

NCCOS Deep Coral Research Project Update: Contributions to Coastal Ecosystem Management Efforts along the US West Coast

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Key Research Partners: Olympic Coast NMS, E. Bowlby; Cordell Bank NMS, D. Howard; Gulf of the Farallones NMS, J. Roletto & K. Reyna; US Geological Survey, G. Cochrane; Southwest Fisheries Science Center, J. Butler; NOAA Deep Sea Coral Research and Technology Program, T. Hourigan

Background: The National Center for Coastal Ocean Science (NCCOS) Deep Coral Ecology Project at the Center for Coastal Environmental Health and Biomolecular Research (CCEHBR) in Charleston, SC provides expertise in coral systematics, coral ecology, deep-sea benthic survey technology, and related data analysis techniques. We offer a unique perspective on deep-sea coral (DSC) research because the Center operates at a national scale, beyond the boundaries of any single Fisheries Management Council (FMC), National Marine Sanctuary (NMS) or other specific protected area. This is important because DSCs have no regard for management boundaries and research questions and techniques are transferable from one place to another, though the composition of DSC assemblages may vary.

Such a national perspective has resulted in a growing list of partnerships along the Western Atlantic, Gulf of Mexico, and the Northeast Pacific Ocean. For example, in recent years the Deep Coral Ecology Project has been engaged in an increasing number of collaborative DSC research initiatives along the west coast, especially those supported by NOAA's Deep Sea Coral Research and Technology Program (DSCRTP). In addition to the coordination with DSCRTP and other agencies outside of NOS (e.g., NMFS, USGS), the list of sanctuary partners along the west coast has grown from one in 2004 (Olympic Coast, OCNMS) to three in 2011 and 2012 (Cordell Bank, CBNMS; Gulf of the Farallones, GFNMS; and OCNMS).

The underlying intention of these collaborative research efforts is to provide science to support NOAA's coastal ecosystem management needs. A major focus has been on helping to fulfill goals of NOAA's NMS and fishery management programs, as called for under provisions of the National Marine Sanctuaries Act (1972) and the reauthorized Magnuson-Stevens Sustainable Fisheries Conservation Act (MSA, 2008). The reauthorized MSA has new provisions regarding deep-sea coral habitat, wherein FMCs have discretionary authority to establish essential fish habitat (EFH) where DSCs exist and to limit fishing activity where there may be threats to these resources. Pursuant to this process, DSC research conducted recently along the U.S. west coast by NCCOS in collaboration with west-coast partners has been made available to support pending EFH management decisions by the Pacific FMC and NMFS. Further details and related outcomes are summarized below.

Relevant Research Contributions:

- Planning, execution, and reporting of 22 remotely operated vehicle (ROV) dives with OCNMS in 2006, 2010, and 2011, including dives inside and outside areas of existing EFH, proposed EFH, and proposed sites of 'no bottom contact' by fishing gear (Fig 1).

- Multibeam mapping of 300 sq km of continental shelf and continental slope habitat within GFNMS in 2011, including unknown hard bottom areas 90-120 meters deep. The targets are a major priority for ROV surveys in 2012 (Fig 2).
- ROV observations of >100 habitat-forming DSC and >100 habitat-forming sponges between 200-600 meters depth in CBNMS in 2010; including four species never recorded within sanctuary boundaries (Fig 3). See the site characterization report to DSCRTP: <http://cordellbank.noaa.gov/science/characterization.html#deepseacoral>
- Five ROV dives along the US West Coast, including observations of > 150 corals and sponges in previously unexplored parts of Sur Canyon in Monterey Bay NMS with Southwest Fisheries Science Center. See NOAA Tech Memo 138: <http://preview.tinyurl.com/3b6m8ef>

Outcomes Pertinent to Coastal Planning and Management:

- Data on the distribution, abundance, and diversity of deep-sea corals were submitted in December 2011 by E. Bowlby, OCNMS to the EFH review process to inform management decisions at Pacific FMC with specific regard to the expansion of EFH boundaries and the restriction of bottom contact fishing gear within portions of the OCNMS (see Fig. 1). To receive a copy of the Bowlby report, contact Peter.Etnoyer@noaa.gov.
- Multibeam data on the depth and topography of Rittenburg Bank, Farallon Escarpment, and a previously unknown hard-bottom feature ('West Fanny Shoal') were submitted in December 2011 to the EFH Review process by G. Cochrane, USGS to support considerations related to future potential EFH zoning and fishing-gear restrictions within GFNMS (see Fig. 2).
- A PFMC EFH Review Committee (EFHRC) meeting to discuss this and other new information for the west coast occurred January 17-18, 2012. The EFHRC will be drafting a summary report, noting new information and recommendations to PFMC in mid March in order to be considered in the PFMC's April meeting agenda. At the April meeting PFMC will decide whether sufficient new information warrants modifications or additions to the EFH areas along the west coast, which would result in a RFP announcement.
- The above research results have also helped to fulfill goals of NOAA's DSCRTP by supporting its current focus on the US west coast aimed at assessing locations of DSCs in this region, their conditions in relation to fishing practices and other stressors, and their value to other species including commercially and recreationally important fishes and invertebrates. Resulting data have been used to develop DSC site characterization reports for offshore waters of the Olympic Coast and OCNMS (Bowlby et al. 2011) and off northern California in the vicinity of CBNMS and GFNMS <http://cordellbank.noaa.gov/science/characterization.html#deepseacoral>.

Olympic Coast National Marine Sanctuary Partial and Completed Dive Sites

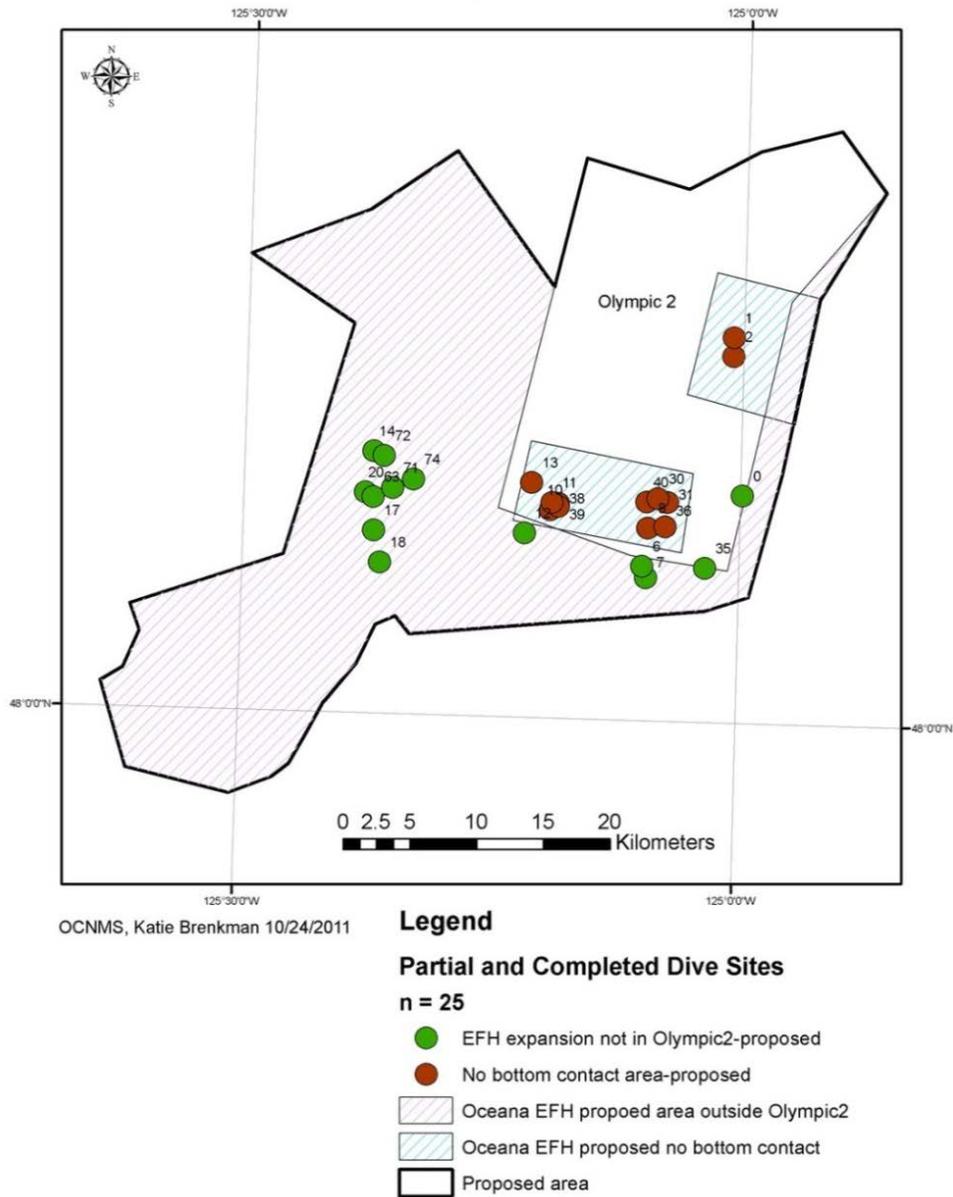


Figure 1. Map of ROV dives conducted as a collaboration between OCNMS, NMFS, and NCCOS. Dives are within proposed Essential Fish habitat (EFH), proposed no bottom contact areas, and existing EFH (Olympic 2) within OCNMS 2006 – 2010. Map provided by E. Bowlby and K. Brenkman, OCNMS.

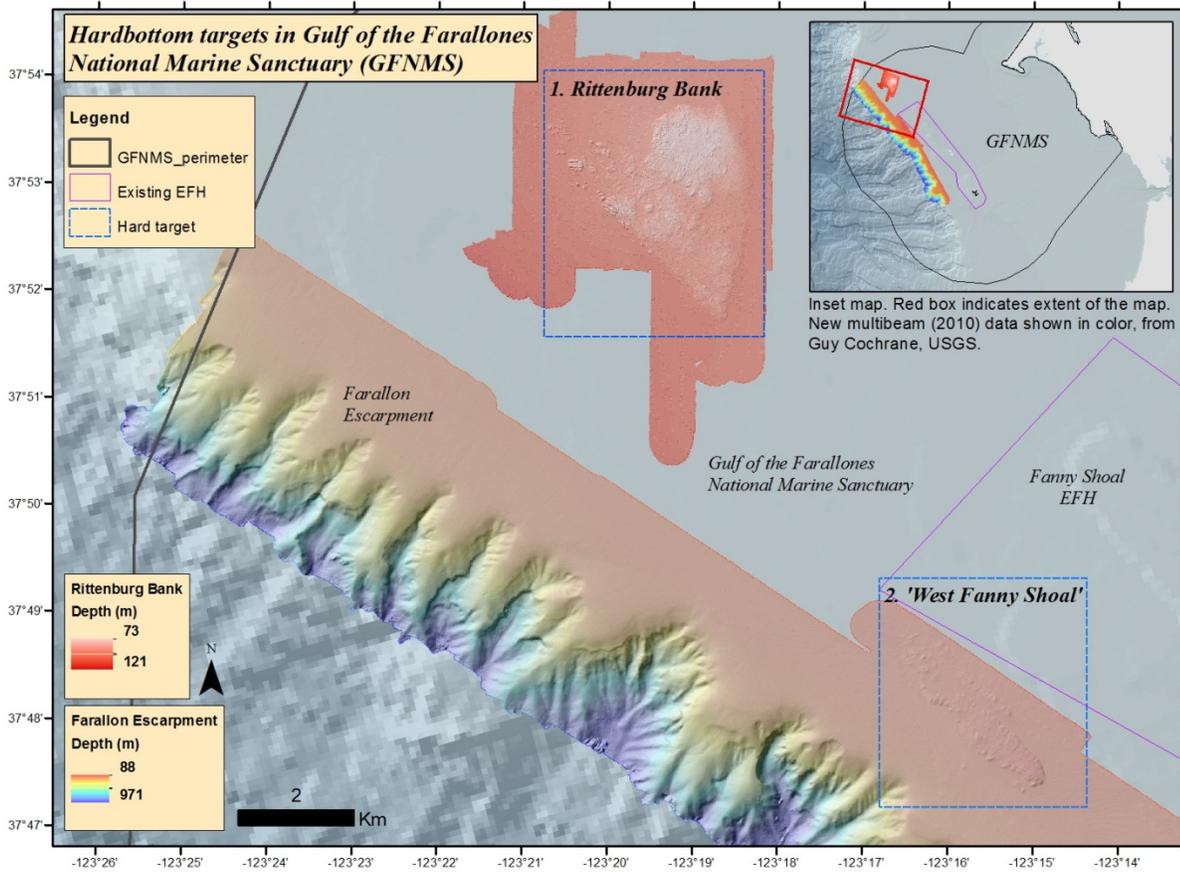


Figure 2. Map showing new multibeam data collected in 2010, in collaboration with Gulf of the Farallones National Marine Sanctuary (GFNMS), USGS and NCCOS. Purple and blue boxes indicate existing essential fish habitat (EFH, Fanny Shoal), and proposed hard bottom survey targets for new EFH, respectively. Multibeam data provided by G. Cochrane, USGS and J Roletto, GFNMS. Map by P Etnoyer, NCCOS.

METHODS: STUDY SITE

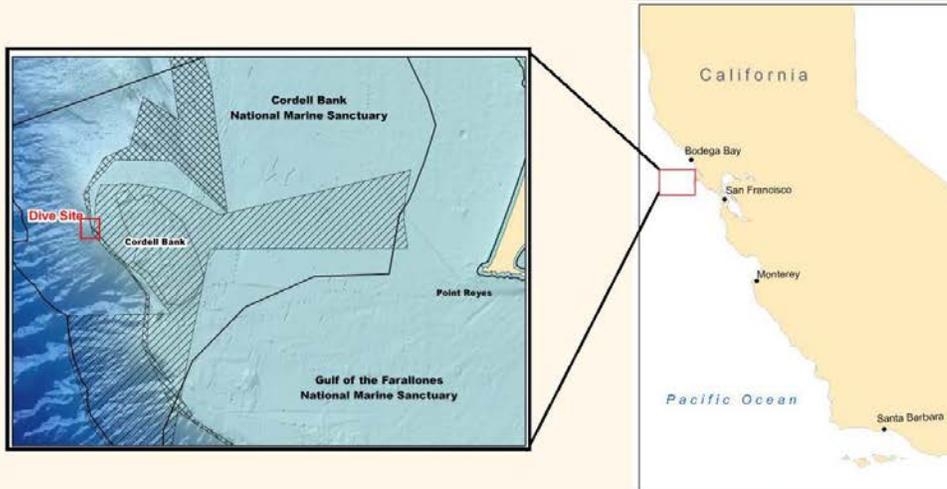


Figure 1(a). Location of ROV dive site on the continental slope west of Cordell Bank, northern California

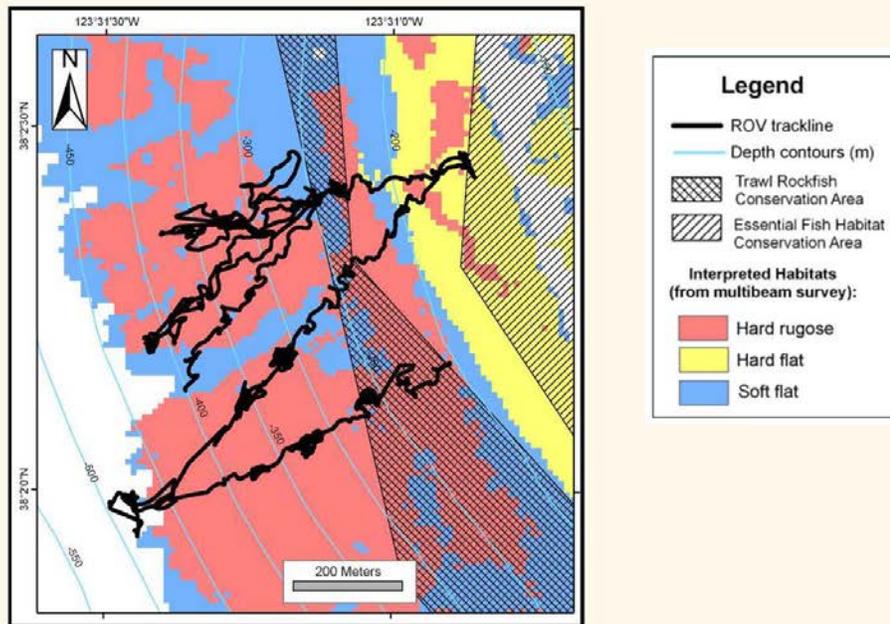


Figure 1(b). ROV trackline overlaid on interpreted habitats at dive site

Figure 3. A page from the site characterization report to NOAA's Deep Sea Coral Research and Technology Program (Graiff et al. 2011) showing dive tracks in and around rockfish conservation areas and established EFH in Cordell Bank National Marine Sanctuary. Collaborators were CBNMS, GFNMS, NMFS, and NCCOS. (Full report available here: <http://cordellbank.noaa.gov/science/characterization.html#deepseacoral>)