**Session Proposal**

# Session Title

Traditional and Novel Concepts, Approaches, and Methods in Studying the Past Genesis of Soils and Soil-Sedimentary Systems

**Traditional and Novel Approaches for Understanding the Past of Soils and Soil-Sedimentary Systems**

# Session Organizers

*Maria Bronnikova*, Texas Tech University, USA; Institute of Geography, Russian Academy of Sciences, Russia, [maria.bronnikova@ttu.edu](mailto:maria.bronnikova@ttu.edu)

*Brad Sion,* Desert Research Institute, USA, [brad.sion@dri.edu](mailto:brad.sion@dri.edu)

*Xue-Feng Hu,* Shanghai University, China, [xfhu@shu.edu.cn](mailto:xfhu@shu.edu.cn)

# Session Description

The utility of soils and paleosols to infer the processes, timing, and rates of their evolution, related to environmental conditions, depends upon the conceptual models, approaches, and methods that are applied. Progress in pedology and paleopedology always benefited from the integration of fundamental concepts with emerging novel ideas borne out of recent technological development. Examples of such fundamental concepts are the traditional functional-factorial model of soil development and the soil memory concept, describing soil-evolution pathways through environmental changes: how to trace, understand those pathways and project them to the future? The answer to this question requires an in-depth understanding of soils and soil-sedimentary systems in time and space. Those traditional concepts continued to serve the soil science community, particularly when combined with emerging analytical and computational techniques that improve estimates of soil age, applying new proxies such as isotopic signatures, various bioindicators, geochemical indicators, new holistic and high resolution approaches and techniques. As such, this session puts a focus on both novel and traditional approaches to the study of soil characteristics to highlight the current state-of-the-art in pedology and paleopedology.

This session will be designed as panel discussions with short presentations and an open debate on the advantages, limitations, and drawbacks of the presented methods, as well as the possibilities of combining different approaches and methods within a single study. We invite contributions that capitalize on emerging, traditional, or a combination of concepts, approaches, and methods to evaluate soils and their characteristics in any range of landscape conditions. We are particularly interested in showcasing studies that demonstrate the utility of novel methods while leveraging traditional techniques. Such contributions may draw from field, laboratory, and/or numerical approaches. Our goal is to bring together specialists applying new lines of reasoning and evidence towards achieving solutions to outstanding problems in pedology.

# Format

Panel discussions

# Proposed Speakers

[Nathan](https://r.search.yahoo.com/_ylt=AwrijOnp29xnFwIAa.oPxQt.;_ylu=Y29sbwNiZjEEcG9zAzEEdnRpZAMEc2VjA3Ny/RV=2/RE=1743737066/RO=10/RU=https%3a%2f%2flsa.umich.edu%2fearth%2fpeople%2ffaculty%2fnsheldon.html/RK=2/RS=JaMiRGOpow.WVfIeCkHXYzm02d4-" \t "_blank)Sheldon University of Michigan, USA, [nsheldon@umich.edu](mailto:nsheldon@umich.edu), geochemical coefficients, quantitative models of climatic reconstructions based on geochemistry, has one of the highest rates of citation in paleopedology within the last 20 years.

- Elya Zazovskaya, [Elya.Zazovskaya@uga.edu](mailto:Elya.Zazovskaya@uga.edu), Center for Applied Isotope Studies, University of Georgia, USA; Institute of Geography of the Russian Academy of Sciences, Russia. Specialist in C14 dating and stable isotopes,

-Vera Aldeias**,** Interdisciplinary Center for Archaeology and Evolution of Human Behaviour, University of Algarve, [vlaldeias@ualg.pt](mailto:vlaldeias@ualg.pt). New approaches in geoarchaeology (block excavation, non-destructive high-resolution site formation studies, micro-xrf, high resolution molecular and microscopic records).