



# *Ohio's Professional Soil Scientists*

2019 SPRING NEWSLETTER  
VOLUME 46, ISSUE 1



## On the Cover

Two soils with contrasting drainage: L - a well drained Miamian (fine, mixed, active, mesic Oxyaquic Hapludalfs) profile from Franklin Co., OH; R – a poorly drained Ragsdale (fine-silty, mixed, superactive, Typic Argiaquolls) profile from Clinton Co., OH. Photos submitted by J. Bigham

## 2019 AOP Executive Council Members

<b>President:</b>	Duane Wood (dwood8830@gmail.com)
<b>President-Elect:</b>	Jeff Glanville (jeff.glanville@oh.usda.gov)
<b>Past President:</b>	Jerry Bigham (jerrybigham.1@gmail.com)
<b>Treasurer:</b>	Jon Gerken (jgerken47@gmail.com)
<b>Secretary:</b>	Scott Demyan (demyan.4@osu.edu)
<b>Editor:</b>	Mike Plunkett ( <a href="mailto:mplunket@columbus.rr.com">mplunket@columbus.rr.com</a> )
<b>Representative at Large:</b>	Terry Priest (priestterry12@gmail.com)
<b>Representative at Large:</b>	Bill Schumacher (bcschumacher@msn.com)
<b>Representative at Large:</b>	Kathryn Sasowsky ( <a href="mailto:kathryn@sasowsky.com">kathryn@sasowsky.com</a> )

## Calendar of Events

- River Rally – June 21-22, Cleveland, OH to celebrate the 50<sup>th</sup> anniversary of the burning of the Cuyahoga [River Rally](#). See page 22.
- Soil Health Institute, 4<sup>th</sup> Annual Meeting – Jul. 16 – 18, Sacramento, CA
- [Certified Crop Adviser \(CCA\) Exams](#) - Aug. 2 - various locations
- 2019 Ohio SCS/NRCS Retirees Luncheon - Aug 14 - MCL Cafeteria at 5240 East Main Street, in Whitehall, OH
- [Earth Science Week](#) "Geoscience Is for Everyone" - Oct. 13-19
- [Onsite Wastewater Mega Conference](#) - Oct. 14-16, Loveland, CO
- ASA, CSSA, SSSA Annual Meeting - Nov. 10-13, San Antonio, TX
- [SSSA Fall Certification Exam](#) - Nov. 15 - various locations

If you know of an upcoming local, regional, national or international event that might be of interest to our members, please submit the name, date, location, and any available link to our Editor.



## President's Message

For those of you who don't know me, allow me to introduce myself through work and education. I'm originally from Wayne County, Ohio. Dairy farming was my family's primary occupation (although my dad taught Industrial Arts at Wadsworth High and occasionally cut hair at my Grandpa's barbershop, also in Wadsworth.) At our peak, we had 150 cows and farmed over 1,000 acres. As you may have noticed, I'm not dairy farming; I'm more of a plant person ☺. I have found that plants rarely kick; nor do they whack you in the head or mouth with a tail covered in you

know what! Some of my early leadership training occurred in 4-H and FFA serving in various officer positions ("I believe in the future of agriculture, with a faith born not of words but of deeds – achievements won by the present and past generations of agriculturists.") Some of you may recognize the FFA Creed; it's a good one. <https://www.ffa.org/about/ffa-creed/>.

College was at The Ohio State University with a BS in Agriculture (Agronomy). I was an SCS student trainee in Huron and Tuscarawas Counties during college. I have an intimate knowledge of the drainage ditches in Celeryville having done many cross sections from a jon boat. I did a couple of years as a rural mail carrier in Hinckley, Ohio (504 boxes per day with lake effect snow and buzzards in March). I then worked at the Tuscarawas SWCD as an Agricultural Specialist pest scouting over 100 fields weekly in the spring and summer through OSU Extension for local farms, and writing manure nutrient management plans when not scouting. Next was the Piketon Research and Extension Center as an Extension Water Quality Specialist for the MESA project with Dr. Larry Brown. During cool mornings you could see the steam rising from the cooling towers a mile or two away at the Uranium Enrichment Facility. Then on to Wayne Soil and Water Conservation District where I was a Nutrient Management Specialist, a Water Quality Specialist, and then the District Program Administrator. I'm retired from the Soil and Water world, but I still volunteer when I can. I faithfully help with the county Vo-Ag land judging contest (and hope you do too). Today I'm a Certified Professional Soil Scientist working as a private consultant doing soil evaluations primarily for septic systems. So, with that out of the way:

I'm looking forward to serving as president and working with our outstanding executive council. However, I must admit a bit of trepidation creeps in periodically now that it's time

to act as president. Past President Jerry Bigham and Larry Tornes before him have done great jobs, and I hope I can come close to the fine work they've accomplished during their terms. I will do my best to move our organization forward in a positive direction.

A number of initiatives have been put in motion from our previous presidents and members. Standardizing the summer workshop should help ease the burden on future president-elects. At present, it has been primarily up to the president-elect to develop a theme and work out the myriad other details from location, food, date, speakers, etc. It can be a little overwhelming, and I think it has been a hindrance to some who might otherwise be willing to serve. Jobs, families, and other commitments make it difficult to meet the additional demands. I know it made me think twice more than once. Dr. Bigham made sure the summer meeting wasn't too extreme by giving me a lot of help, and I hope I can do the same for Jeff Glanville as he works to plan our summer workshop. Jeff's initial ideas for our summer workshop sound great! More information will be shared as details are firmed up.

Another focus area is an effort led by Julie Weatherington-Rice. She's exploring ways to help bring new soil scientists into our fold. To do this, they need a clear path to soil courses, training, employment, AOP membership, and SSSA certification. If you take a look around the room at our Annual Meetings you might notice that many of our attendees are seasoned veterans.

I hope you will feel free to contact me or any member of Executive Council if you have thoughts or ideas about how to keep AOP moving forward and promoting the importance of soil and soil science.

## Annual Meeting Wrap Up

The 2019 AOP Winter Meeting was held on February 21 at the H.R. Collins Lab and Core Repository, a facility operated by the ODNR Geological Survey. Our thanks go out to the folks at ODNR for access to this excellent meeting venue. Approximately 53 registrants were in attendance, and Mother Nature contributed a *not-so-bad* February day for all those weary of winter driving in Ohio.

President Jerry Bigham opened the program by thanking those in attendance and by announcing new members from the previous year. These included James Fincham – Soils Professional, Kevin Craig – Student Member, Ron Winland – Soils Professional, Reed Johnson – Soils Professional, and Anna Michael – Student Member. President-Elect, Duane Wood then convened the morning program.

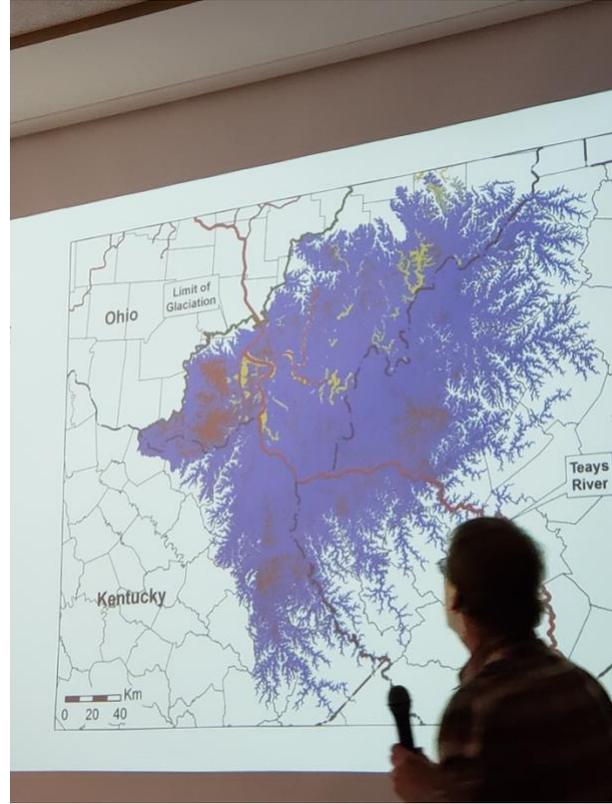
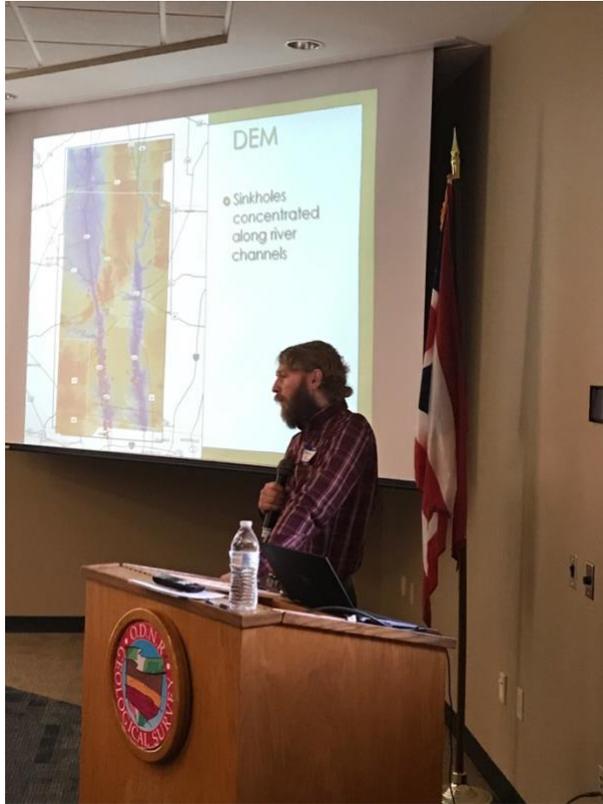
### Technical Program:

The morning technical program focused on soil and geologic hazards in Ohio and included presentations by three staff members from the ODNR Geological Survey. Craig Nelson, Andy Nash, and Doug Aden spoke about their mapping programs directed at groundwater vulnerability to pollution, glacial drift thickness, and karst topography, respectively. All are on-going efforts, but products available to date can be accessed through the Survey's Geologic Records Center or by contacting the authors directly.

Following a comfort break featuring delicious Daylight Donuts and Ringler Family Coffee, Nate Wanner, a Senior Scientist at Cox-Colvin & Associates of Plain City presented his recently published work on sources and influencing factors affecting background concentrations of arsenic in Ohio soils. Jim Erjavec, President of GIS & Environmental Management Technologies, LLC, closed out the program with another recently published report of his work on a new map of Pleistocene proglacial Lake Tight based on GIS modeling and analysis. See page 12 for direct links to these articles. Thanks to Duane Wood for organizing an outstanding program!

### Business Meeting:

After a hearty lunch featuring City Barbecue and plenty of social time, the organization's annual business meeting opened with officer reports. Minutes from the 2018 Annual Meeting were approved along with the Treasurer's financial summary for the past year, which showed a total net worth for the organization of \$41,652 as compared to \$41,790 at the end of 2017. As per standard operating procedures, a financial review of the Treasurer's books was conducted in advance of the annual meeting.



Jerry Bigham noted that the CPSS consultant list on the AOP web site is out-of-date and circulated a form asking those interested to update their information profile. A suggestion from the floor was accepted to have the form available as a recurring component of the AOP Newsletter (see page 18) or on the AOP website in order for changes to be forwarded to the AOP Secretary on a more regular basis.

Matt Sullivan gave a brief update on the AOP Scholarship Fund, and Jerry Bigham referred the membership to a detailed report given in the Winter 2018 Newsletter. One scholarship was awarded in 2018, and the fund had a balance of \$8,897 as of January 1, 2019, with \$1,000 of that total already committed.

Jerry Bigham summarized some of the chronic issues associated with planning summer workshops and presented a proposal developed by the Executive Council that would a) incorporate a geographic rotation for future workshops based on Ohio Soil Regions, b) include several standard elements (e.g., geomorphology, soil morphology, interpretations) for participant training, and c) place greater reliance on knowledgeable AOP members for workshop planning and execution. A request for volunteers was circulated among those present at the annual meeting. More details of the proposed plan

are presented elsewhere in this newsletter, and we encourage you to share your time, talent, and knowledge in planning a future workshop.

Julie Weatherington-Rice led discussion regarding the role of AOP in recruiting and training new, private sector soil scientists. This topic was a carryover from the 2017/18 meetings. As in 2018, no conclusions were reached and the issue will continue to be an item for consideration by the Executive Council in the coming year.

### **Officer Elections:**

Jeff Glanville, Scott Demyan, and Kathryn Sasowsky were nominated and approved by unanimous votes of the membership in attendance as incoming President-Elect, Secretary, and Member at Large, respectively, on the Executive Council. They replaced Larry Tornes, Past President, Joe Ringler, Secretary, and Matt Lane, Member at Large, from the 2018 officers. Our thanks go to Larry, Joe and Matt for their dedicated service to AOP, and we look forward to the leadership of Jeff, Scott and Kathryn going forward.

### **Awards and Honors:**

**AOP Honorary Member:** Tim Gerber was elected an Honorary Member of AOP following a presentation of his nomination materials by Past President Larry Tornes. Tim hails from Canton and graduated from The Ohio State University with a B.S. in Agriculture and a M.S. in Soil Science (1973). After graduation, he began a long and productive career with the Ohio Department of Natural Resources. His work as a Soil Resource Specialist with the Cuyahoga Soil Survey (1973-74) was followed by service as a Soil Survey Project Leader for the Carroll and Jefferson County Soil Surveys (1974-86). He was promoted to Soil Survey Coordinator (1986-91) for the state and ultimately became Soil Inventory and Evaluation Section Administrator (1991-2008). While working for ODNR, Tim received the Soil Scientist Achievement Award from the National Cooperative Soil Survey (2001), the Soil Conservationist of the Year Award from the League of Ohio Sportsmen (2004), the President's Award from the Ohio Federation of Soil and Water Districts (2007), and was named to the Ohio Natural Resources Hall of Fame by the Ohio Department of Natural



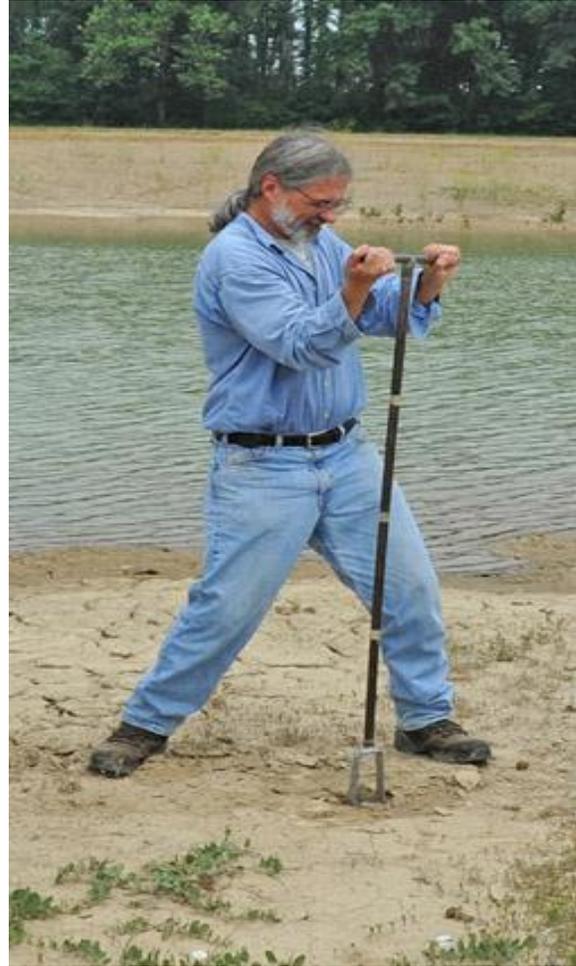
Resources (2008). He was an active member of AOP, serving as President-Elect, President, and Past-President on two occasions (1980-82 and 1988-90), as a member of the AOP Board of Certification (2001-2007), and as Editor (2010-11). Tim retired from ODNR in 2011 and moved with his wife, Joyce, to Bel Air, MD, to be closer to their family. He has remained professionally active as a CPSS, as an Adjunct Instructor at Harford Community College, as an Earth Team Volunteer for the USDA-NRCS in Harford County, and as a member of the Association of Ohio Pedologists. Like most soil scientists, Tim enjoys nature and outdoor recreation. He completed the 1,445-mile Buckeye Trail in July, 2018. Congratulations, Tim, on being named an AOP Honorary Member!

**Pedologist Merit Award:** A belated Pedologist Merit Award was presented by Past President Larry Tornes to Frank Gibbs for his leadership in organizing and implementing the Autumn 2017 workshop that was jointly hosted by AOP and the Indiana Association of Professional Soil Classifiers. The workshop was well attended and well received by the membership of both organizations. Congratulations and thanks, Frank!



**New Chief of ODNR Geological Survey:**

AOP Honorary Member, Mike Angle, was recognized as new Chief of the ODNR Division of Geological Survey. Mike has worked as the Assistant Chief of the Survey since 2012. Previously, he was supervisor for the Geologic Mapping and Industrial Minerals Group and a mapping geologist for the regional geology section. He also contributed his skills to the ODNR Division of Water Resources, where he served as a mapping geologist for the groundwater section. Mike has authored more than 20 maps and more than a dozen articles and publications on various aspects of Ohio's geology and hydrogeology. He earned his bachelor's and master's degrees in geology from the University of Akron, with a specialty in glacial geology and hydrogeology. He has been a long-time member of AOP and a great friend of soil science throughout his career. Congratulations, Mike!



## From SSSA



### Welcome to “The Profile”

We’re excited to announce the launch of *The Profile*, a new digital avenue for member communications for soils-related topics!

This new digital platform, *The Profile*, has been conceptualized by an SSSA member committee - by members and for members - and allows for continuous online postings and communication on soil science topics. *The Profile* features multi-faceted posting options that allow members to present items that would not typically be published in an international research journal, such as field observations, regional work, interesting but non-replicated works, consulting case studies, legal issues in consulting soil science, opinions on soil science issues, etc. Other topics suitable for short articles include soil science education, history, and soils and society (including art and literature) issues. Coming soon will also be discussion boards.



You’ll also find links to the I “Heart” Soil Store, @ Work Career Profiles, and the Soils Multimedia Gallery. These options will give SSSA members a new, dynamic way to interact and communicate soils information.

It is important to note that *The Profile* is not designed to be an indexed journal. However, all submissions will be reviewed for appropriateness and approved by the moderator board, which is made up of soil science professionals.

So, what can you do? Post! *The Profile’s* success depends on contributions from members. Here are some (and only some) examples of ideas for posting:

- You're a consultant and worked on a particularly interesting project, or overcame a particularly difficult situation and are free to share all or some of the details, post in **Consulting Notes**,
- You're an NRCS soil scientist and saw something really interesting when describing soils in the field, post in **Field Notes**,
- You've written a poem or song, or created a work of art that depicts soil or was created with soil, showcase your work in **Soil Art**,



- You're an experienced field scientist who makes a video describing a soil pit, who posts the video in the **Soils Multimedia Gallery**, which can be used by soil judging teams, consultants, or NRCS employees to become more familiar with the soils in a specific location. You maximize your post by cross-posting this as a **Field Note** with a link to the Gallery,
- You've been thinking about the state of the science and would like to express your opinion, post in the **Opinions/Letters to the Soil Science Community**, or
- Have an idea you would like feedback on (or any other general interest topic), post as a **Blog!**
- Finally, there are some general guidelines for posting - they can be viewed [here](#).

### [Visit The Profile](#)

Sign-up for [Email Notifications](#) when new content is posted!

In many respects the sky's the limit, and the functionality of these types of features will be limited only by the imaginations of each of you, our SSSA members, as you put **The Profile** to use to communicate soils information. For a short time during the launch, this member benefit will be open to everyone to read. Only members will be able to post and comment (after logging in).

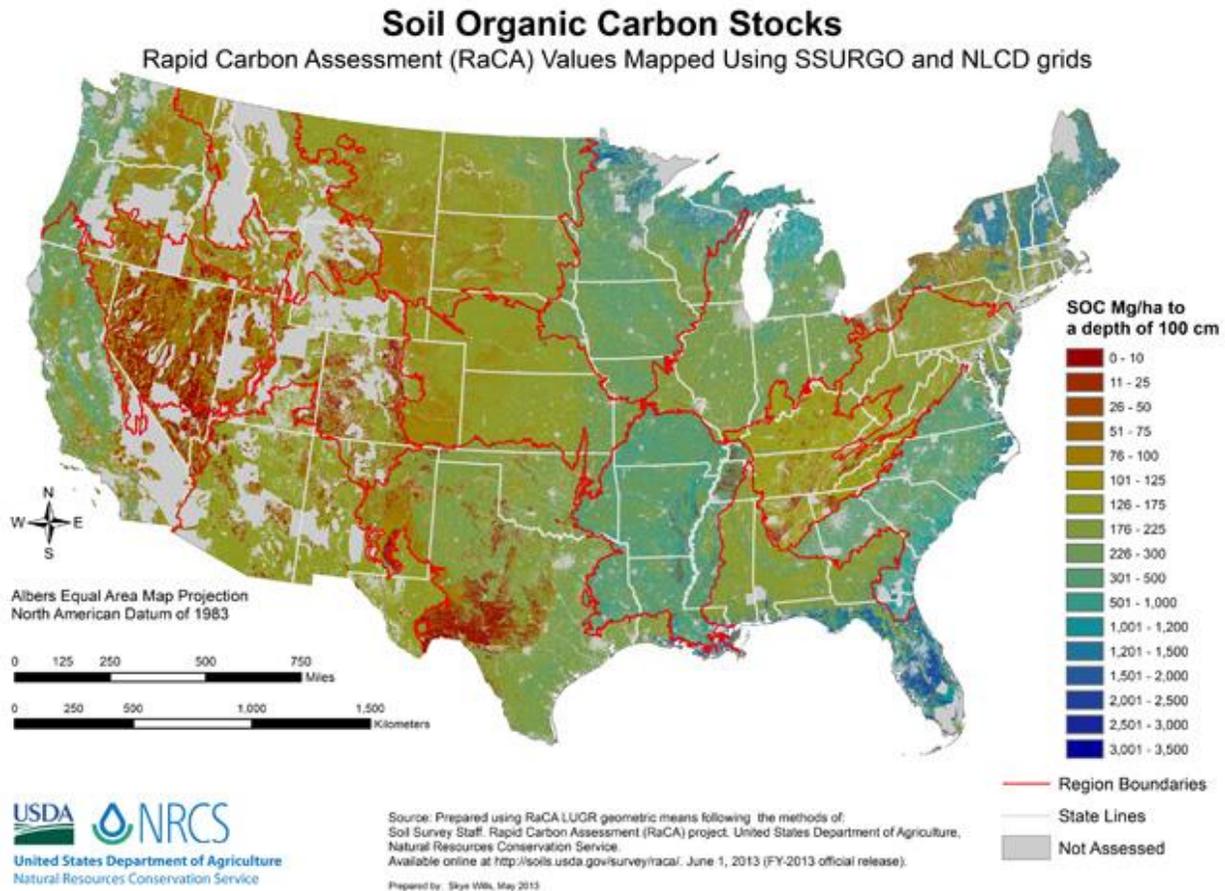
If you have any feedback, please reach out to me at [eric.brevik@dickinsonstate.edu](mailto:eric.brevik@dickinsonstate.edu) – I look forward to hearing from you.

Eric Brevik  
On behalf of *The Profile's* Steering Committee and Moderators

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5585 Guilford Road | Madison, WI 53711-5801 | 608-273-8080  
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## Soil Carbon and Climate Change



The Earth's topsoil contains approximately **2,500 gigatons of carbon**, which is more than three times the amount of carbon in the atmosphere and about four times the amount of carbon stored in all living animals and plants.

During the Soil Science Society of America Annual Meeting in San Diego on January 9, 2019, Dr. Katharine Hayhoe of Texas Tech University gave an address on the topic of soils and climate change. The presentation is available on youtube at: [Soils, Science, and Stakeholders: Talking Climate in a Changing World](#) This was the 7th *Advancing Pedology in the 21st Century* Colloquium. It is well worth watching, and sharing (referred by Brian Slater, OSU-SENR).

## From the Library

### Ohio Journal of Science:

Dr. Lynn E. Elfner, Editor of the *Ohio Journal of Science*, has attended the last two AOP Annual Meetings. Dr. Elfner urges our AOP membership to consider publishing relevant work in the *OJS*. In a December, 2018, letter to the members of the Ohio Academy of Science, Dr. Elfner noted that *OJS* was published in print form from November 1900 to April 2014. At that time, *OJS* added an online version published by The Ohio State University Libraries. Increased printing and postage costs and sharply declining subscription revenue have made distribution of the print version of the *OJS* financially unsustainable. As a result, the *OJS* has now embraced the Open Access (OA) concept. Open access scholarly journals are freely available to anyone with internet access. As opposed to traditional journals, which often charge readers hefty fees to access journal content, OA journals provide content for free on the web and may or may not charge researchers to publish their findings. As a result, *OJS* authors are now assured good, worldwide, visibility because papers published OA are indexed quickly after publication by Google Scholar (<https://scholar.google.com/>). Whereas the publication process used to take many months or even a year, well-written manuscripts can now be published online in several weeks if both reviewers and authors meet deadlines.



The Ohio State University Libraries archives fully keyword-searchable issues of the *OJS* from November 1900 through April 2014: <https://kb.osu.edu/handle/1811/686>

The OSU Libraries' Online Journal Systems archives issues from 2014 through March 2018 here: <http://ohiojournalofscience.org/issue/archive>

Subsequent articles appear here: <http://ohiojournalofscience.org/issue/view/207>

You may directly access the soil arsenic paper presented by Wanner at the annual meeting here: <http://ohiojournalofscience.org/article/view/5851>

You may directly access the Lake Tight paper presented by Erjavec at the annual meeting here: <http://ohiojournalofscience.org/article/view/6548>

## Soil-based Wastewater Treatment:

Jose A. Amador and George Loomis

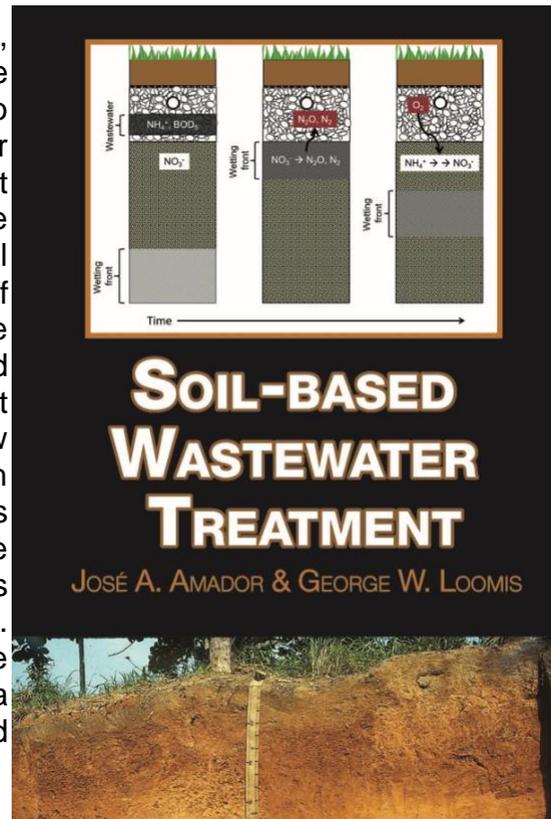
Our book addresses the needs of practitioners, engineers, scientists, regulators, resource managers, planners, and others with a need to know about septic systems. It arose after discussions about the need for a text that integrated current understanding of the hydrologic, physical, chemical, and biological processes involved in the treatment of wastewater using soil. In our experience, people working with septic systems – ourselves included – have a fragmented understanding of what these systems are, how they function, how wastewater moves through soil, how and which pollutants are removed, and how these systems impact the environment and public health. The relevant information is scattered across disciplines, information sources and audiences. This book is an attempt to collect and integrate this information in one place, and provide a scientific framework for understanding soil-based wastewater treatment.

SSSA Members: \$72 Non-members: \$90

Buy the book in hard copy here: <https://web.sciencesocieties.org/Shop/Product-Details?productid={1613680D-85A0-E311-970F-0013210E308C}>

View the book online in our Digital

Library: <https://dl.sciencesocieties.org/publications/books/tocs/acsesspublicati/sbwreatment>



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## FLASHBACK!

The 1999/2000 Ohio State University Soils Team placed first in the Pennsylvania Regional and 9<sup>th</sup> in the Idaho National Contest.

1999 Pennsylvania Regional - 1st place

L – R: Magumi Otaki,  
Matt Deaton, Justin  
Ringler, Danielle  
Balduff, Brad Ott,  
Katherine Whitten, Don  
Burgess



2000 Idaho National - 9th place

L-R: Matt Deaton,  
Danielle Balduff, Justin  
Ringler, Katherine  
Whitten, Brad Ott



## Dr. Richard (Dick) Arnold Reception at Purdue University

Friends, colleagues, former students and the International Union of Soil Science are planning an informal celebration to acknowledge Dr. Richard Arnold's extraordinary Pedology career and his acceptance of the IUSS Guy Smith Medal in Soil Classification which he received in 2018. The medal is the award of Commission 1.4 Soil Classification, and is awarded every 2 years to distinguished soil scientists in the field of soil classification and/or mapping.

The celebration will be held **May 18, 2019 from 2:00 - 4:00 PM in the Purdue Department of Agronomy conference room, LILLY 2-425, West Lafayette, IN.** Parking is available on Saturdays in the gravel lot immediately west of Lilly Hall.

All those who have worked with Dr. Arnold or know his work (including local Purdue University students and friends) are welcome to attend and share fellowship with Dr. Arnold. There will be a short ceremony with well-wishers and a summary of his career by those who know his work as well as presentation of the Guy Smith award by IUSS. Light refreshments and conversation will follow!

Please R.S.V.P. to William McFee Purdue University [wmcfee@purdue.edu](mailto:wmcfee@purdue.edu) or Maxine Levin University of MD [mjlevin@umd.edu](mailto:mjlevin@umd.edu) of your attendance. We are also accepting letters of congratulation or pictures for a memory book for Dr. Arnold.

### Dr. Richard Arnold Bio

Dick Arnold worked as a student trainee doing soil survey work from 1950 to 1952, then worked full time from 1952 to 1955 before moving to Cornell University as a Soil Technician, where he worked on soil surveys and did graduate work, completing a M.S. in 1959. Dick and his wife Helen moved back to Iowa State University, where he was a Research Assistant doing soil surveys and course work, graduating with a Ph.D. in 1963.



The Arnolds moved to Ontario Agricultural College in Guelph, Ontario, where Dick taught Physical Geology and Soil Genesis courses. In 1966, they moved to Ithaca, New York, where he was an Associate Professor and later Professor of Soil Science in the Agronomy Department of Cornell. He taught courses in Soil Survey, Soil Genesis, Regional Studies, and various Special Topics and mentored numerous graduate students. He was the New York representative to the National Cooperative Soil Survey and worked on a number of committees, both regionally and nationally.

The Arnolds spent a sabbatical leave in Venezuela in 1972, where Dick worked with people in soil survey. While at Cornell, he worked with a USAID-sponsored program, TROP SOIL, which dealt with improving Soil Taxonomy to foster soil management transfer to tropical regions. In late 1979, he worked for the Soil Conservation Service in Washington, D.C. as Director of Soil Correlation and Classification. In 1980, he was selected as Director of the Soil Survey Division, a position he held until 1996. During his tenure with

NRCS, Dr. Arnold was also involved in the AID-sponsored Soil Management Support Services that worked with soil scientists in many developing countries to assist them in better understanding and interpreting their soil resources. He was active in both the Soil Science Society of America and the International Soil Science Society (now IUSS), holding several positions and serving as a member of various committees. At one time, he served as Special Liaison with the Russian and Former Soviet Soil Science societies to maintain scientific contacts. From 1996 to 2000, he served as Special Assistant to the Chief, and later the Deputy Chief of Technology, dealing mainly with international interests and global change.

After retirement, he was a Fulbright Scholar to Russia, served on an advisory group to the Director of the Soil Survey, and worked with scientists globally to assist them with current issues in soil science. He and his wife, Helen, moved to West Lafayette, Indiana in 2007 to enjoy retirement and their five grandchildren

### International Union of Soil Sciences

(IUSS)

The International Union of Soil Sciences (IUSS) is the global union of soil scientists. The objectives of the IUSS are to promote all branches of soil science, and to support all soil scientists across the world in the pursuit of their activities.



## Proposal for AOP Summer Workshops

The Summer Workshops are an essential part of the educational programming provided by AOP to its members. According to our by-laws, the President-elect is primarily responsible for planning programs and events, including the summer workshop and annual winter meeting. This responsibility is both important and time consuming and is made more difficult by the fact the President-elect is selected annually and takes office following the annual winter meeting. Consequently, there is usually little time to plan the summer workshop, and it is becoming increasingly difficult to find members who are willing to accept a nomination for this position on the Executive Council. Our membership has also expressed a desire to have more advanced notice of dates and topics for the workshop, and for more systematic exposure to the characteristics and land use interpretations associated with major Ohio soils. In response to these challenges, the AOP Executive Council is proposing a new approach to planning and implementing the summer workshop that involves more active participation from our AOP membership.

In essence, we would like to implement a rotation among Ohio's soil regions and land resource areas and ask our members to volunteer in developing summer workshops that involve several standard elements. Presumably, those most familiar with the soils of a given region will be the ones providing this service to the membership as a whole. The rotation would begin in 2020 and we would ask the planning "committee" to submit a proposal to the EC with dates and general details one year in advance. The President-elect will serve as a committee member and the EC will continue to provide logistical support, as needed. We would not eliminate the possibility of emphasizing special topics in the workshops but, in general, our objectives, audience and approach would be as follows:

### A. Objectives:

1. Learn about major Ohio Soil Associations
2. Gain practical experience with Ohio geology and landforms
3. Gain practical experience with soil morphology and mapping
4. Gain practical experience with important soil interpretations

### B. Audience:

1. AOP members
2. Professional soil scientists from adjoining states
3. Students
4. Other "users" of soil information (sanitarians, engineers, SWCD staff, etc.)

C. Approach:

1. Rotate annually among soil and land use regions in Ohio.
2. Encourage joint programs with adjoining states.
3. Make use of MLRA staff, available data sets, and professionals in other disciplines.
4. Where possible and reasonable, utilize university or other state facilities (e.g., as instructional sites).
5. Develop multiple (1-3) day programs involving both classroom and field activities. For example:
  - a. Day 1: Geology and landforms (taught by consulting geologists, or local geology faculty)
  - b. Day 2: Soil morphology and mapping – taught by professional soil scientists
  - c. Day 3: Soil interpretations for relevant topics (e.g., on site waste disposal, land reclamation, slope stabilization, hydric soils, etc.) taught by faculty, professional soil scientists and other knowledgeable individuals
6. Registration could be for 1, 2, or 3 days.
7. Workshops scheduled at least one year in advance beginning in 2020.

Please consider volunteering to help with this effort by completing and returning the following page.

## AOP Summer Workshop Leadership Opportunity

I am willing to organize or co-organize a 1-to-3-day workshop in the summer / fall of 2020 or in a subsequent year with the expectation of financial and logistical support from the AOP Executive Council. The AOP President-Elect will be a member of the organizing committee. I have experience or am located within the following major soil region(s).

### Ohio Major Soil Regions (please check one or more)

1. Hoytville – Nappanee – Paulding - Toledo\_\_\_\_\_
2. Conotton – Conneaut – Allis\_\_\_\_\_
3. Blount – Pewamo – Glynwood\_\_\_\_\_
4. Miamian – Kokomo – Eldean\_\_\_\_\_
5. Bennington – Cardington – Centerburg\_\_\_\_\_
6. Mahoning – Canfield – Rittman – Chili\_\_\_\_\_
7. Clermont – Rossmoyne – Avonburg – Cincinnati\_\_\_\_\_
8. Westmoreland – Homewood – Loudonville\_\_\_\_\_
9. Eden – Bratton – Brushcreek\_\_\_\_\_
10. Shelocta – Brownsville – Latham – Steinsburg\_\_\_\_\_
11. Coshocton – Westmoreland – Berks\_\_\_\_\_
12. Gilpin – Upshur – Lowell – Guernsey\_\_\_\_\_

Name: \_\_\_\_\_

Contact: \_\_\_\_\_

Expertise or Topics of Interest (Optional) \_\_\_\_\_

Return this page to: Jerry Bigham, 5233 Hayden Woods Ln, Hilliard, OH 43026  
([jerrybigham.1@gmail.com](mailto:jerrybigham.1@gmail.com))

## AOP Consultant List

The Association of Ohio Pedologists maintains a list of Certified Soil Scientists who are currently available for soil consulting. The list may be viewed on the AOP website at: <https://www.ohiopedologist.com/consultant-list.html> Certification *must* be through the Soil Science Society of America, and inclusion on the AOP list is voluntary. If you are SSSA-certified and would like to be added (or removed) from the list or if modifications are required to your current listing, please respond to the following:

Name: \_\_\_\_\_

Action Requested:

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Telephone No: \_\_\_\_\_

Facsimile No: \_\_\_\_\_

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## 50th Anniversary of the Burning of the Cuyahoga: How Ohio Improved Two of its Most Impaired Watersheds

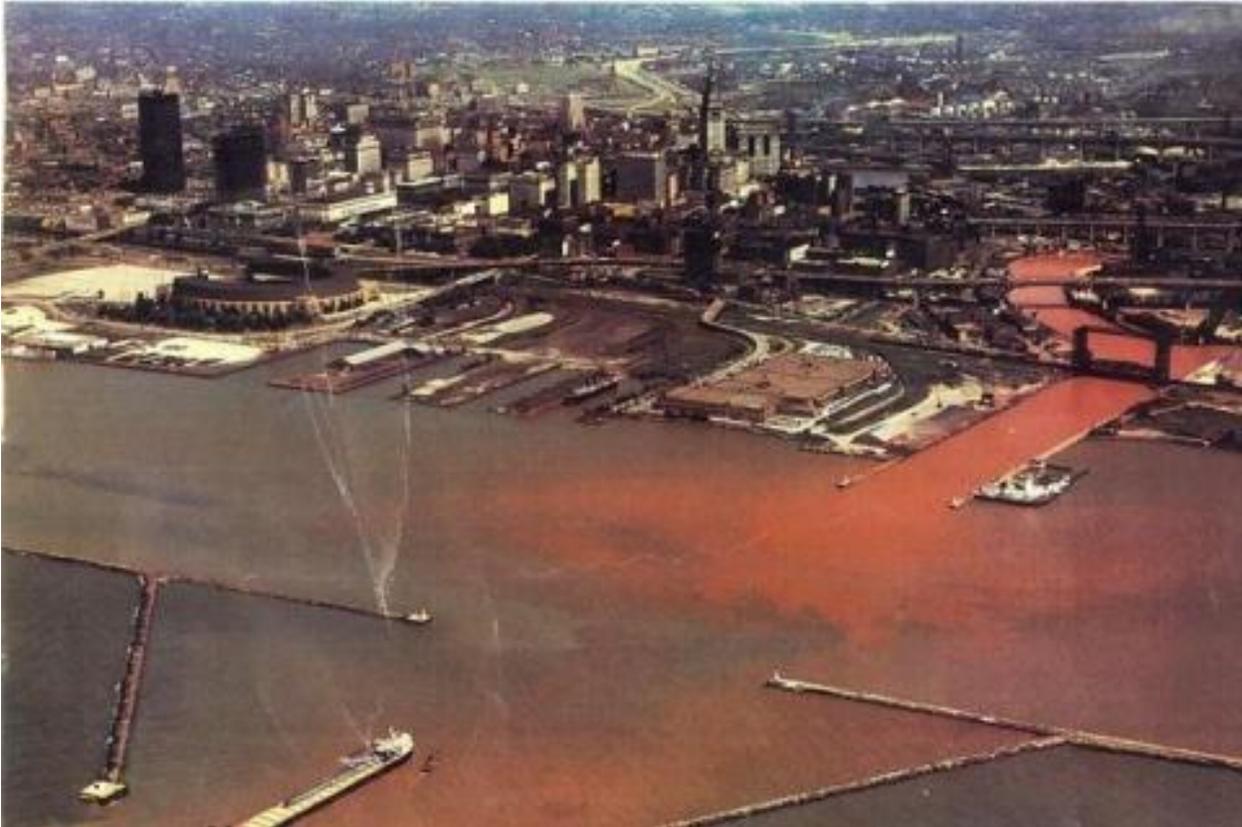
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This June will be the 50th anniversary of the 1969 burning of the Cuyahoga River in Cleveland, Ohio. It was a transformative event in American history that is associated with the birth of the Environmental Protection Agency (EPA) and the Clean Water Act. The ecological movement was just gaining ground with the first Earth Day in April 1970. President Richard Nixon proposed the establishment of EPA on July 9, 1970, and it began operation on December 2, 1970, after Nixon signed the executive order. The Clean Water Act was created by the EPA to quickly start to regulate municipal and industrial point sources through the National Pollutant Discharge Elimination System (NPDES).

The Cuyahoga River burning was caused by the burning of black fresh crude oil near the surface on top of about a foot of old brown oil near the mouth of the river as it emptied into Lake Erie. This area was an industrial area where companies were located, like the Standard Oil Company, founded by John D. Rockefeller. The river had been channeled so that Great Lakes ships and barges could serve the iron and steel mills. The Federal Water Pollution Control Administration noted: "The lower Cuyahoga has no visible life, not even low forms such as leeches and sludge worms that usually thrive on wastes." Even worse, the people in Cleveland had grown so accustomed to the fires (at least 12 over the last century) that they were often reported as short news items towards the end of the local newspaper. It was *TIME* magazine that picked up the story and brought it to national attention in the issue devoted to Ted Kennedy and the Chappaquiddick incident.



The Cuyahoga River in Cleveland, Ohio, circa 1970 . Source: [Reddit](#).

Cuyahoga means “crooked river” and winds through agricultural countryside and wetlands in the headwaters. The river does a U-turn south near Akron before heading north to Cleveland. Akron is the Cuyahoga’s second key industrial city—the rubber capital of the world—and is famous for bicycle and car tire production by manufacturers such as Goodyear and Goodrich. As a result, most of the watershed downstream of Akron to Cleveland was severely affected prior to the Clean Water Act and NPDES.

Beginning in 1997-2000, the Ohio EPA established Total Maximum Daily Loads (TMDL) for all watersheds in Ohio starting with its most impaired watersheds—the Cuyahoga and Sugar Creek. Sugar Creek is located just to the south of the Cuyahoga River but flows to the Ohio River and was polluted mainly by runoff from dairy farms.

Today, nearly twenty years after the Cuyahoga and Sugar Creek were benchmarked, Ohio EPA restudied both rivers and found significant improvements. Starting with basically a dead river (at least downstream of Akron), the Cuyahoga now boasts 84 different fish species with 499,994 individuals counted in their surveys from 1984 to 2017 (Zawiski 2019). The town of Cuyahoga Falls sponsors a kayaking event on its Class V rapids run each summer. The Sugar Creek has also rebounded. In the 1998 study before the 2000 TMDL, the percentage of the streams that were impaired, partially impaired, and

non-impaired were 44 percent, 30 percent, and 26 percent, respectively. In the 2016 restudy, the percentages improved to 27 percent, 17 percent, and 56 percent. Now there are twice as many good streams and some are even “exceptional” (Saas 2019). So what lessons can we learn from these two cases from northeast Ohio that can be applied elsewhere?



Kayaking the Cuyahoga.

First, both the Cuyahoga and Sugar Creek had a dynamic relationship between the regulator (EPA), regulated point sources (NPDES) such as factories and wastewater treatment plants, and active local citizen-based watershed groups. The EPA science-based TMDLs created in the year 2000 set clear limits for the permit holders. In the Cuyahoga case, the Northeast Ohio Regional Sewer District (NEORS), which oversees most of the wastewater in the watershed, has been proactively working with EPA. In the 1970s there were 9 billion gallons of combined sewer overflows which are the combination of storm water and wastewater. In 2011, NEORS had reduced it to 4.5 billion gallons and has plans to reduce it to 0.5 billion gallons by 2036 while giving grants to local communities for a green infrastructure program (Dreyfus-Wells 2019).

In the Sugar Creek case, the Alpine Cheese Company, which EPA was preparing to close for repeated phosphorus pollution non-compliance, combined forces with the local university (Ohio State University), the Holmes County Soil and Water Conservation District, and Ohio EPA to create a water quality trading plan which paid farmers to reduce their pollution. The cheese factory got credit for farmer phosphorus reductions on their NPDES permit at a ratio favorable to the watershed so that more pollution was reduced than what was regulated by the permit (Moore 2013). This plan, which continues to be the longest continuous U.S. trading plan serving an NPDES permit and costs taxpayers nothing, bought time for the cheese factory. The factory could implement its own plan to reduce pollution onsite and reduce both nitrogen and phosphorus because agricultural conservation measures related to manure management usually reduce both.

For both the Cuyahoga and Sugar Creek, local watershed groups worked closely with the Northeast District of the Ohio EPA and the NPDES permit holders and lobbied for creative ways to incorporate new partners. In the Cuyahoga, the Friends of the Crooked Creek along with 22 other NGOs have been active in river cleanups and lobbying for dam removals and kayaking on the river. According to Eileen Marsh, founder of Friends of the Cuyahoga in 1990, the environment was not a public value before the burning. There was a lack of knowledge about environmental systems and people became used to the degradation. There was a widely-held belief in the false economics of pollution—that fixing pollution costs too much money. People thought that things would get better on their own, in great part because the costs and solutions were unknown and were thus presumed to be much greater than in reality. And finally, the policy and legal systems were inadequate and there were formidable vested interests (Marsh 2019).

In Sugar Creek, the Sugar Creek Farmer Partners and three Amish farmer groups were active in working with the county's Soil and Water Conservation Districts and the Ohio State University. The farmers asked the university to conduct intensive bi-weekly water quality sampling on their farms and the University created the Sugar Creek Method (Moore 2009) which advocated for an approach integrating the natural and social sciences, teaming up with local farmers as equal partners, and treating each small stream individually, recognizing that each has unique social, natural, and physical characteristics.

Second, the Northeast District Office of Ohio EPA partnered with Ohio State University and the Cleveland Metro Parks to pioneer biological criteria for evaluating small and medium-size streams. Currently these streams are still classified as "waters of the state" in the EPA rule being debated in Congress (USEPA 2019). Most state EPAs in the country focus primarily on chemical criteria for water quality as a result of the NPDES permit system, which has to focus on chemical outflows from point sources. However, while both chemical and biological criteria are important, it is the biological criteria which inform what life can survive and thrive in fluctuating ecological systems. As a number of my Ohio

EPA colleagues have said, “Biology trumps chemical.” Using biological criteria also forces us to change our perspective from downstream to upstream.

The NPDES system regulates point sources and is primarily a downstream phenomenon and results in looking at streams using the terms “point source” and “non-point source.” As a result, the Ohio EPA started looking upstream at headwater streams and created criteria such as the Headwater Habitat Evaluation Index (OEPA 2018) for primary headwaters and the Qualitative Habitat Evaluation Index for second and third order streams (Rankin 1989). This biological approach also leads to focusing on which species are well-adapted to particular niche habitats. In northeast Ohio, two-lined salamanders are associated with high-quality, perennial, spring-fed streams. Because two-lined salamanders are a keystone species, we know that they represent a high-quality habitat with lots of macroinvertebrate species. We work with homeowners who usually like to have these cute salamanders in their streams to create favorable habitats for them. There are even several locations where native trout specific to northeast Ohio are being protected so that eventually they can be restored to the headwater streams.



Two-lined Salamander in Sugar Creek.

Third, in both the Cuyahoga and Sugar Creek, efforts have been made to create new ecological value based on local environmental conditions and culture. For example, a thriving tourist industry has been created in the Metro Parks based on the river and dam removals. Dam removal created formidable whitewater kayaking rapids. The historic canal system in northeast Ohio is being preserved as part of the Cuyahoga Valley National Park formed in 2000. The park also features wetlands where beavers created beaver dams and then blue herons came to feed on the fish. This unique urban national park also features a farm leasing system to homesteaders who are required to market their foods locally. An NGO called Blue City Green Lake was started in Cleveland to promote sustainability and the city established a sustainability function in the office of the mayor. Burning River Beer now symbolizes the rebirth of the river.

In Sugar Creek, The Ohio State University, with funding from the National Science Foundation (NSF), worked with local schools to pair graduate students with area high school and middle school science teachers to adopt streams for study. Amish farmers fenced cows out of their streams which resulted in their milk quality improving. The somatic cell counts in their cow milk decreased so farmers were able to earn extra income at the cheese factory, which paid higher premiums for the higher quality milk. Farmers also have diverted their milk house waste from ditches and streams and earn extra money from the cheese factory for applying it to land with the bonus of saving on fertilizer costs. More importantly, Amish young people, who had been leaving the farms in previous decades, have rekindled a love for farming and organic farming has become particularly popular.

As a last note, it is clear that the Cuyahoga and Sugar Creek still have environmental challenges. The Lower Cuyahoga, for example, was an industrial dump for nearly a century and today some parts of it are brownfields. Financing brownfield redevelopment as well as dam removal takes a lot of money and the cities of Cleveland and Akron, Cuyahoga County, the Ohio and US EPAs, together with local groups, are working to rectify these remaining problem areas. Sugar Creek still has high levels of bacteria from failing septic systems and runoff from cows. However, more important than the improvement in river water quality is the success story of people's growing awareness of how important water is to their lives and that they want to change their future.

Please consider coming to Cleveland from **June 21-22, 2019**, to attend the [many events of the River Rally planned to celebrate the 50th anniversary](#).

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