RU BIOL 323/ NLU LAN 420

Tropical Biology Field Experience

Fall 2007: trip December-January 2008

Course Description

Exploration of tropical habitats, both marine and terrestrial, in terms of basic biology and ecology and current threats due to development. Emphasis is on coral reefs, including snorkeling of the second largest barrier reef in the world off Ambergris Caye in Belize, with opportunities to observe diverse wildlife in the field. Terrestrial field trips include beaches, mangrove swamps, and tropical deciduous forests. Visits to Mayan ruins and the Belize Zoo on the mainland emphasize local cultural ties to the environment.

Approval to take the class by Dr. McKinley (RU) or Dr. Gross (NLU) is required (submit application form to the International Travel Office). Details of equipment needed and additional costs for travel and accommodations will be explained in detail at the four mandatory weekend class meetings prior to the trip. One course in ecology (BIOL 202 or 315), environmental science (BIOL 112) or general biology is the prerequisite. 3 SH credit.

Required Textbooks:

Kaplan, E. H. Peterson Field Guide: Coral Reefs – Caribbean and Florida. Houghton Mifflin.

Beletsky, L. Belize and Northern Guatemala Traveler's Wildlife Guide. Interlink Books.

Websites:

www.belize.gov.bz
http://ambergriscaye.com
www.holchanbelize.org

Other suggested readings:

Kaplan, E.H. Peterson Field Guide: Seashores – Southeastern and Caribbean. Houghton Mifflin.

Mallan, C. Belize Handbook. Moon Publications.

Required Equipment:

Students are responsible for their own snorkel gear and travel necessities. See attached packing list.

Grading:

20% Pre-Trip Essay and Presentation on your identification specialty
10% Journal and notes written during the trip
20% Field practical exam
20% Written exam
30% Post-trip research paper
Graduate Students in Education: Required curriculum and lesson plans

20% Pre-Trip Essay and Presentation:
Before departing for the field trip, students will be required to research a major group of organisms we are likely to encounter in Belize. Topics will be chosen at the first weekend class meeting. Through doing this research, each student will become the class "expert" on identifying and interpreting the behavior of his or her chosen group. Possible choices include corals, reef fish, large fish (sharks, rays, barracudas, eels), marine shelled invertebrates (mollusks, crustaceans), lower marine invertebrates (reef sponges, echinoderms, cnidarians, annelids), snakes and other reptiles, frogs and other amphibians, birds, and trees.

10% Journal of Major Activities and Field Notebook:
Students will be required to keep a daily journal of field notes and activities, and relate them to the readings in the textbooks. Personal reflections can also be included.

20% Practical Examination given in the Field:
After snorkeling several different reef sites, students will be quizzed in the field on identification of major species (common name and class or order) as well as important ecological concepts relating to certain phenomena previously pointed out in the field.

20% Post-Trip Written Examination:
After returning to Chicago we will have one weekend class meeting in which we will discuss the trip and students will hand in their take-home exam.

30% Post-Trip Written Research Report:
One month after returning from Belize each student must turn in a term paper on a topic chosen prior to departure or during the trip. The paper should be 12 – 14 pages double-spaced, and include adequate primary literature citations.

Course goals and expected student learning outcomes:

After taking this course students should:

1. be able to describe the structure and development of different types of coral reefs and the major organisms found in the different zones that occur within reefs.

2. understand the environmental factors that favor the development of coral reefs and lead to the extraordinary levels of biodiversity found in these ecosystems.

3. be able to demonstrate an understanding of the diverse adaptations for survival evolved by species living in the various habitats visited.

4. be able to identify and understand the unique biological and behavioral characteristics of each of the ca. 10 major species of coral and fish.

5. have a general understanding of the major pathways by which energy and important nutrients enter, move through, and leave the coral reef ecosystem

6. understand food web structure well enough to predict effects on population dynamics of organisms found at trophic levels above or below a trophic level that is perturbed.

7. appreciate the diversity and abundance of symbiotic relationships, including mutualisms, commensalisms, and parasitic relationships found among the animals, plants, and Protista living in coral reefs ecosystems.

8. understand interactions between coral reefs and surrounding ecosystems, including mangrove forests, sea grass beds, river, and beach ecosystems.

9. be familiar with the stresses on reefs that lead to their degradation.

10. be able to describe and distinguish among the major terrestrial ecosystems found in Belize; be familiar with key species found in each ecosystem.

11. be familiar with the geography and history of Belize and the Mayan people, including pre-colonial history, colonization by the British, and interactions with African slaves, other Indian cultures, and Europeans.

12. better appreciate the diversity of marine life forms and understand the importance of preserving biologically rich marine and terrestrial ecosystems. Students should be able to snorkel over a reef and enjoy its beauty and complexity.

Major topics:

1. Phyla and classes of organisms found in reef ecosystems.
2. Major species of coral and characteristics of each species.
3. Major species of fish and their behaviors.
4. Differences among different types of coral reefs.
5. Differences among zones within coral reefs.
6. Factors that favor the existence of coral reefs.
7. Factors that lead to high levels of biodiversity in coral reefs.
8. Adaptations of animal species to coral reef environments.
9. Energy and nutrient flow in coral reef ecosystems.
10. Food webs and population dynamics.
11. Types of mutualism, parasitism, and other symbioses found in coral reefs and reasons for their existence.
12. Relationship of coral reef ecosystems to mangrove swamps, beach, sea grass, and other nearby ecosystems.
13. Threats to coral reefs from pollution, global warming, and related factors.
14. Brief history of Belize, including Mayan history and culture and interactions with other native peoples, Africans, and Europeans.
15. Characteristics of major terrestrial ecosystems found in Belize.

Course Schedule and Travel Itinerary:

Pre-trip class October 21:
Introduction to the course, Explanation of required gear, Pre-trip lecture.

Pre-trip class November 4:
Finalize pre-trip presentation topics, Pre-trip lecture.

Pre-trip class November18:
Pre-trip student presentations, Pre-trip lecture.

Pre-trip class December 2:
Hand in pre-trip essays, Check snorkel gear for fit and use, Pick a travel buddy and room mates, Final questions on packing lists, travel arrangements and safety tips.

Post-trip class meeting date TBA in January
Hand in Take-home exam, Discuss trip and show slide shows.

TENTATIVE BELIZE TRAVEL ITINERARY

Friday, December 28 — Travel to Ambergris Caye, Belize

Morning: Meet instructors at the airport ticket counter at least 2.5 hours prior to departure. Don't forget your passport!
Instructors will hand out boarding passes, and class will go through security together.
You must be at the gate and ready to board at least 45 minutes prior to departure.
The group will stay together at the connecting airports. Grab quick lunch at airport or eat own snacks on plane.

Evening: Arrive at San Pedro airport, take cabs sent by TREC to the field station.
Rooms will be assigned upon arrival at TREC.
First dinner at TREC and Orientation lecture.

Saturday, December 29 — Snorkel Tres Cocos

Morning: Breakfast 8 AM
Be at dock to board vessel by 9 AM
Morning snorkel at Tres Cocos

Afternoon: Lunch on vessel
Afternoon snorkel Turtle Grass beds or beach walk

Evening: Dinner at TREC 6:30 PM
Evening lecture and meeting with instructors 7:30 PM

Sunday, December 30 — Snorkel Mexico Rocks

Morning: Breakfast 8 AM
Be at dock by 9 AM
Morning snorkel Mexico Rocks

Afternoon: Lunch on vessel
Afternoon snorkel Mexico Rocks, wreck, Mexico Cave

Evening: Dinner at TREC 6:30 PM
Evening lecture 7:30 PM or night beach seine

Monday, December 31 — Trip to Mayan Ruins at Lamanai

Morning: Breakfast 6:30 AM
Get cabs to be at dock by 7 AM
Travel by boat to mainland and up the Belize River (North River)
Get bus at Bomba to Orange Walk. Take boat up New River to Lamanai; see transition from mangroves to deciduous forests and wetlands

Afternoon: Lunch at Lamanai (Laman Ayin)
Tour archeological museum and Mayan ruins; climb Mayan High Temple to look out over the forest canopy
Board boats to depart for TREC

Evening: Dinner at TREC 6:30 PM
Evening lecture and meeting 7:30 PM

Tuesday, January 1 — Snorkel Coral Garden and Mangrove Alley

Morning: Breakfast at TREC 8 AM
Dock to board vessel by 9 AM
Snorkel Coral Gardens

Afternoon: Lunch on vessel
Snorkel deep water Mangrove Alley and Blue Crack

Evening: Dinner at TREC 6:30 PM
Evening lecture and meeting 7:30 PM

Wednesday, January 2 — Snorkel Caye Caulker

Morning: Breakfast at TREC
Snorkel Caye Caulker

Afternoon: Lunch/Dinner in town on island

Evening: Night snorkel at Tres Cocos

Thursday, January 3 — Belize Zoo and Guanacaste NP

Morning and afternoon: travel to mainland sites for tours

Evening: Dinner at TREC 6:30 PM
Evening lecture and meeting with instructors 7:30 PM

Friday, January 4 — Snorkel Hol Chan and Shark-Stingray Alley

Morning: Breakfast at TREC 8 AM
Morning Snorkel at Hol Chan National Marine Preserve

Afternoon: Lunch on vessel
Snorkel Shark-Stingray Alley – guaranteed chance to swim with sharks and stingrays

Evening: Dinner at TREC 6:30 PM
Farewell and Pack up to depart in morning

Saturday, January 5 — Travel to Chicago

Morning: Breakfast at TREC
Get cabs to San Pedro airport for flight to Belize City
Group stays together at connecting airports and going through passport checks and customs
Grab quick lunch at airport or eat snacks on plane

Evening: Arrive back at O'Hare International Airport

NOTE: ***the Travel itinerary is subject to change based on weather conditions and other exigencies.***