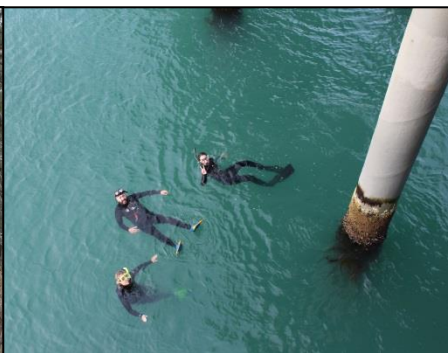
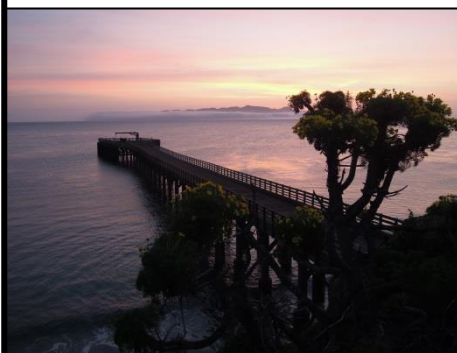




# Santa Rosa Island Research Station

## 2022-23 Annual Report



Russell Bradley, Santa Rosa Island Research Station Director  
Robyn Shea, Santa Rosa Island Research Station Asst Director



## I. DIRECTORS' SUMMARY

The Santa Rosa Island Research Station is part of California State University Channel Islands. The SRIRS creates unique transformative interdisciplinary educational and research experiences that also provide professional development and networking opportunities. Most station visitors come from traditionally underserved communities with limited or no experience in a remote outdoor setting. As the only program connecting the university (CSUCI) with the Channel Islands, and as one of only 11 university run field stations in US National Parks, SRIRS experiences are a core feature of the CSUCI brand. The SRIRS officially opened its doors in the spring of 2014, and we have experienced continued success across a variety of metrics. The 2022-23 Academic Year was successful, and we were finally seeing more relief from COVID-19 restrictions and increased visitation. We continued to be impacted by reduced visitor capacity for overnight accommodation, to fulfill health-safety guidelines. While user days and in-person engagement continued to improve, there is still considerable growth anticipated to be back at full capacity. Additionally, long-time SRIRS Coordinator Aspen Coty resigned her position with the SRIRS and accepted a new role at CSU Northridge. We wish Aspen continued success on her career path.

The contribution of the SRIRS to student success, resource protection and stewardship, and improving equity in our National Parks is represented not only by the number of user days but also by the quantity and diversity of scientific projects, interdisciplinary activities, 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.

<b>Santa Rosa Island Research Station: 2022-23 Summary</b>	
<b>Visitors</b>	<b># User Days</b>
Undergraduate Students	1,484
K-12 Students	974
Researchers	72
Service Learning	525
<b>Total</b>	<b>3,055</b>
<b>Lost user days due to COVID-19 or other reasons</b>	<b>227</b>
<b>Types of Visitors</b>	<b># Groups</b>
Research	23
Education	49
Volunteer/Service Learning	29
<b>Total</b>	<b>101</b>
<b>Research Support</b>	<b># Projects</b>
Minimal (e.g. assist with permitting/project logistics)	3
Moderate (e.g. provide housing/logistic support)	9
Significant (e.g. co-write research proposals/reports, perform fieldwork)	3
<b>Total</b>	<b>15</b>
<b>Partnerships</b>	<b># Partners</b>
Colleges/Universities	10
K-12 or Informal Education Organizations	10
Professional Research Agencies/Organizations	13
Community Outreach/Service-Learning Organizations	11
<b>Total</b>	<b>44</b>

## 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. Undergraduate Research

In 2022-23 we supported 12 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 while supporting student knowledge and critical thinking skills.

### B. Educational Programming

Despite the protracted and continued impacts of the COVID 19 Pandemic – where we have continued testing for overnight visitors, we were able to work closely with our partners at NPS to return our overnight capacity to 90% by AY 22/23. We were able to support 49 educational groups with over 2,450 student user days (college and K-12). This included 10 middle and high school programs and over a dozen of CSUCI's academic programs.

### C. Long-Term Inventory and Monitoring

We continued long-term monitoring of two lagoons (Abalone Rocks Lagoon, Old Ranch House Lagoon) on the east side of Santa Rosa Island in Channel Islands National Park. Building on work initiated in 2016, and new sensors installed in 2020, physical measurements at each lagoon were taken using HOBO loggers and a YSI Pro. By tracking these hypersaline lagoons, and their varying dissolved oxygen, salinity, and pH levels – through the efforts of SRIRS staff and capstone students, we are able to meet critical monitoring needs for sensitive and unique habitats inside Channel Islands National Park.

One of the major challenges in making diverse island-based data and products publicly available is a sustainable digital platform for sharing these important results. In 2020, staff from the SRIRS and from the John Spoor Broome Library at CSUCI formed a partnership to ensure that the island-based work created would be accessible in an online repository. This work continues, and has created a great resource to compile student research from SRIRS: <https://scholarworks.calstate.edu/collections/7d278t997>

Island oaks are a vital endemic species to several islands off the coast of California, including Santa Rosa – and are one of the big trees that SRIRS has been working with capstone students to research in partnership with the NPS and USGS. In AY 22/23 ESRM capstone students conducted the first demographic study of the island oak grove located on the north slopes of Black Mountain. This study laid a baseline for future research on this grove of oaks on SRI in study plots, assessing aspect, slope, altitude, canopy density, height, diameter at breast height, sapling and seedling dispersal rates, and presence of other plants in plots. This work found that mature island oaks tend to exist on northern facing aspects and slopes that range from 17-35 degrees. Island Oaks were also more numerous when nurse plants were present. Furthermore, elevation did not affect the number of nurse plants present and woody species tended to be more abundant inside and on the edge of groves, while herbaceous species tended to dominate outside. Understanding the mechanisms that kept this

stand healthy are imperative to long term restoration efforts on Santa Rosa Island.

#### D. Partnerships

Continued long term partnerships with several agencies and community partners. See more details in the selection below regarding marine debris, but SRIRS efforts working with capstone students on an art exhibit were critical to developing a significant partnership between CSUCI and the Santa Barbara Zoo.

<https://www.kclu.org/local-news/2023-04-14/a-partnership-between-a-south-coast-zoo-and-a-university-is-formalized>

#### E. Crossing the Channel (B-WET)

For the past 4 years, given COVID-19 complications, Sand Paula Unified School District students participated in the Crossing The Channel program, funded through NOAA BWET grants. These efforts under this grant concluded in 2023. have progressed through a series of field study experiences from upper, middle, and lower reaches of the Santa Clara River Watershed (SCRW) and out into the Santa Barbara Channel ending with an overnight trip to experience life as a researcher on Santa Rosa Island. Santa Rosa Island Research Station (SRIRS) provided in-class assistance, field support, and professional level mentorship for planned CTC events. As a result of the CTC curricular framework established in 2013, CTC has helped established environmental education program at Isbell Middle School that is better prepared to further design program units, created new partnerships with local agencies and professionals, refined MWEE activities for both student and future undergraduate engagement, and developed a plan for responsible program management and sustainability beyond the life of this grant with established partnerships and school sites.

CTC programming was accomplished with major alterations due to the COVID-19 impacts beginning in the spring of 2019-20 and in the following year with statewide distance learning programs due to emergence of COVID-19 omicron variant. Table 1 describes the year-by-year BWET funded activities for the past 4 years which included all associated fees, transportation costs, food, and materials.

**Table1.** Year by Year BWET Funded field experiences for the CTC program.

BWET Funded Field Experiences	2019-20	2020-21*	2021-22	2022-23
CI Boating Center	X			X
Lake Castaic Rec Center	X			
Channel Islands Day Trip			X	X
Santa Clara River Estuary/Channel Islands National Park Visitor Center	X		X	X
Santa Paula Creek/TNC Santa Clara River - Fillmore Fish Hatchery	X		X	
Carpinteria State Beach	X		X	X
Santa Rosa Island Research Station			X	X
Take Home Env. Science Kits*		X		

Progress toward objectives

In collaboration with our partners, the activities listed above supported five curricular units designed as progression of concepts aimed at developing a deeper understanding of local watersheds and the critical interactions between terrestrial and marine environments: 1) Watershed: a. Upper, b. Middle c. Lower, 2) Coastal Environments- Monitoring for Change 3) The Santa Barbara Channel, 4) California Channel Islands, 5) and Environmental Stewards. Each unit of study was associated with the above-mentioned activities further supporting the following CTC objectives:

- To create an experiential Santa Barbara Channel watershed curriculum that engages students across academic levels and aligns the content to Next Generation Science Standards.
- To develop and support student knowledge and critical thinking skills through inquiry-rich STEM learning activities and a hierarchical mentorship program.
- To use project-based learning activities to involve students in real-world data collection, analysis, and problem solving within the Santa Clara River Watershed, Channel Islands National Marine Sanctuary and Channel Islands National Park.
- To cultivate a community of Channel Islands National Marine Sanctuary stewards across socio-economic groups and age levels by implementing formal and informal watershed curriculum and developing community outreach projects.

#### **F. Marine debris removal on the California's Channel Islands: improving critical habitats"**

Santa Rosa Island Research Station's marine debris removal efforts take place within the Channel Islands National Park (CHIS) and the Channel Islands National Marine Sanctuary (CINMS). The Channel Islands National Marine Sanctuary (CINMS) overlaps the subtidal portions of the park, and its boundary extends six miles seaward from the park islands. The isolated beaches of CHIS and CINMS provide habitat for large breeding populations of four species of pinnipeds, nesting sites for the threatened Western Snowy Plover, and food resources for the recently delisted island fox.

Starting in 2016 the Santa Rosa Island Research Station (SRIRS) has continuously removed marine debris from the Southern California Channel Islands. The SRIRS removed and tracked debris from four beach sites on Santa Rosa Island (Sandy Point, Skunk Point, Tecolote, and Soledad) and three sites on Santa Cruz Island (Forney's, Sauces, and Christy Beach). Removal of debris from the beaches included sweeps of the entire beach for large objects and derelict fishing gear and complete removal of debris from within historic transect locations. Detailed tracking of this debris consists of weighing and categorizing all debris within 3 x 100-meter shoreline transects at each location. The 21 total transects let SRIRS categorize debris along 2,100 meters<sup>2</sup> (about 1.3 mi) of shoreline during each removal operation.

The major goals of this project were to:

- Remove 12,000 pounds (about twice the weight of an elephant) of marine debris over the three-year grant period
- Collect and catalog data on amount and type of shoreline debris at the island sites
- Compile a profile of plastic debris polymer types at each site
- Conduct outreach activities and recruit volunteers
- Share project results once the grant is complete

The work under this grant was completed in late summer 2023. During that grant period 12,218 pounds of debris were removed from Santa Rosa and Santa Cruz Islands in Channel Islands National Park. The Santa Rosa Island Research Station has removed and catalogued over 20,000 pounds of marine debris on the California Channel Islands since 2016. All performance goals for the project were achieved and, in several cases, well exceeded the target. The outreach and interdisciplinary nature of this project make it truly unique and show the true value of marine debris work in reaching across different audiences and disciplines. This work including several presentations, multiple internships supported, and several art exhibitions.

CSUCI Art students and community artists worked with debris to create found object art pieces to highlight issues surrounding marine debris throughout the duration of this grant. A major art show with over 500 people in attendance was mounted at Made West Brewing in Ventura on September 30, 2022, and was shown for an additional month that October at the 643 Project Space gallery in Ventura.

More details on this exhibition can be found here: <https://www.csuci.edu/news/releases/2022-marine-debris-art.htm>

A large-scale art exhibition titled “Help the Kelp”, a CSUCI art student capstone project, was installed in April 2023 at the Santa Barbara Zoo. A kelp forest built of marine debris was the exhibit selected from 3 designs that the students proposed to the zoo. The exhibit was on public display for over 6 months and was viewed by many tens of thousands of zoo visitors. This sculpture of a kelp forest was constructed almost entirely with marine debris collected as part of this grant, with some non-debris support materials and adhesives.

<https://www.kclu.org/2023-04-18/art-students-from-cal-state-channel-islands-have-created-a-kelp-forest-sculpture-with-a-difference>

In work on this grant, and companion capstone student research, differences were found in marine debris type, and polymer composition between the Channel Islands and mainland beaches, suggesting distinctive pollution sources. Land-based sources and local deposition contributed substantially to debris on mainland beaches, whereas ocean-based sources, such as shipping and fishing activities, contributed substantially to island beach debris. By identifying the relative contribution of polymer types prevalent in marine debris found in both urban-mainland and protected-island coastlines we hope to inform more effective strategies to reduce plastic pollution impacting local marine ecosystems. Additional CSUCI student capstone research conducted in 2022 indicates that a transition to Visual Assessment methods from the current transect assessments will reduce the amount of time and number of staff needed to conduct Marine Debris monitoring, while preserving data precision and accuracy.

## IV. PARTNERS

### A. Academic (20)

1. **K-12 (10):** Cate School, The John Cooper School (The Woodlands, TX), Los Angeles School District – Reseda Magnet High School, Oxnard Union High School District – Channel Islands High School, Santa Barbara Unified School District - San Marcos High School, Santa Paula Unified School District – Isbell Middle School, Santa Paula Unified School District – Santa Paula High School, Ventura Unified School District – Foothill Technology High School, Ventura Unified School District – Ventura High School.
2. **Universities/Colleges (10):** Chico State, Colorado College, Cal State Northridge, Sand Diego State University – Soil Ecology and Restoration Group (SERG), UC Davis, UC Merced, UC Santa Barbara, University of Notre Dame, University of Tennessee - Knoxville, Westmont College.

### B. Non-Academic (24)

1. **Governmental:** Channel Islands National Park, Comision Nacional de Areas Naturales Protegidas, DOD – US Navy, Grupo de Ecologia Conservacion de Islas, Man Tech, NPS Inventory & Monitoring Program - Mediterranean Coast Network, UC Natural Reserve System, United States Fish and Wildlife Service, United States Geological Survey.
2. **Non-Profit:** Catalina Island Conservancy, Channel Islands Restoration, California Institute for Environmental Studies, Crossing the Channel for Cause, Dos Pueblos Institute, Lulapin Chumash Foundation, Santa Barbara Botanic Garden, Santa Barbara Museum of Natural History, Supercollider, The CREW, The Nature Conservancy.
3. **Other:** CSU STAR Program, Islands of the Californias Botanical Collaborative, 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, Art, Astronomy, Biology, Business, Chicana/o Studies, Early Childhood Studies, English, Environmental Communications, Environmental Science and Resource Management, Health Science, Mathematics, N.A.S.A., Physics, Presidential Scholars, Veterans Affairs, CIMAS, CIS-FIP, PEER Mentors, SASEI, Sociology, CI Solutions	ART 202 - Sculpture, ART 207 – Ceramics, ART 311 – Sculpture Media and Tech, ART 323 – Packaging and Pre-Press, ART 494 – Directed Independent Study, BIOL 200 - Organismal and Population Biology, BIOL 203 - Quantitative Methods for Biology, BIOL 433 - Ecology and the Environment, BIOL 494 - Independent Research, CHS 100 – Introduction to Chicana/O Studies, CHS 160 – Chicana/O Cultural Expressions, CHS 200 – Diversity in Latina/O Communities, CHS 320 – Gender & Sexuality, CHS 335 - Chicana Feminisms, CHS 350 – Chicana/O History and Culture, COMM 443 - Environmental Communication, ECS 463, PA 210 – Understanding Dane & Music for elementary Education, ESRM 100 – Intro Environmental Science/Resource Management, ESRM 351 – Field Methods, ESRM 499 – Capstone, HLTH 499 - Health Sciences Capstone, SOC 495 – Capstone I, SOC 496 – Capstone II, UNIV 105 – Empowering First Generation Students, UNIV 150 - First Year Seminar, UNIV 198 – Introduction to Interdisciplinary Research.	AP Biology, AP Env. Science, Biological Oceanography, Honors Env. Science, E.S. Science Academy, Marine Science Academy

## VI. RESEARCH

### A. SRIRS Undergraduate Research

#### 1. Student Capstone/Independent Research Projects

##### a. Biology (3 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: Steven Whittaker*).

##### b. Environmental Science and Resource Management (5 students)

- **Island Oak Demography:** Demographic plots of Island Oaks at Black Mountain – part of research collaborations on large tree populations of Santa Rosa with USGS/NPS. (*CI Faculty Mentor: Dan Reineman; CI Staff Mentors: Russ Bradley and Joe Forrest; USGS: Kathryn McEachern*).
- **Marine Debris Survey Methods:** Assessment of current marine debris survey methods and visual survey techniques to determine best practices going forward (*CI Faculty Mentor: Clare Steele; CI Staff Mentors: Joe Forrest and Russ Bradley*).

##### c. Art (4 students)

- **Cloud Forest Restoration Mural:** Development of mural at Santa Rosa nursery to provide outreach for Cloud Forest Restoration project (*CI Faculty Mentor: Matt Furmanski; SRIRS Staff Mentors: Robyn Shea and Joe Forrest; USGS Mentor: Kathryn McEachern*).

- **Multi-media Capstones – Interpreting Santa Rosa Island:** 2 students worked on different aspects of increasing communications and engagement via interpretive painting and photography. (*CI Faculty Mentor: Matt Furmanski; SRIRS Staff Mentor: Joe Forrest*).
- **Marine Debris Engagement Capstone:** 1 student created a new suite of stickers to help increase outreach and engagement related to SRIRS’s Marine Debris Grant. (*CI Faculty Mentor: Matt Furmanski; SRIRS Staff Mentor: Joe Forrest*).

## B. Faculty Research Projects

### 1. Biology

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

## C. Additional Research Supported by the SRIRS

1. **Westmont College:** Examining the herpetology ecology & evolution on Santa Rosa Island.
2. **Santa Barbara Botanical Garden:** Seed banking and genetics of *Pinus torreyana*.
3. **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, Ironwood, and Island Oak on Santa Rosa Island.
  - Photo point monitoring on Santa Rosa Island.
  - Rare tree census and population structure.
  - Cloud Forest Restoration.
4. **Coastal Marine Bio-labs/Reseda Charter High School & Foothill Technology High School:** Obtaining the unique DNA sequences of island arthropods and publishing results within an international DNA Barcode database.
5. **UC Davis:** Graduate research in the discipline of Entomology, focused on trap-door spiders of the Channel Islands.
6. **University of Tennessee, Knoxville:** TBD by Russ and comms with Emily Moeck.
7. **Supercollider:** Realizing Santa Rosa Island as a nexus where art, science and tech collide to inspire social and environmental responsibility both among professional artists, Undergraduate students and their faculty. <https://www.supercollider.la/about/>
8. **NPS Inventory and Monitoring Program:**
  - Document and quantify changes in water quality and stream condition on Santa Rosa Island over time.
9. **Channel Islands National Marine Sanctuary:**
  - Sandy beach and intertidal ecology citizen science programs.
10. **Channel Islands National Park:**
  - Sandy beach ecology monitoring and morphological assessment.
  - Marine debris monitoring and removal.
  - Native vegetation monitoring.
  - Photo-point Monitoring for long-term changes
  - Rare plant Ecology and Monitoring
11. **CSU Service, Teaching, and Research Program (STAR):** Providing no-cost housing for 4 STAR Fellows during the Summer, to conduct research and lesson-planning for K-12 Science courses.



## VII. FINANCES

### A. Grants and Awards - \$220,324

1. NOAA B-wet (\$59,031) – 2 yr. No Cost Extension due to COVID-19
2. NOAA Marine Debris (\$112,499) 2020-23
3. Native American Initiatives (\$4,390)
4. Edison International (\$10,000)
5. National Park Service – Cloud Forest Technician funding, Year 1 of 3 (\$34,404)

### B. Private Donations - \$97,787

### C. User Fees - \$74,623

## VIII. PEER COMPARISON

Research Station	Affiliation	User Days*	# of Users	Staff
<b>Santa Rosa Island Research Station</b>	<b>CSU Channel Islands</b>	<b>2,988</b>	<b>923</b>	<b>3.5</b>
Santa Cruz Island Research Station	UC Santa Barbara	3,186	719	3
Sedgwick Reserve	UC Santa Barbara	4,690	2,177	7
Hastings Natural History Reserve	UC Berkeley	5,176	642	4
Point Reyes Field Station	UC Berkeley	1,012	331	4
Angelo Coast Range Reserve	UC Berkeley	2,723	460	?
White Mountain Research Center	UCLA	10,235	1,409	6+
Quail Ridge Reserve	UC Davis	1,225	413	2
Yosemite Field Station	UC Merced	2,777	519	2
James San Jacinto Mountains Reserve	UC Riverside	1,247	333	2

\*\*\*UCNRS Stats Averaged over 5 fiscal years between 2017-2022. SRIRS Stats specific for 2022-23

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](http://www.csuci.edu/sri)) or contact the Station Director, Russell Bradley, at (805) 437-8542 or [russell.bradley@csuci.edu](mailto:russell.bradley@csuci.edu).