

Channel Islands National Marine Sanctuary

2010 Sanctuary Science

Accomplishments

In 2010, Channel Islands National Marine Sanctuary (CINMS or sanctuary) completed 96 research days on board the sanctuary's vessels, including 70 days on R/V *Shearwater*, 10 days on *R4107*, and 16 days on *Sharkcat* (acquired from MBNMS in April 2010). The vessels continued to support on-going monitoring projects such as Plumes and Blooms water characterization, rocky intertidal monitoring with Channel Islands National Park, Scripps Inst. of Oceanography's acoustic monitoring, and Blue Whale tagging with Cascadia Research. CINMS continued a second year of projects that were new in 2009 –autonomous underwater vehicle (AUV) surveys with Northwest Fisheries Science Center (NWFSC), larval fish and invertebrate recruitment monitoring with PISCO, a study with Department of Fisheries and Oceans Canada on eutrophication near sea lion haul outs on Santa Barbara Island, and monitoring of movement of large sharks with Monterey Bay Aquarium and CSU Long Beach. CINMS also had 5 days on the NOAA ship *McArthur II* in June-July which was shared with NOAA Southwest and Northwest Fisheries Science Centers for a deep sea coral research expedition at Piggybank reef in the Footprint Marine Reserve. The successful expedition included over 45 hours of ROV video, 5 dives with an AUV, and 9 CTD and niskin casts for water column characterization. CINMS staff took additional water samples near the sites in November to evaluate seasonal variability.

In addition, CINMS completed 7 days of aerial surveys on board various aircraft including NOAA's Twin Otter, US Coast Guard, and contract aircraft in support of the Sanctuary Aerial Monitoring and Spatial Analysis Program (SAMSAP) and shipping lane surveys.

CINMS research department staff made progress in a program administration effort to prioritize science needs by linking them back to mandates, management plan strategies, condition report questions, and other drivers. Research staff shared this exercise with the Research Activities Panel and Advisory Council at public meetings.

Recent papers published or submitted

- Katz, S.L., Hampton, S.E., Izmet'eva, L.R. and M.V. Moore (2011). Long-distance climate teleconnection deciphered through non-stationary long-term environmental data in Siberia. **PLoS-ONE**. 6(2): e14688. doi:10.1371/journal.pone.0014688
- Barnas, K & S.L. Katz (2010). The Challenges of tracking Habitat Restoration at Various Spatial Scales. **Fisheries** 35(5):232-241.
- Tolimieri, N., K. Andrews, G. Williams, S.L. Katz & P.S. Levin, (2009). Home range size and patterns of space use by lingcod, copper rockfish and quillback rockfish in relation to diel and tidal cycles. **Mar. Ecol. Prog. Ser.** Doi:10.3354/meps07930.
- Williams, G.D., K.S. Andrews, S.L. Katz, M.L. Moser, N. Tolimieri, D.A. Ferrer and P.S. Levin (In Press). Scale and pattern of broadnose sevengill shark (*Notorhynchus sepedianus*) movement in Pacific Northwest estuaries. **J. Fish Biol.**
- Shears, N.T., D.J. Kushner, S.L. Katz and S.D. Gaines (In Review). Can marine reserves protect prey species? Reconciling the conflict between direct and indirect effects of marine reserve protection. **Envor. Conserv.**
- Scheef, L.P., D.E. Pendelton, S.E. Hampton, S.L. Katz, E.E. Holmes, M.D. Scheuerell and D.G. Johns (In Review). Assessing marine plankton community structure from long-term monitoring data with multivariate autoregressive (MAR) models: a comparison of fixed station vs. spatially distributed sampling data. **Limnology & Oceanography: Methods**.



Photo: Robert Schwemmer

Fish in a kelp forest in the Channel Islands National Marine Sanctuary.

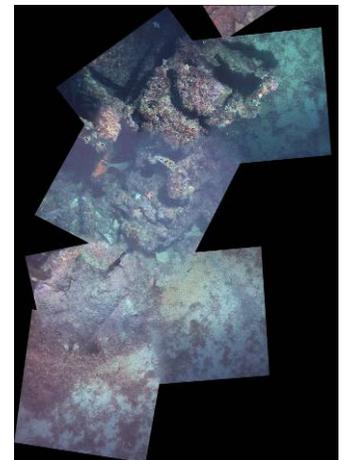


Photo: WHOI, NMFS & CINMS

Partial Photo-mosaic of ship wreck Bar-B engine block collected with AUV deployed from r/v *Shearwater*.



Photo: CINMS

The CTD rosette is deployed from the deck of the r/v *Shearwater* to support carbonate saturation monitoring.



Photo Cascadia Research

Megan McKenna from Scripps Institution of Oceanography places an acoustic monitoring tag on the back of a Blue Whale in the CINMS.



Photo CINMS

Sea lion colony at Santa Barbara island indicating character of nutrient subsidy to the adjacent kelp community.



Photo NOAA OER & CINMS

Basket sponge and indwelling hagfish photographed at 750m depth with Little Hercules ROV during April 2011 cruise on NOAA ship *Okeanos Explorer*.

Grants obtained

Evaluation of large whale responses to large ships and data coordination to evaluate ship activity and whale strike risk in the Santa Barbara Channel. NOAA NMFS Office of Science and Technology. (*renewed for 2010*)

Building the Foundation: New statistical tools for analyzing community dynamics with applications to marine zooplankton. Support from CAMEO program. Co-PIs: Steve Katz (CINMS), Eli Holmes, Mark Scheuerell (NMFS) & Steph Hampton (NCEAS).

Presentations at meetings

Katz, S.L. and K. Barnas, (2010). Tracking Habitat Restoration in the Pacific Northwest: Turning Data Synthesis into Federal Reporting Requirements. *Eos Trans. AGU*, 91(6), Ocean Sci. Meet. Suppl. Abstract MP53A-05

Katz, S.L. (2010). Developing approaches to monitoring ecosystem functions and processes. California and the World's Ocean 2010 Conference, Symposium titled: Aligning Science and Policy.

Productive Partnerships

CINMS looks forward to strengthening our partnership with UCSB through our continuing partnerships at the university: the Plumes & Blooms water quality monitoring program and PISCO. In addition, our continuing relationship with NWFSC & the National Center for Ecological Analysis and Synthesis has resulted in a team of 4 PIs and 6 Post Docs working on the Comparative Analysis of Marine Ecosystem Organization project. In 2010 CINMS developed new partnership with CSU Long Beach, Monterey Bay Aquarium, Sound Data Management and NMFS's SWFSC & NWFSC to tag large sharks and monitor the movements of tagged animals across the US West Coast, see:

- <http://hydra.sounddatamanagement.com/data>

Significant Challenges

- CINMS aims to respond to monitoring needs identified in the 2009 Condition Report and to implement research goals identified in the management plan but currently lacks the program funds to fulfill these needs
- Decreased funding for vessel operations has limited the ability to support CINMS and partner field operation

Highlights for 2011

- About 70 days at sea total on *Shearwater* and *Sharkcat*