

## Summer 2010 SYLLABUS & TENTATIVE SCHEDULE

May 26 - June 8, 2010

### Ecology, Behavior, and Conservation of Manatees and Dolphins in Belize

#### A Unique Field Course in the Drowned Cayes, Belize

Facebook Page: <http://www.facebook.com/event.php?eid=370432825564>

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**Want to be a Behavioral Ecologist or Marine Mammal Biologist?** Here's your chance to join our research team for two intense weeks of total immersion into the world of animal behavior, ecology & conservation, Antillean manatees, bottlenose dolphins, coral reefs, mangrove forests, and seagrass beds in Belize!

**Course Overview:** This is a total immersion field course where you will live, work, and study from a marine science field station on a pristine, private island off the coast of Belize. Data collected during the course will contribute to our long-term research project established in 1998. You will learn through a variety of lectures and learning activities, literature review and discussion, independent and team projects, and actual field research. Be prepared to spend 3-4 hours on the water each day learning about the tropical Caribbean environment as we explore a labyrinth of mangrove islands, seagrass beds, and coral patches searching for elusive manatees and charismatic dolphins. Two days of extra-curricular activities are included: (1) diving or snorkeling at Turneffe Atoll, and (2) exploring an ancient Maya City. Additional, optional SCUBA dives are available as time and weather permits, but additional costs are involved.

**LOCATION:** Spanish Bay Conservation & Research Center at Hugh Parkey's Belize Adventure Lodge, <http://belizeadventurelodge.com/> (Passport required)

**COSTS:** US\$2595 includes housing, meals, field trips, ground & water transfer fees, research & materials fees; DOES NOT include airfare, books, tips, or credit hours.

**CREDIT HOURS:** The course has ~70 contact hours and is comparable to a 3-4 credit university course. You must make arrangements IN ADVANCE with BOTH your advising faculty and Dr. Self-Sullivan for credit. Any credit hour fees must be paid directly to your school and you must fulfill any study abroad requirements of your school. This course is divided into 4 major components: lectures and learning activities (~1 hour per day), independent reading and assignments (~2 hour per day), data collection in the field (~4 hours per day), project development (~1 hour per day) and debate/group discussion of reading materials (~1 hours per day).

**DEADLINES:** Early registration & deposit due March 1st, 2010; regular registration & deposit due April 1st, 2010; balance due April 15<sup>th</sup>, 2010. Late registration (if space available) incurs \$100 fee.

**MINIMUM / MAXIMUM CLASS SIZE:** 8-24 students

**REGISTRATION:** <http://sirenian.org/RegistrationForm2010.pdf>

**Course Objectives:** The objectives of this course are to introduce you to the classical concepts of animal behavior, ecology, and conservation. Additionally, you will participate fully in an ongoing research project, develop and implement your own research project; research and present information on Belizean culture, politics, ecology, or history, etc.; read and think critically about peer reviewed literature related to course content; and participate in a Service-Learning Project.

**COURSE CONTENT** (Lectures, Learning Activities)

- Introduction to the Orders Sirenia and Cetacea, Endangered Species Conservation
- Introduction to long-term research project, results to date, questions for the future
- Introduction to mangrove & seagrass ecology, cost/benefit approach, and optimality theory
- Introduction to Animal Behavior including: Behavior Sampling, Conservation Behavior, Optimality, Marginal Value Theorem, Ideal Free Distribution, Predator / Prey, Movement Efficiency, Sensory Biology, Cooperation, Aggression, Sociality, Learning, Culture

**RESEARCH ACTIVITIES**

- Manatees and Dolphins: point transect scans, focal follows, reconnaissance surveys, photo-id
- Habitat Sampling: seagrass identification to species level, percent cover, density, comparison of epibionts, core sampling, feeding scars.
- Individual or team research project: select from list of approved study subjects and topics

**Daily schedule:** Our schedule is closely tied to sunrise/sunset and tides, with a tentative schedule, below. You will be actively engaged from 06:00 until 20:00, daily. Morning and afternoon learning activities and research will be rotated as necessary.

Time	Daily Schedule
6:00	Observing Wildlife, Individual Project Data Collection
7:30	Breakfast
8:30	Lecture & Learning Activities (alternating AM & PM)
12:30	Lunch
13:30	Field Research (alternating AM & PM)
18:00	Journal Club & Happy Hour
19:00	Dinner
20:00	Belize Sea to Stars Presentations (20-40 minutes)
22:00	Quiet Time in the Dorms (Reading/Writing OK)
23:00	Curfew and Lights Out

**Books & Tools**

We recommend the following books, which are available from Amazon.com:

The Florida Manatee: Biology and Conservation, by Roger L. Reep and Robert K. Bonde, University Press of Florida

The Bottlenose Dolphin: Biology and Conservation, by John E. Reynolds, Samantha D. Eide, and Randall S. Wells, University Press of Florida

A selection of primary literature will be sent to you in electronic format in advance of the course. Students are required to print out these articles and bring them with them to Belize. There is also a library of books and archived journals, including Marine Mammalogy, Animal Behavior, and Conservation Biology journals, in our library onsite in Belize.

**Communication:** If you have any questions or concerns, it's your responsibility to communicate with us via email or phone prior to travel and in person while at the field site. As your professors, we are here to help you learn. But learning is your responsibility.

**Student Expectations:** You should expect us to be enthusiastic about the course material and to be available for one-on-one advising. You should expect us to challenge you to think about how & why the course material is relevant to you and your career goals. You should expect us to respect you as a person, regardless of your academic performance.

**Our Expectations:** We expect you to give respect to everyone in Belize, especially at our field site. We expect you to fully participate in every course activity, including being present and on time for all meals. We expect you to demonstrate an enthusiasm and respect for all living organisms in the tropical marine environment.

**Grading Structure:** Your final grade is based on a **500 point scale**. To determine your "letter" grade, divide points earned by possible points: A  $\geq$  90%; B  $\geq$  80%; C  $\geq$  70%; D  $\geq$  60%.

- **Independent Research Project (100 pts):** Select a topic from approved list\* before fielding; do background research before departure; design and implement a short-term research project during field course; write up results in format of Fact Sheet (see examples from previous students).
- **Field Journal (100 pts):** Purchase and bring a bound notebook to be used as a field journal during the course. Make daily entries following guidelines presented in course; include a 101 species list.
- **Participation in field and course activities (100 pts):** Includes evaluation of your participation in all course activities, including discussions, quiz bowl, and personal essay "Why Marine Mammals?" Be on time and demonstrate enthusiasm for learning for full points.
- **Paper discussion and leading (100 pts):** Read and participate in all paper discussions; present and lead the discussion on one paper (or section) as assigned.
- **Service-Learning (50 pts):** Either as a class or in mini-groups we will contribute the improvement of the island or regional environment. Projects could include picking up garbage in the mangroves, creating signage material for education, helping in the Swallow Caye refuge, participating in stranding or necropsy, giving a presentation at a local school or civic group, giving a talk to island staff.
- **Belize from Sea to Stars (50 pts):** Each student will prepare a presentation before arrival on some aspect of Belize. Topics could include the following\*: Art, Astronomy, Culture, Economics, Ecology, Geology, History, Languages, Music, Politics and others. After dinner, a student will give an oral presentation on their topic. They may prepare handouts but this will not be a power point talk. Ideally, there would be some interactive nature such as stargazing, quiz bowl, role playing, or crossword puzzle. These should be informative and interesting to a general audience. The island staff will be invited to join us when this is feasible.
- **\*See suggested topics at end of syllabus**

**Missed and Late Assignments:** Each Assignment will have a firm due date and time. If you miss the due date/time, you may turn in your assignment late. However, your grade will be reduced by 10% per



**Topics for Independent Research Project (100 pts): Select a species and/or ecosystem from list below BEFORE fielding; do some background research in advance so that you can design and implement a short-term research project during field course; write up results in format of Fact Sheet (see attached examples from previous students).**

**Seagrass ecosystem:** Abundant seagrass beds dominated by *Thalassia testudinum*, with *Syringodium filiform*, *Halodule* spp., surround the caye, providing an excellent environment for snorkel based investigations. Potential projects include ecology or behavior of various organisms within these systems. Suggested species include sea stars (*Oreaster reticulatus*), sea urchins (*Lytechinus* spp.), grunts (*Haemulon* spp.), needle fish (*Strongylura* spp.). Shallow subtidal mangrove peat banks surround the caye and have well-developed communities of fleshy algae (e.g., *Caulerpa* spp., *Dictyota* spp.) and calcified algae (e.g., *Halimeda* spp., *Jania* spp.) with sparse *T. testudinum*, rose corals (*Manicina areolata*), and corkscrew anemones (*Bartholomea annulata*) with symbiotic cleaner shrimp (*Periclimenes* spp.).

**Mangrove ecosystem:** The caye is dominated by large perimeter and dwarf central red mangroves (*Rhizophora mangle*) and 2 significant black mangrove (*Avicennia germinans*) forests, with a scattering of white mangroves (*Laguncularia racemosa*), a few buttonwoods (*Conocarpus erectus*), and planted coconut palms, providing abundant habitat for hermit crabs (*Coenobita clypeatus*) and fiddler crabs (*Uca* spp.); we also sight mangrove crabs (*Aratus pisonii*), snails (*Littoraria angulifera*), mangrove root crabs (*Goniopsis cruentata*), and ghost crabs (*Ucides cordatus*), mangrove rivulus fish (*Rivulus marmoratus*), and giant termite nests (*Nasutitermes* spp.), unidentified bat species locally called rat bats that are thought to roost in the coconut palms during the day but can be observed foraging on insects at dusk and dawn, and many birds including the mangrove warbler, golden fronted woodpecker, osprey, common black hawk, egrets, and herons (see bird list). The central pond of on this caye is strongly influenced by diurnal tides, fluctuating from a mud flat at low tide to about 30cm of water at high tide and would make a good independent variable for natural experiments.

**Belize from Sea to Stars (50 pts): Each student will prepare a presentation before arrival on some aspect of Belize. Topics could include the following: Art, Astronomy, Culture, Economics, Ecology, Geology, History, Languages, Music, Politics and others. After dinner each night, one or more students will give oral presentations on their topic. This is NOT a Power Point presentation! Ideally, there should be some interactive nature such as stargazing, quiz bowl, role playing, or crossword puzzle. These should be approximately 20-40 minutes long, informative and interesting to a general audience. The island staff will be invited to join us when this is feasible. Once you have selected your topic, you must register it with Dr. C to prevent replication of topics by students. For some interesting issues in Belize search the following topics in association with Belize:**

Lethal Yellowing Disease, Coral Bleaching

Business Ventures: Chalillo Dam, BEL, Fortis;  
Cruise Ship Industry explosion; sugar and banana industries

Glow Worms and Bioluminescence (*Odontosyllis luminosa*, Dr. Gary Gaston); Pica Pica and Thimble Jellies

Belize-Guatemala Border Dispute; Government: UDP vs. PUP

Meteor Showers, the Southern Cross and other Astronomical Views

Culture: Maya, Garifuna, Kriole/Creole, Mestizo, Mennonites

Geography: 5 Oceanic Ridges and the Atolls

Local NGOS: BACONGO, TIDE, TASTE, Friends of Nature, Belize Audubon, Wildtracks, Sharon Matola and the Belize Zoo

Baymen of Belize and the 1798 Battle of St. George's Caye

Some Famous People from Belize: Baron Bliss, Andy Palacio, George C. Price, Marion Jones, Jamal Shyne Barrow, Evan X. Hyde, Zee Edgell, Milt Palacio, Said Musa, Dean Barrow

Conservation in Belize: Protected Areas?

Music: Stonetree Records

Destinations: Caye Caulker, San Pedro, Placencia, Orange Walk, Punta Gorda, Dangriga, Belmopan, Corozal, Bermudian Landing, San Ignacio, Benque Viejo, Hopkins

Maya Archeological Sites: Xunantunich, Cahal Pech, Lamani, Altun Ha, Caracol, El Pilar, Lubaantun, Nim Li Punit, Actun Tunichil Muknal

Food: Sere, Hudut, Escabeche, Rice and Beans, Beans and Rice, Cowfoot Soup, Johnny Cakes, Creole Bread, Powder Buns, Black Cake, Dukunu, Meat Pies, Relleno, Stew Chicken, Garnaches, Salbutes, Panades, Tambrand Candies, Gibnut, Bamboo Chicken, Marie Sharp's, Boil-up, etc.