

## Santa Rosa Island Research Station (SRIRS): 2014-15 Annual Report

### A. SRIRS User Days & Partners

#### 1. 2014-15 User Days

User Group	User Days
CSUCI Students	1,942
CSUCI Faculty/Staff	342
Non-CSUCI Students	497
Outside Researchers	345
Other Partners	734
<b>Total</b>	<b>3,842</b>

2. **CSUCI Academic Programs (12):** Anthropology, Applied Physics, Art, Biology, Business, Chemistry, Communication, Computer Science, Education, English, ESRM, Mathematics, and Sociology.

#### 3. Outside Organizations:

- a. **Academic (16):** CSU Fullerton, Cabrillo College, CSU Northridge, Ventura School District, Los Angeles School District, Westmont College, Oxnard College, Cornell, Colorado State, Ojai School District, Oxnard Elementary School District, Oxnard High School District, UC San Diego, UC Berkeley, CSU Los Angeles, and UC Santa Barbara.
- b. **Other (13):** Institute of Wildlife Studies, Channel Islands National Park, Channel Islands Restoration, Island Packers, The Nature Conservancy, NOAA, USGS, Mountain Restoration Trust, Smithsonian, Jepson Herbarium, Santa Barbara Botanical Garden, Sierra Club, and Coastal Marine Biolabs.

### B. SRIRS Student Research

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

##### a. Anthropology (3 Students)

- **Historical Archeology:** Documented and recorded the cultural items and oral history of the historical ranching era (*CI Faculty Mentor: Jennifer Perry; NPS Collaborator: Ann Huston*).
- **Cultural Resource Education:** Developed and implemented curriculum associated with the history and resource use of the Island Chumash (*CI Faculty Mentors: Jennifer Perry and Cause Hanna*).

##### b. Biology (4 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 Mentors: Geoff Dilly and Cause Hanna; NPS Collaborators: Steve Whittaker and Dan Richards*).
- **Sub-Tidal Ecology:** Explored the use of marine remote operated vehicles to perform sub-tidal transects adjacent to intertidal ecosystems (*CI Faculty Mentors: Sean Anderson, Geoff Dilly, and Cause Hanna; NPS Collaborator: Steve Whittaker*).

##### c. Business (17 Students)

- **SRIRS Policies and Procedures:** Reviewed and revised the policies and procedures associated with the SRIRS to increase the efficiency and capacity (*CI Faculty Mentors: Dax Jacobson and Cause Hanna*).
- **SRIRS Mixed Use Exploration:** Investigated and explored the possibility of using the SRIRS for mixed-use visitation (*CI Faculty Mentors: Dax Jacobson and Dan Wakelee*).

##### d. Communications (1 Student)

- **SRIRS Social Media:** Developed the social media protocol and strategies for the SRIRS (*CI Faculty Mentors: Tracylee Clarke and Cause Hanna*).

##### e. ESRM (17 Students)

- **Environmental Education:** Developed and implemented environmental education curriculum associated with 'Crossing the Channel' K-12 program (*CI Faculty Mentor: Cause Hanna; NOAA: Julie Bursek*).
- **Marine Remote Operated Vehicles:** Constructed, deployed, and developed research questions associated with marine remote operated vehicles (*CI Faculty Mentors: Sean Anderson, Geoff Dilly, and Cause Hanna; NOAA: Julie Bursek*).
- **Santa Rosa Island Stream Restoration:** Resampled and expanded on the Quemada stream restoration surveys performed in 1999 & 2003 (*CI Faculty Mentors: Linda O'Hirok and Cause Hanna; NPS: Stacey Osterman Kelm; USGS: Kathryn McEachern*).

- **Santa Rosa Island Shoreline Change:** Georeferenced SRI historical photos and examined changes to the coastline & dunes systems through time (*CI Faculty Mentors: Sean Anderson and Cause Hanna; NPS Collaborator: Rockne Rudophe*).
- **Intertidal Ecology:** Analyzed historical intertidal ecology data to examine the impacts of climate change and Sea Star wasting (*CI Faculty Mentors: Geoff Dilly and Cause Hanna; NPS Collaborator: Steve Whittaker*).
- **Santa Rosa Island Vegetation Change:** Utilized image analysis technology to examine the temporal and spatial variation of vegetation communities across Santa Rosa Island (*CI Faculty Mentors: Cause Hanna and Sean Anderson; NPS Collaborators: Sarah Chaney and Dirk Rodriguez*).
- **Santa Rosa Island Photo-Point:** Created a working SRIRS herbarium and established long-term monitoring photo-points (*CI Faculty Mentors: Cause Hanna and Sean Anderson; USGS Collaborator: Kathryn McEachern; NPS Collaborator: Dirk Rodriguez*).
- **Stream Macro-Invertebrates:** Used macro-invertebrates as bio-indicators of water quality of several SRI streams (*CI Faculty Mentors: Cause Hanna and Linda O'Hirok; NPS Collaborator: Stacey Osterman-Kelm; USGS Collaborator: Kathryn McEachern*).
- **Torrey Pines:** Performed a census, established long-term demography plots, and examined the variables associated with germination & seedling survival of the Santa Rosa Island Torrey Pine population (*CI Faculty Mentor: Cause Hanna; NPS Collaborator: Paula Power; USGS Collaborator: Kathryn McEachern*).

**f. Sociology (9 Students)**

- **SRIRS Student Surveys:** Developed and implemented a survey to examine the changes in a students' connection to nature and the campus community after visiting the SRIRS (*CI Faculty Mentors: Lindsey O'Connor and Cause Hanna*).
- **SRIRS Educator and Researchers Surveys:** Developed and implemented a survey to investigate the experience of researchers and educators at SRIRS and identify potential improvements (*CI Faculty Mentors: Lindsey O'Connor and Cause Hanna*).

**2. SRIRS Conference Presentations**

**a. 2015 Sage Undergraduate Student Research Conference**

- B. Lucero and J. Perry. The Role of the Horse During the Ranching Era of the Channel Islands.
- M. McGurk and J. Perry. The Meaning of Things: Identity Formation through Importation of Material Culture.
- B. Whalen-Crichton and J. Perry. A Policy Paper Regarding the Future Growth of Santa Rosa Islands Research Station.
- A. Wallengren, J. Dorosh, J. R. Newkirk, P. Spaur, A. Syverud, and G. Dilly. Monitoring the Rocky Intertidal Zone of the Channel Islands: Past, Present, and Future.
- G. Faulkner, K. Scrinor, and AJ Bieszcza. CI Rainbow: Data Collection & Analysis Framework for the Santa Rosa Island.
- K. West, S. Anderson, and C. Hanna. The Relationship Between Students and the Environment: A Comprehensive Study at a Ventura County High School.
- C. Wells, B. Swendrowki, and S. Anderson. Determining Fish Species Awareness of Marine Protected Area Borders on Santa Rosa Island, California as a Means to Define Overall Marine Protected Area Effectiveness as Conservation Tools Using Remotely Operated Vehicles (ROVs).
- J. Bunting and S. Anderson. Environmental Education Efficacy Comparison of Classroom Instruction and Experiential Learning of Intermediate School Marine Science Students in Ventura County, CA.
- B. Swendrowki, C. Wells, and S. Anderson, S. Quantitative Analysis of Remote Operated Vehicles for Research Purposes Around Southern California.
- S. Clark, C. Schmidt, and B. Hartman. Validating Passive Restoration After Grazer Removal: Change Detection Analysis of Vegetation on Santa Rosa Island, California.
- T. Hall, S. Anderson, and C. Hanna. Population Dynamics of the Santa Rosa Torrey Pine.
- S. Bednar and S. Anderson. Quantifying Seasonal & Historical Shoreline Change on Santa Rosa Island.
- N. Hibert and S. Anderson. Restoration on Santa Rosa Island: A Geomorphic Assessment of Stream Function.
- K. Burns, R. Pratt, S. Anderson, L. O'Hirok, and C. Hanna. Santa Rosa Island, California: Watershed Spatial Variation.
- T. Lane, S. Anderson, and C. Hanna. Viewing Vegetation Change on Santa Rosa Island: A Photo-Point Study.

- S. Clark and S. Anderson . Creation of the Santa Rosa Island Herbarium and Repeat Photo Analysis on Santa Rosa Island, California.
- J. Dorosh, A. Wallengren, R. Newkirk, P. Spaur, A. Syverud, G. Dilly, and C. Hanna. Rocky Intertidal Study Comparing Protocol Methodologies on Santa Rosa Island, California.
- K. Gaston, S. Anderson, L. O’Hirok, and C. Hanna. Quemada Creek Vegetation Survey: Recovery Following Non-native Ungulate Removal.
- A. Baglietto, S. Anderson, L. O’Hirok, and C. Hanna. Geomorphology of Quemada Creek Following Grazer Removal, Santa Rosa Island, Channel Islands National P ark, California.
- R. Pratt, K. Burns, S. Anderson, and C. Hanna. Water Quality on Santa Rosa Island, California: An Analysis of Riparian System Recovery.
- A. Brinkman, T. Hall, S. Anderson, and D. Neuman. Evaluating the Recent Reproductive Success of the Endangered *Pinus torreyana ssp. Insularis*.
- B. Comfort, R. Pratt, and S. Anderson. Benthic macroinvertebrates as bioindicators of Stream Health on Santa Rosa Island, CA.
- b. Professional Conferences**
- L. O’Hirok, A. Baglietto, N. Hilpert, K. Gaston, R. Pratt, K. Burns, B. Comfort. 2015. Santa Rosa Island, Channel Islands National Park: One Hundred Fifty Years of Grazing Followed by Sixteen Years of Restoration, How Are We Doing? Paper presentation at the 111<sup>th</sup> Annual Meeting of Association of American Geographers, Chicago, Illinois, April 21-25, 2015.
- T, Hall, A. Brinkman, C. Hanna, K. McEachern, and P. Power. 2014. Population Dynamics of the Santa Rosa Island Torrey Pine. SACNAS.
- T, Hall, A. Brinkman, C. Hanna, K. McEachern, and P. Power. 2015. Population Dynamics of the Santa Rosa Island Torrey Pine. George Wright Conference.

## C. Faculty Research Projects

### 1. Biology

- a. 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 Whittaker*).
- b. Ruben Alarcon:** Documenting and measuring the development of physical and biological interactions on the on Santa Rosa Island following the removal of invasive ungulates (*NPS Collaborator: Sarah Cheney; USGS Collaborator: Kathryn McEachern; SB Botanical Garden: Denise Knapp*).

### 2. ESRM

- a. Linda O’Hirok:** Measuring the restoration the watershed efficiency, structure, and stabilization on Santa Rosa Island (*CI Collaborator: Cause Hanna; NPS Collaborator: Stacey Osterman-Kelm, USGS: Kathryn McEachern*).
- b. Sean Anderson:** Developing the use of marine ROVs and aerial UAVs for the use of kelp forest and shoreline change.
- c. Clare Steele:** Examining the anthropogenic impacts on the biological and physical characteristics of the sandy beach habitat (*NPS Collaborator: Steve Whittaker*).
- c. Cause Hanna:** Developing a restoration monitoring project within an ecological interaction network framework to guide the ecosystem recovery process on Santa Rosa Island (*NPS Collaborator: Sarah Cheney; USGS Collaborator: Kathryn McEachern; SB Botanical Garden: Denise Knapp; Coastal Marine Biolabs: Ralph Imondi and Linda Santschi*).

### 3. Anthropology

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

### 4. Computer Science

- a. AJ Bieszczad:** Engineering and developing a wireless sensor network to monitor a variety of biotic and abiotic variables.

### 5. Education

- a. Jeanne Grier:** Developing an experiential educational curriculum in collaboration with NOAA and the SRIRS (*CI Collaborator: Cause Hanna and Chris Rini; NOAA: Julie Bursek*).

## D. Additional Research Supported by SRIRS

- NOAA:** Tracking the movements and abundance of white sharks around Santa Rosa Island.
- Westmont College:** Examining the herpetology ecology & evolution.

3. **Smithsonian**
  - a. Investigating song bird population structure and adaptive radiations.
  - b. Measuring Oak acorn abundance and dispersal.
4. **Santa Barbara Botanical Garden:** Native plant seed preservation and collection.
5. **USGS:** Re-establishing plant diversity and functioning plant community dynamics on Santa Rosa Island.
6. **Coastal Marine Biolabs:** Obtaining the unique DNA sequences of island arthropods and publishing the result within an international DNA Barcode database.
7. **UCSD:** Examining the phenotypic and genetic difference of ant species across the California Channel Islands.

**E. Plans for future work with this initiative**

1. **Academics**
  - a. **K-12:** Expand on current experiential STEM curriculum and continue to develop partnerships with local school district.
  - b. **Undergraduate:** Continue developing service learning courses and research connections across academic programs. Create an interdisciplinary field school that teaches both environmental science and archeological field methods.
  - c. **Professional Training:** Create a professional training course for credentialed STEM teachers.
2. **Grants/Funding:** Apply for the following grants in order to further support and expand upon the SRIRS programing: NEA Artworks, NOAA B-WET, NOAA Marine Debris, and NSF-REU.
3. **Research:** Further cultivate research collaborations across a wide array of academic, non-profit, and professional organizations.