

International Field Trips in Biology Report
Caribbean Marine Biology: Roatan, Honduras
Spring Break: March 11 - 18, 2006

Eleven students and two trip leaders (D. Sakaguchi, GDCB and E. Powell, EEOB) successfully completed a one week field trip to study the coral reef environment off the coast of Roatan at the Roatan Institute for Marine Sciences (RIMS), Anthony's Key, Honduras.

The trip was preceded by a one-credit seminar course (Bio 394a HN) during spring semester 2006. The purpose of this seminar course was to prepare the students for travel abroad and provide academic background relevant to the Roatan marine environment prior to our March 11 departure. Topics included: health considerations while traveling abroad, factors influencing the weather patterns on Roatan and Honduras, introduction to marine biology and coral reef biology, and reef invertebrate and fish biology.

Eight members of our group participated in SCUBA diving activities and five of the participants were snorkelers.

In addition, five students enrolled in an optional six week SCUBA certification class conducted by J. Symons, a PADI open water SCUBA instructor at ISU. During this SCUBA class the students received classroom and pool instruction at the Ames High School Municipal Pool in preparation for open water certification at RIMS. These five students successfully completed their open water certification dives under the supervision of a PADI Instructor at Anthony's Key Resort, Roatan. All open water activities were conducted in a safe and responsible manner and no serious problems were encountered. (Occasional difficulties in equalizing ear pressure during a scuba dive descent were encountered, but these instances were not serious in nature and did not prevent students from scuba diving.)

It should be mentioned that the trip leaders were very impressed by the responsibility of the students on the trip as well as during the pre-trip seminar course. All students contributed to the goals of the trip and used their time wisely.

Images and additional information from this years field trip, as well as from past field trips are available at: http://molebio.iastate.edu/~d_sakagu/394HN.html

**THE ROATAN INSTITUTE FOR MARINE SCIENCES (RIMS):
A CARIBBEAN MARINE LABORATORY**

The Roatan Institute for Marine Sciences (RIMS) is dedicated to the natural resources of Roatan. The Roatan Institute for Marine Science is surrounded by approximately 13 km of protected area known as the Sandy Bay Marine Reserve. Within this area no spear fishing, trapping or collecting of any kind is allowed. The RIMS has initiated a long-term reef-monitoring program within the Marine Reserve. Coral, fish and invertebrate

populations, conditions on the reef such as salinity, turbidity; temperatures are monitored over time as well as reef health. Our students participated in the ongoing reef-monitoring program. Reef fish species and abundance surveys were taken and submitted to REEF (Reef Environmental Education Foundation).

PROGRAMS AND LECTURES

Jennifer Keck, a marine biologist, who has worked at RIMS as the Education Coordinator for approximately 9 years, coordinated our program at RIMS.

Lecture topics included: Coral Reef Ecology, Reef Fish Identification, Mangrove and Lagoon Ecology, Marine Turtle Biology and Cetacean (emphasizing Dolphin) Biology.

The Dolphin lecture series covered topics such as an introduction to cetaceans, indigenous populations, anatomy, physiology, senses, cognition, communication, behavior and conservation issues. In addition, all participants in our Program took part in a Dolphin Discovery Program. AKR's and the Institute for Marine Sciences offers an exceptional opportunity for snorkelers to interact with dolphins on the mammals' initiative. This Program is unique in that the dolphins are free to come and go as they wish in an unstructured environment. There is no feeding enticement to secure interaction with humans. The interaction is achieved by appealing to the dolphins' natural curiosity. As snorkelers, we had the opportunity for physical contact with the dolphins.

ANTHONY'S KEY AND RIMS FACILITIES

The facilities at RIMS are ideal for student groups and included the following:

One large dive boat with captain, divemaster and educational coordinator/dive instructor.

The dive boats, Pro 42's, at AKR are among the best in the diving industry.

Use of tanks, weights and belts.

Wet and dry laboratory facilities (modestly equipped).

Large air-conditioned classroom with audio and video equipment.

Computers for powerpoint presentations

LCD projector

Specimen collections and reference library.

Recompression chamber and medical clinic on call 24 hours (a new medical clinic and recompression chamber were built within the last 2 years).

Museum of Roatan - "The finest small museum in Central America." Through artifacts, murals, maps and documents, the museum reflects the culture and history of the Bay Islands.

Bailey's Key Nature Trail - Nature trail on Bailey's Key exhibiting a variety of islands flora and fauna.

MARINE HABITATS EXPLORED BY OUR STUDENTS

1. Coral reef: miles of diverse fringing reefs surround Roatan. This reef system is part of the world's second largest barrier reef (second only to the Australian Great Barrier Reef). The reef slope is characterized by deep spur and groove formations. Thirty or more scuba diving sites are available within a few minutes boat ride of RIMS. In addition, most dive sites can be snorkeled.
2. Mangroves: Man-O-War-Key: Red mangrove community surrounding a protected bay adjacent to coral reef. One morning was spent snorkeling in the mangroves and nearby lagoon.
3. West Bay beach intertidal zone: Located on western most tip of island. This environment consisted of rocky shoreline, iron shore, coral rubble, tidal pools and sandy beaches. Convergence of water masses from North and South sides of island make this a very nutrient rich area with strong currents. In the intertidal pools we observed numerous species of invertebrates and vertebrates.
4. Seagrass communities: Abundant turtle grass, *Thalassisa testudinum*, beds as well as other seagrass species with easy access for both divers and snorkelers.
5. Back reef areas: calm, relatively shallow, back reef areas with access to seagrass beds and patch corals. A variety of hard corals and reef species.
6. Bailey's Key and Anthony's Key: Excellent shallow water snorkeling areas for day or night time access.
7. Night diving and snorkeling: Safe night diving and snorkeling.

ADDITIONAL OPTIONAL ACTIVITIES

Carambola Gardens: Illustrating many plants found on the island. Nature trails available for access to the hilltop outlook. The Gardens are within walking distance of RIMS and several of our students took advantage of this facility.

Bus excursion into Coxen Hole and West End: Coxen Hole, the largest city on the island, was established by English, French, and Dutch Pirates. West End is a new community catering to tourism and the diving industry. This excursion allowed the students to get a better "flavor" of the island culture.

ACCOMMODATIONS:

Students and trip leaders were housed in wooden bungalows (up to 4 persons/bungalow) located on the hillside overlooking the water. The bungalows are considered "upscale rustic" and each had ceiling fans, bathroom/shower with hot water, louvered windows and sun porches with lounge chairs and hammocks.

TOPICS FOR STUDENT PROJECTS AND PAPERS:

Assignments:

1) Each week the students were given numerous assignments to collect information about Roatan (marine environment, ecosystems, culture, history, economy, etc.). Information was obtained from World Wide Web-based sources and libraries.

2) Oral presentation (10-15 minutes) on a selected topic in coral reef marine biology. These group presentations were presented upon our return to Iowa State. On March 29, 2006 we held a Caribbean Marine Biology Mini-Symposium where students presented their research findings. Presentations were based on research carried out at ISU prior to the field trip field and from actual observations of the marine environment while at RIMS.

3) Term paper on a selected topic dealing with some aspect of coral reef marine biology. Papers were at least 10 pages double-spaced (12 page maximum) and included at least 10 references.

PROJECTS AND PAPERS:

1) Animal and coral diversity at different depths on the reefs. These students compared the coral and fish species at different depths on the same reefs (i.e. comparing the shallower reef flat with the reef slope). This project involved hanging in the water column counting and identifying the fishes that inhabit the water over / around each reef habitat.

2) Cleaning stations. During their observations, students located cleaning stations and made observations on the types of species being cleaned, as well as the cleaner species. Their paper expanded on their observations, giving descriptions of many different examples of these types of behaviors.

3) Dolphin behavior: cow/calf interactions. Students compared what they saw on site with what is written in the literature. Students made scientific observations on the dolphins that they swam with - how did they react when people were close? What seemed to be their keenest sense in locating divers?

4) Coral Diseases. Students discussed and showed photographs detailing a number of common coral diseases found in the Caribbean. These included coral bleaching, tumors, black-band disease, white-band, red-band, and yellow-band diseases.

Biology 394: Caribbean Marine Biology

Field Trip to Roatan

March 11-18, 2006

Course Instructors:

Dr. Don Sakaguchi, GDCB, Rm. 502 Sci. II, Ph. 294-3112, (dssakagu@iastate.edu)

Dr. Edwin Powell, EEOB, Rm. 634 Sci. II, Ph. 294-4956, (ecpowell@iastate.edu)

BIO 394: COURSE SYLLABUS

Biology 394a (Sect. HN): Pre-trip Course Syllabus (1 credit)

Class meets on Wed., 6:00-8:00 PM, in Rm. 115 Science II (unless an alternate location is specified).

Course schedule/syllabus (Subject to change)

| DATE | TOPIC OF DISCUSSION |
|-------------|--|
| Jan. 11 | Introductions: meet your classmates Field trip organization and logistics. Fill out ADD slips to register for course. Reef creature identification quiz. |
| Jan. 18 | Health considerations while traveling abroad: Presentation by Mary Fosse ISU Student Health Center representative. *Note: Class will meet in the lobby of the Student Health Center at 6:00 PM. |
| Jan. 25 | Introduction to marine biology and coral reef biology: Ed Powell Introduction to your research projects: How to select projects |
| Feb. 1 | Coral reef diseases: Dusan Palic Discussion of your research projects. |
| Feb. 8 | Reef invertebrate biology: Ed Powell Discussion of your research projects. |
| Feb. 15 | An informational session on Honduras and the Bay Islands. Sponge Biology: Dennis Lavrov: Reef fish biology 1: Don Sakaguchi Discussion of your research projects. |
| Feb. 22 | Reef fish biology 2 Discussion of your research projects. |
| Mar. 1 | Coastal Marine Policy, The status of coral reefs today and their prospects for the future. Discussion of your research projects. Finalize projects. Field trip organization and logistics. |
| Mar. 8 | Discussion of your research projects. Finalize projects. Field trip organization and logistics. |
| Mar. 11-18 | Marine Biology Field Trip to Roatan |
| Mar. 22 | No class. However, get your film developed or prepare digital slide presentations to share |

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|---------|--|
| | with the Class on March 29. |
| Mar. 29 | Post trip evaluation and discussions. Pizza and pop. Collect your Course Notebook/Field trip journals |
| Apr. 5 | Post trip evaluation and discussions. |
| Apr. 12 | Final papers are due by 5:00 PM in room 502 Sci II. |
| Apr. 19 | |

Assignments:

- 1) Numerous assignments to collect information about Roatan (marine environment, ecosystems, culture, history, economy, etc.). Information may be obtained from various resources: library, World Wide Web-based, etc.
- 2) Conduct research projects on site on the coral reefs surrounding Roatan Island. Projects will be discussed during 394a class - projects must be approved by the course instructors.
- 3) Oral presentation (10-15 minutes) on a selected topic in coral reef marine biology. To be presented on site at the Roatan Institute for Marine Sciences during the field trip to Roatan. Presentations will be based on field observations of the marine environment.
- 4) Course Notebook/Field trip journal: You are required to maintain a Course Notebook/Field Trip Journal. These journals will be collected on March 29, 2006.
- 5) Term paper on a selected topic dealing with some aspect of coral reef marine biology. Papers must be at least 10 pages double-spaced (12 page maximum) and include at least 10 references. Topics for these papers must be approved by the course instructors.

Marine Biology Field Trip homepage is located at the following web address:

<http://www.public.iastate.edu/~zoogen/Bio394/Bio394.html>

Attendance at the seminar is compulsory unless you have a non-resolvable conflict. Anyone who will miss a seminar should Email Don Sakaguchi (dssakagu@iastate.edu) with the reasons before the seminar.

Those enrolled in the SCUBA class through the City of Ames Parks and Recreation, class meets on Thursday nights promptly at 7:00 PM (Beginning January 19, 2006).

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March 11-18, 2006 (tentative schedule-subject to change)

Sat 11 1:35 PM arrival to Roatan. Transfer to resort, orientation and welcome.

7:00-9:00 P Dinner

Sun 12

7:00-9:00 Breakfast

8:00 Orientation to RIMS

8:45 Checkout equipment/dive at dive dock, bring c-card!!!

9:30 Reef dive/snorkel

12:00- 2:00 Lunch

2:00 Dive/snorkel

4:30 Coral Reef Ecology Lecture

6:30 Reef Creature ID Show - optional (Scuba School)

7:00-9:00 Dinner

Mon 13

7:00-9:00 Breakfast

8:00 Fish ID Lecture

9:30 Dive/snorkel - Fish/Coral ID

11:00 Hike to Intertidal

12:00-2:00 West Bay Beach Picnic Lunch

2:30 Dive/snorkel - Fish/Coral ID

7:00-9:00 Dinner

Tues 14

7:00-9:00 Breakfast

8:30 Man -O-War Key mangrove and lagoon snorkel

12:00-2:00 Lunch

2:30 Dive/snorkel -projects

4:30 Reef Monitoring Lecture

7:00-9:00 Dinner

Wed 15

7:00-9:00 Breakfast

8:30 Dive/snorkel – Indicator Species Fish Survey

11:00 Hike to Intertidal

12:00-2:00 Tabyana Beach Picnic Lunch

2:00 Dive/snorkel – Line Intercept Coral Transect

4:30 - 5:30 Dolphin Lecture – Part 1

5:00-10:00 Dinner : BBQ fiesta on key -

Thur 16

7:00-9:00 Breakfast
8:00 Turtle Talk
9:00 Dive/snorkel - projects
12:00-2:00 Lunch – Picnic on Anthony’s Key
2:00 Dive/snorkel – projects
4:30 - 5:30 Dolphin Lecture – Part 2
6:00 Night Dive/snorkel
7:00-9:00 Dinner

Fri 17

7:00-8:00 Breakfast
8:00 Dive– Wreck
10:00 Presentations
12:00-2:00 Lunch
12:00 Dolphin Swim
12:00-3:00 Check out and pack
3:00-6:00 Coxen Hole Trip
7:00-9:00 Dinner

Sat 18

Depart Roatan 2:35 PM Delta Airline.