# Museum Quarterly

## LSU Museum of Natural Science

May 2015 Volume 33, Issue 2

### Museum of Natural Science Director and Curators

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**Frederick H. Sheldon**
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*Curator of Archaeology*

**Judith A. Schiebout**
*Curator of Vertebrate Paleontology*

**Sophie Warny**
*AASP Associate Professor of Palynology and Curator of Education*

*Letter from the Director...*

As summer approaches our graduate students are gearing up for fieldwork in Peru, Panama, Bolivia, Indonesia, and many other destinations. This work is made possible through your generous support of graduate student research at the LSU MNS. We are very proud of our graduate program, which is training the next generation of biodiversity scientists. These students are landing great jobs around the world at museums, universities, and in the public and private sectors. Below you'll find a sampling of where LSU MNS graduates are employed. Have a safe and productive summer!

Best wishes,
Robb


# John P. O'Neill Inducted into the LSU College of Science Hall of Distinction

**by Dawn Jenkins and Valerie Derouen**

The LSU College of Science held its annual Hall of Distinction ceremony on March 20th, 2015. It recognized the contributions of four exceptional individuals, one of them being **Dr. John O'Neill**.

John O'Neill, renowned ornithologist and former director of the **LSU Museum of Natural Science** (MNS), earned his master's and doctorate degrees in Zoology at Louisiana State University. O'Neill was the founder and leader of the MNS field research program in Peru. He pioneered "expedition style" LSU fieldwork in which a large group of LSU ornithologists would head off into the wilds, for many weeks or months, carrying everything with them, often on mules or by canoe. His explorations of South America in the 1960's helped solidify the museum's reputation as one of the most prestigious institutions of ornithology across the country. He was also instrumental in establishing the museum's prominent graduate program in Neotropical ornithology.


**Left:** Dean Cynthia Peterson presenting John with his award.

**Above:** 2015 Hall of Distinction inductees with Dean Peterson. Clockwise from top left: Dr. Meredith Blackwell, Dean Cynthia Peterson, Dr. Edward Zganjar, Lieneke Bouma (wife of the late Dr. Arnold H. Bouma), and Dr. John O'Neill.

John O'Neill and his wife, Letty Alamia.

O'Neill held a number of positions in the MNS, including director, coordinator of field studies, curator of birds, and artist-in-residence. He discovered and described 14 new bird species, including three new genera. He contributed over 7,000 bird specimens to the MNS and Peruvian research collections. He published dozens of scientific papers, mainly on the taxonomy of birds, but his milestone publication was The Birds of Peru, published by Princeton University Press in 2007, which was initiated, co-authored, and co-illustrated by O'Neill. Widely recognized as the most authoritative field guide for birdwatchers and ornithologists traveling to Peru and Bolivia, the text represents the culmination of his more than 40 years of fieldwork and research.

O'Neill raised money to construct a new wing to house the Peruvian ornithology collection at the Javier Prado Museum in Lima, Peru, and has served as a mentor to countless students at LSU, the Javier Prado Museum and the new Center for Ornithology and Biodiversity in Lima. In 2008, Peruvian President Alan Garcia Perez presented O'Neill with the Distinguished Service Merit Award in recognition of his contributions to ornithological studies, particularly the study of Peruvian birds. Dr. O'Neill's career was one of the main focuses of Don Stap's award-winning book *A Parrot Without a Name*. He has a bird species (*Nephalornis oneilli*) and a bird genus (*Oneillornis*) named in his honor.

Guests at the reception held at the LSUMNS. Photo by Van Remsen.


Current and former Directors of the LSUMNS. Clockwise from top left: Dr. Van Remsen, Dr. Mark Hafner, Dr. Fred Sheldon, Dr. John O'Neill, and Dr. Robb Brumfield. Photo by Jodi Kennard.

O'Neill is also a well-known scientific illustrator. His artwork has appeared in more than 100 publications, including the covers of *Science*, *New York Times*, and *Audubon Magazine*. He was art director for the first edition of the very popular National Geographic Field Guide to the Birds of North America.

The LSUMNS held a reception on March 21st, "Pardusco Fest," to honor John that included over 100 guests, a cajun band, a pot-luck dinner, a picture slideshow and speeches from those who were inspired by John in some way. The reception was a great success and lasted until after midnight.

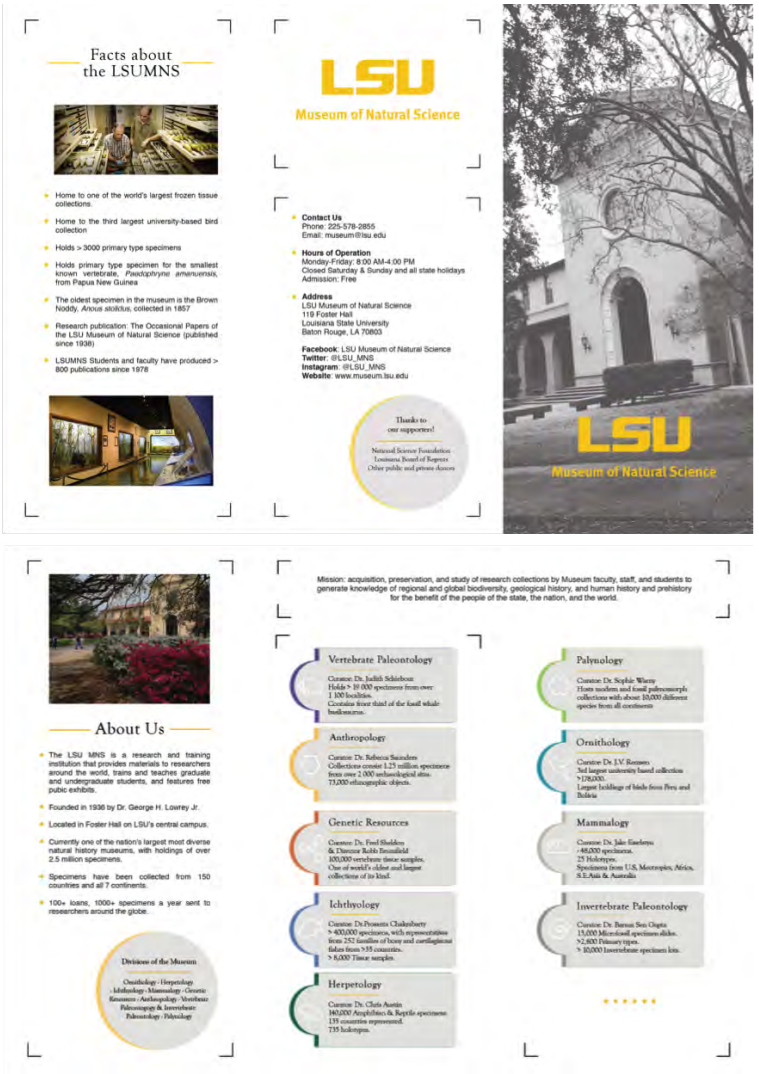
# Mathilde Laurent Interns at the LSUMNS

**by Valerie Derouen**

During the months of March and April, the **LSUMNS** had a visitor from Liège, Belgium, Mathilde Laurent. She was here for an internship with the MNS Education Office under **Dr. Sophie Warny**. Mathilde is a student at Ecole Supérieure des Arts (ESA) in St Luc Liège (Belgium) majoring in Advertising and Graphic Design. For her capstone internship, she decided to work with the LSUMNS to design new promotional materials for the **Museum**. She said this was not only a good opportunity to get more experience with advertising and graphic design, but it was also a great opportunity for her to practice English in a casual and work setting. While here, she designed a brochure, promotional book, banners, and a t-shirt graphic.

Mathilde was also able to experience a little bit of Louisiana culture during her stay. She visited Oak Alley and Laura Plantation in New Orleans, the French Quarter, and Abita Springs in Mandeville. Mathilde said she really enjoyed the creative freedom she had to set her own schedule and design multiple options for us to choose from. She was very excited to see the project through to the finished product, something they don't normally do in her classes. After she graduates, Mathilde plans to work at an advertising agency in Belgium.

**BROCHURE**




**T-SHIRT & BANNER**

# 2015 Louisiana Big Day Report

**by Oscar Johnson**

*We want to thank all of you who made donations to the Big Day fund in support of graduate student research in ornithology. For those of you who would like to support us it's not too late. See directions at end of the report.*

It was 11:59 PM on April 28th 2015. A group of Ornithology Graduate Students was huddled in a driveway near the LSU campus, waiting for the stroke of midnight. As soon as their midnight alarm went off, the team all glanced at the female American Robin sitting on her nest, and then ran to the car. They were off for a whirlwind twenty-four hours of birding across the state of Louisiana.

Every spring, we hold the **LSU Museum of Natural Science** Big Day, an effort to identify as many bird species as possible in the state of Louisiana in twenty-four hours. This event is timed to coincide with the peak of spring migration in Louisiana, at a time when the greatest diversity of migrant species are moving through, but while there are still good numbers of lingering wintering species. Seeing the American Robin sitting on her nest at midnight, however, was not the true start to our Big Day. The previous week we had been scouring and choreographing our planned route, looking for those species that we could potentially miss on the Big Day, trying to pin down such species as Louisiana Waterthrush, Bald Eagle, and Eastern Screech-Owl. This would allow us to spend less time looking for the birds on the actual day.

Even the exact day of our Big Day was not decided until the day before. The intricacies of the weather patterns during spring influence bird migration through a combination of northern cold fronts, rain, and wind direction, all of which are difficult to predict more than a few days in advance. The weather finally looked like it would be good on Wednesday, so we finalized a team of five students and made our

preparations. It would be **Mike Harvey**, **Oscar Johnson, Ryan Terrill, Matt Brady,** and **Andre Moncrieff**. We would need to have food and drinks to eat in the car - there isn't time to stop and eat on a Big Day, after all. Once we had stocked up on enough pizza and caffeine to make it through the day, we tried to get a few hours of sleep before midnight and the crazy day to follow.

After seeing our American Robin, we drove around Baton Rouge for an hour looking for night birds and localized species that we had found nests for previously, ticking off Great Horned Owl, Northern Flicker, and Wood Duck. Heading west out of town we stopped to see a nesting Bald Eagle, a bird that can be tough to see outside of southeastern Louisiana, before continuing on to the Atchafalaya NWR for

**Above:** Scarlet Tanager at Peveto Woods Audubon Sanctuary. One of the many migratory species seen on the Big Day. Photo by Oscar Johnson
**Top Page 5:** The Big Day crew (L to R: Andre Moncrieff, Matt Brady, Mike Harvey, and Ryan Terrill) scanning for birds at Holly Beach. Photo by Oscar Johnson

Barred Owl and Eastern Screech-Owl. Onward into the rice country of south-central Louisiana, we found a Barn Owl hunting over a field, rounding out our owl species for the day. A quick stop at a Cave Swallow colony and a few flooded rice fields for shorebirds and we were on our way north to our dawn location at Kisatchie National Forest, about two hours to the north.

As dawn approached, we tallied our list so far. Thirty species before dawn! We were on a good pace. As the eastern sky started to lighten, the Chuck-wills-widows started calling, followed by Yellow-breasted Chats and the other diurnal species. Then they came fast; Indigo Buntings, Bachman's Sparrow, and Brown-headed Nuthatch. Always the latest-rising species in the piney woods, we finally heard a Red-cockaded Woodpecker call at 6:15, and we were off, running to the car and towards the bottomland forest of southern Kisatchie, where we would be listening for Prothonotary and Yellow-throated Warblers. It was here that we had our first big misses: Swainson's Warbler and Louisiana Waterthrush were not at the territories that we had seen them in previously. Ah well, no time to wait. On to the next spot! Heading south into the rice country, with a quick stop for Painted Bunting, the sharp eyes of our spotters picked up species from the back seat of the car, such as Red-headed Woodpecker and Fulvous Whistling-Duck. It was 9 AM, we were already at 100 species, and ahead of schedule.

Cruising through the rice country, we headed for some flooded fields that Mike had located a few days previously, hoping that the water levels were still good for shorebirds. We lucked out. Two adjacent fields still contained hundreds of birds and we quickly racked up almost all of the expected shorebirds, including Wilson's Phalarope, Hudsonian Godwit, and White-rumped Sandpiper. This field even had a good diversity of ducks, which can be tough to find this late in the spring. At this point we started detecting migrants in small roadside patches of shrubs. If there were migrants here, the coast could be good.
Working our way through the rice country south of Interstate 10, we headed towards Cameron Prairie NWR with high hopes; this was our good waterbird spot and it had produced many new species the previous year. Sadly, it was nearly devoid of new birds. The Snow Geese that were there just two days previously had apparently departed. We headed for the coast with about 170 species, somewhat disappointed with the previous stop, but we were still ahead of schedule and with a higher total than the previous year.

The first stop on the coast was Oak Grove, where we quickly added migrant warblers such as Blue-winged and Golden-winged. Two Baird's Sand-

**Above:** A young American Alligator (*Alligator mississippiensis*) at Cameron Prairie NWR. Photo by Oscar Johnson

pipers at Rutherford Beach were a nice surprise, but the beach was otherwise fairly slow. We did pick up a Western Kingbird, which was our only western species of the day, and we would end up seeing ten throughout the afternoon. Arriving at Willow Island we quickly realized that there were migrant birds everywhere. Bay-breasted and Black-and-white Warblers were everywhere we looked. Thrushes and buntings were flushing from the ground. We hadn't even yet reached the best migrant location on the coast, Peveto Woods, and we were already seeing many tough to find migrants. Driving down Holly Beach, three ducks just off the beach turned out to be our only scoters of the day, both Surf and Black. Then on to Peveto Woods, an hour ahead of schedule, and already with 198 species! It was 3 PM.

Peveto was a disappointment by Big Day standards. There were birds everywhere, but it was all of the same species that we had already seen. After spending an hour and a half combing through the flocks of warblers and other migrants, we turned up only one new species for the day: Scarlet Tanager. We still had two more hours of daylight, so all hope was not lost. We headed towards Lighthouse Woods, the southwestern most land in Louisiana, right on the border with Texas. There were migrants everywhere, but there was a greater diversity, and most importantly, birds that we had not yet seen that day. We quickly added Gull-billed Tern (#200), followed by Bobolink, Crested Caracara, and Warbling Vireo. We even found a few lingering wintering sparrows such as Swamp and Grasshopper. This was a place that we could have spent all afternoon searching through; there were migrant warblers, buntings, vireos, and thrushes feeding in the low weeds and grass, offering great views at close range and we kept flushing out birds with every step. Unfortunately, it was starting to get dark. We checked the list again: 209 species. There were only a few possibilities left that we could get explore before dark and the easiest were beach-going shorebirds. We headed back east to Holly Beach where we picked up our final species for the day, Piping Plover, that endangered denizen of sandy beaches. Having done well on night birds in the early morning, we didn't have any viable options left after dark, so we began our long drive back to Baton Rouge. We had fallen short of the previous record of 221 species, but it was a spectacular day of birding and can be counted amongst the top Big Day totals for Louisiana.

## Donate to Big Day

Make checks out to the **LSU Foundation** with **"Ornithology Student Support Fund"** in the memo line, and mail them to:

**LSU Museum of Natural Science**
**119 Foster Hall**
**Baton Rouge, LA 70803**

In addition to checks, you can also make online donations through the LSU Foundation website <www.lsufoundation.org/givetoscience>. Fill out the form from the link. Click on the section entitled "**Click to choose a fund(s)**" and a window will open. Scroll to the bottom and choose "**Other**." It will ask you to list the fund name in the comments section of the main form, so please type in "**Ornithological Student Support Fund**" as a comment.

**Thanks for your Support!**

# TEDxLSU Presentation

**by Prosanta Chakrabarty**

On February 28th, our Curator of Ichthyology, **Dr. Prosanta Chakrabarty**, along with 11 other speakers, gave a TEDxLSU presentation at a sold out Shaver Theatre. These TED (which stands for Technology, Entertainment, Design) presentations are meant to entertain but also to inspire and spread ideas; this year's theme was "Connect." Dr. Chakrabarty's presentation was titled, "Natural History in the 21st Century" and he discussed research being conducted by some of the curators and students at the **LSUMNS** as well as his own work on historical biogeography of fishes. He modified the opening lines and soundtrack of the movie "Goodfellas" ("As far back as I can remember I always wanted to be a naturalist….._") to make the talk a little more fun. Other speakers include dfamed chef John Besh, musician John Gray, and teen agent of social change, Rashaud Red (who according to Dr. Chakrabarty gave the talk of the day). Dr. Chakrabarty's presentation can be viewed on-line via YouTube (http://goo.gl/E5MU03).


**Above:** Group photo of the TEDxLSU speakers.
**Top:** Prosanta Chakrabarty giving his TEDx talk.

# Curators Join Together for Museum Curatorial Methods Class

The LSUMNS Museum Curatorial Methods class (Biology 7800) coordinated by **Dr. Remsen**, is designed to give graduate students interested in careers in museum-based research (1) a general overview of curatorial procedures outside their area of specialization, and (2) intensive training in their area of specialization. Students meet once per week in the collections area of the appropriate section. The spring 2015 schedule was as follows:

**WEEK 1:** Ornithology (V. Remsen)
**WEEK 2:** Genetic Resources (F. Sheldon)
**WEEK 3:** Palynology (S. Warny)
**WEEK 4:** Mammalogy (J. Esselstyn)
**WEEK 5:** Herpetology (C. Austin)
**WEEK 6:** Ichthyology (P. Chakrabarty)
**WEEK 7:** Archaeology (R. Saunders)
**WEEK 8:** Paleontology (J. Schiebout)

For the remaining weeks, students were able to work on more specialized projects in their section of choice.

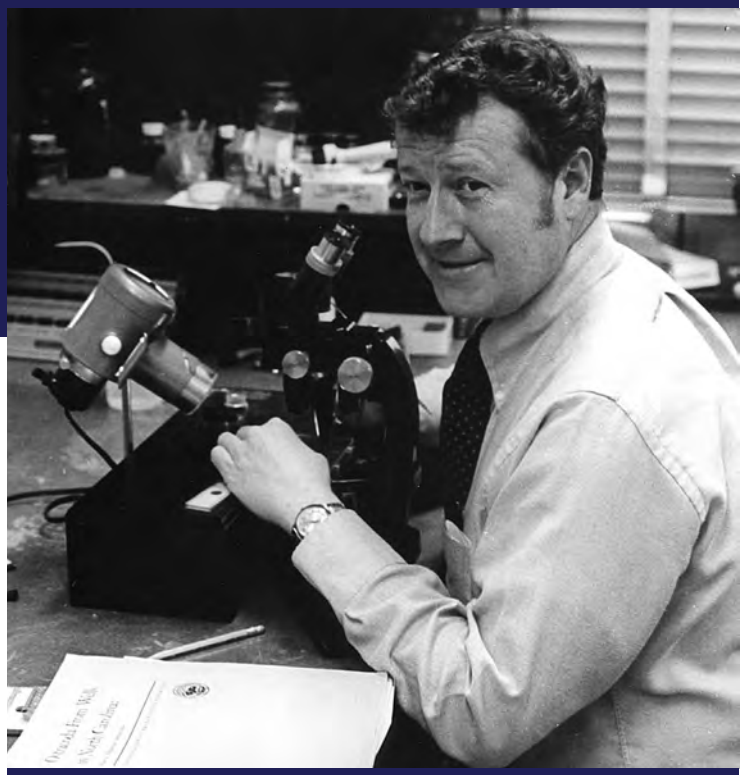
**Above:** Suyin Ting and Lorene Smith holding fossils during the paleontology lab.
**Top:** Suyin Ting shows students the Vertebrate Paleontology collection. From Left: Suyin Ting, Cathy Newman, Jessica Oswald, Subir Shakya, Bill Ludt, and Zach Rodriguez.

**Left:** Students viewing plants and pollen samples during a previous palynology lab.
**Right:** Dr. Judith Schiebout teaches the class about vertebrate fossils. From Left: Cathy Newman, Marco Rego, Genevieve Mount, Paul van Els, Mark Swanson, Andre Moncrieff, Subir Shakya, and Dr. Schiebout.

**Above:** Marco Rego viewing slides during the microfossil lab.

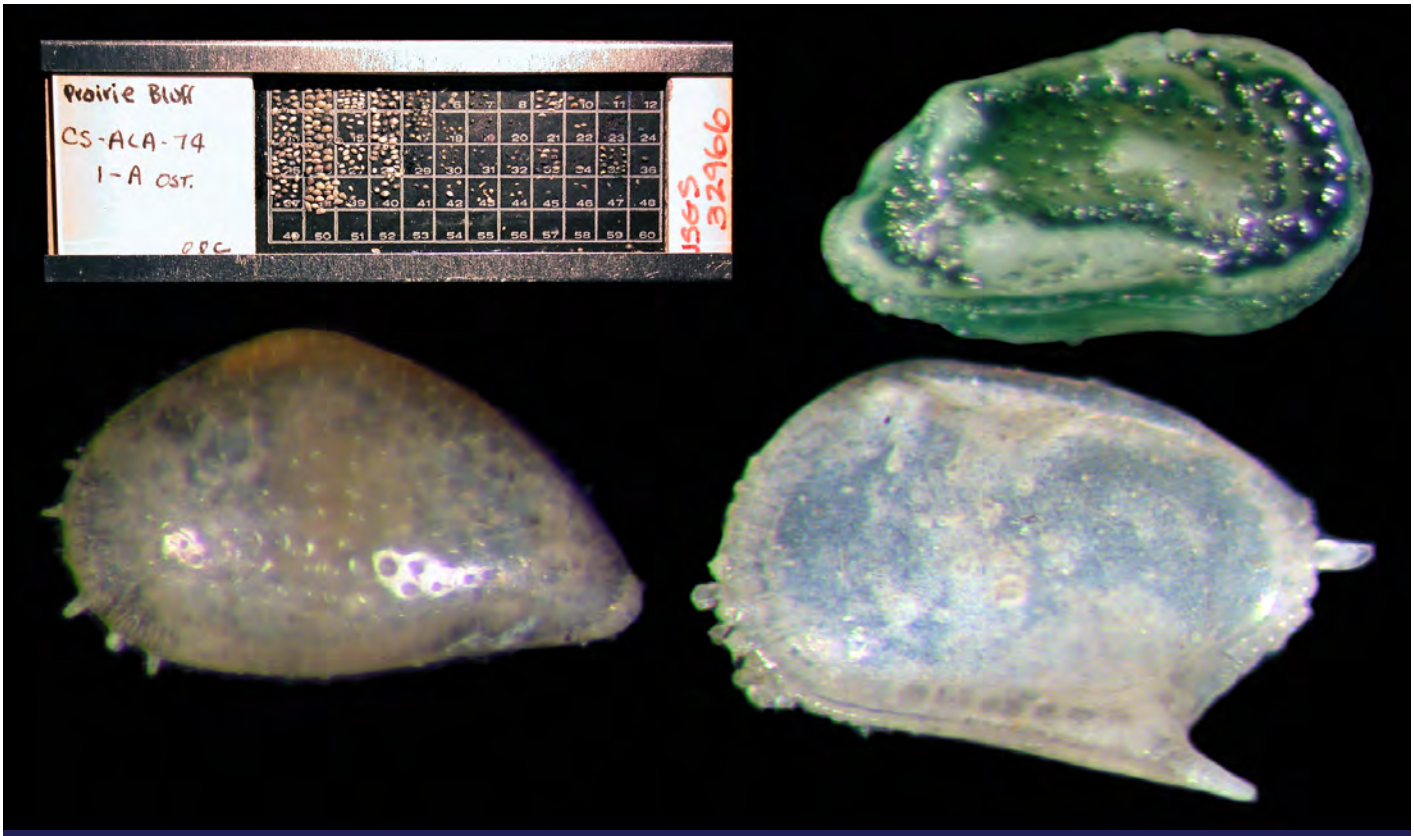
# Visitors to the Invertebrate Paleontology Collection

**by Lorene Smith**



**Above:** Professor Joseph E. Hazel

For a few days last September and again in March 2015, the Fossil Protists and Invertebrates section was visited by Gene Hunt, Curator of Ostracoda at the Smithsonian National Museum of Natural History, and postdoctoral scientist Maria João Martins. The two travelled to the **LSU Museum of Natural Science** to examine the research collections of the late Joseph Hazel, LSUMNS adjunct curator of microfossils (Ostracoda) and Campanile Charities Professor of Geology and Geophysics. Joe donated his collections to the museum when he retired from LSU in 2001, and the specimens remain a valuable resource for new research. Drs. Hunt and Martins are studying sexual dimorphism and the speciation and extinction rates of Cretaceous Ostracoda from the U.S. Gulf Coastal Plain.




**Above:** Upper Cretaceous ostracodes from Alabama.

# 10TH Annual Eagle Expo

by Donna L. Dittmann and Steve W. Cardiff

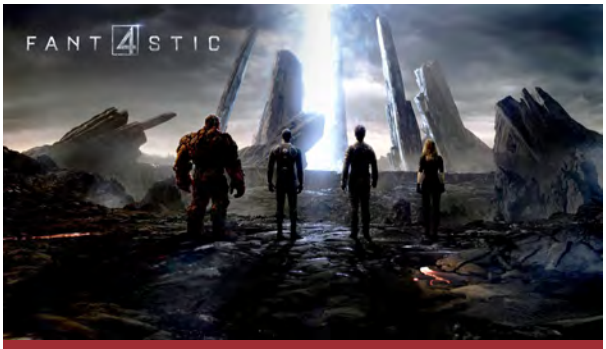
The **LSU Museum of Natural Science** was again a sponsor at the Eagle Expo in Morgan City, Louisiana. Coordinated by Cajun Coast Visitors and Convention Bureau, this year's event was held 26-28 February and included seminars, a photography workshop, a live raptor presentation, and boat tours of area swamps and marshes. LSUMNS Collection Managers **Donna L. Dittmann** and **Steven W. Cardiff** assisted for their eighth year, again leading boat tours on the Friday and Saturday to the Turtle Bayou area. Louisiana Universities Marine Consortium (LUMCON) provides two boats for the three Turtle Bayou trips: Friday morning, Friday afternoon, and Saturday afternoon. Although a bit cold in the early mornings, visitors were otherwise treated to lovely weather. The destination of the Turtle Bayou trip is an area with one of the State's highest breeding densities of Bald Eagles. On each trip participants are encouraged to help keep track of individual eagles observed and trip tallies were 57 & 48 eagles on the Friday tours (70 different individuals combined), and 48 eagles on the Saturday afternoon tour. These trips provide a fun way to learn about Bald Eagles, including identification of eagles of different ages, and seeing adults tending their nests and nestlings. It's also fun just be out on the water in a lovely part of the state. The scenery alone is worth the trip. Exceptional numbers of other bird species are also seen on the Turtle Bayou trips, including various waterfowl, waders, other raptors, gallinules, coots, shorebirds, and Tree Swallows. Especially close-up views of Anhingas, Ospreys, Red-shouldered and Red-tailed hawks, Great Horned Owls, and Belted Kingfishers, and other wildlife such as Nutria (a staple food of the eagles!) and alligators are a staple of these trips. Plan to attend next year: if you'd like to find out more about Eagle Expo or are interested in attending next year's event, information will be posted at the Cajun Coast Visitors and Convention Bureau website: http://www.cajuncoast.com.

**Above:** A Bald Eagle nest in willow tree along the Turtle Bayou trip route. The height of eagle nests in the area range from those high in Bald Cypress tree tops to much lower in a willow, such as this one in a mature willow. The tree chosen must be able to support the immense weight of an eagle nest, which can exceed 2 tons.

**Top:** An adult Bald Eagle flies over the boat providing tour participants with excellent views.

# Fantastic Four Movie Films in the LSUMNS Palynology Lab

This past summer, the **LSUMNS Palynology** lab was filmed for use in the new "Fantastic Four" movie by Twentieth Centrury Fox - in theaters August 6, 2015. The movie, based on the Marvel Comics, is about a team of scientists who acquire superpowers after being accidentally exposed to cosmic rays. The LSUMNS Palynology lab was used as the lab of the "The Invisible Woman" played by Kate Mara. Here are a few pictures from the shoot.

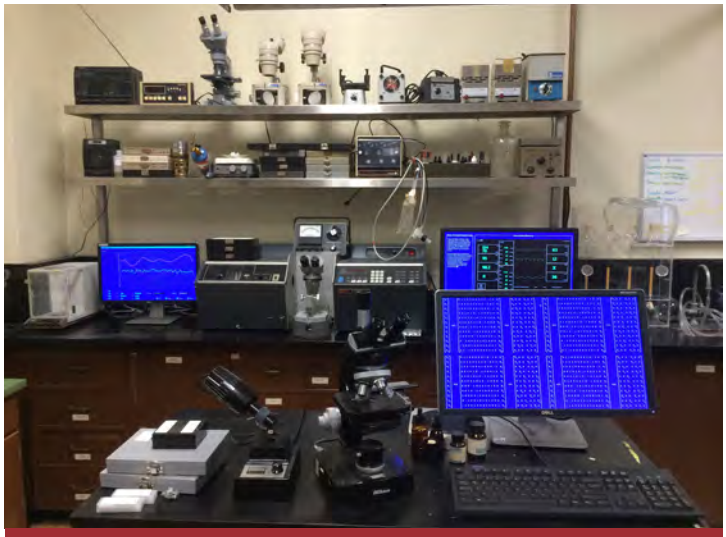



Copy and paste the link to view the trailer: https://www.youtube.com/watch?v=_flR9_6msik

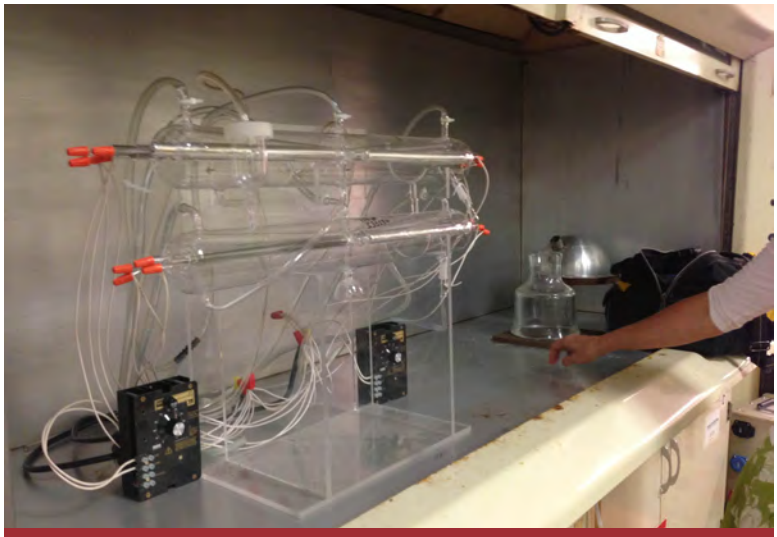

Kevin Mack and Sophie Warny. Kevin Mack is a visual effects artist who has worked on movies such as *A Beautiful Mind, The Grinch, Fight Club,* and *The Fantastic Four*. He won an Academy Award for "Best Visual Effects" for his work on *What Dreams May Come*.


Reserved parking sign for the movie crew.

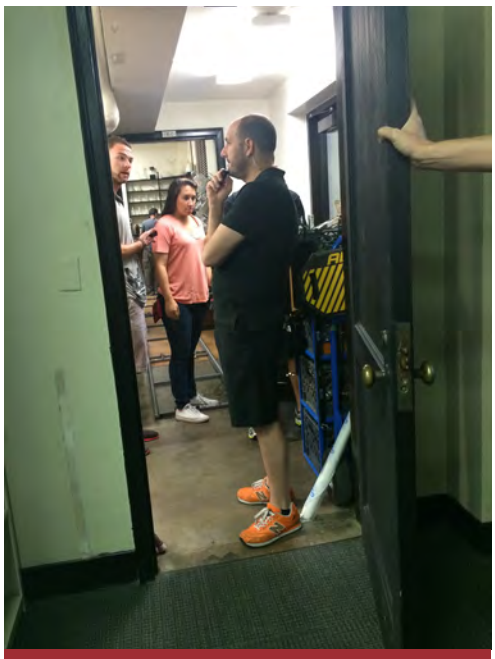
Equipment stored on LSU's campus during the shooting.



CENEX lab ready for shooting "the invisible woman" (played by Kate Mara) in "her" lab.



HF-grade hood used in one of the scenes.



Camera railing set up in the lab for the day of shooting.

Control station outside the lab prior to shooting.

UHigh students C. Coulter and M. Bart meeting some of the design crew.

# Rosalind Remsen Wins 1st Place at Science Fair!

**by Jessica Oswald**

Rosalind Remsen, a junior at Baton Rouge Magnet High School and daughter of John S. McIlhenny Distinguished Professor & Curator of Birds **Van Remsen**, won first prize in the Cellular and Molecular Biology section at the Louisiana Region VII Science and Engineering Fair on February 25. This year, Rosalind presented research that is in collaboration with **Dr. Robb Brumfield** and senior Ph.D. student **Michael Harvey** on elucidating the evolutionary relationships of doves in the genus *Leptotila* with a focus on the enigmatic species, *Leptotila battyi*. The results have significant implications for the biogeography of northwestern South America and Panama. Rosalind will be a co-author on the subsequent manuscript. This semester **Dr. Jessica Oswald** is mentoring Rosalind, but she has been working with Dr. Brumfield and **Dr. Fred Sheldon** and their PhD students on numerous phylogeography projects over the past 2 years. Well-done and congratulations, Roz!

## Using next-generation sequencing to understand population genetic variation in birds

### Purpose

To determine the evolutionary relationships of an enigmatic species of dove, *Leptotila battyi*, found on the Island of Coiba and adjacent mainland with respect to other species of *Leptotila* doves distributed across the Central and South America.

Brown-Backed Dove (*Leptotila battyi*)

### Hypothesis

Based on its geographic distribution and morphological characteristics, *L. battyi* is more closely related to the Central American species *L. plumbeiceps* than to any of the other species in the genus.

Grey-Headed Dove (*Leptotila plumbeiceps*)

### Procedure

#### Materials

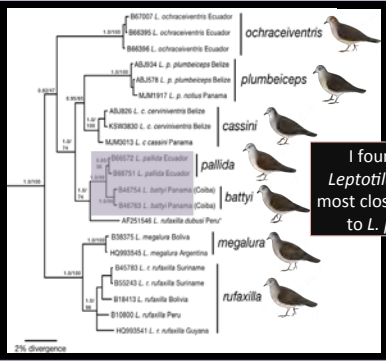
- Qiagen Extraction Kit- amount of materials used depends on amount of tissues.
- Forceps & ethanol
- Distilled Water
- 10% Bleach – For cleaning instruments and surfaces
- Lab gloves to be used during all lab procedures
- Lab coats
- Tubes extractions
- Tube racks
- TBE agarose gel
- SyBrsafe
- Gel plate & comb
- Electrophoresis box
- Loading dye
- UV imaging system
- Pipets and their tips of appropriate sizes (5 µL, 20 µL, 200 µL, 1000 µL)
- Incubator & Centrifuge
- Nanodrop
- Qubit 2.0 and kit that includes all solutions and buffers
- 10x buffer, dNTPs, primers, template DNA & Taq
- 0.2 & 1.5 mL Microtubes
- Thermocycler
- 96 well sequencing plate

#### Methods

1. DNA Extraction- Qiagen DNeasy Kit
2. Quality Control- Nanodrop
3. Quantification of DNA- Qubit
4. Amplification of ND2- PCR
5. Verification of PCR success- Electrophoresis
6. Send Post PCR product for sequencing- Beckman Coulter Genomics
7. Obtain more ND2 Sequence Data for *Leptotila* species - GenBank
8. Analysis- Geneious, jModeltest, MrBayes, MEGA v.6

Aligned ND2 data in Genious

### Results




I found that *Leptotila battyi* is most closely related to *L. pallida*.

### Conclusions

Results did not support my hypothesis that *Leptotila battyi* is more closely related to *L. plumbieceps*. Analyses provide strong support for the surprising result that *L. battyi* is actually most closely related to *L. pallida*, a species from a distant part of northwest South America. This will lead to future studies of why and when this speciation event occurred. This study is a good example of why genetic evaluation of presumed species relationships is necessary.

Pallid Dove (*Leptotila pallida*)

References

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**Above:** Rosalind's winning science fair poster
**Top Left:** Jessica Oswald and Rosalind Remsen with the 1st place ribbon.

# Kate Griener Wins Dissertation Award!

**by Valerie Derouen**

Congratulations to **Dr. Kate Griener** who was selected to receive the Distinguished Dissertation Award at the 40th Annual College of Science Honors Convocation held on April 28th, 2015. Each year doctoral dissertations are screened from every department and separated into two categories: arts, humanities, & social sciences and science, engineering, & technology. Three nominees from each category are chosen based on the quality of their presentation and for the exceptional scientific impact they have made in their disciplines.

Griener won with her dissertation entitled "Changes in Climate and Moisture Availability in the Antarctic Eocene, Oligocene, and Miocene: Evidence from Palynological and Stable Isotope Geochemical Analyses of the SHALDRIL and ANDRILL Cores."

She published three peer-reviewed papers from her Ph.D. research:

Griener, K.W., Nelson, D.M., Warny, S. 2013. Declining moisture availability on the Antarctic Peninsula during the Late Eocene. *Palaeogeography, Palaeoclimatology, Palaeoecology* 383, 72-78. DOI:10.1016/j.palaeo.2013.05.004

Griener, K.W., Warny, S., Askin, R., Acton, G., 2015. Early to middle Miocene vegetation history of Antarctica supports eccentricity-paced warming intervals during the Antarctic icehouse phase. *Global and Planetary Change* 127, 67-78. DOI:10.1016/j.gloplacha.2015.01.006

Griener, K.W., Warny, S., in press. *Nothofagus* pollen grain size as a proxy for long-term climate change: an applied study on Eocene, Oligocene, and Miocene sediments from Antarctica. *Review of Palaeobotany and Palynology.*

Kate and her family at the Honors Convocation. Picture by Barb Dutrow.

Her research is also featured in a permanent exhibit at the California Academy of Sciences in San Francisco. The "Earthquake" exhibit displays some of the plant fossils Griener and Warny found in Antarctica, that attest to previous connections to South America. One of the SEM pictures taken by Griener and Warny at LSU made the cover of the Proceedings of the National Academy of Science (PNAS).

Griener recently graduated from LSUMNS Curator of Palynology, **Dr. Sophie Warny**'s lab in the Department of Geology and Geophysics and she currently works as a Geologist at BHP Billiton in Houston. She is to be commended for working on her publication revisions despite the demand of a new career out of state.

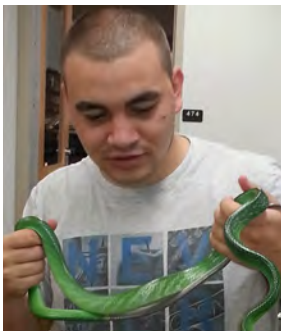

Exhibit created at the California Academy of Sciences in San Francisco, CA using Griener's dissertation research.

# NSF Awards Three Graduate Research Fellowships to LSUMNS students!

by Valerie Derouen

Three LSUMNS graduate students are 2015 recipients of the National Science Foundation's Graduate Research Fellowship. This fellowship is highly competitive and awards scientists early in their career who have demonstrated the potential to be high achieving in their field. Each recipient receives a $32,000 stipend (per year) and a $12,000 cost-of-education allowance for up to three years.

## LSUMNS 2015 GRFP Recipients



**Zach Rodriguez**
1st year Ph.D. student working in the herpetology division under Dr. Chris Austin.
Proposal Title: "The Evolution of Green Blood in Lizards"

**Andre Moncrieff**
1st year Ph.D. student working in the ornithology division under Dr. Robb Brumfield.
Proposal Title: "Understanding Large-Scale Movement Patterns of Psittacines: A Conservation Priority"

**Jonathan Nations**
New graduate student joining us in the fall in the mammal division under Dr. Jake Esselstyn.
Proposal Title: "Scansoriality in small mammals: coupling performance and skeletal morphology to test for phenotypic convergence between two distantly related clades on Madagascar."

**Congratulations to the awardees!**

# Two CENEX Students Hired as Biostratigraphers by the Oil and Gas Industry in the US and in Turkey

**by Sophie Warny**

AAPG, the American Association of Petroleum Geologists just published an article in their March 2015 newsletter entitled "Seismic Killed the Paleo Star". They start their article by stating "Comparing the critically endangered species of the Black Rhino or the Amur Leopard to a paleontologist is not necessarily a far-fetched analogy. The paleontologist is a dying breed in the oil and gas industry. This fact is not new, but it is quickly reaching a critical point. Retirement lies just ahead for the small pool of micropaleontologists still employed by major energy companies or who work as independent consultants."

The Center for Excellence in Palynology (CENEX) at LSU is one of a handful of university programs that is still training biostratigraphers (paleontologists who use microfossils to provide age control of deposits). Programs such as ours are always endangered when a state is facing budget cuts. This said, we are happy to report that in the past 7 years, all of our graduated students have been employed by the oil and gas industry in the US, in London, and in Turkey, confirming that we are serving a very important niche, providing critical training here at LSU for the U.S.

## Isil Akyus

Isil, her husband and Dr. Sophie Warny at Isil's graduation.

Isil Akyus, who just finished her MS in Palynology from my lab, was hired as a biostratigrapher with the Turkish Petroleum Institute. Isil published her MS thesis in the journal *Palynology*. Her paper can be downloaded at http://sites01.lsu.edu/faculty/swarny/bio/ under Akyuz et al. 2015.

**THESIS TITLE**

Palynology of the Turonian Ferron Sandstone Member, Utah, USA: identification of marine flooding surfaces and Milankovitch cycles in subtropical, ever-wet, paralic to non-marine palaeoenvironments

**ABSTRACT**

The Upper Cretaceous Ferron Sandstone Member of the Mancos Shale Formation in Utah includes coal, and gas deposits and is an important outcrop analogue to study reservoir characterization of fluvial-deltaic petroleum systems. Numerous sedimentological and sequence stratigraphic studies of the Notom fluvial-deltaic wedge have been conducted recently, however palynological analyses had not previously been undertaken. Here we present palynological data from one hundred twenty eight samples collected in the Notom wedge of the Ferron Sandstone Member outcropping in south-central Utah. The purpose of this study is to use palynological analysis to refine the broader depositional environments, evaluate the climatic setting, and to build a biostratigraphic palynological framework. The dominance of terrestrial palynomorphs, especially the high yield of moisture-loving cryptogam spores, indicates a primarily ever-wet depositional environment characteristic of hydromorphic floodplain paleosols formed in subtropical to tropical climates. Although dinoflagellates are rare, four intervals with occurrences of marine cysts indicate periods of increased marine/tidal influence associated with previously identified flooding surfaces within Milankovitch-scale parasequences of the largely non-marine stratal succession. These flooding surfaces confirm correlations from regional high-resolution sequence stratigraphic studies and allow correlative marine parasequences and systems tracts to be extended within floodplain-dominated

stratal successions. The presence of *Nyssapollenites albertensis* pollen place the interval studied within the *Nyssapollenites* albertensis Interval Zone (Nichols 1994), constraining the age of the Ferron Sandstone Member to the latter part of the Cenomanian and the early Coniacian. This largely agrees with bentonite and ammonite-derived Turonian age proposed in previous studies.

## Marie Thomas

Marie Thomas, who is defending her PhD in Palynology in my lab on May 8th was hired as a biostratigrapher with Hess in Houston. Marie published the first chapter of her thesis in the journal *Palynology*. Her paper can be downloaded at http://sites01.lsu.edu/faculty/swarny/bio/ under Thomas et al. 2015.

**THESIS TITLE**

Holocene Palynology of the Gulf of Papua, Papua: New Guinea: Using Modern Palynomorph Distribution to Better Constrain Paleoenvironmental Changes.

**ABSTRACT**

The Gulf of Papua (GoP), Papua New Guinea (PNG), has one of the world's highest discharges of sediment to the ocean. Multiple NSF (National Science Foundation)-funded MARGINS Source-to-Sink cruises were conducted here from 2003 through 2005 to better understand how sediment is created at its source, transported, and deposited at its sink. Although much work has been done on the data collected during these cruises, palynological analysis has never been conducted on the hundreds of available cores and sediment samples. Palynology can aid our understanding of sedimentary processes at continental margins in two main ways: 1) palynomorphs are transported as part of the sediment, and thus reflect sediment source and depositional environment; and 2) palynomorphs can enhance our understanding of climate and sea level change, because their distribution changes in response to climatic fluctuations. The first phase of this project examined the modern distribution of palynomorphs and palynomacerals (wood, charcoal, resin, cuticular material, and structureless organic matter (SOM) found in palynological preparations) in order to examine the connection between modern depositional regimes in the GoP and the species assemblages recovered. Statistical analysis of palynomaceral assemblages indicates a correlation between their distribution and bathymetry, sedimentation rate, and distance from shore. In particular, wood and cuticular material is found closer to shore and in areas with higher sedimentation rates, while SOM increases in abundance with increasing distance from shore and lower sedimentation rates.

Characteristic palynomaceral assemblages appear at certain major depositional environments (clinoform topset, bottomset, and foreset, and continental slope/deep xvi ocean). Palynomorph assemblages also indicate a clear correlation with bathymetry, sedimentation rate, and distance from shore. Major groups found in palynological slides reflect the composition of vegetation on mainland PNG (mangroves, tropical rainforest, lower montane/montane vegetation, swamps, and scrub/savanna/grassland). Reworked palynomorphs also provide an indication of sediment source (e.g., from the Ok Tedi mine on the mainland), but this is complicated, because many ages of reworking (e.g., a mix of Cretaceous, Paleogene, Neogene, and Recent palynomorphs) are found in samples. The second phase of this project included a paleoenvironmental reconstruction of the last ~14.5 kyr in the GoP. Three long cores (MD-50, MV-41, MV- 46) were selected for this analysis. Changes in palynomorph assemblages allow delineation of four major climate intervals from 14.5 kyr to present, including the Bølling-Allerød Interstadial (14.5 to 12.5 kyr BP), the Younger Dryas (12.5 to 11.5 kyr BP), Meltwater Pulse-1B (11.5 to 10.5 kyr BP), and the Holocene (10.5 kyr BP to present). Results indicate that mangrove pollen and marine indicator taxa clearly delineate the end of the transgression between 5 to 6 kyr BP Palynomorph data and oxygen-18 isotopes from MD-50 also indicate an increase in El Niño Southern Oscillation (ENSO) activity at approximately 5 kyr BP.

Marie was a recipient of the AASP Student Dissertation Award.

# Earth Day 2015

by Valerie Derouen

The LSUMNS participated in Earth Day at downtown Baton Rouge. The goal of our table was to convey the importance of natural history museums to conservation and preserving biodiversity, and also speak about the environmental issues facing Louisiana and how that affects Louisiana wildlife. We brought specimens from the LSUMNS research collections including a roseate spoonbill, a greater prairie chicken, a red knot, a large-eyed rabbitfish, a pancake batfish, red lionfish, a nutria, fox squirrels, glass lizards, southern red-backed salamanders, and the world's smallest vertebrate (*Paedophryne amauensis*). Thank you to **Tom Giarla, Ryan Eldridge, Mark Swanson, Clare Brown, Vivien Chua, Rafael Marcondes, Cathy Newman**, and **Genevieve Mount** for helping out.


**Above:** From Left - Tom Giarla, Clare Brown, Valerie Derouen, and Cathy Newman.
**Top:** Rafael Marcondes & Mark Swanson speak to visitors.

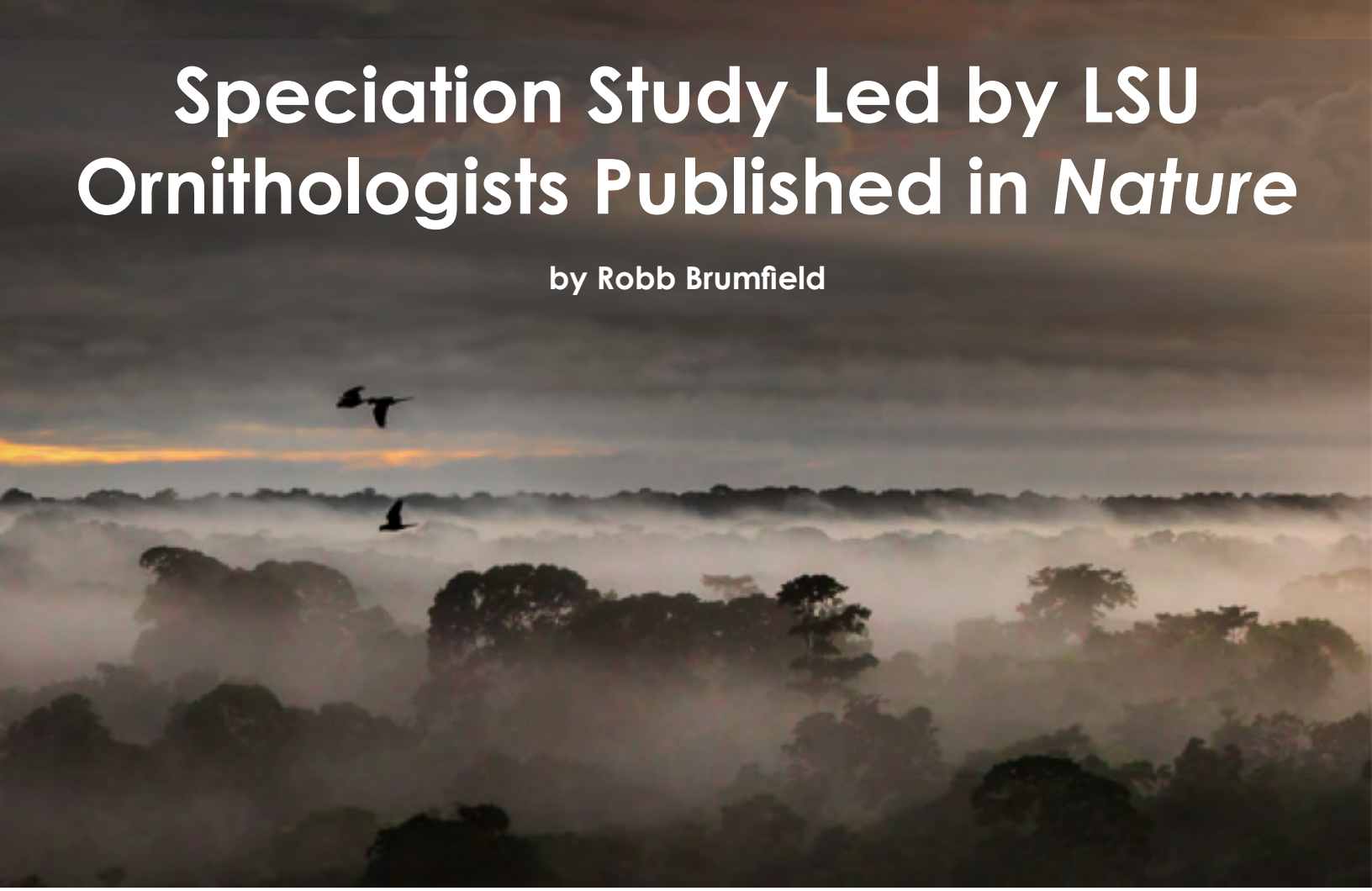




**From Left: Photo 1** - Visitors view fish specimens. **Photo 2** - Visitors view bird specimens. **Photo 3 -** Rafael Marcondes explains a hummingbird's nest. **Photo 4 -** Genevieve Mount shows visitors the herpetology specimens. **Photo 5-** Vivien Chua shows visitors the mammals and birds.

# Speciation Study Led by LSU Ornithologists Published in *Nature*

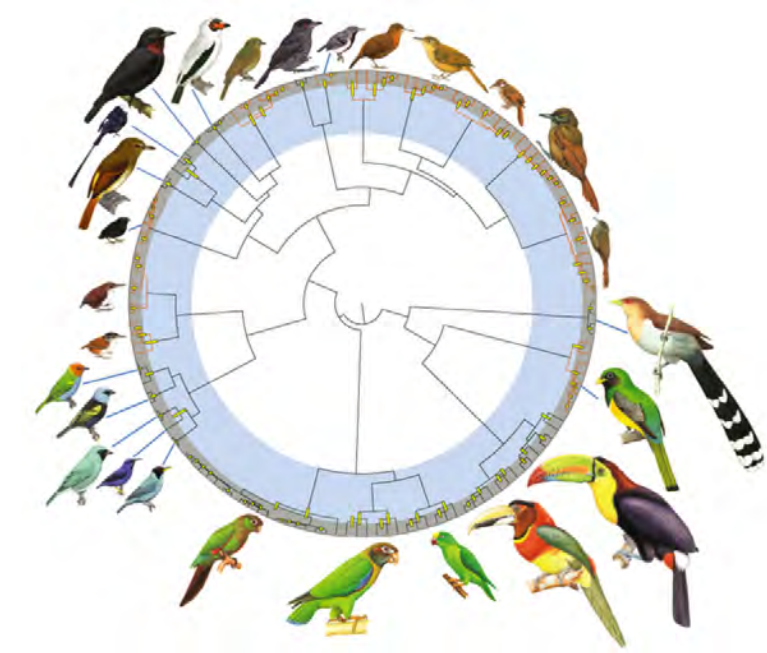
**by Robb Brumfield**



An international team of researchers led by **Museum of Natural Science** ornithologists is challenging a commonly held view that explains how so many species of birds came to inhabit the Neotropics, a rainforest-heavy area that extends from Mexico to the southernmost tip of South America. The research, published in the journal *Nature*, suggests that tropical bird speciation is not directly linked to geological and climate changes, as traditionally thought, but is driven by movements of birds across physical barriers such as mountains and rivers that occur long after the geological origins of those landscape features.

In the tropical lowland rainforests of Central and South America, bird speciation—the process by which new species are formed—is usually linked to changes in the Earth's landscape over time. When rivers change course, mountains rise, and continents drift, a once-continuous population can be divided and isolated into two or more smaller populations that eventually become different species. But an alternative model attributes Neotropical bird speciation to the movement of the animals across these geographical barriers, not necessarily linked to a change in landscape.

"The extraordinary diversity of birds in South America is often attributed to big changes in the landscape over geological time, but our study suggests that the exact opposite, landscape stability, is probably more important. If there are obstacles to dispersal in the landscape then the origin of many bird species in the Neotropics can be explained by two factors: the ability of birds to move through the landscape and the amount of evolutionary time the lineage has persisted in the landscape." said **Robb Brumfield**, leader of the study and Director of the Museum of Natural Science and Roy Paul Daniels Professor of Biological Sciences at Louisiana State University. "The Neotropics have more species of birds than any other region on Earth," said **Brian Smith**, lead author of the publication. Brian worked on the study as a postdoc in the Brumfield lab, and is now Assistant Curator of Ornithology at the American Museum of Natural History. "The unanswered question has been – how did this extraordinary bird diversity originate?"

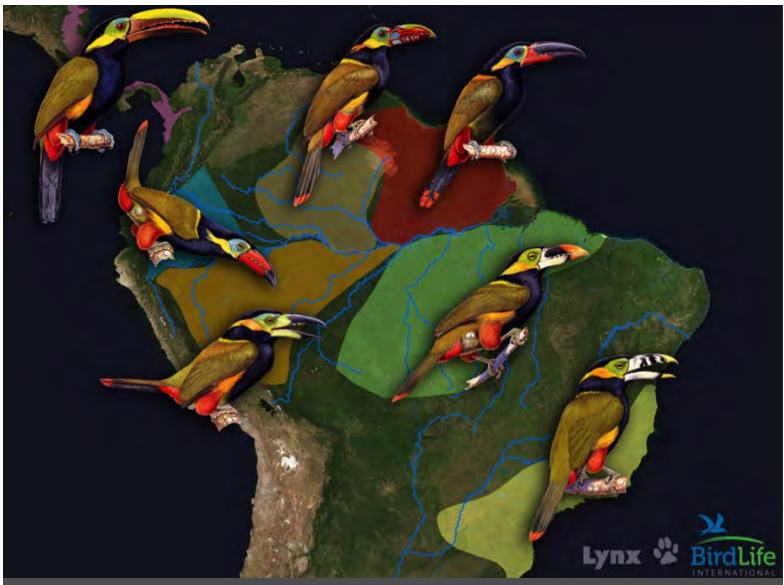


**Above:** Gene tree composed of 27 lineages of Neotropical birds, with species at tips inferred using a Bayesian coalescent model. An exemplar taxon for each lineage is illustrated. Yellow bars corre spond to the 95% highest posterior density for divergence times of each species. The Quaternary (2.6 Myr ago–present) and the Neo gene (23–2.6 Myr ago) periods are shaded in grey and light blue, respectively. Mean stem ages for 25 of the lineages occurred within the Neogene and for two lineages within the Quaternary. Out groups for each lineage are not included in the depicted phylogeny.

To examine these two models, the scientists collected genetic data from over 2,500 vouchered bird specimens (most from the Museum's **Collection of Genetic Resources**) and compared genetic patterns among a diverse array of bird lineages that occur in the Neotropics. Each of the 27 lineages analyzed contained populations situated on the opposite side of large dispersal barriers and, with genetic data, the scientists were able to estimate the time that the populations became isolated from one another. They found that most speciation occurred in the Pleistocene, which began about 2.6 million years ago, long after the origin of the Andes Mountains and the Amazonian river system, aligning with the alternative speciation model. Under this model, bird lineages with a longer occupation of the landscape have a higher likelihood of moving across geographical barriers and speciating.

"It may be only in birds that the genetic sampling is sufficiently dense to examine how interactions between the landscape and natural populations of birds influence the speciation process," said Brumfield. "The thousands of samples used in the study represent the culmination of over 30 years of field expeditions led by generations of LSU students and scientists, plus similar work done by ornithologists at other research collections. Biological collections such as these are priceless."

Co-authors on the study included Brumfield lab PhD student **Mike Harvey** and Brumfield lab alumni **John McCormack** (Assistant Professor and Curator, Occidental College), **Elizabeth Derryberry** (Assistant Professor, Tulane University), **Curt Burney** (Assistant Professor, US Air Force Academy), **Andrés Cuervo** (Postdoc, Tulane University), and two former MNS undergrads (**Sam Fields** and **Jesse Prejean**). Collaborators on the project included MNS alumnus **Alex Aleixo** (PhD 2002, Curator of Birds, Goeldi Museum) and new LSU Department of Biological Sciences Assistant Professor Brant Faircloth. Other institutions involved in this research included City College of New York, Museu Paraense Emílio Goeldi (Brazil), Universidad de los Andes (Colombia), Universidad Central de Venezuela, Colección Ornithológica Phelps, University of California Los Angeles, and the University of Georgia Athens.




**Above:** The geographic distributions of species in a lineage of rain forest toucanets are delineated by rivers, mountains, and dry habi tats. Bird images courtesy Lynx Edicions (Handbook of the Birds of the World), Barcelona.
**Top page 19:** Macaws flying over the rainforest canopy at dawn. The study found that bird lineages that inhabit the forest canopy, such as these macaws, accumulate fewer species over evolutionary time than do bird lineages that inhabit the forest understory. Image courtesy of Mike Hankey.

# Grand Isle Migratory Bird Celebration 2015

**by Donna L. Dittmann, Steve W. Cardiff, and Robb T. Brumfield**

This year's Grand Isle Migratory Bird Celebration (GIMBC) took place Friday 17 April-Sunday 19 April. As in the past, LSUMNS Collection Managers **Donna L. Dittmann** and **Steven W. Cardiff** assisted with bird watching field trips. This year, Donna and Steve co-led birding trips Friday and Saturday with Richard Martin (The Nature Conservancy) through the island's unique maritime forest. On Friday, Donna and Steve were also accompanied by co-leaders Michael Seymour, Dan O'Malley, Casey Wright (Louisiana Dept. of Wildlife & Fisheries), and Natalie Waters (Barataria-Terrebonne National Estuary Program). Despite the stormy wet weather on Saturday, these two to three hour walking tours remained popular. Participants on tours ranged from young to old and from birding beginners to seasoned veterans – all excited to see colorful spring songbird migrants that put down to rest or refuel in the island's woods and wooded yards. If migrants encounter inclement weather such as a frontal system crossing the Gulf of Mexico, many birds "fall out" at the first land to rest and recharge. This year's strong low-pressure system originating in the Pacific had the same effect. Also during the storm, an amazing number of shorebirds congregated on the

**Above:** Wind-sculpted live oak and hackberry trees dominate Grand Isle's unique "maritime forest." These woods provide critical habitat for migrant songbirds. Here, during a break in the rain, C. C. Lock wood (© www.cclockwood.com) captures some of the Celebration's visitors during one of the birding tours.

"Exxon (now Energy XXI) Fields" towards the east end of the island. A respectable 166 bird species were reported during the 3-day period.

**LSUMNS Director Robb T. Brumfield** hosted a LSUMNS table at the Grand Isle Multiplex on Saturday. Robb brought an assortment of bird taxidermy mounts and research specimens to show and discuss as a means to introduce visitors to LSUMNS and its mission.

Robb, as well as Donna and Steve, were able to interact with GIMBC participants, as well as other state organizations also assisting with the event, such as The Nature Conservancy, Louisiana Audubon/National Audubon Society, Barataria-Terrebonne National Estuary Program, Louisiana Department of Wildlife and Fisheries, Louisiana Master Naturalists, and Grand Isle Tourist Commission and Grand Isle Port Commission.

Information about the festival can be found here: http://grandisle.btnep.org/GrandIsleHome.aspx, and don't forget to join LSUMNS in 2016 at Grand Isle during next year's GIMBC.


**Above:** Shelter from the storm, the name and theme of this year's GIMBC poster and t-shirt design by Donna L. Dittmann, was designed to provoke visitors to think about how impor tant the maritime cheniers are to migrants during inclement weather. And, migrant birds did "fall out" during this year's Celebration to seek shelter from thunderstorms.

**Above:** A mixed species flock of shorebirds (© Donna L. Dittmann) seeking refuge at "Exxon Fields" during bad weather and high tide. This flock comprised of Short-billed and Long-billed dowitchers, and Dunlin.

**Page 21 Header:** Most visitors attend the celebration hoping to encounter color Neotropical migrants such as this male Summer Tanager (© Donna L. Dittmann). Taking a rest at the edge of the chenier woodland tired migrants can be very photogenic.

# *In Memoriam*

## Edwin O. Willis

Ed Willis passed away April 11, 2015 in Brazil after dealing with health issues. Ed was one of George Lowery Jr.'s first students at the LSUMNS and had come to be one of the greatest ornithologists to have worked in the Neotropics. His research centered on birds in Brazil, and the Scaled-back Antbird (*Willisornis poecilonota*) is named after him.

# LSUMNS Ornithology T-shirts!

ornithology
LOUISIANA STATE UNIVERSITY
Museum of Natural Science

This year, the LSUMNS Ornithology T-shirt will feature a Black Skimmer design (shown above) drawn by LSUMNS alum Curt Burney. If you would like to purchase a t-shirt email **Vivien Chua (vchua1@lsu.edu)** with the amount of shirts and size(s) you want. You should receive a confirmation email. Available sizes run from XS – 3XL. Shirts are $20 (includes the cost of shipping) and you can make checks out to the **LSU Foundation** with "Ornithology Student Support Fund" in the memo line.

**Mail checks to: LSU Museum of Natural Science, 119 Foster Hall, Baton Rouge, LA 70803**

**Thanks for your support!**

# MNS NEWS & UPDATES

## Mouw Award:

Congratulations to ornithology Ph.D. student, **Ryan Burner**, who received the Mouw Award ($200) for being an excellent graduate student! Ryan is interested in the ecology and distribution of Bornean forest bird communities.

## Delta Kappa Gamma Teacher Award:

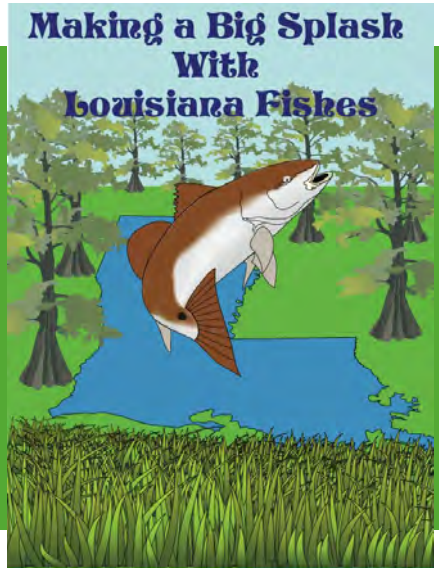
Congratulations to Curator of Vertebrate Paleontology, **Dr. Judith Schiebout** who was awarded the Delta Kappa Gamma Teacher Award from the Delta Kappa Gamma honorary teacher's society for being a member for 25 years! She was awarded at the convention of the Louisiana state organization of The Delta Kappa Gamma Society International hosted by Epsilon State at the Ramada Lafayette Convention Center March 13-15, 2015.

## Collections Study Grant:

Congratulations to ornithology Ph.D. student, **Vivien Chua,** who received the Collections Study Grant from the American Museum of Natural History valued at $855! Vivien's dissertation aims to shed light on the population relationships, biogeography, and ultimately the processes of evolutionary diversification in Bornean montane birds.

## Frank M. Chapman Grant & AOU Research Award:

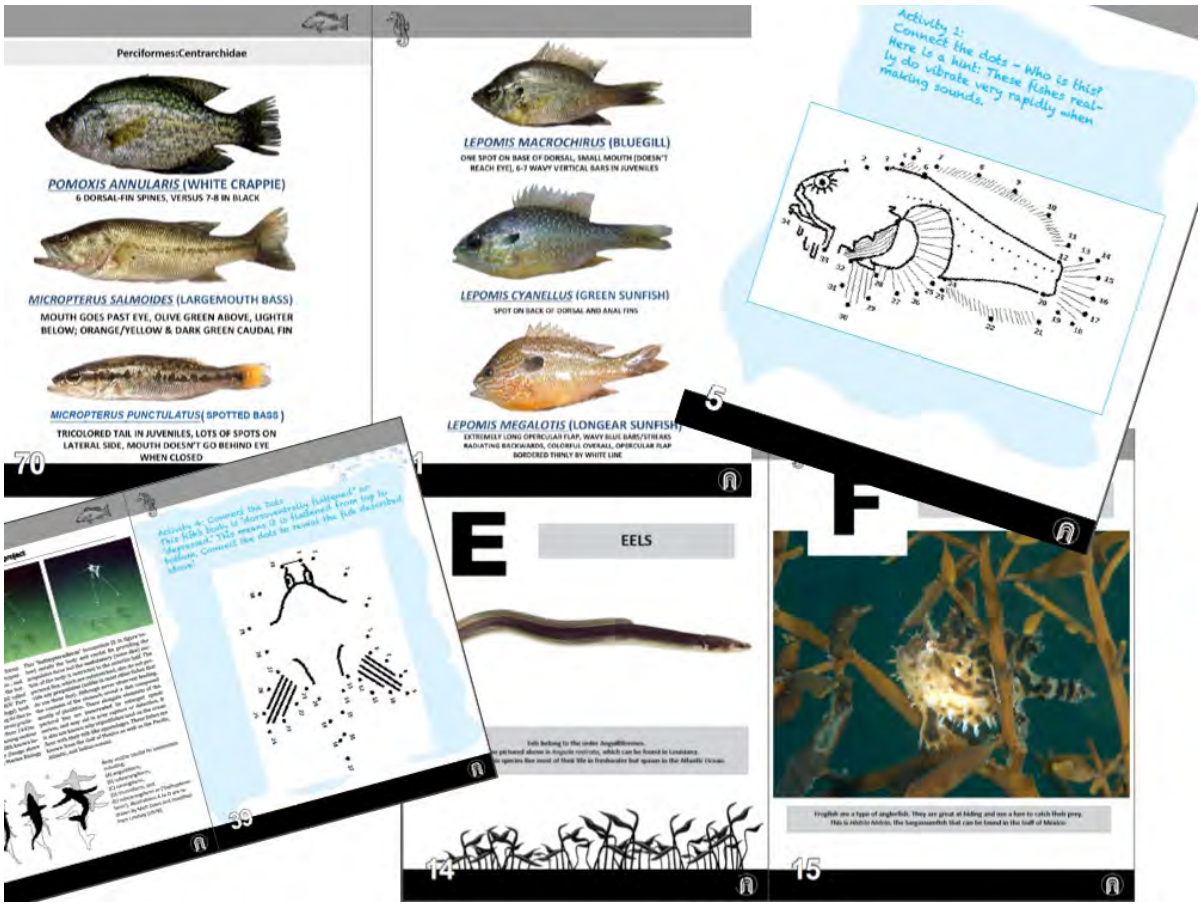
Congratulations to ornithology Ph.D. student, **Paul van Els**, who received the Frank M. Chapman Memorial Fund Grant from the American Museum of Natural History valued at $1700 and the AOU Research Award valued at $1800! Paul is interested in the systematics, ecology, life history, and conservation of neotropical birds.




# Fish Exhibit Book available at the MNS

## "A true guide to Louisiana fishes"

A fish exhibit book targeting students young and old has been published by the **Museum of Natural Science**. The book, "Making a Big Splash With Louisiana Fishes," was written by **Curators Prosanta Chakrabarty** and **Sophie Warny** with **Outreach Coordinator Valerie Derouen.** The book is a complement to a recently created fish exhibit at the MNS in Foster Hall, and includes nearly 100 pages of text, activities, stories, and a field guide to common fishes of Louisiana. It is available for free, at [http://sites01.lsu.edu/wp/mnspapers/]. It is also available for purchase (at cost) printed in color and bound for $20 by check written out to the **LSU Foundation** with "Occasional Papers" written in the memo field. Checks can be sent to "**LSU Museum of Natural Science, 119 Foster Hall, Baton Rouge, LA 70803."** Additional donations can be added to the check but please add "Ichthyology fund" in the memo field and the dollar amount going to each. To request a hard bound copy please email **prosanta@lsu.edu**.



# New Geology Exhibit now open in Howe Russell!

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Email your material to swarny@lsu.edu or mail to:

The LSU Museum of Natural Science
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In This Issue...



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