

Enacting Our Environmental Entanglements:

Innovation/Renovation at the Columbia Climate School's Lamont-Doherty Earth Observatory

Mark Rakatansky + Jorge Otero-Pailos

Fall 2021/A6305-1 HP STUDIO III (6 credits)

Open to all Preservation Students

Mondays 1:30-6:30

Fayerweather 301



View of the Lamont-Doherty Earth Observatory and the Hudson River

The Lamont-Doherty Earth Observatory — founded in 1949 to develop “fundamental knowledge about the origin, evolution, and future of the natural world” — has been designated as the scientific center of the new Columbia Climate School. The Climate School was founded in 2020 “to develop and inspire knowledge-based solutions and educate future leaders for just and prosperous societies on a healthy planet.”

This studio proposes carbon-zero preservation proposals for the adaptive reuse of the original manor house (as innovative conference center and offices). Making full use of the Preservation Technology Lab, we will investigate the existing materials and material systems on the site, in terms of their physical properties as well as their environmental and socio-political histories. Proposals will give new meanings and expressions to these existing materials, and consider the introduction of new compatible materials and systems, in ways that visually enact the global environmental entanglements at play in the Earth Observatory's 157-acre campus. Proposals will range in scale depending on the student's interests and disciplinary focus. For example, conservators may focus on a facade or an interior room, architects on the building and its immediate context, planners on the campus and its relation to the historic free Black settlement of Skunk Hollow. Preservation students will collaborate with students in the architecture program who will be designing a new interpretative commons-building (as visitor center, exhibition space, and dining hall and lounge for the scientists) next to the manor house. This studio is an investigation into the intersecting materialities and environmental entanglements between preservation and architecture, and an introduction to experimental preservation methods for enacting, expressing and presenting those entanglements visually through built form.

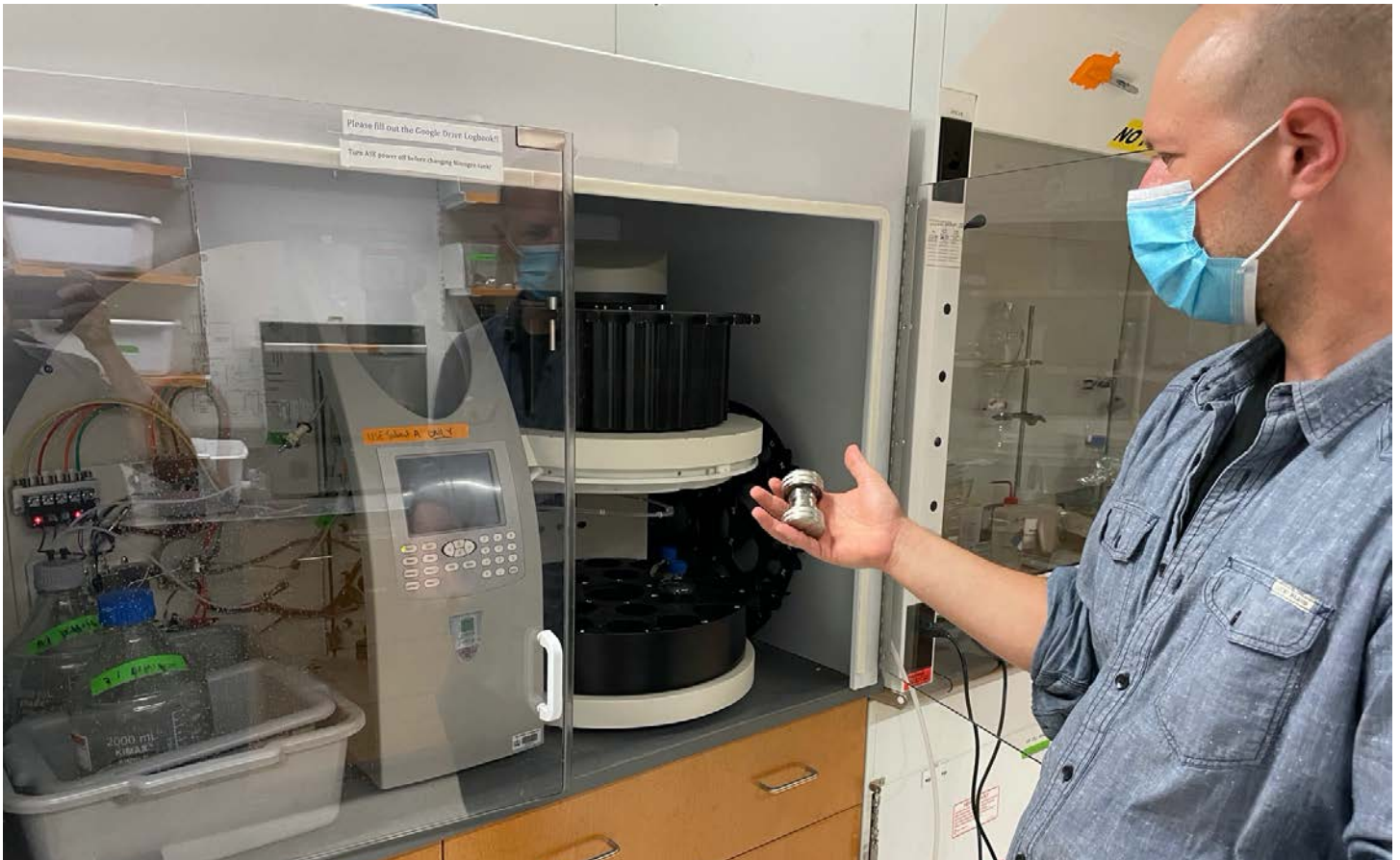


Lamont Hall, the historic manor house of the estate donated to Columbia University



Interior view of Lamont Hall

The fundamental lessons of ecological understanding have been to make evident these entangled interrelations between species and their environment in terms of behavioral, energetic, and informational exchanges. But while recent effort to engage issues of sustainable in architectural preservation have been crucial to bringing greater awareness to the field, but instead of enacting those relational exchanges all too often the resultant designs have privileged a checklist of material and systems as the fundamental features of a building. In regard to energy and information, the term *ergon* has been used to express a quantity of energy or work necessary in a system, whereas the term *parergon* has been used to express both a quantity and a quality of elaboration that seems unnecessary, merely supplemental — and the form of architecture in these designs is considered as supplemental to what is perceived as the primary work being done by energy systems. Rather than as an integrative mean to further develop formally and socially innovative design. In this studio we propose, as has recent critical theory, that what appears to be supplemental in cultural and informational systems is the fundamental framework that establishes and mediates the working of those systems.



Prof. William D'Andrea reconstructs paleo-environmental histories using materials collected from lake sediments

This brings up the question of the entangled mediated labor of these architectural and energy systems, the work involved in these behavioral, energetic, and informational exchanges of this “dynamic community of 500 scientists, students, and staff, with nearly 300 PhD-level researchers, and 80-90 graduate students” who are engaged in research dedicated to environmental awareness and justice. Their work is not merely supplemental to the work of preservation. Accounting for their work in the physical enactment of preservation proposals will be and integral part of the studio.

In this studio students will propose preserving environments that spatialize these relational circulations of mediated environmental matter (air, water, waste), energies (structural and thermal loads), and information (among the scientists and with the visiting public). Proposals will enact and re-enact the existing buildings to visibly perform the interaction between their energy systems, social systems, structural systems, infrastructural systems, and tectonic systems; to engage new and old sustainable technologies, formal techniques, and building materials in designing new environments and re-designing older ones; to investigate the transformational re-cycling of the ecological, formal, material, programmatic, and typological resources of the site, renewing those resources; to reimagine the relations between new and old building materials in their interaction with the landscape, as exchange interfaces of energy and information in a social ecology. The suffix -novation, as in innovation and renovation, already means to “make new,” to “renew,” so innovation and renovation are just ways to indicate a doubling of this revitalizing engagement. All of which will be enhanced through the collaborative exchanges between the architecture students and the historic preservation students in this joint studio.



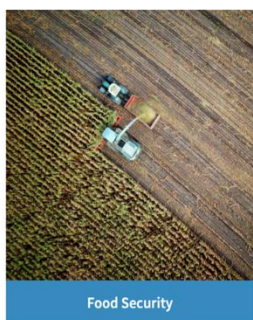


Prof. Maureen Raymo, Director of LDEO and G. Unger Vetlesen Professor of Earth and Climate Sciences, in the archive of sea bed cores

And most significantly, the work of the studio will be developed in collaboration with the Earth Observatory's Director, Maureen Raymo, one of the world's leading climate scientist and oceanographer. She is the first woman to receive the Wollaston Medal, the Geological Society of London's highest award (previous recipients of the medal were Charles Darwin and Louis Agassiz), and in 2020 she was appointed by President Bollinger to be co-founder and co-Dean of the Columbia Climate School.



Ocean Health



Food Security



Extreme Weather

As for the work of the Earth Observatory, it has been at the forefront of climate and earth science: their scientists were first "to map the seafloor and develop a computer model that could predict an El Niño weather event, the first to provide concrete proof for the theory of plate tectonics, and to reveal the oceans' role in triggering abrupt climate change." Resident scientist Wallace Broecker's publication of "Climate Change: Are We on the Brink of Pronounced Global Warming?" in 1975 "generally credited with introducing the phrase 'global warming' into scientific literature."



Shelter



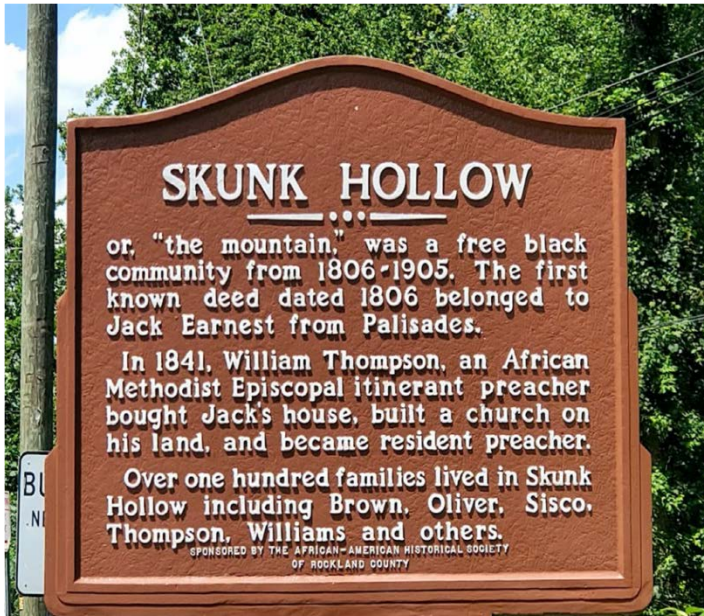
Energy Solutions



Water Availability

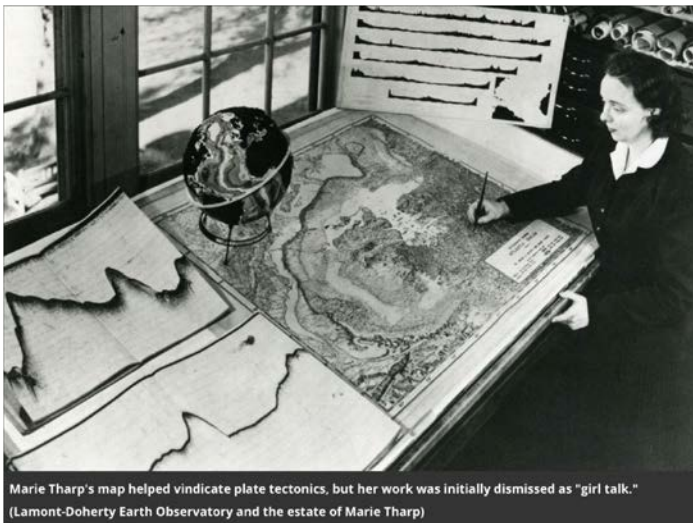
Currently, the pro-active engagements and initiatives of Climate School are exemplified by the Observatory's Center for Climate and Life, a multidisciplinary research and education initiative focusing on six areas of investigation: Energy Solutions (to reduce global carbon emissions through carbon capture and storage technologies), Extreme Weather (engineering systems to predict

and mitigate extreme climatic occurrences while increasing resilience) Food Security (climatic effects on farming and fisheries in the global food supply), Shelter (the effect of raising tides on coastal regions resulting in migration), Ocean Health (impact of climate change on marine ecosystems and the communities that rely on them), and Water Availability (minimize societal vulnerability and improve efficiency in all uses of water: individual, collective, agricultural, and industrial).



From these global environmental investigations to the local: in alliance with the Earth Observatory's "Lamont Statement on Our Commitment to Anti-Racism and Institutional Change," the environmental histories of the local settlement of the river system of the Palisades can be visually spatialized in the project, from the indigenous peoples to the free Black community of Skunk Hollow in the nineteenth century to the later acquisitions of the adjoining lands by Lamont and subsequently to Columbia University.

The visualization of these histories resonates with The Earth Observatory's own local institutional history, as it was the innovative visualization techniques of Marie Thorp in the map of the ocean floor you can see below that verified the fundamental theory of continental drift — for which, like countless women in the sciences, she received only belated partial credit, and it is only in recent years that her full story been documented.



Marie Tharp's mapping and visualization of the ocean floor was initially dismissed as artistic "girl talk," but now is recognized as fundamental proof of the theory of plate tectonics. (image: Lomont-Doherty Earth Observatory and the Estate of Marie Tharp).

These crucial environmental histories and investigations can be engaged as interpretative informational networks throughout proposals for the renovation and adaptive reuse of Lamont Hall. New hybrid programs can be imagined like a laboratory, where the public can engage in participatory demonstration work of laboratory experiments in new forms of auditorium space. Global issues related to the climate crisis and cultures of sustainable sustenance can be spatialized locally in the way your architecture enacts the entanglements of climate, energy, food, social life, waste, and water in the new dining hall.

There are 20 buildings on the 189-acre campus, the earliest is the estate house of Lamont Hall dating from 1929, the latest is the Geochemistry Building from 2007. Among our investigations will be the social entanglements and scaling between the domestic and the institutional in recent designs for scientific research buildings. We will meet with representative scientists and staff and get a tour of the campus within the first weeks of the semester. The Earth Observatory is located 18 miles north of Manhattan on the Hudson River in the town of Palisades, with a 55-minute free Shuttle runs regularly from the Morningside campus throughout the day Monday-Friday, so you will have access to the site as often as you want.