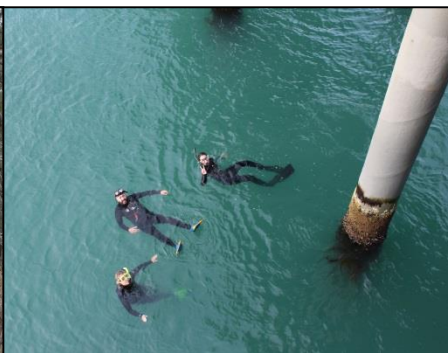
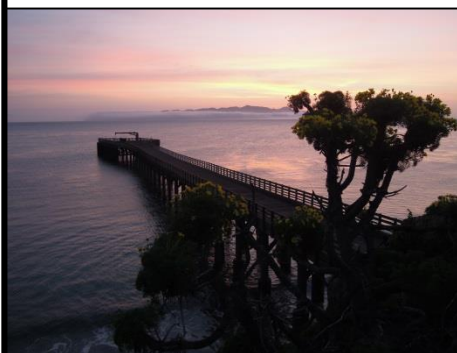




Santa Rosa Island Research Station

2016-17 Annual Report



Robyn Shea, Santa Rosa Island Research Station Acting Director
Dr. Cause Hanna, Santa Rosa Island Research Station Director



I. DIRECTORS' SUMMARY

The California State University Channel Islands (CI) Santa Rosa Island Research Station (SRIRS) seeks to cultivate a diverse community of scholars and initiate innovative resource management solutions by supporting research, education, and outreach programs across disciplines. The ability of the SRIRS community to address management challenges from multiple perspectives has enabled energetic, adept and successful responses to our changing natural and human landscapes.

The SRIRS officially opened its doors in the spring of 2014 and we have experienced continued success across a variety of metrics. The 2016-17 Academic Year was one of extraordinary unforeseen challenges due to the extended medical absence of the Director. Compared to the 2015-16 academic year, due largely in part to a more than 60% reduction in staff, we had a 12% decrease in user days, a 35% decrease in the number of research projects we were able to support, and a 12% decrease in our number of partners (see table below). The contribution of the SRIRS to resource protection, scientific literacy, and stewardship of the Channel Islands National Park is represented not only by the number of user days but also by the quantity and diversity of scientific projects and the partnerships it continues to help develop and support. The following data summarizes the broad range in our users, partnerships and the projects the SRIRS supported.

Santa Rosa Island Research Station: 2016-2017 Summary	
Visitors	# User Days
Undergraduate Students	2,374
K-12 Students	1,106
Researchers	306
Service Learning	639
Total	4,440
Types of Visitors	# Groups
Research	74
Education	55
Volunteer/Service Learning	24
Total	153
Research Support	# Projects
Minimal (e.g. assist with permitting/project logistics)	2
Moderate (e.g. provide housing/logistic support)	22
Significant (e.g. co-write research proposals/reports, perform fieldwork)	25
Total	49
Partnerships	# Partners
Colleges/Universities	21
K-12 or Informal Education Organizations	10
Professional Research Agencies/Organizations	22
Community Outreach/Service Learning Organizations	5
Total	58

II. MISSION

Our Mission

We provide students, faculty, researchers, and our local community with the resources and opportunities to engage in natural and cultural resource based research and education via a partnership between the US National Park Service and CSU Channel Islands.

Touchstones to the Mission

- Build inquiry centered educational partnerships
- Engage stakeholders in discovery and dissemination
- Inspire and transform participants and society

- Encourage broad sharing of interdisciplinary knowledge
- Promote stewardship of resources

III. ACHIEVEMENTS AND HIGHLIGHTS

A. 2016 Human Diversity Award Recipient

The Santa Rosa Island Research Station was the recipient of the 2016 Human Diversity Award given out by peers from the Organization of Biological Field Stations (OBFS). The award recognizes unique activities, programs, or approaches (funded or unfunded) that increase the involvement, engagement, and sustainability of underrepresented groups in field science. This was quite an honor given the relative youth of the facility and the short period of time it's been in operation. Previous award recipients include: Powdermill Nature Reserve (Instituto Nacional de Ecologia), Harvard Forest (Harvard University), Hawai'i Experimental Tropical Forest (HETF) (USDA Forest Service), University of Massachusetts Boston Nantucket Field Station, and Sagehen Creek Field Station (UC Berkeley) to name a few.

B. Undergraduate Research

In 2016-17 we supported 13 CI undergraduate independent/capstone research projects. Undergraduate students were immersed in the start-to-finish process of research at the SRIRS. The place-based research opportunities and successful mentoring relationships supported student knowledge and critical thinking skills. The undergraduate research projects helped expand on our knowledge of resource patterns and processes, developed interdisciplinary collaborations, and wove together the work of the research community. In addition, there were a host of complimentary undergraduate research projects associated with the SRIRS that were presented at the Annual 2017 SAGE Conference held on campus May 6th.

C. Educational Programming

We developed a formal education program that enables instructors and students to choose from a wide variety of experiential learning activities that involve students in real-world data collection, analysis, and problem solving within Channel Islands National Park. The inquiry based research projects at the core of our program enable students to gain perspective on interdisciplinary problem solving in a complex system and change students from passive to active scientists and learners. In the 2016-17 academic year we hosted 69 different education groups and accumulated 2,908 student user days.

D. Long-Term Inventory and Monitoring

We've established long-term monitoring projects in collaboration with Channel Islands National Park. The monitoring projects 1) enable a wide variety of individuals (i.e. K-12 and undergraduate students, professionals, and community members) to directly contribute to the natural and cultural integrity of Santa Rosa Island and 2) provide data that helps inform ongoing and future land management decisions and scientific theories. The data collected from the long-term monitoring projects was entered into a database that will be co-managed by the SRIRS and the National Park Service Inventory and Monitoring program. (Listed in Section VI – C for Channel Islands National Park research projects.)

E. Partnerships

The ability to host multiple groups at the SRIRS is critical because it provides the opportunity for researchers and students across disciplines to expand upon each other's perspectives of the same landscape. We prioritize interdisciplinary CI groups because the SRIRS is run and supported by CI. As a result, ~46% of the groups who used the SRIRS in the past year were from CI and they included 15 of the 25 CI academic programs. The SRIRS is actively recruiting additional partners with the goal of exposing the island and undergraduate students to additional perspectives. In 2016-17, we had a 12% decrease in the number of outside groups that used the SRIRS compared to last year. The groups spanned a diverse array of affiliations (i.e. academic, governmental, non-profit, etc.) and geographic regions. The discussions among individuals from different groups that ensue across the SRIRS kitchen table and across the island have resulted in innovative research proposals and informed many undergraduate career paths. (In Section IV Institutions and Partnerships are listed.)

F. Crossing the Channel (B-WET)

CI faculty and undergraduates teamed up with the Channel Islands National Park, the National Oceanic Atmospheric Administration (NOAA), the Channel Islands National Marine Sanctuary, and two Oxnard school districts (Oxnard Elementary SD and Oxnard Union High SD) to inspire a new generation of environmental stewards and scientists. 'Crossing the Channel' (CTC) unites students across academic levels in the ecological exploration and conservation of the Channel Islands, exposing them to various research and restoration projects. During the first two years of the *CTC* we have engaged with underrepresented students for a total of 2,160 hours of programming. Next year the program will expand across three additional schools. The personal experiences and mentoring relationships the students obtained throughout the program empowered them to become active members of their local scientific community. The greater sense of self, place, and community they obtained will enable them to become life-long stewards of the land they inhabit and the community they depend on.

G. Cultivating Santa Barbara Channel Stewards (Marine Debris)

This project is a community-based Marine Debris Removal project being funded by the National Oceanic Atmospheric Association (NOAA) in conjunction with their NOAA Marine Debris Program. CI Faculty and undergraduates had another opportunity to team up with the Channel Islands National Park, NOAA, the Channel Islands National Marine Sanctuary, The Nature Conservancy, and Island Packers to help cultivate future generations of Santa Barbara Channel stewards and advocates for our local marine environment. Project Staff and volunteers collected trash from 4 remote beaches on Santa Rosa Island, 3 remote beaches on Santa Cruz Island and 2 mainland beaches to: remove the trash in specific transects visited once a quarter, collect data on density and types of debris collected by weighing and cataloguing trash, manage a database for sharing details with collaborators and partners, looking at micro-plastics within the sandy beach community of specific monitoring sites as well as a host of additional parameters. During the time spanning October 2016 through June 2017 (we were not able to conduct any monitoring on the islands over the 2016-17 Winter months due to access issues from weather damage) we hiked out 1,348.93 pounds from all of our sites, and helped Channel Islands National Marine Sanctuary and local lobster fishermen remove an additional 2,180 pounds of trash from Chinese Harbor, Santa Cruz Island. Total marine debris removed was 3,528.93 pounds (1.6 tons).

IV. PARTNERS

A. Academic (31)

- K-12 (10):** Cate School, Chaffey Joint Union High School District, Ventura Unified School District, Los Angeles School District, Santa Barbara Unified School District, Moorpark Unified School District, Oxnard Elementary School District, Oxnard Union High School District, Santa Barbara Middle School, and Ventura County High School District.
- Universities/Colleges (21):** CSU Fullerton, San Diego State University, Cabrillo College, CSU San Bernardino, Cal Poly San Luis Obispo, Glendale Community College, Westmont College, Oxnard College, Santa Barbara City College, Ventura College, Colorado State University, University of Colorado, University of Oregon, University of Wyoming, UC Davis, UCLA, UC San Diego, UC Santa Barbara, UC Santa Cruz, North Dakota State University and University of Nevada Reno.

B. Non-Academic (27)

- Governmental:** Channel Islands National Park, Channel Islands National Marine Sanctuary, Department of Conservation – NZ, Gwaii Haanas National Park Reserve-Parks Canada, NOAA, United States Geological Survey, United States Fish and Wildlife Service, Santa Monica Mountains National Recreation Area, NPS Inventory & Monitoring Program -Mediterranean Coast Network, Channel Islands Naturalist Corps, US Forest Service – Institute for Forestry Genetics, El Presidio de Santa Barbara SHP, and California Department of Fish and Wildlife.
- Non-Profit:** Catalina Island Conservancy, Institute of Wildlife Studies, Channel Islands Restoration, The Nature Conservancy, Mountain Restoration Trust, Santa Barbara Museum of Natural History, Organization of Biological Field Stations, Santa Barbara Botanical Garden, Sierra Club, Havasi Wilderness Foundation, Growing Solutions Restoration Education, San Diego Zoo, and Coastal Marine Biolabs.
- Other:** Island Packers.

V. EDUCATION

CI Academic Programs Use of the SRIRS	CI Undergraduate Course Use of the SRIRS	High School Course Use of the SRIRS
Anthropology, Applied Physics, Art, Biology, Chicana/o Studies, Chemistry, Communications, Computer Science, Early Childhood Studies, English, Environmental Science and Resource Management, Mathematics, Performing Arts, Political Science, Sociology, Project OLAS	ANTH/ESRM 322 Human Ecology, ANTH 352/ESRM 365– Applied Anthropology, ANTH 365 – Natural History and Resource Management of the Channel Islands, ANTH 377 Archaeological Method and Theory, ANTH 494 Independent Study, ANTH 499 Capstone Project, ART 202 Sculpture, ART 314 Digital Media Art, ART 390 Screen Printing, BIOL 203 Quantitative methods for Biology, BIOL 316 Invertebrate Zoology, BIOL 433 Ecology and the Environment, BIOL 494 Independent Research, BIOL 497 Directed Study, CHS 335 Chicana Feminisms, CHS 343 Health in Latina/O Community, COMM 340 Conflict Management and Mediation, COMM 443 Environmental Communication, COMP 494 Independent Research, ECA 462 Supporting Dual language Learning, ENGL 103/105 First Year Composition, ESRM 200 Principles of Resource Management, ESRM 328 – Introduction to GIS, ESRM 494 – Independent Research, ESRM 499 – Capstone, PA 490 Production, PA/CHS 352 Aztec Dance, PADA 353/354 (Jazz 2, Modern 2, & Dance Ensemble), PAMU 385 Audio Design & Recording, PHYS 494 Independent Research, UNIV 150 First	AP Biology, AP Chemistry, Environmental Science, Biotechnology, Marine Science

VI. RESEARCH

A. SRIRS Undergraduate Research

1. Student Capstone/Independent Research Projects

a. Anthropology (2 Students)

- **Historical Archeology:** Documented and recorded the cultural items of the historical ranching era (*CI Faculty Mentor: Jennifer Perry; CSU Fullerton Faculty Mentor: Courtney Buchanan; NPS Collaborator: Laura Kirn; SRIRS Staff Mentor; Robyn Shea*).
- **Island Chumash Terrestrial Resources:** *Dichelostemma capitatum's* significance in the Chumash diet based on corm variability with respect to nutritional content, morphology, and collection times (*CI Faculty Mentors: Jennifer Perry and Colleen Delaney; SRIRS Staff Mentor: Robyn Shea*).

b. Biology (5 Students)

- **Intertidal Ecology:** Identified new intertidal monitoring locations and developed a protocol with the objective of supplementing and expanding upon the Channel Islands National Park long-term monitoring program (*CI Faculty Mentor: Geoff Dilly; NPS Collaborators: Steve Whitaker*).

c. Environmental Science and Resource Management (8 Students)

- **Marine Remote Operated Vehicles:** Constructed, deployed, and developed research questions associated with marine remote operated vehicles (*CI Faculty Mentors: Sean Anderson, Geoff Dilly, and Steven Norris; NOAA Collaborator: Julie Bursek; SRIRS Staff Mentor: Robyn Shea*).
- **Educational Programming:** Quantifying impacts of a current day environment education program – Crossing the Channel (*CI Faculty Mentors: Don Rodriguez, Sean Anderson, Linda O'Hirok, and Cause Hanna; CI Staff Mentor: Chris Rini*)
- **Santa Rosa Island Shoreline Change:** Geo-referenced Santa Rosa Island historical photos and examined changes to the coastline & dunes systems through time (*CI Faculty Mentors: Sean Anderson and Kiki Patsch; NPS Collaborator: Rockney Rudolph; SRIRS Staff Mentor: Robyn Shea*).
- **Passive Restoration on Santa Rosa Island:** Limitations to effectiveness after non-native grazer removal (*CI Faculty Mentor: Brett Hartman; SRIRS Staff Mentor: Robyn Shea*)
- **Santa Rosa Island Photo-Points:** Finalized development of long-term monitoring photo-points (*CI Faculty Mentor: Cause Hanna; USGS Collaborator: Kathryn McEachern; NPS Collaborator: Dirk Rodriguez; SRIRS Staff Mentor; Robyn Shea*).
- **Water Quality/ Lagoons:** Using water chemistry and macro-invertebrates as bio-indicators of water quality of several Santa Rosa Island streams (*CI Faculty Mentor: Cause Hanna; NPS Collaborator: Steve Whitaker*).
- **Marine Debris:** Collected and cataloged information on the amounts, types, sources, and historical changes of shoreline marine debris on one Santa Rosa Island beach (*CI Faculty Mentors: Sean Anderson and Clare Steele; NPS Collaborator: Steve Whitaker; SRIRS Staff Mentors: Robyn Shea and Michaela Miller*).

B. Faculty Research Projects

1. Anthropology

- **Jennifer Perry and Colleen Delaney:** Inventorying the pre-historic and historic artifacts in and around the Santa Rosa Island ranch complex (*NPS Collaborator: Laura Kirn; CSU Fullerton Collaborator: Courtney Buchannan*).

2. Biology

- **Geoff Dilly:** Investigating the impacts of climate change (i.e. sea level rise, ocean acidification, etc.) on the intertidal and sub-tidal habitats of Santa Rosa Island (*NPS Collaborator: Steve Whitaker*).

3. Computer Science

- **AJ Bieszczad:** Engineering and developing a wireless sensor network to monitor a variety of biotic and abiotic variables (*CI Collaborators: Geoff Dilly and Cause Hanna; NPS Collaborator: Rockne Rudolph*).

4. Environmental Science and Resource Management

- **Cause Hanna:** Developing a restoration monitoring project within an ecological interaction network framework to guide the ecosystem recovery process on Santa Rosa Island (*CI Collaborator: Ruben Alarcon; USGS Collaborator: Kathryn McEachern; SB Botanical Garden Collaborator: Denise Knapp; Coastal Marine Biolabs Collaborators: Ralph Imondi and Linda Santschi*).
- **Kiki Patcsh:**
 - Geo-referencing the aerial photography of the Northern California Channel Islands (*CI Collaborator: Cause Hanna, NPS Collaborator: Rockney Rudolph*).
 - Developing a sand budget for Becher's Bay littoral cell, Santa Rosa Island (*CI Collaborator: Linda O'Hirok*).

C. Additional Research Supported by the SRIRS

1. **Westmont College:** Examining the herpetology ecology & evolution on Santa Rosa Island.

2. **Smithsonian**

- Investigating song bird population structure and adaptive radiations.
- Measuring Oak acorn abundance and dispersal.

3. **Santa Barbara Botanical Garden:** Native plant seed preservation and collection.

4. **USGS:**

- Re-establishing plant diversity and functioning plant community dynamics on Santa Rosa Island.
- Establishing and monitoring tree demography plots for the Torrey Pines, Bishop Pines, and Island Oak on Santa Rosa Island.
- Establishing new and revisiting historical photo points on Santa Rosa Island.
- Rare tree census and population structure.
- Cloud Forest Restoration.

5. **Coastal Marine Bio-labs:** Obtaining the unique DNA sequences of island arthropods and publishing the result within an international DNA Barcode database.

6. **UC San Diego:** Examining the phenotypic and genetic difference of ant species across the California Channel Islands.

7. **Colorado State University:** Evolution, ecology, and physiology of the Song Sparrow.

8. **University of Nevada, Reno:** Ocean dynamics of pre-historic Chumash intertidal sites.

9. **NPS Inventory and Monitoring Program:** Document and quantify changes in water quality and stream condition on Santa Rosa Island over time.

10. **Channel Islands National Marine Sanctuary:**

- Sandy beach and intertidal ecology citizen science programs.
- Underwater remote operated vehicles.

11. **Channel Islands National Park:**

- Sandy beach ecology monitoring and morphological assessment.
- Marine debris monitoring.
- Native vegetation monitoring.
- Coastal Dune Formation and Vegetation Stabilization.
- Shoreline Change.
- Photo-point Monitoring for long-term changes

12. **Institute of Wildlife Studies:** Bald Eagle and Peregrine Falcon Population Recovery

VII. FINANCES

A. Grants and Awards - \$295,100

1. NOAA B-wet (\$59,000)
2. NOAA Marine Debris (\$100,000) 2016-18
3. Material. Services Support Facilities and Technology (MSFT) Funding - Santa Rosa Island Research Station – Visitor Capacity Expansion (\$37,100)
4. Edison International (\$15,000)
5. Union Bank (\$10,000)

B. Private Donations - \$25,000

C. User Fees - \$49,000

VII. POSITIONING FOR FUTURE SUCCESS

- A. Undergraduate:** Continue developing service learning courses and multidisciplinary research connections.
- B. K-12 Education:** Expand on current experiential STEM curriculum and continue to develop partnerships with local school districts.
- C. Grants:** We will continue to explore sources of public and private funding to support educational and research efforts associated with the SRIRS.
- D. Research:** Further cultivate research collaborations across a wide array of academic, non-profit, and professional organizations.
- E. SRIRS Advisory Committee:** Develop an SRIRS advisory committee in order to revise and further develop our 5 year plan and ongoing policies and procedures.
- F. Facilities:** Continue to improve facilities utilized by visitors and expanding upon our sustainability platform.

VIII. PEER COMPARISON

Research Station	Affiliation	User Days	User Affiliations	Staff
Santa Rosa Island Research Station	CSU Channel Islands	4,440	58	1.5
Santa Cruz Island Research Station	UC Santa Barbara	4,474	57	3
Sedgwick Reserve	UC Santa Barbara	7,665	64	7
Hastings Natural History Reserve	UC Berkeley	6,790	50	3.5
Big Creek Reserve	UC Santa Cruz	2,781	55	4
Angelo Coast Range Reserve	UC Berkeley	2,966	42	4
Anza-Borrego Desert Research Center	UC Irvine	5,838	63	4
Granite Mountains Desert Research Center	UC Riverside	2,841	60	3
Quail Ridge Reserve	UC Davis	1,260	19	5
James San Jacinto Mountains Reserve	UC Riverside	1,233	33	2.5

***2015-16 data.

The Santa Rosa Island Research Station thanks the following organizations for their generous support:



If you would like more information on the SRI Research Station please visit our website (www.csuci.edu/sri) or contact the Acting Station Director, Robyn Shea, at (805) 437-1653 or robyn.shea@csuci.edu.