



Proposal # _____0795_____
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## ***Instructionally Related Activities Report Form***

**SPONSOR:** Rachel Cartwright, Cindy Wyels  
**PROGRAM/DEPARTMENT:** Biology  
**ACTIVITY TITLE:** Hawaii’s humpback whales  
**DATE (S) OF ACTIVITY:** March 18<sup>th</sup>-25<sup>th</sup> 2017

Please submit via email to the IRA Coordinator along with any supporting documentation at [david.daniels@csuci.edu](mailto:david.daniels@csuci.edu) within 30 days after the activity. Thank you for your commitment to engaging our students!

### **A. ADDRESS THE FOLLOWING QUESTIONS:**

#### **(1) PROVIDE A DESCRIPTION OF THE ACTIVITY**

In this trip, 10 current undergraduate students and 2 instructors traveled to Maui, Hawaii, to work with a local non-profit research organization, the Keiki Kohola Project, and participate in a long term study of the behavioral ecology of humpback whales. The protected waters along the western coastline of Maui constitute critical breeding habitat for humpback whales; the Keiki Kohola Project aims to provide the information required to ensure adequate and appropriate management of this critical region.

This year, there were two key research questions that were focus for the trip. First, students were involved in collecting data that we are compiling to determine and characterize the impact of whale-watching vessels on the health and behavior of humpback whale mother and calf pairs. Students were engaged in all aspects of the research project, from background research, the development of testable hypotheses and design of data collection protocols prior to the trip, through the actual field work and subsequent data analysis. In the field, a graduate student from a previous IRA trip (Sarah Scrivano – Spring ‘15), worked closely with students to ensure that methods used were consistent across successive trips. Sarah’s travel was funded by the non-profit group, the Keiki Kohola Project. A second focus activity in this trip was the collection of aerial imagery, using small UAV’s to document body condition in the region’s humpback whales. Essentially this work was the continuation of a faculty-student collaborative, a University 499 class (Marine Mammal Aerial Photogrammetry Studies) in which the methods to be used were perfected. On returning, students presented their initial findings at the Sage research forum and additionally, they have prepared and submitted several abstracts for the next Society of Marine Mammalogy Biennial Conference, to be held in Nova Scotia in October ‘17.

In response to previous feedback from students, along with their participation in the research, students also spend some time exploring the island and its culture, through a number of field excursions. Time is also allocated each evening for reflective writing and journaling.

## (2) HOW DID THE ACTIVITY RELATE TO A COURSE(S) AND/OR LEARNING OBJECTIVES?

This course directly addresses the course learning objectives for University 394. Time spent reviewing relevant literature introduces students to the principles of behavioral ecology, the natural history of marine mammals and the underlying challenges of associated resource management. Alongside this, as students are actively involved in the development of experimental design, data collection protocols and post-trip data analysis, students also build their critical thinking and problem solving skills, they develop their abilities to work as part of a team while actively augmenting their practical field experience and skill set.

This course also complements a range of biology, ESRM and general science courses. These include Behavioral Ecology (Biol 407), Marine Biology (312), Science and Public Policy (Biol 345) Quantitative Methods in Biology (Biol 203), Conservation Biology (ESRM / Biol 330), Fundamentals of Remotely Piloted Systems (ESRM 370) Coastal Monitoring with Remotely Piloted Systems (ESRM 371) Coastal and Marine Management (ESRM 462).

## (3) WHAT DO YOU SEE AS THE STRENGTHS OF THE ACTIVITY?

This activity provides students with the opportunity to engage in a week long field experience. The key strengths of this experience fall into two areas. Firstly, the students gain at the personal level, building skills such as the ability to collaborate effectively, communicate with their peers, solve problems and think critically. The students are placed into a new situation, where they need to rely on their own abilities to navigate this group setting. Academically and intellectually, participating students benefit from hands-on experience gathering field data, following the research process from design to execution and then analysis, and finally, from critiquing their work. For many students, the experience is transformative; two or three students in each group seem to find a new career path or potential vocation through this experience.

As part of this activity, students are provided with the opportunity to work as part of federally permitted research team, and contribute to ongoing efforts for the conservation of a federally listed, endangered species. This is a truly unique opportunity, and is especially useful for those students planning a career in this field. Additionally, as the field work in progress on Maui is now part of a long term data set, students build a level of personal responsibility and accountability, both within the immediate team and with respect to their contribution to this long term study. When they return to college, students continue to meet on a weekly basis and are actively involved in all aspects of data analysis. This drives a level of engagement, especially in upper division students nearing graduation that is otherwise not always apparent. In this course, students contribute to a larger scientific study and I think that carries weight and brings a sense of purpose to this activity.

Finally, I believe students benefit greatly from the experience of working out problems in a real world setting. Recording data, handling field notes, interpreting data recorded by other students, liaising with other group members and generally meeting the challenges of undertaking field work in an often inclement and challenging environment provides students with the opportunity to build life skills that then translate across their subsequent studies. Students build on their abilities to communicate, mediate amongst their peer group and function as a team member.

Over the several years that this course has now been running, students who may not excel in the more traditional educational environment have emerged as group leaders within this unique setting. Particularly for these students, the experience seems especially impactful and formative, and comprises a memorable component of their university education.

#### (4) WHAT WOULD YOU SAY ARE/WERE THE ACTIVITY'S WEAKNESSES?

Each year, one of our key challenges is the limited group size. In 2017, 10 students participated, however we received over 60 applications for the class, which means a lot of very keen students do not get to participate. Space on the research boats on Maui is a finite factor however; one way to address this would be to broaden the course. Aspects such as reef ecology, coastal management studies and more general review of human impact on island environments would all provide activities that could be used to extend the scope of the trip and increase the number of students involved.

A second challenge is maintaining a balance between the many island activities, and the actual research work that the students are involved in. Early morning starts and long days on the boats mean that evening lectures are not necessarily possible and with only 2 instructors, who are both needed out on the water on each of the research boats, the options for supervision of these alternate activities was limited.

#### (5) HOW WOULD YOU IMPROVE THIS ACTIVITY FOR NEXT TIME?

As with last year, one of the key changes we retained this time was in the scheduling of time spent on the water. Essentially due to boat logistics, students took just a half day boat trip and then spent time organizing and analyzing data. This actually improved their engagement in the data analysis portion of the class. Students met weekly once they returned from Maui and this year especially, their engagement with data analysis was exemplary. One issue that has really helped is having access to the UAV lab as a base for our activities. Having a classroom like this for student activities, with decent resources in terms of computer terminals etc. really made a big difference in terms of continuity and engagement.

#### (6) WHAT DID YOU LEARN FROM THE PROCESS?

1. Students need to be encouraged to allocate specific time for pre-trip preparation and post trip data analysis within their weekly schedule.
2. The more students are exposed to the process of research, the better they become at developing their skills in areas such as experimental design, problem solving and independent organization.
3. Given the opportunity, students from our classes still surprise me with their dedication and commitment to the stewardship of our natural resources.

#### (7) WHAT ARE STUDENT RESPONSES TO THE ACTIVITY?

Student evaluations attached (8)

8) GIVE A SUMMARY OF EXPENSES FOR THE ACTIVITY.

IRA Travel Activity Budget		
	Hawaii's humpback whales	
	Number of Students Participating: 10	
	Number of Faculty: 2	
	Expenses:	Totals
	Airfare	9195
	Ground Transportation	240
	Lodging	8217
	Meals (included)	1431
	Cultural Activities	490
	Vehicle/Van Rental	780
	vessel running costs	5899
	vessel insurance + survey	2894
	<b>Total</b>	<b>29146</b>
	<b>Costs paid by students as course fees</b>	<b>5500</b>
	<b>Costs covered by IRA</b>	<b>23646</b>

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**B. ATTENDEE LIST- SUPPORTING DOCUMENT:**

Attendee list attached

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**C.IMAGES FROM ACTIVITY:**

Images - attached



California State  
University

**INSTRUCTIONALLY  
RELATED  
ACTIVITIES**

C H A N N E L  
I S L A N D S



Students collect ID images of humpback whales



Snorkeling Olowalu Reef, West Maui



California State  
University

**INSTRUCTIONALLY  
RELATED  
ACTIVITIES**

C H A N N E L  
I S L A N D S



**Catching the UAV after a flight**



**Students learn to fly UAV's to catch aerial imagery of humpback whales**



California State  
University

**INSTRUCTIONALLY  
RELATED  
ACTIVITIES**

C H A N N E L  
I S L A N D S



Sample aerial image captured by students – Mother, calf and escort humpback whale swimming in Maui waters.

Assessing health impacts and body condition in Hawaii's humpback whales  
Post trip student survey – Trip dates March 18<sup>th</sup>-25th 2017

Major: Biology

Graduation date: May 2017

1. Provide a brief overview (100-200 words) describing your experience as a participant on this field trip.

The Maui trip was an indescribable experience. Still, months later, when someone asks me how it was I cannot help but respond with "it was SO cool!". Every morning, or afternoon, we got on a boat with high hopes of conducting a follow or seeing what a transect had in store for us. Every time we saw a potential pod to follow, we would all scramble into position with our camera, follow log, timers and Bad Elf. Data collection is a very hands-on activity and every second counts. Seeing the whales, of all different sizes and distances, was incredible. The fact that we were excited to follow a gigantic animal out in the middle of the ocean and got scared by a little moth on the boat should be a good indicator of our love for the whales.

2. Describe the aspects of the course that you found most valuable:

a) From academic/career perspective

The most valuable aspects of this trip in a career perspective was data collection and analyzation. During the day, we stayed on top of data collecting and keeping organized between all who were participating. Tracking the calf's dive times for example required constant time recording, keeping an eye on the puka for distance recording and especially continuously distinguishing calf from mom. At the end of the day, we would collectively condense all the data into organized units. The contrast between data collecting and analyzing started to merge; I found that analyzing became just as fun and interesting as the collecting was.

b) From a personal perspective

Personally, this experience showed me that I can be a fast learner. I had not used the Bad Elf before and started out nervous because I did not want to mess it up in anyway; the follow logs looked like an overwhelming data table. Once we started getting into the groove of things, everything was quite easy. I also learned that you could collect too much data and condensed it. This experience also reinforced my ability to work well with others. Though four of us met every week leading up to the trip, I had not spent time with any of the other six people going with us. By the first full day in Maui, I knew everyone and we felt like a true research team.

3. Please comment on the opportunities provided through this course that allow you to incorporate and contribute to research as part of your undergraduate education.

In courses, we spent a lot of time analyzing data. The data was given to us and we had to figure out what it meant. This trip provided the opportunity to go out and collect the data ourselves. To find out, collecting the actual data is a little harder than just analyzing it. It taught me that just because we go out with the intent to gather information, nature does not follow our research schedule. One day when we wanted to conduct follows, there were no whales.

4. Please provide any recommendations for future trips.

Assessing health impacts and body condition in Hawaii's humpback whales  
Post trip student survey – Trip dates March 18<sup>th</sup>-25<sup>th</sup> 2017

Major: Biology, minor in Chemistry  
Graduation date: May 2018

1. Provide a brief overview (100-200 words) describing your experience as a participant on this field trip. This trip was absolutely transformational. I was able to apply and observe what I learned in my research experience at CI to the field work I conducted in Hawaii. Every day was full of new things to learn and explore, and this trip (along with the people I went with) contributed greatly to my academic development as someone who aspires to pursue a career in research. Although some days were tiring, I was motivated by knowing that my contribution was significant to the overall goal of the Keiki Kohola Project. In addition, being in Hawaii for the first time enabled me to gain an immersive cultural experience. I was familiarized with the vernacular, food, and the amount of kind environment the people in Maui provided visitors. Overall, being given the opportunity to conduct research and interact with humpback whales in an intimate setting was an experience I know I wouldn't have had if I weren't a student at CI.

2. Describe the aspects of the course that you found most valuable:

a) From academic/career perspective

I learned how to apply and observe what I learned in my research experience at CI to the field work I conducted in Hawaii. Being able to integrate my research experience and work experience in a unique setting outdoors contributed greatly to my development as a researcher and student.

b) From a personal perspective

During this trip, I learned how to swim, snorkel, and adjust to living with people I've never lived with before. All three of these skills were strengthened over the course of one week, which made me realize how adaptable I've become because of this trip.

3. Please comment on the opportunities provided through this course that allow you to incorporate and contribute to research as part of your undergraduate education.

Before the trip, I was committed to the aspiration of becoming a researcher in microbiology. During the trip, I realized that the life I want to have in the future requires a balance between being at lab bench and being outdoors. I had already known how much I love being outdoors, but being in Hawaii enabled me to discover a newfound love for the water. During this research experience, I learned how to use a GPS device to track whale movement/migration, how to take pictures of dorsal fins and flukes, how to differentiate between a humpback mother and her calf, and how to analyze the data obtained. All of these skills I've developed and strengthened can be added to my arsenal of skills I can use in the future.

4. Please provide any recommendations for future trips.

More frequent trips! A meeting to train students on how to operate certain devices and to preface what tasks will need to be done during the trip would be beneficial for future trips.

Assessing health impacts and body condition in Hawaii's humpback whales  
Post trip student survey – Trip dates March 18<sup>th</sup>-25<sup>th</sup> 2017

Major:

Graduation date:

1. Provide a brief overview (100-200 words) describing your experience as a participant on this field trip.

As part of this field research experience it was my duty as part of the team to assist in the operations of an Unmanned Aerial System (UAS) and fly an Unmanned Aerial Vehicle (UAV). This task led me to work alongside Dr. Cartwright and another student Nick Sevier for the majority of the trip on a boat named "Trophy Boat." Our goal was to complete successful aerial imagery capture of Humpback whale behavior. Operations revolved around launching our UAS from Trophy Boat, capturing video over whales of interest, and landing back on the boat.

The encounters with Hawaii's Humpback whales during this course is something I will never forget for the rest of my life. I never truly understood how beautiful these creatures are until I was able to sit down and just watch them, follow them, and observe their behavior. For me, this was done from an entirely new perspective granted via a UAS, we were able to capture footage that very few individuals have the means to do so.

2. Describe the aspects of the course that you found most valuable:

a) From academic/career perspective

In order to legally fly the UAS under a research permit, I had to earn a Part 107 FAA pilot certification. Now that I have my Part 107 license I am able to assist other research projects with UAS operations if need be. I also was able to use my experience in Hawaii to relate it to other research that I do alongside Dr. Cartwright and Dr. Newton back on campus.

b) From a personal perspective

This was my first experience in a field research scenario, and I learned that there are many more variables that come into play throughout operations in the field. I also learned that I am not the most adept individual when it comes to boats, mainly knot tying. Overall, I have a greater appreciation for field work, the whales that we work with, and I would gladly do it all over again in a heart-beat.

3. Please comment on the opportunities provided through this course that allow you to incorporate and contribute to research as part of your undergraduate education.

This course proved to be a great reinforcement with the research I do with Dr. Cartwright and Dr. Newton back on campus. This research involves the study of whale muscle tissue including Humpback whales. To sum it up plainly, the chemical pathways involved in muscle formation (fiber type adaptation) are stimulated by exercise (Na release). I was able to experience calf exercise first hand with many breaching events. In the back of my mind I knew there is a possibility that behavior is improving the calf's breathing capacity, and will it to develop into a deep diving adult.

4. Please provide any recommendations for future trips.

I would recommend a “prologue” course for students who are entering the Hawaii course. This prologue course would occur the semester before the Hawaii trip course in order to teach students basic knowledge of operations, whale behaviors, and give an idea of what to expect once they are out there. Many of those who went with including myself had a small version of this type of course in the form of a UAV photogrammetry course the semester before the Hawaii course.

Assessing health impacts and body condition in Hawaii's humpback whales  
Post trip student survey – Trip dates March 18<sup>th</sup>-25th 2017

Major: Biology

Graduation date: May 2018

1. Provide a brief overview (100-200 words) describing your experience as a participant on this field trip.

Participating in this trip was amazing. I experienced what it's like to be in the field every day, while seeing whales up close for the first time. Being able to help with the research by taking photos, notes, marking the location with bad elf, and even helping cook was amazing. These skills will help me in the future for when I am in a PhD program, and if I have cook with others I can help. (I'm not the best cook, so it's helpful to know) My favorite aspect in the field would have to be the photography, I really liked taking the photos of the calves dorsal and the mother's fluke. Aside from the field work it is nice to have a new group of friends on campus from this experience! It was an honor being a part of the program and I hope I can do field research once I graduate.

2. Describe the aspects of the course that you found most valuable:

a) From academic/career perspective

The overall trip was helpful, however, writing down every observation in a field journal was the most important. Being in the moment and trying to write down everything was tedious, but I now have a new skill that I didn't think would be so much fun. Also, working on the boat with the UAV technology was amazing and helpful because I now know that doing research can involve other people that work on entirely different things from research.

b) From a personal perspective

This experience gave me an insight on how my peers and I can collaborate and work as a team. I knew a few students before this trip and after spending a week with them I now know them much more about them than previously.

3. Trips and experiences such as this provide opportunities to learn about our own strengths and weaknesses in terms of personal growth. What did you learn about yourself on this trip? Comment on anything you saw in yourself on this trip with regards to your personal self-confidence, your ability to adapt to a new situation, your roles within a group and as a team player.

This trip has made me realize that I need to be more communicative with my peers. I have tended to be scared of approaching people with my ideas and this trip helped me be a little more assertive in what I want to do in the field. Not only on the trip but the rest of the semester after has been helpful in building my confidence, by talking to team members and organizing a presentation for SAGE has been a real-life experience that can be applied to everything in life.

4. Please provide any recommendations for future trips.

I would say talk to the other students about the living situation and who would be best suited as a roomie for a week.

With thanks for your participation

Assessing health impacts and body condition in Hawaii's humpback whales  
Post trip student survey – Trip dates March 18<sup>th</sup>-25th 2017

Major: Biology

Graduation date: May 2018

1. Provide a brief overview (100-200 words) describing your experience as a participant on this field trip.

My experience of assessing health impacts and body conditions in Hawaii's humpback whales was extremely positive. I learned more about the behavior of humpback whales and certain techniques that would assist in the ability to gather field data in a mass setting. On this trip, I was taught how to work on a team and was encouraged not only to ask questions but offer solutions to questions I may have. It was a unique learning experience that I will always look back on.

2. Describe the aspects of the course that you found most valuable:

a) From academic/career perspective

I found learning to fly the drone in the middle of the ocean helped me fly a drone even better on land. I think this is a fundamental skill to know especially in today's day and age. We can use noninvasive techniques to gather information on a species, I feel that it is the way that most research is going. I also found the SAGE conference and excellent opportunity to put together a research presentation and present to an audience.

b) From a personal perspective

From a personal perspective, I learned how to work on a team with many different personalities but all with the same goal. I learned how much we need to protect the place we call home and just how small we are. It was incredibly humbling being able to view the whales in a close but respectful proximity.

3. Please comment on the opportunities provided through this course that allow you to incorporate and contribute to research as part of your undergraduate education.

After conducting research in Maui, I worked on a team of a few people studying nursing behaviors in humpback whales. We made a master plan of what we thought was occurring and why certain techniques in viewing humpback nursing behavior varied from other techniques. We then combed through hours of data both collected by us and by others and documented nursing behavior. WE were then able to suggest that the findings we found seemed to challenge that of other studies about Baleen whale's nursing. This opportunity allowed me to see what research was like and changed my mind of what exactly I want to do when I graduate.

4. Please provide any recommendations for future trips.

Although the trip was very well organized and a great overall experience, It would have been nice to be on the Island a few more days. I feel by the time everyone was feeling comfortable about their duty and research, we only had a few days left and then it was time to leave.

Assessing health impacts and body condition in Hawaii's humpback whales  
Post trip student survey – Trip dates March 18<sup>th</sup>-25<sup>th</sup> 2017

Major:

Graduation date: May 20<sup>th</sup>, 2017

1. Provide a brief overview (100-200 words) describing your experience as a participant on this field trip.

Being granted the opportunity to participate in this trip was amazing, and I gained a lot of valuable research experience from it. I learned how to collect field data in an exciting field of research, and I learned a lot about how to interact with a team in a completely new way. I felt that I grew a lot from this experience, both academically and personally, and I had such a fun time every day. I did not want to come back!

2. Describe the aspects of the course that you found most valuable:

a) From academic/career perspective

I learned how to collect data in the field using techniques such as GPS tracking and transects. This type of research is something that I do not have experience with, and will hopefully make me a more competitive student in whatever path I choose to follow, whether that be some sort of research, or veterinary school. I was provided with a unique opportunity to work with a species and to learn more about conservative efforts.

b) From a personal perspective

I gained a lot of knowledge of how to work with a diverse set of people. Every research environment presents people with this challenge, and it was especially difficult in this type of situation. Still I learned how to better delegate and how to work cohesively, and I think that this will prove to be a valuable lesson in interpersonal communication.

3. Trips and experiences such as this provide opportunities to learn about our own strengths and weaknesses in terms of personal growth. What did you learn about yourself on this trip? Comment on anything you saw in yourself on this trip with regards to your personal self-confidence, your ability to adapt to a new situation, your roles within a group and as a team player.

I learned that I can thrive in situations where someone is asked to take charge. I tend to fall into leadership roles easily, and it is usually due to my tendency to commit to things (sometimes a bit too much). However, I was happy to take on a more involved role in this situation, and I learned how to do so effectively. I also gained a lot of self confidence in my research abilities, my leadership skills, and even in my cooking abilities!

4. Please provide any recommendations for future trips.

The only recommendation I have is that the trip could be made longer, if possible! I think that there are only so many hours in a day to conduct research, and before you know it, the trip is over!

With thanks for your participation

Assessing health impacts and body condition in Hawaii's humpback whales  
Post trip student survey – Trip dates March 18<sup>th</sup>-25th 2017

Major: Biology

Graduation date: Fall 2017

1. Provide a brief overview (100-200 words) describing your experience as a participant on this field trip.  
This field trip is something I will never forget. This was an incredible opportunity for me as an undergraduate, and I learned so much. Being able to get hands on research experience at this point in my educational career was amazing.

2. Describe the aspects of the course that you found most valuable:

a) From academic/career perspective

Valuable research experience, collecting data, analyzing data, as well as learning new methods, and working with other professionals.

b) From a personal perspective

Traveling to a new place I have never been, and being outside of my comfort zone. I love the ocean and this entire experience ensured me that this is truly what I want to do with my degree.

3. Please comment on the opportunities provided through this course that allow you to incorporate and contribute to research as part of your undergraduate education.

I was able to use the research collected in this course to submit an abstract to the 22<sup>nd</sup> Biennial Marine Mammal Conference in Nova Scotia, as well as present at the SAGE Student Research Conference at CSU Channel Islands. I truly feel that I was a large part of the data collection and analysis that will hopefully aid in answering future questions.

4. Please provide any recommendations for future trips.

I would have loved to see more of the area in which we were conducting research. A more cultural aspect would be very interesting to students.

**Assessing health impacts and body condition in Hawaii's humpback whales**  
**Post trip student survey – Trip dates March 18<sup>th</sup>-25<sup>th</sup> 2017**

**Major:** Chemistry

**Graduation date:** May 2018

**1. Provide a brief overview (100-200 words) describing your experience as a participant on this field trip.**

Overall, the trip was a pleasant experience. To take part in hands-on research has been a goal of mine while attending CI. A hands-on approach to learning has always been a much more powerful method of learning for me. I am glad I was given the opportunity to take this course and be a part of this research team. To be able to interact with other students who are also science-oriented and love animals as much as I do was a nice bonus. The accommodations at the Aina Nalu condos were charming and homely. I am eternally grateful for the experience.

**2. Describe the aspects of the course that you found most valuable:**

**a) From academic/career perspective**

As a chemistry major with a particular interest in environmental chemistry, this course provided me with a first-hand look of the effects of climate change on the environment. On several occasions, I had opportunity to snorkel with my fellow students along different reefs on the west coast of Maui island. Some reefs were bright and colorful while others were bleached, bland, and grey.

The Environmental Chemistry course (CHEM 301) here at CI has taught that the reefs play a vital role in the uptake of carbon dioxide from the atmosphere. As carbon dioxide from the air is dissolved into the ocean, it is used up by the flora of the reef -- the coral use it to build their calcium carbon skeleton; and snails, clams, and oysters for their shells. The loss of these reefs means the loss of not only an important ecosystem but an important carbon sink.

**b) From a personal perspective**

Aside from the academic benefit, this travel experience allowed me the chance to recharge; it was a nice break from the monotony of the daily drive to and from campus. This field trip further provided me with the chance to fuse my undying love for learning new things with my insatiable wanderlust. There is something about packing and unpacking a suitcase that is gratifying.

**3. Please comment on the opportunities provided through this course that allow you to incorporate and contribute to research as part of your undergraduate education.**

The close community atmosphere of CSU Channel Islands allows for easy communication between the different academic programs. Every professor and staff member has been friendly and ready to help with any questions I may have. I had received an email forwarded from the biology department about the project encouraging any student interested to inquire about an application.

The funding that was provided by the IRA was the determining factor in providing the means to partake in the Keiki Kohola research trip. Without the funding, I would not be able to partake in the project.

**4. Please provide any recommendations for future trips.**

Require/encourage students to read the published literature related to Keiki Kohola Project to learn the background of the research, such as why photos of the juvenile dorsal need to be directly behind the whale.

More training before the field trip could prove beneficial. For example, performing a mock follow that was guided by the instructor or students previously involved with the project would allow the students new to the project to learn the subtle nuances of the task, like the useful abbreviations to use when writing on the data sheets, and how to identify a calf dorsal versus an adult dorsal.