?

Docent: I'm sure it's not. That's why I'm doing my part to help by supporting the Sanctuary Exploration Center with my time.

Visitor: What's it like to be a docent?

Docent: Really fun, interesting and educational. I've learned so much. We get to spend time with scientists and biologists who are doing this kind of work. **Scientists learn about the ocean by studying it, which is called research. They use technology to learn about what goes on beneath the ocean's surface.** As docents, we get to take classes and sit in on presentations from the experts. It's pretty exciting to learn about what they are doing.

4.3 Interpretive Objectives

A hierarchical list of outcome-based objectives helps define the goals for Visitor Interpretive Programs and may be used to determine effectiveness of interpretive tools. Docent interactions with visitors include questions to help them assess the visitor's level of involvement and relevance of experience. The objectives listed here are examples of the types of questions that may be developed to help docents assess visitor involvement and learning.

As an outcome of visiting the Sanctuary Exploration Center, visitors will:

1. Show an interest in the Exploration Center's facility, exhibits and topics
2. Voice an emotional connection with natural and/or cultural resources in the ocean
3. Remember and repeat a key message from a visit to the Sanctuary Exploration Center
4. Exhibit awareness that human activities can affect living and nonliving things in the ocean
5. Acknowledge that some human activities can harm ocean ecosystems
6. Describe that a National Marine Sanctuary (specifically, MBNMS) is an agency that protects special places in the ocean from harmful human activities
7. Explain activities that may help protect the ocean or help it recover
8. Convey a desire to learn more about the coast and ocean
9. Indicate confidence in their ability to visit and explore coast and watershed access areas
10. Understand that there are complex management decisions made to protect sanctuary resources, including organisms, species, ecosystems and historic artifacts
11. Express appreciation for the work of people and organizations that protect the ocean
12. Describe behaviors or actions they have personally taken to support ocean protection

Examples

1. Show an interest in the Exploration Center's facility, exhibits and topics:

- My wife is shopping for presents for the grandkids.
- I'm interested but I don't have time today.

2. Voice an emotional connection with natural and/or cultural resources in the ocean:

- My daughter just loves dolphins.
- My son is fascinated with naval history.

3. **Remember and repeat a key message:**
   - We need the ocean and the ocean needs us.
   - I never knew sea turtles travelled thousands of miles to feed on jellyfish.

4. **Exhibit awareness that human activities can affect living and nonliving things:**
   - I didn't know that pesticides so far inland could wash into the ocean.
   - Ocean dumping should stop! Who pollutes the environment like that?

5. **Acknowledge awareness that human activities can harm ocean ecosystems:**
   - That Big Oil Spill – what happened to all those birds? Did they die?
   - Pesticide use upstream can affect sand crabs, which shorebirds feed upon.

6. **Describe that a national marine sanctuary is an agency that protects special places:**
   - My tax dollars contribute to protecting the oceans – I guess I'm OK with that.
   - Marine Protected Areas limit fishing, which is good for the fish.

7. **Explain activities that may protect the ocean or help it recover:**
   - Beach cleanups prevent plastics from getting into the ocean.
   - Slowing down run-off can reduce ocean pollution.

8. **Convey a desire to learn more about the coast and ocean:**
   - Are there more sharks now than there used to be?
   - Is the ocean temperature really increasing?

9. **Indicate confidence in their ability to explore coast and watershed accesses:**
   - I've always wanted to go kayaking in the ocean – now I think I'm going to try it!
   - How do I get to Natural Bridges State Beach? I've always wanted to go there.

10. **Understand that there are complex management decisions:**
    - Wow, that is complicated. It feels like a no-win situation.
    - Monitoring documents ecosystem changes, which determines ecosystem protection.

11. **Express appreciation for people and organizations that protect the ocean.**
    - I'm so glad someone is thinking about these things.
    - Thank You, Ocean!

12. **Describe behaviors or actions they have taken to support ocean protection.**
    - I participate in beach cleanups every year.
    - I find ways to support organizations I think are doing a good job in protecting the earth.

4.3 Sanctuary Exploration Center Exhibit Interpretive Messages

The Sanctuary Exploration Center has 17 different exhibits, each with its own set of identified interpretive goals, objectives and messages. They carry the major interpretive messages of the Visitor Interpretive Program, and have been complied in Appendix A.

5.0 School And Teacher Programs

National marine sanctuary education programs are driven by the mandate to increase ocean literacy opportunities for all education audiences, and to contribute to the education and development of a workforce skilled in science, technology, engineering and mathematics. In Chapter 2, partner organization recommendations emphasized four key elements: national marine sanctuary education, citizen science education programs, bilingual education programs, and reaching out to unfilled education niches. Sanctuary Exploration Center education programs will address these elements as top priorities.

5.1 Exploration Center Education Programs, Year 1

The Sanctuary Exploration Center's first-year priority is development of a school-based education program specific to the Center's state-of-the-art exhibits, technology, graphics and interpretive messages. Titled *This is Your Sanctuary*, the 90-minute program highlights Exploration Center exhibits and activities to enhance understanding of national marine sanctuaries and the Monterey Bay National Marine Sanctuary. *This is Your Sanctuary* is a signature program highlighting the unique qualities of the Sanctuary Exploration Center.

This Is Your Sanctuary will be based upon national science and ocean literacy principles (Chapter 1), input from partner organizations (Chapter 2), MBNMS education program priorities (Chapter 3), and the Sanctuary Exploration Center's exhibit interpretive messages (Chapter 4). Program development is currently under way. Field-testing will begin in 2013. The program will be ready for implementation in the Fall of 2013 (Year 2). The first implementation audience is English-language public school students, grades 3-5. Once developed, the program will be modified to meet additional education audiences, including student grade levels, language acquisition learners and specialized subject areas, as well as offer teacher training programs.

Based upon current funding, *This is Your Sanctuary* is the only education program developed in Year 1, October 2012 – October 2013. Expansion and modification of the program to meet additional educational audiences will be scheduled for Years, 2, 3 and 4, October 2013 to 2015 (See Table 5.2). Program evaluation is designated for Year 5.

Other MBNMS Education Programs

MBNMS has successfully developed three school education programs that have fully developed curricula, teacher training programs and evaluation components. These are MERITO, LiMPETS and *Voices of the Bay,* a three-module classroom curriculum for teachers. Presently, *Voices of the Bay's* third curriculum module*, Balance in the Bay,* is partially funded for the Santa Cruz area and adapted for informal education audiences, grades 9-12. *Balance in the Bay* involves students in a simulated fishery experiment where they learn about resource management techniques and strategies. It is listed as a Year 1 program (Table 5.1). To learn more about *Voices of the Bay*, see Section 1.3 for a review of MBNMS education programs.

Table 5.1. Exploration Center education programs, Year 1 (October 2012 – October 2013). The core program, *This is Your Sanctuary*, will be developed in Year 1. *Voices of the Bay: Balance In The Bay* is funded during Year 1 through a grant independent of the Sanctuary Exploration Center.

	Year 1: October 2012 – October 2013
Core Education Program	***This Is Your Sanctuary***
Audience	English-speaking public school students, Grade 3-5
Program Development Tasks	Program development includes the following: • Core curriculum concepts, aligned with national ocean literacy standards, specific to Exploration Center exhibits • Pre-visit classroom activities • Field trip to Exploration Center • Exploration Center activities • Post-field trip follow-up activities • Evaluation • Outreach and scheduling
Staffing (Educators or Docents)	Science educators will develop and teach the program
Funding	Year 1 staffing funds program development and implementation
Development or Implementation Phase	Development Phase: Program implementation will begin in Year 2

	Year 1: October 2012 – October 2013
MBNMS Education Program	***Voices of the Bay* Module 3*: Balance In The Bay***
Audience	English-speaking public school students, Grades 9-12; community college students
Program Development Tasks	Program development is complete and adapted to Sanctuary Exploration Center
Staffing (Educators or Docents)	Science educators teach the program
Funding	Funded through supplemental grants
Development or Implementation Goals	Program is developed, field tested and complete; implementation in Years 2, 3 and 4 relies on renewed or additional funding

Table 5.2. In Years 2, 3 and 4 (October 2013 – 2015), *This Is Your Sanctuary* will be modified and expanded to meet additional school audiences, language acquisition requirements and specific subject areas. In Year 5, a full program evaluation will be completed to determine necessary steps for the next 5-year plan.

	Year 2, 3 and 4: October 2013 – October 2015	
Core Education Program	***This Is Your Sanctuary***	
Program Development Tasks	Revise program to meet needs of different education audiences, language access learners and targeted subject areas (see below).	
Staffing (Educators or Docents)	Science educators will teach and expand the program	
Funding	Year 1 funding (static) will determine how much the program expands to new audiences	
Development or Implementation Phase	Program implementation begins in Year 2. Program modification and expansion occurs in Years 3 and 4. Program evaluation will begin in Year 4 to be completed in Year 5.	
Education Audiences	**Language Access Learners**	**Targeted Subject Areas**
Grade Levels • Pre-K • Grade K-2 • Grades 3-5 • Grades 6-8 • Grades 9-12 • Alternative/Home Schools (K-12) • Community College • College/University • Teachers (K-12)	• English-Only Speakers • Spanish Only Speakers • Bilingual English Spanish • English as Second Language (ESL) Students • Native speakers of other languages	• English/ • Language Arts/ World Languages • Science • Technical Education • Mathematics

	Year 5: October 2015 – October 2016
MBNMS Education Program	***This Is Your Sanctuary***
Program Development Tasks	Full evaluation of program based upon previous 4 years of implementation
Staffing (Educators or Docents)	Science educators will work with ONMS to develop program evaluation components throughout Years 2,3 and 4
Funding	Funding priority will depend on program evaluation and success in Years 2-4.

5.2 New Education Programs

Education staff developed a number of new program ideas for the Sanctuary Exploration Center. These programs are currently not funded, nor have funding sources been identified. They are listed here and summarized in Table 5.3.

New Program 1: Citizen Science Monitoring Internship

Goal*:* To reach high school and undergraduate level students to:

a. Understand and teach scientific methodology
b. Gain understanding of local resources
c. Provide educational support for citizen science program throughout year

Audience: High school and college undergraduates
Funding: Not presently funded
Cost: One-week intensive program. Funding will be used for staff time to coordinate. In the future grant funding could be used for stipends for interns.
Concept: This program would consist of a one-week intensive summer camp for upper grade high school and undergraduate students. During this week long camp 10 students will be engaged with various citizen science programs, including rocky intertidal monitoring, sandy beach sampling, shorebird identification, plankton identification, whale watching and marine mammal identification, beach clean ups, fish identification, etc.

At the conclusion of the weeklong summer camp students will be invited to interview for yearlong internships that focus on a specific citizen science monitoring program. These interns would help the program coordinator organize, oversee, and conduct the chosen modules throughout the school year (September- May). The interns would also be responsible for maintaining, inputting and analyzing the data throughout the year. At the end of the project the students would share the research project at a year-end symposium.

First Year programs for monitoring include:

(1) Rocky Intertidal Monitoring
(2) Beach Intertidal Monitoring
(3) Marine Debris Monitoring (SOS Beach Cleanups)
(4) Plankton Monitoring

Additional programs could include:

- Beach Health (Beach COMBERS)
- Bay Net Marine Mammal Observations
- Shore Birds Monitoring
- Water Quality

New Program 2: Monitoring With a Purpose (also referred to as Citizen Science Monitoring)

Goal*:* To engage middle, high school, and college classes in environmental monitoring.

a) To teach the scientific method through hands on learning.
b) To promote environmental stewardship.
c) To collect meaningful, long-term data on the marine environment.

Audience: Grade 6-12, community college and college undergraduates
Funding: Not presently funded
Cost: Funding will be used for staff time to coordinate, for all materials, and for field trip scholarships
Concept: MBNMS staff oversees, teaches and coordinates four citizen science programs. The programs will each have two interns that will help instruct, coordinate, collect data, input data and report on the four programs.

The *Citizen Science Monitoring* program should not only have the goal of engaging the public and students in the concepts of scientific methodology, but should also collect meaningful data. With each program there should be a temporal and spatial goal, which produce information or data that are meaningful for management and policy decisions. The initial spatial scale is the Santa Cruz Harbor jetty to Natural Bridges. The interns will coordinate citizen groups, interns, other volunteers and school groups to collect data within our spatial scale on a quarterly basis.

Background: MBNMS is already engaged in several citizen science monitoring programs either independently or through collaborations with partner organizations. This program will augment certain monitoring programs to create several "citizen science monitoring" modules to be completed by students while on field trips. Each module will consist of: a class will visit the Center, classroom training, and a field survey. Monitoring programs will initially be selected based on funding, ability to be adapted for students, and proximity of sampling locations to the Center. For monitoring programs that are currently run by MBNMS (Bay NET, CMMN), SEC staff will run the classroom and field sampling components of the field trip program. For monitoring programs that are run by partners (SOS Beach Cleanups, LiMPETS), either the partnering organizations staff or SEC staff will run the classroom and field components, depending on funding.

With funding, first year programs include:

- Rocky Intertidal Monitoring
- Beach Intertidal Monitoring
- Marine Debris Monitoring (SOS Beach Cleanups)
- Water Quality Monitoring

Additional programs could include:

- Marine Protected Area Human Use
- Shorebird Monitoring
- Plankton HAB Monitoring

New Program 3: Technology Awaits -- A History of the Monterey Bay National Marine Sanctuary

Goal: To explore the general history of Santa Cruz, the maritime history of Monterey Bay, the fishing history of the region, cultural resources that exist today within MBNMS, and the history MBNMS designation.
Audience: Grade 6-8
Funding: Not presently funded
Concept: *Technology Awaits* allows middle school student to explore their MBNMS through technology creating an enhanced historical and cultural perspective in the student. Students will come to the SEC to participate in a four-hour program. During this four-hour program they will understand how ocean technology allows scientists to explore the MBNMS and further understand the cultural resources that are found within. Other activities will focus the historical aspect of indigenous people within the Bay, the creation of MBNMS and the importance of fisheries to the area.

New Program 4: Land Sea Interface
Goal: To explore the interaction of the land and the ocean with a focus on anthropogenic disturbances to the marine environment.
Potential Partners: Exploring New Horizons, City of Santa Cruz, Roaring Camp Railroads
Audience: Grade 4-5
Funding: Not presently funded
Concept: Students will explore how the land interfaces with the sea, and how our actions impact MBNMS. The program starts at the Exploration Center, rotating through exhibits, classroom, outdoors and the surrounding environment. Students will learn about the great forest of redwoods and how they are relevant to the giant kelp forests, partake in water sampling of nearby watersheds, conduct local street and watershed clean ups, and discuss other anthropogenic influences to the marine ecosystem.

New Program 5: *Earth's Changing Climate: Ocean Acidification*
Goal: To teach middle and early high school students the concepts of climate change and ocean acidification, by focusing on water and ocean chemistry.
Potential Partners: Vessel-based education partners
Audience: Grades 6-12
Funding: Not presently funded
Concept: This is a four-activity field program that on ocean acidification and climate change. Science topics and activities include water pH, acid-base dynamics, impacts of acids on calcium-carbonate-based organisms (shellfish), ocean currents, impacts of temperature on pH and oxygen bearing capacity, and long-term impacts to marine ecosystems. The classroom component of the program could be stand-alone or offered concurrently with a vessel-based excursion where students collect real ocean data and compare it to databases they have learned about in the lab.

Table 5.3. Ideas For Education Programs Starting Year 2, Funding Dependent

Program Title	Audience	Description	SEC Exhibit Emphasis	SEC Classroom (45 Minutes)	Field Activity
Voices of the Bay Balance in the Bay Ecosystems/ Fisheries	Grades 9-12, community college, college undergrads	Fully developed MBNMS curriculum program; no permanent funding	Fisheries, shifting ecosystem baselines, Marine Protected Areas	Balance in the Bay/Voices of the Bay	Wharf visit or *Fisherman In Classroom*
New Program 1: Citizen Science Monitoring Internship	Grades 9-12 community college, college undergrads	Week-long Intensive; then students apply for year-long internships to teach monitoring activities to others	Each day new concepts/themes and exhibits will be highlighted	Classroom work will complement field activities (rocky intertidal, marine debris, plankton, etc)	Varies each day: intertidal, MPAs, sandy beach, ocean monitoring, marine debris, etc
New Program 2: Monitoring with a Purpose	Grades 6-12	See Section 1.3: CWMN, LiMPETS, marine debris program, MERITO	Varies with topic – eventually all exhibits are included	LiMPETS Training. MERITO Watershed Program, CWMN,	Varies with topic: intertidal, sandy beach, watershed monitoring
New Program 3: *Technology Awaits*: A History of the Monterey Bay National Marine Sanctuary	Grades 6-8	Students explore MBNMS through technology for an enhanced historical and cultural perspective	Undersea Exploration Technology	Working with underwater technology: side scan and multi-beam sonar, ROVs, Auks	Exhibit activities replace field activities
New Program 4: Land-Sea Interface	Grades 4-5	Students learn from comparisons between redwoods and kelp forests	*Sempervirens;* railroad outside SEC, redwoods outdoors SEC	The land and sea influence each other, compare kelp with redwood forest	Outside SEC observations
New Program 5: Earth's Changing Climate	Grades 6-12	Introduces basic chemistry principles via the theme of ocean acidification	Climate Change, oceanography and water chemistry	Water chemistry experiments, oceanographic patterns & trends	Water collection & analysis from SC pier or vessel

5.3 Ocean Literacy Education Resources

A variety of ocean literacy and education resources exist that can be used in development of new curricula specific to the Sanctuary Exploration Center. An example is supplied in Figures 5.1a and 5.1b. Other science education resources are listed in Table 5.4.

Figure 5.1a. Conceptual flow diagram of ocean literacy essential principles and fundamentals separated by grade levels, consistent with national education standards. Source: http://oceanliteracy.wp2.coexploration.org.

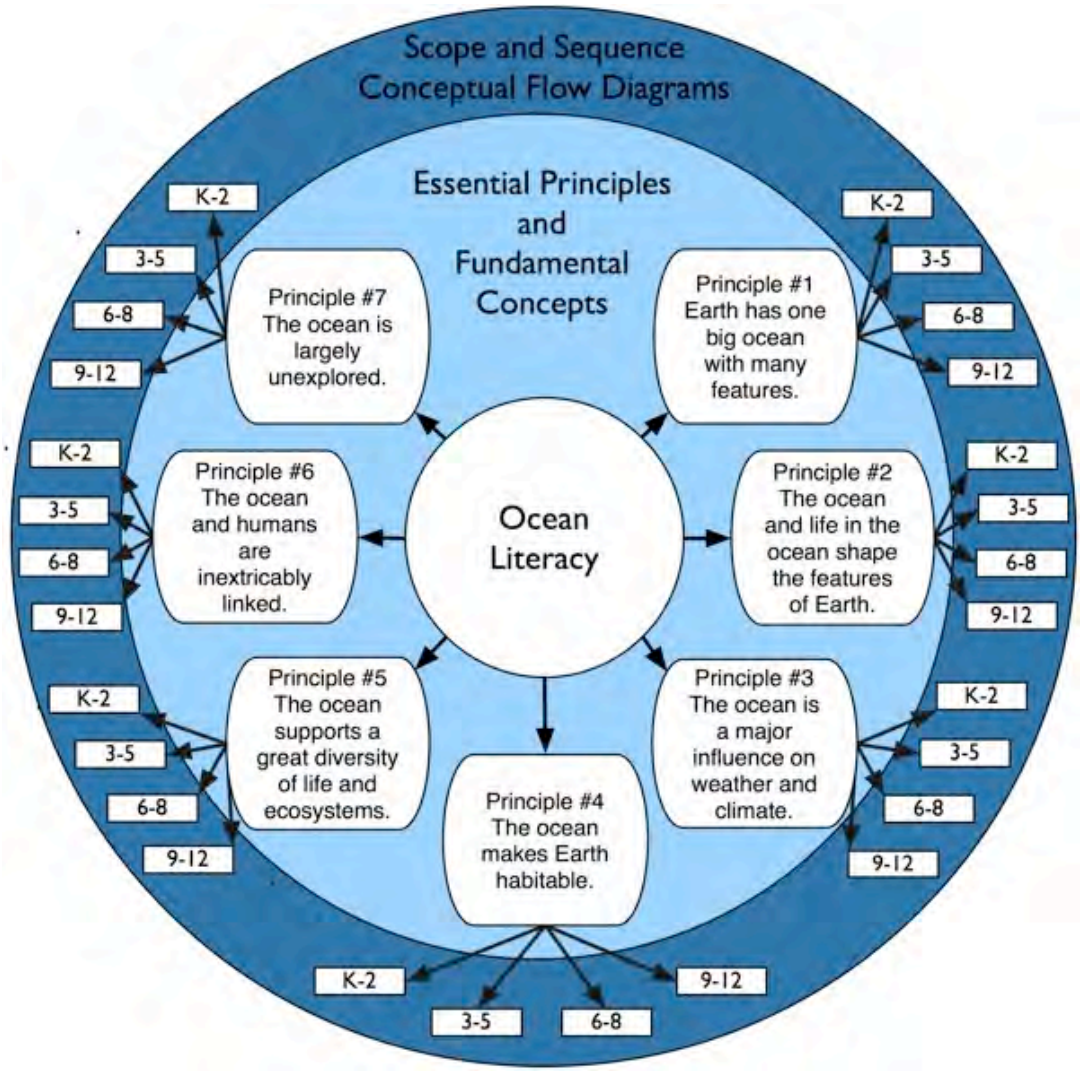
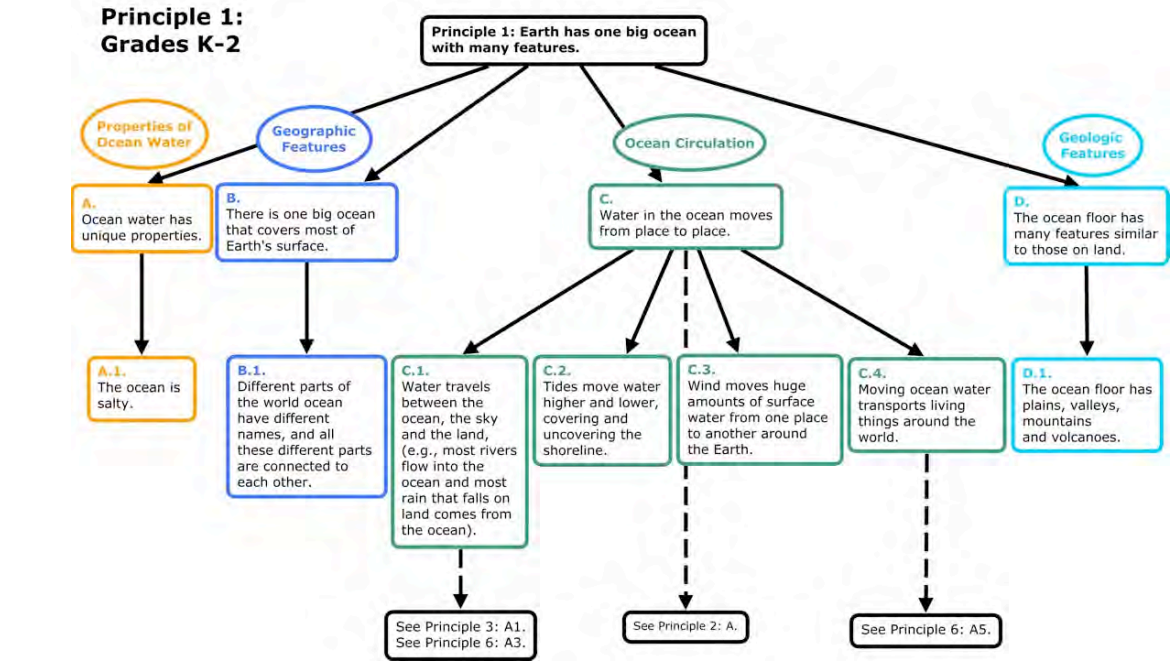


Figure 5.1b. Conceptual flow diagrams of ocean literacy essential Principle 1 for Grades K-2, and Principle 3 for grades K-2. Source: http://oceanliteracy.wp2.coexploration.org



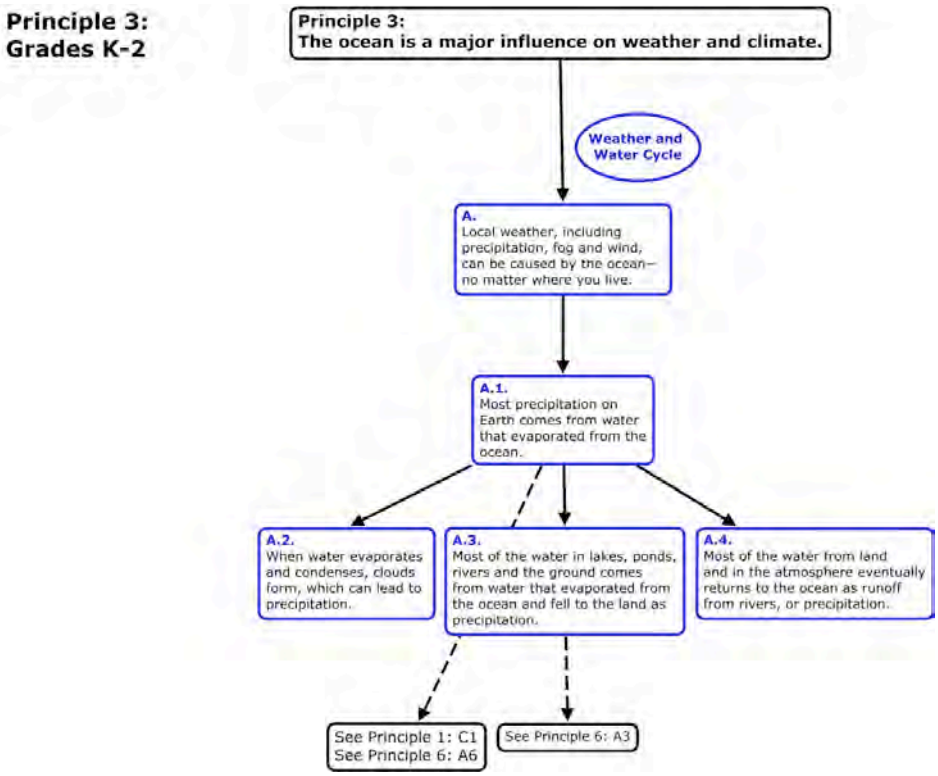


Table 5.4 Education Resources that may be useful in development of educational materials for the Sanctuary Exploration Center.

Education Mandate	Resources	Website
National Science Standards	National Academy of Sciences (NAS) National Science Teachers Association (NSTA)	www.nasonline.org www.nsta.org
Ocean Literacy Education	NOAA Office of Education Office of National Marine Sanctuaries Education Centers for Oceans Education Excellence National Marine Educators Association (NMEA)	www.oesd.noaa.gov http://sanctuaries.noaa.gov www.cosee.net http://www.marine-ed.org
Climate Literacy Education	NOAA Climate Literacy, Climate Program Office Climate Literacy and Energy Awareness Network (CLEAN)	www.climate.noaa.gov http://cleanet.org
California Science Standards, K-12	California Office of Education California Science Teachers Association	www.cde.ca.gov www.cascience.org
Pre-K Education	First Five	www.ccfc.ca.gov
Environmental Education	National Environmental Education Foundation EEI – Environmental Education Initiative (California) California Regional Environmental Education Community (CREEC)	http://www.neefusa.org www.calepa.ca.gov/education/eei www.creec.org
Bilingual Education K-12	National Association for Bilingual Education California Association for Bilingual Education	http://www.nabe.org www.bilingualeducation.org
Technology Education	National Education Technology Plan International Society for Technology in Education	http://www.ed.gov/technology http://www.iste.org
Science, Technology and Engineering and Mathematics	STEM Education	www.stemeducation.com

6.0 Community Programs

Community programs are described as community-based activities and organizations including non-school based events, after-school programs, clubs, youth organizations, community service organizations and activities. As part of fulfilling its mandate for providing opportunities to enhance science literacy throughout its constituent base, the Sanctuary Exploration Center has an opportunity to expand its audience outreach by serving as a hub for Santa Cruz community activities, including MBNMS citizen monitoring events, as well as networking, education and fundraising activities.

Partner interviews suggested a number of suggestions for Exploration Center Community Programs (Chapter 2). These include:

- Participate in Santa Cruz County's Conference and Visitors Council (CVC) Tourism Marketing District efforts and promotions
- Develop collaborative community programs with partner organizations, such as "science after school" programs, nature trolley route, or film festivals.
- Revise citizen science programs from their existing school-based format and invite members of the community to participate in data collection.
- Offer on-site training programs for docents of other organizations and the public
- Offer programs for Spanish-speaking individuals and families
- Offer the Sanctuary Exploration Center facility as a venue for use by others

6.1 Proposed Community Programs

Community programs proposed by MBNMS staff include these recommendations from partners Program components and estimated staff time are summarized in Table 6.1.

Community Program 1 ***First Friday Open House***
Goal: Support CVC activities and provide opportunities for people to visit the SEC during non-regular hours
Audience: Local community, art-lovers
Funding: Internal
Cost: Staff time only, approximately 8 hours.
Donation: Food and wine
Concept: The Exploration Center would advertize and host events with artists that reflect the mission and goals of MBNMS through their art. The Center would be open after hours (6-9 pm) on these events and would provide donated appetizers and wine to patrons. Featured artist's work would be displayed and selected artist's pieces could be sold in the gift store.

Table 6.1. Sanctuary Exploration Center Proposed Community Programs

Community Program Title	Description	Community Audiences	Community Partners	SEC Staff Time	SEC Docent Time
1) First Friday Open House	Highlights artists who reflect the mission and goals of MBNMS through their art, participates in a CVC event	Evening visitors, people who like art	Sc Conference & Visitors Council, local museums & art galleries	8 hours per monthly event: contacting & scheduling artists, promotion, hosting and cleanup	2 docents X 4 hours: preparation, greeting, hosting, cleanup
2) Saturday Art For Kids	A local artist leads an art activity to create marine and conservation themed art projects	Children under age 13; English & Spanish speakers	Local artists; promote programs through SC Parks & Recreation, perhaps offer a "travelling" program with other education providers	8 hours per month: contacting & scheduling artists, promotion, hosting and cleanup	2 docents X 4 hours: preparation, greeting, hosting, cleanup
3) *LiteraSEA*	Marine-themed book is read aloud to children in English & Spanish	Children under age 13; English & Spanish speakers	SC Parks & Recreation; authors who write marine themed children's books	4 hours per month: promotion, hosting and cleanup	1 docent X 4 hours: set up reading, answering questions
4) Citizen Science Monitoring For Adult Volunteers	Volunteers learn how to collect data for MBNMS citizen monitoring programs	Sanctuary supporters, volunteers	SC non-profits & local businesses may assist with training or purchase of materials	8 hours prep per training, depends on # of trainings	2 docents X 4 hours to assist with training; est $100 for printing
5) Citizen Science Monitoring For Families	Volunteers learn how to collect data for MBNMS citizen monitoring programs	Sanctuary supporters, volunteers	SC non-profits & local businesses may assist with training or purchase of materials	8 hours prep per training, depends on # of trainings	2 docents X 4 hours to assist with training; est $100 for printing
6) Community Change	Community members attend seminars & workshops on ways to improve ocean health. Speakers may be from local non-profits or education institutions	Adults	SC non-profits, Businesses & education institutions	8 hours per event: contacting & scheduling artists, promotion, hosting and cleanup	2 docents X 4 hours to staff event
7) Teacher Open House	Teachers learn about programs the SEC offers and listen to a science literacy related talk	Teachers: all grade levels,	School Districts, teacher's groups	8 hours per event,	2 docents X 4 hours to staff event

Community Program 2 ***First Saturday Art Events for Kids***
Goal: To instill a sense of scientific exploration through art for children
Audience: Children under age 13
Funding: Fee Program
Cost: One staff person's time for coordination and hosting of events
Concept: *Saturday Art for Kids* offers 2-3 hour art classes for children to 20-30 students in the SEC classroom. These events will be conducted by local artist or art teacher and will teach students how to create art pieces focused on the conservation of the marine environment.

Community Program 3 ***LiteraSEA***
Goal: To develop literacy while inspiring a personal connection to the ocean and sense of stewardship for it.
Audience: Kindergarten and Pre-K groups
Funding: Fee Program
Cost: Minimal, staff time to coordinate and train volunteers
Concept: Each program is based on a popular children's novel that is relevant to MBNMS (i.e. Coralito's Bay). The students will arrive at the Center have the book read to them in a group setting and then partake in three activities that relate to both the book and MBNMS.

Community Program 4 ***Citizen Science Monitoring For Adult Volunteers***
Goal: To engage the members of the community in meaningful data collection and scientific monitoring through citizen science programs.
Audience: Adult Volunteers (teens may participate with parent supervision)
Funding: Funding Required
Cost: Citizen Science Coordinator, approximately 20 hours a month.
Concept: Weekend trainings are offered for community members to learn data collection skills and the scientific bases for existing MBNMS and partner organization citizen science programs.

With funding, first year programs include:
- Rocky Intertidal Monitoring
- Beach Intertidal Monitoring
- Marine Debris Monitoring (SOS Beach Cleanups)
- Water Quality Monitoring

Additional programs could include:
- Marine Protected Area Human Use
- Shorebird Monitoring
- Plankton HAB Monitoring

Through out the school year Exploration Center staff provide trainings for four MBNMS citizen science programs, schedules monitoring events, collects and inputs data, and provides reports to contribute to the MBNMS coordinator of these sanctuary-wide programs.

Community Program 5 ***Citizen Science Monitoring For Families***

Goal: To engage the members of the community in data collection while promoting environmental stewardship.
Audience: Families, and the Community.
Funding: Funding Required or Fee Program
Cost: Citizen Science Coordinator, approximately 10 hours a month.
Concept: One weekend day a month will be "Science Saturday". Each month will feature a different "Science With a Purpose" program that is adapted for families to complete in one half-day. These one-day events will serve as an introduction to the "Science with a Purpose" program and as a community event. Training for these programs will be shortened, and focus will be more on community building and education through exploration than actual data collection.

- LiMPETS Rocky Intertidal Monitoring
- LiMPETS Sand Crab Monitoring
- Marine Debris and Beach Cleanups
- Watershed Monitoring (ongoing)
- Open Ocean
- Shorebird

Community Program 6 ***Community Change***

Goal: To collaborate with local organizations and educate people on ways they can help the ocean environment through workshops held at the Center.
Potential Partners: Non-profit organizations dedicated to community change
Audience: Adults and older children with parental supervision
Funding: Fee-based, or, costs are covered by the organization that hosts the presentation hosted at the Exploration Center
Cost: SEC staff time to coordinate and/or offer the course
Concept: The Sanctuary Exploration Center would collaborate with local community groups to offer courses on ways to enhance and improve MBNMS. Courses could include day events at the Center that include: compost, garden with native plants, create urban gardens, LEED facility tours, discussions on desalinization, coastal clean ups, the use of solar or alternative energy in the home or other topics helping create a more sustainable community.

Community Program 7 ***Teacher Open House***

Goal: To introduce teachers to the education programs offered at the Exploration Center and to provide enrichments on resources the sanctuary has for teachers.
Potential Partners: Santa Cruz County Office of Education
Audience: Teachers
Funding: MBNMS, grants, or donor support
Cost: Ed Specialist, approximately 10 hours a month.
Concept: Each year the Sanctuary Exploration Center offers a series of open houses for teachers to inform them of education programs the SEC offers, and providing them with a mini-enrichment workshop based on selected ocean literacy and science based topics.

7.0 Docent Training Program

Volunteers play a critical role in the sanctuary system by contributing time, skills and dedication to programs, events as well as leadership and knowledge. The Sanctuary Exploration Center volunteers are a subset of more than 3,000 volunteers serving all national marine sanctuaries. Volunteers who undergo extensive training and education are referred to as *docents*. Training programs are developed and supervised by sanctuary staff to ensure the desired outcome of informed, enthusiastic volunteers who are also ocean literacy educators and ambassadors for national marine sanctuaries.

This section provides an overview and guide for developing a docent-training program. Sample forms are included at the end of this chapter (Page 62). New interpretive facilities like the Sanctuary Exploration Center start from scratch in forming a docent corps that is ready to greet visitors and interpret exhibits from opening day forward. The Office of National Marine Sanctuaries (ONMS) has drafted a Volunteer Handbook and Volunteer Policy, defining standards that all sanctuary volunteer programs must follow.

Contact ONMS Volunteer Coordinator

Tracy Hajduk
Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration
N/ORM 6 11th Floor Rm 11417
1305 East-West Hwy, MD 20910
301-713-7279
tracy.hajduk@noaa.gov

The Purpose Of Docents

The primary purpose of docents is to provide meaningful and relevant experiences for visitors through personal interaction. The more time a visitor stays in the Sanctuary Exploration Center, the more likely the visitor will become interested, curious, engaged or responsive to interpretive messages. Motivated docents do more than just answer questions; they serve important roles as bridges for long-term behavioral change. See Chapter 5, Visitor Interpretive Programs, for more information about interpretation.

Defining Docents

A volunteer is a person who offers to do work for free. A *docent* is a volunteer who has undergone training to perform a specialized task – in this case, interpreting the National Marine Sanctuary Program, its facilities and exhibits. Sanctuary Exploration Center volunteers undergo a minimum of 30 hours of training to become knowledgeable about the sanctuary and the Exploration Center, and how to interpret that information to visitors. They begin as volunteers – and graduate as docents.

7.1 Recruiting Docents

Write A Recruitment Flyer
The flyer should provide enough information to spark the interest of a volunteer without being overwhelming with too much detail. It should include minimum physical and time requirements. The recruitment flyer should include the date, time and location of the Informational Meeting as well as training dates and times so applicants can determine if the training schedule will work with their own. Contact information should be clearly listed. The flyer must be consistent with ONMS Best Practices Guide for Communication and Outreach. Recruitment flyers may be sent to media outlets, listservs, partner organizations, posted on community bulletin boards, mentioned at meeting presentations, social events, coffee houses, playgrounds, harbor offices, grocery stores, and any place that might attract desirable applicants.

Assemble Docent Application Packet
Interested potential volunteers contact the Sanctuary Exploration Center and are sent a packet of forms to read, fill out and return by the application deadline.

Docent Application Packet Contents

1. **Welcome Letter and Schedule**
2. **Docent Job Description or Duty Statement**
3. **Application Form**
4. **Standards of Conduct**
5. **Personal Skills Assessment**
6. **NOAA Volunteer Form OF301A**
7. **Fingerprint requirements**

Docent Application Packet
1. A letter of greeting or welcome is the first form of "handshake" the potential docent receives. It outlines the details of the docent training program, and is "signed" by the docent training coordinator and facility director.
2. The job description or duty statement lists the qualifications needed to do the job. This step clarifies the expectations and requirements of the docent position.
3. An application form gathers the necessary contact information and starts the conversation as to why the applicant want to become a volunteer. This begins the selection process.
4. The Standards of Conduct form informs the applicant of expected behavior and responsibilities. It also serves as an assessment tool when evaluating docent performance. 5. The Personal Skills Assessment invited the applicant to self-assess their knowledge and skills, and may reveal talents the docent brings that are not required but may be useful – Spanish speaking ability, for example. The skills assessment also serves as an introduction to the topics and information docents will be learning about, which can generate a sense of anticipation.
6. The NOAA Volunteer Form OF301A is required for all volunteers, and is provided to the ONMS Volunteer Coordinator.
7. Fingerprinting is required for docents interacting with children. LiveScan fingerprint services are offered through several community sources; providing a list to the applicant is helpful.

Host An Informational Meeting
The Informational Meeting helps applicants learn more about the organization and the expectations before they commit to the training. The meeting usually lasts less than two hours, includes an informational slide show or tour, and leaves plenty of time for questions. Have application packets available for applicant to look through and ask questions about, or direct applicants to a web-based application on-line. If the application is web-based, offer a slide presentation or live access so applicants can see what is required.

The training schedule should be provided, with a prepared policy for missed training meetings. Some people will decide not to apply after the informational meeting. Applicants who are genuinely interested and willing to commit will apply.

Informational Meeting Agenda (Sample)

10 Minutes	Introductions: facility director, docent training coordinator, and any other attendant staff
30 Minutes	Slide presentation: About the Sanctuary Exploration Center
15 Minutes	Review training schedule, times and locations. Establish a clear training attendance policy for applicants who may have to miss meetings.
45 Minutes	Review application packet. If application packets are handed out, go through each page. If application is on-line, use a data projector to access the live links, or offer a slide presentation going over each form. Allow plenty of time for questions.
5 Minutes	Remind applicants of application deadline and thank them for their interest.

Collect docent applications, organize database, and set up interview schedule.
Applications may start to arrive the day after the Informational Meeting. Be prepared to receive them and file them appropriately.

Begin developing a contact database with all pertinent applicant information. Establish selection criteria – for example, an application without adequate contact information would be disqualified. The selection process may involve other staff input or require approvals from management.

Determine the dates, times and locations for interviews, usually over a series of several days. To determine how many hours of interviews are needed, estimate 15 - 30 minutes for each interview for all eligible applicants. For example, 20 applicants, at 30 minutes per interview, will require 600 minutes (or 10 hours) of interview time. This can be achieved by scheduling 5 interviews per day (2.5 hours) for 4 days. Once the application deadline has closed, start contacting eligible applicants to fill the interview time slots.

Conduct Interviews
Interviews allow the docent coordinator to have a face-to-face conversation with the applicant. Interview questions allow the docent coordinator to determine if the applicant fully understands the time requirement and job description, accepts the required standards of conduct, has any

concerns the applicant wishes to discuss, and to answer questions. Questions about skipping training meetings are likely to arise and policies should be determined in advance so that the answer is consistent and clear. Set up interviews as quickly as possible after the application deadline; make decisions and notify applicants as quickly as possible to allow them to plan ahead.

The interview is also an opportunity for the docent coordinator to spend time with the applicant, and observe his or her personality, presentation, and mannerisms. Docents become ambassadors for National Marine Sanctuaries and are expected to interact well with others. The Monterey Bay Aquarium (www.montereybayaquarium.org) describes the qualities of an ideal docent. The ideal potential docent is someone who:

- Enjoys people, smiles and is welcoming
- Is interested in the visitor; and is a good listener
- Is friendly, courteous, enthusiastic and sincere
- Is able to relate to and communicate with visitors both young and old
- Is a good speaker
- Can approach people and get them involved
- Says "I don't know" instead of giving inaccurate or questionable information
- Desires to update and increase interpretive skills

Selection and Notification
Once the interviews are completed, the docents will be eagerly awaiting notification. Selection may require further follow-ups with applicants, or may require approvals from other staff or management. It is considerate to notify all interviewees within a week of their interview. Determine how notification will be made and be consistent – phone call, e-mail or letter.

7.2 Planning A Docent Training Program

Once volunteers have been selected, the next step is planning the training schedule and program. Here's a checklist of what to do before training starts.

Arrange Speakers/Presenters (~2 months ahead)

- Contact speakers 1-2 months (or, at a minimum, 4 weeks) ahead of time and explain what is needed for content of the presentation, number of docents and their background, where to meet and what AV equipment the presenter needs. Have them email a brief bio and short description of their talk beforehand so you can use it to introduce them. In general, speakers know they are not paid for docent trainings, although sometimes this needs to be clarified.
- Prepare a database or contact list of speakers. Use this to send thank you notes or emails after their presentation, and for easy contacting next time.
- Have a back-up plan if a speaker cancels on short notice or doesn't show.

Assemble Docent Training Notebooks (1 week ahead)
Binders will contain only the essential information in print we want all docents to have. This includes the intro and background section of the manual, as well as the background on interpretation and exhibit themes. All other information will be included in the provided flash drive.

- Order/pick up binders from Staples (0.5 in. binder, double pockets for brochure inserts)
- Make photocopies of Training print materials -- make sure to double side and have black and white copies)
- Assemble binders, print materials and dividers in correct order
- Load Flash drives with correct files and insert into folders

Training Days

- Set up tables and chairs, food and beverage, training notebooks
- Sign-in table with pens and name tags
- Have a suggestion box so that docents can make suggestions, ask questions (or complain).
- Presentation materials (projector, computer, activity stations, etc)
- Post an overview of daily schedule and when/where to meet next (flip chart or projected slide)
- If going off-site, set up car-pools
- On second to last training, start scheduling active docent shifts with new docents. Schedule to be completed by day of graduation.

Training Schedule
The training schedule is developed based upon the concepts, themes and skills needed to prepare the docents for their job. Training days should always provide a break at least every two hours, preferably every 1.5 hours. Representing the sanctuary's commitment and respect for the docents, trainings should start on time and end on time. If things fall behind, it is the docent coordinator's job to make the necessary changes to keep to the start and end times. The art and craft of developing training schedules involves mixing up content, skills and social interaction in a fun and effective way. There is only so much heavy informational content a docent can take in a day. Balancing that with social mixers, interpretive skills development, tours of the building, safety procedures, and operating IVK kiosks provides something for all learning styles. See examples of training schedules at the end of this chapter.

Graduation Day
Graduation Day is an important event in the life of a docent. Docents have applied for and been selected for a prestigious volunteer position, successfully completed a prolonged training program, learned a lot, and are about to become formal ambassadors of a federal government agency protecting the oceans. They are about to take on the mantle (uniform) representing NOAA's national marine sanctuary program. It is a significant honor, and may have a profound influence on some individuals. Graduation Day may be an emotional day; docents may be shy or nervous.

On Graduation Day, the docent coordinator leads the new docents through the graduation process. Successful docent graduations include the following components:

- **Assembly**. Docents are asked to gather and come to order, focusing their attention on the docent coordinator. Conversations stop, music is turned off, cell phone are silenced, eating stops, everyone's attention is focused.

- **Acknowledgement**. The docent coordinator acknowledges the achievements of the docents and congratulates them. This is usually done in the form of a short speech. Sometimes there are other speakers as well – local elected officials or sanctuary managers may attend docent graduations and thank docents for their efforts and time to educate visitors about the oceans and national marine sanctuaries.

- **Conference of Identity**. Docents are given a symbol that identifies them in their new status. This could be a pin, a vest, a shirt or a hat – some emblem that identifies the docent in his/her new identity as an ambassador for the sanctuary. This is often done in a ritualistic way, like a graduation, where the docent's name is called, and the item of identity is conferred with a handshake.

- **Closure**. The Docent Coordinator gives some kind of signal to mark the end of the ceremony and beginning of celebration. It may be applause, a cheer, a blessing, or some other signal that the conference of identity is complete.

- **Food**. Meals are celebratory. Graduations are celebratory. Put them together! Potlucks are common with docent graduations, although some organizations will pay for catering or arrange for food to be donated, as a symbol of giving back to docents what they have given with their time.

7.3 Scheduling Docent Shifts

The Sanctuary Exploration Center has had great success using a web based volunteer scheduling program, *VolunteerSpot*, which allows for easy scheduling, changes, reminders and reporting. This program is also being used by Channels Islands National Marine Sanctuary. See www.volunteerspot.com to learn more.

Docent schedules should be completed at least two weeks before the beginning of the month. Once the majority of the shifts have been assigned, the docent coordinator looks at empty shifts and seeks docents who can fill them. There will usually be special scheduling requests each month, including vacation requests, shift trades, requests for special assignments, and working with (or not-with) other docents. Docent schedules may also be affected by unforeseen events including medical, family and natural disaster emergencies. Accommodating occasional special scheduling requests reflects the docent coordinator's awareness that the docent's time is given freely.

Once the schedule has been finalized, shift trades may continue, but it is imperative that the docents involved notify the docent coordinator. The docent coordinator must know who is

scheduled for every shift. Sometimes docents forget they are on duty, but will respond with a reminder phone call. If the docent on the schedule has traded with someone else, the docent coordinator will not be able to track the replacement person down.

Scheduling Tips

- When possible, pair up people that balance out strengths, setting up experienced docents with inexperienced ones, etc
- Use first and last names on scheduling calendar
- Once a week, send reminders to the docents scheduled for that week. You may want to include notifications of changes or updates with the reminder (example, "The sea turtle exhibit is acting up. If it stops working, contact the staff person on duty")
- In general, docents enjoy working with different docents, although it is important to sensitive to docents who do not get along, or who may want to work together or carpool.

7.4 Documenting and Tracking Docent Hours

Use a database program to track docent hours, and keep data from all previous years. Tracking docent hours can be an evaluative tool, in terms of tracking docent retention, average number of years a docent volunteers, or changes in staffing needs. Docent hours may also be required information for some grant proposals, indicating in-kind service. Hours are important to docents. Usually the annual docent appreciation event includes recognition of the hours docents have donated.

NOAA's VolunteerNet Database

Docent contact information and hours are reported to NOAA's VolunteerNet database program. For more information and to receive the handbook of ONMS volunteer policies, contact the ONMS Volunteer Coordinator.

7.5 Continuing Education and Rewarding Docents

Docent training is just the beginning of developing and keeping good docents. New docents may be so overwhelmed by the tasks they have recently learned to do that they forget important content information. Docents should know that continuing education is expected. One way to promote continuing education is to give "hours of credit" for docent attendance at educational events. This works if docents are later rewarded for their hours of duty, including continuing education. In fact, some docents may pad continuing education hours, so it is important to approve of specific continuing education opportunities and confirm attendance.

The docent coordinator determines which events qualify for continuing education. It is common for the docent coordinator to arrange "docent enrichments." These are essentially extra training days. The advantage to this is that the docent coordinator controls the time, the topics, documents who attended and is able to assess how well the docents are getting the message. Docent

enrichments may also have an evaluation element to them, for example, pre-tests and post-tests on the subject. They may also serve as a social opportunity (potluck, for example).

Docent enrichments may be skills-based or content-based. Skills-based trainings cover tangible skills such as operating the cash register, or qualitative skills such as exhibit interpretation, working with small children, or tours for special needs visitors. Content-based training may take the form of a presentation by a content expert such as a scientist or professor.

The docent coordinator may decide to open the event to docents from other volunteer programs. Sharing docent enrichments was a partnership opportunity identified in Chapter 2, Partner Organization Recommendations. When doing so, the docent coordinator is responsible for keeping track who attended and reporting attendance of other volunteers to the partner organization.

Other opportunities for continuing education may include programs offered by other organizations, including the Monterey Bay Aquarium Research Institute (MBARI), UC Santa Cruz, or another research institution. Attendance at these "approved" docent enrichments should be confirmed either by a ticket or receipt, signed note, or informal discussion of what the docent learned.

Ideas For Rewarding Volunteers & Docents

The sanctuary program has many unique opportunities to reward volunteers and keep them coming back.

- ***Recognition For Hours Donated***

Docent appreciation events nearly always include recognition of hours of service. They are formalized with pins and/or certificates of recognition that indicate the number of hours donated. Docent hour summaries are usually conducted annually.

- ***National Program Recognition***

NOAA's ONMS periodically offers special access to events or activities for remarkable docents with high hours or donations to a breadth of programs.

- ***Logo Items***

National Marine Sanctuary hats, T-shirts, coffee mugs or keychains are appealing to docents.

- ***Field Trips***

Boat trips, including whale watching, plankton tows and seabird identification are exciting and educational. Free admission is a special gift to docents.

- ***Educational Gifts***

Books, DVD's, field guides, tickets to museums, aquaria or lectures are great rewards to keep docents inspired.

· ***Special Access To Events***
Invitations to attend closed events such as scientific meetings, fundraisers, and exhibit previews, are meaningful forms of recognition.

· ***Individual Recognition***
Certificates, plaques and awards that include docent's name, such as the "Star of the Sea" certificate.

· ***Donated Gifts***
Local businesses may donate retail gifts or food items. In Santa Cruz, some food stores donate funds to non-profit organizations. Other stores offer discounts to volunteers.

· ***Reciprocal Docent Recognition***
Other partner organizations may offer tickets or free spots at their events or lectures. Reciprocation by offering other docents access to Sanctuary Exploration Center or MBNMS events is appreciated.

· ***Public Recognition***
Feature media stories about docents, including photos, can be sent to media outlets. They serve the dual purpose of docent recongnition and exposure for the Exploration Center.

· ***Recognition of Special Days***
Announcing docent birthdays or the annual date of docent graduations can be very meaningful. For example, the first graduating class of docents will always be recognized for their flexibility while exhibits were still being installed.

7.6 Docent Training Notebook

The docent coordinator assembles a notebook of information, background material, content, scheduling directions, check-in and-out procedures. Docent training notebooks are eternal works-in-progress, with changes and updates made every year. The Sanctuary Docent Training Handbook is available upon request from the Sanctuary Exploration Center Volunteer Coordinator. See contact information, below.

Jeff Rosaler
Education Specialist and Volunteer Coordinator
Sanctuary Exploration Center
(831) 421-9993 x 102
jeff.rosaler@noaa.gov

7.7 Sample Volunteer and Application Packet

Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

MONTEREY BAY NATIONAL MARINE SANCTUARY

Volunteers Needed!

The training program will be:
June 6th - 30th and July 7th - 11th.
Wednesdays 6:00 - 9:00 p.m. and
Saturdays 9:00 a.m. -1:00 p.m.

The training program is designed to help you as a docent interpret the rich natural resources of the Monterey Bay National Marine Sanctuary.

Program topics will include:

- Your role in helping to protect the MBNMS
- Geological features of the Sanctuary
- Migrating leatherback turtles and other charismatic mega-fauna
- Deep sea technology and the animals that live there
- Biodiversity in the rocky intertidal, kelp forests and deep sea environments
- The watersheds that connect the Sanctuary to the land
- Marine Protected Areas as a tool for conservation

Connect to and Explore Your Monterey Bay National Marine Sanctuary

Become a Sanctuary Exploration Center Docent

Monterey Bay National Marine Sanctuary (MBNMS) is seeking a team of dynamic individuals to become docents at the new Sanctuary Exploration Center in Santa Cruz. Working side by side with MBNMS staff, docents will have the opportunity to interpret exhibits to the public, conduct guided tours, assist in daily operations, and participate in events and programs.

Required Informational Meeting: Saturday, May 26th, 2012 @ 11:00 a.m.

Where: Sanctuary Exploration Center – 35 Pacific Ave., Santa Cruz, CA 95060 (across from the Dream Inn and Wharf in Santa Cruz)

Sanctuary Exploration Center docent applications will be distributed at this informational meeting, as the first step in the volunteer selection process. Selected applicants will be provided a required training program consisting of a total of 35 hours.

Please RSVP to: explorationcenter@noaa.gov or (831) 421-9222

http://montereybay.noaa.gov

Sanctuary Exploration Center Cover Letter

Dear Potential Sanctuary Exploration Center Docent,

Thank you for expressing an interest in volunteering at the Sanctuary Exploration Center. Please read the enclosed material for more details and fill out and sign the Volunteer Application, Standards of Conduct, and the Volunteer Questionnaire. These can be sent back in the self-addressed envelope, returned by hand to the Center, or filled out electronically and emailed to jeff.rosaler@noaa.gov.

Docent Training Program 2012

Wednesday, May 16: Information session (7:00 – 9:00 pm)
Completed application packets due: May 23.
You will be contacted after we receive your completed packet. Selected candidates will be asked to sign up for an interview slot at this time. Interviews will be conducted prior to the first day of training.

Training Days are as follows:

Wednesday, June 6, 6:00-9:00 pm
Wednesday, June 13, 6:00-9:00 pm
Wednesday, June 20, 6:00-9:00 pm
Wednesday, June 27, 6:00-9:00 pm
Wednesday, July 11, 6:00-9:00 pm

Saturday, June 9, 9:00 am–1:00 pm
Saturday, June 16, 9:00 am–1:00 pm
Saturday, June 23, 9:00 am–1:00 pm
Saturday, June 30, 9:00 am–1:00 pm
Saturday, July 7, 9:00 am–1:00 pm

All docents will join NOAA's volunteer network database and must adhere to its volunteer policies. Volunteers will serve as ambassadors to both the Monterey Bay National Marine Sanctuary and the City of Santa Cruz. This packet contains an application form, a duty statement, a standard of conduct sheet, and a self-evaluative content questionnaire. Please read, sign and fill out all forms and return by May 23.

We are requesting a one-year commitment of at least 16 hours per month (four 4 hour shifts). Volunteers will be placed on the schedule when training has been completed, all paperwork has been filled out, and fingerprinting requirements are fulfilled.

We look forward to having you join our team at the Sanctuary Exploration Center!

Lisa Uttal and Jeff Rosaler
Monterey Bay National Marine Sanctuary
Sanctuary Exploration Center
35 Pacific Avenue
Santa Cruz, CA. 95060
explorationcenter@noaa.gov

Sanctuary Exploration Center Docent Job Description

Position: Exploration Center Docent

Supervisor: Sanctuary Exploration Center Education Specialist

Location: **Monterey Bay Sanctuary Exploration Center, 35 Pacific Ave, Santa Cruz, CA. 95060**

Qualifications:

- An interest in the natural world, teaching, and enthusiasm for the environment
- Enjoy interacting with the public and being a proactive member of a team, including being dependable and responsible
- Extensive prior knowledge of marine biology and oceanography is not necessary, but must be willing to spend time and expend the effort necessary to learn the appropriate material
- Physically able to lead tours and interpret exhibits (indoors) for four hour shifts

Essential Duties: Volunteer duties include interpreting exhibits at the Sanctuary Exploration Center, leading group tours and school groups, directing the public to nearby points of interest, staffing the information table, supporting partner agencies and organizations, assisting with community events, conducting regular exhibit upkeep and assisting with program development. Docents are required to provide excellent customer service to visitors and/or callers. Docents will also provide support to the general operations of the Sanctuary Exploration Center, including maintaining the safety and sanitation of the facility.

Requirements: Volunteers are representatives of NOAA's Monterey Bay National Marine Sanctuary and must maintain a professional appearance and demeanor at all times. Other requirements include:

- Minimum 18 years of age
- Communicate via email
- Receive and follow directions from the Sanctuary Volunteer Coordinator
- Work four 4-hour shifts monthly
- Be able to lift up to 15 pounds
- Use stairs or elevator
- Sit and work at a desk setting for up to four hours
- Learn and follow safety and emergency procedures
- Volunteers may be asked to assist with tours, visiting school groups, exhibit and program development, and public events

Training: Sanctuary staff provide approximately 35 hours of training over a five week period covering topics related to the knowledge needed to be an effective docent within the Exploration Center. Continuing training and hands on experience will be available to docents through enrichments classes.

Commitment: After completing the volunteer training course, volunteers are required to commit to four (4) four-hour shifts per month. Shifts are projected to be from 930-1:30 and 1:00-5:00 on Wednesdays through Sundays.

Dress Code: Dark slacks, khaki or jeans and sanctuary logo polo shirt.

Benefits: Gain knowledge about marine biology and oceanography and an education on the various exhibits; discount prices in the gift shop; invitations to special events; and volunteer appreciation programs.

SANCTUARY EXPLORATION CENTER STANDARDS OF CONDUCT

1. Care must be taken to keep the exhibits in good, working condition. This includes keeping the area picked up and reporting broken or damaged materials. Brochures and other written material may need to be replaced.

2. Care must be taken for the security of the interpretive center and its administrative offices. Public opening and closing hours are to be strictly adhered to. The public is not allowed in office space.

3. Docents are required to arrive and leave on time for designated shifts, usually ½ hour prior to opening and ½ hour after closing times.

4. The Sanctuary Exploration Center is to be manned at all times during open hours. Docents must notify one another if one docent needs to leave the desk for breaks.

5. Docents are ambassadors for Monterey Bay National Marine Sanctuary program. If a visitor is damaging or behaving inappropriately, the docent has the right to ask the visitor to leave.

6. Docents are to show up for work in clothing issued by the Sanctuary Exploration Center and are to be neatly dressed. No other logos besides those issued by the Sanctuary Exploration Center are to be worn while on duty.

7. Docents are to wear name tags at all times.

8. Docents should not engage in activities for profit while volunteering at the Sanctuary Exploration Center, nor may Docents profit from activities or knowledge associated with the Sanctuary Exploration Center.

9. Smoking, drinking or eating while on duty at the front desk is prohibited, except for water.

10. Dogs or other personal pets are not allowed in or near the Sanctuary Exploration Center while docent is on duty.

11. Docents shall act cordially and professionally while in the Sanctuary Exploration Center. Swearing, sexual or personal remarks, physical contact with visitors, discussions of a personal nature and/or arguments are highly inappropriate and will not be tolerated.

12. Failure to comply with these standards may result in removal from the Sanctuary Exploration Center Docent Program.

Should I be accepted as a Sanctuary Exploration Center Docent, I accept the terms of the Duty Statement, agree to fulfill all the requirements of the Docent Orientation and Training Program and meet the current service requirements of volunteering for two shifts per month for one year, effective upon successfully completing the Sanctuary Exploration Center Docent Orientation and Training Program. I also agree to perform in the manner stated in the Standards of Contact above.

Signature Date

Sanctuary Exploration Center Docent Application Form

APPLICANT INFORMATION

Name
Address
Phone Email

BACKGROUND INFORMATION

Why do want to become a Sanctuary Exploration Center Docent?

What qualities do you feel make a good volunteer?

Please describe any special interest, education and /or employment background that relate to this volunteer position.

Do you currently or have you previously volunteer for other groups? Yes No
If yes please describe:

How did you find about out about the Sanctuary Exploration Center docent program?

The Sanctuary Exploration Center will be open Wednesday – Sunday from 10:00 a.m. – 5:00 p.m.
What days and times are you most available to docent at the Center?

I hereby certify that all statements made on this application are true and complete.

Signature Date

Sanctuary Exploration Center – Volunteer Self-Knowledge Assessment

The following topics will be covered during the volunteer training program. Your self-assessment helps us in developing our training program. Feel free to add comments.

0 = I've never heard of it
5 = I qualify as an expert

_____Monterey Bay National Marine Sanctuary
_____Deep Sea Research and Technology
_____Davidson Seamount
_____Local Marine Wildlife
_____Fishes
_____Birds
_____Marine Mammals
_____Intertidal Organisms and Ecology
_____Kelp Forest Organisms and Ecology
_____Whale Falls and Deep Sea Organisms
_____Bathymetry and Sea Floor Mapping
_____Watersheds and Water Quality
_____Geology and Monterey Canyon Formation
_____Marine Protected Areas
_____Local Fisheries
_____Local History
_____Area Destinations
_____Safety and First Aid
_____LEED Buildings/Standards
_____Spanish speaking ability

I would like my nametag to read

Volunteers are provided with uniform shirts. What size polo shirt do you wear?

Men's

Women's

8.0 Communications and Marketing Plan

A communications plan is a set of products and strategies that can be used to fulfill a broad spectrum of communications objectives. The Office of National Marine Sanctuaries has established strategic communications goals and strategies to increase public awareness and understanding of national marine sanctuaries and other marine protected areas in its handbook, *Best Practices Guide To Outreach And Communication*. The *Best Practices* guidebook outlines ONMS requirements for communications tools, including graphic standards, key messages and talking points.

This plan was developed for the needs of the Sanctuary Exploration Center, and is consistent with the ONMS *Best Practices* guidebook and requirements. It includes Communications Objectives developed from MBNMS planning documents for the Exploration Center; targeted audience groups; examples of story ideas for developing feature stories for announcements, key messages and talking points derived from MBNMS planning documents, communications strategies developed with input from partner recommendations, and sample worksheets that can be used in developing strategies and work plans for reaching target audiences.

8.1 Communications Objectives

Objectives form the foundation of the Communications Plan. For each communication objective, an audience is targeted, communication tools are created, often with the use of idea banks or templates, outreach methods are selected and the plans are implemented. Tracking is essential to determine whether target audiences have received the intended message and to evaluate the effectiveness of communication tools and strategies. A summary is completed to address success in achieving the objective and the plan is revised. Samples are included at the end of this chapter.

The communications objectives of the Sanctuary Exploration Center are to:

- Attract visitors to the Sanctuary Exploration Center
- Increase public awareness of Monterey Bay and its watershed, coastal marine resources and the Monterey Bay National Marine Sanctuary
- Instill an interest in national marine sanctuaries
- Develop coordinated ocean literacy messages in partnership with local and national partners
- Increase public awareness of ocean literacy issues
- Encourage people to get out into the sanctuary
- Attract and train volunteers as exhibit interpreters
- Inform potential users that the facility is available for use as a venue

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8.2 Target Audience Groups

Target audiences are specific groups of people at whom a specific message is aimed. Target audiences are developed from larger population groups, such as age groups, cultural populations, and educational cohorts. Once these distinct groups have been defined, a mix of strategies can be assigned to reach them. Target audiences can be described in degrees of specificity, from "general public" to narrow interest groups. The audiences described here are examples of significant audience groups.

Target Audience

1) Sanctuary Exploration Center Visitors (See Chapter 4, Visitor Interpretive Program)

- People who already know about the Sanctuary Exploration Center
- People who were visiting the Boardwalk, saw the Exploration Center, and walked in
- People who planned a special visit to the Exploration Center

Age Groups

- Adult couples
- Adults with children
- Multi-generational families

2) Spanish Speaking Visitors

- People who already know about the Sanctuary Exploration Center
- People who are visiting the Boardwalk and saw the Center
- People who planned a special visit to the Center

Age Groups

- Adult couples
- Adults with children
- Multi-generational Families

3) K-12 Education (See Chapter 5, School and Teacher Program)

- Students, ages pre-K through 12th grade
- Bilingual English-Spanish students of all ages
- Students who attend informal environmental education programs and facilities
- Students seeking internships or community service projects

Science Education Providers:

- Teachers: primarily science; other subject areas are secondary
- Education and curriculum providers in city, county, and regional Offices of Education
- National and state science education providers

4) Adult Education

- College Students
- Community College students
- English as Second Language (ESL) Learners
- Adult students learning Spanish

5) English-Speaking Media
- Television
- Radio Stations
- Newspapers
- Specialty Publications

6) Spanish-Speaking Media
- Television
- Radio Stations
- Newspapers
- Specialty Publications

7) Tourism Promoters
- Tourism Marketing District (TMD) Organizations
- Chambers of Commerce in greater Santa Cruz area
- Travel & tourism businesses

8) Local Government Representatives
- Regional Association of Monterey Bay Area Governments (AMBAG) Members
- County: Santa Cruz County
- City: City of Santa Cruz

9) Community Service Organizations

10) Businesses
- Geographical neighbor business (in the Santa Cruz Area)
- Businesses that encourage interaction with the ocean
- Business supporters of SEC, MBNMS, NMSP

11) NOAA Family
- Colleagues within MBNMS, Regional West Coast Sanctuaries, ONMS
- Other NOAA Offices in the region (Southwest Fisheries Science Center, etc)

12) Potential Funding Partners
- Sanctuary Foundations
- Potential donors or grantors

13) Marine Conservation Organizations
- Key Partner NGOs in Santa Cruz
- National and International Marine Conservation Organizations

14) People interested in sustainable and green buildings and practices
- People who subscribe to specialty publications on LEED or green design
- People who work in LEED-designed buildings

8.3 Story Ideas

Studies have shown that media exposure increases when members of the media are provided with all the information and tools they need to write or produce a story that will engage their readers or listeners. Short feature stories highlighting Exploration Center exhibits can form the foundation for feature stories, announcements, media updates, and social media outreach. These should be associated with high-quality photographs ready for publication, and a list of individuals who may potentially be interviewed for their opinions, experiences or key messages.

Story Idea 1 Facility History

Monterey Bay National Marine Sanctuary opened a state-of-the art visitor center in July 2012. The Sanctuary Exploration Center is located in the heart of the Santa Cruz's famed beach area just steps away from the city's Municipal Wharf, overlooking the ocean. The center features engaging interactive and multi-media exhibits to help visitors explore the sanctuary's remarkable marine environment, as learn how they have a role in protecting one of America's underwater treasures.

Media: Photos of:

- Location over time, as a surf shack, parking lot, skate park (Fun Spot).
- Exploration Center in construction,
- Exploration Center open with people using it
- Exhibits, gift shop, classroom

Quotes: Interviews with City of SC major partners, interviews with staff, docents & visitors.

Story Idea 2 Multi-Agency Collaboration

The Office of National Marine Sanctuaries (ONMS) collaborated with the City of Santa Cruz and the National Marine Sanctuary Foundation to build the 12,600 sq. ft., $13.9M Sanctuary Exploration Center. ONMS provided design and construction funds, the city offered the $2M ocean-view property and helped manage the construction activities, and the foundation conducted a Capital Campaign to pay for exhibits.

Media: Photos of:

- important planners in the process: City of SC, former mayor Cynthia Mathews, Emily Reilly, Redevelopment and Economic Agency Staff Exploration Center open with people using it
- Exhibits, gift shop, classroom

Quotes: Interview important planners in the process: former mayor Christine Mathews, other city council people, MBNMS managers who carried the process.

Story Idea 3 Green Building Design & State of the Art Exhibits

The Exploration Center is a model for sustainable, environmentally sensitive design, construction and operation, meeting the U.S. Green Building Council's gold standards for Leadership in Energy and Environmental Design (LEED). The center also features engaging interactive and multi-media exhibits.

Photos

- Building design illustrations before construction

- Exploration Center today

Quotes

- LEED Representative
- Architect
- Construction Crew
- Exhibit Fabricators

Story Idea 4 Use of Technology In Research and Exploration

Scientists use technology to explore the ocean floor. Modern technologies include side-scan sonar to "see underwater with sound." The use of underwater autonomic devices (AUDs) collects information about ocean areas far from the coast. Remotely Operated Vehicles (ROVs) follow directions from a mother ship. These and other marine science technologies are explored in the Sanctuary Exploration Center in Santa Cruz, with engaging high-tech exhibits. In the Geology Gallery, a rear projected computer-generated model starts at the shoreline and progresses down into the depths of the submarine canyon. Visitors use a trackball to scroll across the screen, which describes highlights of the sanctuary's features as they go. A boat hull atop the gallery wall "tows" a multi-beam sonar device which projects real-time sonar images of visitors on a video monitor. Graphics describe how researchers use this technology to map the features of the sanctuary floor. Touchable deep-sea exploration equipment surrounds an interactive video kiosk that highlights research in the Sanctuary.

Photos

- Actual AUDs and ROVs
- Exploration Center exhibits of AUDs, side scan sonar, and ROVs with people using them

Quotes

- Scientist explaining the importance of technology to marine research
- Visitor talking about his/her experience using the high-tech exhibits.

Story Idea 5 What Is Ocean Literacy? Why Do Sanctuaries Promote It?

In 2007, NOAA was designated as lead agency for ocean education, with a broad mandate to support educational activities at all levels to increase public awareness and understanding of ocean science and stewardship. The NOAA Office of Education developed an Education Strategic Plan with the overall vision of "an informed society that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions," and the mission "to advance environmental literacy and promote a diverse workforce in ocean, coastal, Great Lakes, weather, and climate sciences encouraging stewardship and increasing informed decision-making for the Nation. Interpretive facilities were identified as ways to achieve ocean literacy goals. Exhibits and education programs are built upon national ocean literacy principles.

Photos

- Children learning in Exploration Center
- Teenagers using ROV exhibit
- Hispanic students doing activities

Quotes

- Jane Lubchenco, Director of NOAA, on ocean literacy
- Sylvia Earle, champion of ocean literacy
- Interview Education Coordinator for MBNMS

Story Idea 6 Climate Change: How Does It Affect You?

Climate change is a long-term shift in the statistics of the weather (including its averages). Climate change could show up as a change in climate normals (expected average values for temperature and precipitation) for a given place and time of year, from one decade to the next. The last decade of the 20th Century and the beginning of the 21st have been the warmest period in the entire global instrumental temperature record, starting in the mid-19th century.
Photos

- Graphs of climate change over time
- Graphs of oceanic temperatures since recorded history

Quotes

- Quotes from leaders in climate change research
- Predictions by local meteorologists (UCSC) regarding impacts to Santa Cruz sea level

Story Idea 7 Research that informs decisions

Resource management policies are based upon informed research. Information about the ocean is collected through regular monitoring of ocean conditions over time. Data are compared and analyzed by scientists, then reported to resource protection agencies. Managers review the analyses and recommendations to make informed policy decisions.
Photos

- Samples of databases and graphs, indicating change over time
- Highlight databases posted on Sanctuary Integrated Monitoring Network (SIMoN)

Quotes

- From UC Santa Cruz climate and ocean experts
- From Sanctuary superintendents or policy decision-makers

Story Idea 8 Connect Local Natural History with Exhibits

Gray Whale Season and Whale Fall Exhibit
Marine Mammal Activities and Exploration Center images and film
Seasons of the Sea and the Open Ocean Mini Theater Film
For All: Provide high-quality photographs and, if possible video clips.

Story Idea 9 Use Exhibit Themes as Story Lines

Every exhibit has a listing of interpretive themes. Each of these offers many story ideas. For example, if a research expedition is scheduled for Davidson Seamount, a story can be developed from the Exploration Center's exhibit interpretive messages, with the tag line encouraging people to learn more about Davidson Seamount by visiting the Sanctuary Exploration Center.
For All: Provide high-quality photographs and, if possible video clips.

8.4 Key Messages and Talking Points

Key messages are general themes that guide the audience to a desired result. Talking points are pieces of information that explain key messages. They are short messages that can guide and direct conversations and be referred to by staff, and docents. MBNMS and ONMS have designated key messages and talking points for national marine sanctuaries, as outlined in the *Best Practices* guide. The key messages and talking points listed here are specific to the Sanctuary Exploration Center.

- The Sanctuary Exploration Center highlights the unique ecosystems, marine wildlife, and biodiversity of the Monterey Bay National Marine Sanctuary.
- The Sanctuary Exploration Center educates visitors about the unique qualities of this coastal and marine environment
- Sanctuary Exploration Center has state of the art exhibits to reveal science technologies to explore the deep sea
- The Sanctuary Exploration Center helps foster a personal connection with the sanctuary and the ocean's relevance in people's daily lives
- The Sanctuary Exploration Center encourages stewardship of the sanctuary and a better understanding of how to responsibly enjoy and protect the ocean
- Interpretive facilities are an important vehicle for achieving ocean literacy objectives established by MBNMS and NOAA
- The Sanctuary Exploration Center serves as a hub for community interaction to enhance ocean literacy

Logistic Talking Points

The Sanctuary Exploration Center is open
Wednesday through Sunday, 10am - 5pm
(Closed Monday and Tuesday)
Call for holiday hours or more information:
(831) 421-9993

The Sanctuary Exploration Center is located directly across the street from the Santa Cruz Wharf at 35 Pacific Street, Santa Cruz CA.

Partner Shout-Outs

The trolley (supported by downtown businesses) is the best way to get back and forth between the exploration center and downtown to avoid traffic and parking hassles.

8.5 Communications Strategies

1) Website-based ways to get the message out and document interest/responses

- Search engine optimization & maximized tracking
- On-line requests for information
- On-line field trip and classroom reservations
- On-line reservations for facility rentals
- Yellow Page Web Listing
- YouTube Channel/Post videos on website
- Make web pages bilingual or offer a link to Spanish translations

2) Social media and networking (Facebook, Twitter, YouTube, Pinterest)

Develop content for weekly posting:

- Web announcements
- E-alerts or updates
- Photographs
- Video clips

3) Active relationships with tourism organizations

- Send web postings, updates and content monthly or quarterly
- Submit entries to tourism publications in accordance with their deadlines

4) Networking with partner organizations

- Cooperative planning for maximum return on programs and promotions

5) Reciprocal partner promotion

- Share web postings, updates and content with key partners weekly or bimonthly

6) Press Releases in Community Newspapers

- Send regular story ideas, with photographs, to local newspapers
- Develop or contribute to a regular column in a local newspaper

7) Monthly Events Calendar

- Develop SEC events calendar with SEC events & activities
- Send event updates to tourism organizations and key partners monthly

8) Host Special Events at Sanctuary Exploration Center

- Attract target audiences to facility with special events

9) Cooperative Participation in Community Events

- See calendar of Santa Cruz Events

10) Attract Spanish-speaking visitors by using the above strategies for Spanish speaking audiences.

8.6 Tracking and Evaluating Communication Activities

Keeping track of efforts to reach target audiences will be beneficial during the evaluation process. What worked and what didn't work can easily be forgotten. Tracking these activities makes it much easier to revise annual efforts and document successes.

Table 8.1, *Sanctuary Exploration Center Communications Plan Objectives, Audiences, Tools and Strategies (Sample)* provides a spreadsheet of ideas for determining communications objectives, reaching target audiences, developing strategies and determining success. Table 8.2, *Sanctuary Exploration Center Communication Plan Tracking and Evaluation (Sample)* provides an example of the kind of tracking sheet that should be maintained by staff delegated to communications efforts.

8.7 Communication Monitoring Worksheets

Identifying target audiences and clarifying key points and messages can be challenging. Often, a general message is intended for a variety of audiences, each requiring a unique strategy. For example, informing the greater Santa Cruz Spanish-speaking community that a new ocean interpretive center has opened with graphic panels in English and Spanish is an important communications goal. But the Santa Cruz Spanish speaking community is composed of many unique audience groups, each using its own methods of information gathering – from watching Spanish-speaking television, to listening to Spanish-speaking radio, to shopping in Spanish-speaking markets. A significant component of communications is keeping track of what audiences were approached, when and for what reason. Reviewing these lists over time may be helpful in identifying audience gaps and useful for implementing new target audience strategies. Figure 8.1, *Communication Monitoring Worksheet (Samples 1 and 2)*, offers a template for tracking communications efforts, including determining the interpretive topic, defining target audiences, strategies for reaching target audiences, and determining success of communications efforts. These tools make it easier to track communications efforts, and may be included in the development of an evaluation plan for Sanctuary Exploration Center education and outreach activities. The following questions are included:

- Topic: What is the interpretive message topic?
- Objective: What is the goal?
- Timeline: Is there a deadline?
- Measurement of Success: How do we know the right people got the right message?
- Who do we want to reach?
- Target Audience Strategies:

Table 8.1 Sanctuary Exploration Center Communication Plan Objectives, Audiences, Tools, and Strategies (Sample)

Objective	Target Audience	Tools	Communication Strategies	Required Tasks	Tracking/ Effectiveness	Resources
Attract Santa Cruz visitors to the Exploration Center	Visitors to Santa Cruz	Feature stories about the Exploration Center	Send stories to visitor and tourism organizations for their annual tourist publications; send stories to local media 4X per year	1) Write feature stories, 2) Identify tourism outreach organizations & media outlets 3) Send stories to publications	**Before**: track visitation to SEC and hits on SEC website **After**: track visitation to SEC and hits on SEC website	List of visitor & tourism information outlets; List of media outlets
Keeping people who already know about the Exploration Center interested	Existing SEC visitors and supporters	MBNMS and SEC listserves, mailing lists, website & social media activity	Interesting updates and intriguing facts to stimulate continued interest; public events to draw return visits	1) Write/create interesting stories, web features 2) Send updates, flyers to listserves 3) Update listserves frequently	**Before**: track visitation to SEC and hits on SEC website **After**: track visitation to SEC and hits on SEC website, look for increase in listserves	MBNMS Staff has mailing lists and listserves
Attracting web browsers to come to SEC	People who do not know about the SEC but use web browsers	Dynamic, interactive website	Web optimization tools, creative web marketing, social media	1) Check w/ webmaster re: optimization & browsing a capacities 2) Frequently change messages	Document number of hits to website from browsers before and after to determine effectiveness	Key Message and Idea Banks, photo banks, video banks
Attracting media to write stories about SEC	Local, regional, state, national and internation al media	Email updates, photos, compelling stories, video clips	Regular updates and new stories designed for their audiences	1) Create list of targeted media outlets, 2) develop stories, 3) Track who stories were sent to & when	Documented increase in media attention	Media outlets for feature stories
Attracting Spanish Speaking visitors to SEC	Spanish speakers who may be interested in visiting the Exploration Center	Feature stories about the Exploration Center in Spanish	Send stories to Spanish publication organizations; send stories to local Spanish media 4X per	1) Translate English stories into Spanish, 2) identify Spanish media outlets	Increased attendance by Spanish speakers	Spanish media outlets

Table 8.2 Sanctuary Exploration Center Communication Plan Tracking and Evaluation (Sample)

Date	Activity	Staff Person	Distribution Efforts	Expected Outcomes	Actual Outcomes	Was It Effective? How and Why?	Next Time?
5/15/12	Volunteer Recruitment Flyer was sent out	Ed Spec 1 (Jeff)	MBNMS & SEC listservs, flyers were posted on local billboards	We hoped for 30 applications	We got over 60 applications	Yes. We got more applicants than we expected. Of those, 85% were selected as docents.	We will post the application on the website and keep a running list of potential applicants
7/1/12	Invitation to grand opening went to press	Director (Lisa)	Local Press & media outlets	We hoped to get covered in local papers	We got a nice article in paper and coverage on local news	Yes, this generated more press for SEC	We will do this every time we have a major event at the SEC
8/1/12	Website announces that group tours may be scheduled online	Ed Team (Liz)	Website and SEC listserv	We hoped people would start using it	We have had group tours use the form since the application went online	Yes. We are able to direct phone and visitor inquiries to the website application	We plan to put all our reservation and application forms online
9/1/12	We were contacted by Exploring New Horizons to use SEC for rainy days	Jeff	They contacted us after learning about the Center	Potential for ENH students to visit SEC on rainy days	ENH did call us on a rainy day and arranged 60 kids to come here (12/3/12)	Yes, we increased exposure with little effort. They brought their own teachers.	We need to be sure we have no other conflicts with previously scheduled groups
9/30/12	A photographer offered to take photos of the SEC	Lisa	He contacted us	We hoped to use the photos for our benefit	We are using the photos – they are great	Yes, we got a great resource we can use for many purposes	We credit his photos so he gets more exposure. These kinds of trades can be mutually beneficial

Figure 8.1 Communication Monitoring Worksheet (Sample 1)

Sanctuary Exploration Center
Communication Monitoring Worksheet
Page 1

TOPIC Recruiting Volunteers

1. Objective: What is the goal?

Recruiting volunteers to become docents at the Exploration Center

2. Timetable: What is the timeline?

We need volunteers to sign up by this date:

3. Measurement of Success: How do we know the right people got the right message?

We hope to have at least _____ applicants by the designated date.

Of those applicants, we expect _____ to meet the criteria necessary to become docents.

If we do not meet these targets, we will re-assess our outreach strategies to determine how to be more effective in our volunteer recruitment efforts

4. Who do we want to reach in general?

People who are interested in becoming docents at the Sanctuary Exploration Center

5. Target Audience Strategies

Target Audience 1

People who already know about the Exploration Center and are on our email listserv

What strategies will we use to reach them? (Refer to SEC Strategic Outreach Plan)

- *Announce it on our website*
- *Send an email announcement to everyone on email listserv*
- *Post flyers in the Sanctuary Exploration Center*
- *Encourage current docents to spread the word*

Required Tasks
Write basic flyer, ensuring all information is included and accurate. Email flyers to listservs, print and ask docents to distribute them

Sanctuary Exploration Center
Communication Monitoring Worksheet
Page 2

TOPIC **Recruiting Volunteers (continued)**

Target Audience 2

Ocean recreation enthusiasts

What strategies will we use to reach them?

- *Send email announcements to key partner businesses that support ocean recreation activities*
- *Post flyers at kayak rentals and on kayak enthusiast websites and listservs*
- *Post flyers at recreational fishing businesses and locations where recreational fishing occurs*

Required Tasks
Send email announcements
Go to on-the-water businesses and post flyers

Target Audience 3

People who may want to volunteer for an environmental organization

What strategies will we use to reach them?

- *Send media announcements to local newspapers and publications (see list of media outlets)*
- *Send announcements to key partner organizations that have volunteers and request that they send them out to their volunteer contact lists (State Parks, Save Our Shores, etc)*
- *Print flyers and ask key partners for permission to post them (Whole Foods, Santa Cruz Parks and Recreation, etc)*

Continue until all specific audiences have been identified and outreach strategies defined.

Figure 8.1 (continued). Communication Monitoring Worksheet (Sample 2)

Sanctuary Exploration Center
Communication Monitoring Worksheet
Page 1

TOPIC Encouraging Spanish-speaking visitors to come to the Exploration Center

1. Objective: What is the goal?

Attract more Spanish speaking people to come to the Exploration Center

2. Timetable: What is the timeline?

Targeted outreach to Spanish speakers by May, 2013 (before summer season begins)

3. Measurement of Success: How do we know the right people got the right message?

We will create a notice in Spanish asking Spanish speakers to notify the Exploration Center Greeter so that s/he can get their email address and add them to the mailing list. This will be a voluntary program, so we will only have general numbers. Once we have established an average number of Spanish speakers visiting the SEC without any targeted outreach, we will then launch a public awareness campaign targeted at Spanish speakers. Then we will document if the number of voluntary reporting increases. If attendance by voluntarily reporting Spanish speakers does not increase, then we will re-assess our Spanish speaker outreach strategy.

4. Who do we want to reach in general?

Spanish-speakers of all ages: families and adults

5. Target Audience Strategies

Target Audience 1

People who listen to Spanish radio, watch Spanish television or read Spanish newspapers

What strategies will we use to reach them?

Send media announcements in Spanish to Spanish media outlets inviting people to the Sanctuary Exploration Center. The announcements will indicate that the exhibits are bilingual and Spanish speakers are welcome

Required Tasks

- *Write the media announcement in English, translate into Spanish; send to Spanish media outlets*

Sanctuary Exploration Center
Communications Worksheet
Page 2

TOPIC Encouraging Spanish-speakers to come to the Exploration Center

Target Audience 3

People who shop in Spanish-language stores and markets

What strategies will we use to reach them?

Make flyers in Spanish and distribute them to Spanish-language stores and markets

Required Tasks

- *Use the existing media announcement and make it into a flyer*
- *Deliver it to Spanish-language stores and markets and get it posted*

Target Audience 3

Spanish speakers taking adult English as Second Language (ESL) classes

What strategies will we use to reach them?

Produce a flyer encouraging ESL students to visit the SEC because it is a bilingual ocean education facility
Design and give presentations to ESL classes about visiting the Sanctuary Exploration Center and learning from its bilingual exhibit graphic panels

Required Tasks

- Identify adult ESL classes in the Santa Cruz area, with the assistance of key partners who may offer ESL classes (Santa Cruz Parks and Recreation Department, Santa Cruz County Office of Education)
- Distribute flyers to ESL program coordinators and send them to ESL teachers
- Develop a PowerPoint presentation for ESL classes about the Sec and its bilingual exhibit panels
- Schedule and provide PowerPoint presentations about the SEC to ESL classes

Continue until all specific audiences have been identified and outreach strategies defined.

9.0 Program Evaluation

Program evaluation is the process of collecting, analyzing and reporting information about an audience's knowledge, attitudes, skills, intentions and/or behaviors for the purpose of making informed decisions about education programming. Government agencies are required to identify performance indicators and document outcomes and impacts based on those indicators for the purpose of decision-making, often for funding purposes [10].

Evaluations serve the purpose of learning about visitor needs, knowledge, abilities, and current practices. Evaluation results provide decision makers with enough information to help them make program design and delivery decisions. A secondary purpose of evaluation is to assist funders in assessing if the funds were well spent, and whether to continue funding programs.

Evaluations are designed with the end in mind – improved ocean literacy in national marine sanctuaries. Evaluation strategies are used to assess effectiveness of education programs in achieving desired learning outcomes. The Office of National Marine Sanctuaries (ONMS) has demonstrated great leadership in education evaluation not only to NOAA but to outside agencies as well. All evaluation elements conducted at the Sanctuary Exploration Center will be conducted in partnership with ONMS.

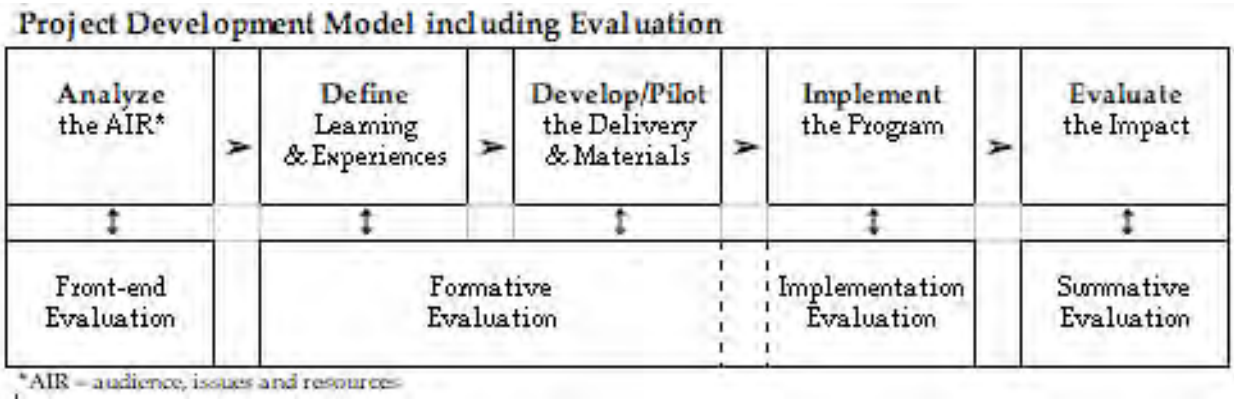
Demographics

In addition to evaluation questions related to one or more of these levels, demographic or other background questions are often included to learn more about the Exploration Center's audiences and make comparisons of different groups, such as the different grade level of students, teachers' technology skill levels, or visitor groups. This information can be useful when developing targeted outreach or marketing campaigns, and is especially meaningful to the Exploration Center and its success at attracting bilingual Spanish audiences.

Evaluation Stages

In many situations, evaluation is not initiated until several years into program development, with the consequence that no "pre" data are captured. This leads to the frustrating question, "Did we make significant improvements in ocean literacy with our constituents in the first years of our program and not know it?" This is a truly important question as often the greatest behavioral impact a new educational facility initiates is in the first three years. Capturing the effect is essential for evaluating the influence of the new center and its programs as it applies to the attitudes and behavior of constituents. The Sanctuary Exploration Center opened its doors in July, 2012. It will dedicate staff time and resources to developing evaluation tools in coordination with the ONMS Education Program. The model in Figure 9.1 illustrates the stages for evaluation, which will be applied to development of a 5-year Sanctuary Exploration Center Evaluation Plan.

Figure 9.1 Standard method for evaluation plan development (Source: B-WET)



9.1 Sanctuary Exploration Center Timeline For Evaluation

Year 1 Front-end evaluation

Front-end evaluation is conducted at the beginning of a project and gathers data about audience's current knowledge, skills, behaviors and attitudes, associated with key issues. An informal version of a front-end evaluation might be the question, "What do you know about…?" This evaluation information is used to assess prior knowledge (and sometimes, misinformation), and develop audience-appropriate goals and objectives.

The first five years of operation of the Sanctuary Exploration Center will have the greatest impact on the community of Santa Cruz. Efforts to collect and document front-end information provide "baseline" information that can never be captured again. Front end evaluations will assist the Exploration Center in determining important information about the people who visit the center in the first year, what their interests are, and basic levels of awareness of ocean literacy, the Monterey Bay National Marine Sanctuary, and local coast and ocean resources. Front-end evaluation tools may take the shape of pre-training tests for docents – the Volunteer Self-Knowledge Assessment included in the docent application is a good example. Pre-field trip questions for students and teachers should be developed as part of the curriculum packet for the Sanctuary Exploration Center's core program, *This is Your Sanctuary*, will help establish baseline information about student and teacher current knowledge, attitudes and behaviors. Knowledge questions may be added to group tour reservation forms. Carefully crafted social media questions can also serve to provide useful front-end information about web visitors. This information will inform the development of Year 2 evaluations.

Table 9.1 provides suggestions for front-end evaluations, to be conducted in 2012-2013. These include suggestions from partner organization recommendations (Chapter 2), MBNMS Education and Outreach goals (Chapter 3), Visitor Interpretive Programs, (Chapter 4), School and Teacher Programs (Chapter 5), Community Programs, (Chapter 6), Docent Training Program (Chapter 7), and Communications and Marketing Plan (Chapter 8).

Table 9.1. Suggested activities for front-end evaluation of Sanctuary Exploration Center audiences.

	Year 1 Front-End Evaluations – What Do You Know?
Audience	**Examples**
Web Visitors	Offer a "What Do You Know About…" interactive game on the website
Web Reservations	Demographic or knowledge content questions on web reservation form
Social Media Interactions	Document frequency of ocean-related questions and topics that come from social media users
Phone Call Inquiries	Document the kinds of questions callers ask; observe change over time
Potential Volunteers	Self-Knowledge Assessment included in docent application packet
Partner Organizations	Invite partners at networking mixers to self-assess their knowledge of marine conservation issues. Ask partners what marine resource issues are of greatest concern to them
Visitors to SEC	Collect demographic information
Visitors to SEC	Docent or staff assessment during interaction with visitors (See outcome-based objectives for Visitor Interpretive Programs, Chapter 5)
Teachers	Teacher workshops at SEC include assessment of current understanding of ocean literacy
Student Groups	Include pre-field trip questions in curriculum packet, modify questions for appropriate age groups
Spanish speakers	Develop front-end evaluation questions in Spanish
Community Members	Include informal knowledge assessments during community programs
SEC Facility Users	Include content knowledge questions on SEC Facility Use Agreement (Example: Is your organization interested in ocean related issues? How so?)
Docents	Conduct knowledge content "quizzes" to determine change in knowledge base before and after training
Marketing and Outreach	Track Year 1 attendance for a full year prior to implementing advertizing and marketing strategies
Internal Evaluation	Develop an internal evaluation tool for assessing staff knowledge, lessons learned, goals for next year, and apply these comments to the annual review process

Year 2 Formative Evaluation

Formative evaluation is conducted during project development, and gathers information about the audience's reactions to, and learning from, draft materials or pilot activities. An informal question for a formative evaluation might be "How is this working?" This evaluation information is used to make changes to improve a project. In Year 1, the Sanctuary Exploration Center's core program, *This is Your Sanctuary* will be developed for a single audience, public school students in Grades 3-5. In Year, 2, it will be field tested and modified per teacher input, then expanded to multiple audiences (See Chapter 5, School and Teacher Programs). The docent training program should also go through a formative evaluation, and well as the Visitor Interpretive Programs and the self-guided and docent-guided tour programs. Input from these evaluations will inform program modifications, which should be evaluated again in Year 4 or 5. Table 9.2 offers suggestions for formative evaluations.

Year 3 Continue Formative Evaluations and Program Modifications, and add Implementation Evaluation Components

Implementation Evaluation asks about the practical lessons that emerge from putting a new program into action. Implementation evaluation is conducted after a program has been going for a period of time, and looks at how it is being used. An informal implementation evaluation question might be "What changes need to be made?' This evaluation information is used to correct the implementation or accommodate any concerns about program delivery and intended outcomes. Lessons learned in implementation help identify where a program approach may need modifying, and what next steps are needed. The Sanctuary Exploration Center docent training program will be implemented in Year 1 and an Implementation Evaluation of it should be conducted in Year 2, or at the latest, Year 3. Table 9.3 provides suggestions for implementation evaluations.

Year 4 Summative Evaluation

Summative evaluation is conducted at the end of an implementation period to gather data about how well a program meets its objectives/outcomes. This type of evaluation information informs administrators and funders about the program's success or impact—how audiences have changed as a result. An informal summative statement might be "What we have learned." Genuine summative evaluations are fulfilled after the other stages have been met. The Sanctuary Exploration Center will begin its first summative evaluation in Year 4 for programs initiated in Year 1 (See Chapter 3). Lessons learned and conclusions from Year 4 summative evaluations will be built into objectives for the next 5-year plan. Year 5 activities involve using the summative conclusions from Year 1-4 to develop new goals and objectives for the next 5-year plan. Table 9.4 provides suggestions for summative evaluations.

The lessons learned by the Sanctuary Exploration Center and its staff in the first five years of operation will be meaningful to all national marine sanctuaries as they pursue their mandate to increase ocean literacy for future generations through the use of interpretive facilities like the Sanctuary Exploration Center.

Table 9.2. Suggested activities in developing formative evaluations of Sanctuary Exploration Center programs, by audience.

	Year 2 Formative Evaluations – How Is It Working?
Audience	**Examples**
Web Visitors	Invite feedback on web-based information, accessibility, and content
Web Reservations	Ask users for suggestions on improving the form and process
Potential Volunteers	Ask applicants for input on how the application process works and suggestions for improvement
Social Media	Invite social media users to provide feedback on SEC programs
Partner Organizations	Regular meetings with partner organizations provide opportunities for input on SEC programs, and suggestions for improvement
Visitors to SEC	Develop on-line visitor evaluation and invite visitors to participate
Visitors to SEC	Continue docent or staff assessment during interaction with visitors (See outcome-based objectives for Visitor Interpretive Programs, Chapter 5)
Teachers	Include teacher input in development and testing of *This Is Your Sanctuary*
Student Groups	Request student evaluations of *This Is Your Sanctuary,* for both content and format
Spanish-only speakers	Invite feedback from Spanish speakers on SEC exhibits
Community Members	Invite community member suggestions on improvement of SEC programs, communication, and accessibility
SEC Facility Users	Invite users to fill out evaluation forms including suggestions for improvement
Docents	Develop docent evaluation of docent training program
Marketing and Outreach	Initiate marketing and outreach strategies
Internal Evaluation	At year end, invite staff assessment of program success, lessons learned, goals for next year, and apply these comments in the annual review process

Table 9.3. Suggested activities in developing implementation evaluation of Sanctuary Exploration Center programs, by audience.

	Year 3 Implementation Evaluations – What Changes Need to Be Made?
Audience	**Examples**
Web Visitors	Continue to invite feedback on web program access and offerings
Web Reservations	Revise reservation form per user suggestions
Potential Volunteers	Modify self-knowledge assessment per applicant suggestions
Social Media	Respond to social media suggestions, revise quickly if possible to keep interest
Partner Organizations	Formalize suggestions from partners for program improvement
Visitors to SEC	Compile and analyze comments from on-line visitor evaluations
Teachers	Expand teacher evaluation input to include all education programs
Student Groups	Develop student evaluation forms for specific exhibits
Spanish-only speakers	Develop visitor evaluation form for Spanish Speakers
Community Members	Invite community member feedback on programs
SEC Facility Users	Assess user demographics (for-profit, non-profit, government agency, etc) to help inform promotion and outreach efforts for facility users
Docents	Revise docent training program, including addressing docent suggestions
Marketing and Outreach	Assess which marketing and outreach efforts are most effective, revise strategy as needed
Internal Evaluation	At the end of Year 3, spend considerable time with staff reviewing the first 3 years of operation, changes that have occurred, data collected from various evaluation sources, and develop a Year 4 plan that will form the basis of the next 5-year plan.

Table 9.4. Suggested activities in forming a summative evaluation of Sanctuary Exploration Center programs, leading into development of the next 5-year plan.

	Year 4 Summary Evaluations -- What We Have Learned
Audience	**Examples**
Web Visitors	Plan website revision per information gathered by web evaluations
Web Reservations	Summarize change in web reservations over time, document changes made during formative (Year 2) and Implementation (Year 3) period, revise per suggestions
Potential Volunteers	Review self-knowledge assessment to seek patterns of change over time, or if the knowledge has remained essentially the same
Social Media	Document changes in marine resource issue emphasis, document change in number of users of social media
Partner Organizations	Share program revision plans with partners and solicit their input
Visitors to SEC	Compare demographic information over 3 years; determine significant visitor groups, assess where to focus efforts to attract new visitor audiences; summarize suggestions from on-line evaluation
Teachers	Summarize teacher input on of *This Is Your Sanctuary* and apply to new program development
Student Groups	Request student evaluations of *This Is Your Sanctuary.* Review student evaluations of interpretive exhibits
Spanish-only speakers	Compare Spanish speaker attendance to Year 1; review Spanish-speaker evaluations of SEC
Community Members	Assemble community feedback and assess the role SEC plays in community
SEC Facility Users	Compare patterns of use each year; develop targeted user outreach strategy
Docents	Compare docent knowledge base for Year 1,2 and 3. Are docents more ocean-literate than they were in Year 1? Do they begin as docents with the same or different knowledge base from Year 1 docents?
Marketing and Outreach	Compare Years 2 and 3 to Year 1 (very little marketing and outreach). Develop conclusions regarding successful marketing efforts.
Internal Evaluation	Spend Year 4 analyzing and summarizing data from Years 1-4. Lessons and conclusions from Year 4 summative evaluations will be built into objectives for the next 5-year plan. The next 5 year plan for Sanctuary Exploration Center education programs, staffing, community programs, outreach, facility uses website and fundraising. Submit the 4-year evaluation, with baseline objectives for the next 5-year plan, in Year 5.

Appendix A

Interpretive Objectives for

Sanctuary Exploration Center Exhibits

Interpretive objectives for each exhibit are unique to that exhibit, and all revolve around the interpretive themes and messages described here. The following pages provide a listing of interpretive objectives for each Sanctuary Exploration Center exhibit.

1) Exhibit Reference Title: Monterey Bay National Marine Sanctuary

Title: Exploring the Sanctuary

Exhibit Theme: The sanctuary provides crossroads for human and ocean life.

General Description:
This series of screens acts as the introduction to the sanctuary. Each individual screen represents a different message, or talking point, supported by images. The screens and messages change, but every screen will always have an image on it.

The messages are as follows:

- Explore your sanctuary
- Care for your sanctuary
- Protect your sanctuary
- Keep your sanctuary clean
- Your sanctuary needs clean water
- Over 345 species of fishes
- 33 species of marine mammals
- 94 species of seabirds
- 4 kinds of sea turtles
- 450 kinds of seaweed
- Thousands of invertebrates
- Awesome surfing
- Incredible diving
- Wonderful tidepooling
- Excellent boating
- Exciting water sports
- Amazing wildlife viewing
- Pristine coastlines
- Miles of beach to enjoy
- Forests in the ocean
- Preservation of wetlands
- Sanctuary education for the public
- Inspiring children to connect to their sanctuary
- Connecting teachers to our sanctuary
- Sanctuary was designated in 1992

Sanctuary Exploration Center Objectives:
Primary Message: Monterey Bay National Marine Sanctuary is like a National Forest, but underwater.

Secondary Message: MBNMS program works cooperatively with partners and the public to balance enjoyment and use with conservation.

Tertiary Message: Monterey Bay National Marine Sanctuary is a place and a program.

2) Exhibit Reference Title: Watershed

Title: Everyone lives in a watershed.

Exhibit Theme: Watersheds are everywhere; they transport water, connecting the land with the sanctuary.

General Description:
A watershed is an area of land where water collects and drains into a river, lake or ocean. We all live in a watershed whether we live in Salinas or Kansas or India. Even if it can't be seen from home, the water that falls on our roofs flows into a river, a lake and eventually, the ocean. Watersheds come in all sizes from a single hillside that drains into a small creek to all of North America west of the Rocky Mountains that drains into the Pacific Ocean.

12,000 square miles of land drain into the sanctuary through 10 major watersheds and 5 major rivers. A single drop of water from creeks travels more than 200 miles before flowing into the sanctuary at the mouth of the Salinas River.

Video 1 (inside the culvert): From the street to the sea

Primary Message: A watershed is an area of land where water collects and drains into the ocean.

Secondary Message: Human alteration of the natural watershed, whether it is in an urban, rural, or agricultural setting, by its nature impacts water quality.

Tertiary Message: Of the multitude of species that inhabit MBNMS only one, humans, is polluting it.

3) Exhibit Reference Title: Water Quality

Title: Water Quality

Exhibit Theme: Maintaining good water quality is a major task in which everyone has a role.

General Description:
Messages from cutouts whose work depends on healthy water quality
Farmer: Good farming practices help preserve the quality of ocean water through the regulation of potentially harmful runoff.
Fisheries Biologist: The health of salmon depends on that of the whole ecosystem, both fresh and saltwater. Clean water is a necessity to the maintenance of these ecosystems.

Runoff from the streets, neighborhoods and farms all enter the sanctuary, taking with it many pollutants (non-point source pollution). The sanctuary supports several water quality volunteer programs and teaches volunteers how to take samples from rivers and streams that can then be analyzed for pollutants. This is an important aspect of water quality monitoring.

To do your part you can: recycle materials as well as water, dispose of waste correctly to avoid its entry into the watershed ecosystem, use organic practices in gardens and lawns, volunteer for local beach and stream cleanups and never put anything down a storm drain.

Primary Message: People need and rely on clean ocean water.

Secondary Message: Marine life relies on clean ocean water.

Tertiary Message: Threats to clean water come from watersheds, human-based activities, and natural occurrences.

4) Exhibit Reference Title: *Sempervirens*

Title: Land Sea Connections

Exhibit Theme: The environments of the land and sea are closely related and linked. In Santa Cruz county protected groves of redwood trees provide recreational and learning opportunities for the public, in numerous State Parks. The idea of protecting natural environments stemmed in the National and State Park system and has now been duplicated in our ocean environment. The State of California through a rigorous public process, designed a network of marine protected areas (MPAs), where the natural and cultural resources of California's oceans are better protected and actively managed. Locally each of these systems of protected areas has been established to protect some of the forests that provide habitat for hundreds of other organisms. On land the forests are primarily comprised of coastal redwood trees, in the ocean the forests are comprised of giant kelp. The linkage of land and sea are most closely tied through our watersheds. Healthy terrestrial ecosystems can spread, sink and slow naturally occurring run off.

General Description:

Good ideas come ashore
Just north of Santa Cruz lies Big Basin Redwoods State Park, a coastal watershed of majestic redwood forests. Almost lost to logging by 1890, a forward thinking organization called Sempervirens Fund preserved these redwoods in 1902 by establishing California's first state park.

More than 100 years later, the idea of saving land has taken to the sea with the creation of a statewide system of MPAs. Like parks on land, MPAs are carefully managed to protect their special underwater features. Some ban fishing altogether, while others allow a limited amount of harvest.

Together, these special areas ensure that California's natural legacy is preserved for everyone to use and enjoy.

Saving Forests
Burning fossil fuels such as oil and coal release greenhouse gases like carbon dioxide into the air, causing global warming and climate change. Cutting down forests causes climate change too. Healthy forests soak up carbon dioxide and play a key role in moderating earth's climate. Coastal redwoods, the tallest trees on earth can absorb a lot of carbon because of their massive size. Giant kelp forests absorb a lot too, because they grow so tall and fast – up to 10 inches a day.

Healthy Forests Support Healthy Oceans
Just as cool ocean mists help redwood trees survive, healthy redwood forests allow ocean life to thrive. Protecting the forest watersheds of the Santa Cruz Mountains helps keep their creeks and rivers clean. These are the same waters that flow straight into the sanctuary, home of sea otters, giant kelp and other marine life.

Some animals depend upon both forest and sea. Salmon and steelhead trout feed in the ocean, but spawn in cool rivers and streams shaded by towering redwoods. Marbled murrelets, a tiny seabird, nest only in old-growth redwood forests but hunt for shrimp and fish at sea.

Primary Message: The sea and land are connected.

Secondary Message: Conservation methods and management that have worked on land, can also be applied to the oceans.

Tertiary Message: Kelp and redwoods are similar as they create biologically engineered habitat that support biodiversity.

5) Exhibit Reference Title: Geological Diversity

Title: Geology - The Sanctuary's Foundation

Exhibit Theme: Monterey Bay National Marine Sanctuary is an extremely diverse geologic area.

General Description:

Geology Wall – *Geology: the sanctuary's foundation*

Davidson Seamount is one of the largest seamounts in U.S. waters.

Monterey Bay has one of the longest stretches of sandy beach on the west coast!

The sanctuary's deepest point is within the Davidson Seamount Management Zone, 12,713 feet (3,875 m) below the surface.

If Davidson Seamount were on land, its base would reach from Santa Cruz to San Jose and its peak would rise about 5 times taller than the Empire State Building! (You can also state, that it would be like going over Donner Pass to get to San Jose).

Geology Wall Graphic Panels

The Sanctuary's seafloor is anything but flat
Lots of landforms mean lots of biodiversity
Like on land, dramatic mountains, sheer cliffs, steep canyons, rolling hills and flat plains surround the sanctuary and continue below the water line.
In fact, the sanctuary contains one of the most diverse sections of seafloor in the world, and it's always changing. Landslides, earthquakes, currents and erosion affect the bottom of the sea just as they affect the surface of the land.
Variety is the key
Different rock types within the sanctuary provide a variety of habitats for bottom-living organisms.

Nearshore habitats in the sanctuary
This small area is the best known
Most of the seafloor is largely unexplored. SCUBA divers can reach only 5% of the sanctuary, the closest to the shore. The water in the other 95% of the sanctuary is deeper than 130 feet (39.6 m) and scientists must use submersibles and other deep diving equipment to access it.
Nearshore can be a rocky reef, sandy beach or even mudflats. All are important habitat for organisms in the ocean.
Deep-water habitats close to shore
Narrow but important
On the East Coast of the United States, the continental shelf can be more than 75 miles (120 km) wide. By comparison, the West Coast has a very narrow continental shelf ranging from more than 25 miles (about 19 km) to only a mile or two wide.

Because the shelf is narrow, animals from the deep sea rise to the surface close to the sanctuary's shore.

The edge of the continent
The continental shelf and slope make up 94% of the sanctuary's seafloor but you'll probably never see these deep areas that are full of life. Worms, crabs, fishes, and other animals beyond counting live in, on and over the soft sandy bottom.
The continental shelf is a gently sloping, underwater plain that stretches from the shoreline to depths of 656 feet (200 m). The continental slope begins at the edge of the shelf and gradually falls away to more than 13,000 feet (4000 m) below the surface.

The sanctuary's submarine canyon
It gets really deep here really fast
The sanctuary is sliced by a series of canyons that cut through the continental shelf and slope. The largest, deepest and most complex of these is the Monterey Canyon System.
Monterey Canyon begins about 60 feet (20 m) from shore at Moss Landing and drops more than 10,663 feet (3250 m) below the sea's surface. Other canyons flow into this one along its more than 40-mile journey toward the deep sea.
The canyons are cold and dark. They're also home to many amazing organisms that never see the light of day.
Grand Canyon compared to the Monterey Canyon System
Monterey Canyon is similar in both shape and depth to the Grand Canyon.

Mountains in the deep
Davidson Seamount
This extinct volcano last erupted about 10 million years ago. It's one of the very few Pacific seamounts that have ever been explored.
Ocean currents sweep water from the deep sea up the sides of the seamount. The nutrients in the water feed a food web that includes forests of deep-sea corals, as well as plankton, fishes, seabirds, and marine mammals in the waters above the seamount.
What is a seamount?
Seamounts are underwater mountains that rise at least 3,281 feet (1000 m) above the surrounding seafloor without breaking the sea's surface. Most seamounts are extinct underwater volcanoes.

Geology Counter and Artifacts

Wave Dynamic Model
The secret to making an effective wave is to rock the display slowly from bumper to bumper to avoid splashing and in time with the natural flow of colored water. You should reach the bumper with the side of the Plexiglas container just before the water.

Sanctuary Sands
Five sand samples from different beaches in the sanctuary are displayed as follows from north to south (from left to right):

North Coast (near Davenport): light buff colored, medium to coarse grained

Monterey Bay (near Capitola): medium tan with a fair amount of dark brown and black grains, fine grained

Carmel Beach: light grayish white peppered with fine black flecks, fine to very fine-grained

Big Sur Coast: Dark grayish browns mixed with earthy greens, reds and white, rounded coarse sand to pebble grain sizes (no fines)

Cambria: dark grayish browns, greens, reds with noticeably less white than Big Sur sand, fine through coarse sand and pebbles

Five samples of bedrock that occur in the Coast Ranges where most of the sand in the sanctuary comes from are also displayed (discussed here from youngest to oldest):

Purisima Formation (Sandstone): Dark gray fossiliferous sandstones and siltstones often containing bright white mollusk shells. These rocks were deposited in near shore marine environments during the Pliocene to upper Miocene approximately 7 to 2.5 million years ago. The fossil shells are easily visible without magnification and resemble the shells of clams and snails that still inhabit the near shore intertidal and subtidal parts of the sanctuary today. The formation also contains thick layers of volcanic ash, which may have come from volcanoes as far away as Oregon and Idaho. These can be seen in the wave cut cliffs that expose the formation near Ano Nuevo.

Santa Cruz Formation (Mudstone): Fine grained tan colored rocks that were originally deposited in the near shore marine environment during the upper Miocene from approximately 10 to 7 million years ago. These sediments formed into pale, usually clearly layered rocks that are often exposed in steep sea cliffs between Santa Cruz and Half Moon Bay. The rocks are soft enough that boring clams can make a home in them, which means they are also susceptible to Seacliff erosion and coastal retreat.

Monterey Formation (Chert): Soft light gray to buff colored fine grained, often thinly layered, sedimentary rocks of sandstone, shale, mudstone, and chert deposited in several deep oceanic basins along the continental edge during middle Miocene time from approximately 20 to 12 million years ago. The mighty Monterey is probably the strangest and most valuable rock formation in California. It contains many commercially valuable mineral products including diatomite, phosphate, and petroleum. It is the source of most of the oil production in southern California and it was the thought of avoiding another environmental disaster like the 1969 Santa Barbara Oil Spill that lead to the creation of the Monterey Bay National Marine Sanctuary. A ban was placed on offshore oil development because Monterey Formation rocks underlie vast portions of the sanctuary. The Monterey Formation, somewhat ironically, is also of great value to environmental scientists who study climate change as it yields one of the best records of ancient climate data during periods of global warming of any rocks on the planet.

Hobnail Granite (Granite): Distinctive white and pink igneous rock peppered with black flecks that makes up much of the Monterey and Carmel Peninsula area. It formed inside a magma

filled pluton deep under a volcano and it is approximately 90 million years old. It gets its name from horseshoe nails called "hobs" because when the nails stick up out of horseshoes the horse is said to be "hobbled". It is full of blocky pinkish crystals of feldspar that resist weathering better than the other minerals in the granite and thus stick up in relief like hobnails especially in the intertidal areas of the sanctuary. It is very similar to some granites to the south in the Gabilan and La Panza Ranges and some geologists think it may be a piece of the southern Sierras that has broken off and moved north along the San Andreas Fault.

Franciscan Formation (Chert): This red and green silica rock shot through with white filled fractures began life as deep ocean sediments known as radiolarian ooze. These sediments, which formed from radiolaria (zooplankton) skeletons raining down in the deep Pacific ocean far from land, are probably about 145 to 150 million years old. They were later cooked, fractured, and crumpled over the approximately 100 million-year interval during which the old oceanic Farallon Plate was being shoved under the western edge of North America into the Franciscan Trench. The Franciscan Formation is an impossibly jumbled mass of old ocean basalts and sediments which have been metamorphosed (recrystallized with heat and pressure) and brought to the surface to give us a rare glimpse inside a subduction zone. The formation contains some amazing and rather uncommon minerals such as green serpentenite and jade, white moonstone, and blue ecologite, which all are considered semi-precious translucent gemstones.

Post-script: Eventually, about 30 to 40 million years ago, the Farallon Plate was consumed, the trench closed off and the collision direction of the boundary changed to a transverse (side to side rather than up and down) motion between North America and the Pacific Plate leading to the formation of the San Andreas Fault about 30 to 15 million years ago and the many other related parallel faults that slice through the sanctuary and adjacent Coast Ranges. This system of faults has moved pieces of the Pacific Plate to the north as far as 350 miles from their point of origin and if it keeps up at it's historic rate, the sanctuary will be in Alaska in another 20 million years.

In answer to the question - Which rock do you think contributed to which sand?

The right answer is technically all of the rocks probably contributed in some proportion into all of the sands because sand moves readily along the coast generally from north to south with the prevailing currents. It is possible, however, to see that some rocks are more dominant contributors at some beaches. Often the bedrock that is closest to the beach contributes the most to the sand but it is an open system, which is a good reason to keep our beaches as clean as possible so no trash enters the sanctuary and moves through it along with the sand.

Fouling Bottle
Biological fouling is the accumulation of microorganisms, plants, algae, and animals on surfaces exposed to the marine environment. Fouling of a new habitat occurs in more or less orderly and predictable stages, such change is known as ecological succession.

Davidson Basalt
The volcanic rocks found on Davidson Seamount are predominantly alkalic basalt, hawaiite, mugearite, and trachyte. These lavas are highly viscous (thick and pasty) and indicate explosive eruptions of gas-rich lava near the summit of the volcano.

Deep Sea Coral
This coral collected from the Davidson Seamount is over 100 years old. Deep-sea corals provide high-relief habitat that is ecologically diverse and intrinsically valuable due to the fragility and age of these living organisms.

Whale Ear Bones
The tympanic bone is unique to whales. It houses the bones of their inner ear. Tympanic bones of all whales are extremely hard and dense, and are common fossils found in marine sediments. These items were generously donated by the Volarvich Family

Primary Message: Under the surface of the water, there are amazing geologic features- some as grand as those found in our national parks.

Secondary Message: Diverse geology means diverse biology.

Tertiary Message: Monterey Bay National Marine Sanctuary is anything but flat.

Additional Messages:
- A river of sand moves along the coast.
- Geology matters to people too! Thank the local geology if you enjoy the beaches, surfing, tidepooling, or kelp forest diving!
- The unique geology found underwater is also responsible for the climate of our coastal region – making it ideal for agriculture, viticulture, and of course, tourism.

6) Exhibit Reference Title: Interactive Video Kiosk (IVK) – Rear Projected Map

Title: Exploring the Sanctuary

Exhibit Theme: The Monterey Bay National Marine Sanctuary is a special place that helps preserve and protect diverse habitats and resources.

General Description:
Interactive portion (explored by visitors via virtual foot, kayak, submersible or research vessel):
What can I see in the sanctuary?

- There are all kinds of geological features in the sanctuary. Each is unique in the community it supports and way it affects the water around it.

Point Lobos State Reserve

- The layers of rocks here are about 100 million years old. Beneath the water, the rocks support lush kelp forests and many kinds of organisms.

Monterey Canyon System

- A series of submarine canyons including Carmel Canyon and the Monterey Canyon System carry rivers of sediment down to the base of the continental rise. There's enough material at the foot of Monterey Canyon to fill the Grand Canyon almost 100 times.

Elkhorn Slough

- The slough (pronounced "slew") is California's largest remaining tidal salt marsh outside of San Francisco Bay. It provides much-needed habitat and is a vital nursery for marine animals.

Davidson Seamount

- Underwater mountains like Davidson rise up from the deep seafloor. They are home to amazing communities of sea life where scientists continue to discover new kinds of organisms.

Cold Seeps

- In places called cold seeps, chemical-rich fluids in seafloor sediments support unusual life forms such as bacteria, clams and tubeworms.

Sand dunes

- For millions of years, ocean currents built up the sand dunes that cover about 40 square miles of Monterey Bay's coast. These dunes are eroding fast, because jetties capture the sand in the sea and plants that kept the dunes from blowing and washing away are now gone.

Sandy beaches

- You can find beaches all along the California coast. Where there's a beach, there's usually trash that gets into the ocean. Each year, volunteers remove thousands of pounds of trash from California beaches - 904,000 pounds in 2007 alone!

Maverick's

- Surf's up in the sanctuary! Storm waves from the Pacific and an underwater rocky reef make Maverick's the site of some of the largest waves in the world that anyone surfs on.

Coastal erosion

- This landslide was a result of the Loma Prieta 7.2 earthquake on October 17, 1989. Landslides and other forms of coastal erosion are one of the major sources of sediment in the sanctuary's near shore waters.

Big Creek State Marine Reserve

- Big Creek is one of nine no-take State Marine Reserves within the sanctuary. Fishes and other organisms from these protected reserves help to repopulate areas where harvesting is allowed.

USS Macon

- This sunken treasure is one of more than 140 shipwrecks and other submerged cultural sites within the sanctuary. The dirigible was built in 1933 as a search aircraft. Within two years, she was damaged in a storm and sank in deep water off Point Sur.

Ano Nuevo and Piedras Blancas

- Elephant seals thrive in the sanctuary from October through May. Ano Nuevo State Natural Reserve in the north and Piedras Blancas in the south is the largest mainland breeding colonies in the world for these marine mammals.

Devil's Slide Rock

- Close to 3,000 common murretts nested here as recently as the early 1980s. The colony disappeared after an oil spill in 1986. The U.S. Fish and Wildlife Service began a restoration project in 1996 and the colony is growing back toward its former size.

Big Sur

- If you visit the Big Sur Coast, you can see geology in action! You'll have to be patient, though. These rocks rise about .4 inches (1 cm) a year.

Primary Message: The Monterey Bay National Marine Sanctuary is a special place that helps preserve and protect diverse habitats and resources.

Secondary Message:
There are many ways, places and mechanisms for you to explore your Monterey Bay National Marine Sanctuary.

7) Exhibit Reference Title: Leatherback Turtle Interactive Video Kiosk (IVK)

Title: Leatherback Interactive

Exhibit Theme: Leatherback turtles are active within the sanctuary and are a major beneficiary of sanctuary protection.

General Description:
The leatherback turtle is the largest sea turtle in the ocean and also the largest living reptile in the world.

The western Pacific population (Papua Barat, Indonesia) of leatherbacks has two nesting peaks, one in January, and the other in July. A portion of the July nesters generally arrive at the central California coast during June/July and stay here until October/November. There is a total population of 300-4000 reproductive females. It is estimated that an average of 180 come to coastal California waters to forage on jellies.

These turtles travel across the Pacific (Papua Barat, Indonesia to Monterey Bay) in a timeframe of 11-12 months. Scientists have used satellite tracking to follow the turtles across the Pacific. After feeding on jellies in the Monterey Bay the leatherbacks then go back to Indonesia to lay eggs. Leatherback populations are steadily declining because of many threats: egg poaching, plastics, predators, nets, ship strikes, and habitat destruction particularly to nesting beaches. We can help protect these magnificent creatures by not using plastic bags, balloons and cleaning our watersheds in our daily lives.

Interactive:
- The leatherback turtle is the largest living reptile in the world. They can get up to 2000 pounds and travel 7,000 miles across the Pacific Ocean from Indonesia to Monterey Bay.
- Help your leatherback fuel up on jellies for its long migration across the Pacific Ocean.
- Directions: Swipe your finger back-and-forth to move your turtle in the direction of its prey.
- Oops! Your turtle thought the plastic bag was a jelly. They can die from eating garbage in the ocean.
- Track your turtle across the ocean. Be careful, this is a long journey and there are many challenges.
- Oops! These turtles are prey for top predators in the ocean.
- Oops! There are many hazards for turtles crossing the Pacific Ocean and ship strikes are just one of them.
- A leatherback lays about one thousand eggs during a nesting season, but only 1-2 hatchlings will survive to become a mature adult.

Primary Message: Monterey Bay National Marine Sanctuary is a critical habitat for leatherback turtles.

Secondary Message: Leatherback turtles come to Monterey from Indonesia to feed on jellies found in these waters.

Tertiary Message: Leatherback turtles have a hard life and current populations are low due to many threats. How can you help them?

8) Exhibit Reference Title: Whale Fall Interactive Video Kiosk

Title: Whale Fall Interactive

Exhibit Theme: Visitors can explore the ocean bottom including fallen whale skeletons as well as the decomposers feeding on them.

General Description: Deep-sea exploration is undertaken via submersible or SCUBA. A main feature of the MBNMS sea floor is whale falls where a whale's carcass has sunk to the bottom to be fed on by a plethora of organisms that catalyze its decomposition.

Interactive:
Whales Falls are whales that die and sink to the bottom of the seafloor providing a feast for deep-sea animals. Come explore some of these unique animals living on a whale fall by diving down in a submersible:

- Hagfish are built to survive! They can go up to seven months without eating and produce an oozy slime to protect themselves.
- The Rattail is stinky because of high levels of a chemical that help prevent them from drying out. This deep-sea fish can live up to 30 years!
- Osedax eat the bones of this dead whale and they don't have mouths or stomachs. Instead, they extend root-like structures into the bones to digest fats and proteins.
- Squat lobsters hide under rocks and use their long, sharp claws to catch food that float by in the water.

Primary Message: Whale falls are an important and little known resource in the Monterey Bay National Marine Sanctuary.

Secondary Message: Whale falls support a great diversity of organisms that enhance the overall biodiversity of MBNMS.

Tertiary Message: The organisms found on whale falls provide an important ecological function.

9) Exhibit Reference Title: Side-Scan Sonar Interactive Video Kiosk

Title: Side-scan interactive

Exhibit Theme: Side-scan sonar is an important tool in exploring the seabed. It provides a picture of the seafloor including its contours and any debris or even shipwrecks that may lie there.

General Description:
Side-scan sonar is a technology that scientists use to map the underwater features of the Monterey Bay National Marine Sanctuary. This technology is usually deployed using a device known as a tow fish. The tow fish is dragged behind a research vessel and is connected by a tether that sends and collects information. The tow fish sends sonar waves down to the seafloor and collects information of the features below based on the return sound waves. Side-scan sonar has been used on MBNMS to record not only the bathymetry, but also collect data on cultural resources in the sanctuary such as planes and shipwrecks.

Side-scan is just one of many technological devices that is currently used in the sanctuary. Other important technologies include: remotely operated vehicles (ROVs), automated unmanned vehicles (AUV), submersibles, and other mapping technologies such as multi-beam.

Interactive "Seeing Underwater with Sound"
- Like whales who use echolocation or sound to see underwater, scientists use sonar to map underwater features.
- Explore the Sanctuary using a side-scan sonar to discover what lies at the bottom of the sea.
- Davidson Seamount
  - This side-scan sonar image shows the Davidson Seamount, an underwater mountain rising up 7,840 feet from the ocean seafloor. Did you know the Davidson Seamount was once an active volcano? It is thought to have last erupted 9.8 million years ago.
- USS Macon
  - This side-scan sonar image is of the remains of the USS Macon, a 785-foot dirigible, which was lost offshore of Point Sur in 1935. Scientists used side scan sonar to locate the Macon's remains in 1990.
  - Because there are no longer rigid hull dirigibles, the Macon wreck site provides an opportunity to study the relatively undisturbed remnants of a unique time in aviation history.
- Shipwrecks
  - There are almost 400 documented shipwrecks and aircraft wrecks in the Sanctuary.

  Scientists used sonar to produce high quality maps of the wrecks, like these of the oil tanker Montebello. The tanker was sunk by a single torpedo fired by a Japanese submarine during World War II on December 23, 1941.

Primary Message: Side-scan sonar is an important technology that allows scientist to better understand the Monterey Bay National Marine Sanctuary.

Secondary Message: Side-scan sonar can be used to map the underwater topography (called bathymetry) of the sanctuary.

Tertiary Message: Side-scan sonar is also used to map the cultural resources found in the sanctuary such as the USS Macon and the Montebello.

10) Exhibit Reference Title: Intertidal Biodiversity

Title: Tide pools - where the land meets the sea

Exhibit Theme: While one of the smallest areas of the sanctuary, the tidepools of the rocky shore is perhaps the most visited area and is home to diverse array of adaptive life.

Explore tidepools respectfully.

General Description:
The rocky shore is one of the most visited habitats in the sanctuary even though it's one of the rarest (overall area in comparison to other habitats). This narrow strip where the land meets the sea is home to an amazing variety of life. Please explore carefully. Watch your step when you visit tide pools and remember the animals are alive. Touch animals gently and put them back where you found them. If everyone took animals home, there wouldn't be any left! The best way to help is to take home trash. Litter is bad for the sanctuary.

Twice a day, the tide rises and falls on the rocky shore. High tide brings crashing waves. Low tide exposes the habitat to drying sun and hungry predators. Plants and animals that live here have adaptations, which are changes to their bodies and behavior that help them survive on the rocky shore.

Interactive (touching tidepool):
Barnacle, Chthamalus spp.
- Barnacles stand on their heads and eat with their feet.
- Barnacles are filter feeders and live in the high tide zone of the intertidal.

Striped shore crab, Pachygrapsus crassipes
- Shore crabs hide under rocks. If you turn rocks over, be sure to put them back.
- Crabs don't bite, they pinch.

California mussel, Mytilus californianus
- Mussels close up tight when the tide is low to keep from drying out.
- Mussels glue themselves to rocks with special threads with the strength of super glue.

Ochre star, Pisaster ochraceus
- Ochre stars use thousands of tube feet to stick on rocks, so touch carefully and don't try to pull them off.
- Ochre stars are a top predator in the tidepools feeding on mussels and snails.

Giant green anemone, *Anthopleura xanthogrammica*
- Touch anemones gently and never poke them.
- Giant green anemones have stinging cells like their relatives, the jellies.

Bat star, Patiria miniata
- Bat stars stick their stomach out of their body to eat.
- Bat stars are named for the webbing between their arms, which resemble a bat's wings.

Owl Limpets, Lottia gigantea
- Owl Limpets have a home they return to on the rocks.
- Many owl limpets find their home scar, a place on a rock where they regularly return to rest.

Black Abalone, *Haliotis cracherodii*

- Abalone are flat snails that eat seaweed on the rocks.
- Declared an endangered species in 2009, Black abalone can be found deep in rocky crevices.

Tidepool Interactive Quadrat:
The user will follow instructions to perform a species count as well as learn about tidepools and the organisms that call them home.

- There are two high tides and two low tides everyday in the sanctuary.
- Sanctuary scientists monitor tidepools to track changes over time. Let's study the tidepool by counting important animals that live here.
- Ochre stars are a top predator, like a tiger in a jungle.
- Mussels are indicators of a healthy community and provide habitat and food for other organisms.
- Turban snails are grazers and make room on the rocky shore for other organisms to settle.
- Sun burst anemones are more common in southern California. Seeing more of these in northern California could be a sign the water is warming.

Primary Message: The rocky shore is the interface between the land and the ocean and provides homes to hundreds of seaweeds, invertebrates, arthropods, and fishes.

Secondary Message: The rocky shore is one of the most highly impacted ocean habitats due to its accessibility.

Tertiary Message: Remind visitors to use a few simple tips to explore gently to protect this diverse area.

11) Exhibit Reference Title: Kelp Forest Biodiversity

Title: What lives in a holdfast?

Exhibit Theme: Kelp forests are home too much more than kelp and display a great amount of biodiversity.

General Description:
Many seaweeds such as giant kelp anchor themselves to the rocky seafloor with holdfasts. They may look like roots but they work like apartment complexes. Giant kelp holdfasts are full of nooks and crannies just the right size for hiding tiny creatures. The average holdfast may house thousands of animals from 6-inch brittle stars to microscopic shrimps. Researchers have found as many as 178 different species of animals in kelp holdfasts.
Nutrient rich waters produce a biodiverse ecosystem.

Interactive (climbing the kelp forest):
Visitors are able to climb from one level of the kelp forest to another as well as explore and learn about the species at each level.
Levels:

1) Canopy
   a) Gas-filled bladders raise kelp fronds to the surface where the leaf-like blades spread out to form a canopy.
   b) Blades collect energy from sunlight and nutrients from seawater. Giant kelp can grow as much as 2 feet (.6 m) per day!
   c) A single giant kelp can rise 100 feet (30.5 m) to the surface and still have another 100 feet (30.5 m) of canopy!
   d) On the surface the kelp canopy provides habitat for sea otters and birds.
   e) These juvenile rockfish settle in the canopy of kelp forests and move to the bottom where they continue to grow and eat small organisms.
   f) You'd be surprised how many products you use regularly that contain some form of kelp or other seaweed.
2) Midwater
   a) Giant kelp don't have roots, stems, leaves or flowers like land plants.
   b) Hundreds of snails, crabs and other invertebrates find food and shelter in kelp.
   c) These sea slugs attach themselves to the kelp and catch plankton with their big hood. Out of water, they smell like lemons!
   d) Leopard shark: Not all sharks are dangerous. This leopard shark eats smaller prey including worms, shrimps, crabs and clams.
3) Holdfast
   a) A kelp's holdfast looks like roots but works like an anchor. Instead of absorbing nutrients from the soil, these little haptera hold the kelp tight to the rocks.
   b) A single holdfast can have over 250 different species living in or on it.
   c) Herbivores like urchins and abalone eat lots of kelp. Sea otters eat enough urchins and abalone to keep local kelp forests lush. Sometimes kelp forests get out of balance: too few sea otters lead to too many urchins and abalone feeding on the kelp.

d) Can you see the octopus in this photo? Octopus are experts in camouflage and hide from predators in the kelp forest.

Interactive Species Identification:

- Cobalt blue sponge, Hymenamphiastra cyanocrypta This cobalt sponge is an animal. Its bright blue color comes from an algae that lives in the sponge.
- Crustose coralline, Lithothamnion californicum This pink algae contains calcium, forming a crusty cover over rocks.
- Purple sea urchin, Strongylocentrotus purpuratus: Although sea urchins have many sharp spines all around them, sea otters have no problem breaking them open to eat their insides.
- Red abalone, Haliotis rufescens: This red abalone is actually a giant snail with one large muscular foot used to clamp down on rocks and to protect itself from predators.
- Bat star, *Patiria miniata*: Nothing goes to waste on the kelp forest floor where clean-up crews include abalone, crabs, sea urchins and these bat stars.
- Decorator crab, Loxorhynchus crispatus: The decorator crab takes camouflage to the extreme.
- Sunflower star, Pycnopodia helianthoides: Sunflower stars have up to 24 arms and use thousands of tiny tube feet to move. algae, sponges and other animals on its back to hide from predators.
- Puff ball sponge, Tethya aurantia: The orange puffball sponge is a filter feeding animal about the size of a softball.
- Harbor seal, Phoca vitulina: Harbor seals are often seen lounging on rocks, but underwater they swim through the kelp forest with grace.
- California sea otter, Enhydra lutris nereis: Sea otters carry a rock in their armpit and use it as a tool to crack open clams, urchins and other shellfish.
- Vermilion rockfish, Sebastes miniatus: This Vermilion rockfish is just one of more than 50 species of rockfish in the Sanctuary. Some rockfish can live over 100 years!
- Kelp rockfish, Sebastes atrovirens: Kelp rockfish are often found hanging around giant kelp blades where they blend in to hide from predators.
- Wolf-eel, Anarrichthys ocellatus: Wolf-eels hide in rocky crevices waiting for crabs whose shells are no match for their large sharp and grinding teeth.
- Mola mola, Mola mola: Ocean sunfish or Mola mola are the world's largest known bony fish and can get as large as 5,000 pounds. They feed mostly on jellies and come to kelp beds to be cleaned by other fish.
- Northern anchovy, Engraulis mordax: Anchovies feed on plankton and are an important prey for many other animals in the food web.
- Giant kelp, Macrocystis pyrifera: Giant kelp is the sanctuary's largest kelp creating a habitat for hundreds of organisms.

Primary Message: Kelp forests are a distinguishing feature of the sanctuary.

Secondary Message: Kelp forests are one of the most productive habitats on earth.

Tertiary Message: Kelp forests provide food, shelter, and nursery grounds for many animals.

12) Exhibit Reference Title: Marine Protected Areas

Title: Sanctuary and MPAs

Exhibit Theme: MPAs and marine reserves protect both the health of the ocean and the future of humans on the ocean.

General Description:
Marine Protected Areas (MPAs), are like underwater parks, special areas where human activities are carefully managed to protect their natural or cultural features. In some MPAs like MBNMS some extractive human activities are permitted, while in others like California State Marine Reserves activities such as fishing are prohibited. MPAs preserve the biodiversity of an area and allow more individual organisms to survive without threat of harvesting which leads to healthier populations.

Talking Heads Exhibit Script:

SCUBA diver: Wow, I was at Point Lobos today diving and the water was so beautiful.

NOAA Manager: Did you know that Point Lobos is a MPA?

Diver: MPA, what's that?

NOAA: Well actually, MPAs, or Marine Protected Areas, are like underwater parks -- special areas where human activities are carefully managed to protect their natural or cultural features.

Diver: I saw the biggest rockfish in the kelp forest there. Can you fish in an MPA?

NOAA: That's a great question, In some MPAs like the Monterey Bay National Marine Sanctuary, we can surf and fish while others like Marine Reserves, and you can't fish or take anything at all.

Diver: I once saw a huge rockfish in the kelp forest, it was as big as my head.

NOAA: Exactly, that's one benefit of a marine reserve, there's no harvesting allowed. The fish get really big and the bigger the rockfish, the more eggs it has to reproduce more young.

Diver: I always see all kinds of creatures out there.

NOAA: Well, that's just another benefit of marine protected areas. They help preserve the variety of animals and plants, or biodiversity, of an area.

Diver: This is so cool. We should go out and explore the sanctuary!

NOAA: I agree! We need MPAs to ensure all of us can continue to dive, fish and enjoy these underwater treasures while maintaining a healthy ocean for the future.

Primary Message: Marine Protected Areas (MPAs) are like underwater parks -- special areas where human activities are carefully managed to protect their natural or cultural features

Secondary Message: MPAs are a tool for conservation of our ocean resources.

Tertiary Message: MPAs can have different rules and regulations. In Monterey Bay National Marine Sanctuary, we can surf, scuba dive and fish, while others like California State Marine Reserves, you can't fish or take anything at all.

13) Exhibit Reference Title: Deep sea submarine canyon

Title: Research and Science in the Submarine Canyon

Exhibit Theme: New discoveries are still being made as the secrets of the deep are exposed through technology and scientific exploration.

General Description:

Graphic Panels:

The sea is mysterious, dark and deep
Most of the sanctuary is pitch black, very cold (less than 45° F, 7° C) and under a lot of pressure. The animals that live there have developed some interesting ways to survive.

Many deep-sea animals have great big eyes like the Pacific Grandier and other have no eyes at all.
Some glow in the dark while others are transparent and camouflaged.

This threadfin snail has large sensory pores to feel the vibrations of animals swimming nearby.

Jellies snare food that bump into their long tentacles.

Scavengers like crab feast when old kelp and dead whales sink from above.

Exploring the deep
Technology makes it possible.
Researchers first dipped into the deep sea with nets. Unfortunately, the delicate animals rarely survived the trip to the surface and were often destroyed by the nets themselves.

Remotely Operated Vehicles (ROVs) allow researchers on the ship to take samples, photos and video from as deep as 22,9666 feet (7,000 m). That is nearly two miles deeper than the deepest part of the sanctuary.

Pressure is a big challenge for underwater exploration. At the bottom of the Monterey Canyon (10,560 feet or 3,200 m), the pressure is 320 times greater than at the surface. That's strong enough to compress a Styrofoam cup to the size of a thimble.

Deep-sea biodiversity
Predatory tunicate: *Megalodicopia hians*
Dumbo Octopus: *Grimpoteuthus*
Eelpout: *Lycodes diapterus*
Tumbleweed anemone: *Liponema brevicornis*
Rockfish: *Sebastolobus*
Sea Cucucmber: *Pannychia moseleyi*
Deep-sea Sole: *Embassichthyes bathybius*

Bubblegum Coral: *Paragorgia arborea*
Blob Sculpin: *Psychrolutes phictus*
Crab: *Lithodidea*
Yellow Sponge: *Staurocalyptus*
Basket Star: *Gorgonocephalus eucnemis*
Mushroom Coral: *Anthomastus ritteri*
Fly-trap anemone: *Hormathidae*

Primary Message: Scientist use technology, such as remotely operated vehicles to explore deep sea environments of the Monterey Bay National Marine Sanctuary.

Secondary Message: The deep-sea areas of the sanctuary are diverse areas, where scientist are still discovering new organisms.

Tertiary Message: Deep-sea organisms are very odd looking, and have developed unique adaptations to deal with their surrounding environment.

14) Exhibit Reference Title: Fisheries

Title: Fishing - a local tradition

Exhibit Theme: Fishing is an important focus of conservation as well as economic sustainability efforts.

General Description:
This exhibit is a flat screen monitor that rotates between four different panels, the text found in those panels is below.
An additional interactive is planned for this area.

Fisheries Interactive:
How to catch calamari

- In late spring, look for boats offshore shining bright lights on the bay by night. That means the market squid have returned to the Sanctuary. They come by the thousands to mate and lay eggs on the seafloor.
- Although these squid live less than a year, each female lays 1,000 to 2,000 eggs. The result is lots of squid to maintain the natural squid population, feed the food web and support a local fishery.
- Market squid (called calamari in restaurants) along with sardines, anchovies and mackerel make up Monterey Bay's wetfish industry.
- When fishermen locate a school of squid or fish, they surround it with a net called a purse seine. Then they draw the bottom of the net closed and haul in the "purse," or pouch, and pump the catch into their boat.

A 10,000 year history

- People have fished the rich waters of Monterey Bay for the last 10 centuries. Native Ohlone peoples were first, followed by Chinese, Portuguese, Italians, Japanese and Vietnamese.

Fishing - a local tradition

- Fishing has long played a key role in this region's economy. The community of researchers, managers and fishermen are working on ways to maintain a sustainable catch so we'll be able to fish for centuries to come.

Primary Message: Fish are wildlife and an integral element of healthy marine ecosystems.

Secondary Message: The sanctuary contains many commercially valuable fish.

Tertiary Message: If we catch fish faster than they can reproduce and survive, we'll overfish them and there won't be any for years to come.

15) Exhibit Reference Title: Open Ocean Mini Theater

Title: Seasons of the Bay

Exhibit Theme: The open ocean mini theatre explores an area of the ocean that is vast and hard to study/visit. The open ocean is an expanse of limitless blue that is visited by large migratory animals. These animals, commonly referred to as charismatic megafauna, provide a sense of awe and inspiration. The changing oceanic conditions and the migratory patterns of large organisms lead to a pattern of change based on the seasons.

General Description:
Seasonal Video:
Summer ~ Transition
Fall ~ Oceanic
Winter ~ Davidson
Spring ~ Upwelling

Outline

I. Introduction (30 seconds)
II. Davidson Period (1.40 minutes)
III. Upwelling Period (4.5 minutes)
IV. Oceanic Period (2.5 minutes)
V. Conclusion (30 seconds)

Seasons of the Monterey Bay National Marine Sanctuary
There are three "seasons", or periods, in the ocean waters of the Monterey Bay National Marine Sanctuary; the upwelling period, the oceanic period, and the Davidson Current Period. Across the seasons water temperatures change, the types of food animals can find changes and the types of animals visiting the Sanctuary changes. Although the seasons are only one factor of many, they strongly influence the biological bounty found in Sanctuary waters.

The Davidson Current Period occurs in winter (from November through February) and is named after a coastal current that appears during this time. The Davidson Current runs from the south to the north right along the coast bringing relatively warm water northward mixing and moving water closer to shore.

During this time, it typically rains a lot and rainwater rushes from the land into the sea. Because so much freshwater enters the sea during this time its salinity is lower than any other time of year.

Big winter storms churn big waves. These winter waves mix the water at the surface of the ocean with deeper, colder waters. Shorter day lengths allow less sunlight to penetrate into the ocean. As a result, plankton becomes less abundant. Along the coast, wave-churned waters become filled with sediment, decreasing the penetration of sunlight further. Kelp forests get decimated as churning waves rip up large or entire sections of the underwater forest.

The ocean temperature decreases compared to September and October, but does not reach the lowest temperatures of the year. Water temperatures range between 50 and 60 degrees Fahrenheit.

During the Davidson Current period, elephant seals haul out on coastal and island beaches to have babies and to reproduce. Gray whales migrate offshore to their breeding grounds in Mexico. Late in this season, as days lengthen, sunlight is able to penetrate through ravaged kelp forests to the seafloor, initiating a new cycle of life for the kelp forests.

The Upwelling Period usually occurs from March through August. During this time winds from the northwest blow surface waters out to sea. As surface waters move offshore, deep, cold, salty waters from below rise to take their place. The movement of deep, nutrient-rich, cold water to the surface of the ocean is called upwelling.

In the ocean, nutrients are necessary for the growth of tiny plants called phytoplankton. Phytoplankton use nutrients from the water and energy from the sun to grow. During the upwelling period, there are a lot of phytoplankton in the Sanctuary. The large numbers of phytoplankton attract animals that eat phytoplankton. Tiny ocean animals called zooplankton feed on phytoplankton. Larger animals like krill anchovies, sardines, and mackerel can be found feasting on plankton. These animals, in turn, attract larger predators. Plankton, fish, birds, and mammals abound during this ocean season.

Kelp forests also depend on nutrients. Nutrients bathe winter-ravaged kelp forests. Increased day-lengths allow sunlight to stream down to the bottom. Nutrient-rich waters and lots of sunlight provide optimal growing conditions for the kelp forest and the kelp quickly towers towards the surface. By June, a well-established kelp canopy blankets the surface of the water.

During the upwelling period, you are likely to see some of the Sanctuary's largest inhabitants feeding on some of the smallest! Huge humpback and blue whales arrive to feed on tiny plankton.

Although there are whales in the Sanctuary this time of year, there may be many days a blanket of fog might prevent you from seeing them. Fog characterizes the upwelling period. Warm air filled with moisture moves across the Pacific Ocean and forms fog when it meets the chilly waters of the California Current and upwelled coastal waters. Although many summer days are chilly and foggy along the Sanctuary, the fog provides moisture needed by crops and redwoods along the coast.

During this time, water at the surface of the Sanctuary reaches its lowest temperature of the year, a chilly 50 to 55 degrees Fahrenheit. Sanctuary waters reach their highest salinities during this time. Cold, salty waters rising to the surface and the lack of rainwater both create salty Sanctuary seas.

The Oceanic Period occurs in fall. Reduced winds allow clear, blue waters from offshore to flow closer to shore and Sanctuary waters become calm.

During this time, the fog disappears and the sun shines. Surface temperatures in the ocean reach up to 65 degrees Fahrenheit, the highest temperatures of the year. These warm, clear waters bring organisms typically living farther offshore closer to shore. Jellies, albacore tuna, sea turtles, and sunfish all arrive along the coast during this time.

Slackened winds stop the occurrence of upwelling and decrease the amount of plankton in the bay. Kelp forests are at their best in early autumn. As winds die down and upwelling ceases, kelp growth slows. However, decreased plankton levels and increased sunshine illuminate the kelp forest in its full glory.

Primary Message: Like on land, the seasons of the sea dictate when and where marine organisms thrive.

Secondary Message: Some marine mammals and birds are year-round residents while others are seasonal residents or migratory.

Tertiary Message: The public is inherently drawn to charismatic megafauna (whales, sharks, otters, Mola's), what can we all do in our daily lives that will help these organisms continue to visit or live in the MBNMS?

16) Exhibit Reference Title: LEED/Sustainability

Title: This building is doing its part

Exhibit Theme: The Exploration Center building serves as a model of sustainability and future mindedness in both design and function earning it a gold rating for Leadership in Energy and Environmental Design (LEED), the Sanctuary Exploration Center is a model for environmentally sustainable design, construction and operation methods.

General Description:

LEED building graphic panel

- Fan towers allow natural ventilation.
- Bike racks are available to encourage staff and visitors to commute by bike.
- 95% of construction waste is recycled or reused.
- Solar panels generate a portion of the building's electricity.
- A cistern collects and stores rainwater to water plants.
- The center is built from certified sustainable wood and materials with high recycled content.
- Insulated windows help keep heat in the building.
- Native drought resistant plants require little water.
- Low VOC paints, sealants and adhesives were used throughout the building.

Graphic panel in restrooms
Wastewater from the toilets in the Exploration Center as well as in homes like yours goes to a nearby treatment plant in Santa Cruz. There, the water goes through two levels of treatment to remove debris and kill harmful bacteria. Treated water is then pumped offshore into the ocean through an outfall pipe.

Graphic panels in first floor hallway
All the water in Center drinking fountains as well as in homes and local businesses comes from Santa Cruz rivers, streams, reservoirs and natural springs. Do your part to conserve; fill your own water bottle at this fountain. Don't buy bottled water. Plastic makes up the majority of ocean debris. Do your part to conserve water by taking shorter showers, turning off the water when you brush your teeth, going to a recycled water car wash and using draught tolerant plants in your yard.

Primary Message: We can all do our part to conserve the oceans, the easiest is to reduce, reuse and recycle.

Secondary Message: This building is doing its part, what can you do?

17) Exhibit Reference Title: Upstairs Deck

Title: Protecting the coast for present and future generations

Exhibit Theme: Shifting baselines of local change

General Description:

The video kiosks (the two view finders) and the graphic panel on the upper deck of the Sanctuary Exploration Center help explain the history of coastal protection afforded to Santa Cruz and the Monterey Bay National Marine Sanctuary. This protection has come through statewide enactment of the California Coastal Act and the protection of the Coastal Commission and through the local grassroots effort to designate the area through the National Marine Sanctuaries Act.

The video kiosks show a short film that explores what Santa Cruz looked like a 100 years ago, how time has changed the landscape, the local grassroots effort to protect the Bay and a brief image of what the Bay could have looked like if the Sanctuary was not protected. In general the video portrays a theme of shifting baselines. Shifting Baselines (also known as sliding baseline) is a term used to describe the way significant changes to a system are measured against previous reference points (baselines), which themselves may represent significant changes from the original state of the system. The term has become widely used to describe the shift over time in the expectation of what a healthy ecosystem baseline looks like.

Graphic Panel:

Protecting the Coast for Present and Future Generations

Worth Protecting
California's unique coastline is a priceless natural heritage, providing vital habitats and a place of relaxation, recreation, and reflection. Its health is critical to our economy.

Citizen Action
In 1972, in response to increasing coastal development, State voters created the California Coastal Commission to protect and conserve their coast.

Coastal Protection
The Coastal Conservancy, Coastal Commission and partner agencies protect and enhance public beach access, reduce pollution, protect and restore sensitive habitats and species, preserve farmlands, and guide responsible development.

Primary Message: The Monterey Bay National Marine Sanctuary protects the coast and ocean for future generations.

Secondary Message: Local grassroots efforts lead to the creation of the Sanctuary to protect the coast from oil development.

Tertiary Message: Without the protection of the Coastal Act and the Sanctuary Act, our coastal resources could appear very different today.

Additional Messages: The concept of shifting baselines can be used to describe the shift over time in the expectation of what a healthy ecosystem baseline looks like.

Appendix B

Citations

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6. Monterey Bay National Marine Sanctuary Management Plan, 2008
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