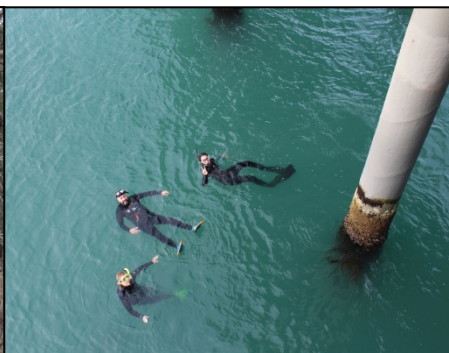
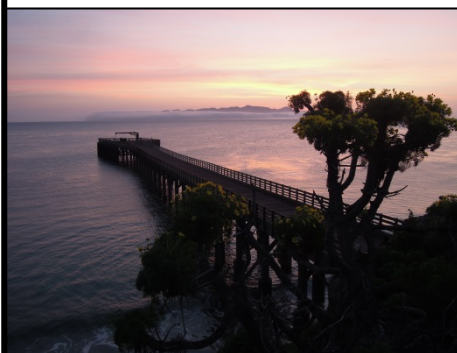




Santa Rosa Island Research Station

2015-16 Annual Report



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



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've experienced rapid growth and success across a variety of metrics. Compared to the 2014-15 academic year we had a 30% increase in user activity, a 45% increase in the number of research projects we support, and an 82% increase 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 has helped develop and support.

Santa Rosa Island Research Station: 2015-2016 Summary	
Visitors	# User Days
Undergraduate Students	2,486
K-12 Students	858
Researchers	359
Service Learning	790
Total	5,010
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)	9
Moderate (e.g. provide housing/logistic support)	12
Significant (e.g. co-write research proposals/reports, perform fieldwork)	35
Total	56
Partnerships	# Partners
Colleges/Universities	29
K-12 or Informal Education Organizations	8
Professional Research Agencies/Organizations	16
Community Outreach/Service Learning Organizations	7
Total	60

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 2015-16 we supported 37 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 weaved together the work of the research community.

B. 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 2015-16 academic year we hosted 55 different education groups and accumulated 3,344 student user days.

C. 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 will help 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.

D. 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, ~60% of the groups who used the SRIRS were from CI and they included 16 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. Consequently, we had an 82% increase 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.

E. Crossing the Channel

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 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.

IV. PARTNERS

A. Academic (37)

- K-12 (8):** Ventura School District, Los Angeles School District, Ojai School District, Santa Barbara School District, Oxnard Elementary School District, Oxnard High School District, Santa Barbara Middle School, and Santa Maria High School District.
- Universities/Colleges (29):** CSU Fullerton, CSU Northridge, San Diego State University, CSU Los Angeles, CSU San Bernardino, Cal Poly San Luis Obispo, Westmont College, Oxnard College, Santa Barbara City College, Allen Hancock Community College, Moorpark College, Ventura College, Cornell University, Biola University, Penn State University, Colorado State University, Michigan University, University of Colorado, Brooks Institute of Photography, University of Oregon, UC Davis, UCLA, UC San Diego, Scripps Institute, UC Berkeley, UC Santa Barbara, University of Wisconsin, and Utah Valley College.

B. Non-Academic (23)

- Governmental:** Channel Islands National Park, Channel Islands National Marine Sanctuary, NOAA, United States Geological Survey, United States Fish and Wildlife Service, Santa Monica Mountains Wilderness Management Area, NPS Inventory & Monitoring Program -Mediterranean Coast Network, Smithsonian Institute, California State Assembly.
- Non-Profit:** Institute of Wildlife Studies, Channel Islands Restoration, California Academy of Science, The Nature Conservancy, Mountain Restoration Trust, Santa Barbara Natural History Museum, Organization of Biological Field Stations, Santa Barbara Botanical Garden, Sierra Club, Havasi Wilderness Society, Growing Solutions Restoration Education, and Coastal Marine Biolabs.
- Other:** Island Packers and Patagonia.

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, Business, Chicana/o Studies, Chemistry, Communication, Computer Science, Education, English, Environmental Science and Resource Management, Mathematics, Performing Arts, Political Science, Sociology	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 201 Painting, ART 314 Digital Media Art, BIOL 312/ESRM 313 Conservation Biology, BIOL 316 Invertebrate Zoology, BIOL 407 Behavioral Ecology, BIOL 452 Entomology, BIOL 433 Ecology and the Environment, BIOL 494 Independent Research, BIOL 497 Directed Study, COMM 443 Environmental Communication, COMM 499 Capstone Project, COMP 494 Independent Research, ECON 498 Faculty-Student Collaborative Research in Social Business, ENGL 260 Creative Writing, An Introduction, ESRM 200 Principles of Resource Management, ESRM 328 – Introduction to GIS, ESRM 351 – Field Methods, ESRM 494 – Independent Research, ESRM 499 – Capstone, MATH 452 – Computational Bioinformatics, PHYS 494 Independent Research, and UNIV 498 Faculty-Student Collaborative Research	AP Biology, AP Chemistry, Environmental Science, Field Methods, Biotechnology, Marine Science

VI. RESEARCH

A. SRIRS Undergraduate Research

1. Student Capstone/Independent Research Projects

a. Anthropology (4 Students)

- **Historical Archeology:** Documented and recorded the cultural items and oral history of the historical ranching era (*CI Faculty Mentor: Jennifer Perry; NPS Collaborator: Laura Kirn*).
- **SRI Military History:** Documented the foundation of former military infrastructure and recorded the oral history of SRI military personnel (*CI Faculty Mentor: Jennifer Perry*).
- **Channel Islands Shipwrecks:** Documented the historical and biological value of shipwrecks around the California Channel Islands (*CI Faculty Mentor: Jennifer Perry*).
- **Historical Island Graffiti:** Enriching island history through the inventory of historical graffiti (*CI Faculty Mentor: Jennifer Perry*).
- **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, Colleen Delaney, and Blake Gillespie*).

b. Applied Physics (1 Student)

- **Real-time Sustainability Platform:** Developed a real-time and low cost sustainability platform (*CI Faculty Mentor: Greg Wood*).

c. Biology (10 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 Whitaker 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 Whitaker*).
- **SRI Land Birds:** An Introduction to Land birds of Santa Rosa Island Field Guide and Animal Bioacoustics Acquisition (*CI Faculty Mentor: Allison Alvarado*).
- **Evolution of an Island Endemic:** Morphological variation of an endemic island bird (*CI Faculty Mentor: Allison Alvarado*).

d. Business (7 Students)

- **Santa Rosa Island -Lodge Concessionaire Proposal:** Conducted research to determine the feasibility of implementing a mixed-use model on Santa Rosa Island (*CI Faculty Mentor: Susan Andrzejewski*).

e. Environmental Science and Resource Management (15 Students)

- **Environmental Education:** Developed and implemented environmental education curriculum associated with 'Crossing the Channel' K-12 program (*CI Faculty Mentor: Cause Hanna; NOAA Collaborator: 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 Collaborator: 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 Collaborator: Stacey Osterman Kelm; USGS Collaborator: Kathryn McEachern*).
- **Santa Rosa Island Shoreline Change:** Georeferenced Santa Rosa Island historical photos and examined changes to the coastline & dunes systems through time (*CI Faculty Mentors: Sean Anderson and Cause Hanna; NPS Collaborator: Rockne Rudophe*).

Environmental Science and Resource Management Undergraduate Research Continued:

- **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 Whitaker*).
- **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-Points:** 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 Santa Rosa Island 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*).
- **Water Quality/ Lagoons:** Using water chemistry and macro-invertebrates as bio-indicators of water quality of several Santa Rosa Island streams (*CI Faculty Mentors: Cause Hanna and Sean Anderson; NPS Collaborator: Steve Whitaker*).
- **Santa Rosa Island Oaks:** Established a long-term citizen science acorn study of three different oak species (*CI Faculty Mentor: Cause Hanna; Cornell University Collaborator: Mario Pesendorfer; USGS Collaborator: Kathryn McEachern*).
- **Bishop Pines:** Performed a census, established long-term demography plots, and examine the variables associated with germination & seedling survival (*CI Faculty Mentors: Cause Hanna and Sean Anderson; USGS Collaborator: Kathryn McEachern*).
- **Marine Debris/Sandy Beach Monitoring:** Collected and cataloged information on the amounts, types, sources, and historical changes of shoreline marine debris on Santa Rosa Island beaches (*CI Faculty Mentors: Sean Anderson, Cause Hanna, and Clare Steele; NPS Collaborator: Steve Whitaker*).
- **Biosecurity – Port of Entry Monitoring:** Recorded the percent canopy cover, distribution pattern (e.g., isolated, scattered or monoculture), and a general phenophase for species and groups on the parks' target invasive plant list as well as newly documented invasive plants (*CI Faculty Mentors: Cause Hanna and Sean Anderson, NPS Collaborator: Dirk Rodriguez*).

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 Buchanan*).

2. Applied Physics

- **Greg Wood:** Developing a real-time and low cost sustainability platform (*CI Collaborator: Cause Hanna*).

3. 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*).
- **Ruben Alarcon:** Documenting and measuring the development of physical and biological interactions on Santa Rosa Island following the removal of invasive ungulates (*NPS Collaborator: Sarah Cheney; USGS Collaborator: Kathryn McEachern; SB Botanical Garden Collaborator: Denise Knapp*).

Biology Faculty Research Projects Continued:

- **Allison Alvarado:** Monitoring the presence and behaviors of native, introduced, and migratory land birds on Santa Rosa Island (*NPS Collaborator: Paula Power*).
- **Erich Fleming:** Inventory and monitoring the freshwater algae on Santa Rosa Island (*NPS Collaborator: Stacey Osterman Kelm*).
- **Steve Norris:** Ichthyological surveys to identify and document fishes within Santa Rosa Island lagoons (*NPS Collaborator: Steve Whitaker*).

4. Communications

- **Tracylee Clarke:** Developing a sibling program to introduce a more diverse group of students to the National Parks and nature (*CI Collaborator: Cause Hanna*).

5. 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*).

6. Education

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

7. Environmental Science and Resource Management

- **Linda O'Hirok:** Measuring the restoration of the watershed efficiency, structure, and stabilization on Santa Rosa Island (*CI Collaborator: Cause Hanna; NPS Collaborator: Stacey Osterman-Kelm, USGS Collaborator: Kathryn McEachern*).
- **Sean Anderson:** Developing the use of marine ROVs and aerial UAVs for the use of kelp forest and shoreline change.
- **Clare Steele:** Examining the anthropogenic impacts on the biological and physical characteristics of the sandy beach habitat (*NPS Collaborator: Steve Whitaker*).
- **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; NPS Collaborator: Sarah Cheney; USGS Collaborator: Kathryn McEachern; SB Botanical Garden Collaborator: Denise Knapp; Coastal Marine Biolabs Collaborators: Ralph Imondi and Linda Santschi*).
- **Kiki Patcsh:**
 - Georeferencing the aerial photography of the Northern California Channel Islands (*CI Collaborator: Cause Hanna, NPS Collaborator: Rockne 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. NOAA:** Tracking the movements and abundance of white sharks around Santa Rosa Island.
- 2. Westmont College:** Examining the herpetology ecology & evolution.
- 3. Smithsonian**
 - Investigating song bird population structure and adaptive radiations.
 - 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.
 - 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.

6. **Coastal Marine Bio-labs:** Obtaining the unique DNA sequences of island arthropods and publishing the result within an international DNA Barcode database.
7. **UC San Diego:** Examining the phenotypic and genetic difference of ant species across the California Channel Islands.
8. **Colorado State University:** Evolution, ecology, and physiology of the Song Sparrow.
9. **University of Michigan:** Sediment analysis of the Santa Barbara Channel.
10. **Penn State University:** Ocean dynamics of pre-historic Chumash intertidal sites.
11. **NPS Inventory and Monitoring Program:** Biosecurity of ports of entry on Santa Rosa Island.
12. **Channel Islands National Marine Sanctuary:**
 - Sandy beach and intertidal ecology citizen science programs.
 - Underwater remote operated vehicles.
13. **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.
14. **Institute of Wildlife Studies:** Bald Eagle and Peregrine Falcon Population Recovery

VII. FINANCES

A. Grants and Awards - \$187,127

1. NOAA B-wet (\$59,000)
2. NOAA Marine Debris (\$100,000)
3. President's Foundation Award Channel Islands
 - a. Patsch, K. and Hanna, C. Georectifying historic aerial photographs (\$8,008)
 - b. Clarke, T and Hanna, C. Santa Rosa Island Student Sibling Research Trip (\$6,124)
4. Material. Services Support Facilities and Technology (MSFT) Funding - Sustainability and Student Research at the Santa Rosa Island Research Station (\$12,995)
5. Organization of Biological Field Station Diversity Award (\$1,000)

B. Private Donations - \$22,098

C. User Fees/Income - \$24,000

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. **Professional Training:** Create a professional training course for credentialed STEM teachers.
- D. **Grants:** Apply for the following grants: National Endowment of Arts Artworks, NOAA B-WET, NOAA Marine Debris, National Science Foundation-Research Experience for Undergraduates, USDA-Hispanic Serving Institute, and the EPA Environmental Education Local Grant Program.
- E. **Foundations:** Contact and apply for funding from the following foundations: Marisla Foundation, Pacific Life Foundation, Flour Foundation, W.M. Keck Foundation, and Keith Campbell Foundation for the Environment.
- F. **Research:** Further cultivate research collaborations across a wide array of academic, non-profit, and professional organizations.
- G. **SRIRS Advisory Committee:** Develop an internal SRIRS advisory committee in order to revise and develop our 5 year plan and ongoing policies and procedures.
- H. **SRIRS Steering Committee:** Develop an external steering committee in order to evaluate our ability to satisfy our mission and our main partners.

VIII. PEER COMPARISON

Research Station	Affiliation	User Days	User Affiliations	Staff
Santa Rosa Island Research Station	CSU Channel Islands	5,010	60	2
Santa Cruz Island Research Station	UC Santa Barbara	4,413	49	3
Sedgwick Reserve	UC Santa Barbara	7,063	44	7
Hastings Natural History Reserve	UC Berkeley	6,608	39	3.5
Big Creek Reserve	UC Santa Cruz	5,336	61	4
Angelo Coast Range Reserve	UC Berkeley	3,359	35	4
Anza-Borrego Desert Research Center	UC Irvine	2,801	34	4
Granite Mountains Desert Research Center	UC Riverside	2,558	53	3
Quail Ridge Reserve	UC Davis	1,578	13	5
James San Jacinto Mountains Reserve	UC Riverside	1,343	29	2.5

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



If you would like more information on the Santa Rosa Island Research Station please visit our website (www.csuci.edu/sri) or contact the Station Director, Cause Hanna, at (805) 437-3785 or cause.hanna@csuci.edu.

Appendix: SRIRS Presentations

1. 2016 Sage Student Research Conference

- Assar, S., Gephart, A., Dilly, G. 2016. Biology Intertidal Biodiversity on Santa Rosa Island. Sage Student Research Conference.
- Baglietto, A., O'Hirok, L. 2016. Restoration Assessment of Quemada Creek, Santa Rosa Island, CI National Park. Sage Student Research Conference.
- Blair, B., Anderson, S., Hanna, C. 2016. Demography Plots and GIS Analysis of the Island Torrey Pine (*Pinus torreyana*). Sage Student Research Conference.
- Buckley, Z., Anderson, S., Hanna, C. 2016. Comparing the Effects of Precipitation Regimes and Fire Ecology on Germination and Growth Rates of Island and Mainland Populations of Bishop Pines (*Pinus muricata*). Sage Student Research Conference.
- Casey, S., Power, P. 2016. Native revegetation following Eucalyptus removal and burning on Santa Cruz Island, California. Sage Student Research Conference.
- Cureno, J., Perry, J. 2016. Enriching Island History Through Graffiti. Sage Student Research Conference.
- Daniels, K., Alvarado, A. 2016. Recent range expansion of an island endemic. Sage Student Research Conference.
- Daniels, K., Alvarado, A. 2016. Morphological variation of an island endemic. Sage Student Research Conference.
- Fadich, D., O'Hirok, L. 2016. Geomorphology Of Water Canyon On Santa Rosa Island. Sage Student Research Conference.
- Forster, E., Anderson, S., Hanna, C. 2016. Demography & Germination Differences Between Torrey Pine from Santa Rosa Island (*Pinus torreyana* ssp. *insularis*) and Torrey Pines State Natural Reserve (*Pinus torreyana* ssp. *torreyana*) Populations. Sage Student Research Conference.
- Garcia, E., Deverson, A., Dilly, Geoff. 2016. Rocky Intertidal Monitoring using Point-Intercept Plots on Santa Rosa Island. Sage Student Research Conference.
- Hanna, C., Clarke, T. 2016. Santa Rosa Island Student Sibling Research Trip. Sage Student Research Conference.
- Horn, D., Steele, C., Anderson, S. 2016. Pervasive Plastics: A New Challenge for Crabs and Our Sandy Beach Ecosystem. Sage Student Research Conference.
- Martinez, D., Hanna, C., Anderson, S. 2016. Prevalence of Invasive Plant Species on Santa Rosa Island in Correlation to Park Visitors. Sage Student Research Conference.
- McIntyre, L., Olivares, J., Moran, R., Dilly, G. 2016. Stress-Induced Changes in Respiration Rates in *Mytilus californianus* and Implications for Hypoxia and Gene Expression Analyses. Sage Student Research Conference.
- Miani, J., Assar, S., Dilly, Geoff. 2016. Intertidal Ecology and the Effects of El Nino on Santa Rosa Island. Sage Student Research Conference.
- McPherson, H., Anderson, S. 2016. Citizen Science and Environmental Education. Sage Student Research Conference.
- Miller, M., Hanna, C., Steele, C.L.W. 2016. Trends in Marine Debris in Ventura County: Changes over the last 30 years on Mainland and Channel Island Beaches. Sage Student Research Conference.
- Newell, A., O'Hirok, L. 2016. Changes in Watershed Vegetation After Removal of Ungulates on Santa Rosa Island, Channel Islands National Park. Sage Student Research Conference.
- Pritchard, B., Hanna, C., Anderson, S. 2016. Current Weather Patterns and Isolated Demographics of the Bishop Pine Population Dictates Survivability on Santa Rosa Island. Sage Student Research Conference.
- Scotti, V., Perry, J. 2016. Demonstrating the Historical and Environmental Value of Shipwrecks on the California Channel Islands. Sage Student Research Conference.
- Scrivnor, K., Marzec, J., Dinkins, T., Bieszczad, AJ. 2016. CI Rainbow Framework for Long-Term

Real-Time Environmental Monitoring - Exploratory CI Park Development' by 'Analytical and Visualization Tools for Environmental Data in the CI Rainbow Framework. Sage Student Research Conference.

- Smith, E., Delaney, C., Perry, J., Gillespie, B. 2016. *Dichelostemma capitatum's* significance in the Chumash diet based on corm variability with respect to nutritional content, morphology, and collection times. Sage Student Research Conference.
- Smith-Gridley, R., Alvarado, A. 2016. An Introduction to Landbirds of Santa Rosa Island Field Guide and Animal Bioacoustics Acquisition. Sage Student Research Conference.
- Strother, C., Gephart, A., Dilly, G. 2016. Characterization of Water Quality in Intertidal Zones Using an EXO2 Sonde. Sage Student Research Conference.
- Summers, R., Hartmen, B. 2016. A Terrain Analysis Study & Vegetation Timeline of Santa Rosa Island, Channel Islands National Park. Sage Student Research Conference.
- Tirado, E., Anderson, S., Hanna, C. 2016. Environmental Attitudes in Underrepresented Students. Sage Student Research Conference.
- Walker, R., Alarcon, R., Hanna, C. 2016. Measuring island restoration progress through arthropod and bee diversity on Santa Rosa Island. Sage Student Research Conference.
- Weber, T., Perry, J. 2016. Guardian of the Mainland: An Anthropological Look at the History and Archaeology of the Session information Military Presence on Santa Rosa Island. Sage Student Research Conference.
- Woolsey, J., Hanna, C., Anderson, S. 2016. Expansion of *Quercus tomentella* Groves at Black Mountain on Santa Rosa Island. Sage Student Research Conference.

2. Professional Conferences

- Burns, K., Comfort, B., Pratt R. 2016. Riparian monitoring on Santa Rosa Island, California: A survey of water quality and benthic macroinvertebrates. American Association of Geographers 112th Annual Meeting March 29-April 2 2016.
- Hanna, C. Role of Plant-Pollinator Networks in Ecological Restoration. 2016. Arthropods and Conservation Seminar Series, UC Santa Barbara.
- Horn, D.A., Steele, C.L.W. Anderson, S. S. 2016. Pervasive plastics: a new challenge for crabs and our sandy beach ecosystem. Oral presentation at the Annual Meeting of the Southern California Academy of Sciences Meeting. May 7th, 2016.
- Miller, M. 2016. Trends in marine debris in Ventura county: changes over the last 30 years on mainland and Channel Islands beaches Oral presentation at the Annual Meeting of the Southern California Academy of Sciences Meeting. May 7th, 2016.
- Newell, A., Fadich, D., Summers, R. 2016. Changes in vegetation and geomorphology after removal of ungulates from Santa Rosa Island, Channel Islands National Park". American Association of Geographers 112th Annual Meeting March 29-April 2 2016.
- Steele, C.L.W., Horn, D.A., van Heerden, V. N., Schmitt, T.J., Anderson, S.S. 2015. Ecological impacts of microplastic debris in sandy beach ecosystems. 96th Annual Western Society of Naturalists Meeting, Sacramento, California, November 7, 2015.
- Steele, C.L.W., Horn, D.A., van Heerden, V.N. 2016. Impacts of microplastic debris in sandy beach ecosystems. Oral presentation at the Annual Meeting of the Southern California Academy of Sciences Meeting. May 7, 2016.

3. Outreach Presentations

- Hanna, C. Santa Rosa Island Research Station - First Two Years. February 2016. Audubon Society.
- Hanna, C. Santa Rosa Island - A Place of Discovery. 2015. Library Lecture Series, Santa Paula, CA.
- Horn, D., Schmitt, T., Anderson, S., Steele, C. 2016. Pollutants and Sandy Beach Health. COAST – WRPI Poster Session. Long Beach, CA, March 8, 2016. Surfrider General Meeting, Great Pacific Iron Works Patagonia Ventura. February 2, 2016.
- Steele, C. Plastic Pollution: How microplastics are impacting beaches in Southern California. CSUCI Library Lecture Series, EP Foster Library, Ventura, CA. May 01, 2016.