PEDOLOGUE

Volume 32, Issue 2, 2021

Newsletter of the Mid-Atlantic Association of Professional Soil Scientists

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PEDOLOGUE (ISSN 2641-662X) is published approximately quarterly by the *Mid-Atlantic Association of Professional Soil Scientists* in College Park, Maryland, USA. Issues are available online at www.midatlanticsoilscientists.org/pedologue

<u>Editors' comments:</u> We contacted MAPSS officers for news about upcoming MAPSS events for this issue, but there isn't much to report due to ongoing concerns about large gatherings of people. That said, the soil judgers dig on! Secretary Jenwei Tsai reported that there will be a Northeast Collegiate Soil Judging Contest hosted by Delaware Valley College Oct. 12-15 as indicated in our calendar of coming events.

Barret and I do have some news about ourselves. <u>In my, Del's, case</u>, on July 13 this year, and a few days before and after, I celebrated my 90th birthday with family members here in Maryland, DC and VA and one MAPSS long-term member, Marty, even brought me a much appreciated 12-pack of Guinness Stout. I had at first hoped to celebrate at my old birthplace home The Womb in Lewis County, NY. That did not work out, but Emily and I plan to get there again to enjoy the autumn leaves and gather with some of our family and friends there in October this year. <u>In Barret's case</u>, he has now completed his Post-Doc assignment with USDA ARS in Bowling Green, KY. In an e-mail message at the end of August, 2021, he say's "I have just started as a Visiting Assistant Professor of Hydrogeology at University of Mary Washington in Fredericksburg, Virginia. I'll actually be able to be more active with MAPSS from here." This is wonderful news for MAPSS and Pedologue, we are so fortunate to have him as our Assistant Editor. I had to check the web to find that Mary Washington was the mother of U.S. first president George Washington.

For this issue, we have been fortunate to have articles submitted by two MAPSS members, Jaclyn Fiola and Russell Losco. Jaclyn, formerly a soil-judging student at UMD, where she was also involved in making soil monoliths, tells us about her experiences as an Assistant Soil Judging Coach with John Galbraith at Virginia Tech coaching the VT 2021 team to a national championship in a virtual National Soil Judging Contest this past Spring Semester. Amazing!

The article by Russell and two of former students at West Chester University in West Chester, PA is about experiments they conducted to investigate the effects of amendments of plastics to sand on the thermal properties of the materials they investigated in the laboratory using a heat lamp etc., see the article for details. The article reviews some of the literature that documents the arising concern about plastics contaminating the soils and waters of the surface of the earth.

The article following the one by the one by those associated with West Chester University and before the final article in this issue about G. Wade Hurt was put together by Fanning about UM Soil Monolith No. 1, Evesboro loamy sand. It contains the official soil series description, OSD, copied from the web of the Evesboro soil series. It has been pointed out that the OSD is available on the web, at the site cited in this article, thus it should not be necessary to reproduce it in the article. As we develop articles about other monoliths in the UM collection in subsequent issues, this question will come up again. If readers have an opinion about whether to include the OSD in articles about other monoliths in the collection, send your thoughts to the editors. In some cases, we do have good descriptions of the pedons for which the monoliths have been made and ideally we encourage anyone making a monolith to make such description and submit it when the monolith is donated to the collection. In some cases, we do have lab characterization data on the monolith profiles and where available we want to present this as well as the description. Subsequent write-ups for Pedologue on other monoliths will provide examples of these things if/when such are completed.

The last article in this issue is about G. Wade Hurt by fellow soil scientists who knew him. Over the years, many MAPSS events and field trips have dealt with indicators of hydric soils. Wade is credited with originating the indicator's concept, thus we are very pleased to publish this obituary article about him in Pedologue to let folks know more about him.

<u>In this issue</u>

<u>Calendar of some coming events</u>

To Be Determined: Next MAPSS meeting

Oct. 12-15, 2021. Northeast Collegiate Soil Judging Contest, hosted by Delaware Valley College, Doyletown, PA.

Nov. 7-10, 2021. ASA-CSSA-SSSA 2021 Annual Meeting, Salt Lake City, UT. About | ASA, CSSA & SSSA International Annual Meetings (acsmeetings.org)

Nov. 21-26, 2021. 9th International Acid Sulfate Soils Conference, University of Adelaide, Adelaide, Australia. https://biological.adelaide.edu.au/acid-sulfate-soil/iassc/ <u>A continuing check of this website</u>

indicates that this conference has been canceled again. It was originally scheduled for 2020, it is now scheduled to take place in Nov. 2022 or early in 2023.

June 13-16, 2022. Northeast Soil Survey Work Planning Conference, University of Delaware, Newark, DE https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/partnership/ncss/?cid=nrcs142p2_053541

July 31-Aug. 5, 2022. 22nd World Congress of Soil Science, Glasgow, Scotland, UK. https://soils.org.uk/wcss22/ .

Future articles etc.,

***Pedologue* needs articles, pictures, poems, cartoons, letters to the editor or other things soil scientists and/or other readers may be inspired to submit. Please submit such items to the editors (preferably to DelvinDel@aol.com, alternatively dsf@umd.edu). Be an author, support your newsletter! It's a way to promote your work, our community, and things we all need to know about soils and the environment.**

2021 MAPSS Officers: **President** Susan Lamb **Past President** Annie Rossi **President Elect** Ben Marshall **Vice President** David Ruppert **Treasurer** Sarah Roberts **Secretary** Jenwei Tsai **Member at Large to serve 2 years** Jim Brewer **Member at Large to serve 1 year** Bill Effland **Ex officio Member** Phil King	**Board of Directors** Jim Chaconas to serve 1 year John Wah to serve 2 years Gary Jellick to serve 3 years **Chairs of Standing** Committees **Finance** Vacant **Constitution and By-Laws** Gary Jellick **Membership and Ethics:** **Nominations** Annie Rossi **Education and Public Relations** Delvin Fanning **Certification** Vacant

The Assistant Editor Returns to the Mid-Atlantic

By: Barret Wessel

I'm sure that with the lack of in person meetings over the past year and a half my absence has been as difficult to notice as few faint depletions, but I weathered the worst of the lockdown in Kentucky working for the USDA-ARS. I'm still working on a few postdoc papers from that, but started as a Visiting Assistant Professor of Hydrogeology this semester with the Department of Earth and Environmental Sciences at the University of Mary Washington in Fredericksburg, VA. I'm teaching introductory courses in geology and environmental science, as well as an advanced course in hydrogeology next semester. The hydrogeology course will include some content on hydric soils so I hope to include some photos of class activities in future issues of *Pedologue*. Undergraduate student research is strongly supported at UMW, and I'm in the process of recruiting students to get a few research projects underway. Please reach out to me if you know of any interesting earth science projects in the region that might benefit from some collaboration at UMW.

Soil Judging During A Pandemic, A Coach's Perspective

By: Jaclyn C. Fiola, PhD Candidate, School of Plant & Environmental Sciences, Virginia Tech, jcfiola@vt.edu or jcfiola@terpmail.umd.edu

Can you interpret a soil profile from a photo? Even more challenging – can you teach someone to interpret a soil profile from just a photo? Rewind to the Spring 2021 semester, in the midst of the Covid-19 pandemic. During soil judging practices you could find us masked and sitting six feet apart, practicing our ribboning techniques and trying to guess soil mineralogy from inspecting a bag of soil without any context.

Dr. John Galbraith and I coach the Virginia Tech Soil Judging Team, which in Spring 2021 included seven undergraduate students who were living on or near the Blacksburg campus. During any typical Soil Judging Contest, the focus is on soils within a small geographic area, such as Western Tennessee or Southern California. To prepare, we delve into the geologic history and study the soil survey maps of the area. However, the Spring 2021 contest had no such constraints – we textured a soil sample from Puerto Rico and described an Alaskan Gelisol in the same afternoon.

The Virtual National Contest consisted of three parts: texture, feature ID, and describing pedons. The texture section was straightforward – teams were sent ziplock bags of practice and contest soils to hand-texture. Feature ID consisted of photos with questions that required the students to not only recognize morphologic and landscape features but also understand their genesis. For example, an arrow points to horizontal streaks of brown soil in an otherwise light-colored matrix at the bottom of a soil profile and asks the students to choose the best horizon label. They had to recognize that the features were lamellae *and* know how to properly label that horizon (do you use a slash or ampersand?).


Practice texture samples (left) and texture practice by the New River (right).

The pedon description section was the most challenging and worth the most points in the contest. Students were provided a photo or two and short blurb about a soil profile and the surrounding landscape. They were given some data, such as the number of horizons, base saturation, percent organic carbon, color, structure, and presence of redox features. Then, they had to complete a soil description and interpret profile characteristics (hydraulic conductivity, water retention), site characteristics (runoff class, erosion potential), soil characteristics (epipedon, subsurface horizons & diagnostic features, classification to the great group), and suitability for various land uses (basements, septic absorption fields, local roads, corn, hopyards, and created wetlands). The pedons were from all over the country so the students had to recognize everything from gelic materials to fragipans to carbonates to plinthite. For

examples, the contest pedons alone included a Fragiudalf from western Tennessee, a Histoturbel from south-central Alaska, and a Paleargid from eastern Colorado.

Socially-distanced field practice.

Group judging during a pandemic? The group portion of the contest included all the components listed above but they were completed by the entire group. We practiced group texturing outside and pedon descriptions while sitting six feet apart. Fortunately, by the time the contest rolled around, all of us had received at least one dose of the vaccine.

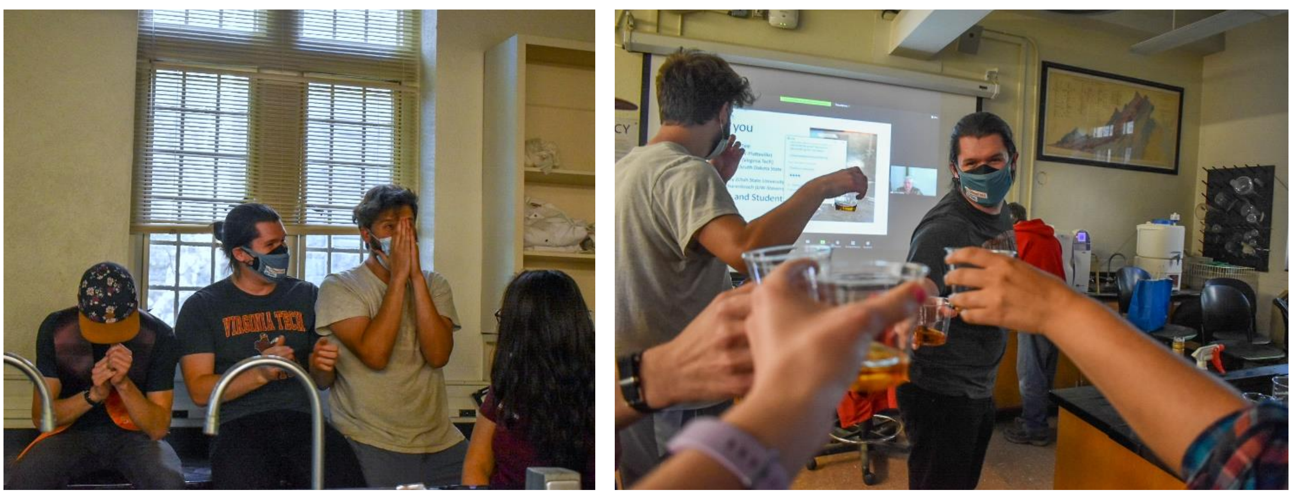
In addition to challenges presented by the pandemic, this contest was so different from normal contests that we had to revise our teaching and motivation techniques. We taught the students to use both Keys to Soil Taxonomy and the Illustrated Guide to Soil Taxonomy. We debated whether sandy clay and silt textures exist. We gave prizes to whoever scored the highest on practice pedon descriptions. We made a tarp-sized texture triangle to help visualize it, with soil samples placed where their texture would be plotted. But mostly, the students diligently worked and studied. They spent around six hours per week attending formal practices with us coaches, and then many more hours on their own completing homework pedons and textures. And this is on top of their actual classes, which were by no means ordinary during this virus-overshadowed semester.

In picture at left. The Hokies practicing soil textures just before the national contest. From left to right: Michael Russell, Kathlynn Lewis, Bernie Frantz, Tessa Naughton-Rockwell, Lisa Small, Alex Greehan, and Clare Tallamy.

The contest itself was conducted over the course of two weeks in April. If you thought a regular soil judging contest was not a spectator sport, image a virtual contest. The students spent a whole day working on their computers, with Dr. Galbraith and I nervously keeping track of time and sustaining them with snacks. They submitted their answers online. Then we waited.

Group texturing and completing individual contest pedon descriptions during the contest.

The awards ceremony was also virtual, though most of our team gathered in the soils lab to watch the Zoom feed together. The organizers took turns announcing the results. We placed third in group judging (a sandy clay upset our texture score). Then came the individual top ten – and our students placed eighth, sixth, and third! Finally, they announced the overall highest scoring teams…we won! A huge Virginia Tech symbol filled the projector screen. I don't know if the other teams could hear us or if we were muted, but we were cheering loudly!



During the awards ceremony. Photos by Clare Tallamy.

The conclusion of the contest seemed anticlimactic. It did not involve a gleeful van ride home or even dinner together. Two of our students were not with us because of final exam schedules. We took a few photos and chatted for a bit until, one by one, the students left to study for their exams. Later, we learned that all seven of our students placed in the top third. I am so proud of them. If you are looking to hire a student or recent graduate with expertise in soil classification, I have seven Hokies who I highly recommend! Overall, we were grateful that this contest was held to let us continue improving our skills during an unusual year. We were lucky that we were able to practice together,

and that all of us stayed healthy. It was a great learning experience, but we're excited to get back in some non-virtual soil pits.


The team (missing Tessa Naughton-Rockwell and Lisa Small) after winning the virtual contest and (right) #3 individual Bernie Frantz with his award.

The contest was organized by Bryant Scharenbroch (Wisconsin-Stevens Point), John Lawley (Utah State), Chris Baxter (Wisconsin-Platteville), Kris Osterloh (South Dakota State), and John Galbraith. Texture samples were supplied by the Natural Resources Conservation Service. Awards were sponsored by the Soil Science Society of America. Pedons and features were submitted by coaches of participating teams. Many thanks to everyone involved for providing this opportunity!

The Effect of Plastic Particles on Heat Transfer and Retention in Sand

Alex Chipman – West Chester University & Brickhouse Environmental

Regina Brown – West Chester University & Geotechnology Associates Inc.

Russell Losco P.G., C.P.S.S.– Adjunct Professor, West Chester University, PA; Delaware County Community College & Lanchester Soil Consultants, Inc. – Soildude@comcast.net (corresponding author). The research reported in this paper was conducted at West Chester University, West Chester, PA 19383

INTRODUCTION

Plastic has become ubiquitous in the environment, comprising 50-80% of the debris found on beaches and 88% of floating debris in the open ocean (Barnes et al 2009; Cozar et al, 2014). It is found in soils, lake bottoms, Antarctic sea beds, Arctic sea ice, incorporated into bird's nests and the stomachs of marine animals and has been found being used by hermit crabs for shells (Barnes, et al 2009). Indeed, one would be hard-pressed to find a part of the Earth's surface that is devoid of plastics. Plastic is one of the most mass-produced materials today with over 320 million tons produced in 2015 according to the World Economic Forum. Plastic production accounts for 8% of the petroleum usage in the world and is estimated to comprise 10% of municipal waste (Thompson et al, 2009; Jambeck et al, 2015). It is estimated that 4.8-12.7 million metric tons of plastic enters the oceans yearly with that figure anticipated to increase by an order of magnitude by 2025 (Jambeck et al, 2015). With longevity in the environment measured in hundreds to thousands of years, plastic is extremely resistant to degradation (Barnes et al, 2009; Cozar et al, 2014). Even so-called "biodegradable" plastics are really plastic composites held together by organic substances, such as starch, that biodegrade leaving the plastic micro-particles intact. Plastic is degraded by ultra-violet light followed by mechanical deterioration due to abrasion by wave action (Barnes et al, 2009; Cozar et al 2014; Thompson, et al, 2004). These

plastic particles are becoming incorporated into the sands of receiving beaches. Up to 30% plastic by weight has been recorded in sand at places such as Kamillo Beach, on the south coast of Hawaii (Carson et al, 2011).

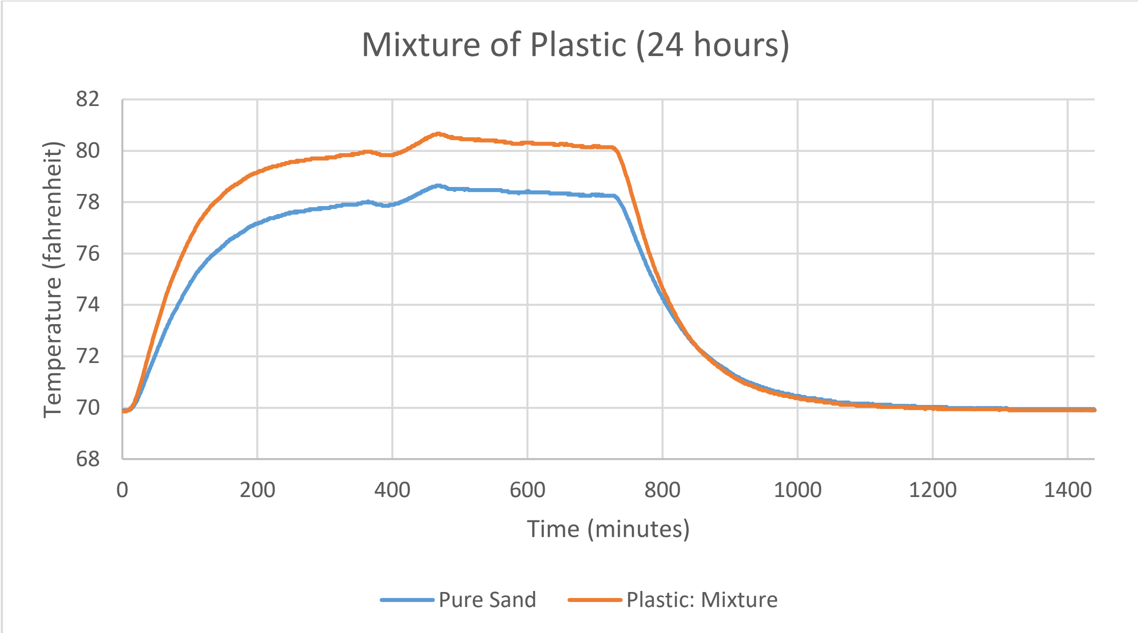
Plastic's insulative properties in sand have been suspected to influence the sex of turtle and other reptile eggs that are temperature dependent, such as crocodiles, alligators, and turtles. In addition, *Emerita* a genus of decapod crustaceans that includes mole crabs, sand crabs, sand fleas, sand fiddlers, and sea cicada could be affected by the plastic insulating the sand (Defeo et al, 2009). Sand with higher temperatures could change the composition of the plant community living on dunes, marsh, or other coastal ecosystems due to thermal tolerance/ intolerance. For example, according to Goldstein, et al, a study shows that new distribution patterns and range shifts of the dune grasses *Ammophila breviligulata* and *Uniola paniculata* are occurring due to temperature increases on the United States East Coast. *U. paniculata* germinates above 29 ° C and *Ammophila breviligulata* germinates at cooler temperatures from 21° C to 26 °C. The dune grasses play a primary role in shaping the morphology and growth forms of dune shape. According to Goldstein et al, "These studies suggest that dunes dominated by *A. breviligulata* coalesce faster than those formed by *U. paniculata*, resulting in high, continuous dune ridges compared to hummocky dune formations associated with *U. paniculate*." This suggests significant implications of potential changes in species composition for dune building under a changing climate. With the addition of plastic insulation sand temperatures could be increasing but contributing to a warmer sand in polluted coastal ecology systems.

METHODS AND MATERIALS

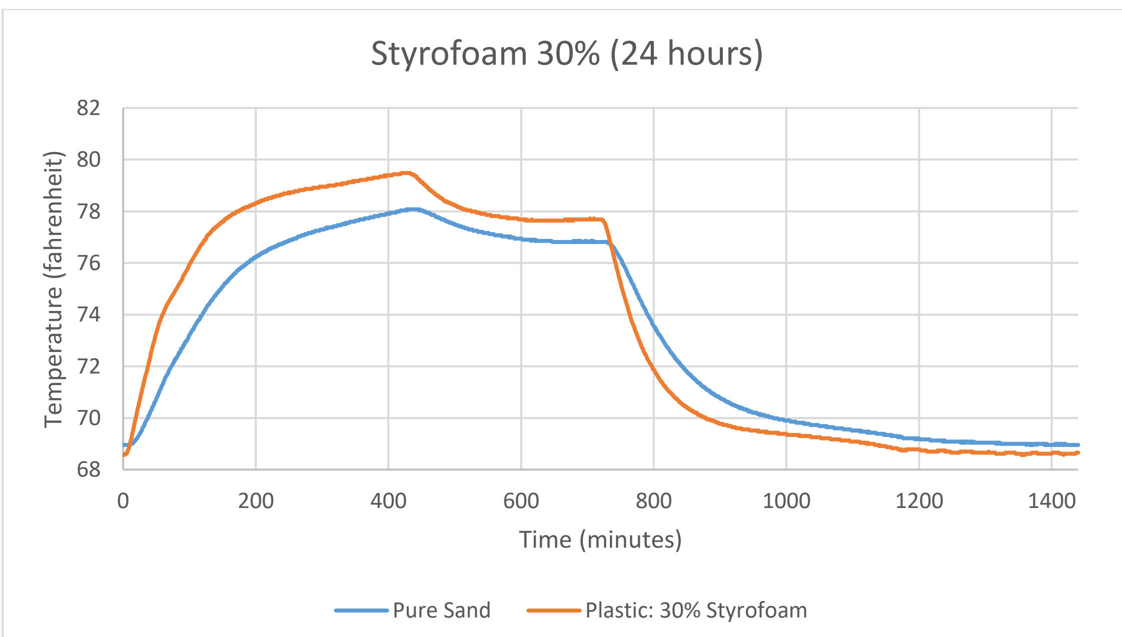
This study sought to find trends in the flux of the temperature of sand due to various plastics added into the matrix. Carson et al investigated these properties in beach sands sampled in situ from Kamilla Beach, then attempted to quantify the plastic amounts in the sand. Our approach was to attempt a more controlled approach using specific plastics in controlled concentrations. This study measured the effects of PVC powder, shredded grocery store plastic shopping bags, and commercial grade styrofoam beads at 10% and 30% by volume for each plastic mixed with silica sand. An additional test used a mixture of the three plastics with each concentration at 10% adding up to a combined 30% by volume. Two beakers were set equidistant from a heat lamp, one containing 900mL of pure sand and another containing the mixture of sand and plastic by volume. The mixture was either 270mL of plastic to 630mL of sand for each of the plastics for the 30% tests, or 90mL of plastic to 810mL of sand for each of the plastics for the 10% tests. The last test's beaker contained 90mL of each plastic and 630mL of sand. The heat lamp was turned on for 12 hours and off for 12 hours by an automated timer. Both of the beakers had Hobo brand temperature loggers that ran continuously for 3 days per test logging temperatures every 1 minute. After each 3 day test the temperature loggers were downloaded and erased clean for the next test. The information was downloaded to a spreadsheet as time and temperature readouts. The data was then divided up by the individual 24 hour cycles and compared with one another against time. Another chart was the difference of Plastic temperature - Sand temperature for the 24 hour cycle.

RESULTS

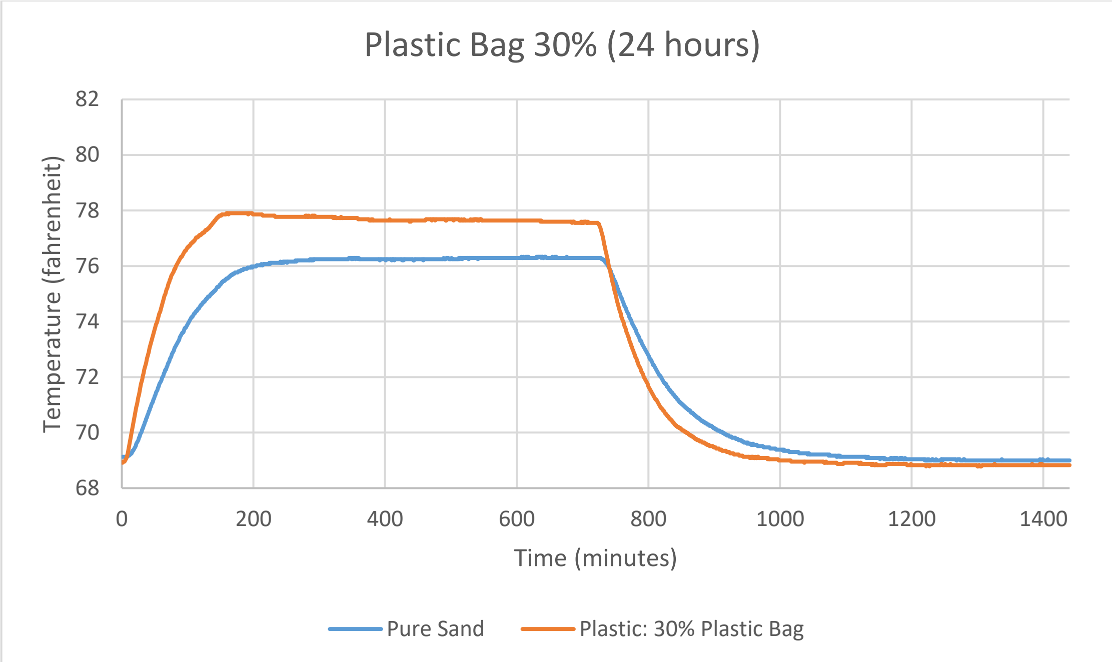
The data from the different combinations of plastic and sand are presented in the following graphs: (see following pages)



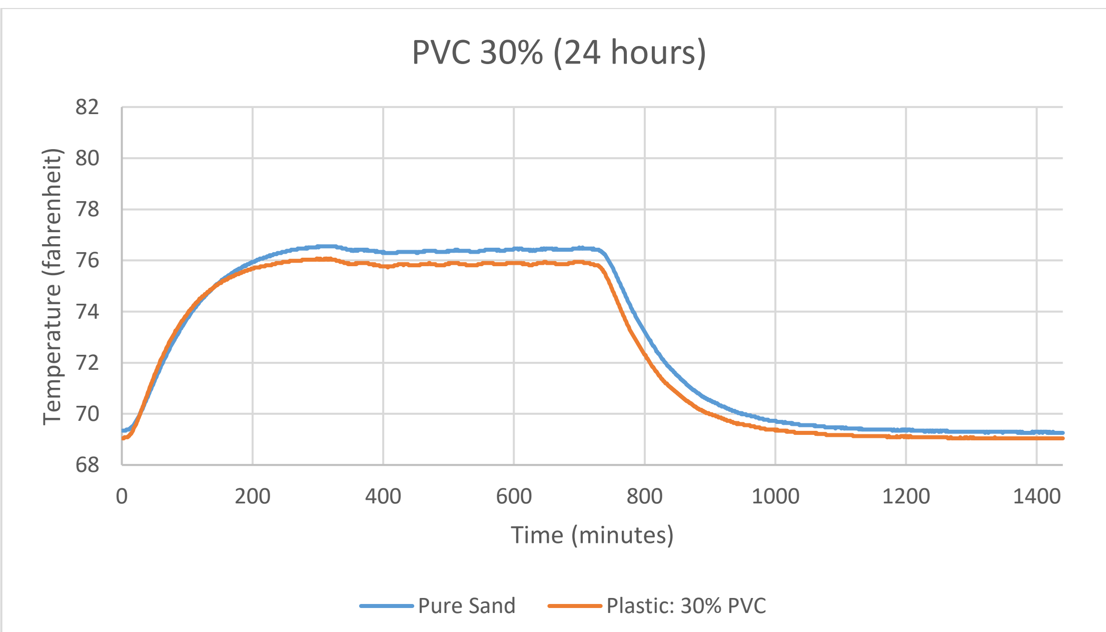
Mixture of Plastic (24 hours). The Mixture of Plastic was 30% by volume of plastic in silica sand, made up of 10% PVC powder, 10% plastic bag clippings, and 10% Styrofoam beads. At the start of the 12-hour heat lamp cycle the sand/plastic mixture heated up faster but then stayed at a consistent 2° warmer than the pure sand. Once the heat lamp shut off the sand/plastic mixture quickly lost the heat and returned to the same temperature as the pure sand.



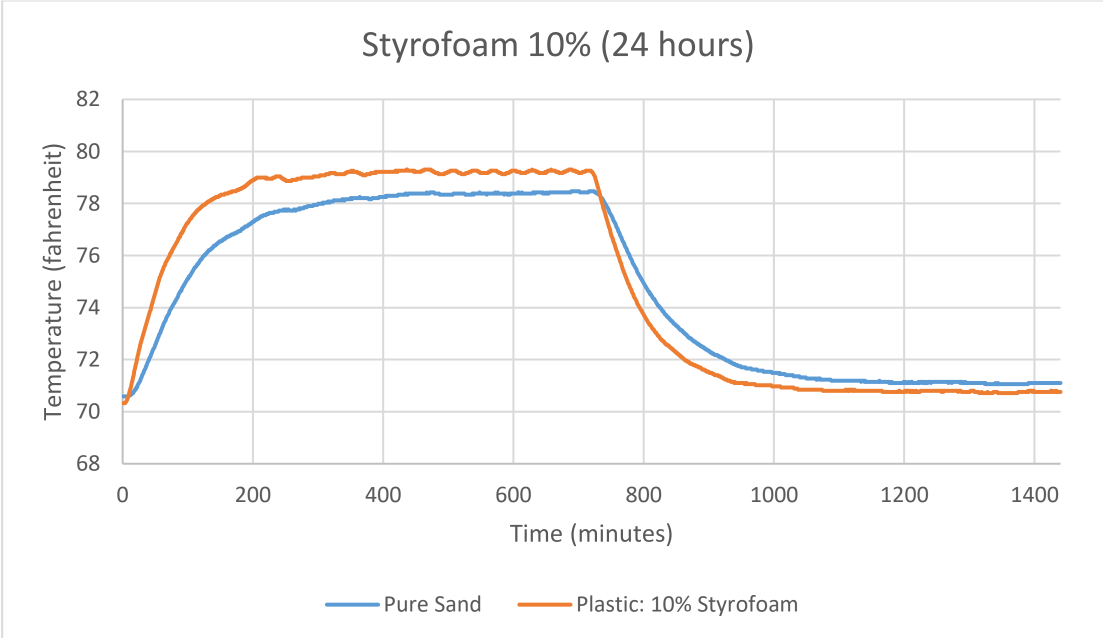
Styrofoam 30% (24 hours). This test consisted of 30% by volume of Styrofoam beads to silica sand. At the start of the heat cycle, the Styrofoam caused the mixture to heat up rapidly to almost a 3° F difference. With time, the sand gradually heated up, making the difference ±1°. A disturbance happened shortly after 400 minutes that caused both temperatures to drop slightly, this may have been due to air conditioning within the laboratory space. Once the heat lamp turned off the plastic lost heat more rapidly than the sand causing the plastic mixture to be a few degrees colder while the sand returned to pre-lamp temperatures.



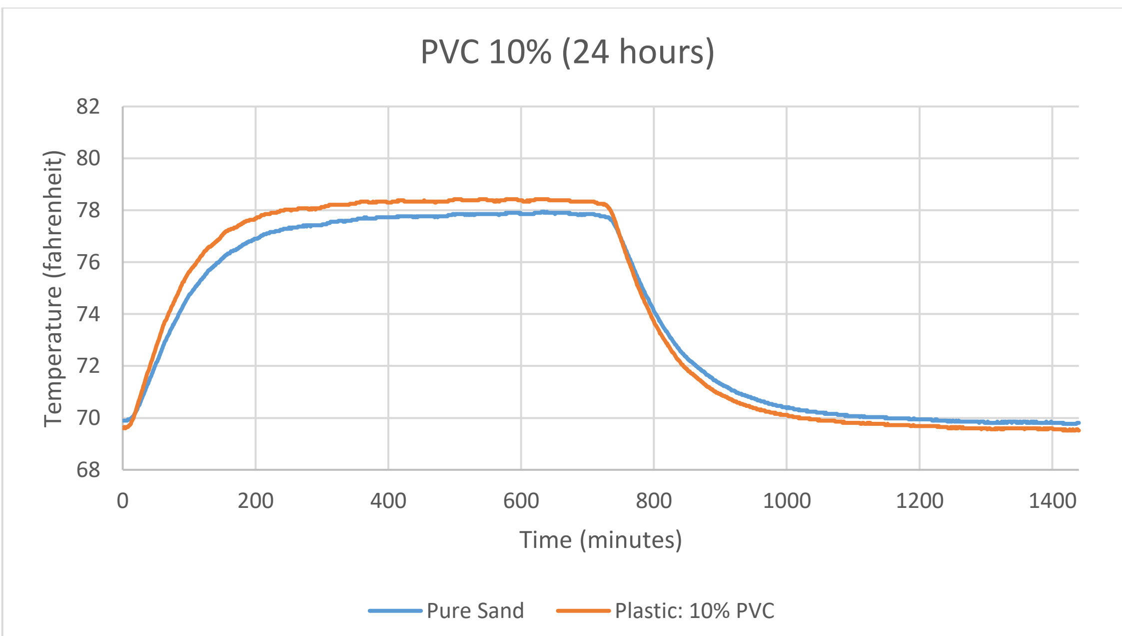
Here the mixture of 30% Plastic Bag is similar to the 30% Styrofoam where the mixture heated up faster than the unmixed sand to a difference of 3° F before the sand heated up to a consistent temperature. Once the unmixed sand was at a constant temperature the difference between the two was roughly 1.5° F until the heat lamp turned off. Then once again the mixed sand lost heat more rapidly than the unmixed, returning to the starting temperature before the unmixed.



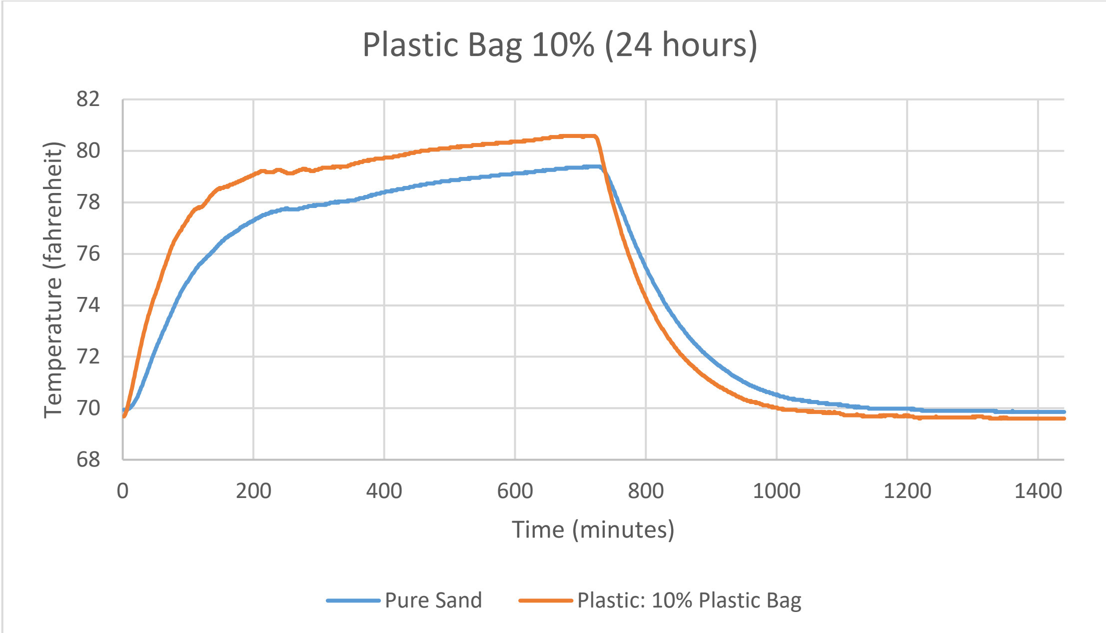
The 30% PVC powder mixture does not follow the same pattern as the other two 30% sand mixtures. This shows that the PVC powder restricts the temperature, not allowing it to heat up as fast as the unmixed sand. There is one point that shows the mixed sand being warmer than the unmixed shortly after the heat lamp turns on, but the remainder of the time the unmixed sand is warmer by roughly 0.5°F. When the lamp turns off, the mixed sand finally follows the pattern of losing heat faster than the unmixed.



The 10% Styrofoam mixture heats up similar to the 30% Styrofoam, but to a lesser extent. In the beginning, the 10% mixture heats up to just above 2° F more than the unmixed sand. Then when the heat levels stabilize, the mixed sand is approximately 1° F warmer than the unmixed sand. After the heat lamp turned off the drop difference in the mixed versus unmixed was less with the 10% mixture. The 10%'s drop difference is just above 1° F but the 30% drop difference was approximately 1.75°F.



The PVC once again runs against the grain of thought. As we saw in the 30% mixture of PVC powder, the mixed sand stayed cooler than the unmixed sand unlike the other mixtures. But this 10% mixture of PVC powder appears to be causing the mixed sand to heat up more than the unmixed. The mixed sand heats up to about a 1° F difference then begins to stabilize around a 0.5° F difference, then, once again, the mixed sand lost the heat faster once the heat lamp turns off.



The 10% plastic bag mixture is almost identical to the 30% plastic bag mixture. The difference in the heating up is the 10% peaked around 2.5^0 F of difference between the mixed and unmixed where the 30% peaked around 3^0 F difference. Once the temperatures stabilized, the difference between the unmixed and mixed sands were about 1.25^0 F. In the 30% mixture the temperatures stabilized with a slightly higher degree of difference. Once the heat lamp turned off the plastic mixture expelled the heat faster.

DISCUSSION

The data shows larger plastic particles in the sand, such as the grocery bag films and the Styrofoam beads, causes the temperature of the mixed sand to be hotter than the temperature of the pure sand. The only exception observed was with PVC powder which appears to insulate the sand resulting in colder temperatures. The difference between the 10% and 30% tests show a positive trend. The twenty-four hour cycle started with a rapid heating of the mixed sand and plastic, bringing its temperature to the largest degree of separation between the pure and mixed sand. The pure sand gradually heated up closer to the sand-plastic mix's temperature, then the temperature stabilized until the heat lamp turned off at the twelve hour mark, at which point the temperature of the sand-plastic mix decreased faster than did pure sand. The sand eventually cooled down to the same temperature as the sand-plastic mix. The plastic that had the highest degree of separation was the grocery bag films (polyethylene). Styrofoam beads heated up only a few tenths of a degree Fahrenheit less than the polyethylene films. The test with the three plastics mixed together show the most stable cycle. The mixed sand heated faster than expected but then maintained almost a constant degree of separation, which was approximately two degrees Fahrenheit warmer, during the majority of the twelve hours the lamp was on.

CONCLUSION

This work suggests that Styrofoam, PVC Powder and plastic bag films can alter the heat retention and expansion when in a mixture of quartz sand. We observed that during the 12 hour periods of light the mixture of plastics and quartz sand were hotter by 1-2 degrees Fahrenheit. During the dark period of 12 hours the plastic mixture was colder by a 1-3 degree Fahrenheit difference. This data led us to conclude that the plastics are in some cases insulating the sand. It seems logical that Styrofoam would be acting as an insulator because it is used industrially and domestically for that

purpose. The interaction between Plastic and Quartz Sand is more complex than previously thought and further investigation is definitely warranted.

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EDITORS' COMMENTS: The following document is being published in this issue of *Pedologue* as an example of documents on individual monoliths of the UM Soil Monoliths Collection that are being developed by the curators of the Collection, Del Fanning and collaborators. It is the *Pedologue* Editors' intention to put a write-up about one or more monoliths in

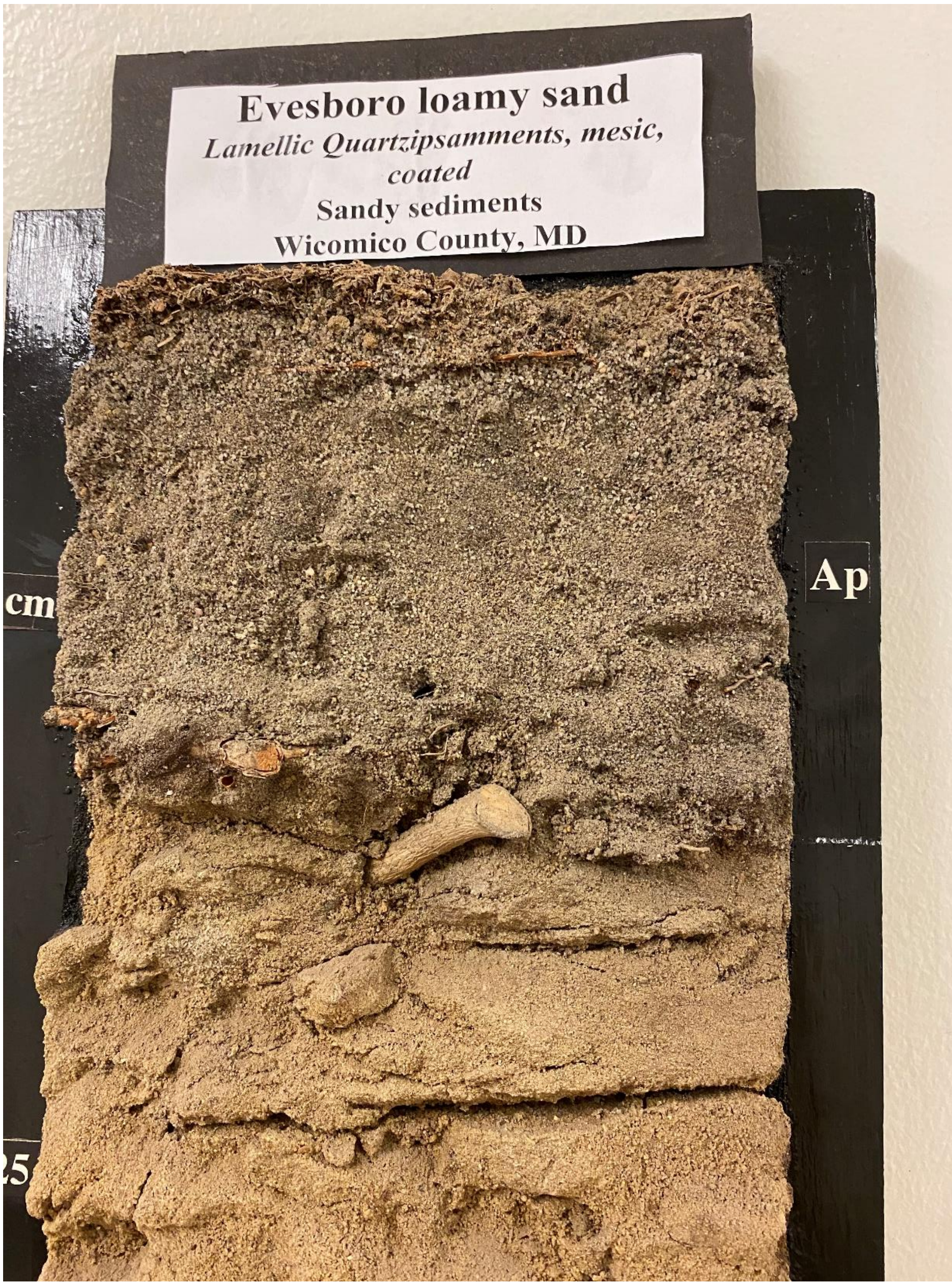
successive issues of *Pedologue* beginning with this issue. A document about the overall collection appeared in the previous issue (Fanning, 2021).

Reference:

Fanning, Del. 2021. The University of Maryland Soil Monoliths Collection. Pedologue Volume 32, Issue 1, pages 24-33.

UM SOIL MONOLITH NO. 1, this information assembled by Del Fanning

Monolith Name: Evesboro loamy sand



Monolith Picture and Labels on this monolith: Only one picture is presented, of the top part of this monolith. The label at the top contains information like presented at the top of all the monoliths in the collection, although that on other monoliths may not be presented in the same order as here. The top line gives the soil series name and the surface texture phase, also used as the Monolith Name. The second line gives the family classification of the soil in current Soil Taxonomy. The next line gives the name of the parent material of the soil, here Sandy sediments. The last line give the county name for the location from which the monolith was collected.

Comment on horizon labels. Horizons are currently (September, 2021) labeled on this monolith as originally

assigned by those who made the monolith, who considered the soil to belong to the Lakeland soil series. They recognized only three horizons, an Ap horizon as shown in the picture, and a C1 and a C2 horizon beneath the Ap carrying down to the base of the monolith at about 125 cm. Today, 2021, it is generally agreed that Evesboro soils have B and sometimes E horizons, see the official series description provided later, even though the B horizons do not qualify for any diagnostic horizon by Soil Taxonomy, thus the soils qualify as Entisols by Soil Taxonomy, very sandy ones as indicated by their classification in the Psamments (Psamm, from Greek *Psammos*, for sandy) suborder. They qualify for the Quartzi, great group because the sand is very low in weatherable minerals, composed predominantly of the inert mineral quartz. They were formerly classified as Typic Quartzipsamments at the subgroup level, but because the soils have thin lamellae of finer texture, but too thin, less than 15 cm in total thickness for all the lamellae present in the soil, to qualify as an argillic horizon, they are now classified at the subgroup level as Lamellic Quartzipsamments. No lamellae show in the monolith, but they likely occurred in the soil beneath the depth shown by the monolith. Evesboro soils are considered to belong to the coated family because the sand and other size grains in the soil are coated with iron oxides and in some places by very small quantities of silicate clay, also coated with iron oxides, giving the horizons brownish colors. Because of their soil temperature in the field, they are in the mesic soil temperature family. Soils like them, farther to the south, would be in the thermic soil temperature family and would be classified in the Lakeland soil series; thermic, coated Typic Quartzipsamments.

Monolith Collected and Constructed by: This monolith was collected and made by Dr. G. A. Bourbeau, the originator of the UM soil monoliths collection, and his collaborators, probably prior to 1960. The soil was collected to represent the Lakeland soil series before Lakeland series was classified as belonging to the thermic soil temperature family.

Further Introductory Comments about the Evesboro soil series and this monolith. Of all the monoliths in the UM collection, this soil represents the closest thing to a "pile of sand" in the collection. The extremely sandy nature of the Evesboro soils may be perceived just by looking at the profile or by the gritty nature of the soil to the touch, even though the sand grains are held together, in the monolith, by monolith glue, which glue also holds it to the monolith board and cheesecloth between the soil material and the board.

Many Evesboro soils are on stabilized, by vegetation, sand dunes although some may be on active dunes, such as on Assateague Island by the Atlantic Ocean in Worcester County, MD. With vegetation removed, stabilized dunes may become active again and subject to blowing that may cause sandstorms during dry windy weather conditions and require special management measures to prevent or manage these hazards.

Evesboro and other very sandy soils have extremely high hydraulic conductivity (percolation) rates and thus are poor filters and are subject to pollution of underlying aquifers from sewage septic tank systems or other sources of water pollution, but they are good for recharge of groundwater aquifers that commonly occur beneath them. However, because of low water holding capacity they have low water supplying ability for crops grown upon them; but, where irrigation is available, they are valuable for the production of vegetable and truck crops. They are also good for supplying sand for children's sand boxes and for making concrete/cement for construction purposes.

Unfortunately, no description is available for the soil for which this monolith was made and the exact location within Wicomico County from which the monolith was collected is not known. We may eventually make an abbreviated description of the soil from the monolith. The monolith shows some interesting morphological features. One is the Ap horizon about 15 cm, 6 inches, thick with an abrupt smooth lower boundary, typical of Ap horizons. In spite of the obvious plow layer, the monolith shows a

tree or other wooded plant root at the base of the Ap, showing that a tree or bush was growing on or near the soil at the time the monolith was collected, like what has been noted in other locations where Ap horizons are found in wooded areas, showing that the morphology of Ap horizons is commonly maintained in soil profiles for many years after a soil has ceased to be cultivated. Directly beneath the Ap horizon in the top of what those who collected the monolith recognized as a C1 horizon the monolith shows a zone with thick platy structure that appears to be a so-called plow-sole that acquired this structure from compaction by the plow from repeated plowing operations that brought the Ap horizon into existence.

To provide a description of an Evesboro soil that does contain lamellae, the zone with E & Bt horizons, the Bt parts being the lamellae, that occur at a depth of from 157 to 244 cm in the soil, the OSD. Official Soil Series Description for the Evesboro soil series, from the Web is presented below. The OSD also provides much other information about Evesboro soils that recognizes that these soils occur in the Coastal Plain and Coastal Lowlands in MD, DE, NJ and MA. On the General Soil Map of Maryland (Miller, 1967) that appears in the same monolith cabinet as this Evesboro monolith, Evesboro soils were recognized as Lakeland, and the soil association containing these soils were recognized as the Lakeland-Galestown, LG, association. Areas of this association are recognized on that map in northern Anne Arundel and nearby Baltimore Counties, on the Western Shore, and also along certain rivers in Caroline, Talbot, Dorchester and Wicomico Counties on the Eastern Shore. Capital Letters of individuals in places in the official description, e.g. EM-EHK, are for NRCS soil scientists who worked to develop the OSD. Some MAPSS members may be able to name these individuals from the initials. Thanks to these individuals for their efforts. At appears that the OSD was last updated in 2006.

In regards to the need for additional monoliths in our collections, we could use one showing lamellae.

Official Evesboro soil series description from web site:

https://soilseries.sc.egov.usda.gov/OSD_Docs/E/EVESBORO.html

LOCATION EVESBORO NJ+DE MA MD

Established Series
CSL/Rev. EM-DHK
06/2006

EVESBORO SERIES

MLRA(s): 149A (Northern Coastal Plain), 149B (Long Island-Cape Cod Coastal Lowland), 153C (Mid-Atlantic Coastal Plain), 153D (Northern Tidewater Area)
Depth Class: Very deep
Drainage Class (Agricultural): Excessively drained
Saturated Hydraulic Conductivity: High in the subsoil and high to very high in the substratum.
Landscape: Coastal Plain upland
Parent Material: Sandy marine and eolian deposits
Slope: 0 to 40 percent, commonly 0 to 5 percent
Mean Annual Air Temperature (type location): 13 degrees C. (56 degrees F.)
Mean Annual Precipitation (type location): 1143 mm (45 inches)

TAXONOMIC CLASS: Mesic, coated Lamellic Quartzipsamments

TYPICAL PEDON: Evesboro sand, in woodland. (Colors are for moist soil.)

Oe--0 to 2.5 cm (0 to 1 inch); black (7.5YR 2.5/1), moderately decomposed plant material; very strongly acid, pH 4.6; abrupt wavy boundary. (0 to 5 cm thick)

A1--2.5 to 5 cm (1 to 2 inches); very dark grayish brown (10YR 3/2) sand; single grain; loose; many fine roots throughout; very strongly acid, pH 4.6; clear wavy boundary. (2.5 to 13 cm thick)

A2--5 to 10 cm (2 to 4 inches); dark grayish brown (10YR 4/2) sand; single grain; loose; common fine roots throughout; very strongly acid, pH 4.8; clear wavy boundary. (0 to 33 cm thick)

B/E--10 to 25 cm (4 to 10 inches); 60 percent dark yellowish brown (10YR 4/6) (B) and 40 percent light brownish gray (10YR 6/2) (E) sand; single grain; loose; common fine roots throughout; strongly acid, pH 5.2; clear wavy boundary. (0 to 20 cm thick)

BE1--25 to 91 cm (10 to 36 inches); dark yellowish brown (10YR 4/6) sand; single grain; loose; common fine roots throughout and common medium roots throughout; strongly acid, pH 5.2; clear wavy boundary.

BE2--91 to 114 cm (36 to 45 inches); yellowish brown (10YR 5/6) sand; single grain; loose; strongly acid, pH 5.2; clear wavy boundary.

BE3--114 to 157 cm (45 to 62 inches); yellowish brown (10YR 5/6) sand; single grain; loose; strongly acid, pH 5.2; clear wavy boundary. (Combined thickness of BE horizon 51 to 152 cm thick)

E and **Bt1--**157 to 193 cm (62 to 76 inches); about 98 percent yellowish brown (10YR 5/6) sand (E); single grain; loose; about 2 percent strong brown (7.5YR 4/6) loamy sand lamellae (Bt) about 0.25 inch thick; massive; very friable; few faint clay bridges between sand grains; strongly acid, pH 5.2; clear wavy boundary.

E and **Bt2--**193 to 244 cm (76 to 96 inches); about 97 percent yellowish brown (10YR 5/4) sand (E); single grain; loose; about 3 percent strong brown (7.5YR 4/6) loamy sand lamellae (Bt) about 0.50 inch thick; massive; very friable; few faint clay bridges between sand grains; strongly acid, pH 5.2.

TYPE LOCATION: Cumberland County, New Jersey, 1.2 miles northwest of the junction of State Highways 49 and Carmel Road on Carmel Road (Union Lake Wildlife Management Area); USGS Millville, NJ topographical quadrangle; lat. 39 degrees 24 minutes 37.40 seconds N. and long. 75 degrees 4 minutes 30.70 seconds W. NAD83

RANGE IN CHARACTERISTICS:
Solum Thickness: Greater than 183 cm (72 inches)
Depth to Bedrock: Greater than 183 cm (72 inches)
Depth to Seasonal High Water Table: Greater than 183 cm (72 inches)
Rock Fragments: 0 to 25 percent, by volume throughout the profile, mostly rounded quartzose pebbles. Layers with more than 15 percent gravel are generally less than 30 cm (l foot) thick.
Soil Reaction: Extremely acid to strongly acid, throughout the profile, unless limed
Other Features: Pedons in wooded areas typically have a microsequence of an A, E, and Bh horizon (micro-podzol). Total thickness of the A, E, and Bh horizons is less than 15 cm (6 inches) and individual horizons are less than 5 cm (2 inches) thick. Some pedons have a Bw horizon based on

color. The soil moisture control section is not dry for more than 25 consecutive days in the 120 days following the summer solstice.

RANGE OF INDIVIDUAL HORIZONS:
O horizon:
Color--hue of 5YR to 10YR, value of 2 to 4, chroma of 1 to 3
Type of organic soil material--highly decomposed to slightly decomposed plant material

A horizon:
Color--hue of 7.5YR or 10YR, value of 3 to 6, chroma of 1 to 4
Texture (fine-earth fraction)--sand, fine sand or loamy sand

Ap horizon (if it occurs):
Color--hue of 10YR, value of 3 to 5, chroma of 2 to 4
Texture--sand or loamy sand

E horizon (or other transitional horizon):
Color--hue of 10YR, value of 4 to 6, chroma of 2 to 6
Texture (fine-earth fraction)--sand or loamy sand, sand fraction ranges from coarse to fine.

Bh horizon (if it occurs is less than 5 cm thick):
Color--hue of 5YR or 7.5YR, value of 4 to 6, chroma of 4 to 6
Texture (fine-earth fraction)--loamy sand

BE horizon (or Bw horizon, if it occurs):
Color--hue of 5YR to 2.5Y, value of 4 to 7, chroma of 3 to 8
Texture (fine-earth fraction)--sand or loamy sand, sand fraction ranges from coarse to fine.

E and Bt horizon, E part:
Color--hue of 7.5YR to 2.5Y, value of 4 to 7, chroma of 1 to 6
Texture (fine-earth fraction)--sand or loamy sand (or fine sand analogs). Sand fraction ranges from coarse to fine.

E and Bt horizon, Bt part:
Color--hue of 7.5YR to 10YR, value of 4 to 6, chroma of 3 to 8
Texture (fine-earth fraction)--sand, loamy sand or sandy loam (or fine sand analogs). Sand fraction ranges from coarse to fine.

C or 2C horizons (if they occur):
Color--7.5YR to 2.5Y, value of 4 to 8, chroma of 4 to 8
Texture (fine-earth fraction)--coarse sand to fine sand with gravelly analogs

COMPETING SERIES:
Runclint soils--have a water table between 107 and 183 cm (42 and 72 inches) on lower landforms
Vanderlip soils--Vanderlip soils have a solum less than 183 cm (72 inches) thick, have rock fragments that are dominantly soft angular sandstone or quartzite and formed in residuum from nonacid sandstone on ridgetops and side slopes.
Windward soils--Windward soils have a solum less than 183 cm (72 inches) thick, consist of dominantly fine sands, and formed in eolian sands.

GEOGRAPHIC SETTING:
Landscape: Coastal Plain upland

Landform: Flats, knolls, ancient dunes
Hillslope Profile Position: Summits, shoulders, and backslopes
Elevation: 3 to 137 meters (10 to 450 feet) above mean sea level
Parent Material: Sandy marine and eolian deposits. Sandy deposits range in thickness from about 1.0 to 6.0 meters and in many places contain thin lenses of finer textured material.
Slope: 0 to 40 percent
Mean Annual Air Temperature: 11 to 14 degrees C. (52 to 58 degrees F.)
Mean Annual Precipitation: 1016 to 1270 mm (40 to 50 inches)
Frost Free Period: 180 to 220 days

GEOGRAPHICALLY ASSOCIATED SOILS:
Downer soils--have a coarse-loamy particle-size control section and an argillic horizon, on similar landforms
Fort Mott soils--have a loamy particle-size control section, an argillic horizon, and sandy layers less than 40 inches thick, on similar landforms
Galestown soils--are somewhat excessively drained and have an argillic horizon, on similar landforms
Klej soils--somewhat poorly drained with a seasonal high water table at 30 to 61 cm (12 to 24 inches), on lower-lying positions
Lakehurst soils--moderately well drained with a seasonal high water table at 46 to 107 cm (18 to 42 inches) and a thin spodic horizon, on lower-lying landforms
Lakewood soils--have a thin spodic horizon up to 15 cm (6 inches) thick, on similar landforms
Matawan soils--moderately well drained and have a fine-loamy particle-size control section, on lower-lying positions

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY:
Drainage Class (Agricultural): Excessively drained
Internal Free Water Occurrence: Very deep (None within 1.83 meters)
Flooding Frequency and Duration: None
Ponding Frequency and Duration: None
Index Surface Runoff: Negligible
Saturated Hydraulic Conductivity: High in the subsoil and high to very high in the substratum.
Permeability (obsolete): Rapid in the subsoil and moderately rapid to very rapid in the substratum
Shrink-swell potential: Low

USE AND VEGETATION:
Major Uses: Most areas are in woodland, fruit and vegetable crops, or urban land. Most area in woodland has been repeatedly cut for wood products. Where irrigated, Evesboro soils are most commonly used for production of peaches, grapes, sweet potatoes, pumpkins and melons.
Dominant Vegetation: The wooded area is predominantly black oak, white oak, red oak, yellow poplar, and chestnut oak with scattered hickories, pitch pine, Virginia Pine, loblolly pine, and scrub and blackjack oaks.

DISTRIBUTION AND EXTENT:
Distribution: Coastal Plain of New Jersey, Delaware and Maryland
Extent: Large

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Pennsauken Creek Project, New Jersey, 1936

REMARKS: The Evesboro series is the mesic equivalent of the Lakeland series. The Bw horizonation is based on color. This layer does not constitute a cambic horizon because the texture is not very fine sand, loamy very fine sand, or finer than these textures. Evesboro series have been reclassified from mesic, coated Typic Quartzipsamments to mesic, coated Lamellic Quartzipsamments.
Diagnostic horizons and other diagnostic soil characteristics recognized in this pedon are:
Ochric epipedon--the zone from the soil surface to a depth of 10 cm (Oe, A1 and A2 horizons)
Lamellic feature--Lamellae with total thickness of less than 15 cm (6 inches) in the series control section

ADDITIONAL DATA: Data from characterization samples S58NJ-009-003, S58NJ-005-004, S58NJ-005-005, S74MD-033-001, S85MD-019-009, S86MD-019-011, S86MD-019-015, S94NJ-001-001, S94NJ-001-002 and S01MD-017-010 are available from the National Soil Survey Laboratory, Lincoln, Nebraska.

2006 OSD revision-JWB

National Cooperative Soil Survey

Reference:

Miller, F. P. 1967. Maryland Soils. University of Maryland Extension Bulletin 212. College Park, MD.

Passing of G. Wade Hurt,

Gilbert Wade Hurt, 76, passed away August 13, 2021 in Gainesville, FL after a short illness. He received a B.S. degree in Soil Science from Mississippi State University in 1968. Wade served in the Army as a military policeman in Japan, where he met his wife Yukie. He was predeceased by his daughter Marie, and is survived by his wife Yukie, son John, and two grandchildren.

In 1971, Wade began a long career with the USDA Soil Conservation Service, later renamed the Natural Resources Conservation Service (NRCS), where he progressed through the ranks from soil mapper to become the State Soil Scientist of Florida. He also served as NRCS's National Leader for Hydric Soils from 1996 to 2007, culminating with his service as chair of the National Technical Committee for Hydric Soils.

Wade retired from federal service in 2007 and accepted a courtesy appointment with the University of Florida's Soil and Water Sciences Department, where he guest-lectured, taught classes on hydric (wetland) soils, and served on graduate student committees until 2020. Wade shared his knowledge of soils and his passion for natural resources with thousands of students and practitioners, often through field courses and research conducted at the Austin Cary Forest near Gainesville.

Over his career he produced more than 160 extension bulletins, refereed journal articles, meeting abstracts, and soil survey reports among others. While most widely known for his work with hydric soils, Wade also made significant contributions in the areas of geographic information systems, pesticide

application rates for different soils, and nutrient (mainly P) management on farms. He received numerous awards throughout his career including the Professional Achievement Award from the *Soil and Water Conservation Society* (Florida Chapter), and the Professional Service Award from the *Soil Science Society of America* in 2005.

Wade's most widely recognized professional contribution will remain the development and publication of *Field Indicators of Hydric Soils of the United States*, a major achievement in soil science that greatly improved wetland protection and management in the U.S. In the 1980's, Wade and co-workers conceptualized the basic processes needed to identify wetland soils and initiated research to improve the accuracy of wetland delineations in Florida. This involved identifying a set of diagnostic soil morphological features that form in response to prolonged periods of saturation, and implementing a practical system to document and delineate the presence of soil features characteristic of wetland habitats.

In 1990, the USDA assembled a National Technical Committee for Hydric Soils (NTCHS) of university faculty and federal agency staff to expand the work led by Wade in Florida for nationwide application. As a founding member of the NTCHS, Wade participated in numerous field investigations conducted across the country, compiling field indicators for virtually all hydric soils in the U.S. Each of the original 40 field indicators had to be painstakingly defined in terms of depth, thickness, organic matter percentage, and color. The research spearheaded by Wade and his team culminated in the publication of the USDA's *Field Indicators of Hydric Soils of the United States*, which he co-edited from 1996 until 2018 and which is still used by all federal agencies to identify wetland boundaries throughout the U.S. Over 50,000 copies have been printed and distributed nationwide, providing a critical tool used by soil scientists, academics, and natural resource practitioners to identify and manage wetlands across the nation.

Wade dedicated his life to soil science and to finding better ways to identify hydric soils. While no one person can be credited with developing the *Field Indicators of Hydric Soils of the United States*, it can be said that without Wade we would not have a defensible and practicable way to identify hydric soils in the U.S. His contributions to soil science and natural resource management must not and shall not be forgotten.

Mike Vepraskas, Jacob Berkowitz, Randy Brown