

CPN Newsletter



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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

Introducing Working Group: Integrating Paleo and Historical Data into Coral Reef Management and Policy

*Principal Investigators: **Katie Cramer & Loren McClenachan***

Studies using paleoecological and historical data can inform coral reef management and policy by providing accurate ecological baselines and by pinpointing the timing, magnitude, and drivers of ecosystem declines. However, these studies have rarely been incorporated into policy and management frameworks. This working group is bringing together coral reef paleontologists, historical ecologists, fish biologists, benthic ecologists, managers, and conservation practitioners to develop a plan for incorporating long-term ecological data into decision-making to advance the sustainable management of reef ecosystems.

Our group is focusing on Caribbean coral reefs, a geography with an abundance of historical ecological data and a track record of collaboration between reef scientists and managers. This spirit of collaboration is enhanced by the immediacy of conservation needs for reef ecosystems in this region. We are focusing on the application of long-term data to two pressing management issues for Caribbean coral reefs, which together address the most pressing top-down (*i.e.*, fishing) and bottom-up (*i.e.*, land-based pollution) drivers of ecosystem change.

More info and updates: <https://conservationpaleornet.org/coral-reef-working-group/>



Image caption: Paleo and historical data are revealing the effects of land-based pollution and fishing on Caribbean reef ecosystem declines, but these long timeseries are rarely incorporated into reef management frameworks.

What are CPN Working Groups?

The network sponsors Working Groups focused 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. The Working Group panel oversees solicitation, selection, development, and assessment of Working Groups.

Conservation Paleobiology Research Highlight

By Dr Renato Pereira Lopes, Universidade Federal do Rio Grande do Sul

***Anomalocardia flexuosa*: a proxy of Quaternary environmental changes along the southwestern Atlantic**

The bivalve *Anomalocardia flexuosa* is an economically important species that inhabits shallow, low hydrodynamics coastal environments of average to brackish salinity (bays, estuaries, lagoons) from the Caribbean (~12°N) to southern Brazil (28°S). Its fossils, however, are found up to Argentina (~40°S), in Pleistocene and Holocene deposits formed by successive marine transgressions, indicating that the past distribution of the species shifted cyclically in response to sea-level and temperature oscillations driven by glacial-interglacial cycles. Its expansion farther south along the southwestern Atlantic during interglacials seem to have been favoured by the increased meridional influence of warm tropical waters carried by the Brazil Current relative to the cold Malvinas/Falklands Current. Another major factor was the development of large sandy barriers in response to interglacial sea-level rise, which resulted in the establishment of a large complex of interconnected coastal lagoons between the southern Brazilian coast and the estuary of the La Plata River, creating a corridor that allowed for *A. flexuosa* and other extralimital species (that currently inhabit tropical areas to the north) to occupy the coasts of southern Brazil, Uruguay and Argentina. The mechanisms that caused the disappearance of *A. flexuosa* and other tropical species south of 28°S in the last ~4-5 thousand years include seawater cooling due to reduced influence of the warm Brazil Current, and

sea-level fall that resulted in freshening and segmentation of large lagoons into several smaller isolated freshwater lakes. The understanding of coastal processes that control the distribution of *A. flexuosa* may help in assessing how mollusks and other marine species respond to environmental impacts related to climate change and sea-level oscillations, which may include loss of habitat and invasion by potentially competing or predatory species, thus can contribute from a paleobiological perspective for conservation and management efforts under present and future scenarios of changes in coastal ecosystems.

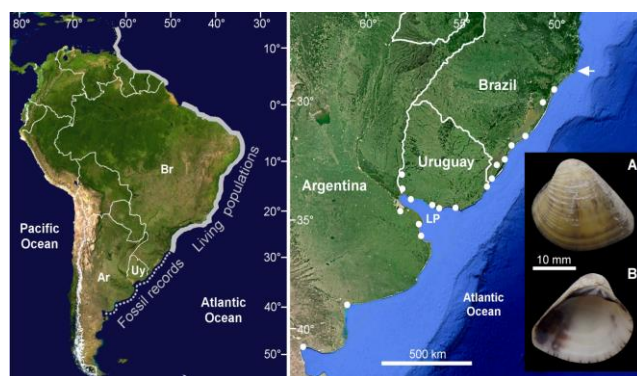


Image caption: On the left, Blue Marble satellite image showing the distribution of living populations and fossil records of *Anomalocardia flexuosa*. On the right, the location of palaeontological sites (white circles) with fossils of the species along the SW Atlantic coast; the arrow indicates the area of the southernmost living populations (LP: La Plata River). The inset shows one left valve of *A. flexuosa* in outer (A) and inner (B) views.

For more details see article by Pereira Lopes et al. (2022) in Journal of South American Earth Sciences:

<https://doi.org/10.1016/j.jsames.2021.103662>

*“The understanding of coastal processes that control the distribution of *A. flexuosa* may help in assessing how mollusks and other marine species respond to environmental impacts related to climate change and sea-level oscillations.”*

Student Section

Conservation connections: Bridging science and practice through conservation paleobiology research

This spring, the CPN Student Panel will host a virtual panel discussion that will explore the divide between paleontological research and conservation practice. The event will highlight the perspectives of early career researchers and practitioners in conservation paleobiology who are actively working to bridge this divide. It will also foster dialogue between network members to help our community develop the insider knowledge and connections needed to build stronger linkages between research and conservation decision-making. Join us for mini-lectures by four panelists, a moderated Q&A session, and optional breakout rooms for small-group conversation. Coming to a Zoom room (and time zone) near you.

Further details will be announced in the coming weeks. Registration will open in mid-April.

Network Updates and Reminders

As of March 2022, the network has reached a milestone of over 600 members! These members represent people from institutions in 46 countries, and we continue to grow each week. Remember that the network exists to serve its members, and you are free to use the listserv to communicate with the community, and reach out to us if you would like to be more involved or have any suggestions.

Don't forget about the **resources database** (<https://conservationpaleorcn.org/resources/>), available on our website and maintained by the student panel, as well as other resources of interest to people involved in conservation paleo.



Announcing the 2nd Conservation Paleo Symposium

The 2nd Conservation Paleobiology Symposium will be held Feb 16-19, 2023 in Gainesville, Florida. More information about abstract deadlines and registration will be forthcoming.

THE 2ND CONSERVATION PALEOBIOLOGY SYMPOSIUM

FEB 16-19, 2023
GAINESVILLE, FL
#CONSPAEO2023



Conservation
Paleobiology
Network

SAVE THE DATE!

Paleo Proxy Spotlight – Pedoanthracology

by Emma Gamba, Institut Méditerranéen de Biodiversité et d'Écologie marine et continentale (IMBE)

What is a proxy? Understanding past life on Earth is of great interest and importance to humanity. Since we cannot travel back in time to see what really happened, we must rely on proxies to measure past temperature and other paleoenvironmental conditions. Proxies allow us to “read” these conditions using the ancient geological material. A proxy is something that can serve as a substitute for another thing which is absent or cannot be measured directly. In any discipline involving researching the past, proxies can be used to reconstruct something long after the original thing is gone. The most widely applied proxy in studying paleoenvironment or past climate change are stable isotopes.

What is pedoanthracology? Pedoanthracology is a paleoecological and phytohistorical discipline which aims to identify, quantify, and date the charcoals found in the soil as a result of wildfires or anthropogenic fires. Contrary to ‘archeoanthracology’ which studies the charcoals from woody species that has been selected and collected by man and mostly retrieved from archaeological excavations, pedoanthracology is interested in charcoals found in the soil context, which have not passed through the filter of human. Soil charcoals generally provide a complementary image of the surrounding vegetation, in addition to charcoals from archaeoanthracological which bear the imprints of the anthropogenic activities.

Paleo Proxy Spotlight – Pedoanthracology continued

Charcoal, a useful proxy: Similar to pollen grains, charcoals found in natural soils allow the reconstruction of vegetation over a millennial scale. This is due to their very good preservation capacity in the majority of soils and their resistance to biological mineralization and mechanical corrosion. Despite the carbonization, the wood anatomy is well-preserved permitting to determine the species that burned, sometimes even to the species level thanks to various identification criteria (Figure 1). Such identifications to low taxonomic levels can be applied to those charcoals measuring 400 microns or more, which attest the presence, in situ, of the species having burned. Generally, the charcoals >400 microns are incorporated and stored in the soils at the scale of the fire area. A big advantage of charcoal as a paleoecological proxy is that it is almost exclusively composed of carbon allowing to be directly radiocarbon dated to obtain an excellent temporal resolution. What a powerful working tool!

Pedoanthracology: a valuable tool for ecologists? The interest of pedoanthracology lies in its potential to clarify regional forest reclamation patterns in a very local scale and at a very precise temporal resolution (^{14}C dating). It is an excellent complementary tool to disciplines such as Quaternary palynology where the vegetation is reconstructed in regional scale. It has been successfully applied to investigate the dynamics of high-altitude forest ecosystems particularly the supraforest zone (beyond treeline) since the 1990s. For example, the origin of the current upward movement in the upper treeline in the southern Alps has been clarified in a number of investigations. A number of studies have shown that the downward movement of this limit has been strongly linked to human activities and that the current rise of trees in altitude is mainly due to the abandonment of these activities.

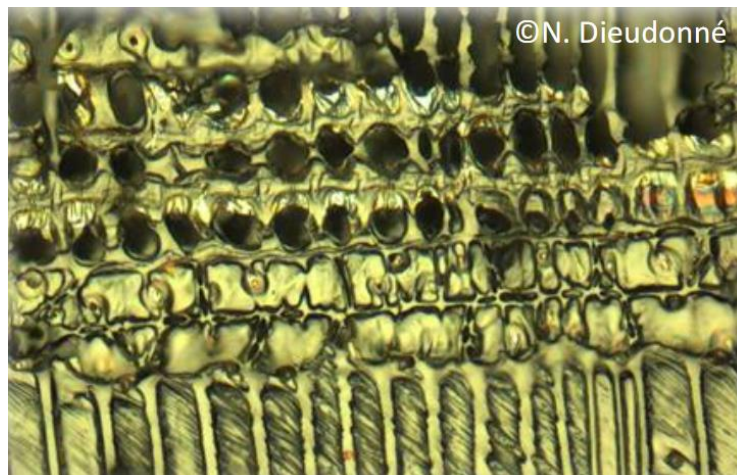


Figure 1: Charcoal of *Pinus uncinata* observed under an episcopic microscope (magnification x500).

Pedoanthracology, a valuable tool for forest managers? Today, pedoanthracology has interesting repercussions in ecological restoration and management of forest ecosystems. Naturalness is increasingly sought after in restoration and management efforts today because it is one of the fundamental keys in defining the 'target ecosystems' representing the forest before disturbance by human activities. Charcoals can thus provide valuable information on the degree of naturalness of a site, where palynology is not applicable due to inadequate pollen preservation in soil and rarity of promising pollen sites. Pedoanthracology provides information on the forest history and can be particularly useful in prioritising a site to conserve. For example, if managers want to favor the conservation of ancient forests that have experienced little anthropogenic intervention, they can rely on the history of the vegetation transcribed by the study of charcoal. They can also rely on pedoanthracology for the choice of the tree species to use for reforestation and maintenance of old forests or open environments. Thus, like many other paleoecological proxies, the soil charcoals, these little guys, are a true paleoenvironmental tool, capable of taking us on a long journey into the past to improve our understanding of the present!

Postcards from the Field

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 us at conservationpaleo@floridamuseum.ufl.edu.

Hilde G.B. Desmet, MSc. Palaeobiology, Belgium

In Krasiejów, the south of Poland, we excavate in the reddish Upper-Triassic continental deposits. There is a bonebed full of big amphibians (*Metoposaurus* and *Cyclotosaurus*) and non-dinosaur archosaurs (Physotarsus and Pseudosuchians). Every summer the University of Opole and the European Centre of Palaeontology 'pitch their tents' there. My main study object is *Stagonolepis*, an Aetosaur of +/- 3 m long with the typical pig-like snout and covered with osteoderms. I hope to find more bones to be able to gain knowledge about the morphology, gait and sexual dimorphism of these Pseudosuchians.





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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!

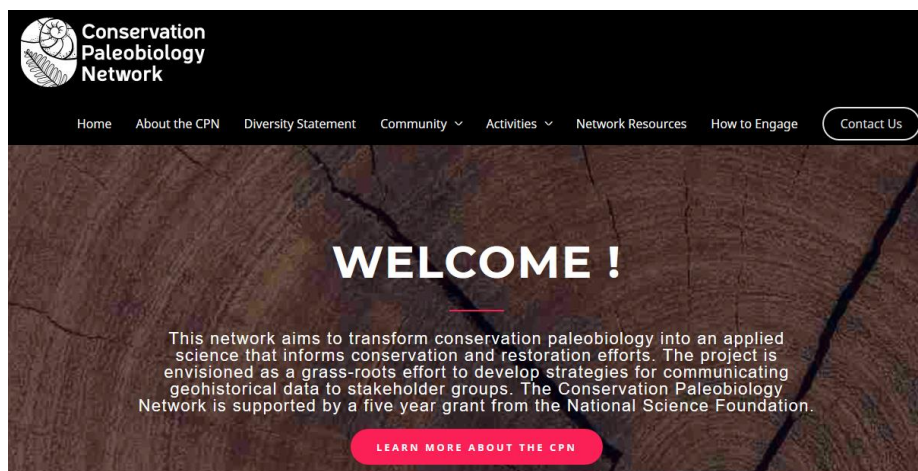
If you know people who might be interested in our network, please invite them to join. You can use the link below to extend your invitation on behalf of our network.

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
2. Nominate and self-nominate for committees and panels
3. Submit announcements for publication in the CPN Newsletter
4. Apply to participate in the CPN activities such as Field Courses
5. View CPN webinars and submit proposals for webinar modules

To join please go to our website and select "Join the Network".

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



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