



MPA Baseline Program

Annual Progress Report



Principal Investigators - please use this form to submit your MPA Baseline Program project annual report, including an update on activities completed over the past year and those planned for the upcoming year. This information will be used by the MPA Baseline Program Management Team to track the progress of individual projects, and will be provided to all MPA Baseline Program PIs and co-PIs prior to the Annual PIs workshop to facilitate discussion of project integration. Please submit this form to California Sea Grant when complete (sgreport@ucsd.edu, Subject [Award Number, project number, PI, "Annual Report"].)

Project Information

Project Year: March 2011 – February 2012 Study Region: North Central Coast

Project Title & Number: Project Title: Analysis of citizen science data from rocky shore and sandy beaches, collected by LiMPETS (Long-term Monitoring Program and Experiential Training for Students). Project #: R/MPA-7

PI name: Amy Dean Co-PI name: [empty]

PI Contact Info Co- PI Contact Info (please list additional PIs and contact info in the "Project Personnel" section if necessary)

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Project Goals & Objectives

Goal: Baseline characterization and monitoring recommendations. Objective 1: Compilation and description of existing LiMPETS data (2002 – 2009) to describe methods and data collected in areas currently surveyed within the North Central Coast MPAs. Objective 2: Conduct LiMPETS rocky intertidal and sandy beach monitoring with students and community groups at the time of MPA implementation (2010 – 2011). Objective 3: Analyze and interpret existing rocky intertidal and beach data to: A) Describe and understand spatial variation in Emerita analoga at sandy beaches that are currently established as LiMPETS monitoring sites within the North Central Coast region. Objective 4: Provide long-term monitoring recommendations, via: A) Using the results of the data analysis above in combination with the North Central Coast MPA Monitoring framework to provide recommendations for long-term monitoring that include informative indicators, potential sampling locations, sampling strategies (temporal and spatial frequency), appropriate analytical techniques, additional considerations for implementing citizen-based long-term monitoring, and cost estimates. B) Participating in collaborative processes (e.g., workshops) with the MPA Monitoring Enterprise and other baseline program project leaders to: i. Contribute towards an integrated and synthesized assessment of ecosystem conditions at the time of MPA implementation and initial MPA effects following MPA implementation ii. Compare results from citizen science and other monitoring methods to provide recommendations for long-term monitoring.

Summary of Project Activities Completed to Date

Overview of Project Year __ Activities, including progress towards meeting goals & objectives

- (1) Seasonal monitoring of LiMPETS rocky intertidal sites within MPAs and reference sites:
 - a. Duxbury Reef (Duxbury Reef SMCA) monitored April/May 2011, August 2011, November 2011, January 2012.
 - b. Fitzgerald Marine Reserve (Montara SMR) monitored April/May 2011, August 2011, October/November 2011, (January 2012 survey canceled due to high surf conditions).
 - c. Pillar Point (reference site for Montara SMR) monitored May 2011, August 2011, October/November 2011, January 2012

Description: Working with the LiMPETS coordinators, local school and volunteer groups have collected data four times over the past year at three rocky intertidal sites. Groups participating include California Academy of Science Rocky Shores Naturalists (San Francisco), City College of SF (San Francisco), Napa Christian Academy (Napa), Ross School (Ross), Crystal Spring Upland School (Hillsborough), EarthTeam (Berkeley), Urban School (San Francisco), Drew School (San Francisco), and Burlingame High School (Burlingame), and FMSA/GFNMS staff and volunteers.

- (2) Seasonal monitoring of LiMPETS sandy beach sites:
 - a. Salmon Creek (reference site for Bodega Head SMR) monitored May 2011, August 2011, October 2011.
 - b. Montara State Beach (reference site for Montara SMR) monitored May 2011, August 2011, October 2011.

Description: Working with the LiMPETS coordinators, local schools and volunteer groups have collected data three times over the past year at two sandy beach sites. Groups participating include Lower Lake Elementary (Lower Lake), City College of San Francisco, and FMSA/GFNMS staff and volunteers.

- (3) Comparison of sandy beach methodologies: Nielson, Morgan, Dugan vs LiMPETS
 - a. Karina Nielsen, Jenny Dugan, Steven Morgan and LiMPETS staff and student volunteers conducted a comparison of methods for sampling mole crab (*Emerita analoga*) abundance on sandy beaches along the North Central Coast (May 2011). A paired sampling block (LiMPETS 50-m survey area alongside of the Nielsen group's 'Baseline' 100-m survey area) was repeated 2-3 times per site at 3 sites, Montara, Limantour, and Salmon Creek beaches. The Nielsen team conducted the analyses and presented the results to the LiMPETS Scientific Advisory Panel for discussion in November 2011.

(4) Data entry for all surveys conducted between 2010 and 2012 completed.

- (5) Initial analyses of rocky intertidal and sandy beach datasets:
 - a. Initial analyses of sandy beach dataset using NCSS software took place in June and July 2011.
 - b. Initial analyses of rocky intertidal dataset using NCSS software took place in June and July 2011.

Description: Statistical analyses of historic LiMPETS data to identify trends both at individual sites as well as among sites. The methods for generating the derived data were described in detail in text format.

Highlights from project progress so far, such as successes achieved or interesting stories from the past year

- (1) LiMPETS Sandy Beach Methods Comparison: A methods comparison for sampling mole crab (*Emerita analoga*) abundance on sandy beaches along the North Central Coast was conducted in May 2011. At Salmon Creek Beach, the study was conducted with 20 7th and 8th grade students from Lower Lake Elementary who were thrilled to participate and see real science in action. Photos from the event at Salmon Creek Beach are included at the end of the report. The study found that data collected using LiMPETS methodology cannot determine absolute abundance of mole crabs on beaches, but it can provide correlated rank abundance among beaches as well as identify change in abundance (especially of young of the year crabs) over time.

Description of any unforeseen events and substantial challenges, and resulting effect on data collection

- (1) LiMPETS Sandy Beach Methods Comparison: Karina Nielsen and her project team identified some inconsistencies and challenges with current LiMPETS sandy beach methodology. Karina and the LiMPETS Advisory Panel discussed the results and made recommendation to the LiMPETS program. Some of these recommendations are highlighted below.
 - a. Online protocols describe the 'start' of transect as centered at high swash. The staff typically initiate transect at high swash, if conditions are safe to do so. Difference between written protocols and in field methodology should be addressed. An additional or different method of identifying the 'start' of the transect might improve consistency of placement of transect in swash, perhaps water table outcrop or slope?
- (2) High surf conditions in January 2011 made rocky intertidal surveys challenging. Scheduled surveys were postponed a number of times and surveys were not able to be conducted at Montara SMR.

Data status (i.e., paper/raw format or digitized; if digitized, what format?)

All data has been digitized in two formats: both entered into the online LiMPETS data portal as well as into an Excel spreadsheet.

Activities Planned for following Project Year __ (if applicable) – Please describe remaining work and approximate timelines for completing that work, including any anticipated budget variances necessary to complete the project.

Description of historic LiMPETS data
Analysis of historic LiMPETS data
Compilation and review of MPA LiMPETS data (2010-2012)
Analysis of MPA data, comparison to historic data
Description of findings
Collaboration with sandy beach and rocky intertidal project PIs.
Map with historic and current abundance and population stats and trends
Final Report: findings and long-term monitoring recommendations

Project Personnel – Please indicate additional project personnel involved in your MPA baseline project, including students and volunteers, or additional PI contact information if necessary.

	<i>Students Supported</i>	<i>Student Volunteers</i>
<i>K-12</i>		242
<i>Undergraduate</i>	38	
<i>Masters</i>		
<i>PhD</i>		

Number of other Volunteers not counted above:

9 members of the LiMPETS Science Advisory Panel (John Pearse, Pete Raimondi, Jenny Dugan and others)

Additional PI contact info not listed on first page:

Cooperating Organizations and Individuals - Please list organizations or individuals (e.g., federal or state agencies, fishermen, etc.) that provided financial, technical or other assistance to your project since its inception, including a description of the nature of their assistance.

LiMPETS is a statewide student-based citizen science program that is managed by the national marine sanctuary program, but is coordinated regionally and run by a variety of non-profit partners, including FMSA in the San Francisco Bay region. The program is funded entirely by donations from organizations, individuals, and corporations – of which there are many. Listed below are some of our regional funders from FY2012.

<i>Name of Organization or Individual</i>	<i>Sector (City, County, Fed, private, etc.)</i>	<i>Nature of cooperation (If financial, provide dollar amount.)</i>
<i>Autodesk</i>	<i>Private</i>	<i>3,000</i>
<i>Disney Worldwide Conservation Fund</i>	<i>Private</i>	<i>18,600</i>
<i>NOAA BWET</i>	<i>Federal</i>	<i>20,000</i>
<i>CA Coastal Commission</i>	<i>State</i>	<i>10,000</i>
<i>Packard Foundation</i>	<i>Private</i>	<i>50,000</i>
<i>Cisco</i>	<i>Private</i>	<i>15,000</i>
<i>PADI</i>	<i>Private</i>	<i>8,000</i>
<i>Wells Fargo</i>	<i>Private</i>	<i>1,500</i>
<i>Private individual donor (anonomous)</i>	<i>Private</i>	<i>20,000</i>
<i>Gant Family Foundation</i>	<i>Private</i>	<i>1,000</i>

Additional Information – Please provide any other project-relevant information, such as descriptions of attached materials, media coverage your project has received, etc.

MPA activities highlighted on LiMPETS website, Facebook page, and in FMSA e-newsletter “Upwelling.” Below is the news piece highlighted on the LiMPETS website as well as a couple of photos from the “methods comparison” conducted at Salmon Creek.

LiMPETS Involved in Historic State Effort to Create MPAs

California is currently engaged in a historic effort to establish a system of marine protected areas (MPAs)—similar to national parks and forests on land—to protect and restore our ocean wilderness. Currently, two LiMPETS partners (Channel Islands National Marine Sanctuary and the Farallones Marine Sanctuary Association) have been awarded funding to support this effort. Students and LiMPETS staff are collecting new data and analyzing historic data within these new MPAs to document key aspects of these areas as they are established.

Lower Lake Elementary Students Join LiMPETS and the MPA Sandy Beach Project Team (Nielsen et al) for a day of sun and data collection at Salmon Creek Beach (May 2011)

