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Arctic Ground Squirrel (*Urocitellus parryi*) | Alaska
Photo by LSUMNS graduate student Subir Shakya

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Letter from the Director...



Welcome to another Museum newsletter. I have humbly taken over the reins as Director of the LSUMNS from **Dr. Robb Brumfield**. The list of Museum directors is not terribly long but it is a very distinguished list of outstanding scientist curators with natural history acumen that is unparalleled. It has been this outstanding leadership over the decades that has made the LSUMNS one of the foremost natural history museums in the United States and I plan on carrying on this tradition. I would like to thank Dr. Brumfield for six years of outstanding service to the Museum, Department of Biological Sciences, College of Science, and LSU. Dr. Brumfield's leadership has moved the Museum forward on numerous scientific, curation, and educational outreach fronts. Importantly, he has overseen the hiring of two new Curators, Drs. Esselstyn (mammalogy) and Mason (ornithology). Adding these two dynamic Curators has bolstered the Museum by replenishing the ranks with outstanding scientists and collectors. He also oversaw the acquisition and renovation of 6,000 square feet here in Foster Hall (formerly the art print shop). This new space now houses the herpetology and ichthyology collections - the first time that the ichthyology collections have been in Foster Hall, thus uniting all vertebrate collections. Dr. Brumfield's also greatly expanded the public education outreach aspect of the Museum. While we have always had a solid public education effort, under Dr. Brumfield's leadership public outreach expanded and shined with numerous highly visible events such as Louisiana Master Naturalist Workshops, Special Saturdays, Girls Day at the Museum, and Night at the Museum (a very popular event for children and their parents). The Museum received 8,224 visitors last year, the highest on record.

Dr. Brumfield is a world-renowned ornithologist and continued his strong research program even with the expansive duties of Director. During his six-year term he continued his outstanding research program obtaining highly competitive Federal grants, training the next generation of ornithology graduate students, and publishing numerous research papers, many in top-tier scientific journals, including two bird genomic studies published in *Science*.

While not leaving the Museum as a valued Curator, Dr. Brumfield has taken on a new administrative role here at LSU. In July of this year, he agreed to be the new Associate Dean of Research and Administration in the College of Science. His strong leadership as Director of the Museum made him the Dean's top choice to lead the College of Science forward on important new directions of research at Louisiana's flagship university. I wish him good luck in both his scientific and administrative endeavors.

Thank you Robb!



A Museum Detective Story and the Discovery of a New Species

by Subir B. Shakya

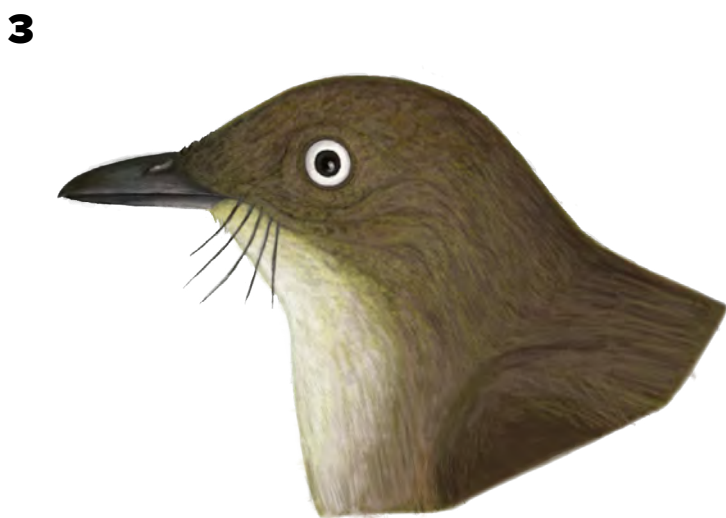
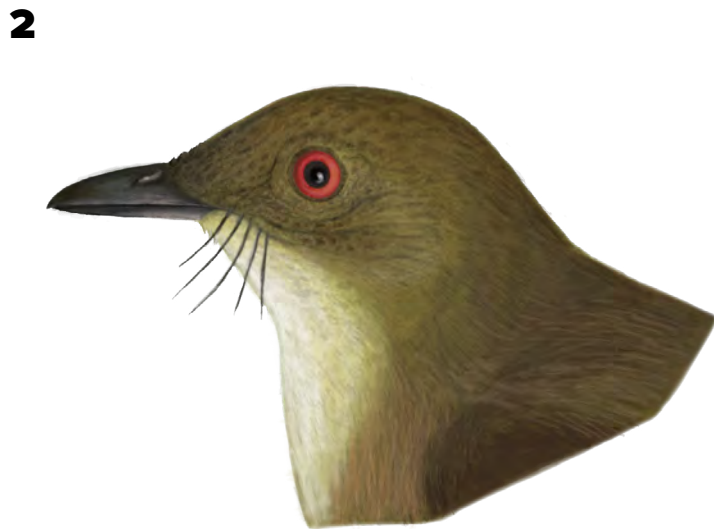
In the past year, I have led two expeditions to the remote regions of Sumatra as part of a collaboration between the Louisiana State University **Museum of Natural Science** (LSUMNS) and the Museum Zoologicum Bogoriense (MZB) in Bogor, Indonesia. The last scientific expeditions to collect bird specimens on these mountains were conducted by the colonial Dutch 80 - 100 years ago. Our recent expeditions, therefore, have yielded extremely important specimen material, including the first tissues for genetic comparisons of bird species from the mountains and islands of west Sumatra and many new ones from the Sumatran lowlands.

Because many of our Sumatran tissues are new to science, as soon as I returned from the field the first thing I did was sequence a mitochondrial gene (a gene called ND2) from each species and compared it to the same gene in birds from other parts of SE Asia, such as Borneo, Java, and Indochina. These comparisons were intended to provide a rough idea of how the Sumatran species and populations are related to others in SE Asia.

This is where the detective story begins. One

of the birds we collected on Sumatra was the aptly named the Red-eyed Bulbul (*Pycnonotus brunneus*). I sequenced its mitochondrial gene and compared it to those of birds from Borneo, peninsular Malaysia, as well as with a variety of other (outgroup) species for perspective. When I got the sequences back, I generated a phylogenetic tree to see how the birds were related to one another. In most cases, all the individuals of a species from one area cluster together and are part of a larger group constituting populations of the species from other places. The Sumatran birds grouped together as expected but something weird happened with birds from the other areas. The Bornean and peninsular Malaysian populations of Red-eyed Bulbul were spread in four different parts on the tree, not together with the Sumatran birds as expected. So, what happened?

The first thing I did was check for contamination in the sequences (e.g., the mixing or switching of sequences in the lab), but the samples didn't seem to be contaminated. Something truly bizarre was going on. There was also the possibility that the specimens had been misidentified in the field. The Red-eyed Bulbul is one of four species of uniformly



1. Bird 1 - Spectacled Bulbul, *Pycnonotus erythrophthalmos*; 2. Bird 2 - Cream-vented Bulbul, *Pycnonotus simplex perplexus*, from Borneo; 3. Bird 3 - Cream-vented Bulbul, *Pycnonotus simplex simplex*, from Malay Peninsula; 4. Bird 4 - Red-eyed Bulbul, *Pycnonotus brunneus*. Illustrations by Subir Shakya.

Title Photo - Bird 5 - Cream-eyed Bulbul, *Pycnonotus pseudosimplex*

brown bulbuls in Southeast Asia, and it is very easy to mix up the species if you rely solely on plumage for identification. However, eye-color is an important trait for distinguishing among these species, and fortunately, the tissues samples were all vouchered, meaning a whole skin specimen (a museum “study skin”) was available for each tissue sample. My first step was to track down these specimens and check the eye color of each individual.

Bird 1: This case was really easy to solve—clearly a case of mistaken identity. When I checked the study skins and the data recorded on their specimen labels, one of birds had red eyes with yellow eye-

ring. A yellow eye-ring does not occur in the Red-eyed Bulbul; rather, it is a trait of another species, the Spectacled Bulbul (*P. erythrophthalmos*). One down.

Bird 2: This bird had been skeletonized (i.e., preserved as a skeleton), so there was no study skin associated with it. However, as in the previous case, the specimen label noted the eye color, in this case—dark red eyes. The Red-eyed Bulbul actually has distinctly orange or two-tone eyes, which is usually how the color is generally reported on tags. Brown bulbuls with dark red eyes belong to yet another species, the Cream-vented Bulbul (*P. simplex*). So even without a study skin, I could tell this species was

a Cream-vented Bulbul. Two down.

Bird 3: Unfortunately, the voucher for bird 3 was in Malaysia so there was no skin or label to check easily. However, all collectors keep a field catalog in which they record the details that go on the specimen tag. I knew this bird was collected by a former LSU student, **Dr. H. C. Lim**. I went to the Museum's bird collection, checked his field catalog, and located the label information for this bird. The line for eye color read, "brown eyes," a trait of a juvenile bird. This bird was a juvenile and, so, could have been any of the four brown bulbul species. However, because I determined that Bird 2 was Cream-vented Bulbul and Bird 3 was clustered with Bird 2 in the phylogenetic tree, the odds were that Bird 3 was also a Cream-vented Bulbul. Here, I will note that the Cream-vented Bulbul, while having dark red eyes on Borneo, actually has white eyes on peninsular Malaysia and Sumatra. Yes, this is very confusing. Three down.

Bird 4: The true identity of this bird was relatively easy to determine compared to the others, as it clustered with the Red-eyed Bulbul from Sumatra in the tree (and you will remember that I was initially investigating the population relationships of the Red-eyed Bulbul). The specimen label for this individual read, red eye, two-toned, the identifying trait for Red-eyed Bulbul. So, at last problem solved. But, not quite.

Resolving the identities of these birds created a new problem, this one dealing with Cream-vented Bubbles. Bird 2 and 3, as I mentioned, were both presumed to be Cream-vented Bubbles. I mentioned earlier that I had included sequences of outgroup species for comparison. Hence, I had included another Cream-vented Bulbul sequence in my original set of Red-eyed Bulbul comparisons from a specimen housed at the University of Kansas (KU) Natural History Museum and sequenced previously by another former LSU student, **Dr. Rob Moyle**. It turns out this individual was not closely related at all to the other Cream-vented Bubbles I had sequenced. I had a hunch what was going on here, and to prove it I had to sequence more individuals of Cream-vented Bubbles. I knew that in Borneo, Cream-vented Bubbles usually had dark red eyes, but occasionally some had white eyes like those in Sumatra and peninsular Malaysia. Until now I had only sequenced red-eyed

birds, so in the next round of sequencing I added a few more red-eyed and all the white-eyed birds in the LSU collection. I got the sequences back, computed a tree, and voilà, Cream-eyed Bulbul still grouped in two distinct clusters in the tree: all red-eyed birds grouped with Birds 2 and 3, whereas all white-eyed birds clustered with the KU bird. The significance of this result was pretty big. It meant that the two populations on Borneo—red-eyed and white-eyed—although found in the same habitats, were not mating with one another and exchanging genes. In a nutshell, they were two different species.

Here is the last twist to the story. A few days later, the same Dr. H. C. Lim mentioned above emailed me and said he was sequencing the same gene as I for birds recently collected on a Smithsonian expedition to Borneo, and he found that Cream-vented Bubbles were falling in two different places in the phylogenetic tree. He asked me if I knew what was going on. Yes, I knew what was going on. I asked him if one of the clusters was composed entirely of white-eyed birds and the other of red-eyed birds. He checked his data and replied yes. At the same time I emailed the curators at KU to confirm that the KU bird had a white eye, and they said yes. So all the pieces of the puzzle fit together into a nice finished product. The next step was to name the white-eyed bird. We decided to name it the Cream-eyed bulbul (*P. pseudosimplex*), reflecting that its eyes are actually slightly off-white. The name *pseudosimplex* is intended to indicate that the new species looks very similar to *P. simplex* and, as a result, ornithologists confused the two species for a century. Discovering a new species had been a bucket list item for me, and this was great way to do it.

I'll end my story with a footnote that probably will probably add to your confusion. As I mentioned, Cream-eyed Bubbles on peninsular Malaysia and Sumatra have white eyes. It turns out these birds are actually the same species as red-eyed birds on Borneo. They are not closely related to the white-eyed Bornean birds. Let that sink in.



Ornithology Expedition to Peru

by Andre Moncrieff

This summer found four current LSUMNS grad students (**Oscar Johnson, Eamon Corbett, Matt Brady**, and me) and one alumnus (**Michael Harvey**) hard at work in the field with local collaborators in Ucayali, Peru. I always love visiting poorly explored areas of the tropics to simply figure out what birds are around. On this trip, however, there was an additional motivation for choosing the primary field site.

The backstory is that around 240 years ago, a large segment of the Ucayali River—a major tributary of the Amazon—suddenly changed course. This well-documented event, known as an avulsion, transferred about 2000 km² of land, including patches of terra firme (upland) forest, from the west bank of the river to the east bank. Because large Amazonian rivers frequently form the boundary between animal taxa, collecting specimens and genetic samples from the recently transferred forest provides an exciting

opportunity to test the effects of river avulsions on gene flow between taxa. There are about 15 pairs of closely related bird taxa that have noticeably different morphological or vocal forms on either side of the Ucayali River, so documenting those forms became a huge priority for us. Would they match the birds from the west side of the river, where this forest was until recently, or the east side, where it is now? No one knew, and we were excited to find out!

With eager anticipation, Mike, Cristhian Felix (a Peruvian collaborator), and I took a 1½-hour boat ride up the Ucayali River from Pucallpa (the capital city of Ucayali) to the town of Masisea. We then transferred

Title Photo: Field crew in Ucayali, Peru. L to R: Michael Harvey, Matt Brady, Cristhian Felix, Oscar Johnson, Eamon Corbett, and Andre Moncrieff. August, 2019.



Above: Band-tailed Manakin. August, 2019. Photo by Oscar Johnson.

Right: Yellow-chinned Spinetail. August, 2019. Photo by Andre Moncrieff.

all of our gear onto three mototaxis and took a very dusty ride for about an hour to our field site on land of the native Shipibo community of Preferida de Charasmaná on the east bank of the Ucayali River, located in the middle of this chunk of land that had “switched” river banks. Cristhian and I had scouted out the area a week earlier, so we were able to set up camp immediately and get to work.

Within a couple of days Matt, Eamon, and Oscar all arrived at our now bustling camp. With nearly twenty mist nets up to sample the understory, plus daily surveys far into the forest, it didn’t take long for us to rack up a nice list of birds. This included the poorly known Silky-tailed Nightjar, first Ucayali records of Rufous-necked Puffbird, and more expected but stunning birds like the Band-tailed Manakin (photo). Based on the voices and morphology of the birds in the area, we found the populations of the east bank taxa, with little morphological evidence of recent ancestry of the west bank taxa. It seems, then, that the small populations of west bank birds that were passively transferred during the avulsion event were quickly replaced or absorbed by the large populations of east bank birds. All the same, it will be really interesting to analyze the DNA of these birds for any genetic signatures of introgression.

After two weeks at our camp at Preferida, we spent another week sampling other unique habitats in the region such as a nearby lake and a large

riverine island near Masisea. These sites produced a stunning number of discoveries including the first Ucayali records of Green-tailed Goldenthrout, Gray-chested Greenlet, Band-tailed Nighthawk, Bicolored Conebill, Brownish Elaenia, Amazonian Black-Tyrant, and Yellow-chinned Spinetail (photo). For those who are interested, many photos and audio recordings from the trip are now easily searchable on the Macaulay Library (www.macaulaylibrary.org).

In my book, any time in the field is well spent. But time in the field—particularly with five other really motivated ornithologists—is also a huge privilege. The amount we learn during each expedition is also a very potent reminder of how much we still have to discover about basic avian natural history in the tropics. Can’t wait to head back to Peru next summer!



(Finally) Collecting Fishes in Haiti

by Prosanta Chakrabarty

In August (of 2019) my PhD student **Diego Elias** and I traveled to Haiti; a place I've been trying to collect from since my first fish expedition trip 15 years ago. Back in 2004 I was a PhD student, and I was in the Dominican Republic, the country on the other side of the island of Hispaniola. Back then I was greener than a Louisiana lawn in Spring, I learned a lot the hard way that first trip. Never-the-less it was a fruitful trip that taught me that there is no substitute for studying your research animals in the field. What I was studying then was a supposedly endemic Dominican cichlid species that was supposedly different from the one on the Haitian side. I would end up synonymizing those two species into one based on some additional Haitian samples that I was loaned, but I always regretted not having gone over the Central mountain range to the Haitian side. Haiti seemed close, but still very far, if not physically than culturally. The biggest barrier would be safety, I was told by my Dominican colleagues that we would need to rent a helicopter and have armed guards to collect on the other side. I didn't know it would take me 15 years to get to the western side of Hispaniola and that very little of what I heard about this country would turn out to be true.

***We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time***
-T.S. Eliot

This trip was part of the last leg of my National Science Foundation grant "Not So Fast: Historical biogeography of freshwater fishes in Central America and the Greater Antilles." The freshwater fishes of Haiti are special; this country has one of the largest freshwater lakes in the Caribbean and some of the most unique fauna in the Neotropics. That largest freshwater lake, Lake Miragoâne, is said to have an endemic radiation of fishes in the genus *Limia*, a group of poeciliids (also called mollies or livebearers because they have live young). Some have called this endemic radiation of *Limia* a miniature version of the famous cichlid radiation in the Rift Lakes of East Africa. For a country that is only 10,000 square miles, it has almost a dozen endemics; in contrast the entire island of Puerto Rico has zero endemic freshwater fishes. Another reason it is special is that Hispaniola is a composite island made up of several other islands smooshed together, we would spend much of our time on the "south Paleo island" around the capital Port-au-Prince which appears to have remained somewhat isolated from the other geological portions of the island.

Unfortunately, despite all their freshwater, Haiti has no practicing ichthyologists. There are plenty of people working in agriculture and business and many people are living off their land. We are often presented with the narrative of how this country is the poorest in the West, but that is only if you measure wealth in GDP; many people here are



Limia from Lake Miragoâne

far from poverty, they have nice homes, many goats, some farmland – they lack debt and many would be better off than most of us if we suddenly lost our jobs. Whenever Haiti is mentioned in the news of a Western website we are fed images of a downtrodden country with open sewers and earthquake- and hurricane-ravaged people. Civil unrest did thwart our attempts to travel there several times, as Haiti was under a Level 4: “Do Not Travel” State Department advisory for much of 2019. Finally heading over there in August (at a manageable Level 3: “Reconsider Travel”) I was expecting to be documenting extinction and counting all the introduced tilapia I would collect instead of natives. Instead what we found is a vibrant country with many pristine natural areas with remarkable, resilient and industrious people.

We were hosted by Martin Reith a botanist working as the curator of the Jardin Botanique des Cayes. Martin is a German who grew up with a strong interest in aquarium fishes and was eager to help us. Dr. Debra Baker from Kansas put us in contact with her student, Wilnise Louise, who is doing her Master’s in agriculture in the north “Le Cap” part of the island. I did not want to collect in another country without locals so I insisted we bring a local student along, and I’m very glad we did – Wilnise was a wonderful contributor to our efforts. We also needed a driver and someone who knew the roads. Martin is relatively new to Haiti, having lived there for less than a year, although you wouldn’t know it from his impeccable Creole. He lived in the Dominican Republic in the five years previous to his move, so he did know the island, but he did not yet feel comfortable driving

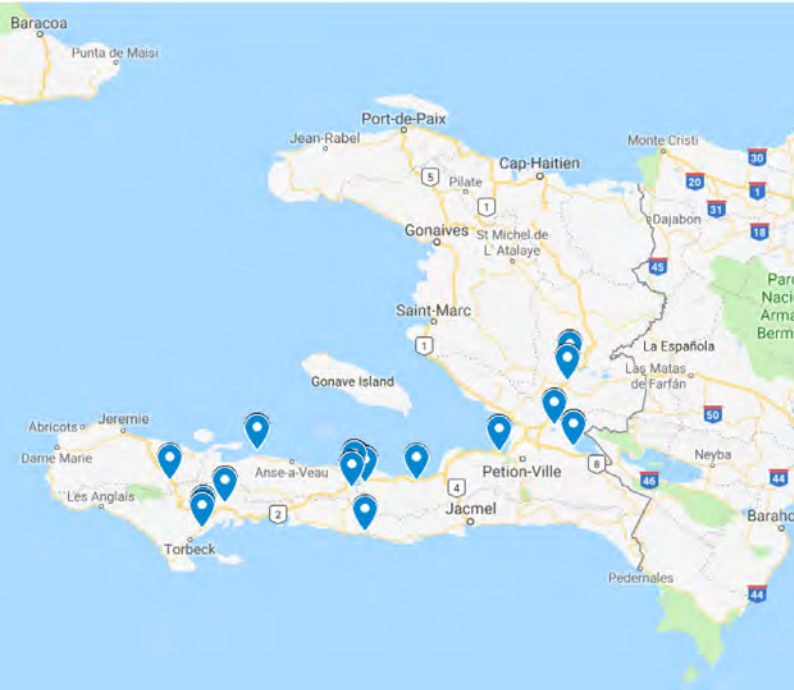
around Haiti. We hired a truck and a driver, Simain Dimmension, and he would also be an integral part of the “L’Equipe Poisson.”

Our trip did not start out well, we turned out of the airport and picked up some bottled waters that had the strong taste of salt. As we would be relying on bottled water during the trip, this saltiness was not a good sign. In most countries I visit, I take my chances and drink the water from the tap if the locals do that – the locals in Haiti were all drinking bottled or bagged water. After getting our first taste of cold salt water, we turned right from the airport and were excited to be headed towards our first field site when we got stuck in traffic – for three hours! Apparently, the major road we needed to take was flooded; we were not moving at all and ultimately had to turn around and find a place in Port-au-Prince to stay. After a long day of travel (we had left Baton Rouge at 5am), the ‘Prestige’ beers and even the fried tilapia tasted great, although I grew concerned that we would see no other species of fish during our trip.

Mercifully we were able to leave Port-au-Prince without incident the next morning. Our first destination was Lake Miragoâne, where I had dreamed of collecting for so long. After some minor sampling along the way we ended up at a little bathing area where people were drinking and partying around the huge lake. It appeared to be the only easily accessible entry for some distance. We



“L’Equipe Poisson” (From L to R) - Martin Reith, Prosanta Chakrabarty, Wilnise Louise, Diego Chakrabarty, Simain Dimmension.



Our sampling sites in Haiti. (Created by Regina Champagne.)

were a curiosity to the crowd at first, and I am used to that. Foreigners coming in with big fancy fishing nets often draw a crowd, but I noticed the space between the revelers and our crew was shrinking. We were doing our best to explain what we were doing to the people closest to us, but there were lots of people and not everyone got the full story. Most of the people around us were men and they were, let's say - not at all sober.

Despite there being bathers nearby we could see that there were lots of small fish in the water. A little secret about the cichlids and mollies is that they like dirty water, the additional nutrients from the soap and grime in the water is like junk food to them. The water wasn't that dirty really, just with some added soapy nutrients, but we knew it would be a good site for collecting some of the endemics from this lake. We explained to a few people around us what we were doing and why, but word did not spread. We entered the water and the crowd around us closed in, the water was very muddy where we entered, which is why there were no bathers in that section. With Diego and I half submerged pulling a large seine the crowd descended and the mood changed quickly from a party atmosphere to more of a skeptical mob - people started picking out our fish and some were helping us put them into containers, others were yelling. Before I knew it four drunk guys were walking off with our seine. It was chaotic, people going in multiple directions with our gear, it turns out that

some inebriated guys thought they were going to get paid for collecting fish for us. Although I'm happy to help people out, there was no way I could start handing out bills in the mess that was going on. In the end, we were able to get our gear back and hop back in our truck, but some of the locals were not happy that we were leaving. A few of the men were demanding money 'for their trouble' – it was clear something had to be done. Diego passed them a bottle of rum and that did the trick. That was some quick thinking on his part, and it saved us from a rather sticky situation.

That event reminded me that we did look like an odd cast of characters, with our fancy nets and foreign faces - the locals should mistrust us. Who were we to collect their fish? Although we did explain to some of the people there, not enough of them were around us to hear. The rest were thinking we were coming in gangbusters doing some strange stuff in their water. I don't blame anyone there for the misunderstanding, I'm just sorry that we didn't have time to explain to everyone why we were there. We were there to document what of the local fish fauna remains so that we can help protect these freshwaters.

We did get a nice collection of fish even from that one spot on Miragoâne. We ended up driving down the road a bit and finding a spot that seemed relatively quiet to process the fish, but even here we were quickly crowded by a group of a dozen or so people, but this time they were a curious and sober bunch, and I was able to use my limited French to explain what was happening. We also had Wilnise and Simain participating in processing the samples. What we were doing must have looked rather strange: taking parts of fish and putting them into small laboratory vials, then tagging fish with plastic labels. Diego had a photobox and was taking some really nice images, which the crowd took great interest in; these images are important because these tiny poecilids are very hard to tell apart. I took the opportunity to explain how to differentiate the introduced species from the natives to the locals. Tilapia, which has been here since the 1950s – introduced by the United Nations to increase protein availability – is not easy to distinguish from the native cichlid, *Nandopsis haitiensis*, and many locals did not know that tilapia was introduced from Africa. Likewise, the poecilids, which are not a food fish, was not a species most of the locals pay much attention to. It



Nandopsis haitiensis

lilies, with jacanas, dragonflies and other wildlife. I was very happy; especially as the channel opened up to the bigger lake. The area was pristine and gorgeous; the big flat lake with dark green water was surrounded by lush mountains on all sides. We were catching plenty of the native *Limia* that we were after; unfortunately, we were also catching Asian carp that we did not expect to see. This species grows very fast and can reach 30 pounds making it easily the biggest freshwater fish in Haiti. These fish can also alter the environment by removing native vegetation.

was a proud moment when I heard Wilnise explaining the scientific goals of our trip in Creole to the locals. This was the start of her training: I wanted her to become an expert on Haitian fishes in a country that lacked such an expert.

We sampled in various parts of Lake Miragoâne over the next few days, driving around looking for areas we could conveniently, and somewhat quietly, enter. The lake is only 10 square miles but remarkably has seven endemic fish species, partly due to the variable habitat. On one memorable trip we went down to a spot where water taxi's (wood or metal canoes) take people to different areas around the lake. The spot was actually between Lake Miragoâne proper and what was being called Petite Miragoâne, which were connected by a shallow waterway that must unite the lakes into one during periods of flooding. We went by canoe through a mass of thick reeds and water

After Miragoâne we went west to Les Cayes where Martin lives and works as curator. Les Cayes is the world's largest supplier of vetiver, a fragrant bunch-grass from India that is used in perfumes, cosmetics and aromatherapy. You could smell the vetiver rather strongly as you entered the town. It was also interesting seeing breadfruit growing and being eaten. Having gone to Tahiti last year, where breadfruit originates, I couldn't help to think



Dormitator maculatus

of Captain Bligh whose men famously mutinied on his ship the HMS *Bounty* in 1789; the mission of that ship was to bring breadfruit to Haiti and other parts of the West Indies (there are five movie versions of *'Mutiny of the Bounty'* the most famous one being with Marlon Brando).

Les Cayes is in one of the most southern stretches of Haiti, and almost at its Western edge. In spots near the coastline I was reminded of Tahiti, with aqua blue waters and the surrounding mountains. But there is also an awful tide of sargassum drifting in from further out in the Atlantic that is currently sullyng the coastline. Luckily, we were not after Caribbean fishes, we were focusing on freshwaters. In Les Cayes, we collected some sleepers (Eleotridae) and gobies that are associated with more brackish habitat. One of my favorites is the fat sleeper *Dormitator maculatus* that has a large bright blue spot behind the head – they look a bit ridiculous but they've managed a pretty wide range. We hope to one day look at the population genetics of this beast that can be found throughout a wide part of the Neotropics and supposedly as far north as North Carolina. We sampled in the lovely Botanical Gardens where we saw lots of amazing plants and saw white necked crows and other neat fauna. Although this site was lovely I couldn't help but notice the many fishes we would see in the ditches around town, after ignoring them for a few days – it is always best to look away from the open sewers in the city center– I decided I would go down into one.

From five feet above I could see there was

a good bit of fish diversity and I kept seeing some flashes of color I didn't recognize. Throwing on a cheap pair of plastic waders and covering my mouth I dropped into the ditch with two dipnets and scooped up all the fish I could get while trying not to smell the poop smells I was kicking up. It was gross but it was worth it – we collected some species we didn't get elsewhere and one – *Poecilia reticulata*, that is introduced and not yet fully documented in the scientific literature – it is also a species that I collected from a much cleaner ditch in Tahiti. I will be sending these to a colleague who studies this species for its endoparasites and population genetics. The ones from Haiti should have a lot, as we sampled the fish we noticed their guts were full of horrible smelling black 'crap' – most likely literal 'crap.' When you eat junk food you need a lot of it to get any nutrients. After I was done sampling I threw my waders into a garbage bag and we headed up to a mountain stream that was the complete opposite of that ditch site.

The Mountain stream 'Riviere Glace' was perhaps the most beautiful of the trip. It was also a relief. The water was refreshingly cool, and as the weather had been hot and humid and we were sweaty and gross it was a wonderful relief to be submerged in the cool clean water. We were not the only people who noticed how lovely the water was, there were people working on the minerals and rocks from the surrounding mountains and these men with white powder covering their faces came down like ghosts into the water, it was startling at first but also fascinating to see them transform from these pale powdered sickly forms to their natural youthful state as they washed clean in the river. As Diego cast-netted I used a trusty dipnet along the rocky banks to catch a few small fish. I was not sure what they were but they looked a little different than the poecilids we had collected at lower elevations. These had a blueish tint, but they were not very big. Diego and I tried to pull a seine across the river but the bottom was so rocky that we had trouble, at the other side of the bank I told him just to hold it up against the banks with me and I asked a man who was sitting nearby to slowly walk towards us in a shallow pool. When he approached he scared the fish that were in the pool into our net, we didn't notice them until we pulled up the net and we saw there were easily 300 robust sized poecilids in it. We didn't see that coming – and that's the magic of seining – you never know what you're gonna get. We took a portion of them, releasing the



Lake Azuéli

majority as they all appeared to be the same species – albeit a potentially new one. We collected many large ones and at that size you could really see the light blue coloration, these certainly appeared to be something we had not seen and not a species we knew about from the literature. It is perhaps new to science but stay tuned. The environment can cause morphological variation in populations that can trick you into thinking you have something new but it is just variation.

In Les Cayes we stayed where Martin lived in a wonderful historic home where he rented a room. The house was a maze of artwork, including a lovely portrait of a woman with a turkey on her head at the front entrance, later on the street I would see a woman with a live turkey on her head in exactly the same fashion. The house was quite a relief as the hotel rooms we had been staying in had limited water access and often no electricity, it often felt like we were staying in hot dark concrete boxes. The old home also gave us access to some privacy where we could sample our fishes at night which is a nice privilege when you can actually take your time and have a good look at what you collected. When you need to prep the samples in the field it can be a bit rushed and you don't get the images or a chance to look over the fresh specimens before their live colors begin to fade. Diego and I sometimes stayed up past midnight so that I could help him take better quality images of some of the fish using his photobox. I also noticed that he was being quite fastidious with the preparation of the specimens. Most of the fishes we were collecting were finger sized or smaller, so we stopped our old sampling method of tagging the fish with a tagging gun (the same one used to tag your

clothes with price tags), instead we were using fishing line to more gently make a loop around the mouth and gills with a tissue tag number. This took more time but made for better specimens. In my 15th year of collecting fishes I was still learning things thanks to Diego and I was proud of his efforts and diligence. I had seen it before when we met five years ago in Guatemala where he is from, but now I saw how his skill set transferred over to his PhD work and it was nice to be able to see it all come together for him.

We would end our ten-day trip staying at the Université Providence d'Haiti, a small new private college on the shores of Lake Azuéli in Ganthier. We were greeted with the loud chirping of African weaver birds and I was worried that the lake would be full of introduced fish too. This lake was notable to me because the eastern shore is in the Dominican Republic side, so you could cross the lake to get to that country. But this lake was 65 square miles, so much bigger than Lake Miragoâne, but the latter is strictly freshwater and this lake is considered brackish. We would get freshwater fish here but also things you would expect in the oceans like large needlefish. Fifteen years earlier I had been on the other side of the mountains in the Dominican side looking at the sister lake adjacent to this one called Lago Enriquillo. Side by side they sit with some of the most unique fauna in the Caribbean. Here there are crocodiles and flamingos, and it feels different than the rest of the areas we visited. The water is calm and flat and there is something about the white flat sands around it that always makes it seem a little hazy, a little more otherworldly. On the Dominican side I remember getting strange pupfish, and we were hoping to get some on this Haitian lake too - we did. These pupfish are resilient little things. They are members of the family Cyprinodontidae that pop up in some odd places including Death Valley, where some pupfish species are known from single localities that are smaller than your average college classroom (Devil's Hole pupfish being the most famous), they are also known from some hypersaline locations. In Louisiana, the Sheepshead minnow, *Cyprinodon variegatus*, is the most common pupfish we would encounter. They are called pupfish because of their tendency to wiggle like happy puppies. We would seine in the lake and surrounding region several times bringing with us local students to show them what we were doing. I also gave a lecture about our trip, and although my French is passable it was suggested



With students from Université Providence d'Haiti.

that I have a student translate my talk in Creole. I had not realized until then how different the languages were, Creole is what most people spoke although much of the business and political matters were done in French. Unfortunately, that creates a bit of a class system and confusion too. I would learn a lot about Haiti from the students and profs at the school. Our understanding of this country is based on the trauma of poverty, earthquakes and hurricanes but we forget that this country had a successful slave revolt 200 years ago that freed this country from the French, and even though Haiti paid the equivalent of billions to the French at the time, the French still claim this small island nation owes them debt. That financial debt significantly handcuffs Haiti's own independent economic success, as does the lack of support from other French speaking countries. But back to the fish.

We would sample in and around the lake and we got massive cichlids here as well with the aid of some fisherman who were collecting in the interior portions of the lake. I had studied *Nandopsis haitiensis* and the other cichlids from Hispaniola and Cuba for my PhD dissertation, I even raised one of these from a thumb nailed size thing to a hand sized adult. We had been collecting smaller sized cichlids throughout our trip so getting big ones, about as big as they get even in aquariums, was amazing. Some males even had big fleshy humps on their heads when they were in a breeding phase. Upon seeing them Diego said 'these are some proper specimens' and they were. I was glad to see that the lake was still able to produce such healthy individuals and I told the students it was their duty to protect these waters and the fishes which they seemed keen to do. I also

told them about the tilapia that we also found in large sizes in the lake and told them to eat those rather than the native *Nandopsis*. Diego and I are working with an undergrad now to put together a pamphlet and poster to send to the students we met there and to give to locals like Wilnise to train others. I still get messages from Wilnise showing me some fishes that she is continuing to collect - nothing could make me prouder. We plan to collaborate on a paper about our collections.

There are so many things about Haiti that surprised and delighted me. I love the packs of kids that were roaming around and following us everywhere, even deep into the wilderness. They were growing up educated by nature as much as by books. At the same time the local knowledge of introduced versus native fishes was lower than I expected and it seemed as though tilapia was the most common fish on the plate and in the freshwaters. Marine species were given much more attention. I had expected to be documenting a freshwater disaster, with little habitat remaining for freshwater animals – instead Diego and I found a forgotten paradise that just lacks scientific infrastructure but certainly not human capacity. I can't wait to help build that infrastructure as we send back the data and information about our collections to our new friends and colleagues.



Mammalogy Expedition to Malaysian Borneo

by Heru Handika and Jonathan Nations

Borneo is the world's third largest island, and a global hotspot of biodiversity. Despite past research into the ecology and conservation of Bornean flora and fauna, the small mammal diversity of the island, especially shrew diversity, remains undersampled, and hence, understudied. Following the **Esselstyn** lab's first trip to Borneo in 2017, we renewed our permit to work in the Malaysian state of Sarawak. Our target was Mt. Murud, nestled in the rolling hills of the Kelabit Highlands in northeast Sarawak along the Indonesian border. At 2,400 meters above sea level, Mt. Murud is the tallest peak in the state of Sarawak. Small mammal diversity is known to increase with elevation in other parts of Southeast Asia, and we hoped that Mt. Murud would harbor high diversity.

The authors, **Heru Handika** and **Jonathan Nations**, represented the Esselstyn lab on this expedition. For Jon, this is a trip to a foreign country and culture, but for Heru, this is almost a trip home to Indonesia. Joining us on the trip were Quentin Martinez, PhD student at the University of Montpellier in France, and Amsyari Morni, Syam Zolkapleyi, and Finaz Azman, three graduate students at University

of Malaysia Sarawak (aka UNIMAS). Our all-graduate student team was quite an international assemblage, with representatives from four countries on three continents. We flew from Kuching to the town of Lawas in north Sarawak. From there, we took 4WD trucks to the village of Ba'kelalan at the base of the mountain. Unlike many past expeditions, things in Malaysia move rather quickly, and we were in the field in our first camp at 1,700 m elevation within 5 days of setting foot in the country. In our first 12 days of work on muddy trails and patchy roadside forest, we collected about a hundred small mammal specimens. Among them were the Bornean endemic chestnut-bellied spiny rat, *Maxomys ochraceiventer*, and the large-bodied giant Sunda rats, *Sundamys infraleutus* and *S. muelleri*. Another notable collection from the first camp was >10 individual shrews of at least two species. We were very excited, as shrews have proved difficult to find in Borneo; but in less than two weeks, we caught three times as many of shrews as we caught in our first trip in Borneo.

Title Photo: Sunset over the Kelabit highlands in Sarawak, Malaysia, Borneo. Photo by Heru Handika.



Left: A gymnure, *Hylomys suillus*, eating an earthworm. Photo by Heru Handika.

Right: A shrew, *Crociodura*, cf. *baluensis*, eating a grasshopper on Mount Murud. Photo by Heru Handika.

Our next camp was called Church Camp. At 2100 meters elevation, it is a three-hour hike from the first camp. Church Camp is a place where, once every two years, ~3000 local Christians gather for a week of celebration. The rest of the time, including during our trip, the camp is empty. We knew there was a lot of infrastructure up there, but we were surprised to see the “village” itself; 100 wooden houses connected through a series of covered boardwalks, all completely empty. Our guide put us in a newly renovated house, resulting in a comfortable and mostly dry fieldwork experience in the middle of this montane tropical ghost town.

With six people trapping, we covered areas below Church Camp all the way to the 2400 meter summit. Our trapping success increased relative to the first camp, with over 20 specimens each day. We finally began to catch some white-bellied tree rats in the genus *Niviventer*, a common Southeast Asian genus that eluded us in our first camp. We also caught lots of the curious gymnures *Hylomys suillus*. With a rotund body, short, fast legs, and a long nose, these odd-looking creatures quickly became a camp favorite. We also added another 25 shrew specimens to our collection, including two additional species, for a total of at least four. These new samples will help us better understand shrew diversity on the island, and Southeast Asia in general. With all the trapping effort combined, we sampled continuously from 1,400 m all the way to the summit at 2,400 m. In total, we collected over 350 specimens of >23 species of small mammals, including rats, shrews, tree shrews, bats, and squirrels.

Our international gang of mammalogists also had an excellent time together. All six of us brought something to the trip, and we all felt lucky to learn from each other and help each other out. Our field-tested friend and collaborator from UNIMAS, Amsyari Morni, kept repeating, “This is the best trip I have ever done.” We were able to collect many poorly sampled species, along with a large variety of sample types, including stomachs and gastrointestinal tracts for microbiome and dietary sampling, and lung tissue for research into symbiotic fungal pathogens. We added a large series of samples to the global museum holdings of Bornean shrews. Coming back down the mountain, we were exhausted but looking forward to the delicious Malaysian cuisine we could share prior to heading home.



A birds-eye view of Church Camp, 2100 meters up Mount Murud. Photo by Heru Handika.



Wilderness First Responder Course at LSU UREC

by Anna Hiller

LSUMNS is well known for undertaking rugged, physically challenging expeditions to some of the most remote regions of the world. But what kind of safety measures do these trips entail?

In the past few years, the LSUMNS community has reflected much on how lucky we have been to have had few, relatively minor, health and safety issues on our expeditions. We have also thought a lot about how to improve future expeditions, to make them not only safer but also more comfortable. First, we now carry two remote communication devices, a text capable Garmin inReach as well as an Iridium Satellite phone. This arrangement lets us text periodic updates to Curators and staff at the LSUMNS, as well as call our families during extended journeys out of cell service range. But most importantly the Garmin inReach has SOS capabilities, and the satellite phone allows us to call local emergency services, just in case things ever take a turn for the worse.

Secondly, this past June twelve LSUMNS graduate students (**Matt Brady, Eamon Corbett, Glaucia Del-Rio, Diego Elias, Heru Handika, Oscar Johnson, Andre Moncrieff, Jon Nations, Marco Rego, Jessie Salter, Subir Shakya**, and myself, **Anna Hiller**), with **Fred Sheldon** representing the curators, took a Wilderness First Responder (WFR) course with SOLO Schools International. We had the amazing Charles Kirkland as our instructor, a certified paramedic and veteran of the National Park Service

and NOAA's US Antarctic Program.

Over the course of 8 intense days at the LSU UREC, we learned lifesaving skills for a wide variety of wilderness scenarios, ranging from when to apply a tourniquet to how to splint a broken arm. The most physically taxing lessons were the practice scenarios we went through every day to prepare us for how to respond in a real crisis. For example, in the most challenging obstacle course I've ever done, we learned how to transport someone with a spinal injury on a backboard over long distances (in the heat and humidity of Baton Rouge in June no less!). Our final day consisted of two mass casualty events, a lightning strike and a car accident, that let us practice our new skills in a real-world scenario. Armed with movie makeup and fake blood, Charles had volunteers simulate head injuries, femur fractures, amputated limbs, and even vomit. We hope to never have to use this information, but it's very reassuring to know that we have the skills, information, and practice to make a difference in life-threatening situations.

Charles was also able to answer myriad field medical questions, such as how far down a mountain you have to descend to start recovering from altitude sickness (only ~250m) and what pain medications are ok to take together (Ibuprofen and Tylenol are ok, but aspirin and Ibuprofen should not be mixed). We know how to clear a helicopter landing pad for medical evacuations, plus how (and when!) to administer an

Epi pen. We now go into the field with a fully stocked med kit based on the lists of essentials Charles gave us, and I can vouch first hand that we ended up using it almost every day on the recent Brazil trip. From wound cleaning, to DayQuil for colds, to anti-fungal cream, and Gatorade to replenish electrolytes, the first aid kit and WFR certification greatly improved the expedition experience.

Thanks Charles!



Top Left: Andre and Subir practicing their tourniquet skills on Diego.
Bottom Left: Jon and Andre practicing a leg splint using a thermarest.
Top and Bottom Right: Fake wound on Anna.

Title Photo: Glaucia showing off a proper splint.



Above: Backboarding and evacuating Marco - halfway around the LSU lakes!

Below: The whole LSUMNS crew with Charles after completing our WFR certifications. From L to R - Subir Shakya, Jon Nations, Oscar Johnson, Diego Elias, Anna Hiller, Heru Handika, Andre Moncrieff, Charles Kirkland, Fred Sheldon, Marco Rego, Matthew Brady, Glucia Del-Rio, Eamon Corbett, and Jessie Salter.





LOS Field Trip Series & Davis Mountain Hummingbird Celebration

by Donna L. Dittmann

LOS Field Trip Series: Cajun Prairie Fall Shorebird and Wading Bird ID, 27 July 2019

As one of the Louisiana Ornithological Society's Field Trip Series trips, **Donna L. Dittmann** and **Steven W. Cardiff** led this trip that had originally been scheduled for 13 July (postponed due to TS Barry). The slightly later date perhaps resulted in increased numbers of returning southbound shorebirds. The trip's focus was finding early fall shorebirds and working on shorebird identification – but of course we did not ignore other waterbirds or land birds encountered. We started in Jennings and ended up spending the entire day in Jefferson Davis Parish, mainly in the vicinity of Thornwell but also along the I-10 corridor at Lacassine, the Welsh landfill area, and Roanoke. Cumulative totals for the day were about 90 species and over 13,000 individuals. Fourteen species of shorebirds was fewer than we had during last year's LOS Field Trip Series trip on 21 July, but numbers were fairly impressive for certain species. Most numerous were Stilt Sandpipers (almost 1500), Least Sandpiper (over 900), Lesser Yellowlegs (over 700), and Long-billed Dowitcher and Semipalmated Sandpiper (almost 300 each) - all individuals were adults. We hit several impressive concentrations of large waders totaling over 1200 Wood Storks and over 600 Roseate Spoonbills. Also of interest were 4 Swainson's Hawks and 3 Crested Caracaras. We were a little surprised that some species were still in full breeding mode, including Fulvous Whistling-Ducks, Black-necked Stilts, Great Egrets, Little Blue Herons, Tricolored Herons, Black-crowned Night-Herons, Cattle Egrets, Glossy, White-faced and White ibis, and Cave Swallows still on nests, with young in nests, or with recently fledged chicks. And, of course, singing Dickcissels are always a showstopper.

eBird lists:

<https://ebird.org/view/checklist/S58544081>
<https://ebird.org/view/checklist/S58556124>
<https://ebird.org/view/checklist/S58556138>
<https://ebird.org/view/checklist/S58544086>
<https://ebird.org/view/checklist/S58544433>
<https://ebird.org/view/checklist/S58544437>
<https://ebird.org/view/checklist/S58544445>



Top: Impressive wading bird concentration near Jennings.

Bottom: Group photo while taking a break from shorebirds to study birds at a swallow colony in Thornwell.

Title Photo: A singing Dickcissel teed-up for the group to enjoy.

Photos by Donna L. Dittmann and Steven W. Cardiff

Davis Mountains Hummingbird Celebration Fort Davis, Texas

As one of last year's LOS Field Trip Series trips, **Donna L. Dittmann** and **Steven W. Cardiff** led a LOS trip to the Davis Mountains Hummingbird Celebration (DMHC) as a pre-festival trip, as well as assisted the DMHC as volunteer trip leaders and program speakers. This year Donna and Steve returned to assist the festival by leading birding trips to the Miller Ranch and Lake Balmorhea (eBird trip lists: <https://ebird.org/view/checklist/S59334154>, <https://ebird.org/view/checklist/S59334182>, and a preliminary scouting trip to Lake Balmorhea: <https://ebird.org/view/checklist/S59159274>). Steve tended an eBird Help Desk to answer participants' questions about their eBird accounts, as well as provided general information about the area's birds. For anyone who has not had the opportunity to visit West Texas, this small and casual event is a must. It is a great way to see and learn about West Texas specialty bird species, visit Trans-Pecos habitats, and meet new friends. Next year's festival is 19-23 August (brought to you by Trans-Pecos Bird Conservation, Inc. and West Texas Avian Research, Inc.; LSUMNS is a festival co-sponsor). Visit online: www.davismountainshummingbirdcelebration.com. This westward trip also supported LSUMNS bird and mammal collections, e.g., photo of skull of feral hog, *Sus scrofa*, collected by Steve Cardiff, and retrieval of various specimens salvaged by LSUMNS's W. TX subcommittee network.



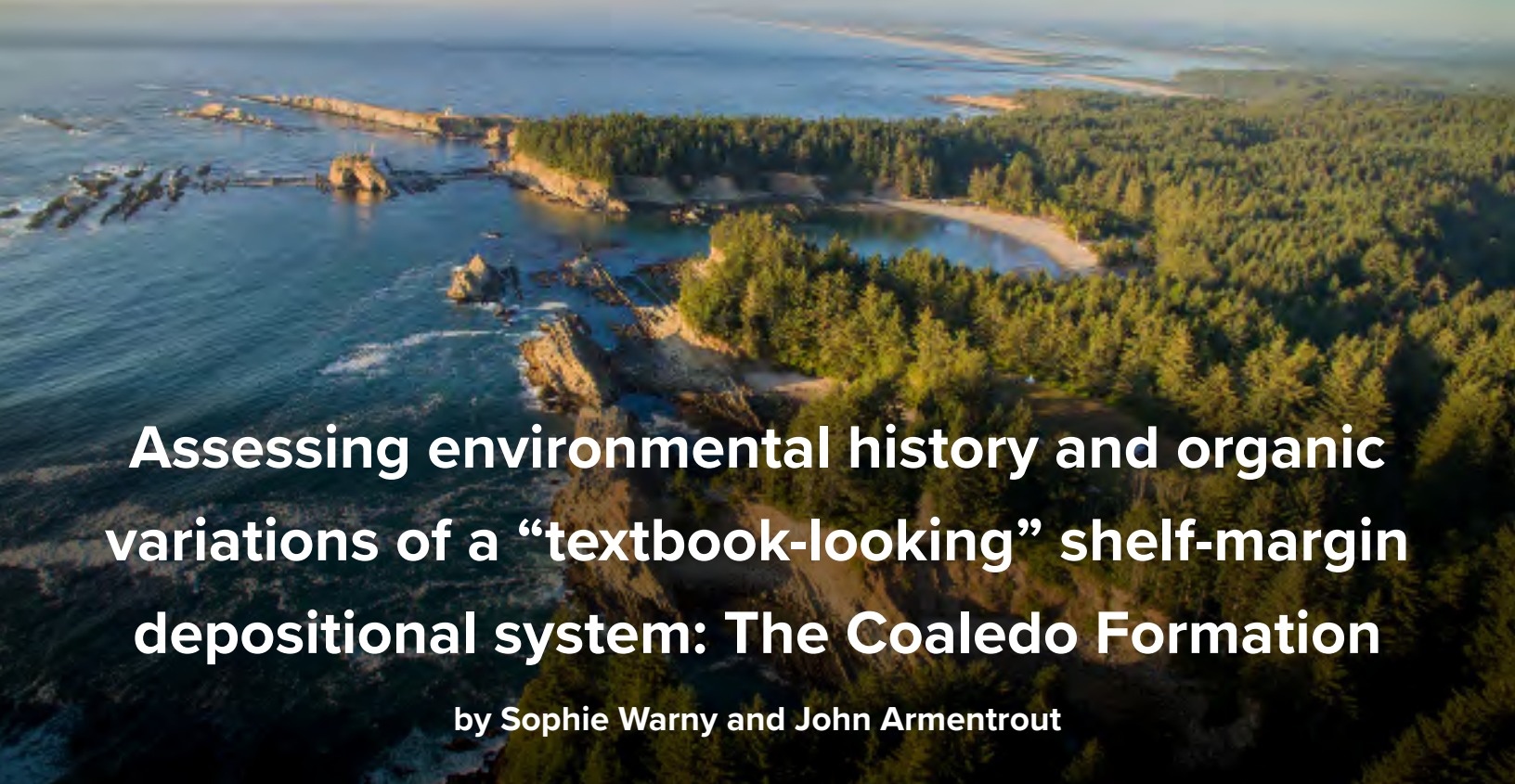
Top Right: Sunrise at the Miller Ranch where participants are looking at a Jeff Davis County specialty bird, the Gambel's Quail.

Middle Right: Gambel's Quail. This species ranges along the Rio Grande River and barely enters the county at this site.

Bottom Right: Feral Hog (*Sus scrofa*) skull collected by Steve Cardiff.

Above: Help desk sign

Photos by Donna L. Dittmann



Assessing environmental history and organic variations of a “textbook-looking” shelf-margin depositional system: The Coaledo Formation

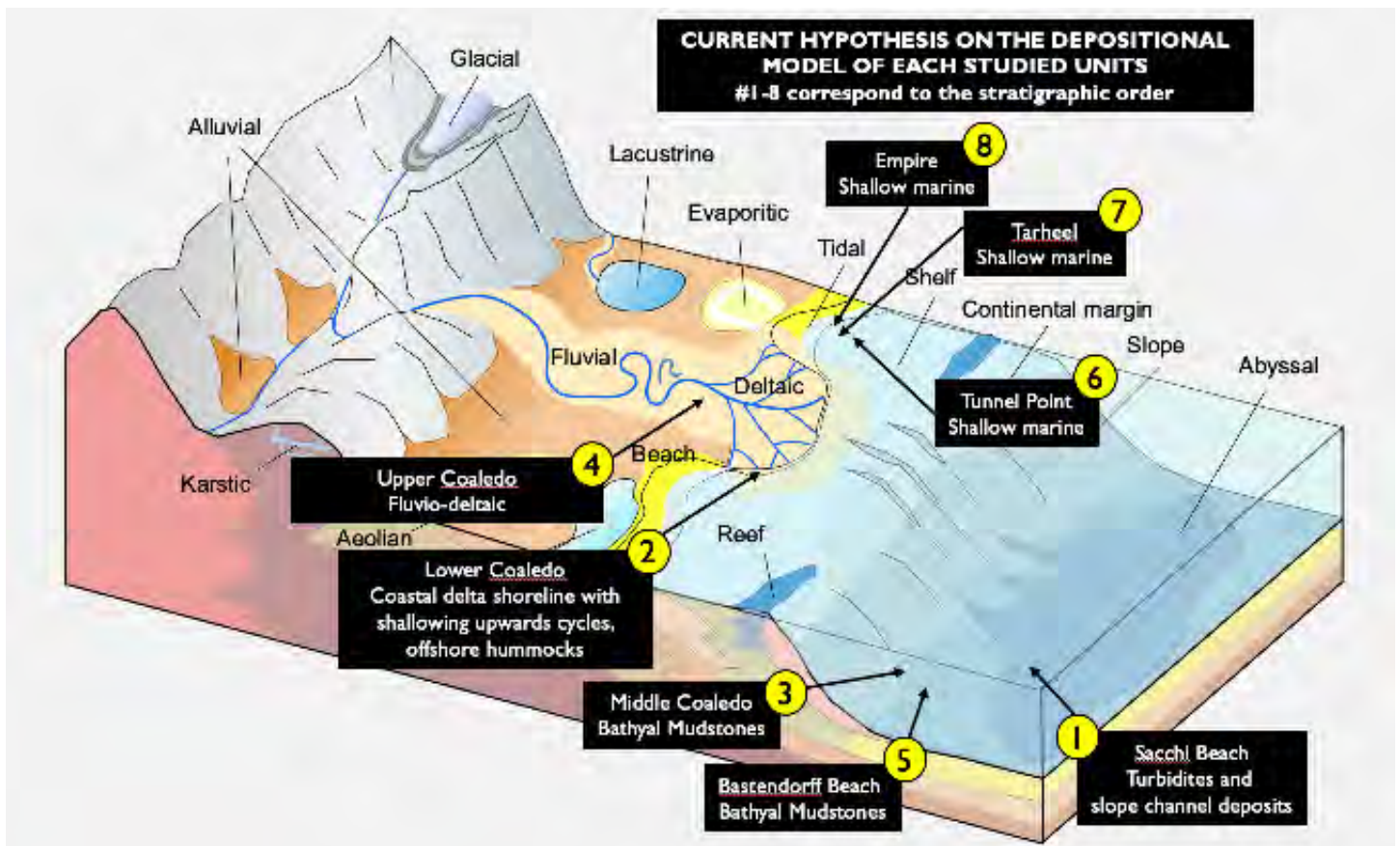
by Sophie Warny and John Armentrout

Understanding how ancient shelf-margin sedimentary systems were deposited in response to climatic and tectonic forcings is key to predict how modern-day delta depositional environments will respond to modern-day changing climates. These shelf-margin depositional systems are also petroleum reservoirs and thus this topic is of interest to both academic and industry researchers. The principle analogues documented in publications include shelf-margin systems in the Ainsa Basin of Spain, West Siberia Basin of Russia, Spitsbergen Archipelago of Norway, and Magallanes Basin of Chile. The Coaledo Formation and Beds of Sacchi Beach, outcropping on the southern Oregon coast, provide an outstanding North American field analogue, yet, there have been few studies since the excellent work of Robert Dott Jr. and his students in the 1980's. This 2303m succession includes shoreface to slope gravity-flow sandstones encased in deep marine mudstones. The delta front channel facies include down-slope slump blocks overlain by a distributary channel complex with lateral shoreface parasequences of probable 200kyr cyclicity. These accessible cliff-face outcrops of continuously exposed strata provide an outstanding field example of sedimentologic organization and deformational overprint of shelf-margin deltaic facies. This continental margin succession affords an opportunity to analyze issues of tectono-eustasy and paleoclimate by linking the megafloral record of

central Oregon to the Pacific Margin marine record for comparison with global oceanic paleontologic and isotopic history.

The first week of August 2019, our group from the **LSU Museum of Natural Science** and the Department of Geology and Geophysics (**Sophie Warny** and new graduate student **Allison Barbato**) joined three other members of the multidisciplinary “Coaledo Team” lead by John Armentrout (a sequence stratigrapher and sedimentologist, linked to the University of Oregon) to gain familiarity with the structural geology and depositional facies, and to collect samples for Allison’s Master’s project. In addition to John Armentrout, the “August” expedition included Kristin McDougall, a senior foraminifer specialist at the United States Geological Survey (USGS) and Laird Thompson, a structural Geologist (retired from Mobil). We focused our efforts around Cape Arago, Sunset Bay and Coos Bay where the sediments of the Eocene Coaledo Formation are beautifully exposed along the southwestern coast of Oregon. The sediments provide a spectacular marine record of forearc sedimentation, ranging from

Title Photo: This drone photo shows the area of Sunset Bay State Park where the Eocene Coaledo Formation crops out along scenic headlands and bays of the Cape Arago area near Coos Bay, Oregon (photo by Rocky Johnson).



This figure illustrates the depositional facies of the Middle Eocene to Pliocene formations of the Coos Bay Basin we are testing. The deposition initiated with the (1) slope siltstones and associated channel and turbidite sandstone of the Beds of Sacchi Beach overlain by (2) progradational 'coaly' sandstones of the Middle Eocene Lower Coaledo. Transgression followed (possibly delta lobe avulsion) and deposition of (3) bathyal silty-mudstones of the Middle Coaledo overlain by the (4) prograding Upper Coaledo deltaic sandstone and conglomerate. Conformably overlying the Upper Coaledo are (5) Late Eocene-Oligocene Bastendorff shales of bathyal biofacies, again suggesting transgression (? avulsion). Gradationally overlying the Bastendorff are Oligocene neretic sandstones of (6) the Tunnel Point Formation. During the latest Oligocene-earliest Miocene the basin was folded before deposition of the unconformably overlying (7) neretic Tarheel Formation. Folding again occurred in the middle Miocene followed by the subsequent deposition over the unconformity of (8) the Late Miocene neretic Empire Formation sandstone. Pliocene deformation again folded the basin resulting in truncation of all of the strata that are most recently overlain by Pleistocene marine terrace deposits.

turbidite to shoreface sandstone encased in deep-water siltstone and mudstone.

Results from this Master's thesis should allow us to evaluate the depositional history of the Middle Eocene Coaledo Formation in much greater details. With the addition of modern geochemical analyses, we will be able to test the hypothesis that the Coaledo Formation is a shelf-margin delta deposited during a global sea-level lowstand. Indeed, shelf-margin deltas typically deposit at relative lowstands of sea level when distributary systems incise to the shelf edge, and are often associated with significant bypass of coarse-sediment into the basin deep. The lowstand shelf-margin deltas prograde over deep-marine mudstones, and are then subsequently transgressed by deep marine mudstones as sea

level rises. But shelf-margin delta may also form during highstand if there is sufficient sediment flux to prograde to the shelf edge. Many shelf-margin deltas are deposited during late lowstand when initial rise in sea level results in vertical aggradation of coarsening-upward parasequences. This results in high-preservation of laterally variable facies partitioned by marine flooding surfaces. This contrasts with highstand deltas that are deposited during a slow rise to eustatic stillstand followed by an initial fall in relative sea level. That progression of eustatic changes usually results in a change in stratigraphic architecture from aggradational to progradational of parasequences. The working hypothesis so far is that the Coaledo Formation consists of two cycles of deltaic progradation, each encased in previously interpreted bathyal mudstones. The dramatic



This figure shows a view of our current interpretation of the distribution of formations we sampled and the principle geographic names of the localities visited.

paleo-water depth changes associated with the two intervals of shallow marine Coaledo deltaic sandstone, each encased in very deep-water mudstone, has been interpreted from benthonic foraminiferal biofacies analyses. Based on the paleowater depths, it has been proposed that the Coaledo Formation is an outer-shelf to slope delta, and it is that hypothesis that is being tested by the research effort encompassing this palynological study. The large-scale proposed paleowater depth changes have been attributed to either tectonic deformation or to distributary avulsion. These hypotheses, previously proposed by the Robert Dott's team, will include a new age model based on zircons, updated biofacies interpretation from several fossil groups, and integration of paleowater depths from both sedimentologic and biofacies analysis. The provincial biozone ages will be updated using magnetic anomaly patterns, and radiometric dating of interbedded volcanic tuffs (by some of our other team members).

The sampling was a success!

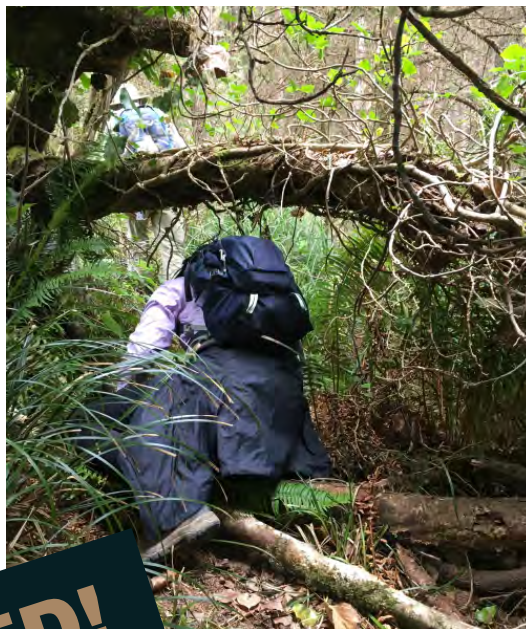
Allison collected 88 samples spanning many of the mud layers found along the ~2300m of outcrop. Her sampling strategy was to focus

on mudstones and other similar fine-grained layers that were sometimes difficult to access. The rare mudstones have a superior chance over sandstones to provide for optimal palynological yields. Now that she is back at the CENEX lab at LSU, Allison will split the samples three ways to conduct three different types of analyses.

First, she will conduct a classic palynological analysis. Samples will be processed to extract all organic-walled microfossils from the sediments. These should include dinoflagellate cysts (marine palynomorphs), and pollen and spores (terrestrially-derived palynomorphs). Dinoflagellate cyst analysis will provide biostratigraphic control and paleo-environmental data on the marine facies correlative to local known events and for regional paleo-oceanographic comparison with global events. Analysis of pollen and spores will provide details on past vegetation, type of environments and climate. These organic microfossils will allow us to assess changes of vegetation between subdelta environments and within cycles of both bathyal-to-outer neritic and inner neritic-to-shoreface sedimentation.

Comparison of marine vs. terrestrially-derived microfossils will be interpreted in a sequence stratigraphic framework to evaluate eustatic cycles. Sampling of muddy lithofacies in multiple cycles, both laterally and vertically, will allow documentation of changes in palynological assemblages both within the shallowing cycles and between the distributary front and delta margin facies. It is anticipated that variations will include marine, coastal plain and upland floral components. By integrating the palynomorph assemblage patterns with those data from foraminiferal, molluscan and elasmobranch biofacies, we should have multiple parameters for identifying discrete depositional settings.

Second, Allison will conduct the organic petrographic evaluation of the maturity of the organo-facies via a Thermal Alteration Index (TAI) study which consists of quantifying the degree of heat and pressure applied to the rock post deposition and, by measuring the vitrinite reflectance (Ro) in the samples, which consist of measuring the percentage of incident light reflected from a polished surface of vitrinite in an



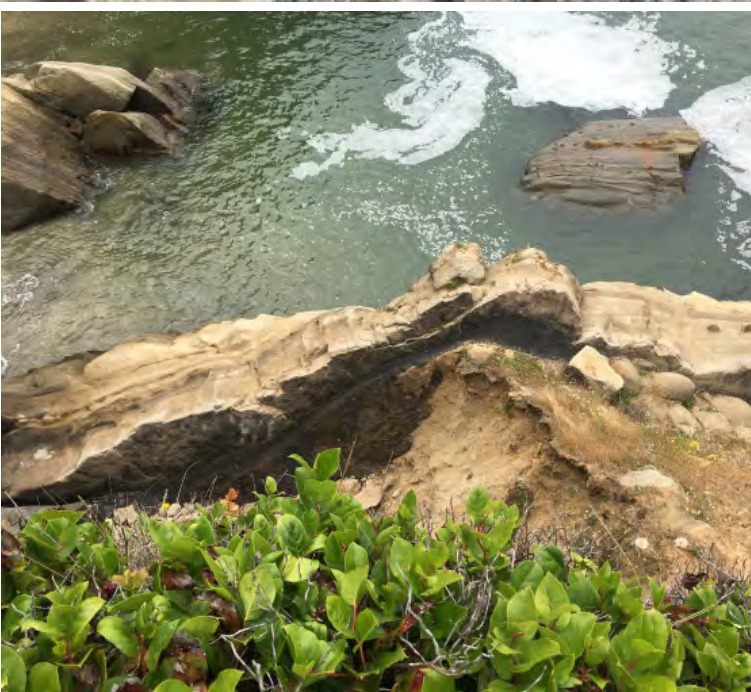
Unlike our fellow curators, we often have no ideas what we are sampling and adding to the collections while we are in the field. We estimate the ages sampled and environment types, so we have best guesses, but no confirmation of the fossil yields until we are back in the lab and we extract the microfossils. Only then, do we know if our field campaign was successful.

Top and middle photos: From experience, we know that we have to look for the finest-grain sediments. Sands usually have a terrible yield in palynomorphs. The outcrop below (bottom photo) contains abundant sand layers. Although breathtaking, these rocks are likely barren in pollen, spores or dinocysts. Instead, as seen to the left, we looked for the most eroded layers to collect the palynological samples.

Bottom: The outcrop below is composed of depositional cycles of lateral to lowermost Lower Coaledo facies of stacked channel-complexes. The channel-complexes are sand-filled river distributaries abandoned and filled as the river-distributaries switched (avulsed) across the coastal plain. These are not ideal for palynological sampling.

MUD WANTED!





organic-rich sample. This will be done with the help of Thomas Demchuk at RPS.

Third, Allison will perform geochemical analyses to evaluate the total organic content (TOC) of the sediment to assess the amount of organic carbon present in the rock, to characterize the potentially varying organic facies within the deltaic system and confining deeper-water marine mudstones.

To understand how we can have ‘stack’ cycle upon cycle like seen in the top photo on page 28, one needs to consider two working hypotheses ‘forcing’ this cyclicity. One hypothesis uses the Mississippi River as a model, with the lateral switching of river-fed depositional lobes. Each lobe consists of a shoaling-upward facies cycle and as the delta compacts and subsides, new space becomes available for another shoaling upward cycle to be deposited. A second hypothesis is the cycles are climate or tectonically ‘forced’, with constant subsidence of the basin margin filled by pulses of increased sediment supply due to more rapid uplift and erosion of the adjacent mountains. This uplift and erosion provides an increase supply of sediment resulting in rapid progradation of the shoreline. One goal of the Coaledo Project is to integrate multiple data sets to identify the most probable geologic process resulting in the depositional cycles.

We wish Allison tons of success with her project and we are delighted that this project gives us the opportunity to collaborate with the diverse community of paleontologists and geologists of the Coaledo Project Team.

More pictures from this trip can be seen on the following pages.

Top: To get to the Qochyax Island tombolo takes a bit of effort. After a quarter mile of brushy trails, there is a 60 foot ‘bank’ (cliff) to descend. We all survived both entry and exit to the study area.

Bottom: Within the Upper Coaledo section is a 1.5 meter thick coal bed (black layer below sandstone), correlated with the Beaver Hill Coal Seam. Could it be correlated with the Middle Miocene Climatic Optimum? This is an exciting question to investigate for Allison.



It is quite ironic that, while we cannot see the microfossils we are collecting (but we hope are present in the mud), creatures long gone leave a very visible trace in the form of fossilized burrows.

Top: Modern clam (pholad) bored boulders as comparison. [Yoakum Point Cove, Yoakum Point State Park]

Bottom Left: Part of the reward to getting to the tombolo outcrop is discovery of Teredo-clam bored fossil-wood, a clear indicator of marine condition but of no help in estimating paleowater depths as water logged wood sinks. [Qochyax Island Tombolo, Sunset Bay State Park]

Bottom Right: This sandstone is highly burrowed, perhaps supporting a shallow water-type environment in clearly well oxygenated conditions. [Qochyax Island Tombolo, Sunset Bay State Park]



Field work in the Coaledo formation provided data on a suite of sedimentary structures, a wonderful way for the rocks to tell us their stories.

Top Left: Occasional small channel-forms filled with mudstone ripups and coalified wood clasts.

Top Right: The sandstone is typically hummocky or trough-cross bedded as in this photo, illustrating the high wave energy of shallow environments.



Middle Left: This photo shows multiple hummocky cross-stratified fine to medium-grained sandstone, with the thickest very-light colored unit Allison stand upon being an amalgamated set of hummocks.

Middle Right: Hummocky beds with scour as the sand is 'lifted' by waves and then settles as more hummocky strata.



Bottom Left: Toward the top of Middle Coaledo the occurrence of tabular foresets and hummocky cross-bedded sandstones suggest shallowing. This facies transition grades upward into the very sandy and conglomeratic Upper Coaledo at Yoakum Point.

Bottom Right: Ripple laminated surfaces most probably related to near-shore storm deposits.



Top: This photo shows three coarsening-upward mud (gray)-to-sand (reddish-tan) cycles along the north shore of Bathers Cove.
Bottom: The Bathers Cove cycles are sketched-in on this photomosaic.



Although macrofossils are not part of our study, it is always exciting to see the diversity in outcrop and learn from the clues they give us.

Top: Crepidula cluster at Fossil Point.

Middle Left: Some of the muddy sandstones contain abundant fossils, here of the gastropod *Turritella*, the modern relatives of which range in water depths from 20 to 200 meters.

Center: Gastropod in the Empire Formation (a younger Miocene-age formation).

Middle Right: *Patinopecten coosensis* in Empire Formation.

Bottom Left: Warny and Barbato are grateful for the guidance in the field by Armentrout and Thompson (center). We got too excited by all the mud found in the cove behind that outcrop and forgot about the tide! (Photo: Kristin McDougall)



Anthropology Division Goes North

by Rebecca Saunders

The Anthropology Division of the Museum of Natural Science has accepted a donation of some 60 Alaskan objects from Trenton and Kay James, of Sunshine, Louisiana. Some of you may recognize the name; Dr. James started a private practice in Baton Rouge in 1971, which became The Baton Rouge Family Medical Center.

While Alaskan ethnography might seem a bit of a stretch for us—our strengths are Native American basketry and Amazonian featherwork—in fact, some of the earliest items accessioned into our collection are from Alaska. These consist of over 100 ‘modern’ craft objects collected by James A. Ford while working on archaeological sites in Alaska between 1930 (when he was 19!) and 1931. Ford became affiliated with the LSU Department of Geology in 1934 and directed Works Project Administration archaeology through LSU beginning in 1938. He became an internationally renowned archaeologist for his groundbreaking research in the Lower Mississippi River Valley and for his theoretical and methodological innovations in

a field that was just beginning to get professionally organized.

The James’ also developed their interest in Alaskan crafts while doing fieldwork. Trent gained his General Practice Residency in the Charity Hospital System working in New Orleans and Lafayette. After completing the residency in 1968, Trent (and, by extension, Kay his wife of one year) enlisted in the United States Public Health Service, Bureau of Indian Affairs, Indian Health Service. He served for two years as a general medical officer with the rank of Full Surgeon (Lt. Commander in naval rank) at the Mount Edgecombe Alaska Native Health Hospital and as School Physician for the adjacent high school, which had 675 Eskimo and Indian students. In addition, Trent was assigned to care for people in remote fishing villages that could only be reached by single-

Title Photo: Tlingit Eagle plaque with story-tellers, 48” x 36”. Photo by Rebecca Saunders.



Left: Tlingit Medicine Man Totem, 26" tall. Photo by Rebecca Saunders.

Top Right: Eskimo caribou-skin family masks: these two leather masks from Anaktuvuk Pass, a village of Eskimos located in northern Alaska, were given to me by the mother of an Edgcombe student who I fitted with glasses, which corrected his severe refractive error and allowed him to see more clearly. I was in Barrow on TDY when amidst a snow blizzard, she and two male companions using snowmobiles came to thank the doctor from Edgcombe who helped her boy to see. It was a quite moving experience in my early career as a physician. These particular masks were made from the faces of the grandparents of the student in question and are reproduced until the grandson has children of his own then the mask molds are destroyed and the spirit of the grandparents are transferred to the child. Ca. 12". Photo by Trenton James.

Bottom Center: Eskimo Madona with Child, 8" tall. Photo by T. James.

Bottom Right: Inuit stone carving: Man to Bird legend, 9" tall. Photo by T. James.

engine float planes. These were occupied by the Tlingit, Klawock-Tlingit, Hydaburg-Haida, and Craig (mixed native and white). Along with general medical care, Trent was trained to perform refractions and fitting of eyeglasses in Edgcombe or on the village visits.

Exposed to active crafting communities, Trent and Kay developed a passion for native art. Many objects in their collection were purchased from patients or from students at the Edgcombe school. They also acquired items in shops in Sitka and Anchorage and in various Museum shops; one item was even acquired at an antique show held at the Bellemont Hotel, Airline Hwy, Baton Rouge, LA sometime in the 1980s (native provenance is not secure for this piece).

The pieces donated include basketry, stone

sculpture, caribou hide masks, and, of course woodworking. A few of the most spectacular items are pictured here.

As the James' wrote: *We are pleased to disperse our collections to institutions that can appreciate, use in study, and display to the public what once Bagatelle [their 177 year-old home] contained and that Kay & I loved and cared for doing our time of ownership.*

The Museum appreciates their passion for the collection and is grateful for the donation.



AASP – The Palynological Society Conferences from Ghent University, Belgium (2019) to LSU, Louisiana (2020)

by Sophie Warny

A BIT OF HISTORY FIRST

AASP – The Palynological society (AASP-TPS) was founded to promote the science of palynology for and in behalf of the public interest. It is a non-profit organization, to foster the spirit of scientific research among its members and others engaged in this field of science. It also aims to gather information and data on this subject that is disseminated to its members and to the general public. AASP-TPS was established as the “American Association of Stratigraphic Palynologists” following a survey conducted by Herbert Sullivan in spring of 1967. It held its first meeting on December 8, 1967 in Tulsa, Oklahoma.

The society has a long history with LSU. First, Dr. George Hart (PhD in Geology from the University of Sheffield, England in 1961), one of founders of the society, was a professor at LSU from 1974 till 1996.

Thanks to Dr. Hart tireless advocating, the Center for Excellence in Palynology (CENEX) was established by the Louisiana State University and the American Association of Stratigraphic Palynologists

(AASP-The Palynological Society) in 1993 to promote research and mentoring in palynology in the United States. One of the main foci is to train the next generation of palynologists to fill the demand in academia (paleo-environmental and biostratigraphic research), forensic labs, medical labs that focus on topics related to allergies, and for work performed in collaboration with the oil and gas industry.

In 2018, CENEX proposed to host the 2020 annual conferences of the AASP - TPS society, and our proposal was selected. The 2020 conference will be at LSU in May 2020. We are hoping to showcase our center, our beautiful campus, and Louisiana’s unique ecosystem to a diverse international group of palynologists and paleobotanists. Hosting this conference will be a way for us to thank the society and its members for cofunding, along with the Board of Regents, the AASP Chair in Paleopalynology at LSU.

Title Photo: The Gravensteen Castle in the town of Ghent, Belgium, where the 2019 AASP - TPS conference was held. The Gravensteen is a medieval castle dating to 1180.

AASP - TPS 2019 GHENT, BELGIUM

This past June, CENEX was well represented at the 2019 AASP - TPS conference, with four CENEX graduate students in attendance (**Peter Moutevelis**, **Meghan Duffy**, **Allison Barbato** and **Vann Smith**), as well as one former student (**Carlos Santos**) who is now working in London.

The students all presented their research and help publicize the 2020 conference that will take place at LSU.

Dr. George Hart was also in attendance, and received quite an ovation as the sole conference participant having had the honor of founding the society.

The AASP - TPS 2020 meeting will be dedicated to him, as a proof of gratitude, for his long time services to CENEX, LSU, and AASP - TPS.



Top Right: Peter Moutevelis sharing his South African palynological research (one of 3 posters and 3 oral presentations of our group).

Middle Left: Dr. George Hart, center, with S. Warny (LSUMNS) and Dr. Annette Goetz (University of Portsmouth).

Middle Right: The venue of the meeting 'Het Pand', located in the very center of the historic city of Ghent. This historical building, a former abbey, was acquired by the university and entirely renovated into a conference center with all up-to-date facilities.

Bottom: Warny with LSU new and former palynological students (Santos, Barbato, Moutevelis, Duffy, and Smith to the right).

AASP - TPS 2020 LSU, LOUISIANA

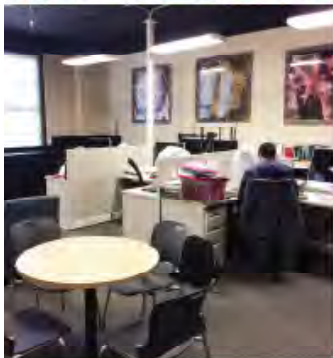
The tentative agenda for the meeting is as follows:

Tuesday May 26, 2020	Pre-conference field trip to Mississippi delta and marshes (LUMCON) Ice breaker
Wednesday May 27, 2020	Technical meeting Tour of CENEX facilities and LSU MNS collections
Thursday May 28, 2020	Technical meeting Conference dinner at Nottoway Plantation
Friday May 29, 2020	Technical meeting
Saturday May 30, 2020	Post-conference field trip to Louisiana swamps and visit of the Tabasco plantation (located on Avery Island, a salt dome)

Sessions will include various palynological topics such as: a) Paleo-climate and paleo-environmental reconstruction. b) Phytoplankton as indicator of water quality from past to present (HABs, etc.). c) Modern coastal palynology. d) A Paleozoic Palynology session in memory of Gordon Wood, with a focus on Permian to honor Dr. George Hart. e) The importance of palynology for biostratigraphy and biosteering.

We highly recommend booking your hotel room early at the LSU campus hotel: The Lod Cook <http://www.thecookhotel.com/>

Note that no contracts have been signed to secure rooms, so book early!



MARK YOUR AGENDA!

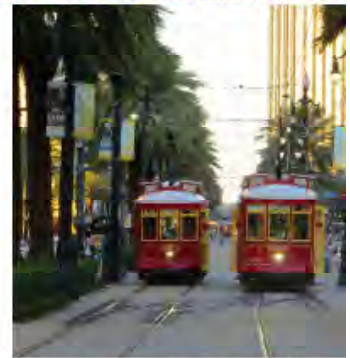
The 53rd AASP CONFERENCE WILL BE HELD MAY 26-30, 2020 ON THE BEAUTIFUL LSU CAMPUS, IN BATON ROUGE, LOUISIANA

The campus is located about one hour west of New Orleans.

The conference will be hosted by the Center for Excellence in Palynology (CENEX) and the Center for Energy and Environment at Louisiana State University

If you have any questions, contact:

Sophie Wenny at swenny@lsu.edu
Sibel Bargo Ales at sbargo@lsu.edu
Kam-Biu Liu at kliu1@lsu.edu

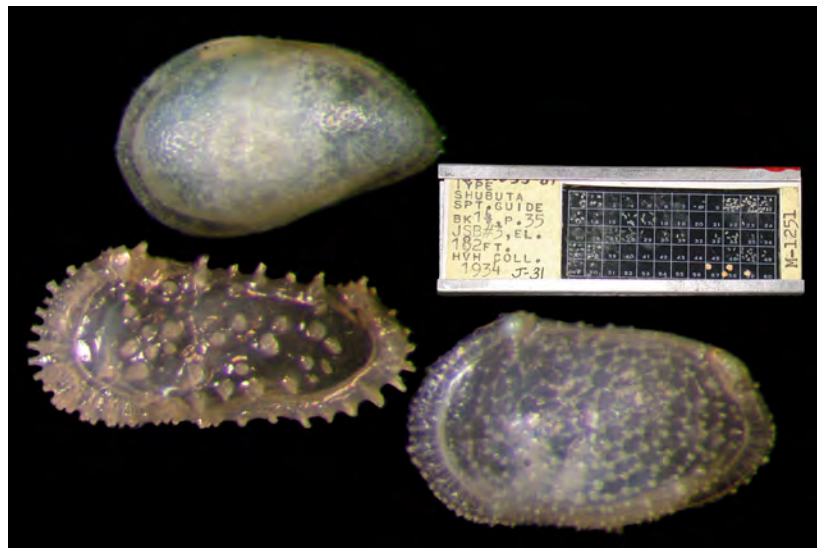


Paleontology News: Visitor from the Smithsonian Institution

by Lorene Smith



Dr. Gene Hunt, Curator of Ostracoda at the National Museum of Natural History, made a fourth trip to the Fossil Protists and Invertebrates section earlier this year. During previous visits, Dr. Hunt and his colleague Dr. Maria João Fernandes Martins examined Cretaceous material for their study of sexual dimorphism and extinction rates of Ostracoda. Data gathered from specimens in the LSU MNS collections made a significant contribution to their paper published in *Nature* (<https://doi.org/10.1038/s41586-018-0020-7>). Dr. Hunt returned this year to study Paleogene specimens in the H.V. Howe Stratigraphic Assemblage Slide Collection.



Left: Gene Hunt of the Smithsonian Institution examines ostracodes in the LSU MNS microfossil collections.

Right: Microfossil slide with Eocene ostracodes collected in Mississippi by Henry V. Howe.

Photos and photomicrographs by Lorene Smith

MNS NEWS

AWARDS



Pam Hart receives Storer Award

Congratulations to LSUMNS Ph.D. student, **Pam Hart**, who received the Storer Award in Ichthyology for best poster at the 2019 Joint Meeting of Ichthyologists and Herpetologists in Salt Lake City Utah.



Jackson Roberts receives Gaige Award

Congratulations to LSUMNS Ph.D. student, **Jackson Roberts**, who received the Helen T. and Frederick M. Gaige Award from the American Society of Ichthyologists and Herpetologists. This award aids in field work and professional development in herpetology.

WELCOME NEW STAFF & STUDENTS



Allison Barbato

New Master's student in joining Sophie Warny's lab in palynology. Although she was born in Lafayette, LA she grew up overseas in Indonesia, Brazil, the Netherlands, and Egypt!



Dr. Carl Hutter

New museum Post-doctoral Fellow coming from the University of Kansas, Biodiversity Institute joining the Esselstyn lab in mammalogy.



Sheila Rodriguez-Machado

New Ph.D. student coming from the University of Havana in Cuba joining the Chakrabarty lab in ichthyology.



Kenneth Tremblay

New Master's student coming from Eckerd College in St. Petersburg, FL joining the Saunders lab in anthropology.

In Memoriam



Former LSUMNS Curator of Anthropology, Dr. Robert Neuman passes away

Bob was born in Chicago, Illinois but grew up in St. Petersburg, Florida with his mother and sister. He graduated from Tulane University and Louisiana State University with degrees in anthropology. His career as an archaeologist included 11 years for the Smithsonian Institution followed by 27 years at Louisiana State University. He retired and moved with his wife to Natchitoches in 1995.

OUTREACH ROUNDUP

SPECIAL SATURDAYS



Ice Sheet Retreat

Dr. Phil Bart from the LSU Department of Geology & Geophysics kicked off our 2019-2020 Special Saturdays program with a talk about Antarctica's ice sheet. He brought along maps, rocks, and videos of researchers taking cores in Antarctica. After the talk, participants got to practice being geologists by taking "cores" of a layered cake, taking measurements, and looking for "ice rafted debris" (raisins). 25 kids attended the event. Thanks to Larry Bird, Anna Sivils, and Sophie Warny Bart for helping out.

NIGHT AT THE MUSEUM



LSU Arthropod Museum

On September 19, we collaborated with the Louisiana State Arthropod Museum for our first Night at the Museum of the semester. It was a packed house with around 100 people in attendance. Arthropod Museum Director, Dr. Nathan Lord, spoke to guests about the collections and the research being done with them. We had tables featuring some amazing specimen drawers, insect art, live insects, and tiny insects you could view under microscopes. Thanks to the LSU Entomology Club for helping with those especially Devon Brits, Leslie Aviles, Lina Bernaola, Paula Castillo, Joseph McCarthy, Pat Shorter, Manoj Pandey, and Megan Mulcahy. After the talk, curator Victoria Bayless gave a tour of the arthropod collection that included a special demonstration in their hi-res imaging studio by Ilgoo Kang and Able Chow. Thanks to everyone who came out and special thanks to Alicia Reigel, Link Morgan, and Jessica Manafi for helping with sign-in, snacks, and photos.

For more information on outreach events and museum tours, contact **Valerie Derouen**, vderou1@lsu.edu.
More photos from all of our outreach events can be found on our Facebook page.

COMMUNITY EVENTS



From May - September we participated in seven events around Louisiana: East Baton Rouge 4H Achievement Day in the LSU Parker Coliseum, Core Element STEM Day in New Orleans, LA, Audubon Day at the Hill Memorial Library, STEM Day at LSU, Ducks Unlimited Greenwings Kid's Event in Covington, LA, the LSU College of Science Block Party, and the Girl Scouts B.I.G. Event hosted by LSU. In total, we were able to reach over 8,000 people. We also put on a natural history workshop and two bird workshops for the Louisiana Master Naturalists of Greater Baton Rouge and the Acadiana Master Naturalists. During the summer, we visited two camps - Kajun Martial Arts and St. Joseph's Summer camp to show campers some of our specimens. Lastly, we loaned a few of our specimens to the Louisiana Art & Science Museum to be part of the "Frameworks of Absence" art installation by Brandon Ballengée. The exhibit will run until October 28.

Thanks to Oscar Johnson, Mark Swanson, Link Morgan, Steve Cardiff, Donna Dittmann, Jackson Roberts, Anna Sivils, Larry Bird, Anna Hiller, Jon Nations, Jessie Salter, Matt Brady, Eamon Corbett, Valencia Henderson, and Madison Dugger for helping out with these events.

Upcoming Events

October 11 - LSU Fall Fest

11am-2pm; LSU Parade Grounds

October 12 - Wild Things

10am-4pm; Lacombe, LA

October 19 - Special Saturdays - All About Penguins

10am-12pm; LSUMNS

October 24 - Ocean Commotion

8:45am-1:30pm; LSU PMAC

October 24 - Night at the Museum - Birds

6pm-7:30pm; LSUMNS

October 25 - Dean's Circle Science & Spirits

6pm-9pm; Downtown Baton Rouge

October 26 - Halloween Art & Nature Fest

11am-5pm; Arnouldville, LA

November 2 - Knock Knock Museum Pelican Event

9am-3pm; Baton Rouge, LA

November 14 - Night at the Museum - Mammals

6pm-7:30pm; LSUMNS

November 16 - Special Saturdays - Phylo-what?

10am-12pm; LSUMNS

December 14 - Special Saturdays - Escape from Disaster

10am-12pm; LSUMNS

January 25 - Special Saturdays - Bust a Move

10am-12pm; LSUMNS

February 1* - Special Saturdays - Fish, Fish, Fishes

10am-12pm; LSUMNS

February 6 - Night at the Museum - Herbarium

6pm-7:30pm; LSU Life Sciences Bldg

**The February Special Saturdays date may change. Check our website to stay up to date.*

2019 FALL SEMINAR SCHEDULE

October 11: Dr. Teague O'Mara, Southeastern Louisiana University

Title: TBA

October 18: No Seminar - Fall Break

October 25: Dr. Ethan Linck, University of Tennessee, Knoxville

Title: "Niche conservatism, speciation, and range limits on tropical mountainsides"

November 1 and 8: No Seminar - Yellow Rails and Rice Festival; Museum Retreat

November 15: Dr. Maggie MacPherson, University of California, Santa Barbara Institute for Social, Behavioral & Economic Research, and Max Planck Institute for Evolutionary Anthropology

Title: TBA

November 22: Glauca Del-Rio, LSU Museum of Natural Science

Title: "Travelogues Part II - Brazil: The Emilie Snethlage Expedition"

November 29: No Seminar - Thanksgiving Break

December 6: Randy Klabacka, Auburn University

Title: "Riverine barriers as drivers of biodiversification in terrestrial fauna of Southeast Asia"

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If you would like to include items in the next issue of *Museum Quarterly*, please send information, articles and photographs to the Museum Education Office. Articles about research, study or any other items of interest are encouraged. Information may be submitted as completed articles with jpeg pictures in attachments, or in list form to be put into article.

Email your material to vderou1@lsu.edu

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