95th ESA Annual Meeting in Pittsburgh, PA

Friday, August 6, 2010

PS 93-55: A web-based Paleoecology Module provides a virtual palynological experience for undergraduates: Virtual Forest Initiative at Black Rock Forest

Terryanne Maenza-Gmelch, Barnard College, Columbia University and Alice J. Cox, Columbia University.
Background/Question/Methods A web-based Paleoecology Module was created to provide a virtual palynological experience for an undergraduate course in the Environmental Science Department at Barnard College that has a three-week component on land-use history. This module uses pollen photomicrographs and pollen percentage data from Sutherland Pond in Black Rock Forest, NY in two separate activities. A Pollen Identification Tool was designed to introduce students to pollen morphology and the use of a diagnostic key. The 15 most common pollen types from the real core are used. Plant macrofossil images and data are also included. The Sediment Sampling Tool allows students to visualize the core and select sampling levels. Once selected, a pie chart of the most abundant pollen types and their percentages at a given core level is shown. Multiple samplings and review of the corresponding pie charts facilitate the visualization of changes in the abundance of various taxa. Students can then choose to download the entire excel spreadsheet of Sutherland Pond pollen percentage data and select various taxa from this top 15 to graph against the AMS radiocarbon data that are also provided.

Results/Conclusions The Paleoecology Module provides to the student a means for learning the discovery process inherent in reconstructing a forest's ecosystem using paleoecological techniques without the time and resource constraints that make actual sediment coring and pollen processing impossible in a classroom setting. Activities incorporating this module may be designed to enable student mastery of sediment core sampling strategies, pollen and plant macrofossil identification, the application of radiocarbon dating methods to core samples, and the use of modern range maps as a means of interpreting paleoecological data. As a teaching and learning strategy, this module provides key interactive and inquiry-based learning opportunities for students, facilitating synthesis of key palynological concepts and skills within the time frame of a traditional lecture based undergraduate course. The Paleoecology Module is one of many ecological and environmental science learning modules currently being developed by the Columbia Center for New Media Teaching and Learning in collaboration with Barnard College and Columbia University faculty. These modules are part of CCNMTL's Virtual Forest Initiative at Black Rock Forest (http://blackrock.ccnmtl.columbia.edu/paleoecology).