2013-14 Year in Review at Romberg Tiburon Center

Milestones

RTC signs partnership agreement with Smithsonian Environmental Research Center
SF State-Romberg Tiburon Center’s partnership with the Smithsonian Institute will pave the way for collaborative research of the coastal marine environment. President Wong and Undersecretary of Science Eva Pell were on hand to sign the agreement. SF State News, Marin Independent Journal, June 14, 2013

San Francisco State University announced today the creation of a new Institute at the Romberg Tiburon Center (RTC), funded by Barbara and Richard Rosenberg who donated a $1 million endowment to support the research center’s efforts to communicate the science behind the world’s ocean environments. July 17, 2013

Director Toby Garfield stepped down and moved on to direct the Environmental Research Division at NOAA Fisheries Service’s Southwest Fisheries Science Center (SWFSC). He will maintain his relationship with RTC as an adjunct professor at SF State. SF State Biology Professor John Hafernik has served as Interim Director since then. November 1, 2013

Events & Programs

Research Experiences for Undergraduates and STEM Teacher and Researcher programs provide undergraduate students and preservice teachers with meaningful research experiences and career preparation in RTC and Smithsonian labs and in the field during 9-10 week summer internships.

The Inaugural Rosenberg Institute Seminar featuring Barbara Block of Stanford University was held on September 11, 2013. She presented a talk on tracking large marine animals to a full house of 140 at the Bay Conference Center.

RTC’s 24th Annual Discovery Day open house, now sponsored by the Rosenberg Institute, was held in October of 2013, for a family audience of nearly 1,000 people.

RTC staff and students presented hands-on activities at the Bay Area Science Festival’s Discovery Day at Sonoma County Fairgrounds, for an audience of 10,000 people on October 27, 2013.

Dr. Sarah Cohen introduced “sea vomit” and other species as she spoke about aquatic diversity in the Bay as part of the multimedia event BAASICS.4: Watershed at the ODC Theater in San Francisco on January 18, 2014.

BioBlitz 2014 Species Inventory in Golden Gate National Parks
RTC scientists, students and colleagues participated in a two-day BioBlitz of citizen-assisted species inventories and educational events on Friday, March 28 and Saturday, March 29. They identified phytoplankton from Rodeo Lagoon in the Marin Headlands, helped citizen and professional scientists with inventories at Mori Point, conducted beach seines to inventory fish at Crissy Field, and counted dock fouling organisms at Horseshoe Cove and the NOAA Pier at Crissy Field. At the end of the BioBlitz, the preliminary count was 2,304 species, including over 80 species new to the GGNRA, and 15 threatened species. Click here for detailed results. March 29, 2014
BioBlitz 2014 Biodiversity Festival at Crissy Field
In addition to the science inventories, RTC is also participating in a Biodiversity Festival to celebrate Bay Area biodiversity with interactive exhibits and edutainment. Our volunteers worked with 1900 4th-8th graders on Friday, March 28 and the visiting public on Saturday, March 29, to explore the biodiversity in a drop of Bay water.

The Inaugural Rosenberg Institute Public Forum featuring Emmett Duffy of the Smithsonian Institution was held on April 2, for another full house at the BCC. Duffy spoke about the new MarineGEO monitoring program and Tennenbaum Marine Observatory Network, which will include Romberg Tiburon Center.

On May 13, Dr. Bill Cochlan and his colleagues will embark on a 25-day mission to study the effects of ocean acidification—the chemical changes caused by increasing carbon dioxide levels in the atmosphere—on phytoplankton, which are the foundation of all oceanic food webs. Before they went to sea, Dr. Cochlan explained the research to the public at The Exploratorium's Bay Observatory. Tennessee middle school teacher Trey Joyner and Texas high school teacher Denis Costello are on board, sharing their experiences on social media. May 9, 2014

Science Saturday: Submerged Aquatic Vegetation of Mountain Lake
Dr. Kathy Boyer kicked off this year’s series of Science Saturday talks at Mountain Lake Park in San Francisco, with a talk on submerged aquatic vegetation. Join Dr. Boyer to learn more about how these cool underwater plants are helping to restore the health of Mountain Lake and other aquatic habitats throughout the Bay Area and beyond. Golden Gate Parks Conservancy, May 9, 2014

Dr. Sarah Cohen and graduate student Darragh Clancy participated in a Google Hangout on Air as part of the 2014 Google Science Fair, and were featured in the Highlights video on YouTube. May 27, 2014

Dr. Kathy Boyer engaged with the public in an evening Conversation about Landscape about an important restoration project in the Bay. Efforts by local scientists to re-introduce native oysters and eelgrass are creating new habitat for diverse species, and are also reducing wave action - showing promise as a mitigation factor in sea level rise. May 29, 2014

Awards, Scholarships and Honors
Abraham King Cada, an undergraduate student in Dr. Tomoko Komada's lab, received his 3rd and 4th Climate Scholars awards for the Fall 2013 and Spring 2014 semesters. Maribel Albarran, an undergraduate in Dr. Cochlan’s lab, received her second award in Spring 2014. Riley Smith, an undergraduate student in Dr. Sarah Cohen's lab, also received an award in Fall 2013. The awards are given each semester by SF State's Center for Science and Math Education to support climate change research. July 16, 2013

COAST Graduate Student Research Awards. Elize Papineau (Stillman Lab) is working on differential gene expression of the "water flea" Daphnia pulex evolving under different conditions of salinity and temperature, while Charles Wingert (Cochlan Lab) is studying the effects of increasing ocean acidity on the diatoms of the California upwelling system. Erin Flynn of the Todgham Lab and Anastasia Ennis of the Cohen Lab also received a $3000 award to continue their research. Erin is studying how warming
and acidification will impact the early life stages of cold-adapted fish. Anastasia is studying genetic variation of the endangered salt marsh harvest mouse. [http://www.calstate.edu/coast/students/](http://www.calstate.edu/coast/students/).

January 16, 2014

RTC graduate Katie Nuessly was selected as one of 91 Presidential Management Fellows STEM (Science, Technology, Engineering and Math) finalists in the new [PMF-STEM program](http://www.calstate.edu/coast/students/) of the Federal Office of Personnel Management. Finalists have opportunities to be appointed to federal agency positions in STEM fields, and receive education, training, and some financial support. The program was created to fill a gap in skilled STEM employees in federal agencies. April 15, 2014

Professor of Oceanography since 1998, former RTC Director Dr. Toby Garfield was named [Emeritus Faculty](http://www.calstate.edu/coast/students/) on May 9, and honored with 19 other San Francisco State University faculty by SF State Provost Sue Rosser. May 5, 2014

**Media Coverage**

[Limpets May Be Biggest Clue to Local Climate Change](http://www.calstate.edu/coast/students/- Most people associate climate change with dramatic events like big storms, or drought, or large chunks of ice disappearing from the arctic. In most cases, the effects are more subtle. ABC7 News follows a San Francisco State University researcher who has been looking at climate change on a much smaller scale. August 2, 2013

[Searching for clues on fish declines in the Delta](http://www.calstate.edu/coast/students/- Delta Science Fellow Julien Moderan is searching for clues as to why so many pelagic fishes in San Francisco Estuary are declining, despite efforts to protect them. [CA Sea Grant News](http://www.calstate.edu/coast/students/, August 15, 2013

[Carbon-sequestering ocean plants may cope with climate changes over the long run](http://www.calstate.edu/coast/students/- A year-long experiment on tiny ocean organisms called coccolithophores suggests that the single-celled algae may still be able to grow their calcified shells even as oceans grow warmer and more acidic in Earth's near future. Featured in [Phys.org](http://www.calstate.edu/coast/students/, [New York Times](http://www.calstate.edu/coast/students/, [Marin Independent Journal](http://www.calstate.edu/coast/students/), August 26, 2013

RTC scientists working with UC Davis researchers and the Coastal Conservancy as part of the San Francisco Bay Living Shorelines Project reported that two million native oysters have settled on man-made reefs in San Francisco Bay over the past year. [San Francisco Chronicle](http://www.calstate.edu/coast/students/, [Marin Independent Journal](http://www.calstate.edu/coast/students/), [CBS Local](http://www.calstate.edu/coast/students/), November 15, 2013

[The Gorgeous, Dangerous World Beneath the Antarctic Ice](http://www.calstate.edu/coast/students/- A team of environmental physiologists led by Anne Todgham is spending several seasons at McMurdo Station in Antarctica conducting experiments on two Antarctic species—the dragonfish and the emerald rock cod—to determine what their fate might be in warmer and more acidic water, and by extension, the fate of the larger polar ecosystem. slate.com. November 26, 2013

[A New Course for RTC](http://www.calstate.edu/coast/students/- With a generous $1 million endowment from Barbara and Richard Rosenberg, it’s full speed ahead for SF State’s Romberg Tiburon Center for Environmental Studies. [SF State Magazine](http://www.calstate.edu/coast/students/). December 6, 2013

Interim Director Dr. John Hafernik's "zombee" research was one of the most popular stories of the year. [View the influential story on KQED](http://www.calstate.edu/coast/students/). December 20, 2013. Also in [USA Today video](http://www.calstate.edu/coast/students/) in May 2014.
Alameda-based marine research suggests a promising outlook for the Bay’s once-threatened aquatic environment. The story includes an interview with graduate student Whitney Thornton (Boyer Lab) about her thesis research on restoration ecology of cordgrass, and research by Dr. Kathy Boyer and former graduate student Stephanie Kiriakopolos. Alameda Magazine, January 3, 2014

Scientists test responses of fish in early life stages to acidifying, warming oceans- Anne Todgham’s research examining how well developing marine life tolerates changes in temperature and CO2 levels was the focus of a National Science Foundation Antarctic Sun article. January 17, 2014

SF State Professor and RTC Interim Director Dr. John Hafernik garners international press in USA Today, the Huffington Post and the following outlets upon discovery of “ZomBees” in Vermont. KFOR 2/5/14; KPLC 2/5/14; WPTV 2/5/14; My High Plains 2/5/14; KFDX 2/5/14; AgriNews 2/4/14; Tottenham News 2/3/14; Die Welt 2/4/14; Tech Times 2/3/14; French Tribune 2/2/14; Web.de 2/3/14; WFMY 2/2/14; Guardian Liberty Voice 2/1/14; WRTV 2/1/14; WPRO 2/1/14 SF State News. January 28, 2014


Living Shorelines: Recruiting Oysters for Habitat Restoration and Climate Adaptation- Dr. Katharyn Boyer and the Living Shorelines Project are featured in "Dispatches from the Home Front," one in a series of articles highlighting groundbreaking work done by Bay Area institutions to comprehend, mitigate, and adapt to impacts of climate change on Bay Area ecosystems. Bay Nature, April-June 2014. April 2, 2014

Turning the Corner on Invasive Spartina- RTC graduate student Whitney Thornton, working with the Invasive Spartina Project to eradicate invasive Spartina alterniflora and restore native Spartina foliosa, are featured in the Conservation in Action column of the April-June issue of Bay Nature. April 2, 2014

Tennessee middle school teacher Trey Joyner will join Dr. Bill Cochlan and his collaborators on a month-long cruise to examine the physiological effects of ocean acidification on phytoplankton. Chattanooga Times Free Press, April 28, 2014. Texas high school teacher and SF State alumnus Denis Costello will also return for his fourth cruise with Dr. Cochlan. Cypress-Fairbanks ISD, February 16, 2014

Climate change: Pacific Ocean acidity dissolving shells of key species, new study builds on Tiburon research-Marin Independent Journal connects new study to previous climate change research conducted by RTC scientists. “The report builds on Romberg Tiburon Center for Environmental Studies research that shows global warming is having an impact in the ocean.” Marin Independent Journal, May 3, 2014

New Genetics Research May Shed Light on the Secretive Salt Marsh Harvest Mouse- Genetics research being conducted by RTC graduate student Anastasia Ennis may help biologists with the US Fish and Wildlife Service keep tabs on the tiny salt marsh harvest mouse, and to develop future management decisions for the endangered mice. Bay Nature, May 6, 2014
Publications

Dr. Wim Kimmerer published two papers on modeling Delta smelt population dynamics in Transactions of the American Fisheries Society, and Dr. Lindsay Sullivan published a paper on egg development in two species of copepods in the Journal of Plankton Research. August 15, 2013

*Emiliania huxleyi* increases calcification but not expression of calcification-related genes in long-term exposure to elevated temperature and pCO₂.

A year-long collaborative experiment conducted by the Stillman and Carpenter labs, on tiny ocean organisms called coccolithophores suggests that the single-celled algae may still be able to grow their calcified shells even as oceans grow warmer and more acidic in Earth's near future. Philosophical Transactions of the Royal Society B, August 26, 2013.


Recent RTC graduate Christina Buck of the Wilkerson Lab published a portion of her Master's thesis on "The Influence of Coastal Nutrients on Phytoplankton Productivity in a Shallow Low Inflow Estuary (Drakes Estero)." In the same journal, Dr. Wim Kimmerer along with Janet Thompson of the USGS published "Phytoplankton Growth Balanced by Clam and Zooplankton Grazing and Net Transport into the Low-Salinity Zone of the San Francisco Estuary." Estuaries and Coasts, January 8, 2014

"Evolution in an acidifying ocean"

Dr. Jonathon Stillman is co-author on this analysis of research to date, which includes recommendations for future study. Trends in Ecology and Evolution, January 16, 2014. Also in SF State News, January 27, 2014

Collaborative research conducted by the Boyer and Cohen labs published in Public Library of Science (PLOS) ONE 9(2): Conservation of Eelgrass (Zostera marina) Genetic Diversity in a Mesocosm-Based Restoration Experiment

Recent RTC graduate Tricia Goulding published Phylogeography of a marine acanthocephalan: lack of cryptic diversity in a cosmopolitan parasite of mole crabs in the Journal of Biogeography, with co-author Dr. Sarah Cohen. The acanthocephalan worm *Profilicollis altmani* parasitizes *Emerita* or mole crabs as intermediate hosts, which are in turn eaten by birds and sea otters.