



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: Year 1: 2/1/2014-1/31/2015 MLPA Region: North Coast

Project Title & Number: Baseline monitoring and characterization of nearshore rocky reefs and kelp forests of marine protected areas along the North Coast of California (Proposal ID: Craig\_7686)

PI name: Dr. Sean F. Craig Co-PI name: Ryan Jenkinson, PhD candidate @ UC Davis

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

The overall goal of this project is to provide a summary description, assessment, and understanding of ecological conditions within nearshore rocky reef and kelp forest habitats both inside and outside of marine protected areas (MPAs) throughout the North Coast Study Region (NCSR).

We plan to meet the overall goals of the Project by:

- (1) Producing a quantitative baseline characterization and comparison of the structure of nearshore rocky reef and kelp forest ecosystems in MPAs and comparable reference areas of the NCSR. To achieve this goal SCUBA surveys at 4 MPA and 4 reference sites will collect data on fishes, invertebrates, and macroalgae as well as characterize substrate and reef rugosity.
- (2) Document initial ecological changes to rocky reefs and kelp forests within and outside of MPAs. This will be accomplished by comparing any notable trajectories of species densities, sizes and community composition between MPA and reference sites during the two year study period, and comparing data collected during this study to historical subtidal data from the area that has been collected by CDFW and HSU.
- (3) Provide a thorough baseline characterization of socioeconomically and ecologically important species found along North Coast rocky reefs, specifically describing current densities and sizes of two high priority species, red abalone (*Haliotis rufescens*) and red sea urchin (*Strongylocentrotus franciscanus*), that are likely to be part of metrics for assessing ecosystem health and change.

## Summary of Project Activities Completed to Date

### *Overview of Project Year 1 Activities, including progress towards meeting goals & objectives*

In June 2014 a team of local SCUBA divers was established, lead by Postdoc Ryan Jenkinson and 4 additional “core” (lead) divers: (1) Johnathan Centoni (brand new grad student in Dr. Sean Craig’s lab), (2) Franklin Moitoza (brand new grad student in Dr. Sean Craig’s lab), (3) Chris Teague (brand new grad student in Dr. Brian Tissot’s lab) and (4) Doug Simpson (HSU graduate and local dive expert). All members of the core team collectively have many years of North Coast SCUBA diving experience or extensive experience in federal and state subtidal/SCUBA monitoring programs from the National Park Service to the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) at UC Santa Cruz. On some occasions where there was an additional (2<sup>nd</sup>) research vessel to use (which unfortunately was not often due to engine problems in year 1- see unforeseen events below), our team was able to use additional divers including the following 6 HSU students & 1 technician: (1) Brett Stacey, (2) Maia Grodin, (3) Allison Lui, (4) Tim Moxon, (5) Jolene Evans, (6) Jeff Bernard, and (7) Kyle Weiss (HSU technician under Dr. Frank Shaughnessy). In the first year (2014) the entire HSU team gained extensive training in SCUBA safety & rescue techniques in the HSU pool, as well at a nearby site (Trinidad harbor) in the field. These activities were lead by CO-PI Ryan Jenkinson (Postdoc) along with HSU Dive Safety Officer Richard Alvarez and HSU Boating Safety Officer Steve Monk. In addition, a full 1-week boating safety course, lead by Steve Monk along with 2 other instructors (James Fitzgerald-UC Davis Boating Safety Officer, and Marti Martinez—U.S. Coast Guard) was taken by our entire dive group, including PI Sean Craig. This boating safety course included everything from knot tying and vessel anchoring to vessel maneuvering in tight quarters, using both the 19’ and 22’ HSU vessels in Humboldt Bay to do things such as rescue a disabled diver in the water.

By the completion of field sampling activities in the first year (November, 2014) significant progress had been made to gather data from subtidal near-shore sites both within and outside of Marine Protected Areas (MPAs) utilizing HSU boats and the above HSU SCUBA divers. All field sites with the exception of Pyramid Pt SMCA were visited and subtidal data on marine invertebrates and algae, pelagic fishes, as well as urchin/abalone abundance was gathered at the following sites: (1) Trinidad, (2) Abalone Pt., (3) Double cone, (4) Ten Mile, (5) Caspar, (6) Cabrillo, and (7) Elk.

Finally, we have just recently (June 1, 2015) completed collecting data from several cells at Pyramid Point in the far Northern Region of the NCSR and are pleased to say that our SCUBA activities have gotten off to an earlier start this year, thanks to equipment purchased in 2014 and earlier training activities facilitated by keeping the core SCUBA diving team intact (see above).

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*Highlights from project progress so far, such as successes achieved, new collaborations or partnerships, or interesting stories from the past year that may be suitable for a blog post or other media venue*

The primary highlight from the 2014 season was getting a large scale, biologically significant SCUBA project up and running and then safely and successfully completed along the North Coast on such a limited budget. A gratifying component of the project was our positive interactions with commercial urchin fisherman of the North Coast- particularly Tom Trumper of Pacific Rim Seafood- who allowed for vessel mooring at the private landing in Noyo Harbor and expressed gratitude that well trained and experienced researchers were collecting systematic data at spatial and depth gradients that were both ecologically significant and useful from management and monitoring perspectives. We were able to survey at a few locations that are rarely visited by recreational or research divers- Double Cone SMCA and the Abalone Point region in particular. Double Cone contained surprisingly little rocky reef habitat, but that that was available was full of life, including high densities of large rockfish. We found the highest densities of red abalone outside of MPA sites, possibly in response to increased red sea urchin abundances due to lack of commercial harvest. Finally, we were happy to observe both recruitment of juvenile sea stars and large numbers of healthy and/or recovering *Pisaster ochraceus*, particularly at the northern-most sites.

*Description of any unforeseen events and substantial challenges, and resulting effects on project activities and progress. Please indicate any issues that may affect other PI's or require coordination with other Baseline partners (e.g., ME, DFG, Sea Grant).*

During the first active summer of this SCUBA project (summer 2014), the brand new outboard engine purchased by HSU for the 19' vessel was immediately recalled, delaying the ability of the team to utilize 2 vessels for several months. In addition, following completion of the first year's boating and SCUBA safety courses (in June, 2014), the onshore weather patterns proved to be very windy, preventing almost all SCUBA activity in the month of June.

Nevertheless-the team began in late July and early August to visit sites in the Fort Bragg area, spending overnight stays at a rented house in Caspar (which was shared by several (n=4) different HSU-MPA projects, including the (1) rocky intertidal MPA team [lead by Dr. Sean Craig], (2) Estuarine MPA team [lead by Dr. Frank Shaughnessy], (3) Sandy intertidal MPA team [lead by Dr. Sean Craig], and (4) Onshore hook-and-line fishing MPA team [lead by Dr. Tim Mulligan]). This shared house proved to be vital to the success of the HSU dive team associated with this project during the months of August and September, 2014.

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

All data collected was reviewed and entered into an ACCESS database created specifically for this research project with the assistance of Dr. Brian Tissot (Director, HSU Telonicher Marine Lab). Data entry occurred between November 2014 and January 2015 and was performed by Co-PI Ryan Jenkinson and grad students Johnathan Centoni and Chris Teague. Beginning in mid- January (2015) preliminary data analysis began and a more detailed review of data is currently ongoing.

**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.**

SCUBA dive operations as part of the Rocky Reef Subtidal Monitoring Project began early this spring (May 2015) with training sessions at the HSU pool for all team divers, lead by postdoc Ryan Jenkinson. These training sessions included boating safety (lead by HSU's boating safety officer Steve Monk), SCUBA diving safety (lead by dive safety officer Rich Alvarez) and training to identify invertebrates, algae and fishes underwater (including tips on identifying marine invertebrates from PI Sean Craig).

The team of divers remains largely unchanged from the first summer's operations: Co-PI and Postdoc Ryan Jenkinson and 4 additional "core" (lead) divers: (1) Johnathan Centoni (MS student, Dr. Sean Craig's lab), (2) Franklin Moitoza (MS student, Dr. Sean Craig's lab), (3) Chris Teague (MS student, Dr. Brian Tissot's lab) and (4) Doug Simpson. All members of the core team have years of North Coast dive experience or extensive experience in federal and state subtidal (SCUBA) monitoring programs from the National Park Service (NPS) to the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) at UC Santa Cruz. Several important milestones were reached by the 3 graduate students on this project this past spring (2015) semester: all three of them completed their thesis proposals (for master's degrees) and met with their respective committees at Humboldt State University. The thesis projects planned by all 3 of these graduate students will leverage this ongoing subtidal MPA work to further examine: (1) associations between fishes and their habitats (Chris Teague), (2) invertebrate settlement and early community development inside versus outside of MPA regions (Franklin Moitoza), and (3) abalone abundance and spatial distribution/proximity as an important indicator of potential breeding ability (Johnathan Centoni). Because this will take extra time (and added dives) our team began their work early this spring (2015).

The following SCUBA divers will return to our team for summer 2015: (1) Brett Stacey, (2) Maia Grodin, (3) Allison Lui, (4) Tim Moxon, (5) Jolene Evans, and (6) Jeff Bernard. In addition, three new divers will join our team in summer 2015, including (7) Johnny Roche, (8) Jack Heimburge, and (9) Billy Ray.

The majority of research activities will continue to be centered around Noyo Harbor in the Fort Bragg area, spending overnight stays at the same rented house in Caspar (again arranged by postdoc Ryan Jenkinson).

We are excited to be able to say that we have already (as of June 2, 2015) finished several cells in the Northern region of our Marine Protected Areas, at both Pyramid Point and Trinidad, the latter site being the location where initial underwater training (using SCUBA) was run to "refresh" experienced divers and train the 3 new ones.

Finally, our team will continue to colaberate with North Coast Sea Urchin Fishermen to gain data (and experience) from them. The expected additional data collection by commercial urchin fisherman- being overseen by HT Harvey and Associates- is expected to begin in July 2015.

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**Project Personnel** – Please indicate additional project personnel involved in your MPA baseline project, including students and volunteers, or additional PI contact information if necessary, as well as the nature of their assistance in the project project.

|                      | <i>Students Supported</i>           | <i>Student Volunteers</i>         | <i>Nature of Assistance</i> |
|----------------------|-------------------------------------|-----------------------------------|-----------------------------|
| <i>K-12</i>          |                                     |                                   |                             |
| <i>Undergraduate</i> | <i>3 new SCUBA divers (2015)</i>    | <i>3 SCUBA divers (2014-2015)</i> |                             |
| <i>Masters</i>       | <i>3 (Centoni, Moitoza, Teague)</i> |                                   |                             |
| <i>PhD</i>           | <i>1 (soon to be Dr. Jenkinson)</i> |                                   |                             |

*Number of other Volunteers not counted above and the nature of their assistance in the project:*

None

*Additional PI contact info not listed on first page:*

None

**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.

| Name of Organization or Individual | Sector (City, County, Fed, private, etc.) | Nature of cooperation (If financial, provide dollar amount.) |
|------------------------------------|---|--|
| Tom Trumper                        | Private Sector                            | Owner, Pacific Rim Seafood Inc. (sea urchin divers)          |
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**Project Outputs and Materials:** Please provide any other project-relevant information, such as descriptions of attached materials, media coverage your project has received, presentations, publications, images etc.

None to report yet-but we will be working on public presentations and media articles in the summer/academic year 2015-2016.