PREFACE

Fifty years of undergraduate scientific field research in the Associated Colleges of the Midwest (ACM) Costa Rica program

Christopher Vaughan[1,2], Judith Magnan[1] & Michael B. McCoy[1]
1. Associated Colleges of the Midwest, San Pedro de Montes de Oca, Costa Rica; acmcostarica@acm.edu
2. Department of Forest and Wildlife Ecology, University of Wisconsin, Madison, Wisconsin; cvaughan@wisc.edu

The importance of preparing students for global citizenship and the development of intercultural competency in an increasingly interdependent world has long been recognized by many higher education institutions in the United States. Experiential learning through study abroad is one means of achieving this goal (Brewer & Cunningham, 2010). For decades, Costa Rica has offered a stable, welcoming and culturally rich environment for study abroad programs.

For undergraduate students interested in pursuing further studies and academic or research careers, the opportunity to develop field research skills is a valuable tool. To carry out professionally guided research with the cultural and linguistic preparation afforded by study abroad not only provides students with academic and cultural development, but it may enable them to make a significant contribution to the host country.

HISTORY OF THE ACM COSTA RICA PROGRAM

ACM Consortium

In 1958, 10 liberal arts colleges of the Midwestern United States formed the Associated Colleges of the Midwest (ACM) to promote institutional collaboration and the achievement of common objectives. The founding group, comprised of Beloit, Carleton, Coe, Cornell, Grinnell, Knox, Monmouth, Ripon, and St. Olaf Colleges and Lawrence University, was joined by Macalester and Colorado Colleges in 1967, Lake Forest College in 1974, the College of the University of Chicago between 1988 and 2008, and Luther College in 2009 (ACM 2013a). ACM currently has 13 member colleges and one university from five states and administers 16 study abroad programs in 11 countries.

Initial consortial goals for joint action focused on the educational effectiveness, efficiency of administrative and cultural operations, and development of additional sources of revenue of the member colleges and university. In 2013, ACM´s mission is to strengthen its members as leaders in liberal arts education through joint efforts to improve the professional effectiveness of faculty and administrative leaders, to provide exemplary liberal arts learning through off-campus studies, and to promote excellence in teaching and learning through collaboration (ACM 2013b).

ACM Costa Rica Program

In 1963, in response to a growing interest in curricular development through foreign study and research, and after considering other potential Central American sites, ACM created the Central American Field Studies Program in San José, Costa Rica. The program was designed to provide participants with experience in scientific field studies in preparation for careers related to the tropical environment

and to allow ACM faculty to develop research interests in Latin American studies. The resulting field research projects would contribute to the growing knowledge of the tropical environment and to teaching materials in anthropology, biology, economics, geography, geology, and sociology.

ACM designated the non-profit research and teaching organization, the Tropical Science Center (TSC), founded in 1962 by tropical ecologist Leslie R. Holdridge, geographer Joseph A. Tosi, and tropical biologist J. Robert Hunter to administer the program. Dr. Hunter was named program director. The initial plans for the program were broadened to include implementing independent study and research throughout Central America, and developing a relationship with the Consejo Superior Universitario Centroamericano (CSUCA). The first group of students began the program in July of 1964 under Hunter´s direction (P. Dennis, 1989).

Costa Rica Program development

Over the past fifty years, Costa Rica has provided the ideal environment for student academic and cultural growth. During this time, the program has maintained a strong field research component in the spring semester while the fall semester has evolved in response to changing contemporary issues in Latin America in general, and Costa Rica in particular. Since 1964, approximately 2 050 students have participated in the program, divided almost equally between the fall and spring programs.

Due to widespread interest in tropical science in the United States at the time, the program received funding from the National Science Foundation and the Ford Foundation until 1967. Program director and agronomy professor, Hunter, was accompanied by TSC professors Holdridge in ecology, Tosi in geography and Jorge Lines in archaeology. At that time, students lived in a boarding house in San José and language was not part of the curriculum.

When external program funding ended in 1967, the relationship with the TSC ended, although Hunter continued to serve as director. Language was incorporated into the curriculum and students were housed with Costa Rican families, facilitating greater cultural integration.

The program did not expand to other Central American countries as was initially planned, and in 1970, was renamed the Costa Rican Development Studies Program. In 1974, under the direction of anthropologist Ridgeway Satterthwaite, the focus of the fall semester changed to "Studies in Latin American Culture and Society," leaving field research exclusively for the spring. In 1977, the field study semester became the Tropical Field Research Program (ACM 2013c; Dennis, 1989).

In the late 1970´s, ACM developed a relationship with the University of Costa Rica (UCR) that led to the signing of a legal agreement between the two institutions. There are three essential components of this relationship: a) the ACM scholarship program through which approximately 200 UCR students have received full, one-year scholarships to attend ACM and other participating colleges and universities; b) a one-year visiting professor position for a recent ACM graduate to teach English at UCR; and c) visiting student status for ACM students at UCR.

In 2009, the Latin American cultural focus of the fall program was redefined with a more local emphasis as Costa Rica: Language, Society, & the Environment. That year, the breadth of research carried out in the spring was reflected in the name of the program that remains today, Costa Rica: Field Research in the Environment, Social Sciences, & Humanities. In 2013, the fall semester was reoriented to encompass new directions with the title Costa Rica: Community Engagement in Public Health, Education, & the Environment.

CURRENT PROGRAM CURRICULA

The fall and spring ACM Costa Rica programs share the common goal of exposing students to Costa Rica's natural and cultural

resources through an intensive language program complemented by educational field trips and guest speakers by means of which they are exposed to projects, local experts and activists in the environmental and social sciences, public health, and humanities. Students further develop their language skills, intercultural competency and appreciation of the host country by living with both an urban and a rural Costa Rican host family. In both semesters, students often express their desire to make a contribution to the country through their internship, practicum or field research.

Since 1967, ACM´s commitment to greater student linguistic and cultural development through host family stays has led to the development of a database of over 100 families in the San José area and approximately 300 families in rural areas throughout the country. Families are selected based on their interest in integrating students in their family life and culture; in exchange, they receive a monthly stipend to cover the student´s expenses. Both students and families receive orientation and follow-up staff support to facilitate student adaptation to the family, community and culture. For students, this experience has long been recognized as a key component of the program and families have expressed their desire to continue to receive ACM students because of their students' academic orientation and interest in the culture. This component of the program has led to the development of a culturally respectful and mutually beneficial relationship essential to the students´ personal and academic growth.

Costa Rica: Community Engagement in Public Health, Education, & the Environment

An estimated 1015 students have participated in the ACM Costa Rica fall semester program over the 50-year period. The present fall ACM Costa Rica program prepares students for exploring, studying and working in Latin America (and developing countries in general) through coursework and other experiences meant to develop language skills and concurrently deepen knowledge in particular fields such as public health, education, and the environment. Although most of the semester is spent in the Central Valley in coursework (www.acm.edu/costarica), an important part of the program is a month-long rural internship or practicum, for which students live with local "campesino" families, participate in local community life, and complete a project related to public health, education and/or the environment. During the 12 week urban stay, divided into an initial 5 week block and a 7 week block at the end, groups take field trips with course professors and resource people around Costa Rica. This helps students appreciate the country's astounding biodiversity, and very interesting cultural, educational, health and historical elements. Spanish language improvement is continuous in small customized Spanish classes and through living with Costa Rican families. Students are pressured and rewarded to speak Spanish in courses, with family members, with peer groups, on field trips, and in other program activities, leaving the country much more fluent than they arrive.

Costa Rica: Field Research in the Environment, Social Sciences, & Humanities

Similar to the fall program, the spring research program was created in 1964 to investigate Costa Rica's natural environment and its people and especially how the country maintains a top ranking in Latin America in biodiversity conservation and human development. ACM student research is focused on applied studies dealing with interrelated aspects of biodiversity, agriculture, public education, socialized medicine, and culture.

ACM COSTA RICA RESEARCH

During the past 50 years, there have been approximately 1088 ACM research projects spanning the natural sciences (532) and social sciences and humanities (556) (Table 1). The research process at ACM Costa Rica has been

likened to conducting significant research and writing a "mini-thesis" because the student goes through all the steps that a graduate student undertakes for a master's thesis. In almost all cases, the students have never conducted research and Costa Rica is their first experience. Working closely with a local advisor, the research coordinator and director, the student designs, carries out, analyzes and writes up a unique field research project. There are currently semester and trimester research programs during which students experience linguistic and cultural immersion living with urban and rural host families. The semester research process consists of three periods: a) one month (usually February) writing a proposal, while students study and improve Spanish in and outside of classes, b) two months of field research (March and April) when students collect data in a rural area following the guidelines established in the research proposal, and c) one month (May) of data analysis when two paper drafts are written before the final paper is turned in and presented orally in the ACM building at a group "semiprofessional" scientific symposium. Since 2010, several changes to strengthen the research program have been instituted. These include: a) a field research course during the first month, b) several drafts of the proposal and final paper, c) use of Dropbox for student folders and the exchange of project-related files, and d) required online training and in class review of ethical principles.

Grading

For grading, this semester is divided into three courses: a) a Spanish course, b) a field research course and c) a field seminar and paper. For the field research course, the academic work is evaluated based on the student's: a) use of field research methods in keeping with the research proposal, b) understanding and analysis of data, and c) dedication in the field. For the field seminar and paper, the student is evaluated based on three oral presentations and the research proposal and final paper. The research proposal and final papers require several drafts (Table 2). Finally, the advisor submits a grade and written evaluation.

Research Advisors

ACM research advisors (acm.edu/cradvisor) have been selected based on their professional fields, research experience and interest in working with ACM. These local advisors are an integral part of the research process, ensuring feasible research projects. Advisors and research coordinators work with students in small groups and individually to provide overall guidance in the development, implementation, data analysis, and preparation of final papers and presentations of student research projects. Work of research coordinators enhances the individual guidance provided by the local research advisors. Several months before travelling to Costa Rica, students accepted into the program are assigned an advisor based on their interests and advisors' expertise. Based on initial contact between the advisor and the student, students begin reviewing and saving published articles pertinent to the proposed research project. This database can be improved in Costa Rica after meeting with advisors at the ACM center or at the University of Costa Rica (UCR) where they are visiting students.

Program Structure

The first month (February) involves learning how to conduct research, writing a research proposal outline, two preliminary drafts, the final research proposal and student and advisor visiting the field site (Table 2). Cultural and language immersion are also emphasized. A workshop on research, proposal design and methodology is given by the natural science coordinator and director which focuses on such topics as research design, preparation of a proposal, and data collection in the field. The proposal should follow guidelines given to students by the director and found on the following website (http://writing.colostate.edu/guides/processes/science/). A Dropbox folder for each student on his/her research project to

facilitate communication is used extensively by the student, advisor, research coordinator and director with numerous folders dealing with drafts, final copies and oral presentations. Students design a data sheet and/or interview to organize data collection. Information on ethical guidelines for human subject research is discussed for students dealing with humans in their research and they are required to take an online course given by the National Institutes of Health (NIH 2013). Students share their research project with their colleagues as a PowerPoint presentation in a short joint meeting. Throughout the semester and during the midterm and final presentations, students share their research projects with colleagues, advisors and staff; so there is a joint progressive learning experience.

During the second and third month (March and April) a minimum of 40 days are spent in data collection at a rural site, usually during weekdays while students live with a rural family. During the research period, students maintain a data sheet and/or carry out interviews, keep a daily activity record with a field or spiral notebook, take pictures and carry out preliminary data analysis when in contact with advisors or research coordinator. Advisors, director and research coordinator visit the site and consult by e-mail (all students have laptops and most have e-mail in their rural site) to ensure the project is proceeding as designed. Changes in experimental design may be made if necessary. Students return to San Jose for a midterm data analysis and individual oral presentation to the group at the ACM office. Bringing computerized data allows additional review, analysis and design changes among student, advisor and research coordinator. As mentioned, oral presentations permit information exchange and learning among all students.

The research objective for the last month (May) is to analyze the data and write the final paper which is presented in an oral presentation. The final paper is written according to the format of the research journal International Journal of Tropical Biology and Conservation and includes the following parts: title, abstract, introduction, methodology, results, discussion, conclusions, and literature cited. Figures, tables and graphs are presented at the end. These parts were also followed during the proposal writing process to facilitate final paper writing. The ACM director provides guidelines for writing the final paper and there are several classes given by the research coordinator and director about writing the final paper. Also ACM Costa Rica uses the following website http://writing.colostate.edu/guides/processes/science to facilitate paper writing. An outline and minimum of two drafts are written before the final paper is turned in (Table 2). All documents are deposited in Dropbox. All research papers are normally written in English unless the director, Spanish language coordinator and advisor agree to the student's petition to write in Spanish. The final paper must be typed (including graphs, charts, diagrams) and double-spaced, with final copies saved in the student's Dropbox folder, sent to the director and advisor in Microsoft Word format. Photographs, charts and appendices must be incorporated in the main Word file. Students may use the ACM Costa Rica research for a senior project, honor's thesis, publication, Costa Rican, U.S. or international symposium or as the basis of graduate research. Eighteen (18) of the ACM Costa Rica student research projects have led to publications in the International Journal of Tropical Biology and Conservation (Appendix 1) and nine more are included in this number of the journal. We are very proud to contribute to tropical biology and conservation as well as the social sciences and humanities through our students' research.

Three oral research reports using PowerPoint are given: a) before leaving for the field the student explains the proposed research proposal, b) at the midterm there is a progress report, and c) a presentation is given based on the research project and final paper. This allows colleagues, advisors, public and staff to participate in the student's research progress. We consider the final oral presentation as a preliminary step to doing the same in national and international symposiums in the students' professional fields (Table 3).

Student Applied Research and Its Contribution

As stated, most of the ACM research would be considered "applied research" and objectives include: a) ensure that students learn to conduct all the steps of a "mini-thesis", and b) focus on interdisciplinary themes combining natural and social sciences and humanities. In most cases, students focus on current challenges in Costa Rican society or at a Central American or international level. As an example of these projects, the May 22, 2013 symposium for the Spring 2013 students included research themes which involved: a) how tourism influences the artisanal identity in Brunca artwork, b) adolescent tobacco knowledge and perception in a rural community, c) public health related to dengue knowledge and perception in a rural community, d) interactions between humans and white-faced capuchins in a resort restaurant, e) rural community perspectives of a national park, f) economic analysis of the impact of "responsible" fishing on artisanal fishing in a coastal town, g) reduction of *Monilia roreri* infection in an organic cacao plantation using a natural fungus, and h) factors related to infection risk of coffee plants by coffee leaf rust (Table 3).

ACM fosters in students a strong sense of responsibility as researchers and commitment to the goal of making a meaningful contribution to the local communities (agricultural or fishing cooperative, tourist resort, protected area, etc.) where they carry out their research. Some students provide their local communities and organizations with printed copies, disks or posters of their research. A program goal is to increase the availability of student research findings and recommendations that can serve to empower both students and local organizations.

Over the last half century, the ACM Costa Rica experience has impacted many of its 1 000 research students and others in different forms. This includes: a) learning to carry out structured applied research, b) developing professional skills in many fields, c) a strong sense of student and local organization empowerment, and d) being able to generate knowledge of benefit to Costa Rica with respect to past development, current realities and future opportunities within the country. We have included comments from several former students dating back to 1968 (Table 4).

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APPENDIX 1

LIST OF ACM COSTA RICA SPRING STUDENT PUBLICATIONS IN THE REVISTA DE BIOLOGÍA TROPICAL

Updated: October 10, 2013

Myers, M., Wagner, J., & Vaughan, C. (2011). Long-term comparison of the fish community in a Costa Rican rocky shore marine reserve. *Revista de Biología Tropical, 59*(1), 1-13.

Spanier, M. (2010). Beach erosion and nest site selection by the leatherback sea turtle *Dermochelys coriacea* (Testudines: Dermochelyidae) and implications for management practices at Playa Gandoca, Costa Rica. *Revista de Biología Tropical, 58*(4),1237-1246.

Guittar, J., Dear, F., & Vaughan, C. (2009). Scarlet Macaw (*Ara macao,* Psittaciformes: Psittacidae) Nest Characteristics in the Osa Peninsula Conservation Area (ACOSA), Costa Rica. *Revista de Biología Tropical, 57*(1-2), 387-393.

Van Hulle, M. & Vaughan, C. (2009). The Effect of Human Development on Mammal Populations of the Punta Leona Private Wildlife Refuge, Costa Rica. *Revista de Biología Tropical, 57*(1-2), 441-449.

Vaughan, C., Bremer, M., & Dear, F. (2009). Scarlet Macaw (*Ara Macao*) (Pssitaciformes: Psittacidae) Parental Nest Visitation in Costa Rica: Implications for Research and Conservation. *Revista de Biología Tropical, 57*(1-2), 395-400.

Vaughan, C., Nemeth, N., & Marineros, L. (2006). Observations of Scarlet Macaw (*Ara macao*) diet in Central Pacific Costa Rica. *Revista de Biología Tropical, 54*(3), 919-926.

Timmock, J. & Vaughan, C. (2002). A Census of Mammal Populations in Punta Leona Private Wildlife Refuge, Costa Rica. *Revista de Biología Tropical, 50*(3/4), 1169-1180.

Paynter, C., Cortés, J., & Engels, M. (2001). Biomass, productivity and density of the seagrass *Thalassia testudinum* at three sites in Cahuita National Park, Costa Rica. *Revista de Biología Tropical, 49*, 265-272.

Williams, H. & Vaughan, C. (2001). White-faced monkey (*Cebus capucinus*) ecology and management in neotropical agricultural landscapes during the dry season. *Revista de Biología Tropical, 49*(3-4), 1199-1206.

Willis, S. & Cortés, J. (2001). Mollusks of Manuel Antonio National Park, Pacific Costa Rica. *Revista de Biología Tropical*, *49* (Suplemento 2), 25-36.

Vaughan, C. & Foster Hawkins, L. (1999). Late dry season habitat use of common opossum (*Didelphis marsupialis*) in neotropical lower montane agricultural areas. *Revista de Biología Tropical, 47*(1-2), 263-269.

Vaughan, C. & Weis, K. (1999). Neotropical dry forest wildlife water hole use and management. *Revista de Biología Tropical, 47*(4), 1039-1044.

Vaughan, C. & Shoenfelder, S. (1999). Dry season activity, movement, habitat and den utilization of nine-banded armadillo (*Dasypus novemcinctus*) in neotropical dry forest, Costa Rica. *Revista de Biología Tropical, 47*(4), 1117-1119.

Vaughan, A., Cabrera, J., Moore, D., & Vaughan, C. (1997). Water loss at twenty natural waterholes in Guanacaste National Park, Costa Rica. *Revista de Biología Tropical, 45*(4), 1681-1684.

Johnson, W. & Vaughan, C. (1993). Habitat use of small terrestrial rodents in the Costa Rican highlands. *Revista de Biología Tropical, 41*(3), 521-527.

Allsteadt, J. & Vaughan, C. (1988). Distress calls of Caiman (*Caiman crocodilus fuscus*) in Caño Negro Wildlife Refuge, Costa Rica. *Revista de Biología Tropical, 36*, 567-568.

Moscow, D. & Vaughan, C. (1987). Food habits and troop movement of the White-faced Monkey (*Cebus capucinus*) in a tropical dry forest. *Revista de Biología Tropical, 35*(2), 287-297.

Phillips, P. & Perez-Cruet, M. (1984). A comparative survey of reef fishes in Caribbean and Pacific Costa Rica. *Revista de Biología Tropical, 32*(1), 95-102.

APPENDIX 2 – TABLES

TABLE 1
Breakdown of research projects by field (1964-2013).

Natural sciences		
Field of Study	Number of projects	Percentage of total projects
Agriculture	41	3.8%
Botany	83	7.6%
Chemistry	3	0.3%
Entomology	37	3.4%
Environmental Studies	89	8.2%
Geography	11	1.0%
Geology	27	2.5%
Marine Biology	78	7.2%
Ornithology	60	5.5%
Zoology	103	9.5%
Natural science total	532	48.9%
Social sciences and humanities		
Field of Study	Number of projects	Percentage of total projects
Anthropology	108	9.9%
Archaeology	46	4.2%
Economics	95	8.7%
Education	24	2.2%
Fine Arts	4	0.4%
Health and Nutrition	90	8.3%
History	5	0.5%
Law	3	0.3%
Literature	5	0.5%
Music	2	0.2%
Political Science	44	4.0%
Psychology	16	1.5%
Sociology	87	8.0%
Women´s Studies	27	2.5%
Social science and humanities totals	556	51.1%
Total projects in all fields of study	**1 088**	**100.00%**

TABLE 2
Spring 2013 timetable. January - June, 2013

I. Orientation Period - January 29 - March 1. ACM Center in San Pedro
ACM operations and logistics. Spanish language and Costa Rican culture course, directed by Mario Morera. Field research: project selection and research design preparation, consultation with advisors and methodology sessions, cultural activities and field trips.

January 29	Meeting with ACM Director at the ACM (10:00 - 11:30 a.m.)
February 5	Meeting with ACM Director at the ACM (11:00 - 12:00 midday)
	Lunch and meeting with students (12 midday - 3 p.m.)
February 7	Advisor meets with student (between 2 and 4:30 p.m.)
	Student submits paragraph describing project to advisor, ACM director and area coordinator (by 4:30 p.m.)
February 11	Advisor meets with student to coordinate the visit to the research site and to discuss what equipment the student will need to carry out his/her research (2-4:40 p.m.).

TABLE 2 (Continued)

February 12	Advisor informs ACM Director where student will be carrying out field research for host family assignment.
February 14	Student submits project outline of his/her research to advisor, ACM Director and area coordinator (by 4:30 p.m.)
	Student submits a list of materials and equipment needed for research to Administrative Coordinator.
February 18	Advisor returns project outline with comments (12 midday).
February 19	Student submits first draft of his/her research proposal to advisor, ACM Director and area coordinator (by 4:30 p.m.)
	Confirm information related to site visit with Administrative and Academic Services Coordinators (dates of visit, means of transportation, where the advisor and the student will stay, visit to host family, among other details).
February 21	Advisor, ACM Director and area coordinator return first draft of research proposal with comments (by 4 p.m.)
February 22, 23 and/or 24	Student visits research site with advisor.
February 25	Advisor submits brief e-mail report on student progress including: research proposal, experimental design, equipment needs, site visit and host family assignment (by 10 a.m.)
	Hand in sheet with host family contact information to the Coordinator of Academic Services in the case of a new family
	Student submits second draft of his/her research proposal to advisor, ACM Director and area coordinator (by 4:30 p.m.)
February 26	Advisor, ACM Director and area coordinator return second draft of research proposal with comments (by 4 p.m.)
February 27	Advisor practices oral presentation of research proposal with student.
	Student submits final research proposal to advisor, ACM Director and area coordinator (by 4:30 p.m.)
February 28	Sign up for interim oral presentation times (April 2) with the ACM Director.
	PowerPoint presentation of research proposal to ACM (12:30 - 4:30 p.m.)
II. Field Research Period - March 2 - April 26. Various Field Sites	
March 2 or 3	Student travels to research site.
March 4 - March 29	First period of field work.
March 30 or 31	Students return to San José.
April 1	Student meets with advisor, ACM Director and area coordinator for preliminary analysis of data and preparation of PowerPoint presentation.
April 2	PowerPoint oral interim reports.
April 3	Students return to research site.
April 4 - April 26	Second period of field work.
April 24	Advisors meet with Director at the ACM (11 a.m. - 12 midday).
April 27	Students return to San José.
III. Analysis and Report Period - April 29 - May 23 ACM Center, San Pedro	
April 29	Student consults with advisor about data analysis and report writing (2 - 4 p.m.)
May 2	Student sends outline of final paper format to advisor, ACM Director and area coordinator (by 4:30 p.m.)
May 3	Advisor returns outline with comments via Dropbox (by 4 p.m.)
May 8	First draft of final paper turned in to advisor, ACM Director and area coordinator (by 4 p.m.)
May 9	Advisor, ACM Director and area coordinator return first draft of paper with comments (by 4 p.m.)

TABLE 2 (Continued)

May 10	Student consults with advisor
May 13	Second draft of paper handed in to advisor, ACM Director and area coordinator (4 p.m.)
	The Director will contact you to coordinate the final oral presentation schedule
	Student submits Spanish abstract of final paper to the Spanish Language Coordinator (by 11 a.m.)
May 15	Advisor, ACM Director and area coordinator return second draft of paper with comments.
May 15, 16 and 17	Final written and oral language exams with the Spanish Language Coordinator (8 - 10:00 a.m.)
May 17	Final draft of paper handed in to advisor, ACM Director and area coordinator (by 4 p.m.)
May 20	Practice for oral presentation with advisor
May 22	Final oral reports.
May 23	End of the program.
IV. Final Evaluation Period - May 27 - June 7.	
	Advisors hand in final grades and written evaluation of students´ work on or before Friday, June 7.
	Please keep in mind that the ACM building closes at 4:30 p.m., Monday through Friday.

TABLE 3
Spring 2013 symposium.

ACM Spring 2013 Research Presentations	
May 22, 2013	
9:30 a.m.	OPENING WORDS
	***Christopher Vaughan*, PhD**
9:35 a.m.	INFLUENCE OF TOURISM ON ARTISANAL IDENTITY IN BRUNCA ARTWORK
	***Brandylyn Arredondo*, Kenyon College**
9:50 a.m.	USES AND PERCEPTIONS OF MEDICINAL PLANTS AND NATURAL MEDICINE BY THE ORGANIZATION PROAL-HOLOSALUD AND THE COMMUNITY OF LLANO BONITO, COSTA RICA IN MARCH AND APRIL OF 2013
	***Jenny Asparro*, St. Olaf College**
10:05 a.m.	CONOCIMIENTOS Y PERCEPCIONES SOBRE EL TABAQUISMO Y SUS EFECTOS DAÑINOS EN LA SALUD ENTRE LOS ESTUDIANTES ADOLESCENTES DE VENECIA Y AGUAS ZARCAS, COSTA RICA
	***Nicholas Bohrer*, St. Olaf College**
10:20 a.m.	KNOWLEDGE, PERCEPTIONS AND PRACTICES WITH RESPECT TO THE PREVENTION OF DENGUE IN A MID-PACIFIC COASTAL VILLAGE OF COSTA RICA
	***Victoria Egedus*, Lake Forest College**
10:35 a.m.	FISHING EFFORT AND PREDATORY BEHAVIOR OF BROWN PELICANS (*Pelecanus occidentalis*) ON THE CENTRAL PACIFIC COAST OF COSTA RICA
	***Lauren Heber*, Colorado College**
10:50 a.m.	INTERACTIONS BETWEEN HUMANS AND WHITE-FACED CAPUCHINS (*Cebus capucinus*) IN A MID-PACIFIC COASTAL RESORT
	***Elizabeth Landry*, Colorado College**
11:05 a.m.	BREAK
11:20 a.m.	EFFECTS OF HUMAN DISTURBANCE ON GHOST CRABS (*Ocypode*) IN COSTA RICA

	***Michael Maurer*, Colorado College**
11:35 a.m.	COMMUNITY PERSPECTIVES OF ARENAL NATIONAL PARK: RESOURCE MANAGEMENT AND RELATIONSHIPS
	***Margaret McKeon*, Colorado College**
11:50 a.m.	CHARACTERIZATION OF VOLCANIC ASH, PRODUCED BY THE 1963-1965 ERUPTIONS OF IRAZÚ VOLCANO; COSTA RICA
	***Margo Regier*, Beloit College**
12:05 a.m.	EFECTOS ECONÓMICOS DEL ÁREA MARINA DE PESCA RESPONSABLE PARA LOS PESCADORES ARTESANALES DE TÁRCOLES EN EL PACÍFICO DE COSTA RICA
	***Emily Rhoades*, Grinnell College**
12:20 p.m.	LUNCH
1:30 p.m.	A COMPARISON OF BIRD POPULATIONS IN LIVE FENCES, RIPARIAN FORESTS, SHADE-GROWN CACAO, AND PRESERVED TROPICAL RAINFOREST IN NORTH-EASTERN COSTA RICA
	***Skye Greenler*, Colorado College**
1:45 p.m.	USE OF *TRICHODERMA* FUNGI IN SPRAY SOLUTIONS TO REDUCE *Monilia roreri* INFECTION OF *Theobroma cacao* FRUITS IN NORTHEASTERN COSTA RICA
	***John Seng*, Grinnell College**
2:00 p.m.	AN ANALYSIS OF FACTORS AFFECTING INFECTION RISK OF COFFEE PLANTS BY COFFEE LEAF RUST FUNGUS (*Hemileia vastatrix*) IN THE LOS SANTOS REGION OF COSTA RICA, 2013
	***Justine Decker,* Macalester College**
2:15 p.m.	SPECIES DIVERSITY AND ACTIVITY OF INSECTIVOROUS BATS IN THREE HABITATS IN LA VIRGEN DE SARAPIQUÍ, COSTA RICA
	***Amanda Cormier*, Colorado College**
2:30 p.m.	DRY SEASON HABITAT USE AND HOME RANGE OF THE WOOLLY OPOSSUM (*Caluromys derbianus*) IN SARAPIQUÍ RAINFOREST, COSTA RICA
	***Danica Lewis*, Knox College**
2:45 p.m.	CLOSING WORDS
	***Christopher Vaughan*, PhD**

TABLE 4
Former ACM Costa Rica student comments.

Peggy Barlett, PhD (*8 in cover*)
Goodrich C. White Professor of Anthropology, Emory University
ACM Costa Rica Spring 1968

The ACM program experience was life-changing for me. I was always interested in Latin America, but I didn't know how much I was drawn to rural communities until I lived with a family in Nicoya, Guanacaste, during the fall of my senior year. In our ACM classes, I was introduced to development theories—which has become a lifelong focus—and in particular the work of Boserup on the role of population and agriculture. I still introduce my own graduate students to Boserup's important influence in social science and development perspectives. Our fieldtrips to sugar and coffee plantations, beneficios, cattle farms, and small, diversified householders gave me knowledge of commodity systems and smallholders before those terms were in use. I have always loved the way I can picture in my mind's eye the movement of coffee from bush to bean to processing to shipment to roasting to cup. I even learned how to roast beans on a wood stove, grind them, and enjoy the resulting beverage in a rural farmhouse, in the company of encouraging and welcoming people. The ACM experiences were not only an introduction to my life as an anthropologist—and I applied for graduate training by candlelight in longhand from the cot in the home of my host family—but also an introduction to our human commonalities behind the differences in our lifestyles and consumer habits. I learned to shed a lot of things I thought I couldn't live without, learned to eat many new foods, learned a new language for communication, and learned the habits of observation, listening, careful attention to details, and the joy of posing a question and finding an intriguing answer. The ACM group led to lifelong friendships, which I value highly. And it cemented my commitment to anthropology, economic and development processes, and what today we call sustainability, but back then was simply, "how can Costa Rican families meet the economic, ecological, demographic, political, and cultural challenges they face and move toward a more just and livable future?"

Kathleen L. Shea, PhD (*6 in cover*)
Professor of Biology and Environmental Studies, Curator of Natural Lands, St. Olaf College
ACM Costa Rica Spring 1969

Over forty years ago I spent the spring semester of my junior year (1969) as an undergraduate at Grinnell College in Costa Rica as part of the ACM Field Research Program. That experience changed my life in numerous ways. The program gave me the opportunity to do an in-depth research project on sugar cane varieties and yields. Through this project I realized that I loved the research process and wanted to go to graduate school. I liked project planning and data collection as well as the analysis parts of research. I gave my first presentation at a scientific meeting, the Iowa Academy of Science Meeting in the spring of my senior year, on my project in Costa Rica.

While in graduate school my experiences in Costa Rica helped me be accepted to an Organization for Tropical Studies graduate course on tropical ecology and a Missouri Botanical Garden course on the Flora of Panama. My experiences in Costa Rica have resulted in a lifelong interest in this country. Living and working with local people was especially valuable in learning Spanish and learning about the culture of Costa Rica. As a professor at St. Olaf College I have taken students to Costa Rica for a January Interim course several times and I am the campus adviser for the ACM Field Research Program. My interests in conservation and sustainable agriculture really began in Costa Rica. I have focused on the issue of how to balance conservation and the need people have to make a living since I was a student in Costa Rica. I still show my current students pictures from my Costa Rica experiences. With my current students we study tropical ecology, sustainable land use, and how conservation can be successful over the long-term. Costa Ricans are proud of their natural resources and have established a viable national park and reserve system because local people see its value and potential to provide jobs through ecotourism. While students today have more options for off-campus study this is one program that has stood the test of time and should be considered. My life has been much richer for having this tropical connection!

Christopher Vaughan, PhD (*Background up in cover*)
Director, ACM Costa Rica Programs; Honorary Associate Fellow, Department of Forestry and Wildlife Ecology, University of Wisconsin-Madison; Retired Director, International Program for Wildlife Conservation and Management, Universidad Nacional, Costa Rica
ACM Costa Rica Spring 1969

ACM provided me with the ultimate education in experiential learning- a structured program, with a study site and advisor for ensuring correct and timely field data collection to complete university requirements. But the ACM experience also allowed me time to think outside the normal university setting, interact with friendly ticos, explore and observe tropical nature on a daily basis and how many humans were impacting nature while a few were trying to conserve it with a multitude

of ideas. While in Costa Rica with ACM, I decided that my mission in life would be to try to understand and work with local institutions and communities to conserve/manage tropical nature. Once this decision was made, my life became very focused, meaningful, and challenging. I am continuously learning from nature, people and literature/documentaries and it is a pleasure to work with the younger generation and expose them when possible to an ACM type experiential learning.

Ken Salazar, JD (*14 in cover*)
Partner in the law firm WilmerHale
Secretary of the Interior of the United States, 2009-2013
U.S. Senator for Colorado, 2005-2009
Attorney General of Colorado, 1999-2005
Executive Director of the Colorado Department of Natural Resources, 1990-1994
Chief legal counsel to the Governor of Colorado, 1986-1990
ACM Costa Rica Spring 1975

In 1975, I participated in the Associated Colleges of the Midwest Program in Costa Rica. The experience shaped much of my future including a deep interest in Latin America. Many times in the United States Senate and at the White House, I have spoken with Presidents and Senators about the imperative of strong mutually supportive relationships with Central and South America. I am rooted in this view in part because of the ACM program and my study of President Kennedy's Alliance for Progress. I believe the future of the United States, and Latin America, are inextricably tied together because of our shared history and shared demographics."

Robin Chazdon, PhD
Full Professor, Department of Ecology and Evolutionary Biology, University of Connecticut
ACM Costa Rica Spring 1976

My experience as an ACM student opened the doors to the world of tropical biology and Latin America for me. I went during my sophomore year and had only had 3 semesters of Spanish. The immersion into Spanish was very effective; I have been a fluent Spanish speaker since. The course gave me exposure to the geographic, cultural, and biological heterogeneity of Costa Rica, stimulating me to pursue doctoral research in Plant Ecology in Costa Rica and to spend over thirty years of fieldwork in the wet tropical lowlands. I have always felt comfortable travelling throughout Latin America and have developed close professional and personal relationships with Latin Americans. I attribute much of my ease to my early experiences as an ACM student and to the early bonds that I formed with Costa Rican scientists and friends.

I went on to pursue a Ph.D. in Ecology from Cornell University, studying understory palms at La Selva Biological Station in the Atlantic lowlands. After starting my faculty position at the University of Connecticut in 1988, I became interested in studying the process of secondary forest regrowth in wet tropical regions, and once again returned to La Selva where I am now involved in a long-term project on vegetation dynamics in secondary and mature forests. I am also starting a similar project in the Osa Peninsula with several Costa Rican collaborators.

As a mentor, I encourage all students to study abroad and to immerse themselves in other cultures and biological worlds. My faculty mentors at Grinnell, Laverne and Leonore Durkee, played a major role in inspiring me to pursue a career in fieldwork and tropical biology and I am forever grateful for the wonderful opportunities that the ACM course offered me during my most "impressionable" years. To date, I have trained 11 graduate and 2 undergraduate students; all have conducted their research in Costa Rica. I am strongly committed to helping Costa Ricans protect and manage their precious biological heritage, to restore forests, and to improve their own livelihoods and education.

Warren Johnson, PhD
Staff Scientist, Laboratory of Genomic Diversity, National Cancer Institute, NIH
ACM Costa Rica Spring 1982

As a Junior at Oberlin College, I spent a semester abroad in Costa Rica as part of the ACM program. It remains one of the most memorable and formative experiences of my life and was crucial in helping me down my career path. I have many memories of that time, but perhaps one of the most illustrative was a trip to Volcan Arenal with fellow students: one who kept pointing out the interesting geology, one that kept commenting on the plants, and a third that had a keen eye for all of the birds. We spent that night on the top of Volcan Arenal with an Italian volcanologist, and I, as the mammalogist, wondered at the sight of the howler monkey several thousand meters above the tree line. In Costa Rica, I had the opportunity to greatly improve my very rusty Spanish, to learn from fellow students from a variety of backgrounds and interests, to learn and feel a part of a different culture, and to have my first taste of field research. The mix of academic study, full immersion with local

families, and publishable research is what sets the program apart from others. I have been many places since then, but can truly say that the ACM program helped launch my career in international research which I continue today.

Thomas Sisk, PhD
Olajos-Goslow Professor of Environmental Science and Policy,
School of Earth Sciences and Environmental Sustainability, Northern Arizona University
ACM Costa Rica Spring 1982

The ACM experience was my first introduction to what research was all about. It opened my eyes to the discovery that I could use my education to learn something new, both fascinating in itself and useful to others, realizing it changed my life. The people I met during my ACM semester in Costa Rica are still with me after all these years. Remembering their faces brings back some of the most important lessons I ever learned.

Lisa Naughton, PhD
Professor, Department of Geography, University of Wisconsin-Madison
ACM Costa Rica Spring 1984

My ACM semester in Costa Rica forever changed me and deepened my understanding of tropical ecology and Latin American society. I enrolled in the semester to fulfill my dream to "be Jane Goodall." Thanks to the guidance and mentoring of my ACM field biology professor (Dr. Chris Vaughan), I did indeed spend two months studying squirrel monkey behavior. I loved the research, but after witnessing rapid deforestation and uncontrolled tourism development, my career interests shifted. From that semester on, I pursued a career in applied conservation research, mainly in tropical countries.

Lic. Judith Magnan (*10 in cover*)
Coordinator of Academic Services, ACM Costa Rica
Official Translator, Ministerio de Relaciones Exteriores y Culto de Costa Rica
ACM Costa Rica Spring 1985

In 1985, the ACM program gave me the unique opportunity of learning how to carry out field research in the extraordinarily biodiverse setting of Playa Nancite in the Santa Rosa National Park under the guidance of conservation expert and author, Christopher Vaughan. Intense language instruction combined with cultural immersion led me to make Costa Rica my home, while developing a career in intercultural education and communication in order to facilitate the exposure of other students to such a challenging and enriching experience.

Michael Pignone, MD, MPH
Professor of Medicine and Chief of the Division of General Internal Medicine,
University of North Carolina- Chapel Hill
ACM Costa Rica Spring 1987

The ACM Costa Rica Field Research program has had a profound effect on my career. The research I did in Costa Rica served as the basis for my undergraduate honors thesis and helped me decide to pursue a career in academic medicine. My language training has allowed me to continue to serve Spanish-speaking patients here in the U.S. throughout medical school, residency, and as a faculty member now at the University of North Carolina.

R. John Kantner, PhD, RPA
Vice President and Professor, Office of Research and Sponsored Programs,
University of North Florida
ACM Costa Rica Spring 1988

My experience in the ACM Costa Rica program still stands out as one of the most influential years in my life. I discovered my passion for archaeology and anthropology during that year, a passion that I still pursue today as a university professor. Perhaps just as importantly, I learned a tremendous amount about myself, for my time in Costa Rica taught me that I can achieve any goal I set my mind to, whether it was learning Spanish, traveling through the countryside alone, or climbing Chirripo to view both the Pacific and Atlantic Oceans. I still read my diary from the ACM program, recalling all the fond memories from years ago.

Nicole Nemeth, DVM, PhD (*4 in cover*)
Assistant Professor, Department of Pathobiology, Ontario Veterinary College, University of Guelph
ACM Costa Rica Spring 1994

ACM really helped cultivate and develop my interests in a very unique and special setting with excellent guidance and long-lasting mentors that have continued to have a presence in my life. ACM provided me with my first opportunity to work in wildlife ecology and conservation, which subsequently motivated me to complete both veterinary and graduate school, followed by a wildlife pathology residency, leading to a position as Assistant Professor at the University of Guelph, where I will help students develop their interests in wildlife health.

Mark Myers, PhD (*11 in cover*)
Assistant Professor, University of Northern Iowa, ACM Costa Rica Spring 1995

I considered a number of study abroad programs before choosing ACM, and what appealed to me about the Costa Rica Field Research program was that it allowed me to pursue independent research at a single site over several months, rather than "touring" many sites for just a few days at a time with larger groups of students, as was typical of many other programs. The educational "pay-off" of this approach, both in terms of insights gained from the many hours spent in the field and in terms of the language skills and cultural experiences gained from living in a small, rural community, was huge. My experience in Costa Rica was a strong influence in my decision to pursue a graduate degree in Conservation Biology, and many of the experiences and contacts I made laid the groundwork for future projects in Costa Rica.

Jonathan Henn (*5 in cover*)
Fulbright Scholarship recipient working on plant regeneration, Patagonia, Argentina
ACM Costa Rica Spring 2011

My semester in Costa Rica was a critical period in my professional and personal development. The cultural immersion, Spanish language practice, and independent research experience has opened many doors as I have continued working toward my goal of working in conservation. For me, the most important part was the independence and freedom you were allowed when developing your project. Instead of being handed an already developed project, the chance to think creatively and critically about what question you would ask and how you would go about answering it was a unique insight into the process of science that is not usually part of an undergraduate education. The feeling of ownership that comes with developing a project from proposal to presentation was very useful. These skills and experiences that I developed during my semester in Costa Rica led to a Fulbright grant in Argentina and I'm sure they'll continue serving as I advance in my career.

Jeffrey Nadel, BA (*15 in cover*)
Deans Scholar and Medical Student, University of Michigan Medical School
Formerly: Research Assistant at the Engelberg Center for Health Care Reform at the Brookings Institution
Post-baccalaureate IRTA Fellow, National Institutes of Health
ACM Costa Rica Spring 2011

My experience as a student in the ACM Costa Rica Field Research Program was transformative and changed me both personally and professionally. My research on elderly mental health was the primary force that pushed me towards a career serving at the nexus of clinical medicine, public health, and policy, working to help eliminate social and health disparities within and between communities. The experience also taught me that no challenge is too great, and that compassion and thoughtfulness can enable amazing connections between people. I still talk to my host families regularly and have been back to Costa Rica to visit them both.

Emma Cornwell (*12 in cover*)
Fulbright Scholarship recipient, ACM Costa Rica Spring 2012

I am so grateful for the opportunity to study abroad in Costa Rica. The ACM program, established in the country for decades, has gathered an incredibly strong network of host families and research advisors. This provided me with experiences that would be hard to find in other study abroad programs: two Costa Rican families with whom I have formed unforgettable lifelong bonds, and an extensive research project of which I can feel proud.

Justine Decker
Macalester College, ACM Costa Rica Spring 2013

The organization and preparedness demonstrated by the ACM Costa Rica staff was absolutely incredible. The program has established hugely valuable connections within the country that make it much easier for students to quickly become engaged within Costa Rican culture and society. These connections were what allowed me to become a part of two wonderful host families and to have the opportunity to work side-by-side with Costa Rican coffee farmers.

John Seng (*13 in cover*)
Grinnell College, ACM Costa Rica Spring 2013

My semester in Costa Rica with the ACM was extremely empowering. As a student, I learned to manage and take advantage of the freedom that comes with conducting independent research. My research skills and Spanish fluency improved greatly, more than I could have imagined. As an individual, I became more confident and adventurous. I wouldn't trade this experience for anything.

Amanda Cormier (*2 in cover*)
Colorado College, ACM Costa Rica Spring 2013

ACM Costa Rica was an amazing opportunity. I got to spend two months doing research in the jungle, I got to work with amazing people, and I got to experience a different culture. Everyone who works at ACM was wonderful along with both of my host families and the advisors. I felt like I was part of multiple families and I would love to return to see all of these excellent people again.

1. Mike McCoy. 3. Lauren Carlson. 7. Shasta Webb. 9. Victoria Egedus.