



## How to Hang a Plant on the Wall

Larry Knowles, Wellesley College's machinist, is excited about the innovation that comes out of his area. When Julie Razryadov, the Botanical Collections Manager, asked him to invent something new to solve a problem in the conservatory, he was enthusiastic and immediately called together a team of students—Yeni Rubio '23, Kaiyla Chavez '23, and Ingrid Betancourt '23—to create a device to hang plants on the walls easily and securely.

Yeni explained, “I was introduced to the Machine Shop during my first year at Wellesley and I have worked with Larry on different projects. Last semester's project was one of the biggest I've worked on: plant wall hangers for the greenhouse that could hold various pot sizes.”

It sounds simple, but the challenges were great. There are many different size pots and they are not standardized. They must be easily removable from their hangers so the plants can be maintained, repotted, etc., and the pots must remain upright for proper watering and for aesthetics. The wall mount therefore must be mobile, adaptable, stable, and sleek.

The process to get to the final product is a long one. First, as with any endeavor, comes research. The team looked for what was already on the market and why it would or would not work. From there they drew out options. “The first problem was trying to come up with a design. We tried googling pictures and eventually we had an idea. Our next challenge was trying to make our 2D drawing into something 3D,” said Kaiyla.



Machine Shop head Larry Knowles watches as Ingrid Betancourt learns Onshape.

Paper components were formed into 3D concepts. The best of these were drawn onto cardboard and cut out for more stable 3D models. For the best versions of these, students used Onshape, a product development platform, to virtually sketch out the concepts. The Onshape sketches can be read by the laser cutter for precision cuts.

The next step was laser cutting the model from plywood to test it. As Yeni related, “After we created our sketch in Onshape,

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## NOTES from the Director

**G**reetings from Wellesley! Have you ever anticipated spring more keenly than this year? Especially for those of us in cold climates with short winter days, the sun arcing higher and longer in the sky every day is such a welcome signal that we can start to break out of whatever kinds of dormancy winter has brought. This winter has seemed especially long, partly because we got a big snowstorm in October that put an early end to the 2020 growing season. Opportunities to get outside are even more crucial with so much of our work and learning happening on screens, but then going for a walk with a mask on means glasses fogging up—so much for enjoying the scenery. When staying healthy has been such a challenge, spring and vaccines offer so much to look forward to.

At the end of February last year, I wrote that bulbs were already flowering and tree buds slipping as there had been more rain than snow. This winter hasn't been that warm—there's still snow around even though it's rained some—and the only places I'm seeing daffodil shoots poking up is next to south or west-facing walls. For the annals of climate weirding, on February 17 Houston got snow while Boston got rain. I don't know what to expect from winter anymore, and am at least as eager as usual to see the first flowers of the year!

Other things eagerly anticipated on campus in 2021 include the completion of the Science Center. The current plan is to move in by the end of the year and be fully up and running in time for spring semester

2022. The new part of the building includes an entrance on the east side into the new Camilla Chandler Frost '47 Center for the Environment, occupying a wing on the right. Adjacent on the left will be the new “teaching and research” greenhouses, replacing the “fingers” of the old greenhouses, where horticulture students each had their own growing space and I filled the research houses with snapdragon plants for pollination experiments back in the late 1990s. The foundation is already poured for the rectangular space that will neatly pack in a teaching house, three small research houses, and the head house that replaces the former potting room. Rough Bros. Inc. will be on site this spring and summer to build the glass structure, which



When our rare Oconee Bells bloom in the arboretum, spring is here.

will look much more like a conventional greenhouse than the Global Flora conservatory does.

The new greenhouses and head house will be in close proximity to Global Flora, and include propagation space for staff as well as students and faculty. In many ways it's a good thing Global Flora isn't yet open to the public, as our staff and students have been using the entry link and mezzanine for the kinds of horticulture work normally done in a head house designed for that

purpose. It's going to be amazing to move into the new spaces, including real offices, and make the Botanic Gardens Visitor Center back into a welcoming place for programs instead of the temporary office space it's been for our whole staff for the past couple of years.

Visitors will be able to enjoy Global Flora, while research projects in the other greenhouses will be off-limits to the public, an arrangement that would have kept my carefully hand-pollinated research snapdragons out of the hands of parents showing their kids how to make the flowers snap! Adjacent experimental gardens and gathering spaces will make working with plants indoors and out a pleasure, and the kitchen garden with its beautiful rustic fence and entry will return to its former spot. Previously hidden behind the old greenhouses, it will face Global Flora and be joined to the other botanical spaces by an accessible path. The years of planning make it that much more exciting to see this all coming to fruition!

I will close with a note of gratitude for being able to have students back on campus despite the pandemic. Wellesley's incredibly thorough planning and implementation has kept the campus “bubble” remarkably safe. The students that are able to be on campus are so eager for in-person experiences, and working in the gardens and Global Flora is so good for mental health and well-being along with the usual big dose of hands-on learning. I am grateful for everyone's daily efforts to keep each other safe and well, and am so looking forward to being able to gather together again.

With best wishes for a healthy and beautiful spring season,

*Kristina*

Kristina Niovi Jones, Director  
Wellesley College Botanic Gardens  
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## WCBG Staff Transition

**T**his August, Assistant Director Gail Kahn will be retiring and Botany Fellow Jenn Yang '12 will become Associate Director of the Wellesley College Botanic Gardens. Below, each of them reflects on the past, present and future of this role.

**Gail Kahn:** It's hard to say goodbye! I'm fortunate to have had several roles at the Wellesley College Botanic Gardens over the past 19 years, including 10 years as the Botanic Gardens' Administrative Director. I've been able to contribute to the growth of the Friends' botanical art program, develop signage and other interpretive materials for the Botanic Gardens, and plan the various student events we've held. I have a special interest in connecting children with plants and have created several children's programs over the years, including activities for kids at Reunion. I helped establish the Botanic Gardens' Thorndike Internship, which employs students as our ambassadors to the college community, fostering connections with our plants and gardens. I've been happy to join the staff and our Thorndike Interns in holding many student events in the greenhouses and gardens, with the Greenhouse Light Show as a personal highlight. And I'm thrilled with our new Global Flora conservatory and the opportunities it will provide to engage with the college and wider communities. It was a pleasure to lead our volunteer docents and student employees in cooperative learning sessions for giving tours of this beautiful space.

It's been so satisfying to see the Botanic Gardens flourish under the direction of Kristina Jones and to be a part of that growth—not only our new greenhouses and gardens, but in the many new connections forged within our diverse



college community. I have thoroughly enjoyed working with my colleagues on the staff as well as our wonderful volunteers, and have been inspired by their knowledge and love of plants. I've been enriched by the many people I've conversed with about our Botanic Gardens, from Wellesley students and reuniting alumni to assisted living groups and school kids.

After retiring, I plan to stay involved with WCBG and I'll probably see some of you around the Botanic Gardens once they re-open to the public. The pandemic has highlighted the natural world's importance to our wellness. Hang around some plants today!

**Jenn Yang '12:** Hi, all! I am grateful to take on the role of Associate Director at the Botanic Gardens, which has already been home to me as a student, alumna, and postdoctoral fellow. Each stage holds different memories and lessons for me, and I am excited to grow and learn new ways to support our connection with plants.

I remember receiving my first-year plant with great enthusiasm though unfortunately, this plant friend withered in my dim Pom double. Happily, no one held this against me when I became the second Thorndike Intern, an incredible chance to get to know not only a diverse plant community, but also a warm and welcoming staff.

My respect and appreciation for plants deepened as I admired their colorful intricate forms, and learned about their central role in our lives and cultures—in food, medicine, art, and inspiration. I found community with others who shared their plant stories, including common

ground with my own relatives in Taiwan, for whom plants I interact with mainly in this academic setting are traditional foods, familiar herbs, and common sights.

After graduating, I pursued this interest in food plants and biology through a Ph.D. at Penn State. On visits to Wellesley's campus, I saw the Edible Ecosystem grow from hard-to-find strawberries, to what is now my favorite spot on campus—a dynamic food forest for foraging, gathering with friends, and learning. At my first reunion, a discussion with Kristina ended in her offering me a chance to delve into this garden as a short-term tech, possibly the best job ever. I learned about edible plants and convinced students, visitors, and friends to taste, smell, or feel them.

The Botanic Gardens and Paulson Initiative generously supported my transition into a postdoctoral position, to support Global Flora and new landscape projects, as well as teach and mentor students. Amidst many learning curves, I most appreciated my time with our staff



teams and student mentees. As the campus shut down last year, it was tough to say goodbye to everyone. We transitioned to remote teaching, welcoming new staff, and creating safe workspaces.

This past year, WCBG has joined others in co-creating programs and structures to build toward greater diversity, inclusion, equity, and justice, a focus I am excited to support. Colleges and botanic gardens, along with most institutions, have legacies founded on settler colonialism and racism that is important to explore, acknowledge, and heal. As an educational garden within a dedicated, diverse interdisciplinary community, WCBG has the opportunity to grow in many ways. I am thankful to be part of this passionate, plant-loving community, and look forward to connecting!

## Teaching Botanical Art Remotely

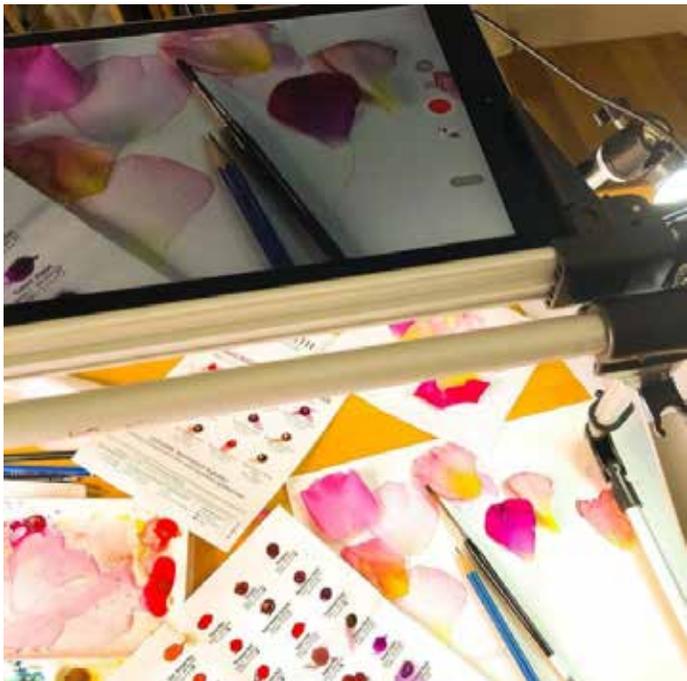
Last March, when all our lives were put on hold, I had just finished teaching a six week class at Elm Bank, our temporary home during the Science Center renovation, and was looking forward to the arrival of spring and the chance to spend a few weeks recording its slow New England beginnings. Our botanical art students were still finishing off their projects, so when we were all suddenly confined to our homes, meeting online to carry on working together was a good experiment to get us through the few weeks we all thought this weird time might last.

The world of Zoom was pretty scary for me (artists are not known for being techy), and working out how to connect to it as well as how to simultaneously use a camera to demonstrate live painting, all added to the anxiety level. Researching lighting, stands for phones and iPads and all the equipment to connect them resulted in many visits from the Amazon delivery man, and I went through many iterations before deciding what worked best to connect with my classes.

In the last year, however, I've learned how to make videos, take progress photos and edit them, as well as navigating the depths of Zoom-world. My patient students suffered through early equipment malfunctions and interruptions, as well as the snoring from my 17-year-old Jack Russell, Georgie, who insists on being my studio assistant. Now, one year in, I feel much more confident in my online classroom. I edit work with my



Sarah Roche's studio now contains lights, stands and cables as well as paints and brushes.



Sarah has learned how to demonstrate painting techniques via Zoom.

Apple Pencil during class, send out weekly updates with photos and worksheets, and demonstrate to my classes, videoing myself painting and then editing the recordings. I've even worked out how to add a soundtrack. My studio looks very different now, with lights and stands and power cables.

Our enrollment level has soared. Pre-COVID, students attending our classes usually spent significant time commuting to Wellesley, so many of them are relishing being able to connect without facing the torture of hours on the highway battling the weather. Our student community has grown and now includes participants from DC, North Carolina and the farther reaches of New England. Another wonderful development is that we can offer classes taught by teachers from all over the world without funding their travel and board, which is so exciting. So even though it's very hard not to be in a classroom together, it's wonderful that we are able to share the beauty and wonder of the botanical world with so many more people. Although the last year has been hard in so many ways, I think this time has taught us a lot. I think the benefits of virtual teaching might mean that it's a continuing feature in our class offerings, and I feel grateful for the support of our community and wonderful support staff so that I can carry on doing what I love.

Sarah Roche  
Education Director, Certificate in Botanical Art & Illustration

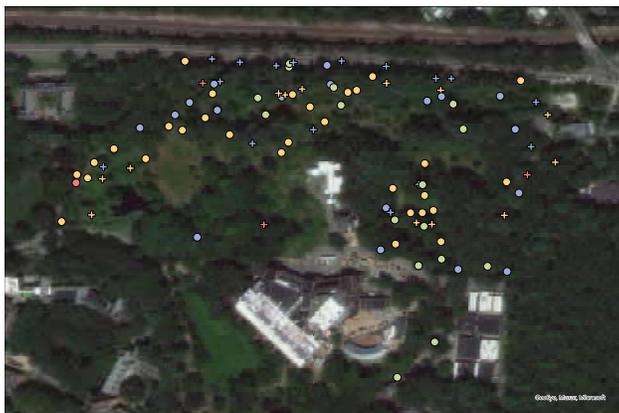
# New Garden Maps Promote Efficient Management

**A**s a new member of the Botanic Gardens staff, my first eight months have been spent learning as much as I possibly can about the gardens: its plants, featured garden areas, design history, past management practices, how visitors use the gardens. With 22 acres of dense and diverse plantings to become acquainted with, I was very happy to discover that the outdoor collections had been inventoried and mapped in GIS (geographic information systems), greatly aiding my ability to learn about them. Using the Collector app from ESRI (a supplier of geographic information system software), I could access the collections database from my mobile device and view information on plant identification, cultivation requirements, the history of particular specimens, and more as I went about the gardens doing my daily work. Thanks to the work of my predecessors, we have an excellent framework from which to continue developing our mapping capabilities.

As summer turned to fall, I began to glimpse what some of the biggest management challenges will be. With an aging canopy of native white oak and white pine, and hundreds of specimen trees from around the world, there is a clear need to document information on our trees' health and needs. A rapid tree assessment conducted in winter and summer would let me track trees that need removal, pruning for health, public safety, or aesthetics, and note signs of disease, pests or decline. I also observed the ever-looming footprint of invasive species throughout the gardens. In some areas like the maple swamp, successful past battles against buckthorn are obvious, and so is the need for continued vigilance. Other onerous species, such as bittersweet, flourish in much of the garden, with a vitality that begs the question of where and how to reduce it. And then there are the escaped accessions, such as sapphire berry, whose unplanned march through the wilder areas of the gardens is a clear problem. With the size of the grounds and the abundance of species to keep tabs on, we need a robust monitoring strategy so our IPM (integrated pest management) program can succeed.

One great asset of a mapping system is its utility in helping to make decisions based on complex, place-based information. And so this winter I set about designing mapping systems to start answering pressing questions, such as: Where do we need to spend our time and money on tree work projects? Are there certain genera or locations within the garden showing decline that we need to

be aware of? What are the most widespread invasive species and how can we best focus our removal efforts? Are some areas more impacted by invasive species than others, and why? To begin addressing these questions, I brushed off my dusty GIS skills

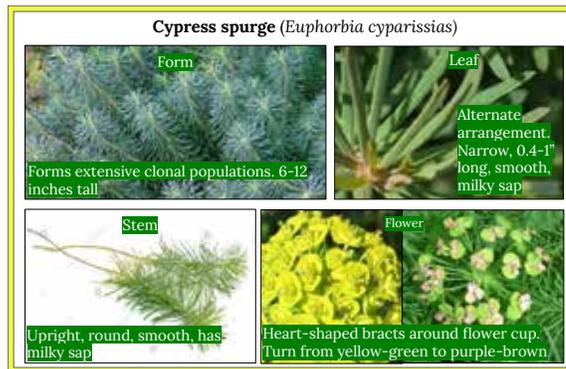


Winter Tree Assessment 2021  
New maps help Anne Beckley manage the outdoor gardens.

and acquainted myself with ESRI's newest desktop software. As a result, with our new Tree Assessment Map, we have a framework by which to rapidly flag trees needing work or evaluation. We can store information about our concerns for each tree, who should complete the work and how urgent it is, and we can collect photos for a visual record over time. We are also well on our way to launching an invasive species mapping program. Maren Frye '23 has developed a beautiful and comprehensive set of reference cards which students can use in the field to map the location and density of invasive species.

I'm very excited for our growing mapping program, as it will allow us to gain deeper insight into the garden's needs. ESRI's new technology has made field data collection and sharing maps among users so much more intuitive and efficient than it once was. With our systems in place, we will have the framework to collect and visualize data over time, tracking changes in the garden throughout the years. And we will be able to introduce our students to the fascinating world of mapping so they can become more adept at reading the landscape and answering questions about how to observe and manage our environment. This is a skill that could serve them well in many future career paths.

Anne Beckley  
WCBG Gardens Horticulturist



New reference cards will help students identify invasives.

## How Beautiful the Plants Are!

**T**hrough these pictures, I am trying to communicate the breathtaking and fragile beauty of nature—the one we tend to overlook in our everyday lives. Sometimes, while walking somewhere, I stop in the middle of the street and realize how unique everything around is. Of course, it does not happen every second of the day. To be honest, I wish I could notice more of these everyday miracles. Because of our struggles and problems, we sometimes forget how lucky we all are to be here, on our planet, here and now. I feel that it's crucial to be aware of this luck despite all the obstacles we encounter. Our greenhouse is a place where one does not even have to look for wonders. They are everywhere. As a photographer, I hope to be able to share these wonders and my perception of them with others. Knowing that someone sees beauty the way I see it, that they enjoy it as much as I

do, makes me happy—and, I hope, makes them happy too!

Arina Zadvornaya '24  
Botanic Gardens Student Assistant



Colors



Blossom



Hello to the Sun

### Global Flora Takes Third Place in Architectural Competition

Our new conservatory was entered into the American Architects Building of the Year competition for 2020 and won third place—an impressive finish, given that the first and second place winners are large municipal structures. The Building of the Year was determined by visitors to the American-Architects.com website during January 2021, who were asked to choose their favorite of the 42 Buildings of the Week featured in 2020. Global Flora received 14% of the votes.

In describing the project, Kennedy & Violich Architecture stated, “The Global Flora reimagines how the design of a sustainable greenhouse can enhance global interdisciplinary science education and deepen a public understanding of nature. It is a free and public botany lab and ‘museum’ that emphasizes the importance of environmental stewardship to current and future generations on-site and online.”

You can see Global Flora's profile at <https://www.world-architects.com/en/architecture-news/reviews/global-flora>

*Friends of*  
**WCBG**

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#### EDITORIAL COMMITTEE

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# Learn With Us

Due to COVID health concerns, we are continuing with remote instruction for all of our botanical art classes, using the Zoom videoconferencing app. Students should have Zoom installed on their laptop or tablet (smart phone screens are too small to use effectively) and familiarize themselves with Zoom's features prior to the start of class. In addition, students should have the ability to email images to their instructor, either by scanning or photographing.

WCBG Friends now accepts credit card payments of program fees via our new e-commerce site:

[wcbg-wellesley.nbsstore.net](http://wcbg-wellesley.nbsstore.net)

Before making a payment, please email your registration form (available online at [www.wellesley.edu/wcbg/learn](http://www.wellesley.edu/wcbg/learn)) to [wcbgfriends@wellesley.edu](mailto:wcbgfriends@wellesley.edu) to confirm space in the class. In order for your payment to be correctly processed, you will need to enter the title of the course. If you know the course number (the letter and numbers that begin with BAC), please enter that as well. Contact the Friends staff at [wcbgfriends@wellesley.edu](mailto:wcbgfriends@wellesley.edu) if you have any questions.

## Introduction to Botany Through Drawing

Discover the structure of flowering and non-flowering plants. Ellen Duarte encourages you in a non-stressful environment to draw quickly and observe more of the endless variety of plant forms and adaptations. No previous drawing experience necessary.

### BAC 21 111

8 Thurs.: Apr. 29; May 6, 13, 20, 27;  
June 3, 10, 17  
9:30 a.m.–12:30 p.m.  
Online via Zoom  
Members \$265 | Non-Members \$315

## Introduction to Botanical Art

Explore the world of botanical art in this course designed especially for you—the beginner. Sarah Roche guides your experience through structured exercises, projects and demonstrations, exposing you to the basic techniques and methods of botanical drawing and watercolor painting. All experience levels welcome.

### BAC 21 101A

4 days: Mon., May 10; Wed., May 12;  
Fri., May 14; Mon., May 17  
9:30–11:30 a.m. & 12:00–2:00 p.m.  
Online via Zoom  
Members \$260 | Non-Members \$310

## Watercolor Botanical Sketchbook

Tara Connaughton will help you discover how to use a watercolor sketchbook as a way to explore and develop botanical art skills. Enjoy live paint-along demos, weekly sketching prompts, and one-on-one feedback. For all experience levels.

### BAC 21 031

4 Tues.: May 25; June 1, 15, 22  
9:30 a.m.–12:30 p.m.  
Online via Zoom  
Members \$150 | Non-Members \$190



© Tara Connaughton

## Introduction to Pen and Ink

Carol Ann Morley will teach you how to use both Crow-Quill and Micron pens and you will practice all the basic pens strokes necessary to create accurate illustrations. Suitable for all skill levels.

### BAC 22 123X

2 days: Mon., Aug. 23 & Tues., Aug. 24  
1:00–4:00 p.m.  
Online via Zoom  
Members \$110 | Non-Members \$130

## Capturing Garden Flowers in Pen and Ink

Enjoy drawing your favorite garden flowers with Carol Ann Morley and watch them come to life with the strokes, textures and richness of tones that this medium brings to illustrations. Prerequisite: Intro to Pen and Ink or similar class.

### BAC 22 143

4 days: Wed., Aug. 25; Fri., Aug. 27;  
Mon., Aug. 30; Wed., Sept. 1  
1:00–4:00 p.m.  
Online via Zoom  
Members \$210 | Non-Members \$260

## An Important Update on Our Participation in the Reciprocal Admissions Program

With the Wellesley College Botanic Gardens currently being closed to the public, we no longer meet the criteria for participation in the American Horticultural Society's Reciprocal Admissions Program. We will not be participating in this program for 2021, and have discontinued the practice of sending membership cards to our members who give a gift of \$50 or more. You can continue using your current membership card to visit participating gardens until its expiration date. We apologize for the inconvenience and urge you to visit public gardens where you live and travel. At this stressful time for nonprofit organizations, public gardens need your support more than ever.

# Friends of WCBG

WELLESLEY COLLEGE BOTANIC GARDENS

Science Center  
106 Central Street  
Wellesley, MA 02481-8203



## How to Hang a Plant

*Continued from page 1*

we used the laser cutter to build prototypes of either cardboard, wood, or plastic to test them out on the pots. There was a lot of trial and error before we got to the final result!" There were many adjustments at this step. Different device sizes were tested with all the sizes and shapes of pots.

"The trickiest aspect of this project was trying to get the pot to fit perfectly. If we were off by as little as 0.1 cm, we had to shift the entire structure to ensure nothing was weak. It was mainly done through trial and error," explained Kaiyla. Only after dozens of revisions was the project ready for the milling of a metal prototype. This is the only part of the process that the students aren't intimately involved with. Larry does the milling.

This process was repeated for four different models, with 4-6 revisions each. Each model was discussed with the ultimate users, Julie Razryadov and the staff at the Botanic Gardens, and modified based on their needs. But even at this point the process was not complete. The prototypes had to be manufactured, which meant more checking and rechecking measurements so the file could be converted to CAD and sent to the

manufacturer. A long process, with satisfying results: "The most rewarding part of the project was seeing our work come to life," remarked Yeni.



The winning hanger design: "mobile, adaptable, stable, and sleek".

For Larry, the most enjoyable part was watching the students develop as they worked with the models, tools, and software. He looks forward to helping the Botanic Gardens on further needs. The staff at the Botanic Gardens, similarly, look forward to working with Larry and his machine shop students. The biggest advantage Larry has in his ability to invent is having seen a lot of design in his time. And his advice to inventors? It is the designs that don't work that are the most important. Keep creating, shifting, adjusting. Failures are never that—they are the experience that informs the successes.

by Julianna Razryadov  
WCBG Botanical Collections Manager

*The contributors to this article would especially like to thank Science Center Director Cathy Summa for the freedom to develop this project and pursue our goals creatively and efficiently.*