



FOSSIL CLUB OF LEE COUNTY

OCTOBER 2016

Letter from the President

By the time you read this our fossil collecting trip to the Mosaic phosphate mine may be history. I hope everyone who went had a good and also productive time! This is going to be the last of the mine trips, according to Mosaic. We are sorry about this era coming to an end. Really. But it is totally out of our control.

During these times that collecting opportunities are dwindling, it is important to widen your interest in other avenues of our hobby. Share what you have with others in the club and help broaden their education. Attend fossil shows and festivals and events such as the National Fossil day celebration and the upcoming November 5 and 6 Orlando fossil show. Attend the monthly meetings. Listen and learn from the speakers and events provided by the club. read and study about your fossils, utilizing the club library and bookstore. Etc.. There is much to stay interested in if you try.

I want to heap massive praise on Al Govin, our Secretary AND Treasurer!! He has spent numerous hours contacting, booking and coordinating this Mosaic field trip! He's taken care of the sign-up lists, notified alternates of availability, and taken care of all the ongoing paperwork required by Mosaic. Even after the trip is over he must send them a final list of attendees. So, folks, it's a lot of work to have us go on a collecting trip, but Al has steadfastly kept after it and got it all done. He also handles the meeting minutes, as well as the finances of the raffle, the club store, the refreshments, the speaker fees, the Fellowship Hall rental fees, the newsletter developer fees, the annual auction accounting, the annual fossil Festival accounting, the sales taxes, and anything else that comes up!! [Thank you Al!](#)

The recent National Fossil day celebration was very nice. besides myself and my wife Leslie, Lou Kiesling, Valerie Rahn and Robin Batt attended and helped out at the FCOLC table. Other members participating was Rick Batt; book signing, Gunther Lobisch; fossil display, Joe Larkin; dealer, Zack (and Dave) Deyo; speaker, and Pam Plummer; organizer. We had a nice representation and everyone had a great time.

This month I will do fossil ID presentation. Next month's speaker is not yet confirmed, December meeting is the annual Christmas pot luck dinner. January's speaker will be Walter Stein. The Fossil Festival will be Feb 18. The February speaker will be Dr. Gary Schmeltz. The March meeting will be the annual fossil auction.

Our February 18 Fossil Festival is gaining steam! Mike Cox and Jim Manderfield are the co-

Minutes FCOLC Meeting 9/15/16

Louis Stieffel called meeting to order.

Louis introduced newest members.

44 members present.

Louis discussed FCOLC library and it's rules.

National Fossil Day is October 1st, 2016.

NFD volunteers will get free admission.

Pam Plumber discussed National Fossil Day.

Louis Stieffel showed flyer which is available to anyone for the Orlando Fossil Show.

FCOLC fossil Festival will be February 18th, 2017. Michael Cox & Jim Manderfield are co-chairman for the fossil festival. Volunteers are still needed for various things.

Water levels on rivers and creeks are still way to high at this time to do any hunting.

Al Govin discussed the Mosaic Trip and the requirements for the members.

Louis announced that Mike Siciliano is recovering from a heart attack and a card is available for signing by all members.

Al Govin announced anyone not having a badge please see him as badges are up to date.

Anyone not getting the newsletters please see Al Govin.

November meeting will be at the church as usual as there are no conflicts like last year.

Bob Fuqua presented a great slide show about the Geologic history of the world and Florida.

Door prizes were awarded.

Snack break was held with snacks provided by Valerie Rahn & Louis Kiesling.

When meeting reopened show-n-tell was held.

Louis reminded members that they need to renew their fossil permits and new members must get a permit. Permits will be required for all club trips.

Dollar raffle was held

Meeting adjourned.

Minutes by Secretary/Treasurer Al Govin

OFFICERS

Louis Stieffel, President
239-851-7499, cape187@earthlink.net
Michael Siciliano, Vice President
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Al Govin, Secretary, Treasurer
239-910-2339

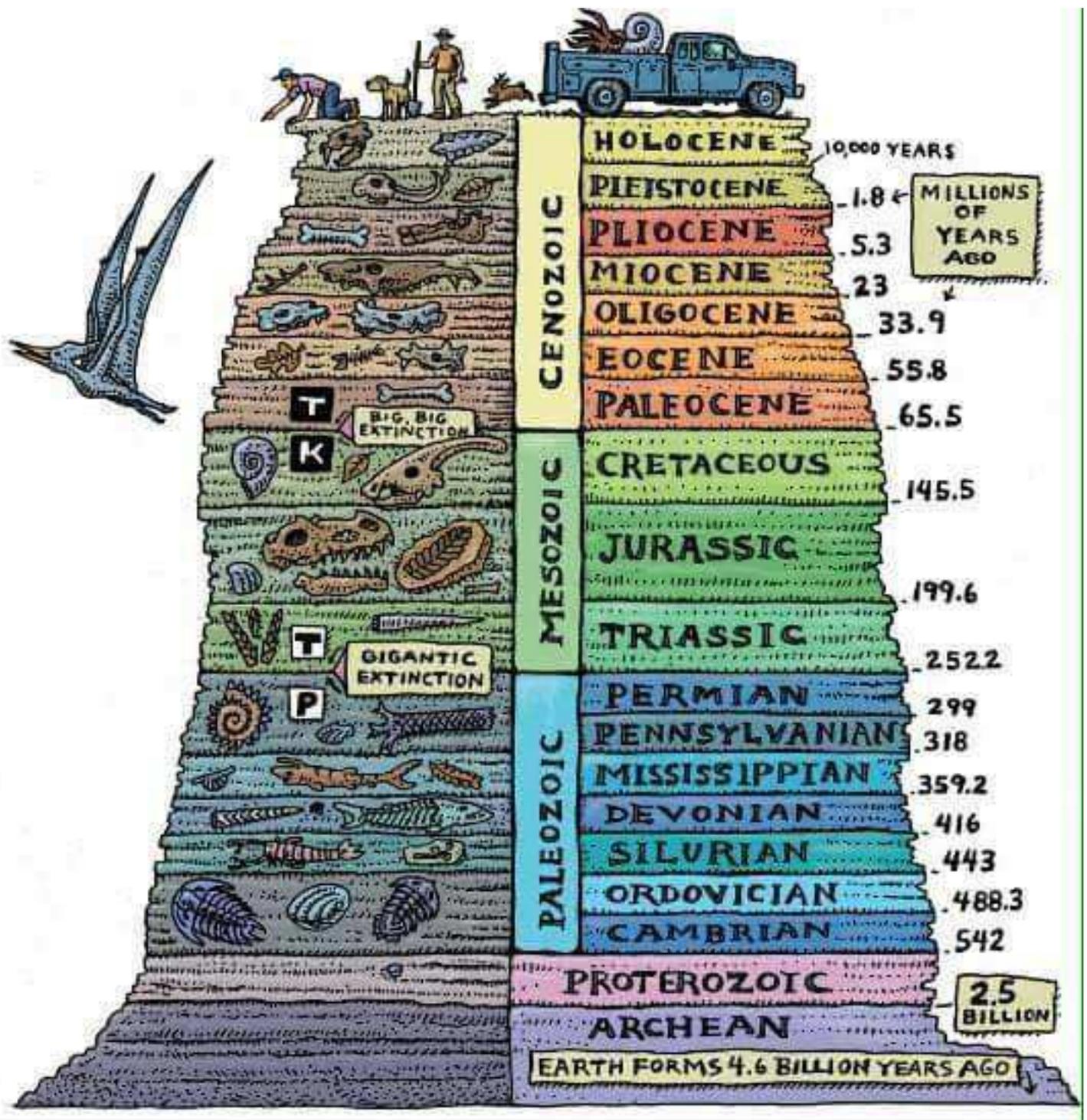
DIRECTORS

Dean Hart.....941-979-8217
Dave Seehaver
Jeanne Seehaver
Jim Manderfield
Dr. John Taraska
Leslie Stieffel

COMMITTEES

Al Govin, Club Trips Director
Curt Klug, Web Master
Cherie Neat, Newsletter Developer
Al Govin, Badges, Membership, Trips
Cindy Bateman, Librarian
Dave and Jeanne Seehaver, Merchandise
Dean Hart, Refreshment
Michael Siciliano, Raffle and Dive Trips
Mike Cox, Jim Manderfield-co-chairmen of the 2017
Fossil festival
Louis Stieffel, Auctioneer, FOSSIL project
representative, Newsletter editor, Speakers,
Vertebrate Education

Meetings are held on the third Thursday of the month, at Zion Lutheran Church Fellowship Hall.



Websites & Locations of Interest

Fossil Club of Lee County: www.fcolc.com

FCOLC Fossil Club of Lee County, Inc. c/o AL GOVIN
TREASURER
3584 MIDDLETOWN ST. PORT CHARLOTTE, FLORIDA 33952

The FCOLC website is a source for links to Fossil websites of interest, archived monthly club newsletters, details on club meetings and officers.

Museum of Natural History @ Gainesville www.flmnh.ufl.edu/

The Fossil Project www.myFOSSIL.org

Randell Research Center PO Box 608, Pineland, FL www.flmnh.ufl.edu/RRC/

Smithsonian Natural History Museum www.mnh.si.edu

Southwest Florida Museum of History 2031 Jackson St., Fort Myers www.MUSEUMofHISTORY.org

The Bailey-Matthews Shell Museum, 3075 Sanibel-Captiva Rd, Sanibel, FL www.shellmuseum.org

Cracker Museum at Pioneer Park in Zolfo Springs, FL Tel 863.735.0119

www.hardeecounty.net/crackertrailmuseum/about.html

Cape Coral Friends of Wildlife Burrowing Owls

www.ccfriendsofwildlife.org

Calusa Nature Center and Planetarium 3450 Ortiz Av, Fort Myers Tel 239-275-3435

www.calusanature.org

Imaginarium 2000 Cranford Ave, Fort Myers

www.i-sci.org

Florida Fossil Clubs

Southwest Florida Fossil Club

www.southwestfloridafossilclub.com

Tampa Bay Fossil Club

www.tampabayfossilclub.com

Orlando Fossil Club

www.floridafossilhunters.com

The Fossil Forum

www.thefossilforum.com/index.php

Fossil Treasures of Florida

www.fossil-treasures-of-florida.com

Florida Paleontological Society

<http://floridapaleosociety.com/>

Collecting Vertebrate Fossils on Florida state lands **requires** a permit. A fossil hunting permit is also part of being an ethical Florida fossil hunter.

Florida Vertebrate **Fossil Permit** <http://flmnh.ufl.edu/natsci/vertpaleo/vppermit.htm>

Peace River Water Levels

<http://waterdata.usgs.gov/fl/nwis/rt>

Picking Up Isolated Native American Artifacts www.flheritage.com/news/faq.cfm

Aimeee's Corner!!

Digging for Dinosaurs

I've been fortunate enough for the last couple of years to be able to indulge my fossil hobby by making modest trips around the USA, so when I received an invitation to dig for dinosaurs in Wyoming in July, I jumped at the chance. The only catch was that the invitation didn't cover anything but the arrangements; the cost was all on me and digging for dinosaurs ain't cheap. Air fare, rental car, and motel room added up but the biggest cost was the dig fee. I have the "in for a penny, in for a pound" frame of mind but I could only justify 2 day's worth of guided digging. It was for the best because digging for dinosaurs ain't easy, either!

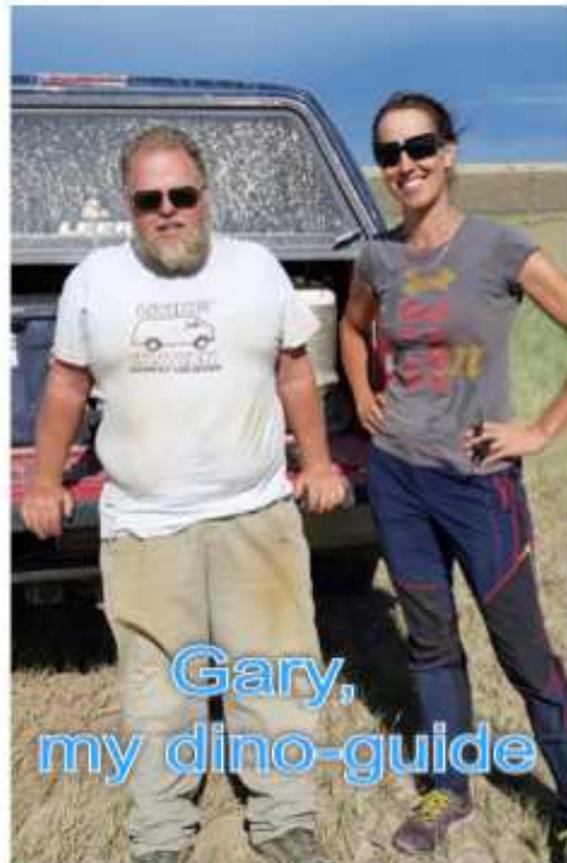
All that being said, I'm very glad I did it. My dig guide, Gary, was awesome. It's a tall order to expect to find dinosaur bones when you only have 2 days to dig but Gary was up to the task. He took me and my digging partner, Shelly, to a productive location, supplied us with tools, shelter, water, and most importantly, his vast knowledge of the area and our quarry, and coached us through the process.

I'm used to standing in the cool water of the Peace River, slinging shovelfuls of gravel hither and yon, so sprawling on the ground in the heat of the Wyoming badlands in July with a dental pick and a paint brush was a shocking change of pace.

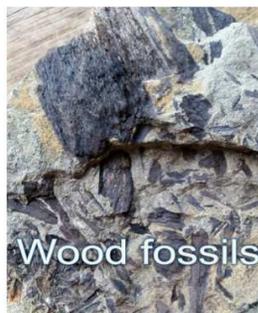
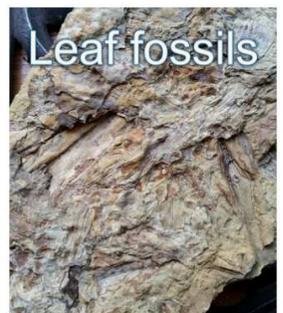
Still, it was fascinating. We were digging in the Lance Formation in an area that dates to the late Cretaceous (about 65 ma) and though the digging was painfully slow, I was amazed at the number of bones and teeth I found. Most of the bones were anonymous fragments but I managed to uncover a triceratops tail vertebra and a hadrosaur vertebra as well as numerous pieces of triceratops frill. I found a number of small teeth, mainly hadrosaur and triceratops, which surprised me until Gary explained that hadrosaurs had hundreds of small teeth in their jaws and triceratops, the dominant herbivore of that time period, replaced their teeth often throughout their life.

My greatest find was a single, beautiful tyrannosaurus rex tooth, about 1.25" long; solid with gorgeous serrations, it fires my imagination every time I look at it and it was well worth the cost and the effort.

If you'd like to read a more detailed account of my Wyoming dinosaur adventure, please check out my blog at www.zookeeperfossils.blogspot.com.



Aimeee's Corner!!



Happy Halloween



Mannisota Beach
sidewalk!!

This shows that fossil
shark teeth are waiting
for you at the beach!

These are at the
pavilion. But, you must
find your own,
loose ones,
in the water!



Tilly bone

We frequently find weird fish bones and they almost always stump the finder. We sometimes mistakenly call them "ballast bones". Oftentimes we call them "Tilly Bones", or "swollen vertebrae", but most folks don't know why. Well, they are not exactly a vertebra. These are called "Tilly Bones" after the researcher, Tilly Edinger, who studied them. They are parts of spines connected to the vertebrae! Although still common today, we frequently find them as fossils.

I have many different ones from different species. I show some of them in these two pictures. (Louis)

A Google search turned up some information responding to a question of a snapper recently caught showing these bones on the skeleton: This answer has been selected and edited by New Scientist staff

The apparent deformities on the backbone of the snapper are known as fish hyperostoses. They are not uncommon in older specimens of the snapper *Sparus auratus* and are also reported in 92 other species of marine bony fish in 22 families. Hyperostoses take the form of regular, cellular swellings in otherwise thin, acellular bone, such as vertebral spines or the thin bones of the skull. In each species they generally occur in the same specific places.

The Australian old-man snapper that the questioner enjoyed so much is characterised by a bony knob or casque on the back of the skull, which is another example of hyperostosis. Fish hyperostoses also occur as fossils (sometimes called fossil brains by collectors), and have been the subject of research for a long time. They are often known as "Tilly bones" by palaeontologists, after the palaeoneurologist Tilly Edinger (1897-1967), who made them a special interest.

Hyperostoses do not seem to inconvenience the fish and are apparently not pathological, but their purpose is uncertain. However, because they occur only in tropical and subtropical marine fish (plus a few temperate species such as the snapper), and a couple of species of freshwater fish in hypersaline environments, it is thought that they may play some part in calcium regulation.

Neville Pledge, South Australian Museum, Adelaide, Australia



FOSSIL PROJECT NEWS!!

Hello, everybody!

As announced on FOSSIL Project social media accounts, we are excited to begin a free webinar series on the fundamentals of fossils. Our first webinar is this coming Wednesday, August 31, from 7-8pm Eastern. The speaker will be Mr. Jayson Kowinsky, a high school physics teacher from Pittsburgh, PA, who also happens to be an incredible amateur paleontologist and owner/operator at www.fossilguy.com. The title of his talk is "Fossil Collecting: Where, How, & When to Find Fossils."

In partnership with the Paleontological Society and with technical support from iDigBio, the FOSSIL Project is thrilled to be hosting a four-part webinar series throughout Fall 2016 (for future dates and speakers, see flyer inserted below & attached). All are welcome to attend these free webinars. Just connect at <http://idigbio.adobeconnect.com/fossil-webinars/>. Connect time will begin at 6:45pm ET, allowing for 15 minutes to address any technical problems. If you are unfamiliar with AdobeConnect online conferencing software, don't worry! All you need is an internet connection and the webinar link above. There is no sign-up or installation. (Unless you wish to use a mobile device – then you will have to download the AdobeConnect app for either Android or iPhone/iPad.) And here is a helpful "[quick start guide](#)" for connecting!

Please note that Continuing Education Units from the University of Florida are available for educators who attend all 4 webinars. To get CEUs, please register through the UF Conference Department at <http://reg.conferences.dce.ufl.edu/SSP/1400056716>.

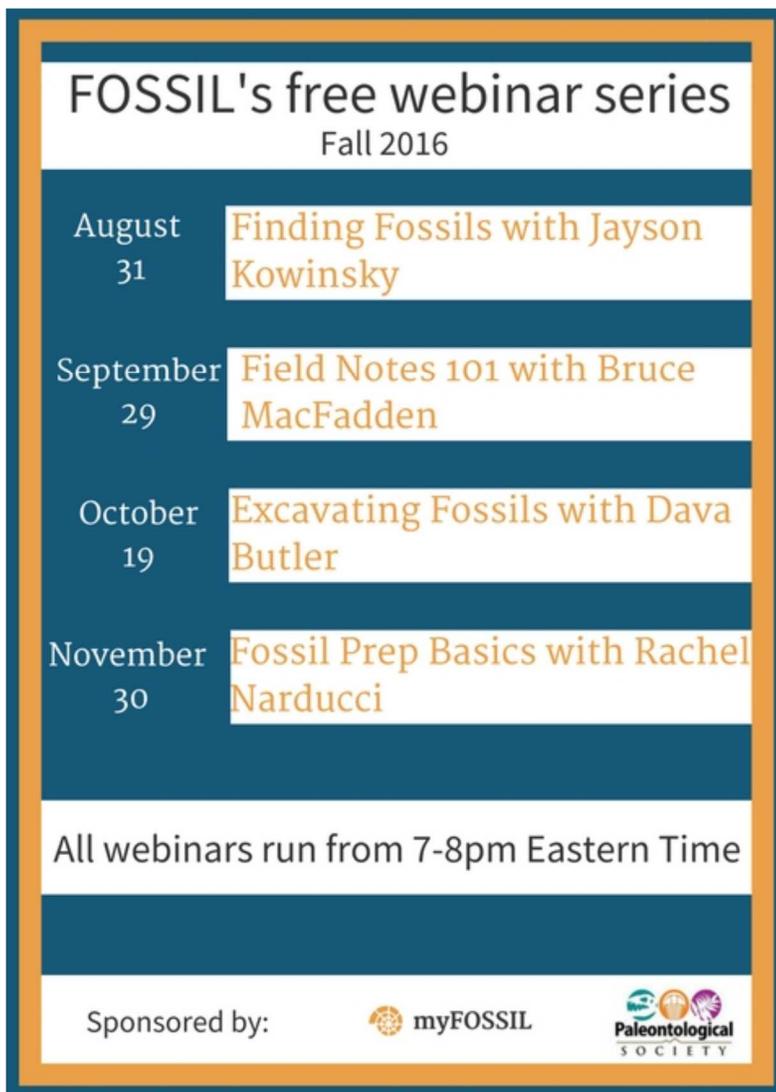
Also, if you haven't yet, please consider joining the myFOSSIL community website at <http://community.myfossil.org>. As a member of myFOSSIL, you can view the recorded webinars at a later time, engage with other members in the [dedicated webinar forum](#), and – best of all – receive a certificate of completion for attending all 4 webinars.

Fossil club/society officers, please feel free to forward this email to your members or include this info in your newsletters and bulletins.

Please contact me, Eleanor Gardner, at fossil@flmnh.ufl.edu with any questions or concerns.

Best,
Eleanor

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FOSSIL Project Coordinator
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The flyer is titled "FOSSIL's free webinar series" and "Fall 2016". It lists four webinars:

Date	Topic and Speaker
August 31	Finding Fossils with Jayson Kowinsky
September 29	Field Notes 101 with Bruce MacFadden
October 19	Excavating Fossils with Dava Butler
November 30	Fossil Prep Basics with Rachel Narducci

Below the list, it states "All webinars run from 7-8pm Eastern Time". At the bottom, it says "Sponsored by:" followed by logos for myFOSSIL and the Paleontological Society.

National Fossil Day!!

National Fossil day was celebrated at the South Florida Museum in Bradenton on October 1.

The FCOLC had some display tables set up and information about the club as well as fossils displayed to educate the attendees. Lou Kiesling and Valerie Rahn joined board member Leslie Stieffel and president Louis Stieffel in presenting the club to the public.

New members, but very enthusiastic, Valerie and Lou were very helpful and friendly, and taught people about the fossils we showed as well as about our club. Leslie, as usual, mostly stayed at the table throughout the day, while her husband, Louis, spent some time mingling among the other exhibits! :-)

We all enjoyed the day and want to thank not only the museum, but also Paul Roth and Pam Plummer for all their hard work organizing a great National fossil day celebration.



FCOLC \$1 raffle!!

Each month we have a table in front loaded with fossils, etc., donated by members. It's a small fundraiser for the club as well as an opportunity for members to take a chance with \$1 raffle tickets to win some of the prizes. well, at the September meeting an unusual number of 'winners' was won by Kai Wilder! 24!! WOW! Congratulations! A ready-made collection!

You never know! But, you can't win if you don't play!

And, if you have extra fossils, consider contributing to the raffle! We ALL win!



Refreshments

We thank Lou Kiesling and Valerie Rahn for providing last month's meeting refreshments. And welcome Dave and Jeanne Seehaver this month (October) in providing refreshments. Cindy Bateman has volunteered for November! Thanks to all of you guys for stepping up and doing this.

We rely on our members to provide refreshments each month, and offer to reimburse up to \$40 if receipts are provided.

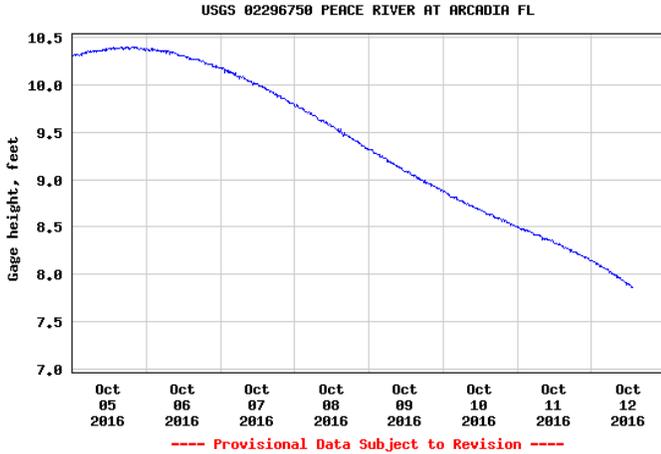
It is not a 'dinner meeting". Simple snacks and liquids are all that's needed. The club has two coolers we keep in the fellowship hall.

If someone volunteers, with the amount of members we have attending meetings, that person should be good for a couple of years or more before being needed again. So, let Dean Hart, the refreshment coordinator know if you're interested! Thanks again.

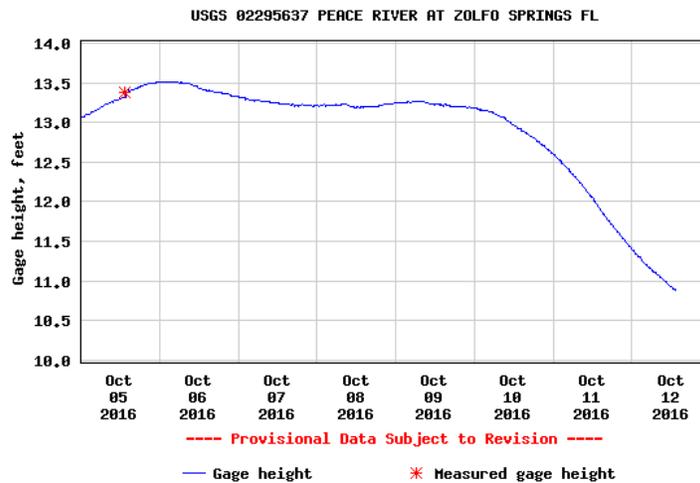
RIVER WATER LEVELS!!

The water levels are still too high. However, without another heavy rain event like a hurricane, the levels will continue to drop and be able to access for fossil hunting in another month or so.

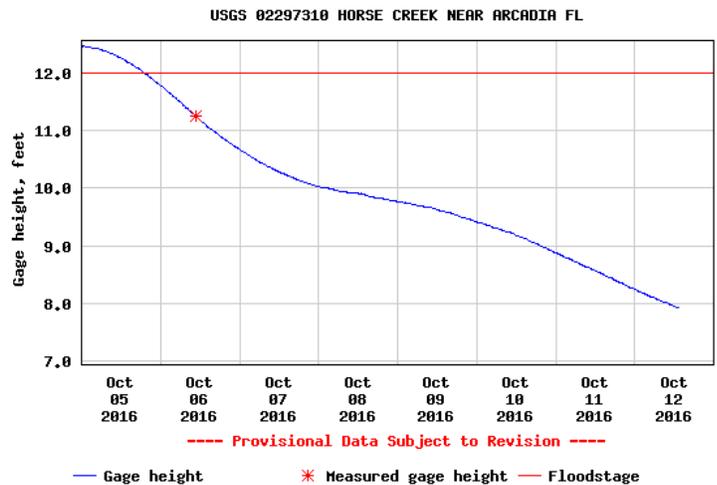
The peace at Zolfo needs to be about 5'. It's now at almost 11'.



The Peace at Arcadia needs to be about 2'. It is now at 8'



Levels at Horse Creek needs to about 1 1/2'. It's presently at 8'.



Meet Granddad: Weird, Ancient Reptile Gave Rise to Mammals

By Laura Geggel, Senior Writer | October 5, 2016 02:25pm ET



An artistic interpretation of what the newly identified cynodont *Bonacynodon schultzi* looked like during its lifetime about 235 million years ago during the Triassic.

Credit: Jorge Blanco

Two weird, mammal-like reptiles that sort of looked like scaly rats, each smaller than a loaf of bread, roamed ancient Brazil about 235 million years ago, likely dining on insects the predators snagged with their pointy teeth, a new study finds.

The analysis of two newfound species of cynodont, a group that gave rise to all living mammals, sheds light on how mammals developed from these late Triassic creatures, the researchers said.

"These new fossils help [us] understand in more detail the evolution of pre-mammalian forms that gave rise to the group of mammals, in which we humans (*Homo sapiens*) are included," the study's lead author, Agustín Martinelli, a paleontologist at the Federal University of Rio Grande do Sul in Brazil, told Live Science in an email. [\[In Photos: Mammals Through Time\]](#)

Cynodonts predate dinosaurs, first appearing in the fossil record about 260 million years ago, during the Permian period. Their descendants include marsupial and placental mammals (the furry creatures usually thought of as mammals), as well as monotremes — mammals that lay eggs instead of giving birth to live young, such as [the platypus](#) and echidna, the researchers said.

However, the early cynodonts that lived during the late Permian and the early Triassic periods weren't mammals, but rather reptiles with mammal-like skulls and jaws, the researchers said.

The specimen of one of the [newfound cynodont species](#) has been resting in the collection department at the Museum of Earth Sciences in Rio de Janeiro, Brazil since 1946. That's when L.I. Price, a Brazilian paleontologist, found the two skulls and two jaws in rock dating to between 237 million and 235 million years ago in the Santa Cruz do Sul municipality of Brazil's southern state of Rio Grande do Sul.

Those specimens belong to a small animal of about 12 inches (30 centimeters) in length, with unusually large, protruding upper-canine teeth suggesting it [ate insects](#). The creature's anatomy indicates that it is part of an extinct family of carnivorous cynodonts called Probainognathidae.

In fact, the newfound species is likely related to *Probainognathus jenseni*, a species discovered in Triassic-age rocks of the La Rioja province in western Argentina. But the researchers said the newly discovered creature is different enough to justify having its own genus and species: *Bonacynodon schultzi*. The name honors two eminent paleontologists, José Bonaparte from Argentina and Cesar Schultz from Brazil, both of whom spent their lives studying the Triassic fossils of South America.

The other newfound cynodont species, also discovered in the state of Rio Grande do Sul, was identified from fewer remains — just a [jaw with teeth](#), the researchers said. The scientists dubbed it *Santacruzgnathus abdalai*, in honor of Fernando Abdala, an Argentinian paleontologist who studies South American and African cynodonts, the researchers said.

S. abdalai was about half the size of *B. schultzi*, measuring only 6 inches (15 cm) in length. The shape and dentition of *S. abdalai*'s teeth are "reminiscent of those present in early mammals," Martinelli said.

However, both cynodonts lived millions of years before the appearance of the first known mammal: a [shrew-like creature](#) that lived about 160 million years ago in what is now China, experts told Live Science in 2011.

The new study was published online today (Oct. 5) in the [journal PLOS ONE](#).

Original article on [Live Science](#).

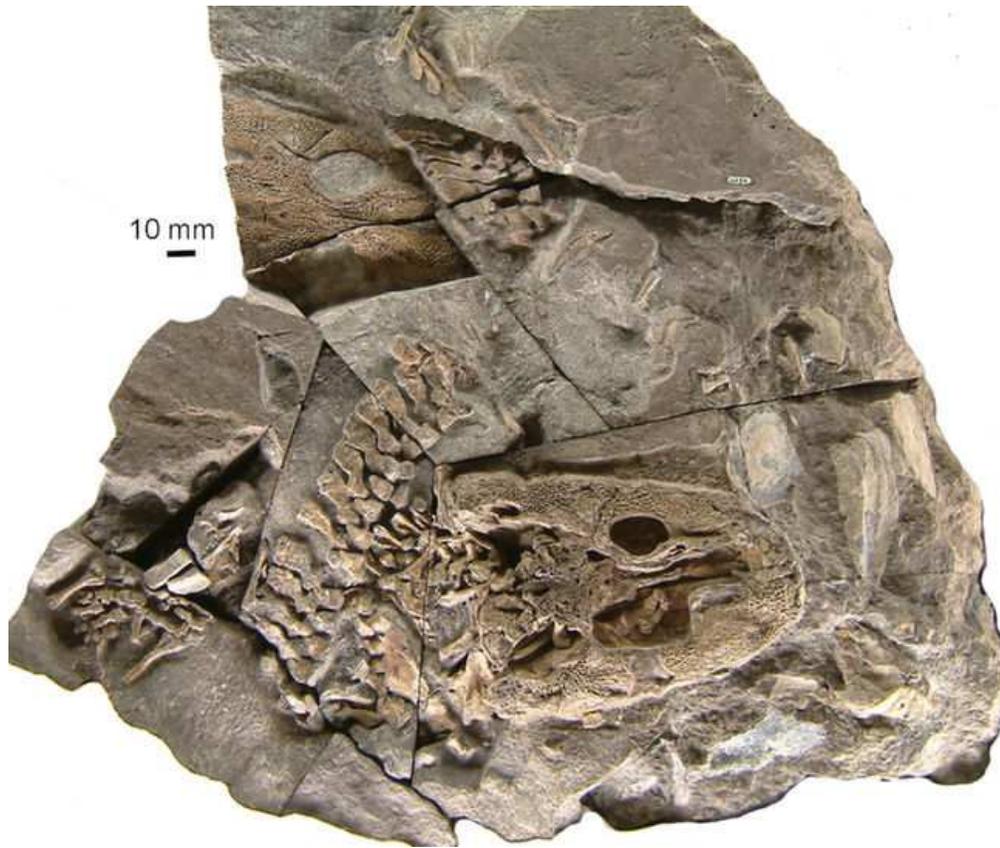
VENICE DIVING!!

After hurricane Hermine went through the gulf on the way to north Florida, it stirred up the fossil beds at Venice! The Diving, after it cleared up, was very productive. This is a facebook picture of one guy's finds, Ben Schultz, in one day of diving off of Captain Mike Konecik's boat. Who said there's no fossil hunting during the summer?



Ancient 4-Limbed Creatures Were Too Young for Trip Ashore

By Laura Geggel, Senior Writer | September 7, 2016 06:35pm ET



The Acanthostega fossil revealed that the animal was in an immature phase, and was still a juvenile at its time of death.

Credit: Jennifer Clack

Some 360 million years ago, a school of juvenile lizard-like creatures — with no parental chaperones around — perished in a watery grave in what is now Greenland. That's the story researchers have pieced together from fossils of some of the first four-limbed vertebrates (called tetrapods) to call Earth home.

The finding took researchers by surprise, as they thought that the fossil specimens of the animal, known as Acanthostega, belonged to water-dwelling adults, not young'uns. The discovery raises the possibility that

once they matured, these creatures moved to land, but fossil evidence of adults is needed to say so for sure, the researchers said.

Regardless, the discovery is painting a more detailed picture of Acanthostega. Until now, little was known about the life cycle of these early tetrapods, which date to the Devonian period (419 million to 359 million years ago). Some early tetrapods were the first creatures to venture from water onto land, the researchers said. [Top 10 Useless Limbs (and Other Vestigial Organs)]

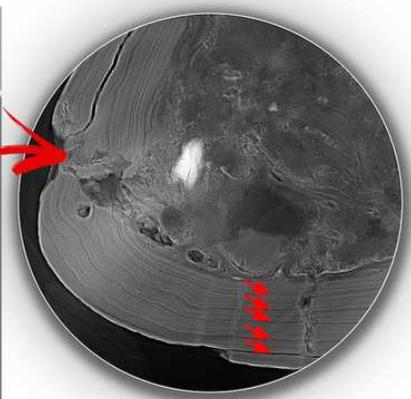
"Understanding the life history of these early tetrapods, which are iconic transitional forms between fishes and land animals, is of great interest for studying the tetrapod move to land," said lead study researcher Sophie Sanchez, who researches the bones of fossil vertebrates at Uppsala University in Sweden.

To investigate, Sanchez and her colleagues turned to dozens of Acanthostega fossils, which study co-author Jenny Clack, an emeritus professor of vertebrate paleontology at the University of Cambridge in England, found in the remains of an ancient stream in East Greenland in 1987.

When Clack discovered the fossils, researchers assumed that the ancient four-legged creatures were adults.

The new team used high-resolution synchrotron X-ray scans to study the upper arm bones of the Acanthostega fossils. The X-rays taken are similar to ones that doctors take in hospitals, only more powerful, Sanchez said.

"The difference is that the fossils are dense like rock, so we need very powerful X-rays to go through them and get access to the microstructure of the bone," Sanchez told Live Science in an email. "We were able to look at submicron resolution and visualize the cell and blood-vessel spaces."



A scan of the upper arm bones of the *Acanthostega* indicated that the animal was still quite young when it died, as the growth rings within the fossil (see red arrows) allowed researchers to assess its age.

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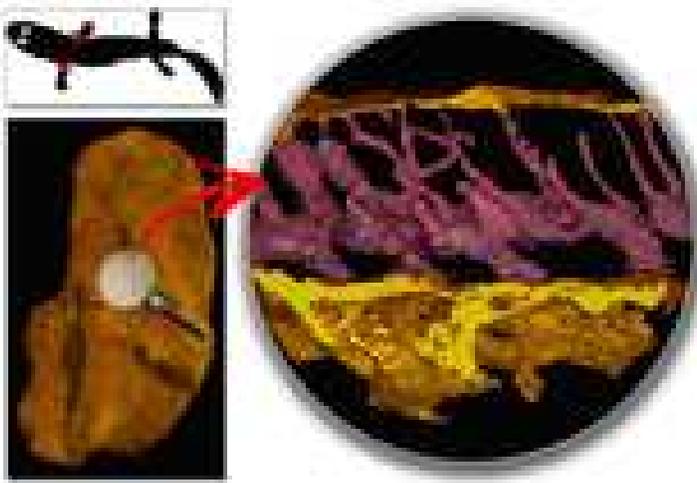
Credit: Sophie Sanchez, Uppsala University and ESRF

The X-rays revealed how *Acanthostega*'s blood vessels were organized, which helped the researchers understand the prehistoric animals' biology, physiology and metabolism, Sanchez said.

Furthermore, the X-rays showed the growth rings within the animals' bones. By counting the rings, which are like the rings of a tree, "we could assess the age and the growth rate of these individuals of *Acanthostega*," she said.

No adults here

Surprisingly, the scans suggested that the *Acanthostega* specimens represented water-dwelling juveniles that were about 6 years or older when they perished, Sanchez said.



A 3D scan of the bone showing blood vessel cavities (in pink) that provide clues about the metabolism of the 360-million-year-old *Acanthostega*.

A 3D scan of the bone showing blood vessel cavities (in pink) that provide clues about the metabolism of the 360-million-year-old *Acanthostega*.

Credit: Sophie Sanchez, Uppsala University and ESRF

"Their growth had not yet begun to slow down as it does at sexual maturity," she said. "In addition, we showed that *Acanthostega*'s foreleg remained cartilaginous until late during its development. In contrast to bone, cartilage is a non-mineralized tissue, elastic and far too weak to allow the fore-

legs to sustain the weight of the animal's body out of the water."

That these creatures still had cartilage suggests that "the *Acanthostega* mass-death deposit represents a school of aquatic juveniles that included few or no adults," study senior author Per Ahlberg, a researcher at the Uppsala Centre for Evolution and Genomics, said in a statement.

What's more, the *Acanthostega* fossils still had gills, another sign that they had not yet reached maturity. In living land-dwelling amphibians, larvae metamorphose in the water, and leave only after they have lost their gills.

But it's difficult to say whether *Acanthostega* ventured onto land once it matured. Without an adult *Acanthostega* specimen, it's impossible to say whether they were aquatic or terrestrial animals, Sanchez said.

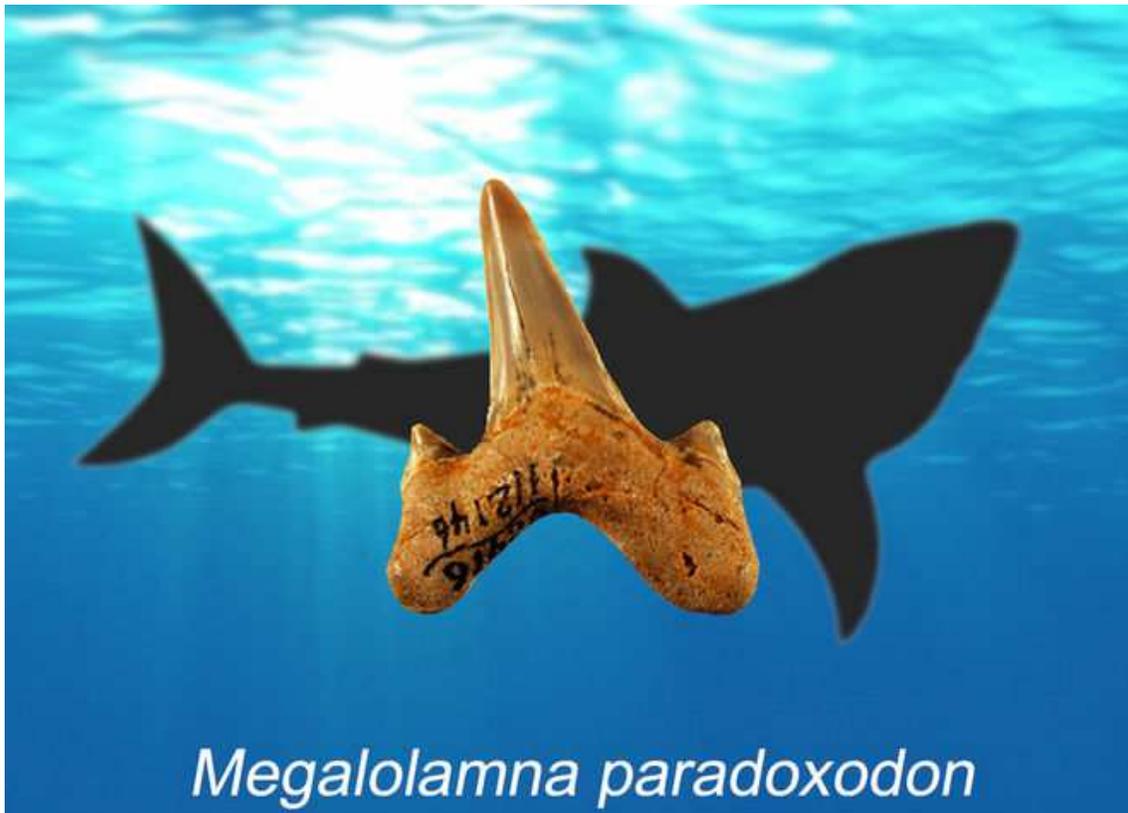
"This means that we need to find the adult fossils before being able to build up theories on the tetrapod move to land," she said.

The study was published online today (Sept. 7) in the journal *Nature*.

Original article on [Live Science](#).

Extinct 12-Foot-Long Shark Is Related to Ginormous Megalodon

By Laura Geggel, Senior Writer | October 3, 2016 07:15am ET



Based on its nearly 2-inch-long teeth, *Megalolamna paradoxodon* likely measured about 12 feet long.

Credit: Kenshu Shimada

About 20 million years ago, a car-size shark swam along the ancient coastlines of the Atlantic and Pacific oceans, hunting for medium-size fish with its pointy teeth, a new study finds.

However, there are few fossil remains of the now-extinct shark. Researchers have found merely five of its nearly 2-inch-long (4.5 centimeters) teeth, in different parts of the world: Japan, California, Peru and North Carolina, the researchers said.

"The fact that such a large ...shark with such a wide geographic distribution had evaded recognition until now indicates just how little we still know about the Earth's ancient marine ecosystem," said Kenshu Shimada, the lead author of the study and a paleobiologist at DePaul University in Chicago. [\[Image Gallery: Ancient Monsters of the Sea\]](#)

Forbidding teeth

Researchers named the shark, which lived in the early Miocene epoch, *Megalolamna paradoxodon*. The genus name is a nod to the shark's mega-size teeth that superficially resemble those of sharks in the genus *Lamna*. The species name notes the shark's strange teeth, with the Latin word "paradoxum," and the Greek "odon," meaning paradox and teeth, respectively.

Researchers found *Megalolamna paradoxodon* fossil teeth in California, North Carolina, Peru and Japan. Credit: Kenshu Shimada



"At first glance, teeth of *Megalolamna paradoxodon* look like gigantic teeth of the genus *Lamna*, that includes the modern porbeagle and salmon sharks," Shimada told Live Science in an email. "However, the fossil teeth are too robust for *Lamna* — it shows a mosaic of dental features reminiscent of the genus *Otodus*. So, we determined it to be a [species new to science](#) that belongs to the family Otodontidae with no direct relationship with *Lamna*."

M. paradoxodon's front teeth were fit for grasping, and its back teeth were adept at cutting; these two types of teeth probably helped the giant predator seize and slice prey, Shimada added.

The shark likely lived in shallow, coastal waters in the mid-latitudes, which is where researchers unearthed its fossilized teeth. But even though the researchers have only its teeth, they were able to estimate the length of the shark by comparing the specimens to modern shark teeth.

By analyzing the tooth-to-body ratio of the shark's modern relatives in the lamniform family — including the sand tiger shark, mako shark and [great white shark](#) — the researchers estimated that *M. paradoxodon* could grow to be up to 12 feet (3.7 meters) long. That makes it smaller than the great white shark, which can reach lengths of between 15 and 20 feet (4.6 to 6.1 m).

However, it's hard to say exactly how large *M. paradoxodon* grew, said John-Paul Hodnett, a shark specialist and graduate student of biology at Saint Joseph's University in Philadelphia who was not involved in the study.

"For teeth, you should always be cautious of the fact that it is possible to have very large or small teeth in a shark's jaw, which do not represent the true aspect of the shark's body size," Hodnett told Live Science. For instance, some of the modern whale shark's teeth are tiny, but the beast can grow to be more than 40 feet (12 m) long, he said.

Megalodon cousin

The prehistoric teeth helped the researchers make another "mega" discovery. They compared them with the teeth of *Carcharocles megalodon*, an extinct species that is the most massive shark ever known to have lived. Megalodon could grow to be up to 60 feet (18 m) long, and its [bite was more powerful than *Tyrannosaurus rex*'s](#).

Both *M. paradoxodon* and *C. megalodon* belong to the extinct family of sharks known as Otodontidae, but scientists previously placed *C. megalodon* in a distinct lineage, Shimada said.

But Shimada and his colleagues now suggest that *M. paradoxodon* and *C. megalodon* are actually close cousins, and that *C. megalodon* should be placed in a new genus. [[7 Shark Mysteries](#)]

"*Carcharocles megalodon* has been the typical expression for the fossil shark," Shimada said. "However, our new study clearly supports the idea suggested by a few previous workers that 'megalodon' should be placed within the genus *Otodus*, and thus it should be referred to as [Otodus megalodon](#) from now on.

The study was published online Oct. 3 in the [journal Historical Biology](#).

Original article on [Live Science](#).

Forget Loch Ness — Storr Lochs Monster Ruled Ancient Scotland

By Kacey Deamer, Staff Writer | September 7, 2016 02:01pm ET



Artist's rendering of Storr Lochs Monster.

Credit: Todd Marshall

Move over, Nessie! There's a new ancient sea monster in town: the Storr Lochs Monster, a fierce, dolphin-like predator that lived 170 million years ago, during the age of dinosaurs.

Found on a beach in 1966 near the SSE Storr Lochs Power Station by the facility's manager, Norrie Gillies, the fossil is the most complete skeleton of a Jurassic-era, sea-living reptile that has ever been found in Scotland.

The ancient reptile, which belongs to an extinct family of marine reptiles known as ichthyosaurs, measured around 13 feet (4 meters) in length. It had a long, pointed head filled with hundreds of cone-shaped teeth. According to researchers, ichthyosaurs thrived in prehistoric seas, feeding on fish and squid. [In Images: Graveyard of Ichthyosaur Fossils Found in Chile]

"Ichthyosaurs like the Storr Lochs Monster ruled the waves, while dinosaurs thundered across the land," Steve Brusatte, a paleontologist at the University of Edinburgh, said in a statement. "Their bones are exceptionally rare in Scotland, which makes this specimen one of the crown jewels of Scottish fossils."

A fossilized skeleton of the Storr Lochs Monster was discovered 50 years ago, but until recently, it was sitting in the National Museums Scotland's storage facility. Thanks to a new research partnership, the fossil has been extracted from the rock that encased the skeleton for millions of years, so that it can now be studied.

"It's all thanks to the keen eye of an amateur collector

that this remarkable fossil was ever found in the first place, which goes to show that you don't need an advanced degree to make huge scientific discoveries," Brusatte said.

Brusatte studied another fossil of the prehistoric marine-reptile found in Scotland, also discovered by an amateur fossil collector. That ichthyosaur specimen was incomplete — consisting of an arm bone and vertebrae — and was smaller than the Storr Lochs Monster.

The fossil record, which Brusatte noted is scarce, shows that sometime during the Middle Jurassic, smaller ichthyosaurs went extinct, while the larger, more advanced ones continued to thrive until their extinction about 95 million years ago, in the early stages of the Late Cretaceous period, the researchers said. The reason for this turnover, however, is unknown.

As paleontologists continue to study the Storr Lochs Monster, it could shed light on the Middle Jurassic Period, which lasted from about 176 million to 161 million years ago, Brusatte said.

"We don't have that many fossils from that time period anywhere in the world," Brusatte told National Geographic. "That's what makes this potentially an internationally important specimen. It's one of the few good fossils of an ichthyosaur that comes from this 'dark' period."

The Isle of Skye, where the Storr Lochs Monster was discovered, is one of the few places in the world where fossils from the Middle Jurassic Period can be found, the researchers said.

Original article on Live Science.

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