Newsletter of the Conservation Paleobiology Network

Issue 4
Nov 2020

CPN Newsletter

Conservation Paleobiology Network

INSIDE THIS ISSUE:

Diversity, Equity, and Inclusion Statement:

The CPN upholds a commitment to diversity, equity, and inclusion as a core value. We seek to build on this commitment by striving to create an inclusive community whose members represent diverse cultures, backgrounds, career stages, and life experiences. This commitment is critical to strengthening our relevance, credibility, and effectiveness within the field of conservation paleobiology and broader STEM community. Through these efforts, we strive to transform the field in practice, while diversifying the face of conservation paleobiology for the future.

Supported by RCN-NSF Award: EAR-1922562

Working Group Pre-proposal Submission

We are currently accepting pre-proposals for CPN Working Groups. Submission deadline is **January 8th, 2021**. Working groups should focus on research questions that integrate conservation paleobiologists, academic partners, wildlife managers, and stakeholders to develop effective strategies for translating products of historical research into conservation and management actions. Each working group will include up to three multi-day meetings to develop approaches to research or applications.

Working groups should engage key interest groups (conservation paleobiologists, archaeologists, environmental historians, federal and state management officers, and stakeholders), tackle problems that focus on one or more species, habitats, or organismal groups, and provide a clear vision of outcomes that will contribute to the broader mission of the CPN of establishing conservation paleobiology as both a basic and applied discipline.

For more info go to: https://conservationpaleorcn.org/working-groups/

EGU Session Announcement

EGU General Assembly 2021

The CPN is excited to co-sponsor session **Conservation Paleobiology: Insights from deep time to recent past** at the European Geosciences Union (EGU) General Assembly meeting (www.egu21.eu), which will be held as a virtual event **vEGU21: Gather Online (#vEGU21)** on 19–30 April 2021. Abstract submissions will be accepted until 13 January 2021. The session will be linked to a student peer mentoring program organized by the CPN Student Panel.

The session will focus on the emerging discipline of Conservation Paleobiology that uses the data from the fossil record and sedimentary archives to inform biodiversity conservation and ecosystem management. Even though humans have altered ecosystems for millennia, direct ecological observations rarely encompass more than the last few decades. At the same time, the accelerating pace of global climate change requires better understanding of the long-term resilience and adaptive capacities of ecosystems facing multiple stressors.

We invite presentations offering both the near-time and deep-time perspective on ecological and evolutionary processes operating during times of rapid environmental changes, ranging from the Anthropocene biodiversity crisis to Phanerozoic mass extinction events. We also welcome contributions highlighting potential biases affecting the fossil record by linking stratigraphic, taphonomic and ecological patterns. We hope to stimulate discussion on novel opportunities and limitations of using different types of geohistorical data to address some of the most urgent questions in Conservation Biology.

For more info and abstract submission go to:
https://meetingorganizer.copernicus.org/EGU21/session/39359

If you have any questions, please contact us at rafal.nawrot@univie.ac.at
Rafal Nawrot, Paolo Albano, Stefano Dominici, Niklas Hohmann, and Vanessa Roden

First published online: Nov 2020

Conservation Paleobiology Research Highlight

By Jed Meunier, Wisconsin DNR

Using historical information to understand fire rotation in Great Lakes pine forests

"What is less obvious is how the type of data (and associated metrics) influences our understanding of historical processes."

Destructive wildfires have grown in visibility across many parts of the globe as has the importance of understanding departure from historical conditions in driving these events. What is less obvious; however, is how the type of data (and associated metrics) influences our understanding of historical processes. In the Great Lakes Region (GLR) fire rotation, or the number of years it takes to burn an area equivalent to the area of interest, is an extensively used metric calculated with Euro-settlement era General Land Office (GLO) records. However, fire rotation and GLO records are best suited for understanding high-severity fires.

Researchers compared tree-ring (to detect low-severity fires) and GLO data across 34 different stands. GLO data were in many ways well aligned with tree-ring data; pines were almost always noted in survey points closest to research plots, density estimates were similar in most cases, and the fire years recorded by surveyors were detected with tree-ring methods as well. However, GLO records do not provide good data for low-severity fires, especially within the commonly used 15-year detection windows used for calculating fire rotation. Within this 15-year window multiple fires were detected at all fire history sites whereas none of the GLO sites nearest our tree-ring fire history sites noted fire. Fire rotation intervals ranged from 11 to 34 years across ecological landscapes whereas GLO data were 65 and 98 times longer in these same landscapes.

High-severity fire regimes are typically found in cold, wet environments where ignition and conditions conducive to burning (e.g., extreme drought) occur infrequently and large patches of high-severity fire, which comprise most of the area burned, drive landscape dynamics. Alternatively, moderately wet climates are most fire prone due to greater fuel production but also periodic dry spells for burning, promoting frequent low- to moderate-severity fires.

This research found an increasing role of drought with larger fire years, including regionally significant fire years and pronounced droughts (e.g., 1736). More commonly however, fires occurred under moderately dry conditions which in turn occurred more regularly than extreme drought and could have helped moderate severe fire effects.

By coupling GLO and tree-ring data, researchers were able to gain a more complete picture of fire regimes in the GLR. Although catastrophic fire was likely infrequent, low- to moderate-severity fires were abundant, large-scale, and widespread. Unfortunately, the relative lack of broad-scale data on low-severity fires has likely inflated the importance of high-severity events while also unintentionally devaluing low-severity fires. Given the high frequency and widespread nature of low-severity fire among multiple landscapes, it is likely that it was one of the primary forcing mechanisms shaping coniferous forests across the entire region.

Photo captions: Tree stumps record annual growth and fire occurrences (top); Jed Meunier in the field (bottom).

For more details please see article by Meunier and Shea in Forestry Ecology and Management: https://doi.org/10.1016/j.foreco.2020.118246

First published online: Nov 2020

Practitioner Perspective

Interview by Alexis Mychajliw

Featured practitioner: Jon Flanders

Jon Flanders is currently the Director of Endangered Species Interventions at the non-governmental organization Bat Conservation International (BCI). He received his PhD from the University of Bristol. Jon has worked extensively in China (East China Normal University) and Japan (Kyoto University), conducting population genetic studies and conservation assessments of bats. Prior to his current position, he served as the Biodiversity Officer for the Staffordshire Wildlife Trust in the UK, where he led habitat restoration projects. His research has been published in venues including Science Advances, Molecular Ecology, Journal of Biogeography, and Ecology Letters, among others. He applies a wide range of techniques spanning bioacoustics, ecological modeling, and genetics to answer questions of immediate conservation relevance, and regularly shares this knowledge by training students and community members.

Photo caption: Dr. Jon Flanders holding a spectral bat (Vampyrum spectrum), courtesy of BCI.

1. What is it like working for Bat Conservation International?

I have both the best and worst job in the world. I get to work with awesome people and bats in countries around the world, but I'm also dealing with highly endangered species and literally trying to prevent extinction. In some cases, it can be tough emotionally when you are a bat species' last hope for survival.

2. How, if at all, do museum collections help you as you work to prevent extinction?

Natural history specimens can be really important. For example, in Rwanda, we are working to rediscover a bat that was last seen in 1981. This past January, I traveled to museum collections in Belgium to examine one of only two specimens of this potentially lost species ever collected.

3. So in general, you would say that historical data are being increasingly used in bat conservation?

Yes. A great example is our ongoing work in Jamaica, which is home to two Critically Endangered bat species that are each restricted to a single cave locality(!). Data from the past 100-200 years can tell us about the past distribution of a species. If we know where a species has been historically – particularly, specific caves – we can try to disentangle the reasons for why a population persisted in one cave but not another. We can look for evidence of past human disturbance within an abandoned cave. For example, when people harvest guano today, they often burn tires to clear the bats out, leaving soot on the roof of the cave that prevents the bats from returning. If we find this soot years later, it can tell us why a cave was abandoned, and help us prioritize other places for habitat restoration.

4. What about paleontological data?

There are definitely differences in the ways that such longer-term data are helpful. When it comes to climate change, any extra information is really useful— we need more interdisciplinary collaborations to reduce the number of unknowns about the future. Data on millennial time scales from the fossil record can tells us how many species have gone extinct. This is helpful for raising awareness because in conservation, our messaging can be a bit fuzzy, but if you can say there's a specific number of extinctions or percent decline, it can change people's perceptions. My main job now is really about changing people's attitudes and behaviors, so anything that can help enrich the story we tell about bats is a bonus.

First published online: Nov 2020

Practitioner Perspective continued…

5. Some paleontologists, like myself, work in caves that may also be home to colonies of bats. How can we ensure that our work does not damage these colonies, now more than ever during COVID-19?

Collaboration in field work can help decrease disturbance to a bat population. White Nose Syndrome in the US has really brought this to light: we should minimize the number of trips people take into caves wherever possible, as each time you enter you can disturb the bats or transmit disease. If permits are needed, you could ask the government if anyone else is going in already and coordinate trips. The Global Union of Bat Diversity Networks (GBatNet, https://gbatnet.blogspot.com) has developed protocols for decontamination for cave access during COVID. We are never trying to hinder anyone's research or recreation, and minimizing disturbance just comes down to good communication.

Photo caption: The critically endangered Jamaican flower bat, known from only one cave in Jamaica. Courtesy of Angelo Soto-Centeno.

6. How do you engage communities in your research and conservation projects?

Planning a project without in-country support is a recipe for disaster. Bat conservation starts with people changing their behavior, and this must be led by in-country partners to respectfully work within different cultural norms. One of our best examples is in Rwanda. Typically researchers will "parachute" in to take data, but BCI has invested the time to build trust and work with the rangers. The Nyungwe National Park Rangers are now carrying out the project independently, which is critical during COVID, as we cannot travel there ourselves.

7. What is your favorite fossil?

I don't know if this counts [because it's not a bone]: mammoth hair! We have some mammoth hair framed on our wall from a shop in London's Covent Garden.

Webinar Series Development Update

The CPN will design and develop a series of online webinars focused on training future conservation paleobiologists, archaeologists, practitioners, and stakeholders to navigate the continuum from basic to applied research. The webinars will be developed to bring faculty to the students and facilitate interaction of students, faculty, and professionals across multiple institutions via virtual platforms. Ultimately, the webinars will be freely available in English and Spanish to educators, students, stakeholders, and the public.

The first of this series of webinars is being developed by Dr. Karl Flessa, and he has beta tested the presentation with several college classes this Fall, including at UC Riverside and Macalester College.

Updates from the CPN webinar panel will be provided in subsequent newsletter issues, and finalized webinars for the utilization and education of CPN members will be announced on our listserv.

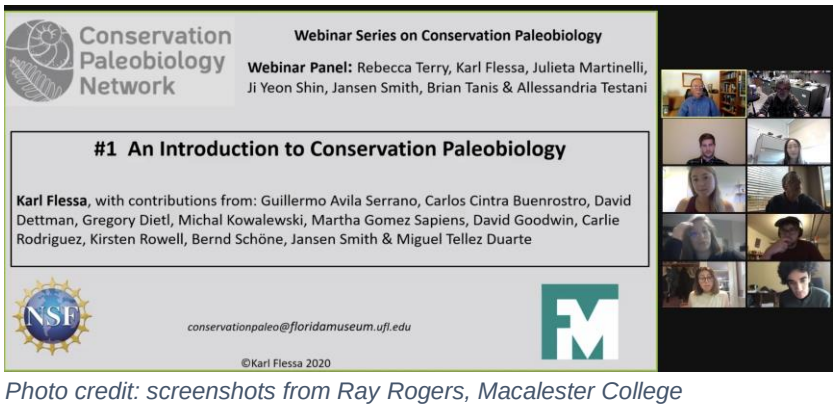

Photo credit: screenshots from Ray Rogers, Macalester College

Introducing Members of the Student Panel Compiled by Jaleigh Pier

The student panel aims to engage, facilitate networking, and organize resources for CPN student members. Here we would like to introduce you to the members of the student panel and their corresponding roles in the CPN. If you have any questions, resources, or ideas, don't hesitate to reach out! General inquiries can be directed to **students.cpn@gmail.com.**

Screenshot of a student panel zoom meeting (Note that Sage Vanier is not pictured).

Jonathan Cybulski *(he/him)* – **Student Panel Co-chair,** PhD Student, University of Hong Kong
My current research focuses on the story of Hong Kong's coral reefs - what was their past diversity, how have regional stressors shifted their composition and range, and what might this mean for their persistence into the future. I use a combination of historical research, archaeology, ecology, geology, and biogeochemical methods in order to understand and communicate the story of corals through time. Besides coral fossil hunting, I love competitive weightlifting, brewing beer, getting into the woods, and reading nerd novels. I am happy to answer any general questions about the Panel's activities and goals, and would also love to chat SciComm if anyone wanted to brainstorm! Contact: cybulski.j@gmail.com

Erin Dillon *(she/her)* – **Steering Committee and Student Panel Co-chair**, PhD Student, UC Santa Barbara
I am currently working on reconstructing patterns of shark abundance over the last several thousand years on coral reefs using shark dermal denticles (shark scales). My primary interests lie in paleoecology, historical ecology, community ecology, and conservation. I'm also a big fan of science communication. When I'm not in the lab sleuthing for ancient sharks, you can find me running, experimenting in the kitchen with new recipes, or exploring new music. Please get in contact (erinmdillon@ucsb.edu) if you have any questions about student activities or ways to engage with the CPN student community.

Meaghan Efford *(she/her)* – **Webinar Panel**, PhD Student, University of British Columbia
My MA research was based at BMSC in the Broken Group Islands in Barkley Sounds, BC, and included research performed over the past 30 years throughout Nuu-chah-nulth territories. My PhD research is in service to Tsleil-Waututh Nation: my project is designed based on the needs and questions of the community. I am using Ecopath with Ecosim (EwE) to create a pre-contact (AD 1792) food web baseline model of Burrard Inlet, BC. When I'm not counting fish bones or trying to figure out modelling, I'm dancing, baking, and hanging out with my cat! Find me at @megefford on Twitter or by email at m.efford@oceans.ubc.ca!

Niklas Hohmann *(he/him)* – **Networking and Mentoring**, MS Student, FAU Erlangen-Nürnberg
My work focuses on modeling taphonomic processes to understand how ecological information derived from skeletal remains changes as they transition from live assemblage to death assemblage and the fossil record. In the long run, I hope to develop statistical methods based on these models that can be used to infer taphonomic conditions in the sediment. I really enjoy doing science communication, and I think especially scientists who work in conservation or climate science should do more of it to educate the public.

Introducing the Student Panel continued…

Angelina Ivkić *(she/her)* – **Field Course Panel**, PhD Student, University of Vienna
My work consists of a comparison between fossil (MIS5e) and modern coral reefs from the Red Sea. Calcifying organisms (such as corals and foraminifera) are particularly appealing to me, and I aim to understand how they currently are and will further be affected by climate change. I enjoy science communication and spend my free time preferentially either under water or outside with a canine companion. If you have any suggestions for the field course panel, I am excited to receive them! Contact: angelina.ivkic@univie.ac.at

Hannah Kempf *(she/her)* – **Working Groups Panel**, PhD Student, UC Davis
I'm broadly interested in traditional shellfish management techniques, how shellfish respond to ocean acidification, and the underlying genetic mechanisms involved in biomineralization. Currently, I'm also the Communications Coordinator for the UCD Chapter of the Association for Women in Geosciences, and the Paleontological Collections Coordinator for UCD's Biodiversity Museum Day. In my free time I enjoy hanging out with my two german shepherds and reading cook books.

Broc Kokesh *(he/him)* – **Annual Meeting Panel**, PhD Student, University of Chicago
My research addresses taphonomic dynamics, biomonitoring applications, and animal-sediment relations of benthic death assemblages (primarily bivalves). I collaborate with monitoring agencies that conduct long-term and routine surveillance of sediment conditions and biota. Current projects are set in the southern California shelf, Puget Sound, and Jamaica's Kingston Harbour. When not sorting shells and worm tubes or debugging R scripts, I enjoy intramural softball, Lake Michigan, and strumming guitar. Please feel free to reach me with any questions or ideas you have regarding conference planning! Contact: bkokesh@uchicago.edu

Gregor Mathes (*he/him*) – **Peer Training Series**, PhD Student, University of Bayreuth and FAU Erlangen-Nürnberg
My research interests include conservation palaeontology, analytical macroecology, and data science. I am particularly interested to apply novel statistical tools to the fossil record to gain insights about Earth's history. Using this information about the past, I then focus on the conservation of recent biodiversity under current climate change. Besides my research, I enjoy travelling the world with my wife, bodybuilding, and large amounts of food.

Kristin Oliver *(she/her)* – **Science Communication Committee**, MS Student, Simon Fraser University
I am trained as an archaeologist with focuses in marine subsistence practices (specifically fish and mollusks), and food sovereignty. I am currently the chair of the Science Communication sub-committee, meaning I work with the content that goes up on the CPN student blog! If you have an idea about a blog post that you think we should write (or that you want to write!), or if you have any other thoughts about science communication, please drop me an email (kaoliver@sfu.ca) – I'd love to chat!

Gabriela Serrato Marks *(she/her)* – **Diversity, Equity, and Inclusion Panel**, Postdoctoral Scholar, MIT
I recently completed my PhD in the MIT-WHOI Joint Program in Oceanography, where I focused on reconstructing past climate change using stalagmites. My primary research looks at hydroclimate shifts in northeast Mexico during the Holocene. I'm currently continuing my research as a postdoc while also doing some freelance science writing. Get in touch with me at gserratomarks@gmail.com if you want to bring anything up to the CPN Diversity, Equity, and Inclusion panel. You can find me on Twitter and Instagram as @gserratomarks.

Sage Vanier *(she/her)* – **Student Resources Page**, MS Student, Simon Fraser University
As a member of the Faculty of Environment, my research focuses on past human-plant interactions, the persisting ecological legacies that these interactions leave on the landscape today, and how this data can challenge and inform current archaeological theory and practice. I am committed to utilizing community-derived and community-oriented approaches that reconnect and strengthen Indigenous ties to land and heritage.

Postcards from the Field Compiled by Fernanda Cabrera and Jaleigh Pier

In this feature of our newsletter we showcase members' research in the field, lab, or other setting. Please submit your "postcards" with approximately 100 words of text to Fernanda Cabrera, fcabrera@fcien.edu.uy, and cc us at conservationpaleo@floridamuseum.ufl.edu. Note that if we run out of space to fit your postcard into the upcoming newsletter, it will be included in a subsequent newsletter. Submissions might also be featured as blog and social media posts. Thank you in advance for your contributions!

Patrick Hänsel (PhD student) GeoZentrum Nordbayern, Friedrich-Alexander-Universität Erlangen-Nürnberg, Bavaria, Germany

My PhD project is about the microfacies and stable isotope geochemistry of the Gotlandic picture stones' raw material. The picture stones are ancient monuments which are mainly made of limestone, and they are full of pictures from the Nordic mythology. Gotland itself is a carbonate platform which dates back into the middle part of the Silurian. The aim is to find out where the raw material sources for these prehistoric monuments are placed on the island. Further targets are the reconstruction of possible transport tracks and which facies types were preferred. My research of the picture stones has two aspects: The fossil content and the facies of the limestone visible on the surface, and the isotope measurement of carbon ($\delta^{13}C$), oxygen ($\delta^{18}O$), and in cases of doubt strontium ($^{87}Sr/^{86}Sr$). This research project fills the gap between geology, paleontology and archaeology by answering archaeological questions with geoscientific methods.

Kristina Barclay (PhD) University of Alberta, Edmonton, Canada

My name is Kristina Barclay, and I recently finished my Ph.D. at the University of Alberta (Edmonton, AB, Canada). My research focuses on the effects of ocean acidification and human activity on predator-prey relationships through time. I do a lot of research in modern marine labs, including ocean acidification experiments on live snails to understand how their shells are affected by changes in ocean chemistry, and crab feeding experiments. I also study predation traces (repair scars) on both modern and fossil snails to study crab population health, particularly in southern California. My goal is to use these projects to highlight the use of palaeontological techniques as a tool to not only understand the effects of past changes in ocean chemistry on predator-prey relationships, but to also help protect coastal ecosystems and economically valuable crab fisheries from human activities and climate change.

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Conservation Paleobiology Network

Supported by RCN-NSF Award: EAR-1922562

Are you interested in:

…contributing to **Postcards from the Field**?
…sharing a recent publication as a **Research Highlight**?
…being featured in a **Practitioner's Perspective** piece?
…providing other content suggestions for this newsletter?

If yes, please email us at conservationpaleo@floridamuseum.ufl.edu

Invite Your Colleagues to Join our Network!

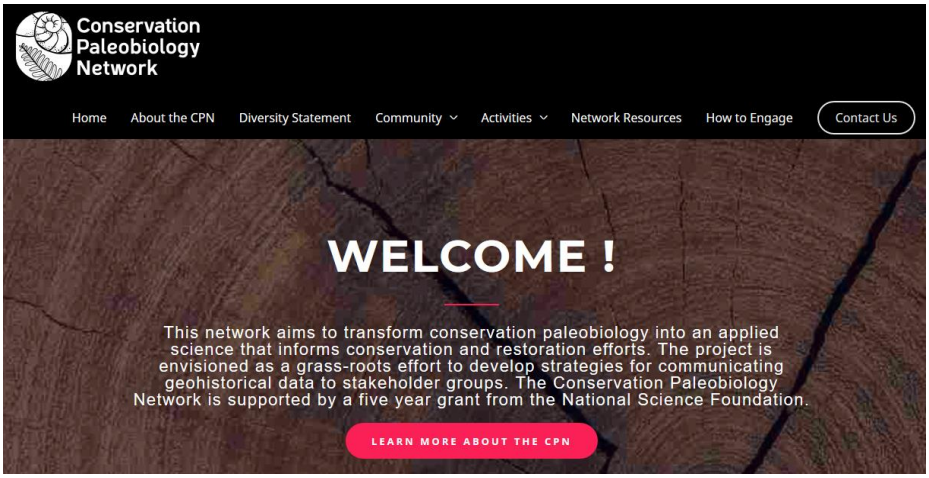
If you know people who might be interested in our network, please invite them to join. You can use the link below to extend your invitation on behalf of our network.

By joining the network, you become a member of our Community of Practice. The membership does not impose any obligations, but enables participants to engage fully in network activities. Members will be able to:

1. Participate in the CPN mailing list and online forum
2. Vote on future elections to CPN committees and panels
3. Nominate and self-nominate for committees and panels
4. Submit announcements for publication on the CPN website
5. Apply to participate in the CPN activities
6. Submit proposals for CPN field courses and CPN working groups
7. Submit proposals for webinar modules

To join please go to: https://conservationpaleorcn.org/contact/

Visit the website! https://conservationpaleorcn.org/



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First published online: Nov 2020