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Sea Monsters Unearthed



At NMNH, the team worked hard during installation Phase One!
L to R: Louis Jacobs, Diana Vineyard, Myria Perez, Yasmin Jackson, Wayne Furstenwerth, Tyler Nelson, Mike Polcyn, Bill Johnson

At 10:00 AM on Friday, November 9, 2018, the exhibit **Sea Monsters Unearthed: Life in Angola's Ancient Seas** opened at the Smithsonian Institution's National Museum of Natural History, the premier natural history museum in the US and most visited educational space in the world. Previous ISEM newsletters have provided progress reports during the planning and building stages. This newsletter digs deeper into how the exhibit was made and SMU's role in it.

Sea Monsters Unearthed is a unique cooperation between the Smithsonian and ISEM at SMU. ISEM's role is the result of an international cooperative study of the vertebrate fossils that inhabited the South Atlantic Ocean as it grew during the tectonic separation of Africa and South America. That program of cooperative study, which began in 2005 and is called Projecto PaleoAngola, links Universidade Agostinho Neto in Luanda, Angola, with SMU and the Universidade Nova de Lisboa, Portugal, and the Naturalis Biodiversity Center, in the Netherlands. The exhibit at the Smithsonian presents results of Projecto PaleoAngola obtained between 2005 and 2017, and reflects the group effort of over 100 SMU undergraduate students in the lab, one exhibit intern, two Engaged Learning fellows, and four PhD's awarded to SMU graduate students.

Sea Monsters Unearthed was planned, designed, and executed through a core team consisting of the Smithsonian's **Jill Johnson** (Project Manager), **Kim Moeller** (Designer), **Juliana Olsson** (Writer), **Jennifer Collins** (Education Specialist), and **Charles Chen** (Audiovisual Technologist). From ISEM at SMU, core team members included **Louis Jacobs** and **Mike Polcyn** (content specialists and collaborating curators), **Diana Vineyard** (content specialist; thought up the name for the exhibit), and **Myria Perez** (undergraduate intern). The two basic messages of the exhibit honed by the Smithsonian-SMU core team are that (1) changes in Earth through geologic time have major impacts on life, and (2) life in the past was at once both familiar and strange.

The exhibit is encapsulated in the title, *Sea Monsters Unearthed*. How did extinct marine lizards and other swimming reptiles, buried on the floor of the ocean, come to be found in the desert cliffs of Angola millions of years later? What can we learn about their past world? During the 2017 Projecto PaleoAngola field season, when planning the exhibit was nearly complete, a specific search was made for barnacle-covered stones of just the right size and touchable fragments of giant oysters, similar to those found in Dallas, to help tell the story in the exhibit. A five-minute looping video, **Unearthing Angola's Sea Monsters**, made in Dallas thanks to ISEM Trustee Ray Marr and video editor Edd Chappell, introduces the exhibit. In the video, SMU students **Reagan Long**, **Yasmin Jackson**, **Myria Perez**, and **Evan Snyder** share their stories of lab work through interviews provided by SMU.

Every item included in the exhibit passed through the laboratories in Heroy Hall. Each fossil was CT or digitally scanned and modelled. Missing parts were 3-D printed. Bones were molded and cast to recreate a quarry floor and some were sculpted to reconstruct skulls now placed next to the original bones in the exhibit. A 23 foot long mosasaur was built to show the skeleton in dynamic swimming mode using the same bones that came from the quarry floor. Metal armatures were designed, bent, and welded to fabricate mounts.

New methods to display bones were devised and tested. All of these activities were spear-headed and directed by ISEM Senior Fellow Mike Polcyn with a devoted team of volunteers from the Dallas Paleontological Society

Continued on back page.





L to R: Ryan Karakani, Sunday Eiselt, Jordan Hardin, Lauren King, Barrett Stout, Bonnie Etter, Rachel Burger, Christy Bednar



The **Archaeology Research Collections at SMU** are the result of excavations and survey under the direction of **Fred Wendorf** from 1958 to 1991. Overseen by **Associate Professor of Anthropology Sunday Eiselt**, the **Fred Wendorf Legacy Collections Project**, supported by ISEM, provides SMU undergraduates with comprehensive training in curation, digital preservation, and online exhibit production. Interns learn the laws and ethics that guide conservation of archaeological objects as well as consultation with Native American tribes.



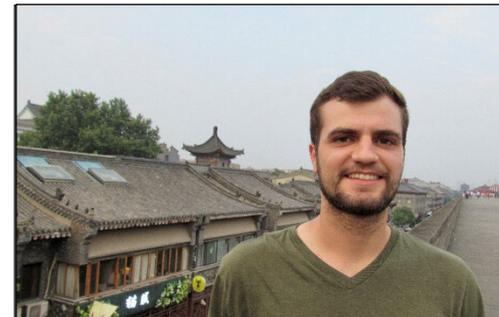
Myria Perez, SMU '18 and intern with *Sea Monsters Unearthed*, began her new job at the Perot Museum's brand new fossil lab!

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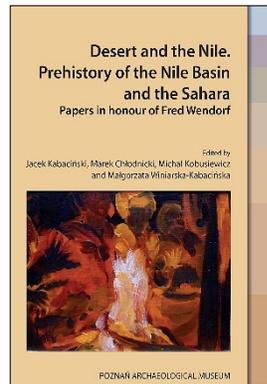
Kate Andrzejewski received support for her field work on paleosols, clay minerals, and stable isotopes to understand Cretaceous climates in North Texas. She also is giving a name to another new north Texas dinosaur – one that can be seen in the Perot Museum.



Senior **Harrison Schumann** is working with Professor of Earth Sciences, **Heather DeShon**, comparing induced and natural earthquakes to understand damage zone fault width associated with shale-gas production in the Fort Worth Basin.

PAPERS IN HONOR OF FRED WENDORF

A memorial volume titled **Desert and the Nile, Prehistory of the Nile Basin and the Sahara, Papers in Honour of Fred Wendorf** edited by Jacek Kabaciński, Marek Chłodnicki, Michał Kobusiewicz and Małgorzata Winiarska-Kabacińska brings together a collection of research results by Dr. Wendorf's friends and colleagues from his decades of archaeological exploration in Egypt and North Africa. Dr. Wendorf, a member of the US National Academy of Sciences, founded the Department of Anthropology at SMU.



Matt Clemens (second from left), shown here at Baylor Medical Center, CT scanning a dinosaur from Mansfield. He was supported by ISEM for his Ph.D. research, which included obtaining the first radiometric dates from the Eagle Ford Group in the Dallas area. At 95.28 million years old, this dinosaur is among the most precisely dated in North America.

JAMES E. BROOKS AWARD

Assistant Professor **Maryann R. Cairns**, is the recipient of the **2018 James E. Brooks Faculty Award**. Cairns is a cultural and environmental anthropologist. Her research focuses on the connections between infrastructure, environment, and human health in areas that face water pollution issues. She is currently PI of the NSF-funded MERA Investigation, a four year study focused on recreational water quality and human health impacts stemming from wastewater pollution and rapid coastal tourism infrastructure development in Costa Rica. She has further projects in Macedonia, Bolivia, and the US that center on issues of water and waste. Cairns is a Fellow of the Hunt Institute for Engineering and Humanity here at SMU. Her work has been published in several interdisciplinary journals, including *Environmental Science & Technology* and *World Development*. She actively includes both SMU-based and international undergraduate students in her research, alongside graduate students and postdoctoral scholars.



Marr Scholars Featured at Annual Celebration

Each year ISEM Marr Scholars and Dedman College Hamilton Scholars are featured in a celebration of their achievements. This year's honorees included geology majors **Myria Perez** and **Yasmine Jackson**, and geophysics major **Evan Snyder**. All three of these students worked diligently on the *Sea Monsters Unearthed* exhibit, and all star in the explanatory video looping in the exhibit. Thanks to ISEM Trustee Ray Marr for his continued support of students – and for producing the video in which they star!



Energy Roundtable participant, Meredith Faber, SMU '12.

As a graduate student interested in pursuing a career in the energy industry, **Meredith Faber** was a student participant in the 2010 ISEM Game Creek Ranch Energy Roundtable. She received her Ph.D. in 2012 and now she works for Noble Energy.



Resolution in Appreciation of W. Herbert Hunt

The Board of Trustees of ISEM at Southern Methodist University proudly notes the 13-year history of the **Game Creek Ranch Energy Roundtables** hosted by **Herbert and Nancy Hunt** in their unique, most hospitable, and welcoming manner. Many of the world's greatest leaders in energy attended these Roundtables and spread good messages about the results. Some Roundtables were attended by SMU students, and more broadly, the Roundtables supported numerous SMU students in their studies of Earth. The Board expresses deep appreciation to **Herbert Hunt** for the many contributions he has made to ISEM and especially for his contributions to the Energy Program through the Game Creek Ranch Energy Roundtables.



Provost **Steven Currall** hosted an alumni reception at The City Club of Washington to hear from SMU faculty and students about *Sea Monsters Unearthed*, including an exclusive conversation with the PaleoAngola team.



L to R: Nick Rosenau ('13), Zachary Frone ('15), Bonnie Jacobs, Myria Perez ('18), Jewel Lipps ('15), Betsy Alexander, Madie Jones ('16), Diana Vineyard ('95, '09)

FROM PROJECTO PALEOANGOLA TO SEA MONSTERS UNEARTHED

including **Bill Johnson, Wayne Furstenwerth, Rocky Manning, Larry Bell, and Dan Eley**. From the labs at SMU, items for display were driven to Washington, D.C., for installation. The first and larger of two installations was in August. Deadlines closed in. It was crunch time. Everyone involved pitched in with long hours. Then, the evening before shipping, ISEM held an open house in Heroy Hall 153 where specimens were set up for final examination to give friends and colleagues at SMU a sneak preview.

In both the August and October installations, former students **Tyler Nelson** and **Connor Flynn** came back to help. Tyler drove a truck loaded with fossil skulls from Dallas to Washington for the October installation. At the Smithsonian, the very professional and talented exhibits team fabricated cabinets, platforms, bracketing, installed background photomurals, graphics, art, and monitors for animations.

The fabric through which the story is woven is provided by artwork and animations. The visual impact and informative educational value of ISEM Trustee **Karen Carr's** artwork and **Ralph Gauer's** animations, all courtesy of **Karen Carr Studio, Inc.**, provides a striking thread of realism throughout the exhibit, bringing an essential backdrop for the specimens on display and a transformational museum learning experience as the mounted sea monster appears to swim into a mural. The Cretaceous sea is brought to life through animations projected into the mural populated with sea creatures.

ISEM at SMU is indeed honored by its role in this exhibit. This achievement simply could not have been obtained without the ISEM Board of Trustees and SMU. Projecto PaleoAngola partners around the globe and especially our hosts, the people of Angola, are greatly appreciated. The exhibit effort and Projecto PaleoAngola research on which it is based has been supported internationally by Sonangol E.P., LS Fimes, La Vida Foundation, Zilina Trust, the National Geographic Society, the Petroleum Research Fund of the American Chemical Society, The Saurus Institute, and ISEM at SMU.

Opening Day Exhibit Preview with Dean DiPiero and Angola Officials



Drs. Louis and Bonnie Jacobs with Dedman College Dean Thomas DiPiero and officials from The Republic of Angola Embassy



The SMU Team present an open house preview of exhibit components before transportation to D.C. L to R: Bill Johnson, Myria Perez, Mike Polcyn, Louis Jacobs, Diana Vineyard, Wayne Furstenwerth

Ambassador of the Republic of Angola, and Sant Director of the National Museum of Natural History, and ISEM will host a special reception celebrating the opening of the exhibit on December 17. The event is supported by the U.S.-Angola Chamber of Commerce in Washington, D.C.



SEE MORE! LEARN MORE!

All artwork and animations for *Sea Monsters Unearthed* were generously provided by ISEM Trustee Karen Carr and her Karen Carr Studio, Inc. Check out the exhibit animations at: http://www.karencarr.com/by_client.php?cl=87

Southern Methodist University: <https://www.smu.edu/AboutSMU/SeaMonstersUnearthed>

Smithsonian Magazine: <https://www.smithsonianmag.com/smithsonian-institution/prehistoric-angolan-sea-monsters-take-residence-natural-history-museum-180970774/>

Dallas Morning News: <https://www.dallasnews.com/news/science-medicine/2018/11/14/smu-dinosaur-hunters72-million-year-old-sea-monstergot-smithsonian>

Washington Post Science Magic Show: https://www.youtube.com/watch?v=m_b1IntFADU [youtube.com]

Voice of America: <https://www.voanews.com/a/fossils-from-angola-bring-strange-yet-familiar-ocean-into-view/4662712.html>



Chris Joyce (right), National Public Radio science correspondent, at SMU following *Sea Monsters Unearthed* from the lab to installation at the Smithsonian! Tune in here ... https://www.npr.org/people/2100689/christopher_joyce

