Nov 30th, 3:45 PM - 5:00 PM

Climate change and ecosystem transformation: Plant wax evidence from Indian Ocean drilling

Sarah Feakins
University of Southern California

MONTCLAIR STATE UNIVERSITY

The Doctoral Program in Environmental Science & Management and MSU Sustainability Seminar Series Present:

Climate change and ecosystem transformation: plant wax evidence from Indian Ocean drilling

WHEN: Nov. 30, 4:00 pm WHERE: online

Dr. Sarah Feakins

University of Southern California

Dr. Feakins is an Associate Professor of Earth Sciences at the University of Southern California. She received her Ph.D. from Columbia University and was a NOAA Postdoctoral Fellow at Caltech. Sarah has worked on Indian Ocean deep sea drilling cores for the past 20 years – since her senior thesis at Oxford University. She served for 3 years on the Science Evaluation Panel for the IODP, and is an author of the Science Framework for the mission of IODP through 2050. USC postdoc Camilo Ponton and graduate student Hannah Liddy sailed as shipboard scientists on Indian Ocean IODP Expeditions 354 and 355.

ABSTRACT. Plants – from lush rainforests to desert shrublands – map climatic differences on the landscape. The waxy molecules coating plant leaves are some of the most resilient biochemicals made by plants and they contribute to the sedimentary legacy of past environment, archived in deep sea sediments. The International Ocean Discovery Program has recently drilled the two largest submarine fans in the world, the Bengal Fan (Expedition 354) and Indus Fan (Expedition 355). These megafans yield thick deposits of dominantly terrestrial organic matter derived from the Ganges-Brahmaputra and Indus River systems respectively. In addition, legacy cores from the Gulf of Aden (Expedition 24) contain wind-blown terrestrial organic material from NE Africa. From each of these expeditions we have uncovered a record of vegetation and climate change. Plant waxes are key to this story as their C isotopic composition reflects photosynthetic pathway and their H isotopic composition that of precipitation. Dual analyses in the same plant wax molecules allow climate and ecology to be tracked in tandem. Using this approach, we answer longstanding questions as to whether changes in monsoon rainfall coincided with the expansion of C4 grasslands.

For more information contact Dr. Passchier at passchiers@montclair.edu