



MOUNTAIN LAKE ECHOES

MOUNTAIN LAKE BIOLOGICAL STATION



Spring 2014, vol.10

NEON Excavation Reveals Soil Horizons

MLBS Staff

The National Ecological Observatory Network (NEON) broke ground last fall at their MLBS satellite site. Before beginning construction at a new site, NEON excavates a 5' x 6' soil pit to a depth of 7', or until hitting bedrock—whichever comes first. At MLBS, they reached the full depth of 7' and identified 9 soil horizons (figure at right).

“O” stands for Organic. These horizons include the soil just beneath the leaf litter, which contains large amounts of decomposing materials. The “A” horizon, known as “topsoil,” is the uppermost mineral soil horizon. It also

Horizon	Depth (cm)	Texture / notes	Roots	Structure	Boundary
Oi	+5-0	Slightly decomposed plant material	-	-	Abrupt, smooth
Oe	0-3	Moderately decomposed plant material	Very fine	-	Abrupt, smooth
Oa	3-6	Highly decomposed plant material	Very fine, fine, medium	-	Abrupt, smooth
A	6-39	Black sandy loam	Fine, medium, coarse	Weak, coarse subangular blocky; moderate fine granular	Abrupt, smooth
E	39-51	Loam	Very fine, fine	Weak, coarse subangular blocky	Abrupt, smooth
Bw1	51-100	Loam; 15% moist iron-manganese masses, clear boundaries; 85% moist clay depletions, diffuse boundaries	Very fine, fine	Weak, medium subangular blocky	Gradual, wavy
Bw2	100-135	Loam	Very fine	Weak, very coarse subangular blocky	Gradual, irregular
2C1	135-16	Sandy clay loam; 15% nonflat subangular sandstone fragments	Few	Structureless, coarse single grain	Abrupt, smooth
2Cg2	160-200	Sandy clay; 25% nonflat subangular sandstone fragments	Few	Structureless, very fine massive	Abrupt, smooth

Soil horizons identified at MLBS' NEON satellite site

contains partially decomposed organic matter, and therefore tends to support a lot of biological activity.

“E” stands for “eluviated,” which means that many of the clay, iron, and aluminum oxides have leached out. This horizon is only found in old soils that have had a long time to develop—like those on Salt Pond Mountain.

The “B” horizons are sometimes called “subsoil.” Small clay particles and oxides (like iron) leached from above tend to accumulate here.

Finally, The “C” horizons form as bedrock weathers

into smaller particles. There is little biological activity here, and the particles remain relatively unchanged by soil formation processes. ♦

ArtLab 2014

Stephen Vitiello has been selected as the 2014 MLBS Artist-in-Residence. Vitiello is an electronic musician and sound artist who works with atmospheric noise to create soundscape installations. (www.stephenvitiello.com) He will be joined by 8 globally-recruited visiting artists and UVA undergraduate studio art majors. Some of the artists' work will be shown at the Open House on July 19th. The ArtLab class for 2014 is Science Writing: Creative Approaches to Biology and Ecology. ♦



7 feet below soil surface at NEON site

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Upcoming Events

- SUMMER 2014 CLASSES: NEW TERMS BEGIN MAY 19, JUNE 16, JULY 14
- SUMMER SEMINAR SERIES: BEGINS MAY 27
- WALTON LECTURES: JUNE 30 & JULY 1
- JULY 4TH FESTIVITIES
- OPEN HOUSE: JULY 19

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From the Director

Butch Brodie

As almost everyone reading this newsletter knows, MLBS launched its first concerted effort at development this winter. With the help of the College Development Office, the Station has reached out to past and present Mountain Lakers and the response has been truly gratifying. Through the generosity of many, we are able to put the Walton Lecture back online for 2014 (welcoming Dr. Joan Strassman & Dr. David Queller of Washington University in St. Louis) and to bolster the fellowships that enable so many students to experience Mountain Lake. Our sincere thanks go out to all who could give. It makes a huge impact.



One of the unexpected treats of the campaign has been the collection of notes and stories from the past. Three couples told stories of meeting their eventual spouses during a summer at MLBS. I wouldn't claim match-making as one of our missions, but we are

Lewis Hall

clearly good at it. Other letters described growing up at MLBS while parents did research or taught courses, and learning much about science and life in general in the process. A few people have even sent or offered photos of MLBS in the "old days." Connections with our past community continue to thrill the current cohort of Mountain Lakers, so please keep the stories and photos coming!

On the horizon for 2014 are two major construction projects. NEON is finally breaking ground for its canopy tower and sampling facility. That work should be operational by summer. Plans are also moving rapidly to build a new permanent greenhouse. The new facility should dramatically increase both square footage and functionality, including keeping out meddlesome voles and other intrusions. Stay tuned for details as the greenhouse project gets underway.

Walton Lecture Rebirth

MLBS Staff

We are grateful and excited that the Walton Lectures are back after a one year hiatus. This is 100% due to the generosity of the friends and family of the Station who made donations to our fundraising campaign. How perfect that we will be welcoming Joan Strassmann and David Queller, who study the costs and benefits of social cooperation! Prof. Strassman first came to MLBS to study cell lineage conflicts in the social amoeba *Dictyostelium discoideum* in 2000. "*D. discoideum* is abundant in the soil of Mountain Lake Biological Station, making this an excellent place for natural

collections of social amoebae and their associated bacteria. In a long series of studies, we have documented the population structure of *D. discoideum*, then used the clones we collected for a series of behavioral and evolutionary experiments. At MLBS we discovered the first ever wild fruiting bodies on deer feces right outside the main laboratory. We are currently exploring metagenomics of bacteria associated with *D. discoideum*,

and are collecting samples from soil and feces for further study." The Queller/Strassman Social Evolution and Multicellularity lab is

at Washington University in St. Louis. Learn more at strassmannandquellerlab.wordpress.com/ ♦



Lab technician, Boahemaa, showing Joan and Dave her project

Interview with Professor Zack Murrell

MLBS Staff

For over a decade, Professor Zack Murrell of Appalachian State University has come to Mountain Lake from Ash County, North Carolina (northeast of Boone) to teach Plant Conservation and Diversity: Bioinformatics, Systematics & Field Techniques. We spoke with him this winter and asked him to tell us about the class.

“It is a total immersion class, offering enough time in the field that we get a much greater understanding of what nature is all about. A classroom is one



Flame azalea

thing, but if you can get out and see what is there, explore the locality, see a lot of habitats and a lot of plants, then it changes people. It truly changes people. If you’ve never seen a starry night, never walked on a trail (let alone off trail), it is pretty exciting.

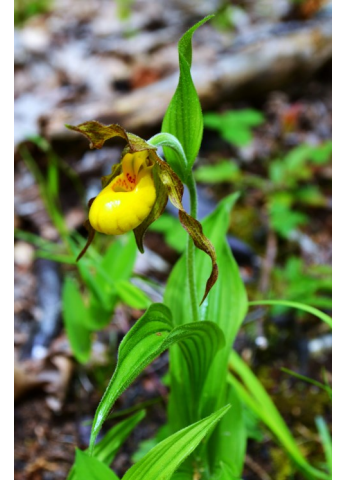
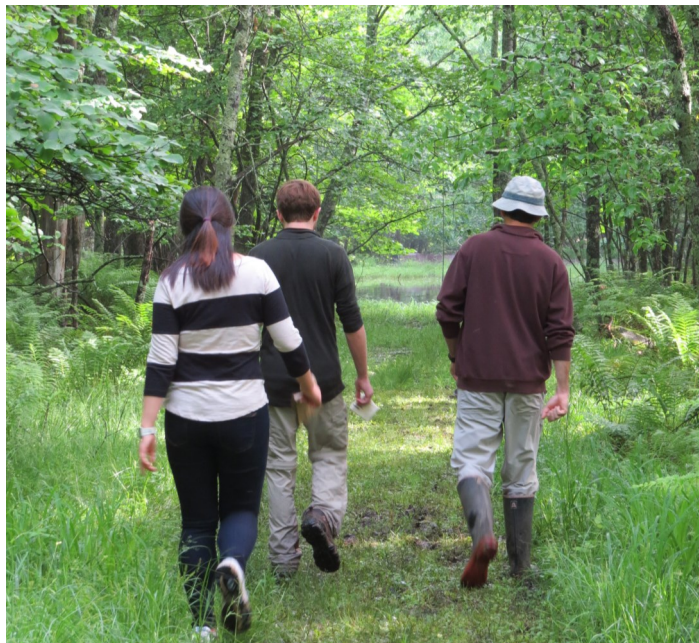
When I was growing up I had lots of chances to be outside, lots of tracts of forest and farmland, and freedom to roam. Our lives can be so focused on hu-

mans and human culture that we can lose that we are part of the thin layer of biology that covers the rock we are living on. Nature is a great teacher. Every turn in the trail provides another set of ideas to talk about. It is a question generator. It is what makes my job easy.

One of the class themes is understanding the structure and function of plants. If students can see by observing leaf patterns, branching patterns, flower clusters, etc. then it helps them get a sense of everything from biomechanics to evolutionary pathways. We can suffer from plant blindness and not notice or recognize the importance of plants in the biosphere. On the first day of class everyone takes 15 minutes to really look

at a plant, and describe it in detail to the group.

Then we put it in an evolutionary and classical framework. When you put it into a deep time frame, and then a classification that reflects that understanding and using the various tools that are available for identifying plant (keys, online tools) then it is like learning how to fish. You can go anywhere in the world and use same observational deductive tools to piece together a region. Once you can start to differentiate the green backdrop and put it into a scheme then you can differentiate how different communities of plants and animals co-occur. There are a tremendous number of community types right in the area, but we also go on field trips.



Yellow lady's slipper

Lastly, we explore conservation and how we can go about preserving what we have. We go to many different sites, managed in different ways by private, state and federal operations. We look at what humans are doing and whether they are being effective and whether they could they be more effective.

The world of biodiversity informatics tries to make information available in very large datasets. It provides opportunities for study that weren't available 10 years ago. We can drill in to data at a scope and scale that allows students a chance to ask questions that have never been asked before.

The theme through all of this is to help students think about where they are going, to understand opportunities and challenges, and to open up a window.” ♦

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View from overlook on Mountain Lake Road



Science Writing: The landscape will serve as muse

Butch Brodie, Director
Eric Nagy, Associate Director
Melissa Wender, Office Manager
Jaime Jones, Station Manager
Tom Mc Namara, Facilities Manager

Summer 2014 Courses



SESSION I
May 19—June 13

PLANT CONSERVATION AND DIVERSITY (3cr) Zack Murrell, Appalachian State University

BIOLOGY AND CONSERVATION OF FISHES (3cr) Dave Neely, Tennessee Aquarium Conservation Institute

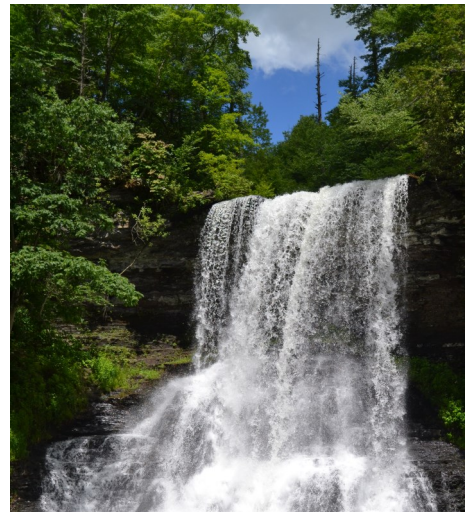
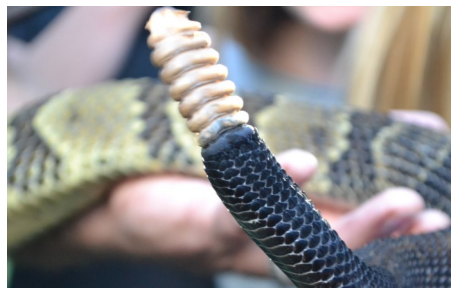
SHORT COURSE May 19-30

SCIENCE WRITING (3cr) Hannah Rogers, University of Virginia

SESSION II
June 16—July 11

FIELD HERPETOLOGY (3cr) Caitlin Fisher-Reid, University of Richmond

GIS FOR FIELD BIOLOGISTS (3cr) Chris Gist, University of Virginia



SESSION III
July 14— August 1

STREAM ECOLOGY (3cr) Christine May & Scott Eaton, James Madison University

APPLY TODAY!