

Panama Field Research Contract

I. OVERVIEW

The goal of this field research contract is to carefully delineate the responsibilities of the student and supervising faculty member embarking upon field research. The goal of the student field-research experience is to allow you to (1) take what you have learned in the lab, particularly through data analysis, and apply your knowledge to the field acquisition of data, (2) develop and test a hypothesis in the field, and (3) challenge yourself by confronting and overcoming the problems of field research.

Field-research experience is highly valued in academia and industry because you are no longer in a highly-controlled environment. You are now working in a tropical country, dealing with a different language, coping with the daily and hourly unpredictability of climate, animal behavior, and even equipment. This will be a test of your character and your commitment. For this reason, I only give students who have demonstrated strong interest in research and excellent research ability the opportunity for field research. That you have been chosen is a strong testament to your abilities.

II. GENERAL REQUIREMENTS

It is both a privilege and a responsibility for myself and for you to be conducting field research in at the Barro Colorado Nature Monument in Panama. It is a privilege because our application to conduct research has been approved by the Smithsonian Tropical Research Institute and because several granting agencies have given funds, including taxpayer dollars, to make this possible. It is a responsibility because we must be good stewards of these privileges, returning the trust of our hosting institution, ensuring that we will fulfill the promises made to the granting agencies, and serving as good ambassadors of our county and university in Panama.

A. STUDENT RESPONSIBILITIES

Through your research in the field, you will be given the opportunity to fully engage in the exciting area of tropical research. I am committed to helping you succeed in this endeavor and helping you derive the most educational benefit from it. I therefore expect that you will come and talk to me when you have questions about your work and when you feel that you are not deriving the most from your experience. However in order for you to succeed, you need to commit to the following:

- 1. Time commitment: 8 research hours per day, 6 days a week.** Field research is not a 9 to 5 job. Animals usually do not behave on demand, and thus you may find yourself extremely busy when experiments are working well. To work most efficiently, you should take advantage of such times to obtain as much data as possible. Keep in mind that although it works today, it may not work tomorrow!

In the field, we will generally awake at 7:00 am, and be out performing experiments by 8:00 am. We may return for lunch (12:00 to 1:00 pm), but we may also take out a packed lunch, depending on the experiments we are conducting. We will usually end by 4:00 pm. In the evening, we will spend some time entering in the data collected during the day and/or perform some video editing.

You will have one day a week off. The day off will usually be determined by natural breaks in our experiments. This is largely because our field experience is so short (two weeks). In addition, you will have our first and last days in Panama to explore Panama City.

2. Maintaining attention & interest. A major part of field research involves monitoring bees at feeders. This can be quite interesting but also quite monotonous (particularly if you working at the control feeder). There are long periods of time when nothing may happen, followed by brief moments of frenzied bee activity. Such controls and control experiments are vital, because without them, the other research is of little scientific value. I and any other field researchers will share equally in these monotonous tasks, but in order to make the time more interesting, I suggest the following:

- a) Bring music that you can listen to (a CD player)
- b) If you are at an experimental feeder to which there is no recruitment:
 - a. Ensure that all of the visiting bees are carefully and clearly marked. Mark maintenance is very important.
 - b. Keep accurate 15 min censuses.
 - c. Use this opportunity to study forager behavior and take data for your own ethograms.
- c) If you are at a control feeder
 - a. Keep in radio contact with the other researchers to keep abreast of how the experiment is progressing
 - b. Think critically about the research being conducted, your own research, and the data that you have previously collected, and formulate hypotheses.
 - c. Relax! You should keep a good watch out for bees at the control feeder, but this is also an opportunity to relax in a field season that is quite packed. Many people like to sketch while keeping an eye on the feeder.

3. Field notebook: You will be asked to keep a well-organized field notebook that documents what you are doing at each step of the project. This is particularly important because a great deal of effort, time, and money is being expended to collect and analyze this data. When in doubt, write it down. These notebooks will remain with the lab and should be sufficiently clear to allow another student working on the project or myself to understand what you have done and what should be done next. *General lab notebook guidelines apply.* All notes should be written in non-erasable ink. All notes and numbers should be clearly legible. Data or material that is incorrect should be crossed out but left such that the original is

still legible. Also, an explanation should be appended to clarify what the error was. At the end of each page, sign on the bottom of the page. **At the end of your field season, your notebook will remain in the lab. However, you may take a copy of it with you.**

4. Data organization: You will be given a project binder containing a plastic envelope in which you can store all of the summary data CD's and DVD's pertinent to your project. If your project has extensive video data, this will be stored in your own project box. The binder should be logically divided into several sections corresponding to your project. The first section is reserved for your final paper. Subsequent sections should contain relevant papers, figures, tables, processed data (divided as appropriate), and raw data. **At the end of your field season, your notebook will remain in the lab.**

5. Computer usage: Computers are used as available. No computers are exclusively used with any given project. Some computers are newer and more powerful than others. Priority on using these more powerful computers is given to students who are conducting extensive video analysis. If someone comes and needs to use your computer, please try to accommodate him or her.

6. Firewire drives. All of your files will be saved on a firewire drive. Plug your drive into an available computer and work directly off the drive. Do not save files onto the computer hard drive or onto the desktop. Save everything onto the firewire drive. **Other users may accidentally erase files saved on the computers!** Periodically, all of the files will be erased to clean the computers.

7. Data backup: Data backup is essential because all of your hard work can disappear with a single keystroke. Save your data onto your firewire drive and burn a CD or DVD copy of all of the analyzed data (Excel, JMP, Videopoint, Illustrator, Word, etc. files) once a week (to be stored in your binder). If you are in a location with an Internet hookup, use Zipit software once a week to compress all of your analyzed data into file that you upload onto your WebCT folder (example: "Nieh042202.zip" is a backup made on April 22, 2002).

8. Written report: At the end of the field season, you will submit a brief one-page report about your research.

9. Teaching: Because teaching is one of the best ways to learn, you will also share your techniques and reciprocally teach and learn from other students who are working in the field. This may include other lab members, but you should also reach out to learn from other researchers in the field. If your goal is to continue on in biology, perhaps even conducting tropical field research, you will have a great opportunity to meet and interact with foreign research and scientists in Ecology, Behavior, and Evolution. These types of contacts, teaching, and learning will be among your most important field experiences.

B. FACULTY RESPONSIBILITIES

I am committed to helping you succeed in your field research. I define success as (1) having completed the requirements listed above, (2) learning the details of your

research question, (3) learning how to think critically about your research and that of others, and (4) extending the results of your research to the next logical step. Not all projects will obtain the results they originally envisioned. This is part of the scientific process. It is important to understand why your results do not match your expectations and to determine how to proceed next.

1. **Time.** I will work with you on your project for at least 30 hours per week.
2. **Project planning.** I will monitor the progress of our project on a daily basis. We will jointly decide upon changes in the project schedule and will then post them in our field lab.
3. **Training.** I will train you in all the necessary techniques.
4. **Paper & presentation.** I will carefully and critically review your one-page paper to ensure that you fully understand the relevant concepts involved and are able to clearly present your project and its results to others.
5. **Scholarships.** There are several scholarship opportunities for undergraduate research. If you are successful in your work (see above) and you have a genuine interest in continuing, I will help you identify and apply for relevant scholarships and grants.

III. LIVING FACILITIES

1. **Rooms:** Barro Colorado Island has dormitory-style accommodation. You will most likely be sharing your room with another student. Each room comes with a shared bathroom with shower. You will be supplied with a bed, sheets, a pillow, a towel, a blanket, and soap.
2. **Laundry facilities:** Laundry can be done in the laundry (see BCI map). Bring quarters for the washing machines (quarters are available from the “change chief” on the island, but this person can sometimes be difficult to find). Drying is free and laundry detergent is supplied.
3. **Food:** There is a dining hall on BCI where breakfast, lunch, and dinner are served. If we will be coming in late for dinner or lunch, we can sign up for late dinner or lunch and the cooks will set aside plates of food for us. The food is usually Panamanian: rather salty, heavy on the meat, but there are vegetarian options available.
4. **Telecommunications:** There is a phone in the dining hall and you can use a calling card to call home. There are also telephones and Internet jacks in all of the individual labs (we will have one facing the water). The computers that we bring will be able to connect to these jacks. Thus email should be no problem. The connections on BCI are relatively fast.
5. **Entertainment:** There is lounge with books, magazines, movies, and videos. There is also the whole island, a pristine place that most people need to wait for over a year on a waiting list to see, then fork over \$100 for a single day’s visit. In the bay, there is a swimming platform. Bring you swimsuit!

IV. WHAT TO BRING

- 1. Clothing:** The iron in the dust will stain most things reddish brown and will not wash out. Bring field clothes that you will not mind turning brown. Cotton clothing is best for breathability. Ticks can be a problem. Bring long socks and long pants that you can tuck into your socks. You may have the opportunity to swim—bring a swimsuit. For going into town, it is good to bring a set of non-field clothes. Remember that Latin American society can be quite conservative. To fit in (for safety), avoid wearing shorts, tank tops, or other revealing clothing in town.
- 2. Avoid leather clothes, shoes, & accessories:** In Panama, everything organic can rot and turn moldy, especially leather.
- 3. Footwear:** Bring boots and also a pair of sandals for when you are not in the field.
- 4. Jewelry:** Do not bring any jewelry. It is safer this way. What you don't bring can't be stolen.
- 5. Watch:** Bring a functional watch with a second hand or, even better, a stopwatch function. Avoid anything flashy.
- 6. Hat:** VERY IMPORTANT! The tropical sun can be merciless. Bring a hat with a broad brim and bandanas
- 7. Sunscreen & medicines:** Bring sunscreen! Bring sunscreen! (minimum SPF of 16). Also bring mosquito repellent. Assemble a first-aid kit. I suggest going to Walmart or Target and buying a ready-made kit (\$8.00), then add anything else you think you might need. Do not forget anti-diarrheal medicine, topical antibiotics, and cold medications. Also, obtain a prescription for a powerful broad-spectrum antibiotic such as Ciprofloxacin and bring some. **There is no malaria in the Canal Zone.** Please check the CDC website to confirm this. If your doctor insists that you bring malarial prophylaxis, make sure that he or she is aware of exactly where you are going and make sure that you understand all the dangers and side effects of the medication.
- 8. Backpacks:** Bring one old backpack for field research. This will become dirty and stained. Bring another bag for going into town.
- 9. Money:** Your food and basic transportation expenses to and from the field site will be taken care of by grants. However, this does not cover extra trips into town, eating out at restaurants, etc. Luckily, food and entertainment are fairly inexpensive in town, but it is good to bring money for souvenirs, food, etc. The best way to get money is to bring an ATM card. You can also bring Traveler's Cheques (American Express is best), but be aware that you will be charged an exchange fee per check. Thus changing \$100 in five \$20 checks will cost you more than changing a single \$100 check (at the bank). In most hotels and restaurants and mainstream shops, they will accept credit cards. You can often obtain very good exchange rates through paying with a credit card.
- 10. Reading material:** Bring a good travel guide or a good book about the region.

- 11. Music:** Bring a CD player (if you like music).

V. CHECKLIST

- 1. Immunizations:** Please check the CDC website to determine which immunizations are necessary. Schedule an appointment with your doctor or a travel nurse. Do this at least two months before your date of departure.
- 2. VISA requirements:** Check into the VISA requirements of the country that you will be visiting. Start before the ticket is bought.
- 3. Equipment:** You will be asked to carry a suitcase of research equipment (including a computer) into the field. Please make sure that everything that was given to you is in the bag and that all items of value are labeled as property of the University of California San Diego in English and Spanish or Portuguese. The computer should be a carry-on item.
- 4.** Make sure you have “what to bring” items 1-11.

VI. MY VISION OF FIELD RESEARCH

My vision of the ideal field-research group and the ideal lab are essentially the same: a closely-knit group working towards the common goal of understanding more about animal communication—a group in which all members share their ideas, knowledge, and efforts. However, field research is quite different from lab research in several important ways. You are working intensively on a research project, sometimes in trying conditions. Many of the amenities of home are not available. You are working with nearly constant contact in a research group. Privacy can become an issue. Thus good communication is critical to the success of our field season—to your learning experience and to the research.

STUDENT: I have read the field research contract and agree to the responsibilities listed in this document.

Signature: _____ Date: _____

P.I. (James Nieh): I have reviewed the field research contract with the student and agree to the responsibilities listed in this document.

Signature: _____ Date: _____