

Risk Management in International Undergraduate Field Classes: A Costa Rican Case Study

Risk management often conjures images of liability release forms and proof of insurance. The primary purpose of these documents is to protect the institution and its resources from excessive lawsuits. They are critical elements of a risk management program in an undergraduate setting and should be used by faculty who lead undergraduates on educational field experiences. However, risk management should go well beyond just paperwork and should be integrated into the planning, design, implementation and evaluation of an educational field experience. Accidents, illness and criminal activity pose threats to all participants, but in a group that is in remote locations in a foreign country such problems can have pronounced negative effects on the experience of the entire group, not only the victim. Even a relatively minor accident or illness can make it difficult to achieve the educational objectives of the program for all participants. On campus, a sick or injured student does not generally prevent the rest of the class from continuing. In the field, and especially when abroad, the entire class can be affected. Clearly, minimizing risk to all participants in a field program is important for providing the best possible educational experience.

I have been taking classes of students to Costa Rica since the mid-1990s to study tropical ecology. The classes consist of undergraduate biology majors, most of whom have completed a semester-long course in tropical biology. The group size is limited to ten students. The course is titled "Tropical Biology Field Experience" and the field experience consists of an intensive three-week visit to four different ecosystems in Costa Rica. The primary objective of the course is to compare tropical ecosystems with an emphasis on community structure and composition. Most of the time is spent in the field collecting data for whole-class and small group research projects. Additional time is spent in natural history observation. My Costa Rican classes have accumulated over a thousand student-days in the field. During this time they have experienced a scorpion sting, one injury that required minor first aid and no illnesses that prevented full student participation in the rigorous activities. Using my experiences as the basis for a case study, I will describe how risk management was a consideration throughout the planning, implementation and evaluation of the classes.



Figure 1. A scorpion encountered during a night project at Palo Verde National Park in 2006. Biting and stinging arthropods are frequently encountered but problems are avoided by watching where you place your hand and looking before you sit.

Pre-Course Planning

During the early 1990s Mount Union College received a grant from the Lilly Endowment, Inc. to "internationalize" our curriculum. The grant sponsored several group study trips but also allowed individuals to propose educational travel for themselves. I have long held a strong belief that exposing biology students to tropical ecosystems through an intensive, research-based field course could have a profound impact on their view of the diversity of life on earth and their enthusiasm for the life sciences in general. I now had a chance to travel to a tropical region to investigate the possibility of teaching such a course. Using support from this grant I was able to take two trips to the tropics: a group study tour to Brazil and other South American countries and an individual visit to Costa Rica.

Choosing a Country

In choosing a country or region for a tropical biology field course, my first consideration was based on the educational and research objectives of the class. I needed to identify locations that had appropriate ecosystems for the class to study, that had adequate accommodations for a class-sized group and that could be reached with a minimum amount of travel time, allowing for maximum time in the field. After that, risk management was the principal consideration. My three chief concerns relative to risk were political stability, crime and public health.



Figure 2. A fer-de-lance hunting beside a trail at LaSelva Biological Station during a 2004 visit. Venomous snakes are common, but bites are very rare. Being observant when off trail and wearing appropriate footwear are essential.

I assessed the political stability and crime situation using the US Department of State's web-site for international travel: <http://travel.state.gov>. This site maintains up-to-date travel warnings; any country on the warning list was immediately suspect. Even if the country is not on the travel warning list, the State Department web site provides "Consular Information Sheets" for every county which are a good source of information on crime. These information sheets are regularly updated to include recent levels and forms of criminal activity directed towards tourists and identify areas within a country where criminal activity may be of concern. It is important to review these prior to any trip.

I investigated public health issues through the website of the Centers for Disease Control (CDC) at <http://www.cdc.gov/travel>. Their site includes information on recommended immunizations, good health practices while traveling in a particular region and a link to an electronic version of a valuable resource, the "Yellow Book" that is produced by the CDC every two years. The book is also available in print form (Kozarsky, Arguin & Navin, 2005). The website is updated periodically and should be consulted for the latest information. An additional source of current information on disease outbreaks is the World

Health Organization which maintains a country-by-country database at the website <http://www.who.int/countries/en/>.

Even before proposing to take a class on a field-based research trip to the tropics, I determined that Costa Rica would satisfy my criteria for a country that provided the field sites for tropical ecological study and the social and physical environment that would minimize risk to my students and me.

Visiting Specific Field Sites Before Taking a Class

I have always enjoyed the adventure of exploring new places. As an instructor, I wanted my students to have that sense of adventure as well, but I wanted to know that the sites I would be using for my class's research projects were appropriate for educational purposes. I also wanted to be aware of research opportunities and potential dangers at each site. A visit to a country as a tourist, or even as a scientist, will not reveal the unique nature of individual field sites. To identify appropriate sites for teaching and student projects, I contacted a number of faculty members at institutions around the country who did research or taught field course in Costa Rica.

I learned that the Organization for Tropical Studies (OTS) had a long history of supporting educational and research opportunities in Costa Rica. OTS is a consortium of 63 universities and educational institutions from around the world. It was founded in 1963 to “provide leadership in education, research and the responsible use of natural resources in the tropics” (Organization for Tropical Studies, 2007). It operates three field stations in diverse ecosystems and has close connections with a number of private biological stations and sites appropriate for teaching and research. Most important to me from the perspective of risk management was that OTS had a long and continuous experience with supporting undergraduate field experiences and they were themselves concerned with the safety and well-being of students. Of note was that OTS has sponsored a number of courses for graduate students in tropical biology that served as a model for the field course that I developed. The centerpiece of the OTS courses is a series of short-term research projects conducted by students.

Working with OTS, I set up a tentative itinerary for a field experience that would utilize both their field stations and other sites in Costa Rica that would meet my educational objectives. I spent ten days traveling around Costa Rica, meeting field station directors and managers and talking to researchers and students in residence. I became familiar with the biological communities, the terrain and the support facilities at each site and then contemplated appropriate research activities. Although my time was limited, I was focused on planning for the course and I was able to anticipate many of the potential risks as well as discover some good opportunities for research and teaching. As a result of these visits, I made some changes in my initial plans. I dropped visits to areas that seemed more appropriate for tourism than education and added side trips to two coastal ecosystems that were not part of the OTS suite of field stations. In subsequent years I have made additional modifications to the itinerary, but the class goals and organization have remained the same.

Having familiarity with the sites allowed me to prepare my students for the experience and offer a first-hand, and hence to the students, a more authoritative perspective on the risks to be anticipated at each site. For example, scorpions (Figure 1) are fairly common at one site, venomous snakes at another (Figure 2). Having encountered both on my preliminary visit, I was able to make my students ready for similar encounters.

Preparing Students Before the Trip

The field experience that I lead is designed to be a continuation of an on-campus course in tropical biology. For the most part, students that participate in the trip will have completed the on-campus course immediately before the trip. Thus, they will have a good understanding of tropical biology and have knowledge of some of the organisms and ecosystems that are encountered during the field experience.

However, this class is inadequate preparation for the specifics of tropical travel and attendant risk management. To address this, all students who are interested in the trip are invited to several meetings during the early part of the semester. During these meetings the itinerary is described and photos of research sites, trails, living accommodations and information about previous student projects are shared. From the onset students are made aware of certain generic risks that are associated with travel as well as certain regional, site and activity specific risks associated with this particular educational experience. For example, one of the greatest risks is the traffic in San Jose, where pedestrians do not enjoy the level of respect that they sometimes find in the United States.

After weighing financial and time costs as well as considering educational benefits and personal risks, students can then decide if they want to take the class. Students who want to go must submit an application form that includes risk management queries. The form is used to gather personal data about individual health limitations, allergies and prescription drugs. The form asks if the student is capable of walking five miles a day in rugged terrain. In addition, the form requires data on their medical insurance coverage and requests the name and phone numbers for someone to be contacted in case of emergency. These data are kept confidential, except in case of an emergency. The forms travel with the group in the event that medical personnel in Costa Rica require the information. After the trip the materials are returned to the student or destroyed. Legal waiver of liability forms are also reviewed and signed by students prior to the trip. These liability release forms are kept in department files during the trip and for at least two years afterwards.

Students who are accepted into the program then meet as a group several additional times to review packing lists, pre-trip requirements and suggestions for immunizations, health or travel insurance, and risk factors to consider for the trip. For example, malarial prophylaxis is not required but highly recommended for work in Costa Rica, and I make my students aware of that.

Travel guides are helpful in preparing for a tourist trip but not neces-

sarily for scientific trips to remote areas. Fortunately, an experienced tropical biologist, John Kricher, wrote a book (Kricher, 1997) that included an appendix entitled “And Hey, Let’s Be Careful Out There.” Kricher’s admonitions go well beyond most travel books; he presents the risks faced by those doing field studies and research in the tropics and suggests ways to avoid them in a manner neither threatening or cavalier. I have all my students read this before signing up for the trip and again after we get to Costa Rica. If such a well-written safety guide were not available for a region to which I was taking students, I would surely prepare one.

Transportation and Lodging Decisions

There are basically three possibilities for transportation in most countries: public transport, renting and driving your own vehicle, or hiring a vehicle with a driver. Public transport is inevitably the cheapest. Rental vehicles are intermediate in cost but may require several hours of paperwork and the assumption of liability. For my classes in Costa Rica, I have always hired a small bus or van with a local driver (Figure 3). While slightly more expensive than renting a vehicle, the benefits far exceed the small increase in cost. Obviously, a local driver is more familiar with driving laws and habits, road problems and detours. A

good driver is also helpful in choosing appropriate places to stop for lunch and advising about areas that should be avoided.

From an educational perspective, having someone else drive the vehicle frees me to be more observant of the landscape and call the attention of students to points of biological interest that we pass. Short roadside stops could be made as opportunities for observation arise or due to other necessities. For example we often have stopped to examine an operating pineapple or banana plantation or to view an interesting bird or other animal. In addition, we could make efficient use of time by having control over the transport schedule. Although not a part of the course objectives, the students benefit from getting to know the driver personally and thus learning about the country from a native Costa Rican.

I use similar logic in choosing lodging. In most cases our group has utilized the housing and food services available at the OTS or other biological field stations. This means that we have close access to desirable research sites, on-site security and healthy food. We could certainly find more inexpensive quarters, but the time spent in transit, the lost opportunities for extended hours and night work, and the security of the environment would all detract from meeting the educational objectives of the trip.



Figure 3. Hiring a bus and local driver pays off. OTS arranged for my class to hire a trained driver and bus for the duration of our visit. This photo was taken during a traffic jam that resulted from an accident. The road would be blocked for hours. Our local driver, Jorge, knew a detour around the blockage and we reached our destination before dark. Having someone else drive also meant that travel time could be used for teaching or rest, rather than the exhausting task of driving.

Risk Management During the Trip

Our field research takes us off the trail and into the various ecosystems that we study (Figure 4). Students sometimes work as a whole class of up to ten students, but they are just as likely to work in pairs or as groups of three investigating projects of their own design. During the time that students are working on independent projects I circulate among the groups, which sometimes requires me to do a good deal of hiking, to assist with their scientific investigations and also to provide a check on their well-being.

No matter how much you plan and how extensive your pre-visit, you can never be as familiar with an area and the current conditions as a local resident. Thus, at each field station that we visit, a member of the resident staff provides an overview of the site, explains some of the current or recent research, and reviews locally important safety and health concerns. This provides students with an authoritative perspective on safe practices for the particular field site, and it also introduces them to someone on-site who can answer their site-specific questions during our stay.

Having adequate first aid and medical supplies is part of risk management. We carry a well stocked first aid kit that is prepared and maintained by OTS. Its contents are based on decades of experience in supporting visiting researchers and classes. The kit includes routine first aid supplies such as band-aids, antihistamines, gauze, topical antibiotics and the like. It also includes epinephrine injectors for use under the guidance of a medical professional in the event of severe anaphylactic shock. In addition I carry a limited supply of over-the-counter medications for such things as travel sickness, diarrhea, itching, sunburn, or nasal congestion that are available for self-administration by students. Many similar items are also found in the OTS provided kit, but students are sometimes more comfortable with familiar medications.

Daily and timely safety reminders are necessary. For example, students may forget to wear appropriate footwear or to carry a flashlight. Simple things such as wearing sunscreen in the tropics or having insect repellent available during an all day field project can make a huge difference in the health of the students and in their ability to benefit from the experience. Reminding them in a timely manner so that they can be prepared is helpful. Prior reminders can also minimize time that is wasted while waiting for compliance and the negative atmosphere created by what may appear to be nagging. If the entire group

has to wait for someone to return to their quarters and get boots to replace their sneakers, the problem seldom arises again.

The excitement that students experience when seeing their first monkey in the wild, catching a glimpse of a resplendent Quetzal, or seeing a huge fer-de-lance (Figure 2) slither across their path are some of the reasons that field research in the tropics with undergraduates is so rewarding. Sometimes in the heat of that excitement, we, students and faculty, are strongly tempted to throw caution to the wind. At this point the instructor should try to maintain enthusiasm while injecting an appropriate note of caution. When risk management has been incorporated into all aspects of the course, students will generally monitor their own actions and provide healthy feedback on behalf of others in the group.

Attitude plays an important role in risk management during a trip. Overemphasis on risk can result in either excessive fear or even blatant opposition to safety guidelines. On the other hand, mindfulness of the environment and respect for the known and unknown dangers can contribute to a more satisfying experience. In addition to keeping students healthy and safe, attention to detail develops observation skills and creates more opportunities to learn about the field environment in which we are operating.

After the Trip: Evaluating Effectiveness

After every trip, beginning on the flight back, I ask students about their experiences. I ask about the educational value and I invite them to suggest ways to improve the quality of the trip for future classes. I also ask them if there are areas for which they could have been better prepared. From these suggestions, I have learned that students appreciate several practices that I have described above. First, pre-trip meetings to prepare them for the specifics of our research sites, including risks, have been helpful. Second, it is very important to review safety measures in the field on a daily basis. Students are immersed in an intense experience; they may not remember a safety rule that they heard a day or two ago.

Fortunately we have never had an accident or illness that required outside help. Should such an event occur, I am prepared to keep notes on what actions were taken by whom and for what reasons. Subsequently I would undertake to determine if the incident could have been prevented and take appropriate precautions in the future. In the case of the field research work described here, we have the benefit of the



Figure 4. Research in Montane Cloud Forest in Costa Rica. Kevin Burls measures tree height in an oak forest at Cuerici Biological Station. This remote station provides a trained emergency medical technician during the time that our class is there.

experience of others over many years, much of which is shared by OTS with visiting classes and researchers.

Summary

Risk management for international study and research trips should begin long before the experience is advertised to students. The value of preliminary visits to the sites that will be utilized is of particular value. Minimization of risk includes considerations of location and logistics that will decrease the potential for accidents or illnesses and thereby increase the opportunity for a rewarding educational experience. Utilizing local resources for lodging, travel and scientific guidance should be the rule, even for those intimately familiar with a country and its research sites. Risk management of international field research experiences is a continual process that must be woven into the processes of planning, implementation and evaluation.

References

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Dr. Charles A. McClagherty, Professor
Brumbaugh Center for Environmental Science
Mount Union College
1972 Clark Avenue
Alliance, OH 44601
EM: mcclauca@muc.edu

Chuck McClagherty is the Brumbaugh Professor of Ecology and Environmental Science at Mount Union College in Alliance, OH. He has been taking students on field-research trips to Costa Rica since 1994. He is an ecosystems ecologist with interests in carbon and nutrient cycling in terrestrial ecosystems.

CUR

Posters on the Hill

On April 25, 2007 CUR hosted Posters on the Hill at the Rayburn House Office Building on Capitol Hill. The event was co-sponsored with the American Chemical Society in celebration of their Public Service Awards. Seventy-nine students presented fifty-eight posters. Included was a research project from North Seattle Community College, the first community college to participate in Posters on the Hill. Virginia Military Academy submitted the first humanities abstract to be accepted. Nine representatives and 31 congressional aides attended the reception. In the morning, students attended a hearing for the America COMPETES Act and most had appointments in the afternoon with their Senators and Representatives. The day before Posters on the Hill, several students had a behind-the-scenes tour of the Smithsonian Museum of Natural History. Pictures of the visit are available at <http://www.nmnh.si.edu/rtp/>. Another group of students had a tour of the Washington Monument with a National Park Service Ranger and were able to walk down the interior stairs of the monument. This walk-down tour has been closed to the public since 1976.

The American Association of State Colleges and Universities recently included a story about Posters on the Hill in their newsletter. This article can be viewed by visiting: <http://www.aascu.org/at-aascu.htm>

In honor of International Polar Year, the Council on Undergraduate Research would like to encourage the submission of research abstracts for Posters on the Hill that involve polar research. Posters on the Hill abstracts for the 2008 Posters on the Hill will be accepted starting September 3, 2007, and are due by 5 PM Eastern Standard Time on Thursday, November 15, 2007. Posters on the Hill will be held in Washington, D.C in April, 2008.