

# 2018 Scholars

*The Garden Club of America*



# Seeding the Future



Kathy Keller. Photo by Jane Rogers

**G**CA scholars are seedlings that grow into leaders throughout the world's horticultural community. The Scholarship Committee is extremely grateful for the support club members give, enabling The Garden Club of America to offer life-changing opportunities to deserving students whose research will both further their careers and increase the body of knowledge in their chosen fields.

The committee is proud to announce the Class of 2018 in the following pages. More applications were received this year than ever before. There were 61 applicants for the Pollinator Fellowship, which has been one of the most popular scholarships since it was

established in 2014. Other popular GCA scholarships support study in urban forestry, coastal wetlands, and ecological restoration. As you read the scholars' profiles, you will understand how they are already making a difference and how eager they are to continue their quests to solve some of the problems facing our planet. Learn what steps Uma Venkatesh and Angela Merriken, the first recipients of the GCA's Montine M. Freeman Scholarship in Native Plant Studies, are taking to conserve native plants. We are also excited to report on what former scholars Lauren Ponisio, Elizabeth Kalies, and Andrew Sell are doing today.

Are Twitter and other forms of connection with current and former scholars helping to promote GCA scholarships? We believe so. The committee works hard to maintain relationships with scholars through social media and the GCA scholars' LinkedIn group, established last summer.

We have much to celebrate! This year marks the 70th anniversary of the Interchange Fellowship. Our 2018 fellows, Brady Hedgecock and David Bull, join the amazing family of 117 McLaren and Interchange fellows, which began with Daphne Vince-Prue in 1948. Many Interchange fellows are leaders at botanic gardens and other horticultural institutions throughout the world. Some also have become members of GCA clubs. Kudos are due to former Interchange fellows Eve Rickenbaker for designing the new scholarship flyer and Stephanie Jutila for serving as the Scholarship Committee's Zone XI rep.

The success of the GCA's scholarship program is because of YOUR generosity and dedication. Our goals are dynamic. As you may know, the GCA has joined the Seed Your Future initiative to encourage careers in the green industry. Please continue to help us spread the news about the GCA's many scholarships as we work to plant the seeds of new growth.

*Kathy A. Keller*

## Scholarship Committee 2017-18

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## The Anne S. Chatham Fellowship in Medicinal Botany

*Established in 1997 to protect and preserve knowledge about the medicinal use of plants by providing research support in the field of ethnobotany for recent PhDs or PhD candidates, this fellowship is administered by the Missouri Botanical Garden.*

**Katherine Farley** is a PhD candidate in sociocultural anthropology at Washington University in St. Louis. Her research is concerned with the emerging market for wild-simulated ginseng (*Panax quinquefolius*) and other medicinal herbs grown in Appalachia. She is particularly interested in how growers acquire knowledge about the operation of wild-simulated systems, as well as how value-added qualities like wild or wild-simulated adhere to products as they travel through medicinal plant supply chains. Farley's research has implications for medicinal plant conservation in Appalachia because wild populations of many species are under threat due to overharvesting and habitat loss.

**Grady Zuiderveen** is a PhD candidate in the Department of Ecosystem Science and Management at Pennsylvania State University. His research is focused on the habitat, chemistry, and genetics of goldenseal (*Hydrastis canadensis*), which is a medicinal herb native to the forests of Appalachia. He will be working to determine the influence of habitat conditions and genetics on the expression of the alkaloids that are associated with its medicinal value. The results of this work will help inform decisions about the conservation of the species through cultivation.

**Amanda Thiel** is a PhD candidate in cultural anthropology at Washington State University. She conducts research in Guatemalan Q'eqchi' Maya communities of

various sizes—from rural village to semi-urban. Her research seeks to understand how acculturation and cultural values affect ethnobotanical medical knowledge and practice in these communities. Thiel's master's thesis, based on fieldwork in a Q'eqchi' Maya village, was centered around utilitarian aspects of local ethnobotany and the variation in cultivation of medicinal plants in village home gardens.

## The Garden Club of America Summer Scholarship in Field Botany

*Established in 2000, this scholarship is for students interested in furthering their knowledge and experience beyond the regular course of study in field botany.*



**Nicki Gustafson** is a first-year master's student at the College of William & Mary in Williamsburg. She is interested in how herbivore interactions influence plant reproduction. Her current project is looking at the potential for specialist herbivores to benefit reproductive efforts in common milkweed. This summer at Blandy Experimental Farm, a research institute in Virginia, Gustafson will be working on pollination studies with common milkweed (*Asclepias syriaca*) and milkweed longhorn beetles (*Tetraopes*) while mentoring two undergraduate students. She will also be conducting a greenhouse experiment looking at how beetle larvae influence asexual reproduction.

## The Zeller Summer Scholarship in Medicinal Botany

*Established in 2003, the Zeller Summer Scholarship encourages undergraduate students to expand their knowledge of medicinal botany through coursework or internships.*



**Ezra Houston** is an undergraduate student at Pennsylvania State University, studying forest ecosystems management. His project is titled "An Analysis of Chemical Compounds in Goldenseal to Determine Factors of their Variance." Goldenseal (*Hydrastis canadensis*) is a native herbaceous medicinal plant containing three compounds with antibacterial properties. Houston will analyze the leaves of the plant throughout the summer to determine the relative concentrations of the chemical compounds. Understanding the plant structure will allow for a more sustainable harvest of goldenseal for commercial markets.



**Tara Neuffer** is a senior at Brigham Young University in Provo, Utah. Her focus is on public health, women's studies, and international development. In connection with her research, Neuffer will live in Malawi, assessing the medicinal plants administered to women during pregnancy and labor. She will conduct 90 in-depth interviews with traditional healers, birth attendants, and their clients about the medicinal plants prescribed and then collect samples of each plant discussed. At the University of Malawi she will aid in testing these specimens for their contractile properties. Neuffer hopes that her study, one of the first to document plants administered during pregnancy in Malawi, will identify which plant species may be contributing to the country's high rate of uterine ruptures.

**Kathryn Bagger** is an undergraduate majoring in human health at Emory University in Atlanta. She is currently receiving training in properly collecting, identifying, and extracting active compounds from medicinal plants native to Georgia. She will be working with the Quave Research Group at Emory to study Native American botanical remedies for wounds and infections. Bagger will participate in extensive book and journal research identifying prospective medicinal plants, after which she will assist in fieldwork and collection for three weeks at the Joseph W. Jones Ecological Research Center in Newton, Georgia. For the remaining three months of summer she will work in the lab studying these plants' active compounds as well as proposing possible applications for them.

## The Joan K. Hunt and Rachel M. Hunt Summer Scholarship in Field Botany

*Established in 2003, this scholarship encourages the study of field botany beyond the regular curriculum, thus promoting the importance of botany to horticulture.*



### Anthony Logan Ferrero

is a second-year microbiology major at California Polytechnic State University, San Luis Obispo. This summer he will be studying the mechanism and adaptive significance of nickel hyperaccumulation in *Streptanthus polygaloides*, a serpentine species endemic to the western Sierra Nevada foothills. He will perform field collections of *S. polygaloides* (milkwort jewelweed) in its native range, as well as conduct a garden study examining factors affecting nickel hyperaccumulation in this species, including drought stress and microbial diversity. Results may have implications for the use of hyperaccumulators in phytoremediation, which employs living green plants for decontamination.

**Jason Liu** is a junior studying biology at the University of California, Santa Barbara. His project is titled "Ecological Roles of Floral Pigment Variation over Ontogeny." This field season he will be investigating how pollinator behavior is affected by changes in petal pigment of elegant *Clarkia unguiculata*, a California wildflower, as its flowers progress from functionally male to functionally

female. The results of this project will be valuable for deeper understanding of the intricate mechanisms that plants utilize to communicate with their pollinators and ensure successful reproduction.

*Funded by Friends and Colleagues of Nishi Rajakaruna*

## The Garden Club of America Award in Tropical Botany

*Established in 1983 and administered by the World Wildlife Fund's Education for Nature Division, the award supports fieldwork in tropical forests for doctoral candidates in botany.*



### Jeannine H. Richards,

a PhD candidate at the University of Wisconsin, focuses her research on tropical forests where high biodiversity frequently intersects with rapid deforestation rates. Shade grown coffee has become a model system for studying how agriculture that incorporates trees may serve as substitute habitat for forest species. Epiphytes, or air plants, may be especially able to utilize shade trees as substrate. These plants serve a keystone role, cycling nutrients and providing food and habitat for invertebrates and birds. Management decisions alter abiotic environments in coffee farms, affecting epiphyte assemblages. Richards compares vascular epiphyte richness, composition, and abundance on small and large farms, and links environmental conditions favoring epiphytes to producers' management decisions.

### Juan Carlos Penagos

**Zuluaga** is a PhD candidate studying tropical ecology and evolution at Yale University School of Forestry & Environmental Studies. Zuluaga's research integrates ecological and evolutionary approaches to understand the breeding systems of the tropical woody genus *Ocotea* (Lauraceae or laurel family). Through molecular analysis, he will aim to determine the number of transitions in breeding systems that have occurred in this group and the evolutionary pathways they have taken. His results will contribute to understanding the evolution of breeding systems in tropical trees and will advance the taxonomy of Lauraceae.

### Timothy M. Perez

is a PhD candidate at the University of Miami and affiliated with Fairchild Tropical Botanic Garden. His project is titled "Predicting the Susceptibility of Tropical Plants to Climate Change Using Fairchild Tropical Botanic Garden's Living Collections." Tropical plants are believed to be close to their high-temperature thresholds, and their heat tolerances may help predict which species are most susceptible to climate change. Perez's research will harness the diversity of Fairchild's collections to measure the physical characteristics of leaves and photosynthetic heat tolerances in order to understand which species are in the greatest danger of thermal stress due to global warming.

### Nichole Tiernan

is a PhD candidate in a joint program by Florida International University and Fairchild Tropical Botanic Garden. Her research focuses on the neotropical genus *Plumeria*, commonly called frangipani, a charismatic tropical garden plant that grows throughout the Caribbean. Although several species are commonly grown, much remains unknown about them. Tiernan's research seeks to resolve the confusing taxonomy using molecular phylogenetics and morphological studies. The revised classification also will help inform conservation threats. Systematic studies of threatened

plants provide a framework for what and where to conserve, especially in the Caribbean, which is a biodiversity hotspot.

**J. Aaron Hogan** is a PhD candidate at the International Center for Tropical Botany at Florida International University in Miami. Working with Drs. Christopher Baraloto and Oscar Valverde-Barrantes, he is interested in the relationships between root functional traits and other plant characteristics in tropical forests. Specifically, in collaboration with researchers at the Key Laboratory of Tropical Forest Ecology in Xishuangbanna, China, Hogan is examining how mycorrhizal fungal communities influence root function and structure.

## The Garden Club of America Award in Coastal Wetland Studies

*Established in 1999 to promote wetland conservation through the support of young scientists in their field work and research, this award is administered by the Center for Coastal Resources Management at the Virginia Institute of Marine Science of the College of William & Mary.*



**Johnny Quispe** is a doctoral student in the Ecology and Evolution Graduate Program at Rutgers University. He is investigating the survival of tidal marshes under two sea-level rise (SLR) scenarios by installing small weirs along the Raritan River in New Jersey. His research seeks to understand the effects of SLR on marshes dominated by common reed (*Phragmites australis*)

and smooth cordgrass (*Spartina alterniflora*), as well as how these two wetland species help marshes keep pace with SLR. The goal of Quispe's research is to assist in the development of policy recommendations for local and regional planners to ensure the conservation of tidal marshes, and help coastal communities reduce flooding and other damage from future storms through the use of natural defenses.



**Katherine Culatta** is a master's student in plant biology at North Carolina State University. Her project is titled "Taxonomy, Population Genetics, and Status Assessment of Cape Fear Spatterdock (*Nuphar sagittifolia*).” Her research will inform conservation decisions regarding this aquatic plant endemic to the southeastern Atlantic coastal plains. A combined morphological and genetic approach will be used to determine the plant's taxonomic limits and describe its genetic diversity.

**Serina Wittingham** is a PhD candidate in biological sciences at the Virginia Institute of Marine Science, College of William & Mary. Her research goal is to understand how the chemistry of salt marsh plants can combat herbivory and, in turn, protect shorelines. Herbivory of smooth cordgrass (*Spartina alterniflora*) can create patches of denuded marsh. In some patches, plants are re-growing but are not consumed. This study will examine if changes in plant chemistry are responsible for protecting new plants from further consumption, thus increasing the resiliency of the salt marsh.

## The Garden Club of America Fellowship in Ecological Restoration

*Established in 2000 and administered by the University of Wisconsin–Madison Arboretum, this fellowship supports specialized graduate studies and research in ecological restoration and the active healing of land.*

**Julie Larson** is a PhD candidate in the Ecology & Evolutionary Biology Department at the University of Colorado Boulder. An early summer job as a restoration technician spurred her interest in invasive plants and grassland restoration. As a researcher, she now asks questions about what allows some plant species to persist in a given environment while others are threatened. In her project, Larson explores whether differences in seed and plant traits can predict grassland species' chances of storage or regeneration, and whether seeding or grazing practices based strategically on traits can help restore persistent communities.

**Riley Pizza** is a master's student in integrated biosciences at the University of Minnesota Duluth. Her research project is titled "Are Restoration Seed Pools Evolving under Commercial Propagation?" Pizza is studying the potential domestication of native plant species grown on farms for restoration projects. Currently conservationists are using seed that is grown and mechanically harvested on farms for restoration, but few have considered whether these seeds are evolving to acquire domestication traits that would reduce their survival in the wild. The results of this research will provide information about how seeds are collected for restoration purposes.

**Carmen L. Tubbesing** is a PhD candidate in the Department of Environmental Science, Policy, and Management at the University of California, Berkeley. She researches the long-term consequences of large, severe fires in the Sierra Nevada—fires that are ahistorical but have become more common as a result of human activity. Specifically she studies competition between montane shrubs and young native conifers. This plant interaction is poorly understood but essential to determining how post-fire plant communities will change over time. This work will help land managers foster diverse forests in the aftermath of big fires.



**Lindsey Hendricks-Franco** is a PhD candidate in the Department of Integrative Biology at the University of California, Berkeley. She studies how plant functional diversity drives post-fire recovery of soils in Northern California's chaparral shrublands. Shortly after summer fires, herbaceous plants grow prolifically, likely absorbing nitrogen from ash before it runs off to pollute nearby bodies of water. She uses herb-removal experiments to demonstrate the combinations of plants that maximize post-fire nitrogen retention and soil restoration. Hendricks-Franco will assess the impacts of herb removal on roundworms, which are biological indicators of soil health and recovery.

## The Sara Shallenberger Brown Garden Club of America National Parks Conservation Scholarship

*Established in 2010 and administered by the Student Conservation Association (SCA), this scholarship encourages college undergraduates, ages 19-20, to pursue careers in conservation by experiencing field training while protecting the treasured resources of America's national parks through the SCA's apprentice crew leader program.*

**Blake Toney** is majoring in environmental management and protection, with a minor in indigenous studies in natural resources and the environment, at California Polytechnic State University, San Luis Obispo. For the past three years he has been a Trail Corps volunteer for SCA and has assisted in leading extended outdoor trips through the university's Poly Escapes program. Toney's research experience includes university-affiliated field and laboratory work with the California ground squirrel and the western bluebird.

**Ella Schwab** is a student at California Polytechnic State University. A two-year alumna of SCA's National Crew Program, she has participated on crews at Yosemite National Park in California and Olympic National Park in Washington state. Schwab is majoring in biological sciences. An accomplished photographer and filmmaker, Schwab has also received medals in amateur rowing and wrestling competitions.

## The Garden Club of America Award in Desert Studies

*Established in 2006 and administered by the Desert Botanical Garden in Phoenix, this award enables graduate or undergraduate students in horticulture, conservation, botany, environmental science, or landscape design relating to arid landscapes to further their studies of the arid environment, with preference given to projects that generate scientifically sound water and plant management.*



**Garrett Langefels** is a sophomore majoring in landscape architecture at Arizona State University. While interning at the 140-acre Desert Botanical Garden in Phoenix, he will advance his knowledge of desert plants and their use in landscape design. He will also focus on sustainability in desert regions and on new strategies for protecting native bird habitats from the constant threat of human development. Hoping to make Moerur Park in Tempe more hospitable for roadrunners, for example, Langefels is working on an exhibition at the park to emphasize the importance of conserving the dwindling natural desert within the Phoenix metropolitan area.

### Heather Bendingtree

is a student in environmental horticulture at Santa Barbara City College and an ongoing intern at Santa Barbara Botanic Garden, where among other duties she is an instructional aide for a series

of classes offered by entomologist Frédérique Lavoipierre. This year she is contributing to Lavoipierre's Garden Allies program, undertaking research on the relationship between specific California drought-adapted plants and beneficial insects. The public education arm of the program is to teach the ability of these plants to attract and provide habitat for beneficial insects as a key element in conservation biological control.

## The Garden Club of America Scholarship in Garden History and Design at the Archives of American Gardens

*Established in 2001, this scholarship supports independent study in the field of landscape history and design. Preference is given to students planning to intern at the Archives of American Gardens (AAG) at the Smithsonian in Washington, DC.*



**Katharyn Gove** is a master's student in the Museum Studies Program at the University of Kansas, where she is focusing on access, inclusion, and representation within collections. Her interest in horticulture, research, and public education through digitally accessible collections aligns with her goals as an intern at the Smithsonian Institution's Archives of American Gardens (AAG). She will work on processing and digitizing archival materials as well as promoting AAG on social media, with the hope of reaching a broad audience.

## The Douglas Dockery Thomas Fellowship in Garden History and Design

*Established in 2000 to further the study of history and design in the American garden and also look to the future of gardens and their place in the environment, this fellowship is administered by the Landscape Architecture Foundation.*

**Sara Jacobs** is a PhD candidate at the University of Washington. Her dissertation explores the historic relationship between landscape and site to propose a model for how design can engage the social, ecological, and political complexity of cities. Her professional design experience includes working at SCAPE Landscape Architecture, where she helped to lead urban design and waterfront projects; and at OPSYS Landscape, where she used mapping and visual representation as media for revealing environmental, political, and infrastructural intersections. Sara has an MLA from Harvard University and a BA in architecture and conservation resource studies from the University of California, Berkeley. She plans to pursue a career in academia.

## The Catherine H. Beattie Fellowship

*Established in 1983 and administered by the Center for Plant Conservation, a network of 40 botanical gardens in the US and Canada that is headquartered in Escondido, California, this fellowship promotes the conservation of rare and endangered flora in the southeastern United States by supporting field research by graduate students.*

**Rachel E. Becknell** is a PhD candidate in the Evolution, Ecology, and Population Biology program at Washington University in St. Louis in affiliation with the Missouri Botanical Garden and the university's Tyson Research Center. Her project is titled "The Effects of Soil Microbes on the Growth and Survival of Endangered *Astragalus bibullatus*." Her dissertation focuses on the effects of soil microbes, such as mycorrhizal fungi and fungal pathogens, on community dynamics in tallgrass prairie restorations and in the reintroduction of the federally endangered glade plant species *Astragalus bibullatus*. This species is currently known to exist in only eight populations in central Tennessee. Becknell will examine whether it possesses species-specific microbes necessary for its successful long-term reintroduction.



**Patrick A. Smallwood** is a PhD candidate in the Department of Plant Biology at the University of Georgia. His research is focused on the interactions between orchids and their mycorrhizal fungal partners. Specifically, he is interested in how the identity of the fungus may change across orchid populations as the needs of the orchid change. He intends to use molecular techniques to understand how orchid mycorrhizal communities associated with the yellow lady's slipper orchid change across eastern North America. He hopes that the results of his work will help inform native orchid conservation.

## The Katharine M. Grosscup Scholarships in Horticulture

*Established in 1981, this scholarship is designed to encourage undergraduate and master's students in the study of horticulture and related fields.*



**Isabella Garramone** is a master's student at the University of Michigan School for Environment and Sustainability. Her area of focus is behavior, education, and communication. Previously having worked in children's education at both Longwood Gardens in Pennsylvania and the New York Botanical Garden, she is currently with The Farm at St. Joseph Mercy Hospital to research, create, and implement a toolkit-based system to facilitate collaboration among farms that participate in health care. Garramone intends to become a leader in engagement and outreach to educate communities about their local food systems and their impact not only at home but also with respect to the global environment.

**Keri Plevniak** is a master's student in plant ecology at Cleveland State University. Her research compares the plant communities of restored and unrestored meadows in northeastern Ohio to understand how plant traits contribute to restoration outcomes. The presence and abundance of species along with leaf, height, and seed traits will be studied to assess the impact of restoration efforts on the diversity of plant establishment. Plant traits and their relationship to the structure of plant communities can be of value in

analyzing restoration. Results from this study will aid managers of natural areas in planning restoration activities.

**Hannah Magney** is pursuing a degree in sustainable agriculture at the University of Kentucky's College of Agriculture, Food, and Environment in Lexington. Her dual major in the interdisciplinary program of the Department of Community and Leadership Development will be augmented next year, when as a junior she will be adding a minor in plant and soil sciences. Magney believes that the fields of agriculture and horticulture provide bountiful opportunities to begin stabilizing communities through fulfilling the need for nutritious food and for a connection with nature. Her academic focus is to develop community programs that benefit both the environment and local residents.



**Madison Proctor** is a junior majoring in environmental studies and biology at Hiram College in Ohio. She currently works at the college's James H. Barrow Field Station, a research and educational facility and wildlife rehabilitation center. Last summer she did research with rhododendron rootstock at the 3,600-acre Holden Arboretum. This summer she will be an interpreter at the Upper Delaware Scenic & Recreational River, a national park in Pennsylvania. Proctor hopes to continue her career in environmental outreach and education, working in state and national parks.

## Tara Corinne Quesenberry

is an undergraduate at the University of Kentucky, where she majors in agricultural education. She has worked in the agriculture industry for the last several years and is devoted to the national Future Farmers of America (FFA) organization. Her experience has enabled her to see that the lack of education is the most pressing issue facing the industry. Upon graduation Quesenberry wants to teach agriculture and be an FFA advisor in order to do her part in educating the general public and preparing for the future of the agriculture industry.

**Joshua Hitchner** is a master's student in landscape architecture at Temple University's Tyler School of Art. Hitchner's focus is on the ecological restoration of landscapes, improving sites not only for human enjoyment but also to enhance the ecosystems. During his final year of study, Hitchner will investigate creative solutions for improving degraded landscapes. He hopes to have a positive influence on the selection of native plants offered by growers and in turn used in design plans. Hitchner is currently working for a large wholesale nursery in New Jersey.

**Parker Strand** is an undergraduate at Pennsylvania State University's Department of Plant Science. He aspires to have a management position at a public botanic garden and use his influence to promote the public horticulture industry to younger generations. Strand has spoken at the American Horticultural Society's National Children & Youth Gardening Symposium and is currently employed at Chanticleer Garden, in Wayne, Pennsylvania, as a member of the visitors service department. Strand plans to pursue a master's degree in public horticulture.

*Funded by Shaker Lakes Garden Club, Zone X*



**Megan Bender** is a junior studying horticulture at the University of Cincinnati. After graduating she intends to pursue a career in either landscape design or public horticulture. Having completed three internships in public horticulture over the past two years, Bender will be delving into the commercial side of the horticulture industry this summer by working at a wholesale greenhouse. She is excited to learn more about greenhouse management and diversify her skill set with this opportunity.

*Funded by Garden Club of Cleveland, Zone X*

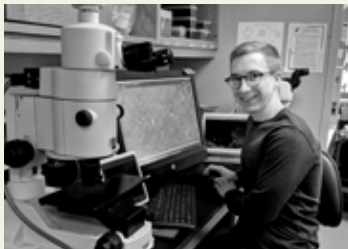
## The Loy McCandless Marks Scholarship in Tropical Horticulture

*Established in 1999 and awarded in even-numbered years, this scholarship fosters the study of tropical ornamental horticulture at institutions abroad that specialize in the study of tropical plants.*

**Benjamin Proulx** is a master's student in landscape architecture with a focus in Latin American studies at the University of Georgia. His research looks at the benefits of integrating agricultural and ornamental landscapes. He will participate in a study abroad program at the University of Georgia's Costa Rica campus, where he will work on the redesign of the San Luis Botanical Garden. Architecture students from the University of Costa Rica will collaborate on a design proposal for the Torres riverside community of Los Cipreses in Barrio México, San José, Costa Rica.

## The Corliss Knapp Engle Scholarship in Horticulture

*Established in 2010 to encourage the development of research, documentation, and teaching skills in the field of horticulture, this scholarship honors the memory of the exceptional and inspiring Corliss Knapp Engle, a long-time member of the Chestnut Hill Garden Club (Zone I). The scholarship is open to undergraduate and graduate students, advanced degree candidates, and nondegree seeking applicants above the high school level.*



**James Fischer** is a PhD candidate in the Department of Ecology and Evolutionary Biology at the University of Kansas. His research focuses on how rising atmospheric CO<sub>2</sub> can affect leaf development, specifically with respect to the production of leaf hairs (trichomes). These structures play major roles in defense against herbivores, enhancement of water retention, and production of essential oils. His work is contributing to a growing base of molecular knowledge available to plant breeders, horticulturists, and agronomists. Fischer is also interested in the imaging of plant structures through electron microscopy and macro photography and, generally, in the role of scientific imagery in advancing student learning.



**Gisele Nighswander** is a master's degree student in the School of Forest Resources & Conservation at the University of Florida, in Gainesville. Her project, titled "The Role of Vegetational Characteristics and Landscape Context in Controlling Arthropod Pests in Ornamental Gardens," focuses on alpha (site) and beta (structural) diversity and complexity in various landscape environments. This information can guide the design and placement of ornamental gardens in residential areas in order to limit pressures from arthropod pest herbivory and therefore reduce reliance on traditional chemical pest controls.

**Crystal Conner** is a first-year PhD candidate in plant pathology at the University of Florida. She is conducting research on identifying blueberry plant genes that are resistant to bacterial wilt, which is fatal. In 2016 bacterial wilt, caused by the bacterium *Ralstonia solanacearum*, was isolated and confirmed on multiple blueberry farms in Florida. Conner is studying the blueberry genomes of both wild species and cultivars. The blueberry industry in North America is rapidly growing, projecting a 25% increase in production over a four-year span, from 750.2 million pounds in 2015 to 940 million pounds in 2019. Fresh blueberry retail sales in the US were valued at \$1.5 billion in 2015. Conner's research will aid in the development of disease-resistant cultivars.

**Rob Straser** is a PhD candidate in the Department of Entomology at the University of California, Riverside. His research focuses on understanding under what conditions alternative management strategies in

agriculture, such as on-farm habitat diversification, have the potential to promote viable natural enemy insect populations to benefit both crop yield and financial return on investments. Straser aims to provide comprehensive insights into the ecological and economic limitations of current techniques to enhance biological control. Furthermore, he seeks to provide new information to help develop more targeted and effective strategies in integrated pest management for the delivery of ecosystem services.

## The Garden Club of America Hope Goddard Iselin Fellowship in Public Horticulture

*Established in 2013 and administered by the American Public Gardens Association, the fellowship furthers the study of public horticulture through experiential learning that takes place at a recognized public garden, botanic garden, or arboretum within the United States.*



**Olivia C. Caillouet** is a master's student in Agricultural and Extension Education at the University of Arkansas. She received her bachelor's degree in horticulture and aspires to work at botanical gardens or in higher education. She has worked at farms in Mozambique, presented research in Uruguay, and completed internships at farms in California and Puerto Rico. Her project will implement educational signage at the Botanical Garden of the Ozarks in

Fayetteville, Arkansas. The signs will cover concepts such as plant succession, riparian zones, and pollination. After the signs are installed Caillouet will research the educational impact on visitors.

## The Garden Club of America Montine M. Freeman Scholarship in Native Plant Studies

*Established in 2017 to encourage the understanding and development of underutilized native plants, this scholarship is open to college undergraduate and graduate students, advanced degree candidates, or nondegree-seeking applicants above the high school level to encourage the development of research, documentation, and teaching skills in the field of horticulture. It was made possible by utilizing surplus funds from the Montine M. Freeman Medal account and the generosity of the Freeman family.*

**Uma Venkatesh**, PhD, is a post-doctoral scholar in the Department of Biology at Pennsylvania State University. She is involved in the analysis of large-scale genetic data for the entire collection of over 1,200 species of native and naturalized plants as well as cultivars at the university's arboretum. Venkatesh is also studying the phylogeny, or molecular evolution, of parasitic plants. This project will allow her to rediscover and propagate three rare native parasitic plants. In the course of her work Venkatesh will gather information about the plants' biology, current status, growth requirements, and performance as cultivated plants in botanical gardens with an eye toward their conservation.





**Angela Merriken** is a horticulture and landscape design student at St. Louis Community College–Meramec in Kirkwood, Missouri. Her research will contribute to the development of a threatened plants of the Ozark Plateau garden at Shaw Nature Reserve, operated by the Missouri Botanical Garden. Merriken will establish a working list of rare and endangered plants for inclusion in the garden. This rare-plant research will be used to create interpretive materials that will help connect the garden audience to Shaw Nature Reserve's conservation efforts.

## The Garden Club of America and the Royal Horticultural Society Interchange Fellowships

*Established in 1948, these two fellowships provide for a reciprocal exchange of British and American students in horticulture, landscape architecture, and related fields to study and intern in each other's country for one year.*

## The Garden Club of America Interchange Fellow

**David Bull** will spend a year at Longwood Gardens, beginning in September, doing a variety of rotations among their extensive collections, special exhibits, and annual events. David has degrees or certifications from Shrewsbury College, University of Exeter, Edinburgh Botanic Garden, Capel Manor, and English

Heritage Wrest Park in Bedfordshire. He has volunteered at Kew Gardens and worked for a commercial garden center. Beyond gardening and horticulture, Bull worked at Christian Aid in London as a Humanitarian Risk, Security, and Programme Officer; served as a digital communications officer for Voluntary Services Overseas; and was involved with in-country programs in Latin America. Along with his horticultural background and work experience, David brings great enthusiasm for spending a year in the US.

## The Royal Horticultural Society Interchange Fellow



**Brady Hedgecock**, a recent graduate of North Carolina State University with a degree in general horticulture, has a passion for public horticulture and a special interest in the ginger family (Zingiberaceae). He seeks to hone his practical skills in horticulture and gain experience in botanical curation, with the eventual goal of becoming a garden director.

## The Rome Prize Fellowship in Landscape Architecture

*Established in 1928, this fellowship provides American landscape architects the opportunity for advanced study at the American Academy in Rome.*

**Zaneta Hong** is an assistant professor in landscape architecture at the University of Virginia. Architects and designers routinely reorganize the earth's matter and form, using

complex material ecologies. Hong's project aims to investigate the hidden histories of materials used in the construction and manufacturing of Roman architecture and urban infrastructure. Moreover, she will examine how specific materials have shaped and been shaped by contemporary shifts in climatic zones, geopolitical territories, regional to global economies, and emergent technologies. Her research will begin with the study of a single material—one that is environmentally and symbolically foundational to the history, present, and future of Rome—Carrara marble.

## The Frances M. Peacock Scholarship for Native Bird Habitat

*Established in 1994 and administered by the Cornell Lab of Ornithology in Ithaca, New York, the scholarship is awarded to college seniors and graduate students for the study of habitat-related issues that will benefit threatened or endangered bird species and inform land management decisions.*



**Martha Wohlfeil** is a PhD candidate at the University of California, Davis, studying avian biogeography in the Great Basin, the largest area of contiguous watersheds in North America. Her project, titled "Potential Mechanisms of Within-Season Elevational Movement of Passerine Species," identifies a novel pattern of upslope movement in some bird species and aims to better understand why this does or does not occur. Also studying how avian flight

patterns have changed over the past two decades, Wohlfeil hopes her work will aid avian conservation efforts.

**Logan Maxwell** is a master's student at the University of New Hampshire. Her project is titled "Fitness Consequences of Hybridization in Saltmarsh and Nelson's Sparrows." Maxwell's research will use field-collected demographic data in combination with molecular genetic tools to study outcomes of hybridization in these two tidal marsh birds, which are threatened by sea-level rise. She will evaluate their drivers and patterns of hybridization in the center of the hybrid zone through a lens of local adaptation within a changing environment. The results will help enable predictions about adaptive capacity and population viability into the future.

## The Garden Club of America Board of Associates Centennial Pollinator Fellowship

*Established in the spring of 2013 and administered by the Pollinator Partnership, this fellowship supports one or more graduate students to advance the knowledge of pollinator science. It was made possible by generous gifts given in honor of the GCA Centennial by members of the Board of Associates.*

**Kristen M. Lear** is a PhD candidate in integrative conservation at the University of Georgia Warnell School of Forestry and Natural Resources. Her project, "Assessing and Developing Critical Foraging Habitat for an Endangered Pollinating Bat," focuses on conservation of the Mexican long-nosed bat (*Leptonycteris nivalis*), a key pollinator in US and Mexican ecosystems. Lear will use an interdisciplinary approach that combines the natural and social sciences to investigate the bats' foraging ecology and understand how to develop and implement programs

that restore critical foraging habitat in northeastern Mexico. Her research will directly inform on-the-ground conservation efforts for the species.

**Pamela Blackmore** is a master's student in landscape architecture at Kansas State University. Her project, "Butterflies, Tallgrass Prairie, and Green Roofs," evaluates the butterfly communities of two urban green roofs planted with native prairie vegetation compared to nearby urban native prairie and protected tallgrass prairie sites. Since urbanization is a driver of habitat loss, it is essential to understand how habitat for pollinator communities in cities can be improved. One potential solution is to use green roofs and other green infrastructure to make cities more hospitable to pollinators.



**Kristen Birdshire** is an environmental sciences master's student at the University of Colorado Denver. Her research, titled "Influences on Wild Bee Richness and Abundance Along an Urban-Rural Gradient," focuses on native and exotic bees in a dry montane climate. The study seeks not only to define these population metrics along the slope, but also to determine each bee species' physiological and ecological characteristics in terms of its ability to promote or undermine survival in the urban landscape. Ultimately Birdshire's research will identify ways to enhance bee populations and pollination in Denver's city center.

## The Clara Carter Higgins Summer Environmental Studies Scholarship

*Established in 1964 to encourage college students to further their studies and careers in the field of ecology, this scholarship offers opportunities to gain knowledge and experience beyond the regular curriculum.*

**Gauri Kambhatla** is a sophomore studying computer science and cognitive science at the University of Michigan. She is passionate about interweaving artificial intelligence with sustainability to create solutions to the major issues of climate change: how AI and machine learning can be used to combat or prevent damage to ecosystems worldwide. She will be studying in Denmark and modeling glaciers to learn about their formation, preservation, and destruction; their part in our global climate system; and the effects of climate change on them. She will be doing fieldwork in the glaciers of Iceland, creating models for glacier behavior and learning on-site.

**Jordan Sims** is a rising junior majoring in ecology and evolutionary biology and minoring in biochemistry and cell biology at Rice University in Houston, Texas. She has spent a semester developing an effective method for isolating viruses from coral mucus, which is secreted by stressed corals. To continue this project, she will travel to Mo'orea in French Polynesia to explore how viral abundance in coral mucus changes during coral bleaching. This research aims to answer big picture questions about the health of coral reef ecosystems in rapidly changing environments.

## The Garden Club of America Awards for Summer Environmental Studies Scholarships

*Established in 1993, this scholarship encourages undergraduate summer studies in fieldwork, research, or classroom work in environmental studies beyond the regular curriculum.*

**Christian J. Moore** is currently a fourth-year undergraduate landscape architecture student at The Ohio State University. His project, "People of the Grassland: A Comparative Study of Volga German Communities and Ecologies in Saratov Oblast, Russia," explores the relationship between cultural identity and grassland landscape typologies. This work is part of a larger investigation into landscape architecture's role in the design and development of agricultural communities. Through this research, Moore intends to gain a better understanding of the common environmental challenges facing these communities across international borders.



**Alison Moss** is a junior studying microbial ecology at Towson University in Maryland. This summer she will investigate the metabolic activity of bacteria found in the dung beetle gut. Like humans, dung beetles host symbiotic bacteria that assist in digestion and provide essential

nutrients. Commonly found on dairy farms, dung beetles can minimize the environmental impact of raising cattle by consuming and redistributing animal waste. Identifying the abilities of other members of their microbiome will increase our understanding of how microbes regulate agricultural waste, helping us to predict how disturbances—like antibiotic use or climate change—may alter this important dynamic.

*Funded by Green Spring Valley Garden Club, Zone VI*



**Mary Devlin** is a senior in the Environmental Earth and Soil Sciences program at California Polytechnic State University, San Luis Obispo. Her project is titled "Implications for Better Management of a Threatened Habitat—California's Serpentine Grasslands." This summer she will investigate how nutrient enrichment in serpentine soils affects the ability of non-native invasive grasses to become established in them. Serpentine soils, typically heavy-mineral-rich and nutrient-poor, are a refuge for rare and endemic plants in California, but nutrient deposition from human activity, such as fossil fuel combustion and use of fertilizers, could change their nutrient balance. Understanding how nutrient enrichment influences competition between non-native and native grasses will inform future management of California's serpentine grasslands.

## The Caroline Thorn Kissel Summer Environmental Studies Scholarship

*Established in 2004, this scholarship promotes environmental studies for residents of New Jersey or persons studying in the state.*



**Natalie Kashi** is a doctoral candidate in the Natural Resources & Earth Systems Science PhD Program at the University of New Hampshire. She studies peatland development in response to permafrost thaw and, specifically, how nutrients released from permafrost thaw impact microbes that produce and consume methane, an important greenhouse gas. This research has important implications for managing greenhouse emissions in the restoration of wetlands.

## The Mary T. Carothers Summer Environmental Studies Scholarship

*Established in 2005, this scholarship is for undergraduate students who are doing summer fieldwork, research, or classroom work beyond their regular curriculum.*

**Hallie Fischman** is a junior concentrating in ecology and evolutionary biology at Brown University. She is currently studying the effects of Hurricane Irma on sand dunes at Sapelo Island, Georgia. Her project will specifically look at the role of sea oats (*Uniola paniculata*) in promoting dune recovery. Sea oats are commonly planted in the southeastern US for dune restoration, and this research will inform conservation practices.

## The Elizabeth Gardner Norweb Environmental Studies Scholarship

*Established in 2005, this scholarship encourages undergraduate summer studies doing fieldwork, research, or classroom work in environmental studies beyond the regular curriculum.*



**Soren Struckman** is a senior with a biology major and a minor in applied statistics at the College of William & Mary in Virginia. He will be part of a research team studying leaf chemistry and insect herbivory and their effects on common milkweed (*Asclepias syriaca*) demographics. He will be using field data to create a computational model of milkweed population dynamics to determine the effect of temporal variation in leaf traits and of herbivory on population growth. This area of research has strong implications for monarch butterfly conservation and the restoration of pollinator-friendly habitats.

**Camille DeSisto** is a junior at Harvard University studying integrative biology with a secondary concentration in environmental science and public policy. This summer she will expand upon a project she started last year, studying the invasive strawberry guava in Madagascar. The goals of the project are to understand animal-mediated dispersal networks, impacts of the strawberry guavas on floral and faunal community structure, and the genetic diversity throughout the country. The field work for this project will be conducted primarily in Ranomafana National Park, but Camille will also collect data in other national parks in Madagascar.

## The Garden Club of America Zone VI Fellowship in Urban Forestry

*Established in 2005 for advanced undergraduate or graduate students to study urban forestry and related subjects, this fellowship is administered by the GCA in collaboration with Casey Trees, Washington, DC.*

**Kaitlyn Pike** completed her BA in environmental studies at DePaul University, where she is now working toward an MS in sustainable management. In collaboration with the city forester of Highland Park, Illinois, her research will analyze the conditions of preserved private trees on properties undergoing construction. These trees, classified as heritage trees by the city, are protected under ordinances before, during, and after construction. The aim of this research is to develop a better understanding of how redevelopment impacts trees by species and how both municipalities and homeowners can more effectively protect their urban forests.



**Amy M. Blood** is a PhD candidate studying urban forestry in the Geospatial and Environmental Analysis Graduate Program at Virginia Tech. She repurposes underutilized datasets to address large-scale urban forestry challenges. She will be combining ground based measurements and geospatial data from multiple cities to develop a classification of different forms, structures, and configurations (a “typology”) of the landscape types present in urban forests. She will develop a classification system for these types and qualitatively assess their unique ecohydrological characteristics. Understanding where these landscape types occur in urban environments may improve storm-water management and related tree planting and conservation policies.

**Danica Doroski** is a PhD candidate at the Yale School of Forestry & Environmental Studies. Her project uses data from recent tree plantings in cities across the US to evaluate tree diversity on a regional and national scale. While tree planting efforts have increased in recent years, information on them is often siloed by municipalities, making it challenging to identify national trends or make city-by-city comparisons. By working with municipalities and nonprofits, this project will help consolidate and synthesize data to illuminate patterns in species composition that can inform future tree planting projects and improve such programs nationwide.

## The Elizabeth Abernathy Hull Awards

*In addition to announcing scholarships, the GCA recognizes individuals who work with children under 16 to inspire “their appreciation of the beauty and fragility of our planet.” Awardees are proposed by a GCA club or club member.*

### Maurice Cullen

Virginia Beach, VA  
*Proposed by Allison McDuffie, The Virginia Beach Garden Club, Zone VII*

Maurice Cullen, a teacher for more than 17 years, says, “I want to teach science all day! Life Science is about anything alive.” His lessons incorporate everyday observations that help his students see the delicate relationships among all things living. His classroom is full of plants and live animals that are incorporated into his lesson plans. Activities include raising and releasing oysters, collecting trash from local waterways, and improving bird habitats. Cullen understands the importance of developing curricula to foster future environmentalists.



### Karin Giger Eustis

New Orleans, LA  
*Proposed by Cathy Pierson, New Orleans Town Gardeners, Zone IX*

Karin Giger Eustis has been a hands-on leader in gardening and environmental education for 30 years. As president of the Louisiana Children’s Museum, she oversaw experiential learning about the

Mississippi River and broad water issues in New Orleans. Her garden project, the Propagators, began in 1999. After Hurricane Katrina it evolved into the Edible Schoolyard, a program integrated into the academic curriculum in four schools serving children from kindergarten to eighth grade. Other initiatives are a sweet potato festival, meet-the-farmer days, composting workshops, and family food nights.

### Jane Jackson

Mill Neck, NY  
*Proposed by Augusta Reese, North Country Garden Club of Long Island, Zone III*

Jane Jackson is an educator at heart, and her love of nature is infectious. She has spent time at The Nature Conservancy and the New York Restoration Project. More recently she founded and administers the North Shore Land Alliance’s Walk in the Woods and Other Cool Things to Do Outside programs. Jackson also designed and teaches the Long Island Water Education Program, with its focus on the sole source aquifer that is the area’s drinking-water source. Additionally, she has spearheaded Earth Day celebrations, introducing underserved youth to a 70-acre preserve near their homes, by planting trees and revitalizing the area after Hurricane Sandy.

*Funded by South Side Garden Club of L.I., Zone III*

### Emily Goodwin Martin

Hood River, OR  
*Proposed by Elizabeth Evins Martin, Peachtree Garden Club, Zone VIII*

Emily Goodwin Martin is a passionate environmentalist. She began her career as a marine biology teacher in San Francisco, later teaching estuarine ecology to grade school students. In 2011 she founded Cascade Mountain School at the base of Mt. Adams in the Columbia River Gorge, Oregon. This outdoor science school offers a range of day and overnight science-oriented educational programs geared to children aged 6 to 15.



### Al Salopek

Wellington, FL  
*Proposed by Elizabeth Thebaut, Garden Club of Palm Beach, Zone VIII*

Al Salopek, affectionately known to children in Palm Beach County as “Al the Bee Man,” has a mission: to educate, raise awareness, and demystify the honey bee for children while helping them connect to nature. In 2009, realizing that the plight of the honey bee illustrates an important lesson for humankind, he set up his own nonprofit, Bee Understanding. Salopek employs multi-sensory techniques, using props, role-playing, and hands-on activities that make learning fun. One such program is the Gift of Bees, which he developed to reinforce the idea that “the sustainability of the world we live in will be determined by what we do now with the young people growing up.” His personal presentations and outreach programs reach over 10,000 students annually.

*Funded by Ridgefield Garden Club, Zone II*

### Mollie Parsons

Santa Fe, NM  
*Proposed by Carol Ann Mullaney, Santa Fe Garden Club, Zone XII*

Mollie Parsons is the education director for the Santa Fe Botanical Garden (SFBG), where she initiated Garden Sprouts and the Children’s Discovery Nature Zone, both of which engage pre-school children in hands-on exploration of the environment. For elementary and middle school children, field trips to both SFBG and its second property, the Leonora Curtin Wetland Preserve, have varied in focus from soil studies to assessing the health of the garden’s orchard. Parson’s innovative work has served more than 1,500 students in the Santa Fe school system.

### Eileen Prendergast

Glencoe, IL  
*Proposed by Toni Harkness, Lake Geneva Garden Club, Zone XI*

Eileen Prendergast, director of education at the Chicago Botanic Garden, has dedicated 23 years to encouraging children to view the natural world as a joyful place where they can indulge their curiosity. Programs that are often intergenerational serve 130,000 people each year. Weekend family classes target children aged four to ten. Nature Nights, Little Diggers, and Leave No Child Inside are other popular programs. Prendergast’s Inspiring Nature Play Conference is a highly valued resource for preschool teachers.



### Emi Yoshimura

Los Angeles, CA  
*Proposed by Ann Murphy, Pasadena Garden Club, Zone XII*

Emi Yoshimura is the director of education at Descanso Gardens, a 150-acre botanical garden in Los Angeles County. Her 15+ years of experience in museum education have resulted in innovative science-oriented programs exploring the interconnectedness of the plants and animals that make their home at Descanso Gardens. Habitat Detectives, a program for children from kindergarten through the second grade, explores the garden as a wildlife habitat. Seeds of Wonder is an exercise in creating habitats, and Harvest Garden introduces the planting and harvesting of personal food gardens, underscoring the “pleasure of dirty hands.”

## Former Scholars Making a Difference



**Lauren C. Ponisio** is an assistant professor of entomology at the University of California, Riverside (UCR). She is the principal investigator at Ponisio Lab at UCR. Recently their research team was awarded a Pollinator Health Fund grant from the Foundation for Food and Agriculture Research to study the effectiveness of almond orchard management practices in reducing negative impacts of pesticides, parasites, and inadequate nutrition on bees. In addition to the initial grant, matching funds from various UCR departments will total nearly \$1 million to fund this project. Ponisio holds a BS and MS in biology from Stanford University and received her PhD in 2016 from the University of California, Berkeley. In 2014 Ponisio was one of the first recipients of The Garden Club of America Board of Associates Centennial Pollinator Fellowship. She has received many other fellowships and awards including the 2016 Global Food Initiative 30 Under 30 in Food Systems.

**Elizabeth (Liz) Kalies** is the director of science of the North Carolina chapter of The Nature Conservancy where she uses her expertise in ecology, forestry, and scientific methods. She coordinates large-scale monitoring to assess land protection as well as using evidence-based synthesis approaches to solve management problems, and researching wildlife ecology and connectivity. Kalies holds a BS in biology from Cornell University along with an MS in ecology from Yale University and a PhD in wildlife ecology from Northern Arizona University. Kalies, a 2008 Garden Club of America Ecological Restoration fellow, remarks, “The Garden Club of America supported my work in ecological restoration when I was a new PhD candidate working on restoring western pine forests to prevent catastrophic wildfire. I appreciate that the GCA gave me much-needed resources to start me down this life-long path.”



**Andrew Sell** is currently working on the planting design for a 50+ acre park in Tianjin, China, where the main focus is restoring habitat and providing ecological resources for migrating birds and pollinators in this major port city. Last summer Sell joined Sasaki Associates in Watertown, Massachusetts, and is one of three landscape architects focusing on landscape ecology. Plants and public gardens are his specialty. Working for a large design firm has allowed Sell the opportunity to collaborate with urban planners, architects, civil engineers, and other landscape architects on projects in the United States, Peru, Afghanistan, India, and China. He has especially enjoyed expanding his botanical knowledge to include the vast realm of plants native to China, as well as the importance of stormwater management and the loss of native Chinese pollinators. Sell maintains his connection to public gardens and arboreta through his association with the American Public Garden Association and plans to attend its annual

conference this summer. He feels that his experience at Sasaki Associates will broaden his knowledge and prepare him to lead a public garden in the future. A two-time recipient, Sell received the 2015 Katharine M. Grosscup Scholarship in Horticulture, followed by The Garden Club of America Hope Goddard Iselin Fellowship in Public Horticulture in 2016. He holds a BFA along with a master's degree in landscape architecture and conservation ecology from the University of Michigan.