UNIVERSITY *of* WASHINGTON

Undergraduate Research Symposium May 17, 2019 Mary Gates Hall

Online Proceedings

SESSION 1A

CLIMATE CHANGE: GASSES, CLOUDS, MEASUREMENTS

Session Moderator: Dennis Hartmann, Atmospheric Sciences
MGH 074
12:30 PM to 2:15 PM
* Note: Titles in order of presentation.

Investigating Global Warming Impact on Phytolith Size
Kailyn M. (Kailyn) Zard, Senior, Biology (Molecular, Cellular & Developmental)
    Mary Gates Scholar
Mentor: Camilla Crifo, Biology
Mentor: Caroline Stromberg, Biology

Plants take up silica over the course of their lives along with other essential nutrients in the water that they absorb through their roots. The silica becomes deposited within their tissues in the form of solid bodies (phytoliths); when the plant dies and decays, phytoliths are left in the soil where they can fossilize. Fossil phytoliths preserve the original morphology of plant cells and can be used to reconstruct past vegetation. The Middle Miocene Climatic Optimum (MMCO) was a major global warming event that happened ˜17-14.5 million years ago. Researcher have reconstructed the climate of the Santa Cruz Formation in Patagonia, Argentina during this period as warmer and drier. While we would expect the vegetation to become more open (i.e., grassy or shrubby versus forested), phytoliths from the Santa Cruz Formation tell a different story; in particular grass phytoliths (and therefore grass abundance) seem to decrease through time, but also become smaller. Some researchers have noticed that grasses tend to respond to reduced water availability with reduced cell size. Therefore, we hypothesize that the reduced size of grass phytoliths observed in the Santa Cruz Formation during the MMCO is due to increasing aridity. However, because this trend of decreasing cell size was only noticed by qualitative observation, we need to quantitatively assess significant changes in cell size. To do so, I studied and imaged grass phytoliths under a microscope, categorized them by subfamily/tribe based on their shape, and measured their size. I then statistically compared the phytoliths from younger and older strata to test whether there was a change in size through time. This work will be used to predict how our current global warming event may impact plant life based on the trends of the past.

SESSION 2I

EQUITY AND ACCESS IN HIGHER EDUCATION

Session Moderator: Gillian Harkins, English
MGH 254
3:30 PM to 5:15 PM
* Note: Titles in order of presentation.

The Grammar of Poetry: Promoting Agency and Creativity in the Education of EFLs
Emily H Huber, Senior, Comparative History of Ideas, English
    UW Honors Program
Mentor: Caroline Simpson, Comparative History of Ideas

Students who speak English as a foreign language (EFLs) are pushed within U.S. academic settings to strive for "standard" English—an academic English heralding grammar "correctness" and adherence to rules. EFL curriculum prioritizes for "standard" English, but ignores the ways that terms like "standard" are exclusive, and rarely addresses how an EFL writer may use language in more inventive ways. How do we reimagine the teaching of writing in ways that can not only help EFL writers in formal high-stakes writing, but also open the door to other creative uses of writing which need not adhere to such strict and increasingly hackneyed standards? My research will draw from many of the conversations focused on second-language acquisition and bilingual education, including work from scholars such as David Freeman and Sara Alvarez, to understand the most recent and effective approaches to teaching English as a second language, as well as discover what approaches to teaching creative writing hold untapped potential for EFL students to acquire new language skills. I will use *The Chicago Manual of Style* as a contemporary example of a style guide which prescribes "standard" grammar convention. Using an assortment of the grammar topics selected from Chicago for comparison, I will discuss examples of deviations from grammar conventions by writers from various linguistic backgrounds, including Safiya Sinclair, Ocean Vuong, and Mohsin Hamid. By investigating who makes En-

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glish "standards," how EFLs best learn, and how these standards have been broken for the better, I aim to create a subversive style guide for EFL writers which is useful for both formal and creative writing.

POSTER SESSION 3

Commons East, Easel 59

2:30 PM to 4:00 PM

Investigating the Origins of the First Asian Grasslands
Stokke Xu, Senior, Earth and Space Sciences: Geology,
Drama: Design
*   UW Honors Program*
Mentor: Alexis Licht, Earth and Space Sciences
Mentor: Caroline Stromberg, Biology

Grasslands cover approximately 20% of Earth's land today and spread gradually worldwide in subtropical areas during the last 40 million years. Pollen data from sedimentary rocks in Myanmar suggest that grasslands might have existed there as early as 25 million years ago but did not spread to other Asian regions until much later, 10-6 million years ago. To fully understand the ecology of these early Asian grasslands, I reconstructed the paleoenvironments of Myanmar during the late Oligocene and early Miocene, 25 to 18 million years ago. I used two paleoenvironmental proxies on paleosol samples from Burmese sedimentary rocks: carbon isotopic composition of bulk sediment and phytolith analysis. The bulk carbon isotopic composition in paleosol is an indirect insight into the local aridity and can help reconstructing soil productivity; phytoliths–silica bodies deposited inside living plant tissue that remain in the soil after the tissue decays, forming fossils—when extracted, can help identify the grass types and their relative abundance in the ecosystem. Documenting the characteristics and paleoenvironmental setting of these early grasslands will help us understanding why they did not spread until millions of years later in Asia –and if this timing of ecological expansion is linked to the regional evolution of monsoonal intensity.