Seminar Schedule for 2023-24

September 8, 2023 – Professor Matt Carter, Williams College
1:00pm in Wachenheim Room 102
“Strategies for Designing and Delivering a Scientific Presentation”
A hands-on workshop for GEOS thesis students or anyone that will be presenting at conference(s). A copy of Prof. Carter’s book “Designing Science Presentations: A Visual Guide to Figures, Papers, Slides, Posters, and More” is available in the GEOS student lounge.

September 27, 2023 – Dr. Marisa Palucis, Dartmouth College
3:00pm in Wachenheim Room 116

“Mars on Earth: Using terrestrial landscapes to quantify the role of climate change on sediment transport rates and processes”
Many landforms found on Earth and Mars are the result of flowing surface water. Understanding how water volumes and climatic conditions are recorded in the form (and sediments) of these features may provide key insights into habitability and climate change on Mars. However, terrestrial studies aimed at quantifying the hydrologic conditions needed to form these geomorphic features rarely assess the total amount of water that passes through a landscape, which can be problematic when inferring past climate. I will present results from several ongoing field-based analog studies. The first is at Meteor Crater (AZ, USA), where work is being conducted to understand sediment transport processes on steep slopes and the amount of water that formed the network of gullies along its inner walls. The second involves the
characterization of sediment transport processes and fluxes across periglacial alluvial fans in the Aklavik Range in the Richardson Mountains (NWT, CA). Both sites have undergone significant climate change, providing ideal testing grounds for how sediment supply, water availability, and the frequency, duration, and magnitude of sediment transport events change under changing climate.

**September 29, 2023** – Thesis Previews with our Class of 2024 thesis students: Martina Berrutti Bartesaghi, Gwyn Chilcoat, Amalia Culpepper-Wehr, Annabel Flatland, Sylvain Foisy, Berenize Garcia Nueva, Kennedy Lange, Peter Miles, and Elaine Yu.
2:00pm in Wachenheim Room B11 (Bronfman Auditorium)

**October 3, 2023** – [Dr. Yolanda Lin](#), University of New Mexico
3:00pm in Wachenheim Room B11 (Bronfman Auditorium)

“Catalyzing active hope for disaster resilience”
How can hope change the way communities approach disaster risk and resilience? In this talk, I will discuss new approaches to catalyze active hope in the field of disaster science through counterfactual thinking, co-created scenario development, and SciArt. By applying a lens of hope to traditional disaster risk assessment and reduction methods, this work can support more equitable decision making and help prepare communities for uncertain futures in the face of natural hazards and disaster risks.

**November 7, 2023** – [Dr. Terry Plank](#), Columbia University
3:00pm in Wachenheim Room B11 (Bronfman Auditorium)
“Magma Stalling and Launching Depths beneath Active Volcanoes”
An exciting development in volcanology has been the discovery of precursory shifts in the CO2/S ratio of gas emissions months to hours before eruption. Equally interesting are the near steady-state ratios that occur during the interruptive period. What are the source depths of these different modes of degassing, and how can they be used to inform forecast models? This talk will introduce the “volcanic gas revolution” and then show how tiny melt inclusions inside crystals record the degassing of magma as it rises to the surface prior to eruption.

November 10, 2023 – Lauren Interess Adventure Fellowship Presentations with fellowship recipients Kennedy Lange ’24 and SJ Brusini ’23.
11:00am in Wachenheim Room 102

Kennedy Lange
“An Exploration of Southern Japan Volcanism and its Impact on Culture”
My interest in volcanology stemmed from my summer internship project in Oslo, Norway where I studied volcanic ash deposition in lacustrine sediment cores. This was a collaborative project that combined modeled volcanic eruption data with high-resolution sediment core samples and archaeological evidence to study volcanism-driven climate change during the Norwegian Viking Age. After months of sifting through sediments in search of cryptotephra particles, my passion for volcanism was ignited, and I sought to learn about climatic forcing from volcanic eruptions, plume heights,
explosivity indexes, and about different volcano types from my collaborators.

SJ Brusini
“Using geomorphology to understand how erosion has altered the setting of Bronze Age cliff top forts on Inis Mór, Aran Islands, Ireland”

The Aran Islands, off the west coast of Ireland, are a beautiful place geologically, culturally, and archaeologically. Inis Mór, the largest island, is home to some of the most striking archaeological sites in Europe – namely the Bronze Age stone forts Dún Aonghasa and Dún Duchathair. It also hosts dramatic limestone cliffs, a karst landscape, and unique terrestrial and marine ecology. Each of these pieces that make the Aran Islands such a gorgeous landscape has the potential to be studied from a classroom independently but studying this place remotely cannot provide a real understanding of how those pieces function together to create Inis Mór in its entirety.

**February 12, 2024 – Dr. Elizabeth Burakowski, University of New Hampshire**

3:00pm in Wachenheim Room 114

“Connecting Climate Change to a Community: Impacts of Warming Winters on Ice Climbing in the Mount Washington Valley, New Hampshire”

Over the past 100 years, winters in New England have been losing their grip. Temperatures have warmed and extreme cold has become less frequent. Snowpack has responded in kind, shrinking in both areal coverage and depth. Across the northeastern United States,
future winter climate projections portray additional warming and snow loss that will impact ecosystems and society. In this talk, I will present a case study on how the changes we’ve seen in winter impact the tightly knit ice climbing guide community in the Mount Washington Valley of New Hampshire. We connected a treasured photo archive of ice conditions at a popular ice climbing route to the weather records recorded at Pinkham Notch, NH, and projected future climate and climbing conditions to 2100. The photographer, a local legend in the community, captured the waxing and waning of ice climbing conditions throughout twenty climbing seasons, dating back to the winter of 2001. Through a survey and focus group, we heard from the local guides whose livelihoods depend on the cold and what they anticipate for the future. With support from the American Alpine Club, the research study was documented in a short film Freeze//Thaw, which we’ll screen and discuss in the context of approaches to science communication and advocacy.

March 12, 2024 – Dr. Sam Muñoz, Northeastern University
3:00pm in Wachenheim Room 113

“Riverine floods in a changing environment”

Riverine floods rank among the costliest and most frequently occurring natural disasters in the United States, with large uncertainties in near- and long-term projections of flood hazard. In this talk, I will describe a series of projects that integrate instrumental datasets, paleoclimate and paleoflood records, climate reanalysis, and climate model output to examine the response of river systems to climate variability and climate change. Over inter-annual and decadal time-scales, we show how flood occurrence on the Mississippi River
and its tributaries is highly sensitive to major modes of climate variability centered in the Pacific (ENSO) and Atlantic Oceans (NAO, AMO), providing a means to improve seasonal flood forecasts. We also examine the response of midcontinental North American rivers to the relatively warm and dry Medieval period (ca. AD 1000–1300) – a partial analogue for projected warming – to show that flood hazard was reduced across the Mississippi River basin at this time. These findings support model projections of reduced Mississippi River discharge in response to greenhouse forcing, but do not incorporate changes in river and floodplain management that are also critical to mitigating flood risk today and in the future.

**April 25, 2024 – Dr. Paul Harnik, Colgate University**

3:00pm in Wachenheim Room 114


How have humans altered coastal ecosystems? Answering this question is challenging because our species has been interacting with coastal ecosystems for millennia, yet scientific monitoring of these environments is limited to a few decades at the most. In my talk, I will discuss how the skeletal remains of marine organisms are used to establish baselines for ecosystems prior to anthropogenic environmental change. Comparing these baselines with the characteristics of present-day populations can reveal historical changes and inform our predictions for how coastal species will respond to future environmental conditions. I will focus on examples from our lab’s work in the Gulf of Mexico that illustrate the ways that bivalve mollusks have responded to anthropogenic eutrophication.
May 13, 2024 - Thesis Presentations  
10:00am in Bronfman Auditorium (Wach 011)

- **Martina Berrutti Bartesaghi**: Correlation of Marine and Lacustrine Tephra Layers from 14.6ky ago in the North Pacific
- **Gwyn Chilcoat**: Small worms in an ancient pond: scolecodont miniaturization in the Late Devonian mass extinction
- **AJ Culpepper-Wehr**: Geoscience meets Genealogy: An Interdisciplinary Analysis of Inundation, Land Use Changes, and Ancestral Tribal Land Ownership in Southern Louisiana
- **Annabel Flatland**: Melting Arctic or Climate Variability: What Causes Recent Changes in Arctic Sea Ice Drift Patterns
- **Syl Foisy**: Investigating Liquid-Liquid Phase Separation of Hydroxynitratre Containing Aerosols
- **Berenize Garcia Nueva**: California's Central Valley: The Dynamics and Thermodynamics of Heat Events in a Warmer Climate
- **Kennedy Lange**: Algorithmic Insights into Grounded Ridge Detection and Quantification along the Alaskan Arctic Coastline using Remote Sensing Techniques
- **Peter Miles**: Modeling the evolution of nitrogen in Earth's mantle and atmosphere through deep time
- **Elaine Yu**: Beneath the Surface: The Critical Role of Soil Composition in Trichloroethylene Flux