

“Virginia Scientists” is the official newsletter of the Virginia Academy of Science (VAS). This publication offers information for VAS members such as upcoming events, past events, scholarships/awards information, accomplishments of VAS members and other timely information.

#### Editors:

Sujan Henkanaththegedara  
Deborah Neely-Fisher

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# Virginia Scientists

Volume XXIV, Issue I

Spring 2018

## The 96<sup>th</sup> VAS/VJAS Annual Meeting at Longwood University

The 96<sup>th</sup> Annual Meeting of the Virginia Academy (VAS) and the 77<sup>th</sup> Annual Research Symposium of the Junior Academy of Science (VJAS) will be hosted by Longwood University on May 23-25, 2018. Longwood University is a four-year, public, liberal arts institute, located in Farmville, Virginia. Founded in 1839, Longwood University is the third oldest public institute in Virginia. Currently, more than 5000 students continue their undergraduate and graduate studies at Longwood University and they represent 25 US states and 20 countries. This is the first time Longwood University is hosting the VAS/VJAS meeting and the local organizing committee is busy preparing for the big event.

The annual meeting provides unique opportunities for STEM researchers to present their research and network with other scientists. VJAS brings hundreds of middle and high school students from all the corners of the state and they will present their research and participate in STEM activities and programs. Undergraduate and graduate students, faculty researchers, industry and

state agency scientists will present their research via posters and oral presentations. Additionally, many awards and honors will be presented at the annual meeting including scholarships for VJAS members, recognition of VAS fellows and honorary members, and awarding the J. Shelton Horsley Research Award and the Ivey F. Lewis Distinguished Service Award.

Longwood University offers many undergraduate STEM programs including, biology, environmental sciences, physics, chemistry, mathematics, computer science and psychology. The low ratio of faculty to students makes it a one-on-one learning experience for students in a small class setting. In addition to class work, Longwood students have many opportunities to hone their research skills in STEM disciplines through faculty-led research, student-led research and PRISM summer undergraduate research program.

The online submission of presentation titles is currently concluded.



LONGWOOD UNIVERSITY 

You can find more information about the program schedule, guidelines for oral and poster presentations, and registration information at <http://vacadsci.org/vas-meetings/annual-spring-meeting/>

## President's Message

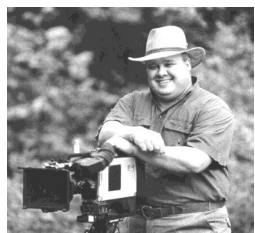
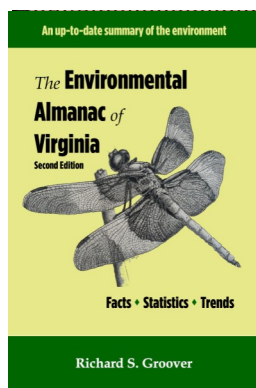
I write as the winter solstice has just passed and I look forward to a season during which I get home before dark! Meanwhile I'm happy to report that, in contrast, the state of the Virginia Academy of Science is fantastic, and the future is bright!

I say “fantastic” because our membership is up, our committees are well-led, our comparatively newer fall meeting is expanding, and exciting and relevant new research findings are being shared in ever larger numbers at our annual May meeting. It truly is a fantastic time to be part of the VAS.

I also claimed that the future is “bright.” I'm sure you completely agree if you have attended an annual VAS meeting in May and seen the professional posters and oral presentations given by undergraduate and graduate students who often accompany their professors. This year we head to Farmville where our host institution, Longwood University, is preparing to welcome us. I'm excited to share that while I still enjoy national and international conferences, my research students and I have decided to make the annual May meeting of VAS... *Cont. P 5.*



Dr. Robert Atkinson  
President, VAS



## A New Book by a VAS Fellow: *The Environmental Almanac of Virginia, 2<sup>nd</sup> Edition*

*The Environmental Almanac of Virginia, 2<sup>nd</sup> edition* is now available for purchase. The book was last published in 1998, twenty years later, new data are available. Chapters include population and land use, air quality, water quality, solid waste issues, toxins found in Virginia's environment, plant and wildlife species of Virginia, including updates on endangered and invasive species.

The author is Dr. Richard Groover, a former member of the Governor's Climate and Resiliency Commission, 2014 – 2015. He has a PhD in Environmental Science and Public Policy, and actively researches environmental issues. Groover states that, "he spent the past five years assembling the most current Virginia information for this book".

In 1998, climate change was not the issue it is today and the first edition had very little on this topic. The first chapter Groover wrote was "Climate Change". Details on greenhouse gases are provided. The chapter includes the latest data on impacts in Virginia on biota, rainfall, drought, coastal communities, farming, the Chesapeake Bay, and other related issues. Other new topics since the first edition have been updated in this edition, such as energy strategies, Marcellus Shale deposits, uranium deposits, and alternative energy possibilities. "Alternative energy was not as popular in 1998, but Virginia now appears to be slowly moving in that direction," Groover mentions.

This reference book contains hundreds of pages packed with up-to-date information, more than 30 maps, charts and tables organized in a user-friendly format for quick access. Some information that is irretrievable for government sites, internet searches or current research has been distilled for the reader's use. The book could be a great reference book found in college or university libraries.

For more information on the book, <http://www.virginiaenvironmentalalmanac.com/>.

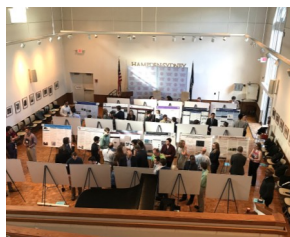
## 2017 Fall Undergraduate Research Meeting Held at Hampden-Sydney College



It was a quintessential autumn day—the kind when movies are filmed on college campuses: clear and sunny, with autumn leaves approaching their colorful peak. On October 28, Hampden-Sydney College (HSC) hosted the Academy's 2017 Fall Undergraduate Research Meeting. Both the historic and attractive campus and the event itself embodied the Academy's ideal of promoting science education and scientific research in Virginia.

The meeting featured 28 posters prepared by undergraduate students in collaboration with their faculty mentors. A total of 67 people attended, including 40 student presenters, 12 faculty mentors (3 served as judges), 5 additional judges, 5 science careers panelists, and 5 other attendees including HSC's president and the keynote speaker.

Students and mentors came from 11 different institutions: Christopher Newport, Ferrum, George Mason, Hampden-Sydney, Liberty, Longwood, Lynchburg, Shenandoah, Mary Washington, University of Virginia, and Virginia Tech. A \$4000 gift from the VAS Fellows made it possible to increase the number of awards to nine, and the amount of each award to \$750. Our challenge for 2018 and future years will be to find funds to match or exceed this amount. The names of award recipients, and the titles and synopses of their research, will appear in a future issue of the Academy's *Virginia Journal of Science*.



New this year was a plenary session, *Advice from Science Professionals about Careers and Graduate School*, which followed lunch. Five panelists representing government, private industry and academe provided perspectives about choosing career paths, beginning professional life, and getting the most out of graduate or professional programs.

While judges concluded their deliberations, Dr. Kristian M. Hargadon, Elliott Associate Professor of Biology at HSC, gave the meeting's keynote address. His presentation was entitled *Tipping the Balance in the War on Cancer: How Insights into the Basic Biology of Tumor Progression are Revolutionizing Cancer Therapy*. Dr. Hargadon described how immunotherapy and targeted therapies have emerged as powerful weapons, and how research by undergraduates in his lab may ultimately shape future cancer therapies.



As the meeting's program coordinator, I would like to extend the Academy's appreciation to Hampden-Sydney College, especially Mike Wolyniak who handled local arrangements, and to Dean of the HSC Faculty Mike McDermott, whose office covered the cost of lunches. Corporate sponsor for the event was Wetland Studies and Solutions, Inc. (a Davey Tree Company), thanks to \$500 donated by WSSI founder and president Michael Rolband. I also thank Carolyn and Art Conway, the ad hoc program committee, and the participating judges, panelists, and students for making this event a success.

Submitted by **Woodward S. Bousquet**  
*Professor of Environmental Studies and Biology, Shenandoah University*  
*President-elect, Virginia Academy of Science*



## Virginia Scientist in the Spotlight

### Conley K. McMullen

**Affiliation:** Department of Biology, James Madison University

**Education:** B.S. (Biology) Eastern Mennonite College, M.S. (Biology) James Madison University, and Ph.D. (Botany) University of Maryland at College Park.

**Your teaching/classes?** Courses that I've taught frequently include biology for first-semester majors, introductory biology for nonmajors, and upper level botany classes (Plant Systematics, Morphology and Anatomy of Vascular Plants, Field Botany). I also recently began offering a lecture course on the Galápagos Islands (Biodiversity and Conservation).

**Your research? Past and current projects?** My botanical research focuses on the eastern U.S. and the Galápagos Islands (floristics, systematics, pollination biology), although I have also conducted studies in Perú and Bolivia (investigating the coca plant), and mainland Ecuador and Haiti (plant collecting). Current research in Virginia and West Virginia includes natural history and conservation studies of two endangered plant species, the shale barren rock cress (*Bochera serotina*) and piratebush (*Buckleya distichiophylla*). Additionally, I am conducting studies along with a former student on a plant species known from only one population in Virginia, Michaux's gladecress (*Leavenworthia uniflora*). A major part of each of these studies involves pollination experiments and flower-visitor observations. Floristic surveys in Rockingham County and other parts of the Shenandoah Valley also comprise some of my Virginia botanical studies.

My Galápagos research has taken a variety of directions. Over the years, my work has concentrated on the reproductive biology of Galápagos natives and endemics. I am

currently involved in a systematics study of a few members of the Galápagos endemic flowering plant genus *Scalesia*. My colleagues and I, using morphological and molecular data are attempting to determine the boundaries of these species, and whether they are capable of forming fertile hybrids. I am also involved in a study with a colleague in Mexico which looks at morphological variation in floral structure among endemic Galápagos members of the genus *Alternanthera*. Past floristic studies in the archipelago have allowed me to publish a field guide on the plants of the archipelago. And, I have been working on a second book dealing with Galápagos natural history in general, not simply the plants, as animals are pretty cool too! The above-mentioned activities are just some of my interests. As with most scientists, there are always other projects in the planning stages, which one may or may not find time or funding to pursue!

**Notable work/publications?** I am Director of the Norlyn L. Bodkin Herbarium at JMU and serve on the E.J. Carrier Arboretum Advisory Board. I have served on the Flora Advisory Board for the Flora of Virginia Project, and for many years have been a group leader at the West Virginia Wildflower Pilgrimage. I have also served the Association of Southeastern Biologists as Secretary, the Society of Herbarium Curators as Executive Board member and editor of *The Vasculum*, and the Southern Appalachian Botanical Society as President. Additionally, I am an Honorary Research Associate of the Brooklyn Botanic Garden, a member of the Science Advisory Board of Galápagos Conservancy, an elected Fellow of the Linnean Society of London, and an elected Governing Member of the Charles Darwin Foundation for the Galápagos Islands. I have authored approximately 40 scientific papers, including my book *Flowering*



Dr. McMullen basking with Galapagos marine iguanas

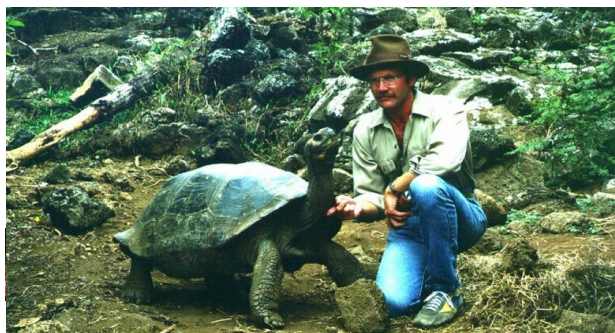
*Plants of the Galápagos.*

**Hobbies?** I enjoy many outdoor activities, including hiking, camping, hunting, shooting sports, and of course, identifying wildflowers. I also enjoy working out, reading about history, and keeping active in my local church.

**Advice for students?** Is there any good advice left to be given? Let's see, to my college students, and students in general I'd say that once you've discovered your passion, chase it 'til you've attained it. There will be discouragements along the way, but they'll make goals, once attained all the sweeter. Also, be aware that a career's not always about the money, it's really about the enjoyment and satisfaction you obtain ... *Contd. P 6.*

*“Once you’ve discovered your passion, chase it ‘til you’ve attained it. There will be discouragements along the way, but they’ll make your goals, once attained all the sweeter.”*

*-Conley McMullen*



Dr. McMullen's research gave him opportunities to meet new friends like this Giant Galapagos tortoise.

*Published since 1950, the Virginia Journal of Science is an academic, peer-reviewed publication focused on all areas of science affecting the state of Virginia.*

## An Invitation to Submit Articles to *Virginia Journal of Science (eVJS)*

Virginia Journal of Science (eVJS) is ONLINE and OPEN ACCESS now!

Published since 1950, the Virginia Journal of Science is an academic, peer-reviewed publication focused on all areas of science affecting the state of Virginia. As the official publication of the Virginia Academy of Science, it also includes meeting minutes, notes, and reports of the Academy, as well as proceedings from annual meetings.

We are pleased to announce that the Virginia Journal of Science has transitioned to an electronic format in the Summer 2016, making the submission, review and publishing more streamlined and efficient.

You can explore eVJS at <http://digitalcommons.odu.edu/vjs/>.

We are currently accepting original articles and short notes in the various disciplines of engineering and science. Cross-disciplinary manuscripts dealing with advancements in science and technology and the impact of these on man and society are particularly welcome. We also welcome manuscripts dealing with natural history; Virginia's flora and fauna; and the impact of environmental change on species diversity.

Please find instructions to authors at <http://digitalcommons.odu.edu/vjs/policies.html>

We are looking forward to review your manuscript!

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Old Dominion University

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# VIRGINIA JOURNAL OF SCIENCE

## OFFICIAL PUBLICATION OF THE VIRGINIA ACADEMY OF SCIENCE



### We want YOU to review articles for *Virginia Journal of Science*

The Editorial Board of the Virginia Journal of Science is looking for reviewers for VJS. The STEM disciplines that need to be covered include (but are not limited to); Agriculture, Forestry & Aquaculture; Astronomy, Math & Physics; Biology; Biomedical & General Engineering; Botany; Chemistry; Data Science, Computing & Statistics; Education; Entomology; Environmental Science; Medical Sciences; Natural History & Biodiversity; Psychology; Structural Biology, Biochemistry & Biophysics .

If you are willing to be a reviewer for VJS, please e-mail VJS Associate Editor, Dr. Sujan Henkanaththegedara ([Henkanaththegedaras@longwood.edu](mailto:Henkanaththegedaras@longwood.edu)) and let us know your preferred disciplinary areas.

### Changing the World, One Idea at a Time – VJAS 2018 Update



The entire Virginia Junior Academy of Science (VJAS) committee is looking forward to hosting more than 800 young middle and high school scientists this year at Longwood University for the 77th Annual Meeting and Research Symposium.

Each year, we bring highly talented, young students from across the Commonwealth of Virginia together to celebrate their independent work in scientific and research endeavors. Our new motto, “where ideas and young minds converge”, embodies the fundamental focus of

the Junior Academy’s mission – to create a place and a meeting where our young students from every corner of Virginia can come together to brainstorm and share their ideas and results.

This year’s Research Symposium will feature a new theme – “changing the world, one idea at a time”. At each of our nightly gatherings, we will feature guest speakers who will bring the theme to life – that each and every student, and their work, can impact the world, even if it is a small idea.

The research papers and applications are due by February 21, 2018. From there, the VJAS Committee and Team will review each submission for completion, then will be sent out to volunteer readers for screening. We will announce the 2018 VJAS acceptances by mid-April. Any questions should be forwarded to the VJAS Director, Susan Booth at [susan.science@gmail.com](mailto:susan.science@gmail.com).

Submitted by **Se Joeng**  
Chair, VJAS Committee



## The *Flora of Virginia* Mobile App for Android and iOS Phones and Tablets Is Now Available

When *Flora Virginica* was published in the mid-1700's by Johannes Gronovius in Europe but based on the manuscript by John Clayton of Gloucester, Virginia, who could have imaged the idea of a computer or mobile tablets and smart phones! The second edition of *Flora Virginica* was published in 1762 but it took 250 years for a modern *Flora of Virginia* to be published, in 2012. The modern *Flora of Virginia* covers almost 3200 native and naturalized species found in Virginia. The first printing weighs almost 7 pounds and is 7.5 x 10.5 x 3 inches, has 1572 pages with more than 1400 illustrations, and is chock full of so much knowledge. The 2013 second printing with corrections is slightly less thick and heavy. Only the second printing is now available and well worth having if you do not have a copy. It can be ordered through the Foundation of the Flora of Virginia Project ([floraofvirginia.org](http://floraofvirginia.org)) for \$89.99.

Now there is a companion *Flora of Virginia* Mobile App for smart phones and tablets that is available for \$19.99. The App is available for both iOS and Android phones and tablets and can be ordered via links given on the homepage of the *Flora of Virginia* Project, [floraofvirginia.org](http://floraofvirginia.org). The App contains virtually all of the content of the *Flora* (including detailed plant descriptions and dichotomous keys) but additional photographs, illustrations, range maps from the Digital Atlas of the Virginia Flora, conservation ranks, and levels of invasiveness scores. The App also includes a Graphic Key that will be easier to use than traditional dichotomous keys. The App allows the *Flora* Project to continue to update information on new species discovered in

Virginia, changes in distribution of species, and other information to achieve the newest initiative of the *Flora* Project, "Keeping the Science Current."

In this digital age, the App will make information on Virginia's flora accessible to a new generation and to the general public. The next step for the *Flora* Project is to develop a *Flora* Office App for use on Windows and Macintosh desktop and laptop computers.

The colony of Virginia was the first to have a flora, *Flora Virginica*, which described the colony's known plant species. John Clayton, an early Virginia botanist, had collected and pressed specimens of Virginia plants and sent them to Mark Catesby in England, who in turn shared them with both Linnaeus, the Swedish taxonomist, and the Dutch botanist Gronovius. Clayton prepared a manuscript which he likewise sent to Catesby, who in turn shared it, too, with Gronovius. Gronovius translated the manuscript into Latin and in 1739, without Clayton's knowledge or permission, published the first volume of *Flora Virginica*. Gronovius did acknowledge Clayton's work by the time he published the second volume of the first edition, in 1743. In 1762 A second edition and final edition of *Flora Virginica* was published.

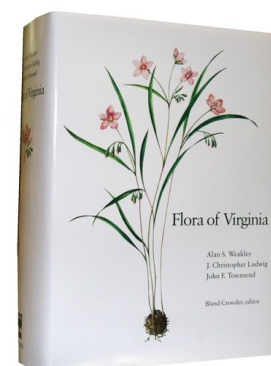
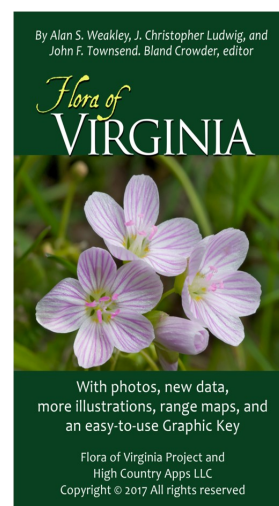
In 1926, the Virginia Flora Committee of the Virginia Academy of Science was founded with a primary goal of producing a modern flora for Virginia. From the 1930s various attempts were made to begin this work. With Academy support Alton Harvill published the first edition of the *Atlas of the Virginia Flora*, which documented,

county by county, species of native and naturalized plants in Virginia. In late 2000, a VAS grant from the Small Project Research Funds was granted to explore the possibility of identifying authors for development of a modern *Flora*. The Foundation of the *Flora of Virginia* Project was established as a nonprofit, and the Academy quickly became a partner of this project. The Academy and the Fellows have been major supporters of and donors to the *Flora* Project for both the development and printing of the *Flora of Virginia* and later development of the Mobile App.

The 1926 goal of the Academy's Committee on Virginia Flora was realized with the 2012 publication of the *Flora* but now goes beyond the imagination of these Academy members with the release of this App! Order and install your copy today by visiting <http://floraofvirginia.org/>. Please visit the [floraofvirginia.org](http://floraofvirginia.org/) to follow the progress of the Foundation of the *Flora of Virginia* Project and also subscribe to periodic and events related to FFVP at [floraofvirginia.org/stay-flora-informed/](http://floraofvirginia.org/stay-flora-informed/).

The focus of the *Flora* Project is now keeping the science current. The work on the Mobile *Flora* App and later on the Office *Flora* App will set the stage preparing a second edition of the *Flora of Virginia*. The App was created by computer from the *Flora of Virginia* text. The database of the App will be used to create future editions of the *Flora of Virginia*.

Submitted by **Marion Blois Lobstein**  
VAS Member and Fellow, former Chair of Virginia Flora Committee, and Vice President of the Foundation of the *Flora of Virginia*



**"The book covers 3200 species, weighs almost 7 pounds and is 7.5 x 10.5 x 3 inches, has 1572 pages with more than 1400 illustrations"**

## President's Message *Contd from P 1.*

our every-year destination! Advantages include the flexibility to attend the meeting just for a single day or to spread over two nights, the convenient drive from campus, and the potential for my alums to simultaneously attend a conference and a reunion!

In an even more futuristic way, talented undergrads pitch their research ideas each fall in a meeting I hope you will consider attending if you haven't already. This event is

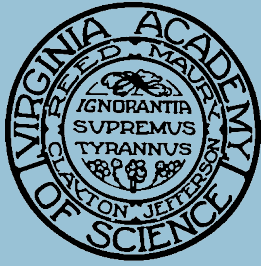
attracting more research support both from VAS and from sponsors so that we have a higher percentage of winners and larger financial payouts across a wide diversity of science fields. Negotiations are underway for future venues which may include Ferrum and Christopher Newport. Stay tuned for those details to emerge!

In closing, I would just like to add how pleasant it has been to take a turn in the leadership of the Acad-

emy. I found things incredibly well run and the colleagues I've met in our Council meetings are wonderful new friends. If you are asked to serve in a section or on a committee, all of which are described on our shiny new website, I hope you will say "yes!" All require a manageable amount of time and think of all the energy you will have once the spring equinox arrives.

Submitted by **Robert Atkinson**  
VAS President

## Pop Quiz! Know your VAS logo



1. What is the flower depicted in the inner circle of the VAS Logo?
2. Who are the four famous Virginia Scientists listed in the middle ring of the Seal or Logo?
3. What is the Academy's Maxim?

Answers: 1. The flower is the Dogwood. It is in full bloom at the top of the seal and as a bud at the bottom of the seal. 2. The four famous scientists are Walter Reed, a physician, Matthew Fontaine Maury, an explorer and cartographer, John Clayton, a botanist, and Thomas Jefferson, an agriculturist and educator. 3. Of course everyone should get the last question correct, the maxim is "Ignorantia Supremus Tyrannus" Ignorance is the greatest tyrant.

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### VAS Office Hours:

Tuesday & Thursday - 10 am - Noon

## Come Celebrate Earth Month on April 21 at the Longwood BioBlitz!

Do you know that April is the Earth month? Would you like to be a citizen scientist and celebrate the Earth month with Longwood BioBlitz? Come help us explore the biodiversity at Lancer Park- find, identify and record species. All events are free and open to anyone interested in exploring outdoors. Bring your family, friends and neighbors!

Kids! Be a citizen scientist and help us document species, come explore our "touch" tables, make origami animals, learn about biodiversity, do a scavenger hunt and get your BioBlitz participation certificate and more!

**When:** Saturday, April 21 from 9am- noon  
**Where:** Environmental Education Center, Longwood University  
Cormier Drive, Farmville, VA 23901

**Registration:** <https://docs.google.com/forms/d/1r0k2BIXx83eXIC7ND-2XayZwkO1XX5FJ-n7XLlczQeA/edit>

Find more information at Longwood BioBlitz website at <https://blogs.longwood.edu/longwoodbioblitz/>; Direct any questions to Sujan Henkanaththegedara ([Henkanaththegedaras@longwood.edu](mailto:Henkanaththegedaras@longwood.edu))



## Virginia Scientist in the Spotlight *Contd from P 3.*

when you love what you're doing. Honestly, I have the best job in the world! And, remember that when it's all said and done, it's those whose lives you've touched in a positive way that you'll remember, and those are the ones who will remember you!

**Advice for peers?** See my advice for students!

**When did you join VAS?** Honestly, I'm not sure! I received a research award from VAS as a graduate student in 1983, so I was a member at that time. My membership may have lapsed while I was pursuing my doctorate degree and teaching elsewhere, but I became an

active member again upon returning to Virginia and JMU in 1997.

**Your Role in VAS?** I am now serving, or have served in the following capacities: Past President, President, President-Elect, Vice President, Secretary, Council, Executive Committee, Virginia Flora Committee, Awards Committee, Fall Undergraduate Research Meeting Committee, Fall Undergraduate Research Meeting Judge, Science Museum of Virginia History Committee, Executive Officer Search Committee, Trust Committee, Finance and Endowment Committee, Annual Meeting Local Arrangements Committee, Annual Meeting Program Committee, Membership

Committee, Nominating Committee, Botany Section Chair, Botany Section Secretary/Editor, Botany Section Vice-Chair.

**Something "cool" about you?** In the 1990s, while teaching at a college in West Virginia, one of my students, who was fairly well-known in the area for his singing and guitar playing decided to quit school and give Nashville a shot. As I recall, I encouraged him to graduate first, as most young folks taking that path never make it big. Perhaps, I was wrong, as that student was named Brad Paisley! Several years later, he thanked me for passing him, and he did later graduate!

## VJAS Named "Partners in Excellence" by the Virginia Environmental Endowment

On October 5, 2017, the Virginia Junior Academy of Science was named one of 22 "Partners in Excellence" in celebration and recognition of the 40<sup>th</sup> Anniversary of the Virginia Environmental Endowment (VEE). All 22 "Partners in Excellence" were recognized in a special awards ceremony at the Virginia Historical Society, with each "Partner" receiving a \$1000.00 stipend to support their mission and goals.

The mission of the VEE is to improve the quality of the environment by using its capital, expertise and resources to encourage all sectors to work together to prevent pollution, conserve natural resources, and promote environmental literacy ([www.vee.org](http://www.vee.org)). The VEE was

established in 1977, by court order, as a result of Allied Chemical Corporation polluting the James River with the insecticide, Kepone.

The VEE generously provides the funds for two college scholarships awarded through the Virginia Junior Academy of Science at the VJAS Annual Research Symposium. *The Frances and Sydney Lewis Environmental Science Scholarship* enables promising young students to pursue undergraduate studies in environmental sciences; and *The Henry W. MacKenzie, Jr. Environmental Scholarship*, is awarded to a student whose project makes a significant contribution to the environmental science of the James River Basin and Chesapeake Bay.

For more information about the VJAS VEE scholarships see [www.vjas.org](http://www.vjas.org) under the VJAS Handbook of Rules and Guidelines. For more information about the VEE visit [www.vee.org](http://www.vee.org)



Left to Right: Dixon M. Butler, Board of Directors, VEE, Deborah Neely-Fisher, Past-President, VAS, Susan Boothe, Director, VJAS, Joseph H. Maroon, Executive Director, VEE.