



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

SPONSOR: [Gregory G. Wood](#)

PROGRAM/DEPARTMENT: [Physics](#)

ACTIVITY TITLE: [Air Quality at CSUCI and Santa Rosa Research Station](#)

DATE (S) OF ACTIVITY: Spring 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;
  - (2) HOW DID THE ACTIVITY RELATE TO A COURSE(S) AND/OR LEARNING OBJECTIVES?
  - (3) WHAT DO YOU SEE AS THE STRENGTHS OF THE ACTIVITY?
  - (4) WHAT WOULD YOU SAY ARE/WERE THE ACTIVITY'S WEAKNESSES?
  - (5) HOW WOULD YOU IMPROVE THIS ACTIVITY FOR NEXT TIME?
  - (6) WHAT DID YOU LEARN FROM THE PROCESS?
  - (7) WHAT ARE STUDENT RESPONSES TO THE ACTIVITY? ATTACH STUDENT EVALUATIONS OR ASSESSMENTS (IN ACCORDANCE WITH FERPA RESTRICTIONS YOU MUST REMOVE ALL PERSONALLY IDENTIFIABLE STUDENT INFORMATION)
  - 8) GIVE A SUMMARY OF EXPENSES FOR THE ACTIVITY.
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### **B. ATTENDEE LIST- SUPPORTING DOCUMENT:**

In addition to the report form, *in a separate document*, attach to your email a list of attendees complete with each student major and grade level. This for IRA Committee reference only and will not be published on the IRA website. Include your name and the title of your IRA activity on the document.

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### **C. IMAGES FROM ACTIVITY:**

Finally, attach to your email up to 6 images demonstrating student participation (under 2 MB total) with captions/titles. Please attach these photos in .JPEG format directly to email. Thank you!

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

Most of the Spring Semester we used to experiment with air quality sensors. We have working sensors for: oxygen, carbon dioxide, carbon monoxide, air pressure, altitude, temperature and humidity. We worked to integrate these sensors with a tiny, portable computer (Raspberry Pi) which stores the data.

The group travelled to Santa Rosa Island and took readings on several trails. Further, we visited many spaces throughout campus and recorded air quality levels. Lastly, we presented our findings at the Sage Student Research Conference.

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

The course objectives are all surrounding sustainability. We wanted to ensure that the indoor air quality is good. To cycle air through buildings requires energy. The question we wanted to answer is: are there areas of campus where the air quality is particularly good or bad, so that designs from these buildings can be replicated, or avoided.

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

The students were able to make great progress developing the sensors and were able to collect data from all over campus. We were able to take good baseline data on Santa Rosa Island, from several parts of the island.

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

Many of the sensors I purchased did not work properly and somewhat more expensive sensors (about \$100 per sensor, instead of about \$10 per sensor) are required for us to get reliable data.

Ventura county does not meet federal standards in the areas of ozone and PM10, which is particles less than 10 micrometers in size. Thus these are our next targets.

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

I would use a larger budget for sensors and we should be able to add ozone, natural gas, and dust.

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

The students were able to make a remarkable amount of progress on this project with minimal guidance from me, so this was a great project in that regard. Overall, the air quality on campus is very good. That said, our attempts to get readings during labs were affected by the use of dry ice (which is solid CO<sub>2</sub>) during those labs. In this regard,



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the labs we visited were the “worst case scenario”, but the building (Sierra Hall) air handling system was highly efficient at removing the added CO<sub>2</sub>.

**(7) WHAT ARE STUDENT RESPONSES TO THE ACTIVITY? ATTACH STUDENT EVALUATIONS OR ASSESSMENTS (IN ACCORDANCE WITH FERPA RESTRICTIONS YOU MUST REMOVE ALL PERSONALLY IDENTIFIABLE STUDENT INFORMATION)**

**Please note: I only asked students to reflect upon the trip to Santa Rosa, so their replies are mostly in regard to that trip.**

1. Santa Rosa was an amazing experience. To live in a land hardly touched by the technology of today is an amazing escape from everyday life. I had the opportunity to just think about my life, and my place in this world while hiking the beautiful hills of Santa Rosa. The weather was pristine and the wild growth from the rain had been its best in over five years. What my research team was able to accomplish was also important. An Air Quality device that we had worked on during the semester was a huge success. The device garnered solid data of the air particles on the island. Overall, I would recommend a trip like this to every Channel Islands student, it is a powerful representation of our college and the pride that the name of Channel Islands holds. The islands for all it's ancient and historic beauty and the college for which it represents is an important piece to California and to the world
2. Our trip to Santa Rosa Island was such a memorable experience. Being able to explore the Island with fellow classmates was the thing that I enjoyed the most. Seeing how beautiful the Island is and how much history was being preserved was very eye opening. This made me grow a greater appreciation for the National Park Service, because I was able to see how much they provide to keep the Island safe and also a great place to visit. This type of trip is something that would be beneficial for any college student. It's a great way to get out of your everyday environment and learn something that you wouldn't regularly learn sitting in a classroom.
3. The trip to Santa Rosa Island and the time spent on it was a real experience. It had been the first time in about 15 years I had been on a boat, let alone ever be able to experience seeing a whale (an orca, it's fin at most) on the way to the island. I completely enjoyed the time I and everyone else was able to spend while hiking together as a group including the first hike with Robin and the ESRM group. I will however say that even though all the hikes we did, with all of the beautiful vegetation that had managed to grow back (I could do without fear of poison oak even knowing what it looks like). The enthusiasm and independence we had as individuals at the research station, taking care of ourselves, cooking, cleaning and resting. Being out there and having fun and enjoying ourselves gave me something back as an individual, making me want to give back and do it all again!

**(8) GIVE A SUMMARY OF EXPENSES FOR THE ACTIVITY.**

Boat travel to Santa Rosa for five at \$104 each, \$520.  
Assorted sensors: \$92



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Note: I provided several hundred dollars of additional sensors, as well as food for the island trip, many additional components such as additional circuit boards, cases, batteries, cables, fans, and assorted hardware.

**B. ON SEPARATE DOCUMENT, PLEASE ATTACH ATTENDEE LIST  
(PERSONALLY IDENTIFIABLE INFO REMOVED)**

**C. PLEASE INCLUDE UP TO 6 IMAGES AS ATTACHMENTS TO YOUR  
SUBMISSION**

IRA for Spring 2017

PI: Gregory Wood

UNIV 492 Class:

Geluz,Zosimo Sarreal

Leiterman,Erik Kari

Marson,Bradley Ray

Ramirez Jr,Juan Carlos

Segrue,Jenna Leigh





