

## Ken Norris Center for Natural History 2016-2017 Annual Report - July 2017

The Norris Center was established in March 2014 with the support of the Packard Foundation to expand on UC Santa Cruz's long commitment to natural history teaching and experiential learning. The center is dedicated to cultivating natural history skills for students of all ages, fostering each student's passion for the natural world, and supporting natural history research that serves as the basis for understanding and conserving the complex and rapidly changing ecosystems around us. We do this by offering educational opportunities to a range of audiences, curating important collections, and serving as a hub for the UCSC naturalist community. Below we summarize our major initiatives during the past year and discuss plans for the coming year.

### *1. Serve as a dynamic, on-campus natural history resource center.*



*Figure 1: Senior Intern Max Taus teaches science illustration students about reptiles*

Our space continues to be used by many classes and groups, including the staff of Hidden Villa Environmental Education Center, the Forest School after school program, and the CASFS Farm apprenticeship program. We hosted visits of elementary school students participating in both spring break and summer camps run by the Santa Cruz Museum of Natural History. Support from the March Conservation Fund enables us to hire student workers to keep the Norris Center open three or four days each week for six hours a day throughout the year, even at times when the Center Director is teaching or in the field. During open hours the space is nearly continuously occupied by students and other

volunteers. In total, the Norris Center logged 7471 user days during the 2016-2017 academic year. In addition to formal activities, many students use the space to study and socialize.

### *2. Support hands-on learning opportunities through internships and laboratory and field activities in undergraduate classes; work to expose undergraduates to natural history training opportunities early in their college careers*



*Figure 2: Student from ENV5 17 pose in front of their finished display about mammal skulls*

The Norris Center continues to support a large number of UCSC classes (24), which are primarily in the Environmental Studies (ENVS) and Ecology and Evolutionary Biology (EEB) Departments, but also include an Earth and Planetary Sciences class and 10 sections of an Introductory Art course. Our collections are also used by Science Illustration and Vertebrate Biology courses at CA State University Monterey Bay. In addition to formal classes, the student-led Natural History Club meets weekly in the Norris Center and offered natural history training to students of all class levels. In winter 2017, Administrative Director Lay again taught Curation of Natural History Collections (ENVS 17), which provided training in natural

history collections management and interpretive exhibit design to 15 students. Seven ENVS and EEB students did internships, developing skills in curating the insect and mammal collections, and three senior interns completed natural history projects under the supervision of Administrative Director Lay. Four curation groups met at the center, focusing on insects,

vascular plants, bryophytes, and fungi. These groups include graduate students, undergraduates, and community members from the CA Native Plant Society and Lichen Society, and provide excellent training opportunities for the undergraduate participants.

Chris Lay completed a Manual of Best Practices for Safe Field Teaching in consultation with Sara Souza at UC Berkeley, who is responsible for field risk management for UC systemwide, and staff in Environmental Health and Safety at UCSC. The manual is now available online and has been adopted for use by the entire UC system ([www.ucop.edu/environment-health-safety/groups-and-programs/centers-of-excellence/field-research-safety/introduction.html](http://www.ucop.edu/environment-health-safety/groups-and-programs/centers-of-excellence/field-research-safety/introduction.html)).

### 3. Outreach with broader community



Figure 3: Left - Community members at our fall Cross-Pollination Open House. Right – Graduate fellow Andy Kulikowski and undergraduate Jessie Klovee share information on insects with visitors to the California Academy of Sciences.

A major focus of fall 2016 was planning and running our public event “Cross Pollination: the Art and Science of Santa Cruz Natural History” at the Hay Barn in November. We highlighted the Randall Morgan Pollinator Collection, with numerous student-designed exhibits on pollinators and the artwork of renowned natural history artist Mary Jo Koch. Over 200 people attended our Friday night opening reception and another 800+ people visited the exhibits during the weekend. Children and adults alike participated in our natural history scavenger hunt designed to help participants further their knowledge of Santa Cruz insects. Some of these exhibits were also displayed at a “Pollinator Fair” at the California Academy of Sciences (in San Francisco) where ~500 people visited the tables

With support from the Helen and Will Webster Foundation, we have continued to work with staff at the Santa Cruz Museum of Natural History (SCMNH) to pilot, revise, and teach their kindergarten-second grade field trip program about local animals to include inquiry-based techniques and align with Next Generation Science Standards. Senior Alexandra Draime did a critical review of the program and revised the program and docent manual accordingly. She also translated some of the program materials to Spanish so that they are more accessible to English Language Learners and their parents who accompany the field trips. Between 1/1/16 and 6/30/17, 60 classes participated in the program, of which 32% were from schools with >50% of students eligible for the free and reduce-price meals program.

The Norris Center continued to provide support for the Bird School Project, a program run by two Environmental Studies alumni, which inspires 7<sup>th</sup>-12<sup>th</sup> grade students and teachers to develop a scientific understanding and appreciation of their local environment through learning about birds in their schoolyards. Since 2014, the Bird School Project has worked with over 4000

K-12 students at 38 schools in California, primarily in the Monterey Bay Region, and trained over 20 UCSC interns. The Norris Center supported the BSP in transitioning to an independent non-profit organization, and Norris Center Directors edited several of their proposals to grant agencies and private foundations.

#### 4. Curate the Randall Morgan Insect Collection



*Figure 4: Graduate student Angie Aschbacher (with help from her daughter) measures bumblebee species found in Morgan's collection*

In September 2016 we learned that we were awarded a 2-year (Oct. 2016-2018) \$100,000 grant from the Institute of Museum and Library Services. The grant, along with over \$35,000 in matching funds from private donors, will support the curation of Randall Morgan Insect Collection, which is our most valuable collection for research and conservation. Santa Cruz naturalist Randall Morgan collected over 70,000 insects (primarily pollinators) from 39 sites between 1989 and 1999, and made detailed notes on plant-insect associations ([norriscenter.ucsc.edu/collections/insects](http://norriscenter.ucsc.edu/collections/insects)).

During the 2016-2017 academic year, Norris Center graduate fellow Andy Kulikowski and Norris Center administrative director Chris Lay have overseen the curation of the collection and supervised six undergraduate students who have assisted with the curation, helped with databasing field notes, and made educational exhibits about insects. As result of funding from the Board Opportunity Fund, IMLS, and private donors, we have accomplished the following progress over the past nine months:

- Rehoused the collection in new cabinets for long term storage
- Sorted all the major pollinator groups to family to family and the other insects to order
- Labelled all unlabeled specimens
- Entered over half of Randall Morgan's field notes about the pollinators
- Set up the forms for the online database that will be developed over the next year
- Started consulting with taxonomic experts to identify all pollinators in the collection.

We will continue the curation of collection during the 2017-2018 academic year. This will include continuing with species identifications, photographing examples of each species, and developing a fully searchable online database of the entire pollinator collection.

Unfortunately, Randall Morgan died of cancer in June 2017. We have been working with his friends and family to fundraise for the Randall Morgan Natural History Initiative ([norriscenter.ucsc.edu/collections/Collectors/images/RM-Initiative.pdf](http://norriscenter.ucsc.edu/collections/Collectors/images/RM-Initiative.pdf)), which will increase the Norris Center endowment to fund curation of his collection and to extend his legacy of mentoring young naturalists and working to conserve the endemic ecosystems and species of the Santa Cruz region.

## 5. Natural History Art Initiative



Figure 5. Left - Painting Feathers, our first weekend art workshop. Right – Norris Center Graduate Fellow Juniper Harrower teaches science illustration class.

With the generous support of a private donor, we are excited to be developing programs to link the art and science of natural history. Norris Center graduate fellow, Juniper Harrower, has been helping us to develop this program and to train undergraduate students in natural history illustration. She taught a natural history illustration independent study course during spring 2017 and had 60 applicants submit portfolios for the 10 available slots, demonstrating the high demand for natural history illustration courses on campus. Each week different faculty and graduate students met with the students to teach them about organisms on which they had expertise, and then the students drew those organisms. The students set up an exhibit in the window boxes in the Art Division and displayed their work at the Environmental Studies undergraduate research symposium. Their drawings are also being used for field guides, in scientific publications, and for notecards.

Other natural history art events we have sponsored during 2017 included:

- Artists Mary Jo Koch and Erika Perloff led weekend workshops for a mix of community members and UCSC students. Both filled quickly, and we will expand our offerings in coming year.
- We co-sponsored a talk with the Seymour Marine Discovery Center by painter Lily Simonson, who shared her experiences of diving with scientist in Antarctica and painting deep sea animals.
- We have hired a local artist and educator to teach a natural history illustration course in fall 2017. The course filled within two hours of enrollment opening, so we are planning to offer an additional session in the coming year.
- Jennifer Keller, program coordinator for the Science Illustration Program at California State University Monterey Bay, provided training to UCSC students during a 10-day Natural History Field Quarter trip to the Mojave Desert.

In addition to offering more classes, workshops, and artists in residents, in the coming year we are planning to offer competitive stipends for artistically skilled students to collaborate with graduate student and faculty members to help them share their work. We are also busy planning for a weekend hands-on, art-focused public open house in November.



Figure 6: Drawings by students Hannah Caisse (top) and Willow Mosely (bottom)

## 6. Competitive grants program

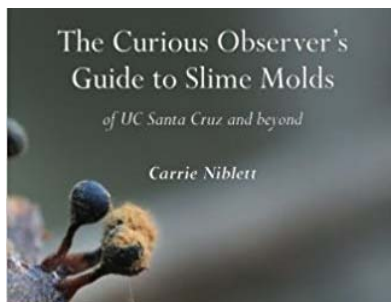


Figure 7: Front Cover of the first ever UCSC Slime Mold Field Guide

We made [ten student awards](#) (Appendix 2) to support a diverse set of projects, ranging from field guides to the amphibians of Fort Ord and the slime molds of the UCSC campus; to research projects on the chytrid fungal pathogen on amphibians at UCSC and kangaroo rats in the Santa Cruz mountains; to a video on ocean acidification. These awards provided support for student projects sponsored by nine different faculty in the ENVS, EEB, and Art Departments. We are developing an online database of the various theses, posters, and displays produced so that they are available to a wide audience and can serve as models for students applying for grant funding in the future.

## 7. Natural history field quarter and the 45<sup>th</sup> alumni reunion



Figure 8: Final circle at the Field Quarter 45<sup>th</sup> alumni reunion

The Natural History Field Quarter (NHFQ) class was successfully taught for the 44<sup>th</sup> time during spring 2017. The Norris Center supported NHFQ by providing teaching, meeting, and group project space when the class was in Santa Cruz in-between trips. The course also made use of the natural history collections, library, and field equipment. The responsibility for overseeing staffing, budgeting, course evaluation, and planning for 2017 was accomplished by the NHFQ Executive Committee (Appendix 1). This year NHFQ was taught by Chris Lay and returning lecturer, Ryan Carle, a NHFQ alum and former course assistant. The course included 27 students, two course assistants, and two instructors. The course went on four multi-day field trips, including a stay at the Big Creek Reserve despite road closures. The course also made a new 1.5-day trip to Mount Diablo and the Sacramento/San Joaquin Delta region. This year, the course incorporated a record number of guest lecturers, including Jenny Keller (NHFQ '83) who taught an extensive curricular piece focused on science illustration. We awarded seven partial student scholarships for a total of \$2,000 to help offset the course fees that students pay. We continued to keep a [course blog](#) detailing the students' collective experience.

During Alumni weekend in late April, we hosted ~200 NHFQ alumni for 2 days at the Little Basin Campground in the Santa Cruz Mountains for a lively celebration of the 45<sup>th</sup> year since Field Quarter began in 1972. The focus of the reunion was to celebrate the contributions of long-time FQ instructor Breck Tyler, build community and cross-generational connections, and raise funds for future FQ priorities. Fun was had by all, and many new connections were made.

## **Appendix 1. Advisory Committee Members**

### **Norris Center Executive Committee**

*Jenny Anderson*, retired Environmental Studies staff & instructor and representative of the Friends of the Norris Natural History Programs

*Karen Holl*, Norris Center Faculty Director and Professor of Environmental Studies at UCSC

*Bruce Lyon*, Professor of Ecology and Evolutionary Biology at UCSC

*Chris Lay*, Norris Center Administrative Director

*Richard Norris*, Professor of Geosciences at UC San Diego and representative of the Friends of the Norris Natural History Programs

**Appendix 2. Norris Center Student Project Awards for 2016-2017 Academic Year. For project descriptions click [here](#).**

Student	Faculty sponsor	Major	Project Title
Dylan Huntzinger	Tim Duane	ENVS	Forging solutions with environmental policy: the case of Mono Lake
Carrie Niblett	Greg Gilbert	ENVS	A field guide to the slime molds (Myxomycetes) of the UC Santa Cruz Campus
Deanna Rhoades	Gage Dayton	EEB	Historic and current distribution of the endemic Santa Cruz kangaroo rat
Kylie Sullivan	Barry Sinervo	EEB	Presence of chytrid fungus pathogens on the UCSC Forest Ecology Research Plot
Trevor Barclay	Dan Costa	EEB	Assessing the validity of mass estimation via an unmanned aerial system on northern elephant seals
Erica Ferrer	Kristy Kroeker	Marine Biology	Seeing is believing: a video of ocean acidification effects
Max Taus	Gage Dayton	ENVS	Field guide to the reptiles and amphibians of Fort Ord
Teague Corning	Erika Zavaleta	ENVS	Field guide to aquatic insects of Point Reyes
Danielle Devincenzi	Karen Holl	ENVS	Seabird habitat restoration on Año Nuevo Island
Elexis Padron	Jimin Lee	Art	Natural history linocuts