



# FARALLONES MARINE SANCTUARY ASSOCIATION

## 2011 Annual Report

**Project Title:** Baseline Characterization of Newly Established Marine Protected Areas Within North Central California Study Region – LiMPETS Intertidal Citizen Science

**Project Number:** R/MPA-7

**Grant Number:** 09.015

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## Description of progress:

- (1) Seasonal monitoring of LiMPETS rocky intertidal sites within MPAs and reference sites:
  - a. Duxbury Reef (Duxbury Reef SMCA) monitored April 2010, August 2010, November 2010, January 2011
  - b. Fitzgerald Marine Reserve (Montara SMR) monitored May 2010, August 2010, November 2010, January 2010
  - c. Pillar Point (reference site for Montara SMR) monitored May 2010, August 2010, November 2010, January 2010

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 within MPAs or as reference sites to MPAs (Figure 1). Groups participating include Urban School (San Francisco), Aragon High School (San Mateo), Lick-Wilmerding High School (San Francisco) and the Romberg-Tiburon Center's Sea Lion Bowl Diversity Initiative (Marin).

- (2) Seasonal monitoring of LiMPETS sandy beach sites within MPAs and reference sites:
  - a. Salmon Creek (reference site for Bodega Head SMR) monitored May 2010, August 2010, October 2010
  - b. Montara State Beach (Montara SMR) monitored May 2010, August 2010, October 2010

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 within MPAs or as reference sites to MPAs (Figure 2). Groups participating include Lower Lake Elementary (Lower Lake), City College of San Francisco, and FMSA/GFNMS staff and volunteers.

- (3) Work on EML compliant database with standardized metadata begun. Progress ongoing.  
Description: We have participated in all EML data standardization surveys conducted by Rani Gaddam (UCSC) and are in the process of updating our database to make it compliant with NCC MPA EML requirements. We will continue to do so as new requirements are put in place.
  
- (4) Compilation and review of historic data from all LiMPETS sites (rocky intertidal and sandy beach) within the North Central Coast Study Area completed. Initial data analysis begun.  
Description: Review of historic LiMPETS data to identify trends both at individual sites as well as among sites completed. Figures and data summaries completed (Figures 3, 4). The next step which we are just beginning is statistical analyses of these data.
  
- (5) Preliminary review of LiMPETS data gathered from April 2010—January 2011 for MPA baseline characterization completed.  
Description: Review of data collected during the seasonal monitoring trips listed above in (1) and (2) completed. Figures and data summaries completed. See included maps for examples of initial data review.
  
- (6) Year 1 regional site map with examples of preliminary findings completed. Included in Annual Report.  
Description: Two maps - one of LiMPETS sandy beach sites within the NCC study region and one of LiMPETS rocky intertidal sites within the NCC study region – are included in this report (Figures 5, 6). Both maps provide examples of preliminary data collected during year 1 of the baseline characterization funding period.





Figure 1. Students from Lick-Wilmerding High School perform rocky intertidal baseline monitoring at Pillar Point.



Figure 2. Students from Lower Lake Elementary perform sandy beach baseline monitoring at Salmon Creek Beach.



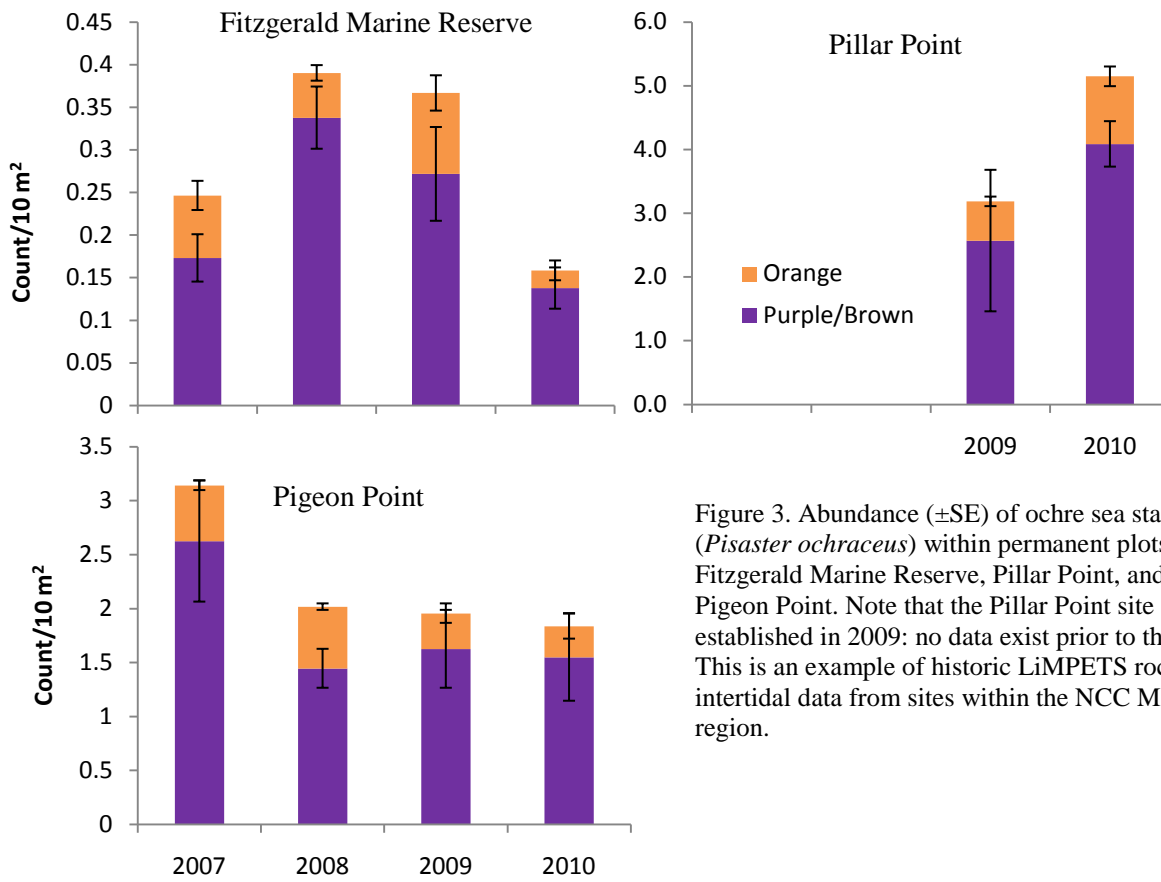


Figure 3. Abundance ( $\pm$ SE) of ochre sea stars (*Pisaster ochraceus*) within permanent plots at Fitzgerald Marine Reserve, Pillar Point, and Pigeon Point. Note that the Pillar Point site was established in 2009: no data exist prior to then. This is an example of historic LiMPETS rocky intertidal data from sites within the NCC MPA region.

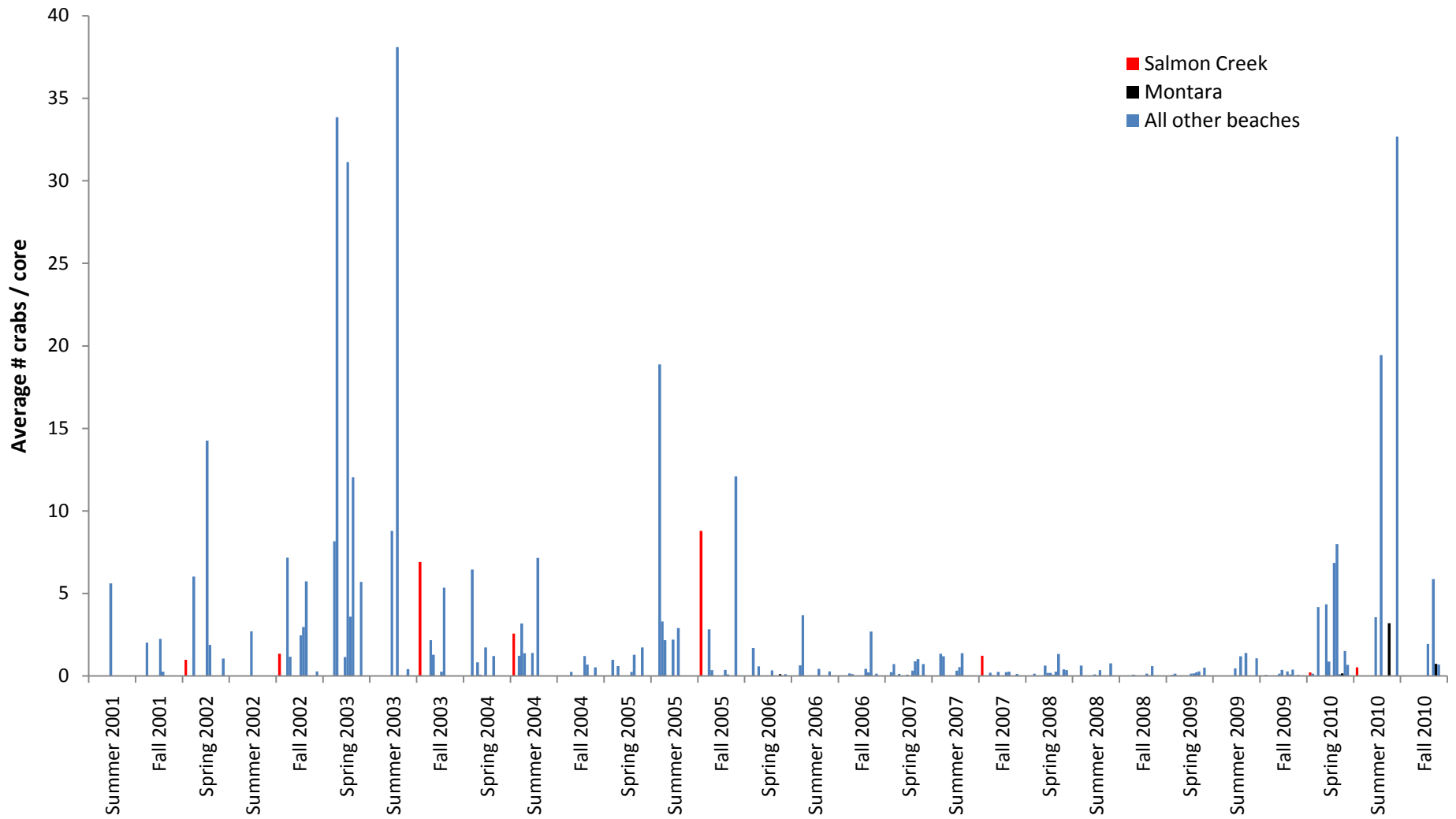





Figure 4. Mean number of *Emerita analoga* found per core (area 0.0189 m<sup>2</sup>) per season at all LiMPETS sandy beach sites within the NCC MPA region. The two beaches LiMPETS is monitoring for the baseline characterization are highlighted: Salmon Creek Beach is in red, Montara State Beach is in black. All other beaches are in blue (14 other beaches total). Note that not all beaches were sampled every season.


Figure 5. Seasonal percent cover (+/- SE) of *Endocladia muricata* at select LiMPETS sites.

 LiMPETS Rocky Intertidal Monitoring Site

 State Marine Reserve

 State Marine Conservation Area

 National Marine Sanctuary Boundary

 Bathymetric contours (100m interval)

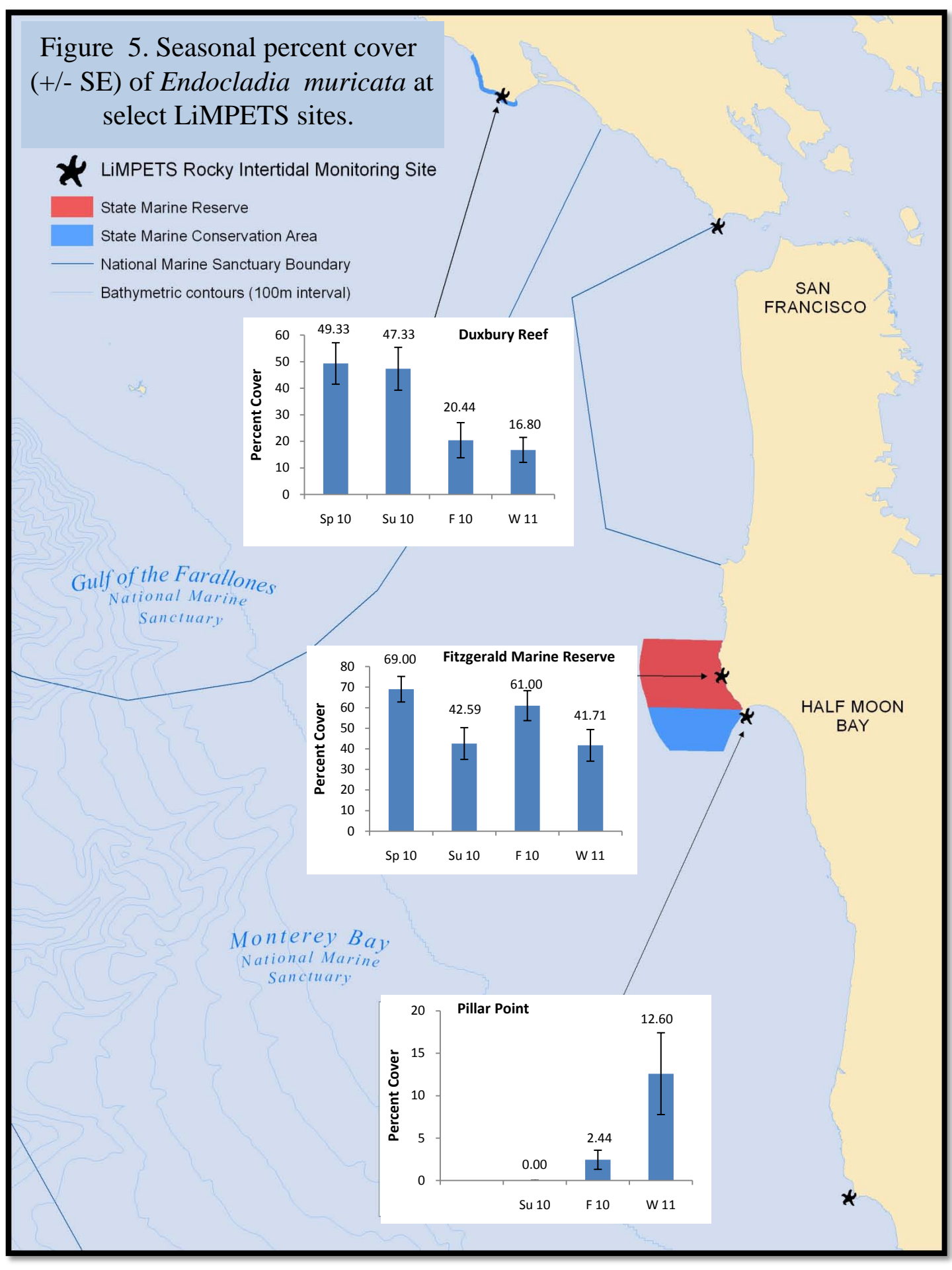
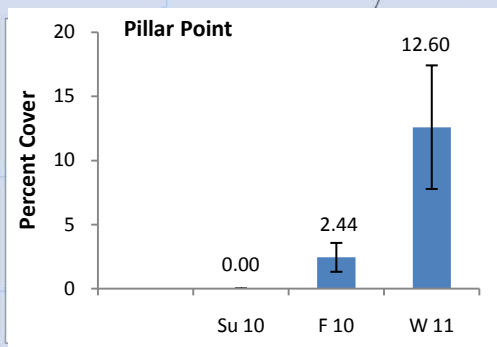
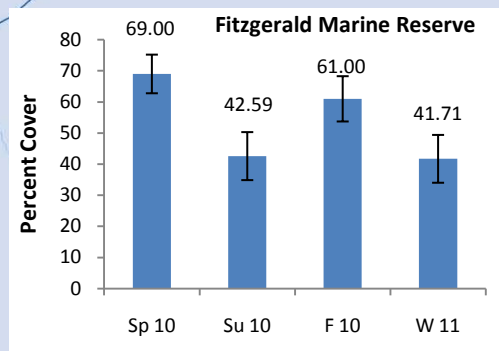
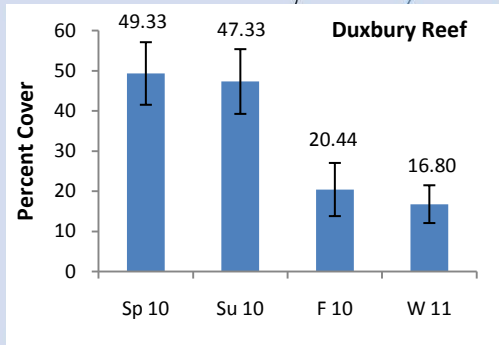
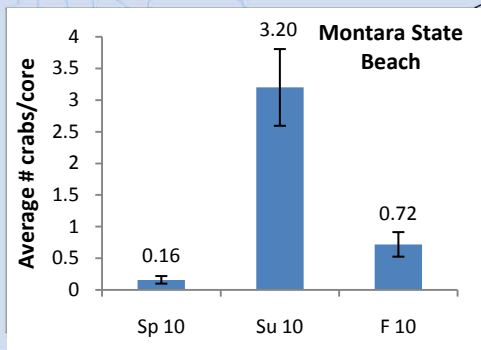
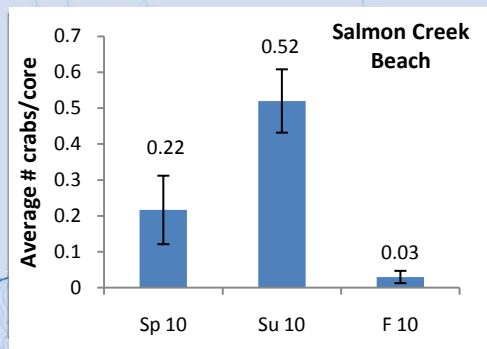


Figure 6. Seasonal abundance ( $\pm$  SE) of *Emerita analoga* at select LiMPETS sites. (Area of core = 0.0189 m<sup>2</sup>)



-  LiMPETS Sandy Beach Monitoring Site
-  State Marine Reserve
-  State Marine Conservation Area
-  National Marine Sanctuary Boundary
-  Bathymetric contours (100m interval)

