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"The best geologist is one who has seen the most rocks." H.H Read, 1940

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2018 Winter/Spring Newsletter

Message from the President

Your society has been as active as ever in recent months, with field trips to Cuba, and a return trip to the Lake Wales Ridge Sand Pits to search for fulgurites. Summaries of these events are included below. SEGS will also be partnering with several other societies to sponsor the International Sand Collectors Society (ISCS) *SandFest 2018* Conference in Jacksonville, on September 19-24, 2018. There are several field trips associated with this event, including heavy mineral mines in both Georgia and Florida, and a couple of coastal trips. There are also presentations, including our own VP Jennifer Coor. I encourage you to consider participating in this unique opportunity. See the *ISCS SandFest 2018* webpage at:

<http://sandfest.sigmabookstore.com/>

An additional fall 2018 SEGS fieldtrip is in the planning stages. Standby for details.

SEGS member Jonathan Valentine, President of the USF Geology Club, kindly represented SEGS with a brief presentation at the *EnviroWorkshop* remediation training on February 28th in Tampa. Below is a brief recap of the event. On behalf SEGS—*Thank you, Jonathan!*

In late February, SEGS had the opportunity to be represented at a remediation workshop in Tampa hosted by Enviro-workshops. Many career environmentalists were reminded by us that while working in the environment is important, appreciation for it is best built by taking part in outdoor activities such as those offered by SEGS. To which the audience was quick to agree that no one in the room is too far removed from college to remember having fun outdoors. Speakers were entertaining, even when technical, and we could all learn from the, "Ten most common mistakes made by environmental scientists". And if the author of this short spurt kept their mental inventory correctly, they would tell you them. ~Jonathan Valentine

Starting in 2017, SEGS launched its first **Student Research/Field Work Grant Opportunity**. This competitive grant award initiative is for the promotion of greater understanding of Southeastern U.S. geology through student research and/or field work. Grants are available on an application merit basis to any student, undergraduate or graduate, enrolled at any accredited University or College in Florida, Georgia, or Alabama. SEGS has allocated grant awards of \$1,000 for an undergraduate student applicant and \$2,000 for a graduate student applicant, and a free year membership to SEGS. Awards are targeted for expenditures such as (but not restricted to) field work, research travel, laboratory analyses, research materials, etc.; they are not intended to fund indirect/overhead costs or wages. Proposals are judged on:

(1) merit of proposed research/field work; (2) clarity of expression, and (3) strength of recommendation letter from a college faculty sponsor. Applications for 2018 must be postmarked on or before **June 30, 2018**, and the awardee(s) will be notified by August 31st. The 2018 notice is attached to this newsletter.

In March, we send an all-SEGS member message to invite our members to consider leading a field trip. We had some response, but it was minimal. I want to reoffer the invitation. Please do not consider SEGS as a “consumable” product. We are an all-volunteer organization, and nothing happens unless our membership collectively steps up to the plate and does their share. Field trips advance the geological knowledge of our members, encourage research, provide field experiences for geology students, create networking opportunities with others in our profession, and without exception create enjoyable social events for members, family, and friends who attend. If you want to run a fieldtrip and write the field guide for your trip, please contact myself (Jon Bryan) or Vice-President Jenn Coor with ideas.

I hope all of you will maximize your participation in SEGS events. *And please, do not forget to pay your 2018 dues!* Field trips are restricted to paying members.

Keep Looking Down,

Jon Bryan
SEGS President

Research Update from SEGS 2017 Student Research/Field Work Grant Awardee, Derrick Vaughn, Ph.D. Candidate, Department of Geological Sciences, University of Florida

In August of 2017, Derrick Vaughn, Ph.D. candidate in geology the University of Florida, was awarded the first SEGS Student Research/Field Work Grant, for the amount of \$2,000 (plus a 2018 membership to SEGS). His research concerns carbon sequestration by mangroves and marshes on Florida's Gulf and Atlantic coasts in response to climate change. Congratulations, Derrick! Below is a research update from Derrick on his work.

Marshes and mangroves along the Big Bend coastline provide many ecological and ecosystem benefits but one benefit many do not consider is their ability to store large amounts of carbon, often referred to as blue carbon, on time scales from centuries to millennia. This large storage of carbon could potentially counteract modern increases in atmospheric CO₂ concentrations; however, the conversion of these wetlands through both anthropogenic activity and rapid sea-level rise prevents these ecosystems from storing newly sequestered carbon and could release carbon pools that have been stored for hundreds to thousands of years. Thus, there is a strong need from a climate perspective to protect wetlands from further losses through their incorporation into coastal management policies. In order to accomplish this, we need research on natural blue carbon sequestration rates in wetlands and on how natural variations in carbon sequestration compare to anthropogenic-driven changes.

I received a fieldwork grant from SEGS in the fall of 2017 to collect and analyze soil cores in a marsh-mangrove ecotone along the northern Gulf coast of Florida (a.k.a. the Big Bend coast). The overall goal of this study is to understand the burial and transformation of organic carbon as related to the recent expansion of mangroves northward with a warming climate and to climate variability and sea-level rise throughout the Holocene. We hypothesized that the expansion of mangroves into the saltmarshes along the Florida Big Bend coast would result in an increase in organic carbon being sequestered in these systems as mangroves tend to have higher above- and below-ground biomass than saltmarsh vegetation and can capture more allochthonous material. We also hypothesized that our cores would capture changes in the depositional setting during the mid- to late-Holocene as sea-level rose and these wetlands developed.

Cores from the Big Bend coast were collected from Waccasassa Bay on May 1st, 2018 using a vibracoring rig. There were three cores in total and each represented a zone with different dominant vegetation (saltmarsh, mangrove, and a zone where mangroves are in the process of expanding into saltmarsh). The cores were then transported to and split at the University of Florida. The top of the cores, representing modern deposition within the wetland, consisted of organic-rich peats whereas the base of the cores, representing older material that has been stored for possibly thousands of years, consisted of sand with dense amounts of shell fragments. The sandy layer with shell fragments may indicate this mangrove-marsh ecotone in Waccasassa Bay may have been a former tidal creek or cove, which implies there has been a transgression of the shoreline with sea-level rise during the Holocene. These cores will now be subjected to several geochemical analyses, include stable isotope analysis and the identification of specific molecules termed biomarkers within select intervals of the cores. We ultimately hope to use these analyses to further interpret how this environment has changed throughout the Holocene and to determine whether the modern encroachment of mangroves into the saltmarsh affect carbon sequestration and storage within this ecotone.



Photo 1: Using the vibracoring rig in Waccasassa Bay to collect our core from area dominated by black mangroves (*Avicennia germanins*).



Photo 2: Collecting above-ground biomass in the saltmarsh

dominated by black needlerush (*Juncus roemerianus*) to estimate productivity in the environment.



Photo 3: The transition zone where mangroves are encroaching into the saltmarsh.



Photo 4: The transition core after being split at the University of Florida. The top of the transition core represents modern peat whereas the bottom of the core consists of shells that indicate a possible aquatic environment.

Revenge of the Lake Wales Ridge Sand Pits

On 24 March 2018, SEGS partnered once again with the University of South Florida Geology Club, and returned to Lake Wales to collect fulgurites. The following report is from SEGS Secretary, Cortney Cameron, who also attended the trip:

Approximately 50 attendees—including nearly 30 students, 5 new members, and 8 children—attended this year's Lake Wales Ridge fulgurites field trip, led by SEGS member Marc Hurst and hosted by SEGS in conjunction with the USF Geology Club. After Mr. Hurst provided a quick briefing on safety and the Ridge's formation, participants were released into Pit No. 1, where current and future geologists—fervent in their search of fulgurites—could be observed imitating mountain goats along the sides of 40 foot tall mining sand dunes. Later in the day, USF's Dr. Matthew Pasek made a surprise showing to provide the group with a brief lecture on all things fulgurite, his talk barely done before one exhilarated fulgurites fan purchased the only demo copy of his recently-published book. All the while, participants enjoyed drinks and snacks courtesy of SEGS (the chewable fruit treats proving popular with the youngsters). By the trip's closing at lunchtime, signaled in part by large numbers of languid college students aggregating on the dune-side of Pit No. 4 to sunbathe, it appeared that a majority of attendees had uncovered fulgurites, including at least one impressive ~3-inch diameter specimen.



The Cypresshead Formation, Lake Wales Sand Pit

Geology of Western Cuba

From 18-23 March 2018, seventeen SEGS members embarked on a long-anticipated geological excursion to Florida's geological next-door neighbor, the Caribbean island of Cuba. SEGS partnered with Holbrook Travel of Gainesville, specialists in eco-tours and scientific excursions, to coordinate our trip. SEGS member Roger Portell, who has been to Cuba several times conducting paleontological research for the Florida Museum of Natural History, worked closely with SEGS President Jon Bryan to organize the trip.

Fortunately for us, we quickly linked up with renown Cuban geologist, Manuel A. Iturralde-Vinent, of the Cuban Academy of Sciences, to personally lead our fieldtrip (the field book, written by Manuel, is now an SEGS publication (Guidebook 72), and will soon be available on the SEGS website). The experience was unforgettable. Our accommodations were exceptional. The trip seemed to be as much cultural as geological. Cuba is a beautiful island with an amazing geologic history. Cuba is actually part of the North American Plate. It was striking, even disconcerting, to see mountains with Jurassic limestone and Cretaceous ophiolites, so close to the the undisturbed Quaternary carbonates of south Florida. The following travel log was graciously provided by SEGS member and Cuba participant, Ms. Julie Zydek, hydrologist with SWFWMD (be sure to click on the photo gallery links). *Thank you, Julie!* (*Note: Cuba photos, including Julie's will be posted on the SEGS website).



SEGS in Cuba (Bacunayagua Bridge). Our guide, Manuel Iturralde, on the far right

Cuba Travel Log, by Julie Zydek

From March 18th to March 23rd, I visited Western Cuba with the Southeastern Geological Society (SEGS) to study outcrops and the geomorphology of the western part of the island. The geology of the Cuban archipelago is very complex as it has a history of volcanism, tectonic action, sea level transgressions and regressions, metamorphism, and sedimentary deposition. We were hosted by Cuban geologist Manuel Iturralde-Vinent, the unsung hero of Cuban geology. He plays a fundamental role in preserving the integrity of the outcrops for future field trips, research, publishing, public outreach on geology, health, safety, and the Museo Nacional de Historia Natural in Old Havana. We were also hosted by a local travel guide named Osmin and tour bus driver, Jose Louis. During the first four days, we visited many outcrops in and between Viñales, Varadero, and Havana to observe the mountainous, coastal, and karstic terrains. The last two days were spent exploring Old Havana.

VIÑALES

<https://photos.app.goo.gl/SjQ7688PZQWfZwdV2>

On the first day in Viñales, we received a presentation from Manuel about the geology and karst overview at the visitor center of Viñales Natural Park. Here there are many tower karst formations and we witnessed the geomorphology of the Viñales valley and surroundings. We also visited the KT boundary and Paleogene foredeep deposit near Moncada. An email we received before the trip stated that Che Guevara staged hardware, munitions, and troops in anticipation of a U.S. invasion in the early 60s here.

On the second day, we visited the Jurassic-Cretaceous continental margin sections of Pangea to the Proto-Caribbean and Cuevo del Indio. The formations observed were the Middle Jurassic sandstone and shales (San Cayetano Fm), the organic-rich shales and limestones of the Jagua Fm, and the Kimmeridgian carbonate platform (both Jurassic in age) and Jurassic-Cretaceous boundary sections.

K-T Boundary

The K-T boundary near Moncada demarcates an erosional contact between the Late Cretaceous age Moncada Formation and the overlying Manacas Formation. The Moncada Formation is composed of shocked quartz, vesicular impact melt fragments, and altered grains of possible impact glass. This Formation also contains cross-laminated ripple marks that occur in many horizons which indicate north to south trending paleocurrent directions with reversals. Additionally, variable grain size within the horizons are indicative of tsunami wave action.

Viñales Stonehenge

The “Viñales Stonehenge” (so named by Manuel himself) in the Dos Hermanos valley are formed by vertically flowing water after rain events. This causes the limestone to be dissolved with pinnacle and other karren-like geomorphological features.

San Cayetano Formation

Another featured observed in Viñales are the folds of the Early to Late Jurassic aged San Cayetano Formation that outcrop on La Palma Road. These inverted folds of sandstones and shales are the oldest known deposits of the Guaniguanico mountains. The deposition of this Formation occurred simultaneously with the break up of Pangea in the Mesoamerican area. The portion of this Formation observed on La Palma Road is made up of well-bedded, reddish to yellowish, fine to medium grained sandstones and shales. Muscovite and zircon are observed in the sandstones, and the Paleoproterozoic zircons are thought to have originated from western and northern parts of South America. The overlying Late Jurassic Jagua Formation contain fossiliferous concretions. Fossils recovered from this Formation include: dinosaur, fish, plesiosaur, pliosaur, metriorhynchus crocodile, pterosaur, and ammonites.

Cuevo del Indio

Cuevo del Indio is a vadose zone cave, formed by the Cuyaguaje river (which flows inside the cave) cutting into the limestone hills (mogotes). It is home to many galleries that can be accessed by foot and by boat. The scallops seen on the walls were formed by currents.

VARADERO

<https://photos.app.goo.gl/22JagljD9ub7ftc2>

We left Viñales on the **third day** to head to Varadero, a popular tourist spot on a peninsula east of Viñales, for two days. Here we visited the K-T boundary and the quaternary marine and coastal deposits, as well as allochthonous serpentinite ophiolites, Cretaceous arc rocks, and rocks from the Paleocene in the Havana-Matanzas area. We went snorkeling along a shallow reef at Playa Coral and inside Cueva de Saturno. The coral reef is currently recovering from sands which were imported to transform a rocky shore into a beach. However, wave action is removing the sands from the beach and the corals are recovering. We also visited Cueva Ambrosio, a protected cave that contains aboriginal drawings.

Bacunayagua Bridge

The Bacunayagua Bridge is one of the highest in Cuba and overlooks outcrops of Miocene age marls of the Cojimar Formation and limestones of the Guines Formation. To the south, the Yumuri valley cuts across Cretaceous volcanic sediments and mafic to ultra mafic, late Cretaceous to Miocene age sediments.

Terraces at Dupont and Hicacos

The shoreline in and around Varadero is dominated by rocky beach shores and unconsolidated dune deposits. Four marine terraces are identified, with the first identifiable terrace being from the Late Pleistocene age Jaimanitas Formation. The second identifiable terrace is several tens of meters away from the shoreline, in the Vedado Formation, which outcrops near the Hotel Nacional de Cuba in Havana. Terraces west of the Peninsula de Hicacos contain Sante Fe Formation cross laminated dunes made up of eolian calcarenites that reach heights of five to eight meters. In this area, as well as Dupont, tidal notches are apparent as erosional features of the terraces.

HAVANA

<https://photos.app.goo.gl/g3xkkRGNXp4xseqG2>

We spent the last two days in Havana where we visited the Museo Nacional de Historia Natural in Old Havana and were given a guided walking tour by our local tour guide, Osmin, of the city. We visited the Hotel Ambos Mundos and the house Ernest Hemingway had once lived in at Finca Vigia. The hotel we stayed at was the Hotel Nacional de Cuba, which housed many celebrities and mobsters during Cuba's heyday.

Manuel A. Iturralde-Vinent awarded life-membership to SEGS

In appreciation for the work of our Cuban geological guide, Manuel Iturralde was awarded a life-membership to SEGS, and invited to attend any of our fieldtrips when in Florida. SEGS President also gave Manuel a copy of the *Roadside Geology of Florida*. Below is the text of the award:

*In recognition and appreciation of the work and assistance of our colleague, **Manuel Antonio Iturralde-Vinent**, during the 18-23 March 2018 field trip, Western Cuba Geology, Karst, and Coastal Geomorphology, the Southeastern Geological Society is pleased to offer Manuel a life membership to the SEGS, and extends to him an open invitation to participate in any SEGS fieldtrips or activities, whenever he is able to join us in Florida. Thank you, Manuel!*

Jonathan R. Bryan

SEGS President 2018

The Southeastern Geological Society (SEGS) is a non-profit group of avocational and professional geologists dedicated to advancement of the geological sciences.
