



Time Scavengers: A Website to Disseminate Climate Change and Evolutionary Principles to Increase Public Literacy

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Origins and Objectives

- Dr. Adriane Lam and Dr. Jen Bauer started the site in summer 2017 to:
- Communicate information on climate change and evolution in a way understandable to the public
- Introduce the public to the real lives of scientists
- 2 site curators (Adriane and Jen) and 10 site collaborators write the blogs and share their research and experiences in science as graduate students/post docs/faculty/avocational scientists



Origins and Objectives

There are several main objectives of the site:

- Explain climate change and evolutionary theory in a simplified manner with plain-language text and figures
- Provide background information on geology, paleontology, climate, and evolution
- Through a series of blogs, we introduce the public to the lives of scientists (professional, academic, avocational)
- Collect data on site visitors and the impact of social media sharing to determine best practices for online science communication

Collaboration Team



Jen Bauer and Adriane Lam



Rose Borden



Sarah Sheffield



Cam Muskelly



Megan Thompson-Munson



Maggie Limbeck



Mike Hills



Kyle Hartshorn



Andy Fraass



Susanna Fraass



Dipa Desai

Collaboration Team

To be a collaborator:

- Commit to at least one blog post every 1-2 months
- Other optional contributions:
 - Come up with a fossil for #FossilFriday
 - Help monitor our social media accounts
 - Help create graphics on Canva for posts
 - Edit posts in Hootsuite (social media manager) for consistency, clarity, and content

Site Set-up

Two types of pages:

- Static informational pages
 - 30+ pages currently
 - Can be updated or added to, but are mostly for background information on various topics
- Blog posts
 - Dynamic, new posts released twice a week
 - Written by collaborators and guest scientists

Home Page

HOME ABOUT US ▾ INTRODUCTORY MATERIAL ▾ CLIMATE CHANGE ▾ EVOLUTION ▾ PALEO, LIVE! ▾

MEET THE SCIENTIST CLIMATE & PALEO NEWS EDUCATIONAL RESOURCES EXTRA INFORMATION ▾ REFERENCES

TIME SCAVENGERS

SCAVENGING THE FOSSIL RECORD FOR CLUES TO EARTH'S CLIMATE AND LIFE

Home

Welcome to our site!

Climate change is one of the biggest problems facing humanity and life on Earth today, and one of the most fundamentally misunderstood scientific theories is evolution. You've probably heard about climate change and evolution in the news and on social media, but what are these concepts, and how do we know they're 'real'? We've made the site to help you understand more about both of these concepts and answer some questions, such as:

- How do we know the Earth is warming, and where does the data come from?



About Us

Project Overview



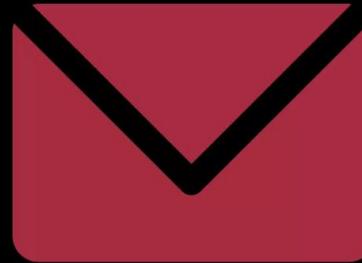
Project Overview

Biographies of
Team Members



Biographies of Team Members

Contact Us



Contact Us

Products and Outcomes



Funding Sources



Introductory Material

- General Science
- Geologic Time
- What Is Paleontology?
- What Is Paleoclimatology?



How do scientists
determine the age
of rocks?

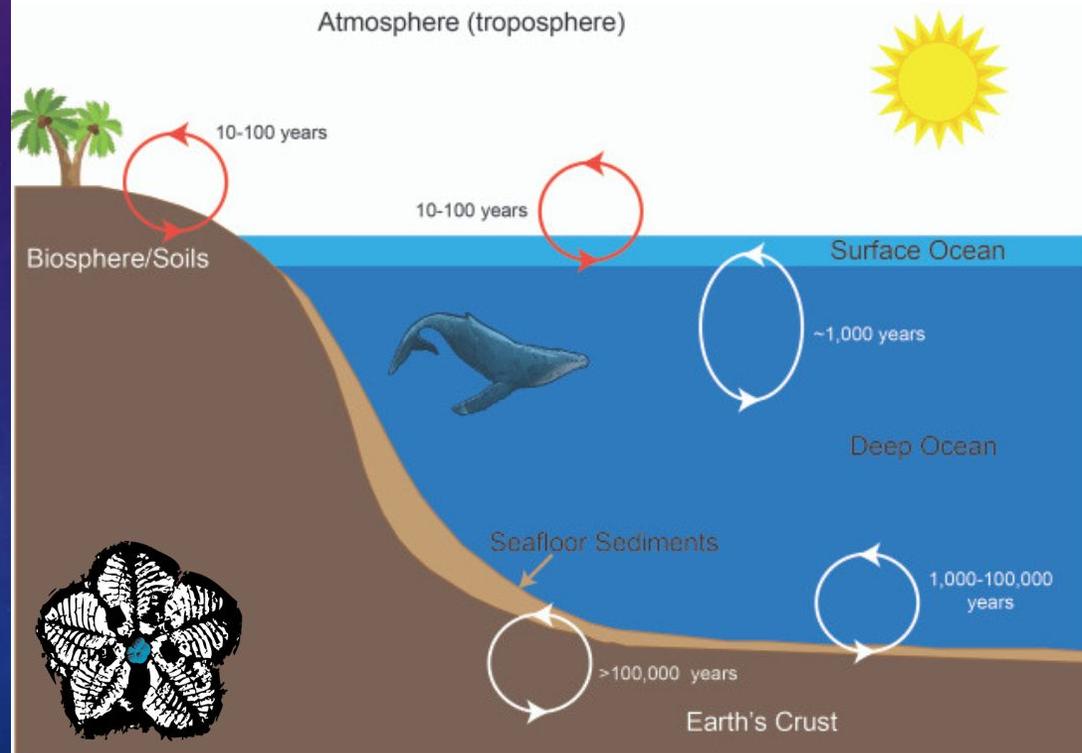
Read more about relative and
absolute dating on our blog!

http://bit.ly/Geologic_Time

Climate Change

- Modern Atmosphere
- Ocean Layers & Mixing
- Ocean Chemistry & Acidification
- Ocean Circulation & Stratification
- CO2: Past, Present, & Future

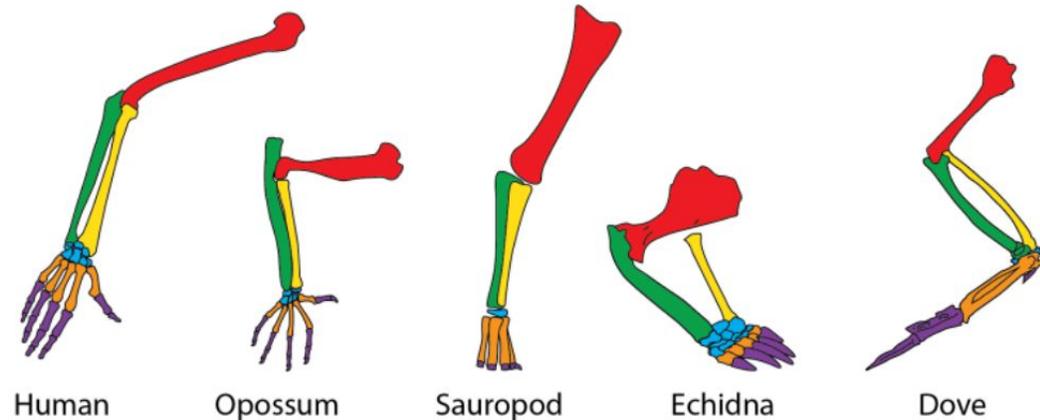
Did you know our oceans are layered? Ever wonder how the surface ocean mixes with the deep ocean? What timescales does this happen on? And what does all of this have to do with climate change? Read our '[Ocean Layers & Mixing](#)' page to find out!



Evolution

- Evolutionary Synthesis
- Taxonomy
- Reading the Tree of Life
- Homology
- Extinction

Learn about homology:



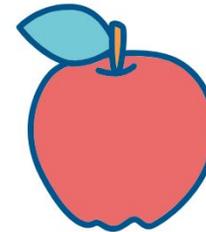
**Shared features among organisms
due to inheritance from a
common ancestor**

<https://timescavengers.blog/evolution/homology/>

Educational Resources

- Many links to resources for teachers and classrooms based on the topics covered on the website
- Links to sites for teachers explaining science concepts and giving resources for communicating science
- Links to sites with lesson plans, slide shows, and visualizations of science concepts
- Also has a link to a compiled list of K-12 paleontology/geology-themed summer camps

EDUCATIONAL RESOURCES



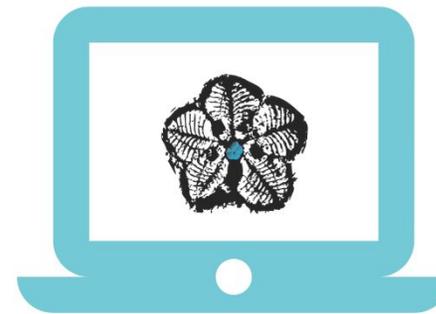
Summer camps
Background content
Targeted activities

<https://timescavengers.blog/teaching-resources/>

Extra Information

- Additional Reading (Books!)
- Fossil ID & Databases
- Organizations & Societies: from international, to national, to regional and local
- Podcasts & Blogs

Podcasts and Blogs



Share your
favorite science
blogs and
podcasts with us!

References

- Citations and DOIs for all papers referenced in static informational pages
- Concern that many papers are behind paywalls that our readers may not be able to access
- Suggestions?

References

We are aiming to provide a comprehensive reference list of the sources used within the Time Scavenger pages. Every time a reference is cited within our pages it will be added to this list. This list includes links to the articles and DOI numbers incorporated into citations. Unfortunately, we know that many of these publications are trapped behind a paywall for our nonacademic users. We apologize in advance.

Blastoids

- Fay, R.O., 1967. Introduction, p. S298-S300. In R.C. Moore (ed.), *Treatise on Invertebrate Paleontology, Part 5, Echinodermata 1* (v. 2). The Geological Society of America and University of Kansas, New York and Lawrence. 352 p.

CO₂: Past, Present, & Future

- Berner, R. A., Kothavala, Z., 2001. **GEOCARB III: A revised model of atmospheric CO₂ over Phanerozoic time.** American Journal of Science 301, 182-204.

Blog Posts

- Released twice weekly on Mondays and Thursdays
- Written by collaborators and guest bloggers (for Meet The Scientist)
- Designed to introduce readers to life as scientists, showcasing research, field trips, conferences, and other topics such as applying for grad school or academic jobs and managing stress



 **Byte of Life: Last Minute Opportunities!**

16th International Echinoderm Conference, Nagoya University, Nagoya, Japan

Jen gets the opportunity to attend a conference in Japan only days ahead of the meeting! She discusses why although stressful, this opportunity was an awesome opportunity for her!

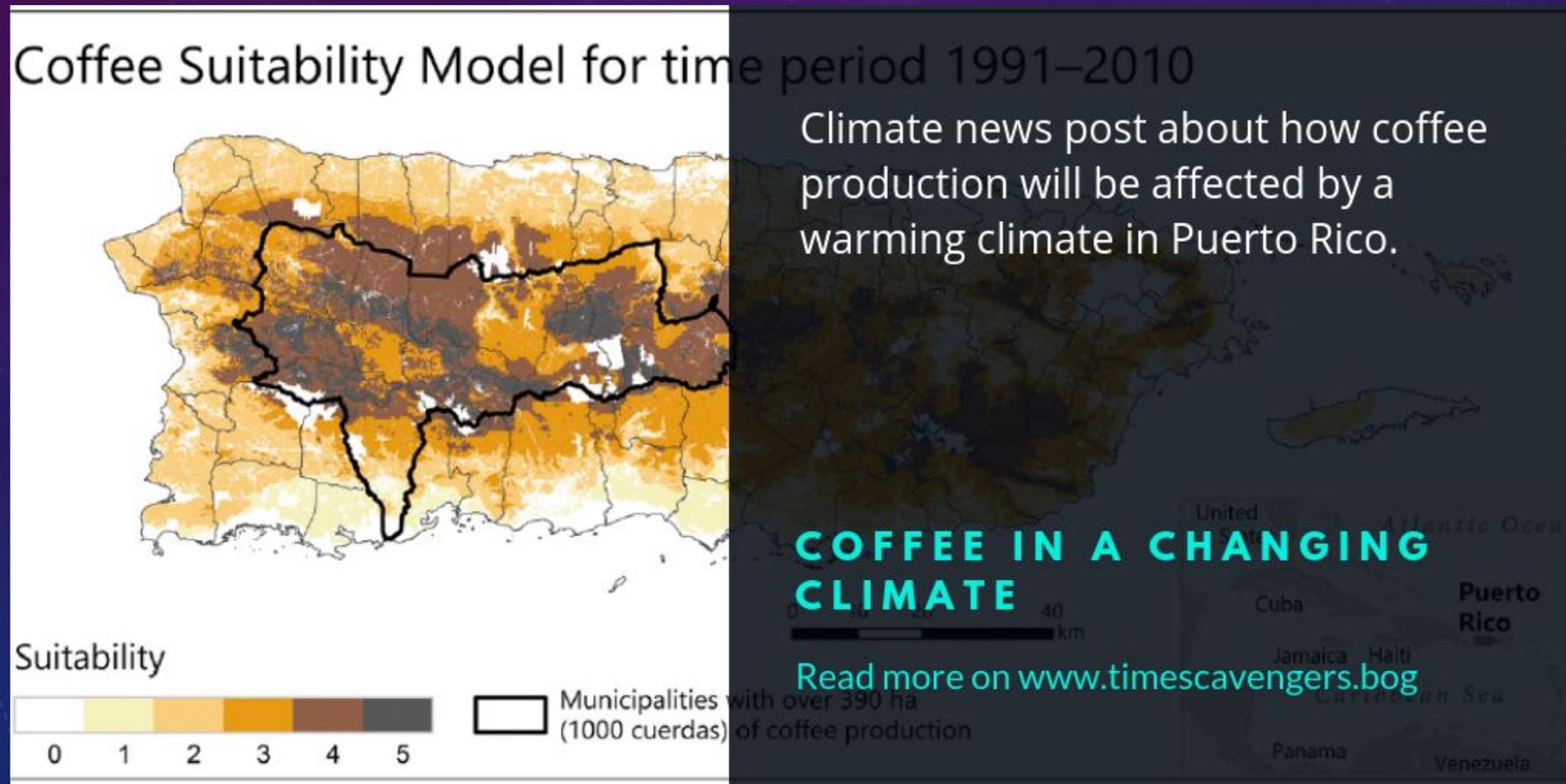
Paleo LIVE!

- Our Research Explained: Foraminifera and Blastoidea
- Field Excursions: Field Trips from conferences, teaching, or research; also geologically interesting vacation trips!
- Education & Outreach: Teaching experiences, outreach events
- Science Bytes: Research experiences
- Byte of Life: Stress management, applying to grad school, applying to jobs, our journey to where we are today



Climate & Paleo News

- Summaries of recent scholarly articles
- Explains what the research was, how it was conducted, results, and why it is important



Meet The Scientist

- Intended to introduce readers to scientists from any field, not just climate/paleo
- Write about who you are, what your research/job is, why it matters, how you got into science, advice for students considering science jobs
- Trying to showcase scientists from all fields and all demographics, so folks can see scientists who look like them
- We are always looking for scientists to write these!



Google Analytics

- Our site is through Wordpress, so we use their built-in analytics as well as Google Analytics to track readership/site visits
- We can look at data and statistics for site visitors such as: geographic location (by country), age, how they accessed the site (google, social media, direct link), number of visitors by hour, day, week, month, number of new vs returning visitors
- We use these data to track how people are finding the site and ideal times to release new posts

How are people finding the site?

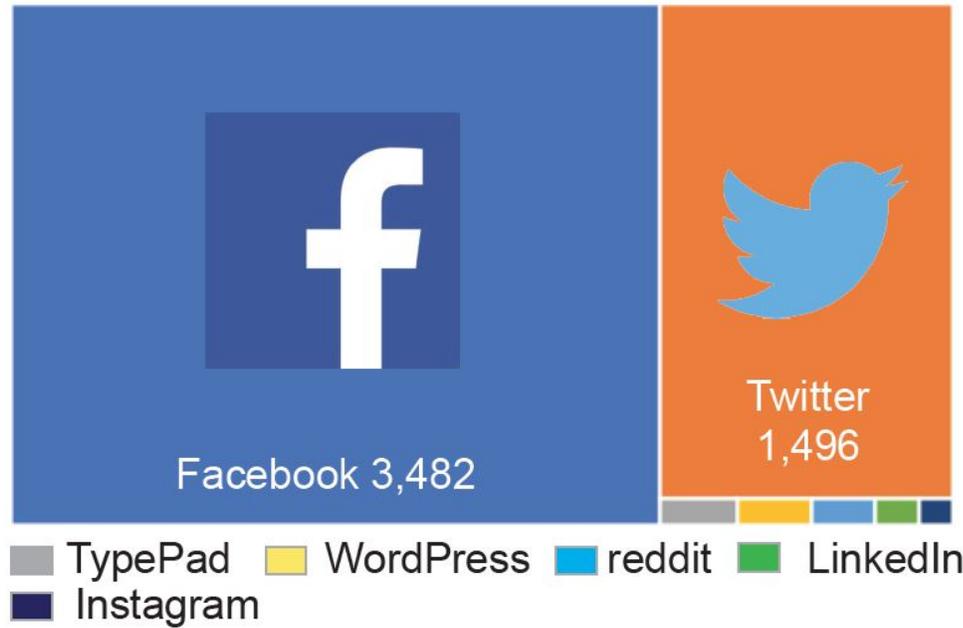
Site Visitors to TimeScavengers.blog

Table 1. Channels through which people find the site.

	Site Visitors	%New Sessions	New Visitors
Organic Search	14,975	86.72	12,986
Social Media	5,075	62.33	3,163
Direct	3,799	78.05	2,965
Referral	1,974	63.53	1,254
Other	4	100	4

Table 2. Top keywords used by people who reach the site through organic searches.

Keyword	Number of Searches
(Not Provided)	14,545
Types of preservation	17
Amazon	8
Isotope/s	15
Ocean stratification	8
Levels of ocean body	5
Ocean layers	4



Most site visitors are reaching the site through organic searches.

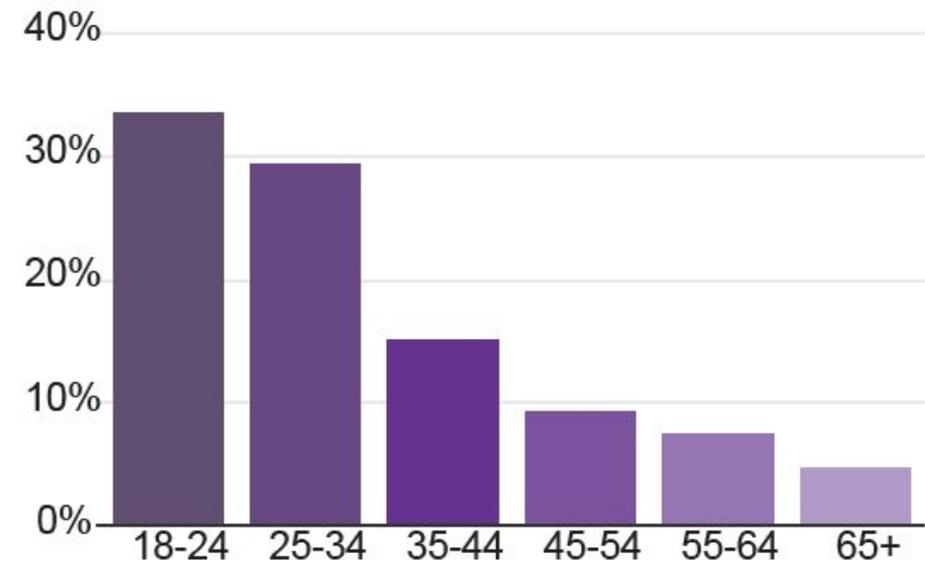
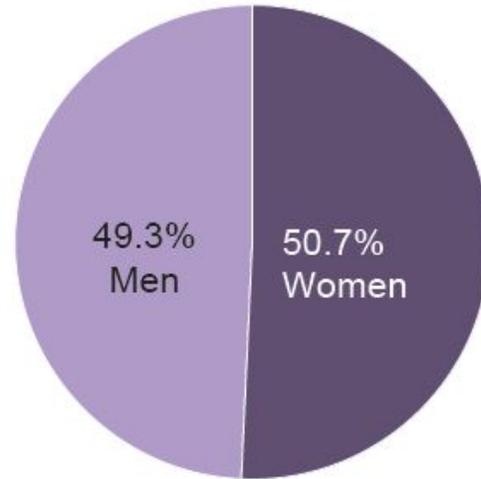
Of the site visitors reaching the site through social media platforms, Facebook is the main channel, with Twitter in second.

Of the total site visitors (25,827), only 15.5% are reaching the site through social media. This indicates that organic searches dominate the way in which the public find the site.

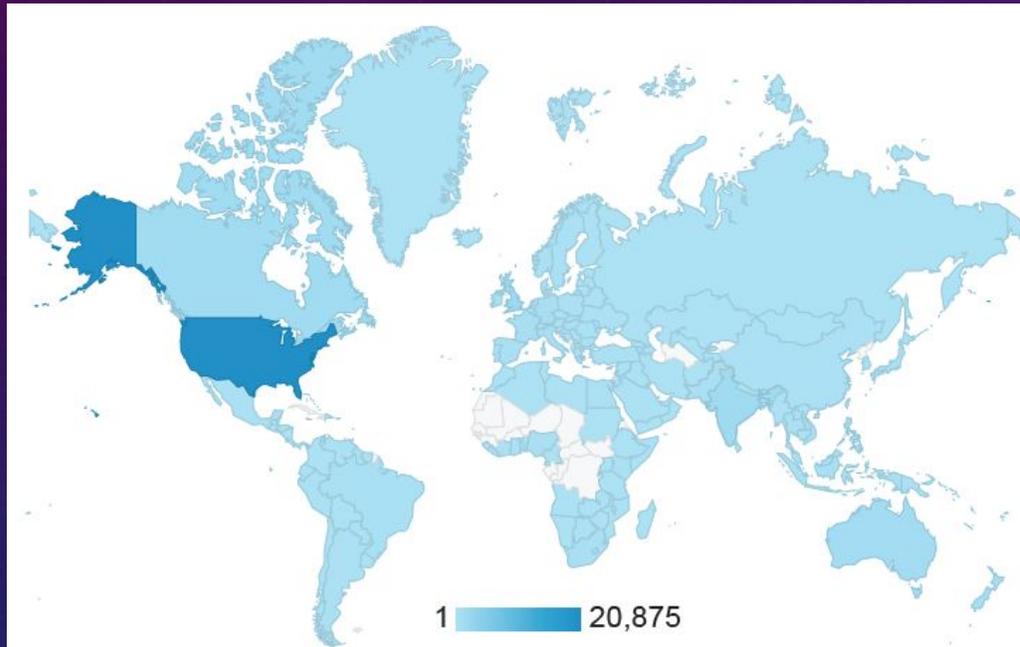
Reader Demographics

Demographic Overview

Visitor age bias heavily skewed to 18-34 age range. May be due to lack of older people using social media platforms to reach the site.



Reader Demographics



Geographic Overview

Time Scavengers is reaching a global audience, with most visitors from the U.S.

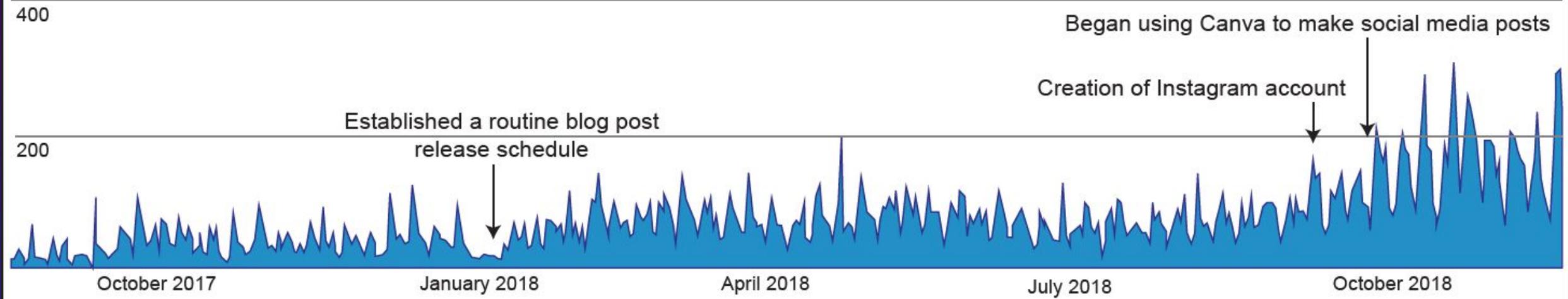
Regional bias may be due to family, friends, and colleagues visiting and interacting with our site.

To appeal to broader audiences and be more accessible, we are featuring more

international scientists on our 'Meet the Scientist' blog and have installed a translation app on the site.

Views Over Time

All site visitors to TimeScavengers.blog



Hashtags

Holotype vertebra

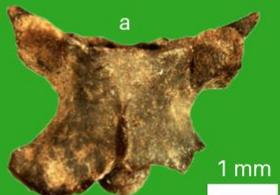


View of the side that would
have been closer to the
head (anterior)



Wing-like extension

View of the top or back-side
(rather than belly-side;
dorsal)



Wing-like extension

a indicates the same spot on the fossil
Jasinski and Moscato, 2017

Fossil Friday

Zilantophis schuberti

Fossil snake

5 million years old

Zilantophis translates to 'winged snake'

Named for the authors' graduate advisor

(Dr. Blaine Schubert)

Gray Fossil Site, East Tennessee



Follow Friday

GeoLatinas

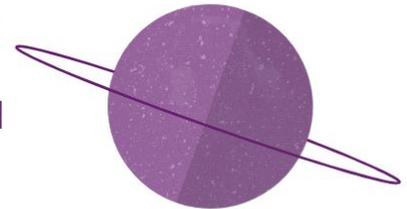
*Our mission is to empower, embrace, and
inspire Latinas to pursue and thrive in
careers in Geoscience and Planetary
Science*



@geolatinasinsta



@GeoLatinas



<https://geolatinas.weebly.com/>

Conference Presentations



Time Scavengers

FIND TIME SCAVENGERS AT

AGU2018

Thursday, 13 December 2018 1:40 - 6:00 PM
Walter E Washington Convention Center
Hall A-C (Poster Hall)

Adriane Lam, Rose Borden, and Andy Fraass

TimeScavengers.blog

Conference Presentations

P147

Time Scavengers: A collaborative website for exploring climate change and evolution through scientists' experiences

Jennifer E. Bauer¹, Adriane R. Lam², Raquel M. Bryant³, Andrew J. Fraass⁴, Susanna Fraass, Keenan B. Golden⁵, Kyle R. Hartshorn⁶, J. Mike Hills⁷, Maggie R. Limbeck⁸, and Sarah L. Sheffield⁹
¹The University of Tennessee, Knoxville, ²University of Massachusetts Amherst, ³Sam Houston State University, ⁴Dry Dredgers, ⁵University of Dayton, ⁶University of South Florida

@TimeScavengers



Objectives

Time Scavengers is a collaborative website for exploring climate change and evolution through scientists' experiences. The website is designed to provide a platform for scientists to share their experiences and insights into climate change and evolution. The website is designed to be user-friendly and accessible to a wide range of audiences, including students, educators, and the general public. The website is designed to be a resource for scientists to share their experiences and insights into climate change and evolution.

Site Overview

Time Scavengers is a collaborative website for exploring climate change and evolution through scientists' experiences. The website is designed to provide a platform for scientists to share their experiences and insights into climate change and evolution. The website is designed to be user-friendly and accessible to a wide range of audiences, including students, educators, and the general public. The website is designed to be a resource for scientists to share their experiences and insights into climate change and evolution.

Example Page: Homology

The Homology page is an example of the website's content. It features a title, a main image, and several sections of text and images. The page is designed to be user-friendly and accessible to a wide range of audiences, including students, educators, and the general public. The page is designed to be a resource for scientists to share their experiences and insights into climate change and evolution.

Paleo LIVE!

Paleo LIVE! is a section of the website that features a title, a main image, and several sections of text and images. The page is designed to be user-friendly and accessible to a wide range of audiences, including students, educators, and the general public. The page is designed to be a resource for scientists to share their experiences and insights into climate change and evolution.

Analytics

The Analytics section of the website provides a detailed overview of the website's performance. It includes a title, a main image, and several sections of text and images. The page is designed to be user-friendly and accessible to a wide range of audiences, including students, educators, and the general public. The page is designed to be a resource for scientists to share their experiences and insights into climate change and evolution.

Conference Presentations



Open Access Publication: Journal of STEM Outreach

Vol. 2, Issue 1, 2019

Time Scavengers: An Educational Website to Communicate Climate Change and Evolutionary Theory to the Public through Blogs, Web Pages, and Social Media Platforms

[Adriane Lam](#), [Jennifer E. Bauer](#), [Susanna Fraass](#), [Sarah Sheffield](#), [Maggie R. Limbeck](#), [Rose M. Borden](#), [Megan E. Thompson-Munson](#), [Andrew J. Fraass](#), [J. Michael Hills](#), [Cameron E. Muskelly](#), [Kyle R. Hartshorn](#), [Raquel Bryant](#)

February 25, 2019

digital classroom

climate change

evolution

science communication

<https://www.jstemoutreach.org/article/7557-time-scavengers-an-educational-website-to-communicate-climate-change-and-evolutionary-theory-to-the-public-through-blogs-web-pages-and-social-media-platforms>

Funding

UMass
Amherst

THE UNIVERSITY of
TENNESSEE 
KNOXVILLE


FLORIDA
MUSEUM™


WORDPRESS

Paleontological
SOCIETY

Funding

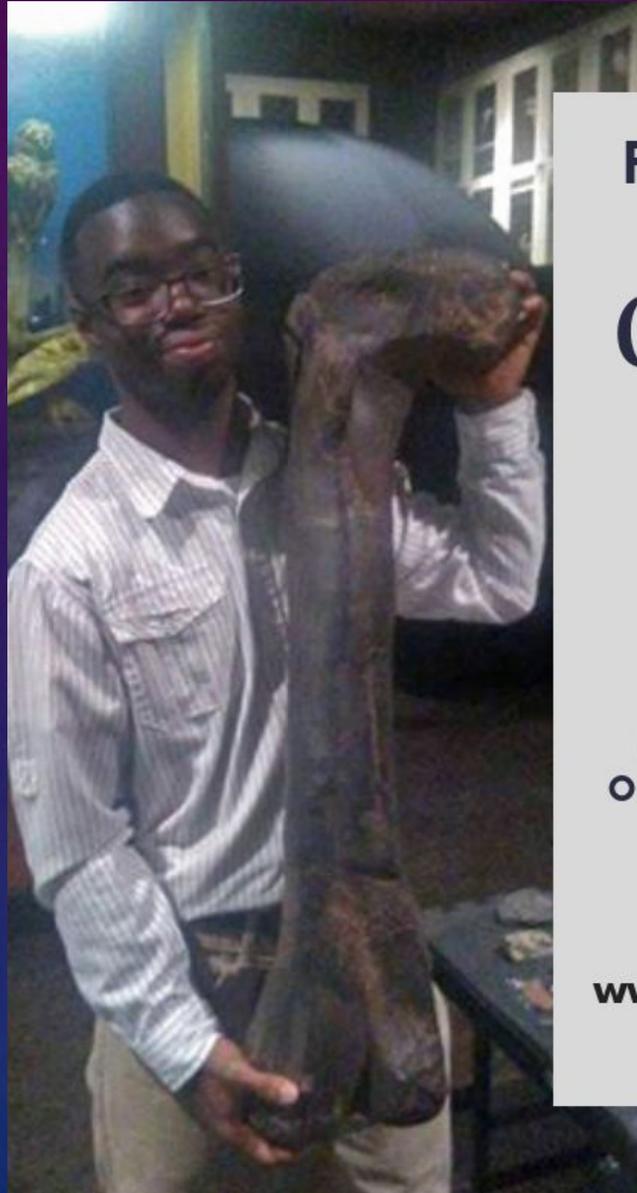
Support us on Patreon

No secure funding for this educational project

See select content released early
Help keep the site up and running
Request #FossilFriday content

<https://www.patreon.com/TimeScavengers>

Patreon Fundraiser for Cam Muskelly

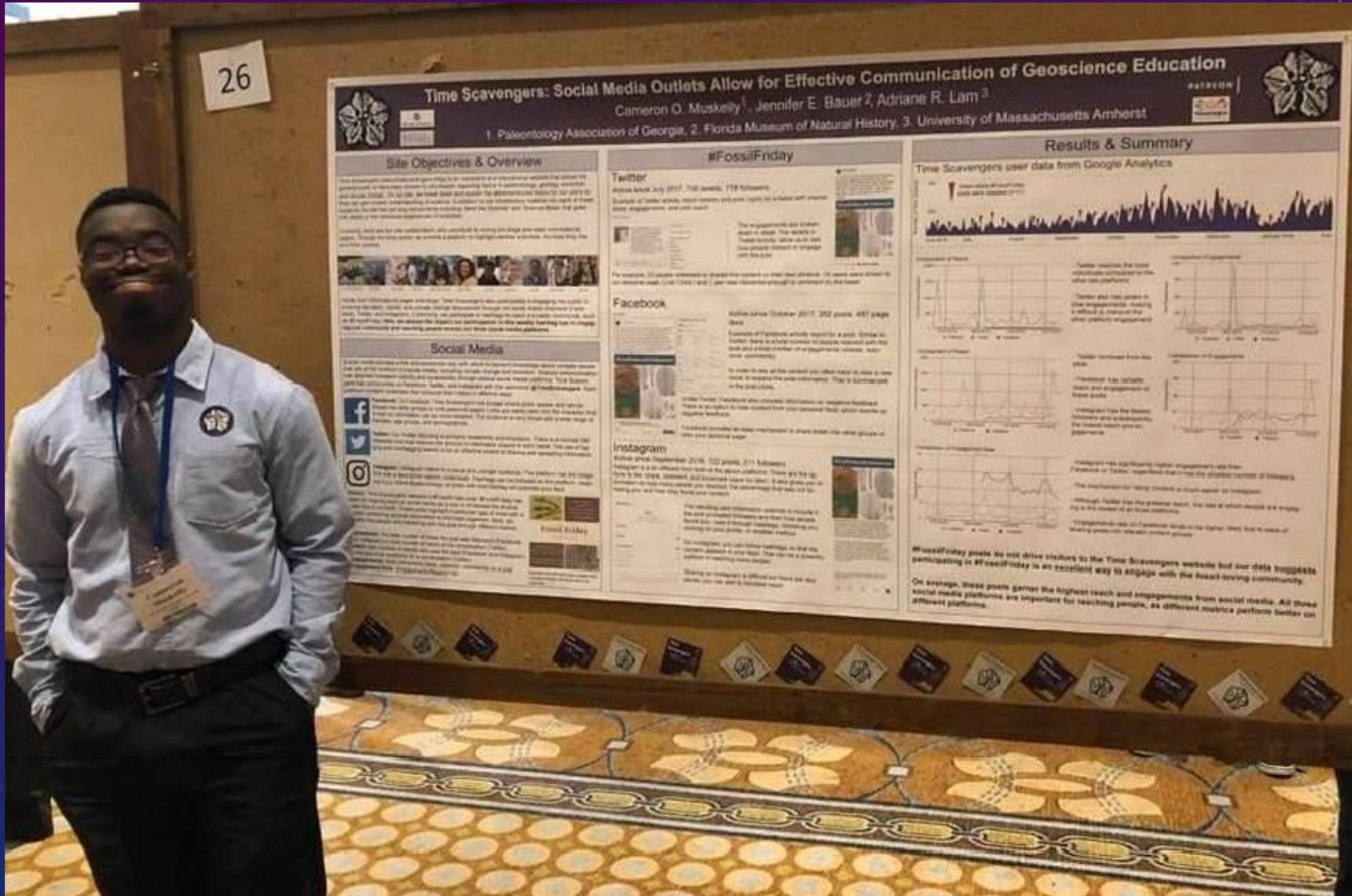


FUNDRAISER FOR CAM'S TRAVEL TO #SEGSA2019

PROCEEDS FROM OUR
PATREON ACCOUNT FROM
OCTOBER-JANUARY WILL GO
TOWARD FUNDING HIS
TRAVEL

www.patreon.com/TimeScavengers

Patreon Fundraiser for Cam Muskelly



Future of the Site

- Expand collaborators and guest bloggers
- Obtain stable funding
- Continue to evaluate statistics to find best practices for posting and promoting new content

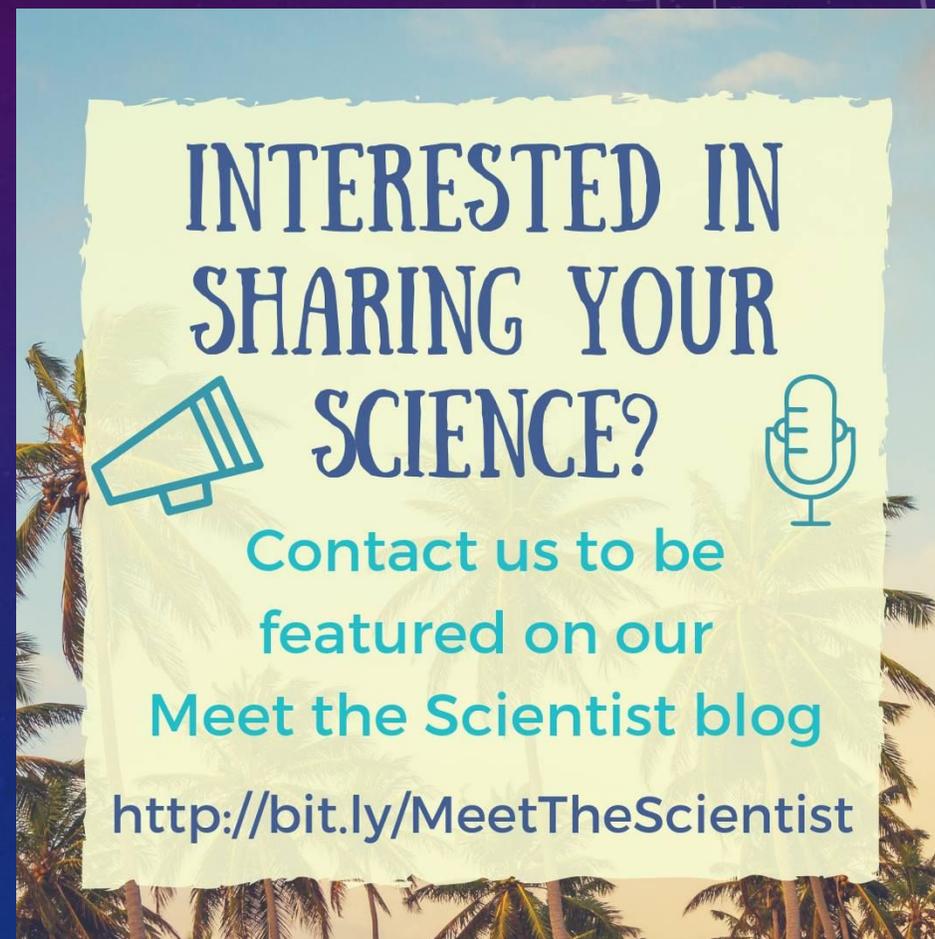


Contact Info

E-mail: timescavengers@gmail.com

Twitter and Instagram:
@timescavengers

Facebook: Time Scavengers



**INTERESTED IN
SHARING YOUR
SCIENCE?**

Contact us to be
featured on our
Meet the Scientist blog

<http://bit.ly/MeetTheScientist>