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Jan 23rd, 4:00 PM - 5:00 PM

Understanding Abrupt Climate Change Over The Last 100,000 Years

Jennifer Hertzberg
Old Dominion University

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The MSU Sustainability Seminar Series Presents:

Understanding Abrupt Climate Change Over The Last 100,000 Years

WHEN: January 23, 4:00 pm

WHERE: CELS 120 lecture hall

Dr. Jennifer Hertzberg
Old Dominion University



Dr. Hertzberg is currently a Postdoctoral Research Associate at Old Dominion University in the Department of Ocean, Earth, and Atmospheric Sciences. She holds a Ph.D. in Oceanography from Texas A&M University and recently completed a Postdoctoral Fellowship at the University of Connecticut Avery Point. Dr. Hertzberg's research is focused on two main areas: (1) Developing and understanding paleoceanographic proxies through geochemical analyses of seawater and recently deposited sediment, and (2) Applying these proxies down-core to reconstruct past climates and ocean temperature, salinity, productivity, and circulation during the late-Quaternary. She is particularly interested in elucidating the drivers and global impacts of past abrupt climate change events using faunal, stable isotope, and minor/trace metal analyses on foraminifera.

Unlike the relatively stable climate Earth has experienced throughout the Holocene, Earth's climate system underwent a series of abrupt oscillations and reorganizations during the last glacial period and termination.

The first part of this seminar will investigate the trigger for the atmospheric CO₂ rise that occurred during the last deglaciation, beginning 17,500 years ago. I will show that abrupt changes in the Atlantic Meridional Overturning Circulation occurring synchronously with the initial CO₂ rise may have altered the oceanic biological pump, allowing CO₂ to accumulate in the surface ocean and atmosphere. Records of surface and intermediate water foraminiferal $\delta^{13}\text{C}$ suggest that the biological pump weakened as the overturning circulation slowed, which would have decreased the sequestration of carbon in the deep ocean.

In the second part of the seminar, I will present initial results of a newly funded project aimed at reconstructing tropical Pacific mean state and El Niño dynamics across the abrupt climate events of the last glacial period. Records of thermocline temperature and upwelling variability, reconstructed from foraminiferal Mg/Ca ratios and faunal analyses, respectively, suggest that abrupt warming events in the Eastern Pacific were characterized by warmer thermocline temperatures and decreased upwelling – conditions synonymous with an El Niño-like state. Both of these studies have important implications for future climate variability.