



<http://www.csuci.edu/ira/index.htm>

Application
Instructionally Related Activities Funds Request
2012-2013 Academic Year
DEADLINE: Fall and Academic Year 3/31/12
Spring 2013 deadline is 10/31/12

Applications must first be sent to the appropriate program chair. Chairs will then recommend and route them to the Dean's Office for review and authorization. The Dean's Office will then forward them to the IRA Committee for consideration.

Activity Title: Research at Sea

Project Sponsor/Staff (Name/Phone): Christopher Cogan 437-3319

Activity/Event Date(s): April 2013

Date Funding Needed By: January 2013

***Please Note that for Fall Requests the earliest that you will be notified of funding availability will be early June 2012 and for Spring Requests early January 2013.*

Please check if any of the following apply to your IRA:

- | | |
|---|---|
| <input type="checkbox"/> Equipment Purchase | <input checked="" type="checkbox"/> Field Trip |
| <input type="checkbox"/> Event | <input type="checkbox"/> Participant data collection for public dissemination, i.e. interviews/surveys that result is a journal/poster session/newsletter |
| <input type="checkbox"/> IT Requirements | <input type="checkbox"/> Risk Management Consultation |
| <input type="checkbox"/> International Travel | <input type="checkbox"/> Late Submission |
| <input type="checkbox"/> Space/OPC Requirements | |
| <input type="checkbox"/> Infrastructure/Remodel | |
| <input type="checkbox"/> Other _____ | |

Previously Funded: YES NO Yes, Request # _430_

*If previously funded, please attach copy of IRA Report

Does your proposal require IRB (Institutional Review Board) approval: Yes No

Assessment submitted for previously Funded Activity: YES NO

Academic Program or Center Name and Budget Code: ESRM

Date of Submission: 29 October 2012

Amount Requested: \$4850
 (Should match item 2. E. on page 4)

Estimated Number of Students Participating: 20

Application
Instructionally Related Activities Funds Request
2012-2013 Academic Year

1. **Brief Activity Description.**

The proposed “Research at Sea” field activity is designed as a capstone level experiential learning activity using ship-based oceanographic and ecological research methods. The research is proposed as a UNIV 391 1-unit class with student fees. The course theme is “marine and coastal ecosystems” with a focus on the quantification of spatial heterogeneity in ocean productivity. Target students are graduating seniors in science majors.

Students will learn the relevance of temporal, spatial, and thematic scales for coastal and marine systems, while gaining hands-on experience with scientific methods. Combining skills from the fields of oceanography, ecology, environmental science, chemistry, and geography, the students will integrate their data using Geographic Information Systems (GIS) to measure and map marine ecosystems in the Santa Barbara Channel. In this project, the students will spend two days and one night aboard the tall-ship schooner *Bill of Rights*.

Accompanying lectures and discussions will be held in the evening while at anchorage. At Santa Cruz Island, research students will also be introduced to this special terrestrial island-ecosystem. Topics on the terrestrial marine interface will be introduced, and ecotone boundary and biodiversity cross-over topics emphasized.

The proposed student research experience begins with teamwork to set-sail and quickly progresses to data collection and analysis. The experience is designed to let students discover that field science is hard work, not always predictable, but at the same time they are having fun while learning. The learning pace is accelerated - running from dawn into the evening, then up early the second day. Emotionally, the combinations of teamwork and close-quarters on the ship, the transition to a very different living and working environment, and the lack of cell-phone or texting access translate to an in-depth science-team experience and a sense of accomplishment and empowerment.

A similar “Research at Sea” program was conducted in 2010 with 60 students from Oxnard College as part of the HSI-STEM summer institute. The Fall 2010 (v. 14, n.2) edition of CI’s “Channel” features an article on the research. With IRA support in 2011, this opportunity was opened to CI students. As described in the 2010 HSI-STEM Annual Report:

Student research on the Tall Ship Bill of Rights was a culminating experience for many of the Summer Institute students. For many, it was a new and exciting venture. As one student commented, it was, “simply a life-changing experience!” This is echoed in their ratings of the experience of being on the Tall Ship, some of the highest ratings of any facet of the Summer Institute.

As one student wrote in their Student Ratings of Teaching (SRT) following the 2011 trip:

"I enjoyed every minute of this class! I feel I obtained more from this than I have in any other typical course. It was awesome to have real experience in the field I want to continue in. I am very grateful to have had this opportunity!"

From the academic science perspective, the "Research at Sea" experience is designed to promote experiential learning with an emphasis on scientific thinking, knowledge of the scientific method, awareness with field research methodology, quantitative analysis, spatial literacy, and technical computer skills relating to the use of geographic information systems for spatial data analysis.

2. **Relation to IRA to Course Offerings.**

Most of the ESRM courses as well as other science programs are strongly connected to the proposed "Research at Sea" experience. Field research with an emphasis on scientific methods, critical thinking, data gathering, data analysis, and spatial literacy represent core elements of CI's science programs.

3. **Activity Assessment.**

Students will prepare a poster for presentation alongside their capstone poster session in the library. In addition, students will complete a student assessment of teaching to further assess the course.

4. **Sources of Activity Support.**

The Tall-ship "Bill of Rights" operates as a non-profit organization specializing in ocean-going classroom activities. Commercial rates are substantially higher. Basic equipment (marine sensors, microscope, GPS, computers) has been provided by previous grants.

5. **Acknowledgment.** Project Sponsor and Program Chair acknowledge that they have reviewed and accepted the Conditions and Considerations detailed on page 2.

Signatures and Dates

Chris Cogan

_____ 29 Oct 2012
Date

Don Rodriguez

_____ 29 Oct 2012
Date

 Kaven Carey

_____ 10/31/12
Date

Application
Instructionally Related Activities Funds Request
2012-2013 Academic Year

ACTIVITY BUDGET FOR 2012-2013

1. Operating Expense Budget

A. Supplies	\$250 (poster printings) _____
B. Vendor Printing	_____
C. In-State Travel	<u>\$125 * 20 students * 2 days = \$5000</u>
D. Out-of-State Travel	_____
E. Equipment Rental	_____
F. Equipment Purchase	_____
G. Contracts/Independent Contractors	_____
H. Honorarium	_____
I. OPC Chargeback	_____
J. Copier Chargeback	_____
K. Other (Please Specify)	Meals @ \$10/day/student \$400 _____
TOTAL Expenses	\$5650 _____

2. Revenue

A. Course Fees	\$65 per student * 20 students = \$1300
B. Ticket Sales	_____
C. Out of Pocket Student Fees (exclusive of course fees)	_____
D. Additional Sources of funding (Please specify And indicate source)	_____
Total Revenue	\$1300 _____

E. Total Requested from IRA **\$4850** _____

Instructional Related Activities
Report Form

SPONSOR	DEPARTMENT
Christopher Cogan	ESRM / Chem / Bio

ACTIVITY TITLE	DATE (S) OF ACTIVITY
Research at Sea: A Tall-Ship Adventure Exploring Spatial Variability of the Santa Barbara Channel	27 March - 20 April 2012

PLEASE EXPLAIN (1) DESCRIPTION OF ACTIVITY; (2) HOW DID THE ACTIVITY RELATE TO A COURSE(S); AND (3) WHAT YOU LEARNED FROM THE PROCESS.

1) The class is a research at sea, 1 unit course. Science themes include environmental science, biological oceanography, GIS, field data collection, marine ecosystems, marine chemistry and more. We sail for two days with an overnight aboard the ship at Santa Cruz Island. Sail dates are 19-20 April (Thursday-Friday). Three on-campus class meetings (27 March, 2 April, and 10 April, 6:00 – 7:30 pm) before the cruise introduce the concepts covered.

2) Most of the ESRM courses as well as other science programs in Chemistry and Biology are strongly connected to the proposed “Research at Sea” experience. Field research with an emphasis on scientific methods, critical thinking, data gathering, data analysis, and spatial literacy represent core elements of CI’s science programs.

3) The research class provided an atmosphere of exploration and challenge for students from multiple academic programs. We found that our preparation for the class paid off, allowing synergies between the students to promote learning. The students were challenged to learn, to teach, and to expand their interdisciplinarity. The classroom lecture and discussion hours were critical; however the real benefit to the students came with the work at sea, and in the somewhat unfamiliar surroundings of the Channel Islands. As one student explained in their Student Ratings of Teaching (SRT):

“I enjoyed every minute of this class! I feel I obtained more from this than I have in any other typical course. It was awesome to have real experience in the field I want to continue in. I am very grateful to have had this opportunity!”

Moving forward, it will be valuable to incorporate this type of research trip with our plans for a field station on Santa Rosa Island.

CLASS PARTICIPANTS:

ID	Name	Grade Basis	Units	Program and Plan	Academic Level	Add Dt	Grade Dt
1 000452843	Alexander,Stacey Lea	Graded	1.00	Undergraduate - BS: Biology, Ecology emp	Senior	02/01/2012	05/26/2012
2 000991758	Benham,Alaina Marie	Graded	1.00	Postbaccalaureate - BS: Biology	Graduate	02/01/2012	05/26/2012
3 000745876	Brown,James Stanford	Graded	1.00	Undergraduate - BS: ESRM, Resource Management	Senior	02/01/2012	05/26/2012
4 000618359	DeMaranville,Cameron Thomas	Graded	1.00	Undergraduate - BS: Biology	Senior	02/01/2012	05/26/2012
5 000869272	Devine Torti,Cameron John	Graded	1.00	Undergraduate - BA: History	Senior	01/31/2012	05/26/2012
6 000589278	Dexter,Cassandra Alyse	Graded	1.00	Undergraduate - BS: Biology, Ecology emp	Senior	01/31/2012	05/26/2012
7 000578306	Eriksson,Austin Lennart	Graded	1.00	Undergraduate - BS: Environ Sci Resource Mgmt	Senior	01/31/2012	05/26/2012
8 000734891	Gaunt,Katie Leigh	Graded	1.00	Undergraduate - BS: ESRM, Resource Management	Senior	01/31/2012	05/26/2012
9 000798656	Gleason,Stacie Jean	Graded	1.00	Undergraduate - BS: Biology, Ecology emp	Junior	01/31/2012	05/26/2012
10 000500124	Grover,Carolyn Paige	Graded	1.00	Undergraduate - BS: Chemistry, Biochemistry	Senior	01/31/2012	05/26/2012
11 000880049	Grundy,James Edmund	Graded	1.00	Undergraduate - BS: ESRM, Environmental Sci	Senior	01/31/2012	05/26/2012
12 000449905	Hanson,Les Hightower	Graded	1.00	Undergraduate - BS: ESRM, Environmental Sci	Senior	02/02/2012	05/26/2012
13 000625132	Migdali,Matt A	Graded	1.00	Undergraduate - BS: ESRM, Environmental Sci	Senior	02/01/2012	05/26/2012
14 000676625	Nalbandian,Christopher J	Graded	1.00	Undergraduate - BA: Biology, Pre-Professional	Senior	01/31/2012	05/26/2012
15 000676690	Robus,Adam Charles	Graded	1.00	Undergraduate - BS: ESRM, Resource Management	Senior	02/01/2012	05/26/2012
16 000742301	Ryan,Thomas C	Graded	1.00	Undergraduate - BS: ESRM, Resource Management	Senior	01/31/2012	05/26/2012
17 000539683	Serrato,Kimberlie Ann	Graded	1.00	Undergraduate - BS: ESRM, Resource Management	Senior	02/01/2012	05/26/2012
18 000448501	Starr,Alexander Hartley	Graded	1.00	Undergraduate - BS: ESRM, Resource Management	Senior	01/31/2012	05/26/2012
19 000657060	Terminello,Bianca Marie	Graded	1.00	Undergraduate - BS: Chemistry, Biochemistry	Senior	01/31/2012	05/26/2012
20 000561562	Walker,Shannon Marie	Graded	1.00	Undergraduate - BS: ESRM, Resource Management	Senior	02/02/2012	05/26/2012

INSTRUCTORS:

CHRISTOPHER COGAN, BLAKE GILLESPIE, UTA PASSOW, KEVIN EDEN

**Please attach assessment forms from students, list of attendees, peoplesoft program report

Spring 2012 Regular Academic Session Survey Spring 2012-1 2012	California State University-CI Channel Islands
---	---

Course:	UNIV 391 01 - US TRAVEL STUDY EXPERIENCE	Academic Program:	University
Responsible Faculty:	Christopher Cogan	Resp. Rec'vd / Expected:	15 / 20

SRT		Cogan, Christopher							
		Responses				Individual			
		[SA]	[A]	[D]	[SD]	N/A	S.D.	N	Mean
Q1	I understood the learning outcomes expected from the course.	13	2	0	0	0	.34	15	3.9
Q2	To me, the course content seemed well organized.	11	4	0	0	0	.44	15	3.7
Q3	To me, class sessions seemed well organized.	13	2	0	0	0	.34	15	3.9
Q4	The time I spent in class sessions furthered my understanding of the course material.	13	2	0	0	0	.34	15	3.9
Q5	Examples and illustrations provided in this course aided my understanding.	13	2	0	0	0	.34	15	3.9
Q6	The course provided some general concepts that helped me see connections among specific topics.	14	1	0	0	0	.25	15	3.9
Q7	The course was a valuable learning experience for me.	14	1	0	0	0	.25	15	3.9
Q8	The assignments in this course aided my learning.	13	0	0	0	2	0	13	4
Q9	I was able to effectively use instructor feedback to increase my learning.	13	1	0	0	1	.26	14	3.9
Q10	I learned ways of reasoning that I could apply to other disciplines.	13	2	0	0	0	.34	15	3.9
Q11	My learning experience increased my appreciation for the subject covered.	15	0	0	0	0	0	15	4
Q12	I gained awareness of the relevance and importance of the course material.	15	0	0	0	0	0	15	4
Q13	The course made a relevant contribution to my overall education.	15	0	0	0	0	0	15	4
Q14	I felt I was evaluated fairly in this class.	14	0	0	0	1	0	14	4
Q15	I felt I was treated with respect in this class.	14	1	0	0	0	.25	15	3.9
Q16	The class atmosphere supported my learning.	14	1	0	0	0	.25	15	3.9
Q17	I felt encouraged to contribute civil dialogue to this class.	14	1	0	0	0	.25	15	3.9
Q18	When I sought outside help from the instructor (such as by phone, e-mail or office visit), I received it.	10	0	0	0	5	0	10	4
Q19	I felt welcome to seek help and advice from the instructor.	11	0	0	0	4	0	11	4
Q20	The help I received from the instructor was useful to my learning.	12	0	0	0	3	0	12	4

Responses: [SA] Strongly Agree=4 [A] Agree=3 [D] Disagree=2 [SD] Strongly Disagree=1

Q21 - What changes would you make in your own approach in order to improve your learning?	
Faculty:	Cogan, Christopher
Response Rate:	40.00% (6 of 15)
-	I would make the trip longer so we could performe more experiments
-	There is nothing I would change about this class. Everything ran very smoothly and the objectives were very clear.
-	The stations along the way should have been more frequent. Also, we should have been more organized on the rotating of the stations all day long.
-	None. I'm sure this comment will make my assessment less than anonymous, but coming in as a history major, I tried coming in with an open mind and ready to learn. I appreciate Professor Cogan, Professor Passow, and Kevin for being so willing to help and make the learning environment great.
-	maybe a longer trip night on boat, backpack across the island maybe
-	I would have prepared myself more on the material concerning what we would be studying prior to our trip.

Q22 - What aspects of the course would you advise your instructor to retain?	
Faculty:	Cogan, Christopher
Response Rate:	66.67% (10 of 15)
-	This course was a great learning experience and a lot of fun. All the work we did was interesting and fun. All the water sampling tests were interesting to learn and will be useful in the future in other classes and in possible jobs. All the instructors made the experience not only fun and interesting, but helped us learn in a new and exciting way.
-	None all aspects of the course had positive influence on my learning
-	This was a great experience and we are very lucky to have the opportunity do this.
-	This was a great learning experience. "learning to sail was a bonus to collecting data as we traveled. "The different data collection stations let us see how things are connected outside the class room. Being able to hike Santa Cruz was a nice change after being on the ship for a full day.
-	I enjoyed every minute of this class! I feel I obtained more from this than I have in any other typical course. It was awesome to have real experience in the field I want to continue in. I am very grateful to have had this opportunity!
-	The classes before the actual trip were very important. While some of the ideas presented in the lectures were review (even for a guy whose been writing history papers for two years straight), it worked well as a warm-up to get my mind thinking in the right way again.
-	I think that the class size was good, even though the ship couldn't hold anymore. I think with more people it might have lead to less productivity. I also think that the diverse group of people from different areas and majors was a great learning experience
-	everything
-	GREAT CLASS. LEARNED A LOT.
-	It was good to have three sessions prior to the trip as they enabled us to gain an understanding on what we would be monitoring and the relevance in monitoring that data. The hike on Santa Cruz Island was very enjoyable and allowed us an opportunity to explore the terrestrial surrounding. Partaking in the activities to operate the boat were very enjoyable as well and gave everyone an opportunity to work together.

Q23 - What suggestions would you provide to your instructor for revisions that would produce a better learning experience for you?	
Faculty:	Cogan, Christopher
Response Rate:	33.33% (5 of 15)
-	None my professor made the trip for the best learning experience i could have possibly asked for.
-	Maybe to have more lecture meetings.
-	Although I'm sure the budget won't allow for it, it would have been great to extend the field experience in order to experience a wider range of conditions for data.
-	I thought the course was great. Don't change a thing. I would say it would have been nice to do more sample points on the way home, but weather did not allow for it.
-	Maybe spending a little more time on Santa Cruz Island if possible.



CSU Channel Islands Tall Ship Research Project:

Spatial Variability of Marine Ecosystems in the Santa Barbara Channel

A. Robus, A. Benham, A. Starr, A. Eriksson, B. Terminello, C. Demaranville, C. Devinetorti, C. Grover, C. Dexter, J. Brown, J. Grundy, K. Gaunt, K. Serrato, L. Hanson, M. Migdali, S. Walker, S. Alexander, S. Gleason, T. Ryan, K. Eden, Dr. U. Passow, Dr. C. Cogan

This research project incorporated ship-based oceanographic and geographic methods to measure and map marine ecosystems in the Santa Barbara Channel.



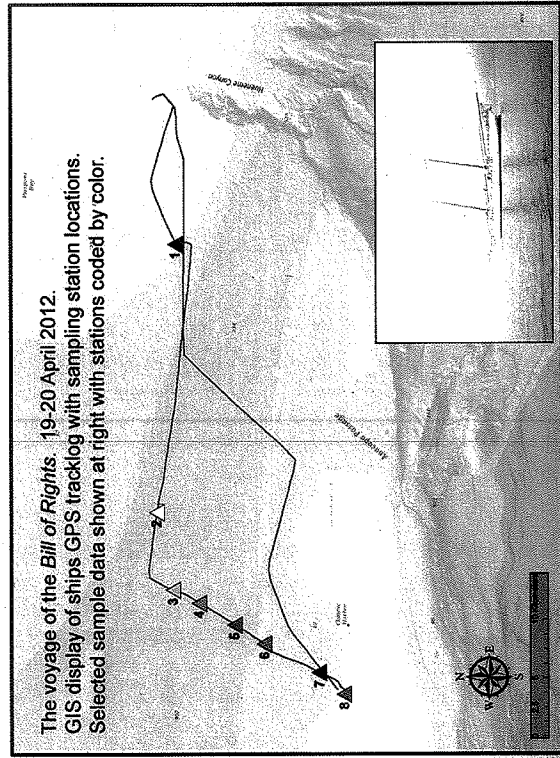
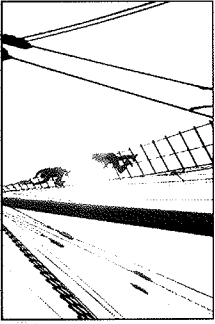
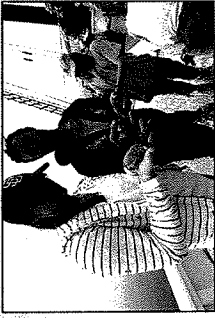
Oceanographic data collection in real-time using a water-resistant "toughbook" computer running ArcMap GIS software.



GPS Track log from Santa Cruz Island Hike. Prisoners Harbor to the Del Norte Trail.



UV light experiments with phytoplankton. Fluorescence and Quantum Efficiency (a proxy for phytoplankton health) decreased rapidly after exposure to UV light.

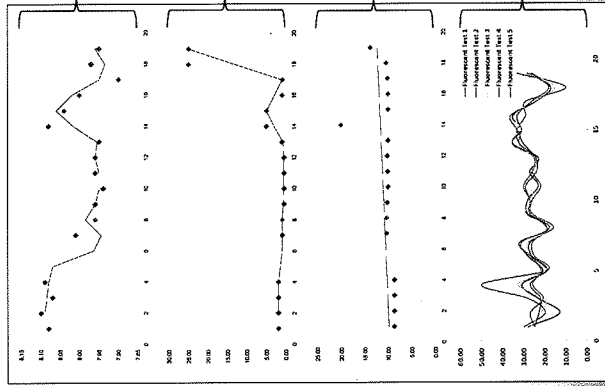


pH vs. Sample #
Global average pH is approx. 8.0. Lower values indicate increased respiration and upwelling. Higher values indicate uptake of CO₂ via photosynthesis.

Phosphate (µM) vs. Sample #
Nutrients such as phosphate and nitrogen are essential for phytoplankton growth. Here, low PO₄ concentrations at the surface are contrasted with higher values at depth near Santa Cruz Island.

O₂ (mg/l) vs. Sample #
Oxygen levels are a function of temperature and biological activity. The slight increases shown here reflect colder waters with peak values due to aeration during sampling.

Fluorescence (arb. units) vs. Sample #
Fluorescence is a proxy for chlorophyll. Microscopy revealed that large centric diatoms dominated these samples.



The sailing ship experience provided an atmosphere of exploration and challenge, and over the two-day project senior science students worked together as a team to advance their skills, explore their environment, and build confidence through sailing, island hiking, and technical climbing. Special thanks to Captain Stephen Taylor and the crew of the tall-ship *Bill of Rights*!

