USC Wrigley Institute for Environmental Studies

Research Experiences for Undergraduates (REU): Coastal Ocean Processes

2017 Program Handbook For Mentors and REUs

Revised April 11, 2017. Available on-line: dorsife.usc.edu/Wrigley/reu/

This material is based upon work supported by the National Science Foundation’s Division of Ocean Sciences under NSF Award OCE-1263356. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.
TABLE OF CONTENTS

The USC Wrigley Institute for Environmental Studies (WIES) and the WIES Research Experiences for Undergraduates (REU) Program .................................................. Page 3

The USC Wrigley Marine Science Center (WMSC) on Catalina Island ........ Page 4

For Undergraduate Researchers (REUs)

  Overview ............................................................................................................. Page 5
  The Research Project .......................................................................................... Page 6
  WMSC Lab Supervision Policy ........................................................................... Page 8
  REU Professional Development, Training, Seminars, Networking ........ Page 9
  Finances and Travel .......................................................................................... Page 10

For REU Mentors

  Expectations, Important dates and Reminders ................................................. Page 11
  WIES REU Program Contact Information ...................................................... Page 14
  2017 REU Mentors and Fellows ........................................................................ Page 16
THE WIES REU PROGRAM: COASTAL OCEAN PROCESSES
This NSF-funded Research Experiences for Undergraduates (REU) Program is administered by the USC Wrigley Institute for Environmental Studies (WIES) and the USC Dornsife College of Letters, Arts and Sciences.

The WIES REU program will support twelve highly motivated and talented undergraduate students to conduct independent but guided research that focuses on Coastal Ocean Processes during an intensive 10-week program (June 5 - August 11, 2017) at USC in Los Angeles (week 1) and the Wrigley Marine Science Center (WMSC) on Catalina Island, CA (weeks 2-10).

The program will also provide undergraduate students with training in laboratory and field methodologies, special seminars in oceanography and environmental science, academic and career advisement, networking opportunities with faculty and other professionals, and field trips to explore Catalina Island.

Eligibility
Applicants must be U.S. citizens, U.S. nationals or permanent residents of the U.S. to be eligible for this program. Students must also have completed at least one year of undergraduate study by the summer of 2017 and must plan to be enrolled in an undergraduate degree program during the Fall of 2017. For the 2017 WIES REU program, special consideration will be given to students who attend a university or college in California and/or institutions with limited research training opportunities, but we encourage applications from all students nationwide who meet the NSF REU program’s requirements for eligibility. We especially encourage students from underrepresented groups in STEM fields to apply. This program will be especially beneficial for undergraduate students with a strong interest in pursuing graduate school or a career in marine or environmental science and research. Competitive applicants will have at least a 3.25 GPA, one semester of chemistry, one semester of biology, and one semester of calculus or statistics. Prior research experience is not required.

THE WRIGLEY INSTITUTE FOR ENVIRONMENTAL STUDIES
The Wrigley Institute for Environmental Studies (WIES) is USC’s hub for environmental research, education and outreach. Our main offices are in Los Angeles on the USC University Park Campus, and we proudly oversee the research laboratories and conference facilities at the Philip K. Wrigley Marine Science Center on Catalina Island, at Big Fisherman Cove near the community of Two Harbors.

The mission of WIES is to encourage responsible and creative decisions in society by providing an objective source of marine and environmental science and fostering an understanding of the natural world among people of all ages.
Wrigley Institute-affiliated faculty conduct research in all aspects of the environment, such as the biological adaptations to climate change, interactions among humans and natural systems, and the analysis and development of environmental policy. WIES works with foundations and the public to enhance environmental awareness. More information can be found at: http://dornsife.usc.edu/wrigley/.

THE WRIGLEY MARINE SCIENCE CENTER

The WMSC is located near the town of Two Harbors on Catalina Island, about 20 miles from the port of Los Angeles, California. The location is remote but beautiful, with easy access to open ocean and coastal ecosystems. We have a 5.5-acre campus with housing, a conference center, a dining hall, a common lounge, an administrative building, a laboratory…and an ocean!

The environment
Catalina sits in a mild, temperate maritime setting. The marine systems between Los Angeles and Catalina range from urban/impacted sandy and rocky shorelines, to deep canyon-cut continental shelf systems, spectacular blue water environments, to pristine rocky intertidal and subtidal kelp forests. This is a perfect setting to examine diverse marine ecosystems with adjacent lands that include contrasting uses like commercial ports, substantial recreational activity, and marine protected areas. Catalina’s terrestrial landscape is also protected (through the Catalina Island Conservancy) and includes more than 400 native plants. This landscape offers an opportunity to compare land-ocean interactions in heavily human impacted vs. natural settings.

WMSC Laboratories
The WMSC’s 21,000 sq. ft., 3-story laboratory includes teaching facilities, six shared use research laboratories plus individual laboratories with bench space for visiting researchers; ultra clean flowing seawater, radioisotope analytical and molecular capabilities, a computer center, library, wired and wireless internet connectivity, and video-conferencing. By fall of 2014, a research greenhouse will be available for scientists to conduct plankton, aquaculture, biofuel, and terrestrial studies.

Networking and Collaborations
Visiting scientists, students and educators come from regional, national and international institutes, with many returning year after year. This will provide unique opportunities for REU Fellows to interact and network with a global scientific community.
FOR UNDERGRADUATE RESEARCHERS (REUs)

Overview
Program dates: June 5 (Mon) – August 11 (Fri), 2017 (10 weeks)
You will spend the first week of the 10-week program at the USC University Park Campus (UPC) in Los Angeles, CA and stationed at the USC Wrigley Marine Science Center (WMSC) on Catalina Island, CA for the remainder of the program. Research schedules can be very demanding and will vary from project to project. Do not expect the “standard” 40-hour/5-day week/9-5 job. During the 10 weeks, you will be expected to:

1. Plan and execute an independent research project under the guidance of a research faculty mentor and (for some projects) near-peer mentors (e.g., graduate students). We anticipate that a minimum of 70% of your working time during the program will be devoted to activities directly related to your research project.
2. Submit a written research proposal by the beginning of the third week of the program, and present your proposal to the WMSC scientific community for feedback. Guidelines for the proposal and presentation will be provided during the first week of the program.
3. Submit a Final Report at the end of the program. Guidelines for the Final Report will be provided during the first few weeks of the program.
4. Present your research findings at a joint poster symposium organized by the USC Wrigley Institute and USC Center for Dark Energy Biosphere Investigations (CDEBI). The symposium will be held on the USC UPC in Los Angeles on August 11, 2017 (Fri) and will be open to the USC community and general public.
5. Participate in other research activities in your mentor’s lab.
6. Participate in the WIES REU seminar series.*
7. Participate in REU program networking activities and field trips.*
8. Participate in career- and skill-building workshops.*
9. Attend Mentee Lunches with the REU Director and/or Coordinators on Tuesdays (day subject to change).
10. Have fun and enjoy southern California and beautiful Catalina Island!

* The REU calendar of events can be found here. We ask that you try to plan around REU activities when possible, but research should take precedence. Please inform the REU Program Director and/or Coordinators of any conflicts in schedule as far in advance as possible.
The Research Project

1) **Before you arrive:** If your mentor(s) has(have) not been in touch with you yet, contact your mentor(s) via email to introduce yourself and ask for reading materials that will help you to hit the ground running once you arrive. 10 weeks is a short period of time, so any preparatory work that you can do will help, including reading papers and familiarizing yourself with methods. Some mentor-mentee teams also chat via phone or video conferencing prior to arrival to discuss project ideas. Engaging your mentors prior to your arrival will show enthusiasm and initiative.

2) **The Proposal:** During the first week of the program, you will work closely with your mentor(s) to design a summer research project. Since good science often thrives on collaboration and interaction among researchers, you will present your research proposal to the WMSC science community for feedback at the beginning of the third week of the program (10 minute talk, including feedback and questions). You will also be responsible to turn in a written version of your proposal. *It is recommended that you ask your mentor(s) to review your draft proposal and go through at least one practice run of your presentation with them.* You will receive guidelines for the written proposal and oral presentation during week 1 of the program.

3) **Execution of the Project:** The details of your project will define your work schedule for the summer. You will work with your mentor(s) to develop a research plan, which should include a timeline that outlines the weekly tasks that must be completed in order to finish the project in the 10-week period. We encourage you to trade field and laboratory help with other REUs in the program as well as other members of your mentor’s laboratory to maximize your research experiences and to learn about other projects. Be prepared for potentially erratic or irregular and long working hours.

4) **Laboratory notebooks:** Each student will be given a laboratory notebook at the beginning of the program. Notebooks should be used to keep detailed notes of the research project, including experimental design of field work and/or lab experiments, results and other notes that are pertinent to the research project. Be diligent about taking detailed notes and, whenever possible, create a duplicate electronic copy of your notes (especially if you take your notebook out into the field). These notes will be critical during data analyses and preparation of final reports and posters. Mentor(s) may also ask to see your lab notebook and/or ask to keep your notebook at the end of the program if the project will be continued with other students.

5) **Weekly meetings:** You will be required to meet with your faculty and/or graduate student mentor(s) at least once a week. During the weekly meetings
with mentors, you should be prepared to provide a progress report of your research project, including results, issues, troubleshooting ideas, next steps, and other research-related matters. Each REU-mentor pair will determine the best day to have these weekly meetings, which can be done in person or via video or phone conferencing. You should take very detailed notes during these meetings, and make sure you clearly understand any expectations, comments and/or suggestions expressed by your mentor(s).

6) **The Final Report and Poster Presentation**: You should plan to end your data collection at least 10 days before the last day of the program. Data analysis and interpretation as well as the process of putting together a poster and final report usually take longer than planned, so we suggest you begin this process as early as possible. Keeping detailed notes as you conduct your research will help you develop your final report and poster. You might also consider starting the Introduction and Methods sections early. Your mentor will guide you in analyzing and interpreting data. Further guidelines for the final report and poster presentation will be provided during the first few weeks of the REU program. Electronic versions of the final report will be due on August 10, 2017. These reports will be bound together into a single volume that will be kept at the USC WMSC library, and your Final Report abstract will be “published” on the [USC WIES-REU program web site](#). You will also present a poster of your research findings at the USC Wrigley Institute/CDEBI joint poster symposium at USC on August 11, 2017. The symposium will be open to the USC community and general public. You’re welcome to invite friends and family!

7) **Lab Cleanup**: It is important that your research activities do not result in additional cleanup work for other researchers after you leave. Before leaving the WMSC and the USC UPC, you must clean your workspace in your mentor’s or assigned lab space and dispose of any samples that your mentor does not plan to save using approved protocols. For WMSC lab spaces, you will receive a “Checkout List” that needs to be approved by the WMSC lab manager (Lauren Oudin) or the lab technician (Kellie Spafford) to show that your obligations have been met prior to your departure.

8) **Acknowledgements**: The National Science Foundation requires that any publication resulting from, or including, work supported by the NSF REU-Sites program include the following acknowledgement: “This material is based upon work supported by the National Science Foundation under NSF Award OCE-1263356.” You should also acknowledge the Wrigley Institute for Environmental Studies, USC Dornsife, your faculty mentor(s), near-peer mentor(s), lab mates, and anyone else who helped you during the summer.
WMSC Lab Supervision Policy
Draft date: 30 May 2013

To conduct research in a lab unsupervised, all undergraduate students must complete a 6-hour campus safety course (or the equivalent at your home institution) and a 1-hour WMSC-specific safety talk.

To work in a lab under supervision (by a graduate student or instructor/faculty), all undergraduates must complete a 3-hour safety course (or the equivalent at your home institution) and the same 1-hour WMSC specific presentation. All supervisors must complete the 6-hour training and the 1-hour WMSC-specific safety talk.

Undergraduate students enrolled in academic courses need only complete the 1-hour WMSC-specific safety talk.

No one is permitted in the Radiation Lab unless they have completed the Radiation Safety Course and are named on a current Radiation Permit.

Students under the age of 18 are not allowed to work unsupervised in the labs. If ANY students in a group are under 18, the group must have a supervisor (who has completed the six-hour training) and an adult chaperone to watch over each “bay” being used in the lab). Chaperones are not required to complete any formal training, but are encouraged to complete the 1-hour WMSC safety course.

Note: Students over 18 are allowed in the lecture hall, computer room and library at any time without supervision.

USC Lab Safety Course Information:

** REU students will complete the 6-hour laboratory safety training course on the first day of the program at the USC UPC.
REU Professional Development, Training, Seminars and Socials

The USC WIES REU Seminar Series
Researchers and professionals from academia, industry, government and non-profits will be invited as guest speakers for the weekly REU seminar series. REU students will have an opportunity to network with speakers and learn about diverse marine and environmental research topics.

Career- and Skill-Building Workshops
Several career- and skill-building workshops will be organized for REUs. Topics may include: scientific communication (proposals, presentations, and scientific papers); applying to and choosing a graduate school and program of study; career opportunities in science; research ethics; education and outreach; oceanographic research methods; and more. Workshops will be posted on the REU Calendar.

Mentee Lunches
The USC WIES REU Program Director, Dr. Karla Heidelberg, and REU Coordinators, Dr. Diane Kim and Dr. David Ginsburg, will meet with REUs every Tuesdays at lunch (day subject to change) throughout the summer. These meetings will provide REUs with an informal setting to openly discuss their progress, challenges, and/or questions they have about their research project or other REU-related matters. This will also be a time for the REU Director and Coordinators to make important announcements.

Field Trips and Orientation Activities
During orientation, REUs will get a tour of USC and WMSC campuses and research laboratories, have a “meet and greet” with other undergraduate researchers and mentors (faculty and near-peer mentors), receive laboratory safety training, visit the Natural History Museum, explore Catalina through hiking and kayaking excursions, network during beach cookouts, and more!

Activities will be updated throughout the summer on the REU Calendar.
Finances and Travel

Finances
REUs will receive a stipend of $500/week during the 10-week program. Stipends will be disbursed in two installments of $2,500. The first installment will be issued on June 5, 2017 and the second installment will be issued on July 24, 2017.

For non-USC students: you will receive an e-mail from USC’s Supplier Portal (technicalsupport@sciquest.com) to complete a new vendor application (non-USC students need to be set up as an ‘external vendor’ for payments). Please fill out the application, which will also include an option to set up direct deposits. If you have any problems filling out the application, please contact the Portal help desk at 213-740-2716.

Taxes: This fellowship may also be taxable under California and Federal law. All tax matters are your responsibility. Please consult the Internal Revenue Service (IRS) (http://www.irs.gov/publications/p970/index.html, IRS help-line at 800-829-1040) and/or consult a qualified tax advisor.

Housing
Housing on the USC University Park Campus during the first week of the program (June 5 - 12, 2017) and last two days of the program (August 10 – 11, 2017); and at the Wrigley Marine Science Center on Catalina Island from (June 12 – August 10, 2017) will be provided. Students will be housed 2 or 3 people to a dorm. Dorms are furnished with bedding, towels, desks, chairs, and most also have mini refrigerators. Our rooms are comfortable, but remember that you will be living at a remote field station for most of the program.

Meals
Meals at the WMSC on Catalina during weeks 2-10 of the program will be provided. REU students are responsible for their own meals during week one of the program at the USC UPC campus in Los Angeles. The first half of stipends will be issued on the first day of the program to use for food.

Travel
Travel expenses from and to home institutions will be covered by the program. The REU Director and/or REU Coordinators will contact you in mid-April to begin arranging your travel.
FOR REU MENTORS

Important dates and reminders:
Before the program begins, please communicate with your REU student(s) about summer research plans by email, telephone or video conferencing. Please send students manuscripts and other “homework” so that they can hit the ground running when they arrive!

Week of May 29: Info Session and Meet and Greet for Mentors

June 5 – 12, 2017 (week 1): REUs will be on the USC UPC and spend most of their time in mentors’ labs. Please work with students to develop a feasible research plan for the summer. Students will be stationed at the WMSC on Catalina for the remainder of the program (June 12 – August 10, 2017) and will be back on the main campus for the REU joint poster symposium with CDEBI on August 11, 2017 (Fri).

June 26 (Monday): REUs will give an oral presentation about their summer research plans at the WMSC on Catalina Island. The presentation will be open to the WMSC science community. Mentors are highly encouraged to attend!

July 31-August 10, 2017 (last 2 weeks): Mentors will be responsible to guide REUs in data analysis and preparation of posters and final reports.

August 11 (Friday): REUs will present their research at the main USC campus in Los Angeles.

Time on the island: REU mentors will have access to a housing at the WMSC or Two Harbors throughout the program to stay over on the island and work with their REU student(s). Please note that you may have to share the apartment with other mentors/USC researchers. The apartment will be available on a first-come, first-serve basis. Please email dianekim@usc.edu to make arrangements as far in advance as possible and at least 3 days in advance of your expected stay. Space on the Miss Christy will be prioritized for REU mentors throughout the program. You can contact us or wiesboat@usc.edu directly to reserve space on the boat. If you make your own reservation, please mention that you are a REU mentor. REU mentors will be responsible for their own meals. Breakfast and lunch at the WMSC Dining Hall are $8 each, and dinners are $15 each. The mentor apartment has a full kitchen, so mentors can also bring their own food, but we encourage you to dine with REU students!
A note about mentor teams and shared mentoring responsibility:
The goal of this REU program is to provide the best mentoring situation for
undergraduates, so please keep this in mind when developing a mentoring plan
for your student(s). Team mentoring (faculty, postdocs, graduate students,
and/or other members of the lab sharing mentoring responsibilities) can be very
effective and is highly encouraged to expose REU students to researchers at
different career stages and to provide mentor training opportunities for
postdoctoral researchers and graduate students. However, if primary
responsibility for undergraduate researcher(s) will be assigned to post-docs,
graduate students and/or some combination of personnel in faculty mentors’
labs, please keep in mind that faculty mentors are still expected to directly
engage with REUs at least once a week, either in person or via video/phone
conferencing. We know from experience that this will have a significant impact
on the REU student’s experience in the program! The faculty mentor’s role will be
especially important during the first and last two weeks of the program.

Lab Supervision
REU students must be accompanied by near-peer and/or faculty mentors to
work in the WMSC laboratories. The REU Director and Coordinator will be on site
to provide supervision during times that mentors are not available.

The Research Project
Please think about a research project that an undergraduate student can
execute and complete (semi-independently) during a 10-week period, mostly
spent at the Wrigley Marine Science Center on Catalina Island. Ideally, the
research project will contribute to or complement ongoing work for a
dissertation, research grant, or proposal. REU students often produce high
quality work and have the potential to make significant contributions to
research programs, so please think strategically about what project to carve out
for them. Please note that some mentors allow REUs to develop their own
research questions, others provide options for summer projects, and some assign
specific projects to students. Whatever the situation, please be sure to inform
students about the research process, and engage them in as many stages of
the research process as possible (e.g., decision-making about experimental
design or explaining why a specific experimental design will be used).

Expectations
In addition to clearly laying out a road map of the research project and goals,
mentors should also clearly articulate other expectations that they have for the
REU student, including working hours, participation in other lab activities or
projects, sharing data, authorship, and other relevant matters at the start of the
program.
**Mentor Meeting**

The REU Director and Coordinator will organize a REU Mentor Meeting prior to the start of the program. This optional meeting will cover information provided in this handbook and also address any questions or concerns mentors may have. We strongly encourage new REU mentors to attend the meeting (date TBD).

**Follow-ups**

Please inform the REU Program Director (Kheidelb@usc.edu) and/or the REU Coordinators (dianekim@usc.edu and dginsbur@usc.edu) of any publications or presentations at scientific meetings that you coauthor with your undergraduate researcher.

The National Science Foundation also requires that any publication resulting from, or including, work supported by the NSF REU-Site program include the following acknowledgement: “This material is based upon work supported by the National Science Foundation under NSF Award OCE-1263356.”

**Thank you!**

Being an REU mentor has both some costs and some great benefits. We greatly appreciate your willingness to serve as a mentor. We hope that you find it rewarding as well as scientifically productive. Please feel free to contact the REU Program Director and/or REU Coordinator if you have any problems, concerns or suggestions.
USC WIES REU Program Contact Information:
If you encounter any concerns or questions about the REU program, or have any general comments that you would like to share, please contact the REU Program Director and/or REU Coordinators:

Dr. Karla Heidelberg
REU Program Director
USC Environmental Studies Program
Kheidelb@usc.edu, office (310) 510-4038 or cell (301) 518-1770

Dr. David Ginsburg
Associate Professor (Teaching), USC Environmental Studies Program
REU Coordinator
dginsbur@usc.edu, office (213) 740-8576

Dr. Diane Kim
Undergraduate Programs Director/REU Coordinator
USC Wrigley Institute
dianekim@usc.edu, cell (213) 820-9191

Connect with us on Facebook and Twitter!
Twitter: @WIES_UP
Facebook: https://www.facebook.com/UscWiesREU

For reservations on the Miss Christy:
Please e-mail wiesboat@usc.edu

USC WMSC Laboratory Contact Information:
For WMSC laboratory related matters, please contact:

Lauren Czarnecki Oudin
Laboratory Manager
lauren.czarnecki@usc.edu, (310) 510-4002

Kellie Spafford
Lab Technician
kspaffor@usc.edu, (310) 510-0811

Wrigley Institute for Environmental Studies
3454 Trousdale Pkwy, CAS 200
Los Angeles, CA 90089-0371
(213) 740-6780
wies@usc.edu
dornsife.usc.edu/Wrigley/reu
Wrigley Institute Interim Director
Dr. John Heidelberg
jheidelb@usc.edu, (213) 740-5791

Wrigley Institute Associate Director
Ann Close
close@usc.edu, (213) 740-6705

Wrigley Marine Science Center
P.O. Box 5069
1 Big Fisherman Cove
Avalon, CA 90704
Phone: (310) 510-0811
Fax: (310) 510-1364

WMSC Assistant Director of Operations
Sean Conner
sean.conner@usc.edu, (310) 510-4012

The Program Director for this REU site is Dr. Lisa Rom (Ocean Education, Division of Ocean Sciences): elrom@nsf.gov or (703) 292-7709. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.
2017 REU students, mentors and projects

Averilla, Lauren
College of William and Mary (Biology, Class of 2019)
REU Faculty Mentors: Dr. Sergey Nuzhdin (Professor, USC Computational and Molecular Biology)
Graduate student mentor: Levi Simmons
Project topic: Biogeography of marine microbes, title TBD

Basden, Isabelle
Florida State University (Biological Sciences, Class of 2019)
Dr. Mark Steele (Associate Professor, Cal State University Northridge Biology)
Graduate student mentor: Alexis Extrada
Project topic: Marine invertebrate and fish ecology, title TBD

Caballero, Anthony
Cal State University, Dominguez Hills (Molecular Biology, Class of 2018)
REU Faculty Mentors: Dr. Adriane Jones (Assistant Professor of Biology at Mt. St. Mary’s University); Dr. John Heidelberg (Associate Professor of Biology at USC); Dr. Diane Kim (Director of Undergraduate Programs at USC Wrigley Institute)
Project topic: To investigate microbial diversity and function in an aquaponics system at the USC Wrigley Marine Science Center on Catalina Island, title TBD

de la Zerda, Rafael
University of Miami (Marine science/chemistry, Class of 2018)
REU Faculty Mentor: Dr. James Moffett (Professor of Biology, Earth Sciences and Civil and Environmental Engineering at USC)
Graduate student mentor: Kenneth Bolster
Project topic: Trace metal biogeochemistry of decaying macroalgae, title TBD

Dillon, Taylor
University of Miami (Marine Science and Biology, Class of 2019)
REU Faculty Mentor: Dr. Douglas Capone, Professor of Biological Sciences
Graduate student mentor: Yubin Raut
Project topic: To investigate nitrogen fixing organisms and nitrogen fixation rates associated with the invasive kelp species, Sargassum horneri, at Big Fisherman Cove (a marine reserve at Catalina Island), title TBD

Doyle, Katelyn
Indiana University Bloomington (Environmental Sciences, Class of 2019)
REU Faculty Mentor: Dr. David Hutchins (Professor of Biology at USC)
Graduate student mentor: Josh Kling
Project topic: Microbial response to ocean acidification, title TBD
Fogle, Megan
Florida Southern College (Marine Biology and Environmental Science, Class of 2018)
REU Faculty Mentors: Dr. Sergey Nuzhdin (Professor, USC Computational and Molecular Biology)
Graduate student mentor: Nathan Churches
Project topic: Shellfish aquaculture, title TBD

Healey, Lauren
California State University, Long Beach (Earth Science, Class of 2018)
REU Faculty Mentors: Dr. Lynn Dodd, Associate Professor of the Practice of Religion and Director of the USC Interdisciplinary Archaeology Undergraduate Major, and Dr. Su Jin Lee, Lecturer for the Spatial Sciences Institute at the University of Southern California.
Project topic: Reconstructing the hydrology of Catalina Island using GIS, aiding archaeologists to identify submarine groundwater discharge sites that may have also been sites of inhabitation for native people when sea levels were hundreds of feet lower than they are today, title TBD

Hernandez, Jacqueline
University of Southern California (Environmental Studies, Class of 2018)
REU Faculty Mentors: Dr. David Ginsburg (Associate Professor of Teaching in Environmental Studies at USC) and Dr. Diane Kim (Director of Undergraduate Programs at USC Wrigley Institute)
Project topic: Exploring kelp as a potential source of biofuel, title TBD

Langesfeld, Ivan
Pomona College (Environmental Analysis, Class of 2019)
REU Faculty Mentors: Joshua Troll (Research Associate in Biology at USC)
Project topic: Squid and Vibrio - Host responses to interactions with beneficial microbes, title TBD

Nixon, Emily
University of Southern California (Biological Sciences, Class of 2019)
Dr. Mark Steele (Associate Professor, Cal State University Northridge Biology)
Graduate student mentor: Alexis Extrada
Project topic: Marine invertebrate and fish ecology, title TBD

Sturges, James
University of Southern California (Environmental Studies, Class of 2018)
REU Faculty Mentors: Dr. David Ginsburg (Associate Professor of Teaching in Environmental Studies at USC) and Dr. Diane Kim (Director of Undergraduate Programs at USC Wrigley Institute)
Project topic: Exploring kelp as a potential source of biofuel, title TBD