I. Topics:

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I. Objectives and Learning Outcomes:
This course is designed to provide an introduction to modern carbonate environments, using San Salvador Island, the Bahamas as a microcosm of these environments around the world. San Salvador Island is only 10 miles long and 2.5 miles wide, yet it has an impressive variety of geologic stops that include the current type sections for Pleistocene carbonate island stratigraphy. In this course, we will use the field and dive locations on this island to learn about carbonate depositional environments, sedimentation and diagenesis, and carbonate island hydrogeology. We will spend 5 class periods prior to the field trip reading and discussing peer-reviewed literature about the geology, tectonics, depositional environments, sediment history, and hydrology of the Bahamas. This coursework will be followed by a week-long field trip to San Sal where we will stay at the Gerace Research Centre (http://www.geraceresearchcentre.com/), visit field localities during the day, discuss the day’s activities and prepare for the next day during evening sessions, and work on group research projects that will be presented prior to the end of the field trip.

Upon completion of the course you should have a better understanding of carbonate environments, including an understanding of:

1) the theories for formation of the Bahamas Bank  
2) the stratigraphy of the Bahamas  
3) how carbonate sedimentation varies with sea level  
4) how carbonate sedimentary process differ from silicate sedimentary processes  
5) how carbonate sediments are altered after deposition  
6) carbonate petrology  
7) the way that fresh water shapes the islands  
8) the important role of fresh water for island sustainability

In addition, work for this course should improve:

1) your ability to read, understand, and discuss scientific literature  
2) your oral presentation and communications skills  
3) your ability to use the sedimentary record to infer conditions in the past
II. Classroom Logistic: We plan to teach this course in a modified team-based learning format. Each class will be initiated with an individual Readiness Assurance Test (iRAT). That test will consist of 10 multiple choice questions based on the readings for that day. Immediately following the iRAT, students will take the same test within a group in a team Readiness Assurance Test (tRAT). Both the iRAT and tRAT will be closed notes, books, internet etc. The iRATs will be graded while students take the tRAT, and the results of the iRAT will focus the discussion and potential exercises that occur during the remainder of the class period. Following the tRAT, discussions of the papers will be led by the teachers and will include presentations and analysis of selected figures/diagrams from the papers.

III. Field Trip Logistics: We are planning to spend seven days traveling to and staying at the Gerace Field Station on San Salvador, Bahamas around March 25 -April 1. The exact day we leave and return will depend on flight options and costs (each additional night costs $70.50/person). The goal is to be back home by Sat. April 1st, so there is a day before classes on Monday.

IV. Behavior requirements for San Salvador
1) If you arrive in the morning incapable of participating (not just tagging along) in that day’s field trip, you will fail the class.
2) Illegal drugs will not be tolerated. If you are found with drugs, or try to buy drugs on the island, we are not responsible for your legal problems. If you are in jail, we will leave you there when we return to the States. Marijuana is illegal in the Bahamas, and the penalties for possession include jail time. You do not want to go to Bahamian Jail!
3) Do not party with locals, either at bars or alone on the beach. San Salvadoreans are generally very friendly, but there are many off-island Bahamians there now, who may not be so nice.

V. Estimated Costs:
(1) Airfare ~$450
(2) Gerace Field Station Room and Board $69/night + $1.50/day insurance +$10 tech fee ($433)

We will collect a non-refundable deposit of $475 to purchase airline tickets at the Jan. 18th class meeting. Checks should be made out to Ellen or Jon Martin.

We'll collect the remainder of the money in mid March (estimated to be about $410 depending on the final airfare, class enrollment).

Additional costs you will be responsible for:
- We will probably need to spend a night in Miami, Ft. Lauderdale or Nassau en route to San Sal. We’ll put multiple people in each room, so it’s usually ~$40/person plus dinner costs.
- Incidentals on the island.
VI. Grade

- \(i\text{RAT} + t\text{RAT}\) 20%
- \(i\text{RAT}\) \(\geq 5\%\)
- \(t\text{RAT}\) TBD
- Discussion participation 25%
- Topics presentation in field 20%
- Field Notebook 15%
- Field Project 20%

Grading Scheme: \(\geq 93 = A; 90-92 = A-; 87-89 = B+; 83-86 = B; 80-82 = B-, etc\)

VII. Things you will need

*****Passport!!!!*****

Field notebook
Mask/fins/snorkel and way to carry them
Bathing suits
Beach towel

Hand lens

Rock hammer (we’ll need a few of these so we should coordinate)
Flash light for caving (likely to get wet)
Sunscreen
Sunglasses
Hat
Insect repellent
Money in small denominations, there are no ATM’s or banks on San Salvador Island.
Chargers
Camera/ spare batteries

Shoes with sturdy soles- can be Chacos or water shoes, but coastal karren is nasty stuff
A pair of old sneakers

Other useful items
- The water will be around 78 degrees, so wet suits aren’t necessary, but useful for people who get cold
- Snacks- everything is expensive on the island, you can save a lot by bringing popcorn, nuts, crackers, granola bars, etc. That way you can save your money for fruit juice and things to put in the fruit juice
- A sweatshirt- it does get cool in the evenings
- A light cover- we’ll be driving around in open trucks, so you will be exposed to the sun a lot. It helps to be able to cover up while we’re traveling. It can also be cold driving in the back of the truck after getting out of the water
- Rain gear
- You don’t need a lot of clothes, but it is expected that we will clean up and look decent for meals.
- Laundry detergent- there are several washing machine available so you can run a load while you’re there (air dry)
GLY5786/4930 – Field Topics in Geology of the Bahamas
Spring, 2017

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**January 18th – Geology of the Bahamas and Introduction to San Salvador Island**


**February 1st – Tectonics of the Bahamian Banks**

Ginsberg and Gartner, 2001, Summary of origins of the Bahamas – a two paragraph summary of Bahamian tectonics.

Ladd, J.W., and Sheridan, R.E., 1987, Seismic stratigraphy of the Bahamas: AAPG Bulletin 71, 719-736. (This is a long, detailed paper describing a series of seismic lines in minute detail. Read Abstract and Introduction (start 719) and Geologic History (starting 734). Be certain to understand summary figure (Fig. 17).


**February 15th – Modern Carbonate Sedimentation**

Bosence and Wilson, Carbonate depositional systems, Chap. 11, part 4 Carbonates.


March 1<sup>st</sup> – Diagenesis and Hydrology (papers may change)

March 15<sup>th</sup> - Petrography