UA SCIENCE Geosciences

Climate Group Newsletter 2019

Hello Alumni! The UA Geosciences Climate Group is excited to share with you the newest updates of the Cohen, Lofverstrom, Russell, Thirumalai, Thompson, and Tierney Labs!

Cohen Lab

Andy and a Neanderthal at the HSPDP Chew Bahir meeting in Neandertal, Germany (10/ 2019)

It has been an exciting year in **Dr. Andy Cohen's** paleolimnology lab! **Dr. Anne Billingsley** and **Dr. Chad Yost** both received their PhDs in 2019! The Hominin Sites Paleolakes Drilling Project (HSPDP) is wrapping up and will culminate with a final meeting in Nairobi next summer. We welcome a new graduate student, **Julia Manobianco**, who is reconstructing changes in seasonality over time in the Turkana Basin of East Africa using bivalve shells to see how changes in seasonality affected early human evolution. Masters student **Tumaini Kamulali** is reconstructing Holocene food webs during past environmental and climate changes to predict how Tanganyika fisheries will react to future anthropogenic climate change.

Lofverstrom Lab

Dr. Marcus Lofverstrom

Dr. Malin Odalen

Exciting year for **Dr. Marcus Lofverstrom**'s Lab! **Dr. Malin Odalen** will be joining the lab as a postdoctoral researcher in January 2020, and will strengthen the research activities in large-scale dynamic meteorology in past, present, and future climates. Recent contributions from the group include a new theory for extreme precipitation events influencing North America and Europe at the Last Glacial Maximum, and the first ever high-resolution simulation of glacial inception using a comprehensive Earth system model with a fully interactive ice-sheet component. Dr. Lofverstrom also received an RDI seed grant to analyze factors controlling the observed structure of atmospheric circulation.

Russell Lab

The Russell lab has been busy this year! PhD student **Becki Beadling**'s work on assessing the ability of climate models to accurately represent properties and transports in the Southern Ocean was published in Journal of Climate. The Southern Ocean Carbon and Climate Observations and Modeling project (https://soccom.princeton.edu) received another four years of NSF funding and will continue to deploy floats into the Southern Ocean. **Dr. Joellen Russell** and Becki recently attended the 2019 Comer Science Conference to present their work on the role that high latitude regions play in abrupt climate change (see photo). Thanks to our collaboration with **Dr. Ronald Stouffer**, now part of the Russell Lab, UA is one of the first universities in the world to contribute to Coupled Model Intercomparison Project Phase 6. The simulations performed using our "UA-MCM" model will contribute to the assessment of climate change in the next IPCC report.

Thirumalai Lab

UA Geosciences welcomes **Dr. Kaustubh Thirumalai**, the newest faculty member of the climate group! Dr. Thirumalai is in charge of the Arizona Paleoceanography Laboratory, which focuses on reconstructing ancient climate change using the stable isotope and trace metal geochemistry of carbonates. His lab will primarily use microfossils such as foraminifera in marine sediments to generate past records of ocean temperature and salinity. Thirumalai's work also highlights the chemistry locked in cave deposits and coral skeletons to investigate climatic change across key intervals in Earth's history. Over the next few years, the Paleoceanography Laboratory will focus on the Indian monsoon sector and understand ocean circulation in the Indian Ocean over geological timescales.

Thompson Lab

Alice Chapman (L) and Dr. Thompson (R) pull up a successful sediment core in the main lagoon of Kiritimati in 12/2018.

As Director of Marine Research at the Biosphere II Ocean, **Dr. Diane Thompson** is involved in studying the biogeochemistry of a degraded reef system, remediating the reef, and engineering state-of-the-art life support to study solutions for building resilient reefs of the future. This past year, the B2O experienced its first fish introduction since 1996 and its first custom-built experimental tank for growing and manipulating corals. Dr. Thompson's Tropical Climate and Coral Reefs Lab also had an eventful year. Last December, Dr. Thompson and PhD student **Alice Chapman** traveled to Kiritimati Island in the equatorial Pacific to collect water and sediment samples as part of a project that uses a novel coral proxy to reconstruct Pacific trade-wind patterns. PhD candidate **Emma Reed** is wrapping up a project that uses coral geochemistry to track changes in the tropical Pacific rain belt through time. She also recently attended the Water Isotopes and Climate workshop hosted by US CLIVAR, and is finishing a Carson scholarship to develop her science and communication skills!

Tierney Lab

Over the last year, the Tierney group has presented their research at conferences in 3 countries, published in 6 different journals, and welcomed two new postdoctoral researchers - **Dr. Lauren O'Connor** and **Dr. Matthew Osman**. In November, **Dr. Jessica Tierney** launched her newest project, the Climate Systems Center (climatesystemscenter.org), which will highlight and support the work of climate researchers in southern Arizona. In addition to her research at UA, Dr. Tierney is serving as a lead author on the chapter addressing the water cycle for Working Group I of the IPCC Sixth Assessment Report.