



Annual Report



Scan the QR code or visit the Digital Museum at
www.floridamuseum.ufl.edu/feature/annualreport20-21

MESSAGE FROM THE DIRECTOR

The past year was challenging for all of us. Not only did the COVID-19 pandemic touch the lives of almost everyone, but its effects also reverberated throughout the museum community. In fact, the year began with most museums shuttered as the coronavirus spread across the nation and around the world. The American Alliance of Museums estimated that of the approximately 30,000 museums in America, as many as one-quarter to one-third could be at risk of not surviving the pandemic. Thankfully, we were not among them.

The Florida Museum reopened to in-person visitors July 1, 2020. Attendance was initially modest as visitors were hesitant to venture out into public settings. However, strict adherence to Centers for Disease Control and Prevention guidelines and university protocols such as face masks, social distancing, reduced occupation capacities for indoor spaces and vigorous cleaning of high-touch surfaces reassured people that the museum was a safe place to visit. By year's end, our in-person attendance topped 150,000, about 70% of pre-pandemic levels.

As visitors returned to the museum, so did faculty, staff and students, many of whom became proficient at working remotely. Our research labs, collection areas, exhibit galleries and offices gradually sprang back to life. Unfortunately, we were forced to make many adjustments in response to the new reality we faced. No school tours or facility rentals meant elimination of these programs. Our popular *Discovery Zone* was closed all year, and large special events were canceled or reimagined as virtual events. Yet we were able to weather the pandemic challenges in large measure because of the support and guidance provided by our parent organization — the University of Florida.

While the lingering coronavirus influenced our daily operations all year, many exciting developments occurred nonetheless. Our temporary exhibition, *Survival of the Slowest*, featured many live animals, including Flash the sloth, and turned out to be immensely popular. UF awarded us two new faculty positions in artificial intelligence as part of its Faculty 100 initiative. Jon Bloch was appointed to another three-year term as chair of the department of natural history, and Keith Willmott became director of our McGuire Center. And at our Randell Research Center in southwest Florida, Annisa Karim was hired as the on-site operations manager, replacing Cindy Bear, who will retire this year after many years of dedicated service.

Finally, '20-'21 saw the groundbreaking for a long-awaited and much-anticipated capital project, our new Special Collections Building. Located just south of Powell Hall and west of the Curtis M. Phillips Center for the Performing Arts, this 23,500-square-foot, purpose-built facility will be completed in 2022 and will house the museum's "wet collections," about 4 million to 5 million specimens stored in alcohol. After the project was in the planning stages for decades, UF provided the necessary funding. The state fire marshal, along with our collections and curatorial staffs, are eagerly awaiting its completion.

I hope you enjoy this annual report. Thanks for a great year and for your continuing support.

Douglas S. Jones

Director

Florida Museum of Natural History



“ One of the most exciting things to report this year is that we began construction on our new Special Collections Building.



INTEGRATED DIGITIZED BIOCOLLECTIONS

(iDigBio)

Unlocking collections: iDigBio celebrates 10 years of leading museum digitization

Scientists have collected animals, plants and fungi for hundreds of years, meticulously cataloguing and curating these organisms for posterity. Before the Internet, however, the wealth of information these specimens offered was largely confined to the drawers and shelves of museums and universities. Digitization, the process of uploading key specimen data and imagery to online platforms, compiles this information in a searchable archive of life that can be used by researchers, educators, policymakers and community scientists around the world.

For the past decade, [iDigBio](#), a collaborative program funded by the National Science Foundation and based at the Florida Museum of Natural History, has led the push to digitize the estimated 1 billion biological specimens held in U.S. museums. These online records of animals, plants and other organisms help researchers identify species in danger of extinction, track the spread of invaders, study how climate change is reshaping ecosystems and possibly [predict the next pandemic](#).



Thanks to iDigBio's coordination, training and community-building efforts, about 40% of specimens in U.S. collections are now represented in the program's [portal](#), comprising one of the largest virtual collections of life on Earth and contributing to more than 2,000 studies so far.

This year, NSF awarded iDigBio nearly \$20 million to continue its mission of digitizing natural history collections nationwide, propelling the next five years of the program's success, said iDigBio Director [Gil Nelson](#).

"We need to sustain the momentum that has been developed over the last 10 years in the collections community," he said. "Our goal is to digitize everything we can."

From tracing the spread of invasive lionfish to examining an outlier leopard shark collected 155 miles north of its normal range, researchers can tap into information previously accessible only by visiting individual collections in person or online or by borrowing specimens.

Scientists are using the data to explore a variety of questions, including how museum records and [the field notes of Henry David Thoreau](#) document the shift in New England's fruit season under a changing climate; the ways in which [chemical cues in bat hair](#) serve as a travel log to uncover their migration pathway; and [whether pollinator communities return](#) when their natural habitats are restored.

iDigBio's major achievements also include assembling a growing network of more than 300 museums and academic institutions and training their collections staff how to fold digitization into standard curation protocols. As new digitization techniques emerge, such as 3D imaging and [CT scanning](#), iDigBio has evolved in step.

"iDigBio has brought the museum community together and allowed us to work with one another in ways that weren't possible before," Nelson said.

Engaging community scientists to help upload specimen information has allowed the project to scale up, said botanist [Austin Mast](#), a co-principal investigator on the grant and professor at Florida State University, a key iDigBio partner. Currently, the iDigBio portal contains more than 130 million specimen records, representing an estimated 400 million museum specimens.

"With the new NSF funding, 'sustainability' is now iDigBio's middle name," Mast said. "We will continue to focus on building long-term plans for sustaining high-value activities, both at iDigBio and in our broader community of collections that are creating and managing digital data about their specimens."

Arizona State University and its [Symbiota](#) software package, under the direction of [Nico Franz](#) with co-leaders [Edward Gilbert](#) and California Polytechnic State University's [Jenn Yost](#), is joining iDigBio as its newest partner. Symbiota provides tools for communities to build their own portals for specimen and observation-based information, including maps of where species live, specimen images and interactive identification keys. The Symbiota hub accounts for about 20 million specimen records in iDigBio's database.

iDigBio also will continue to connect students and early career scientists with natural history collections. The program will expand its development of [learning activities](#) and provide skill building to support underrepresented students, as well as host an [annual conference](#) for high school and undergraduate students to introduce them to careers in biological sciences.

Nelson said the presence of the Florida Museum made UF a natural homebase for the program.

"We've got one of the best natural history museums in the country, and we've had nothing but good support from the university and the provost and vice president for research," he said. "[Former iDigBio Director] Larry Page built a strong team during his directorship, and Doug Jones has been fantastic. He helps us out in any way he can."

The COVID-19 pandemic highlighted the importance of the digital data and virtual connections offered by iDigBio, as scientists and educators turned to online resources during lockdowns. In March of 2020, the iDigBio team rapidly shifted its focus to enhancing and expanding virtual platforms, activities and techniques, a pivot that resulted in one of the project's most productive years.

"Now, everybody realizes that online access is really even more critical than we thought," said Steven Ellis, iDigBio's NSF program officer. "We're starting to better leverage digitized resources and the kinds of opportunities they represent."

Still, digitization doesn't diminish the value of curating physical specimens, Nelson said.

"Specimens are one small step away from biodiversity in nature. Without collections, we don't have the ability to return to a specimen to examine it more closely. Even with good observations, images and records, there's no replacement for the actual specimen. You just can't lose that."

iDigBio Status at the End of the Tenth Year

31 (TCNs) and 52 Partners to Existing Networks (PENs) supported, representing 900+ collections in 300+ institutions



131,079,736

Specimen records digitized



122,674,144

Records viewed



5,047,054,652

Records downloaded



43

Graduate students & postdocs
trained



18,619

Participants in 482 workshops,
symposia & other events



2,235

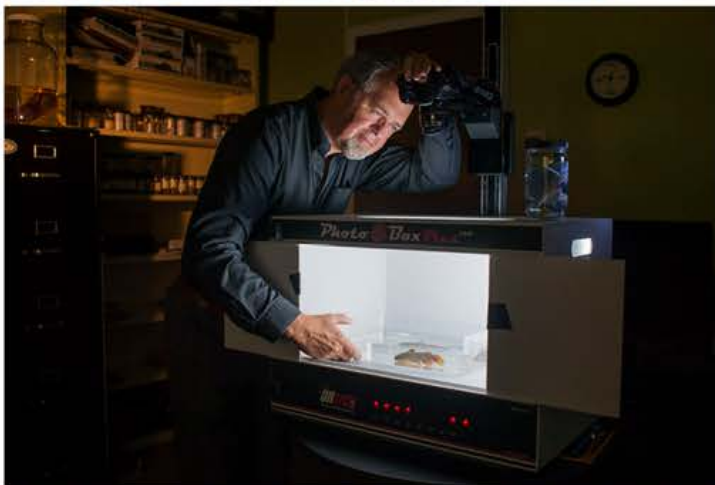
Studies published



33

Working groups supported





RESEARCH & COLLECTIONS

Department of Natural History Highlights

Despite the pandemic, the [Department of Natural History](#) experienced a remarkably productive year. Scientists focused on leveraging existing collections with the help of new technology and large-scale digitization efforts, and fieldwork resumed in the spring after a year of lockdowns. Accomplishments include many high-profile publications and a very successful year bringing in external funding for our collections and research. We quickly pivoted to virtual teaching, meetings, conferences and collaborations, working with colleagues from all over the globe. These platforms have changed how we approach our research collaborations, make our discoveries more accessible and will continue to shape the way we engage into the future.

Collections & Research Data



222

Peer-reviewed publications



62

Grants & contracts worth \$12 million



119

Undergraduates & postdoctoral fellows working in the collections



40+

Million specimens & artifacts



243,906

New accessions to collections



139,494

New specimens & artifacts cataloged



27,601

Specimens & artifacts loaned via 243 loans



4,300

News articles about museum research with potential readership of 7.8 billion



Discoveries in collections

Specimens continue to yield surprises long after they are curated. Digitization and DNA analysis uncovered a [new species of Florida lichen](#) in the [University of Florida Herbarium](#) that had gone misidentified for more than a century. Now the hunt is on to find it in the wild – if it still exists. Digital data also revealed the puzzling [backstory of teeth in frogs](#), showing the group has lost the feature more than 20 times throughout its evolution.



Documenting life on Earth

For the first time in 60 years, scientists described a [new native Hawaiian land snail species](#), sounding a rare, hopeful note in a story rife with extinction. The same team also [rediscovered](#) a snail species long presumed extinct on a remote Hawaiian island. Museum researchers are also identifying the [major killers of Florida's birds](#), thanks to a collaboration with rehabilitation centers. And scientists were astonished when a survey of sea anemone gut contents revealed an unexpected meal: [ants](#).



Revolutions in ancient DNA

Advancements in the study of ancient DNA are redefining what we know about [the first people to settle the Caribbean](#) and helping resolve longstanding questions from an archaeologist's career of more than 40 years. Ancient DNA also uncovered a previously unknown [link between Old World birds and Caribbean avian life](#). A new grant from the National Science Foundation will fund an investigation of how humans have impacted bird diversity and extinctions over time, with specimens from the museum's archaeological and paleontological collections.



Science communication and education

Online programming rapidly expanded across museums during the pandemic, but it comes with challenges. Megan Ennes unpacked why [partnerships and professional development](#) are key to these programs' long-term success. Michelle Lefebvre and David Blackburn's "Introduction to Natural History Collections" immersed UF graduate students in the inner workings of museums. Akito Kawahara dispelled [myths about the sparrow hornet](#) and why nicknames such as "murder hornets" do more harm than good.



Paleobiology

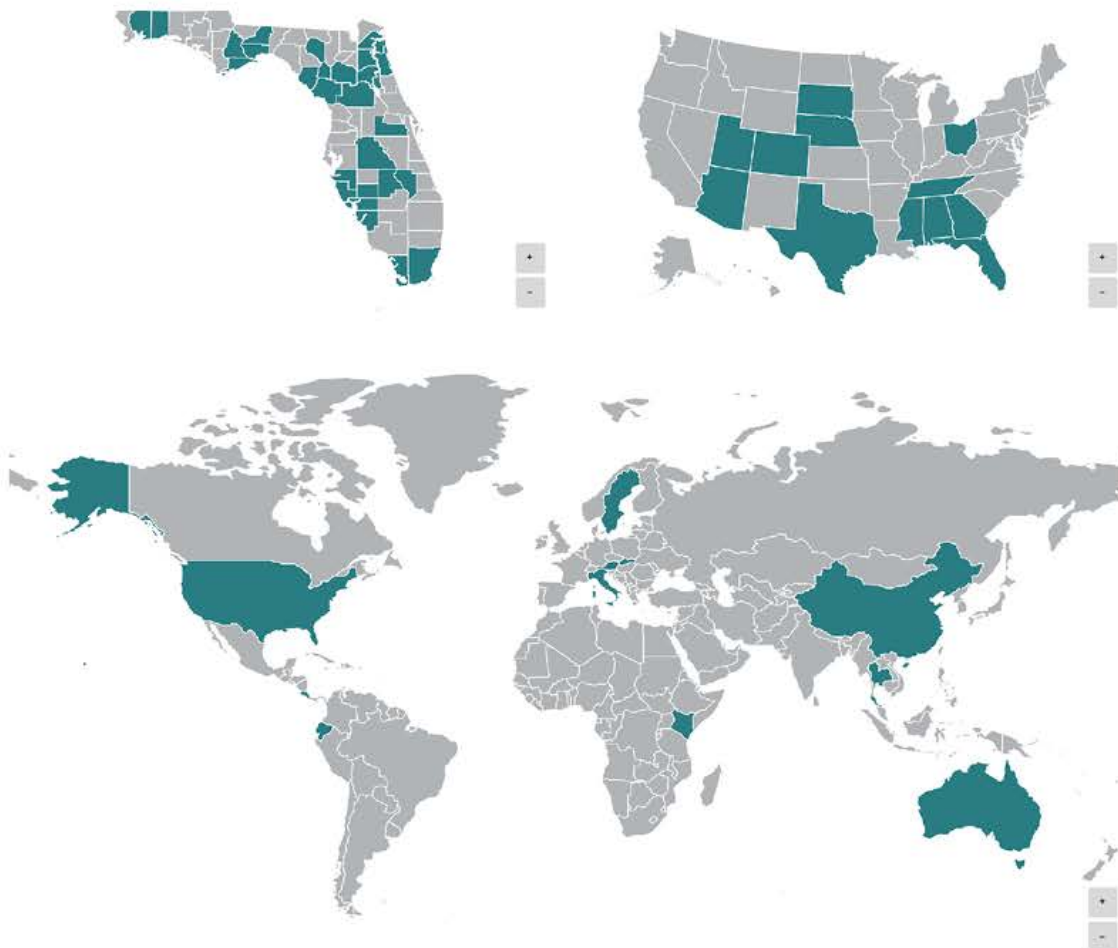
Computer network modelling overturned the textbook model of [what drives major transitions in ocean life](#), showing battles between predators and prey reshaped the sea as dramatically as mass extinction events. A high school lesson gone wrong led to a new way of estimating [how big megalodon was](#). CT scans of bizarre, armored amphibians provide the [earliest evidence of a slingshot-style tongue](#). Finally, keep an eye out for a new virtual reality game that initiates would-be paleontologists in the joys of collecting and comparing fossils.



Advancements in the herbarium

A [trio of NSF grants](#) will fuel new discoveries at the UF Herbarium. Using the wildflower genus *Lobelia*, researchers [will study](#) why certain species grow together and make predictions about how climate change could disrupt these patterns. The herbarium is also leading a [grant](#) to study Melastomataceae, the eighth largest family of flowering plants on the planet, to understand the evolution of worldwide tropical plant diversity. Another collaboration will result in the [digitization of nearly 1.2 million lichens and bryophytes](#), a group that includes mosses, hornworts and liverworts – organisms often underrepresented in digital collections.

Research Locations



McGuire Center for Lepidoptera & Biodiversity

Curators and staff with the [McGuire Center for Lepidoptera and Biodiversity](#) continued their groundbreaking research focused on the conservation, diversity, ecology and evolution of moths, butterflies and other insects. This year, [Keith Willmott was appointed as director](#) of the Center, whose collections continued to grow apace through donations and the efforts of its staff and students.



Hawaii Moths

Museum researchers helicoptered onto volcanoes to study [gaudy, minuscule moths](#), discover new species and conserve Hawaiian biodiversity.



Escape Artists

Studies of colorful butterflies showed that their bright markings [signal to birds not to bother](#) even trying to attack these fast-flying insects.



Battle of the Sexes

Male butterflies sometimes attach bizarre winged, flanged or spiky structures on female abdomens to prevent them from mating again. McGuire Center researchers examined who is winning in this [battle of the sexes](#).



Florida Backyard Discoveries

Many mysteries remain to be uncovered among the [insects in our own backyards](#). Collections Coordinator Andrei Sourakov explained how Florida moths can [keep invasive plants in check](#), documented insects that [live in hollow trees](#), and [disposed of mountains of poop](#) during ongoing studies of Florida caterpillars.



Inspiring the Next Generation

Efforts to inspire the next generation of Lepidoptera researchers included [expansion of the museum's butterfly garden initiative](#) and movement of the popular summer [LepCamp to a COVID-friendly, online format](#).



Conserving Declining Insects

An education and awareness campaign highlighted the [current decline of insects](#), and Associate Curator Akito Kawahara described some [simple steps we can take to help reverse this trend](#). A new exhibit provided [stunning close-up images](#) to show ongoing efforts to conserve insects. Curator Jaret Daniels received a grant from the Disney Foundation to continue [work on imperiled butterflies](#), and scientists continued to uncover the secrets of one of Florida's rarest insects, the [blue calamintha bee](#).

Faculty Promotions



David Blackburn

Curator of Herpetology

Blackburn has worked as a curator at the Florida Museum since 2015, where he's conducted research on amphibian biodiversity and conservation, with a particular focus on African frogs, and leads the [oVert initiative](#).



Nico Cellinese

Curator of Informatics

Cellinese's work is centered around the development of computational tools that aid researchers in cataloging the tree of life. She also studies the evolution and diversification of flowering plants using advanced genomic techniques.

Staff & Faculty Teaching

108

Graduate
committees chaired

158

Graduate
committees served

122

Independent
studies supervised

43

Courses taught by
Museum faculty

New Staff Hires



Annisa Karim

Operations Manager, Randell Research Center

Karim manages the day-to-day operations of the archaeological research center in Lee County, in addition to developing educational materials and activities for visitors and students from local schools. [Learn more](#)



Aaron Woodruff

Collections Manager II, Vertebrate Paleontology

In his new role, Woodruff oversees the screen washing and fossil collection of small mammals, reptiles and amphibians. He also identifies and curates fossils from Thomas Farm in Gilchrist County.

Staff Retirements

Art Poyer

Collections Manager II, Vertebrate Paleontology

From 1985-2020, Poyer helped to maintain the vertebrate paleontology collection and actively participated in research, fossil digs and community outreach activities.



Thomas Webber

Collection Manager, Ornithology

From 1984-2020, Webber helped to manage the museum's ornithology collection, including conducting research, identifying and preparing new specimens, processing loans and participating in collection expeditions.



OUTREACH

Exhibits & Public Programs

On July 1, 2020, the Florida Museum kicked off both the fiscal year and a public reopening following the unprecedented pandemic closure. In a challenging year, the museum played a vital role in welcoming and supporting visitors at a critical time. The [Butterfly Rainforest](#) provided beauty and respite, while [Megalodon: Largest Shark that Ever Lived](#) and the visiting exhibition [Survival of the Slowest](#) engaged audiences in safe, but entertaining, learning. As the pandemic made road trips more popular, the museum welcomed visitors from each of Florida's 67 counties, all 50 states and 10 other countries.

Programs also provided meaningful community support. While virtual programs continued, in-person programs resumed in outdoor settings. Virtual events such as [Science off Tap](#), [Mushrooms at the Museum](#), speaker and [film series](#), and [360-degree exhibit tours](#) engaged people from all over the state, country and world. The in-person nature-based program [Museum in the Parks](#) partnered educators, scientists, state parks and public participants for deep learning on topics such as fish, insects and birds. [Outreach events](#) for community partner summer camps and after-school programs provided science learning for youth who might otherwise be unable to visit the museum. Focusing on outreach efforts allowed the museum to reach people where they were, deepen community partnerships, engage youth and families in nature, and expand its strategic outreach goals.

Although the pandemic did not end with the fiscal year, the year did close with stronger and more diverse visitation than in prepandemic times, underscoring the museum's value to visitors, their families and friends. These visitors also reminded us of the amazing work done by our education, exhibits and front-line teams to keep visitors safe and engaged in unprecedented times. [Butterfly Rainforest](#), security, visitor services and gift shop staff all navigated the complexities of pandemic visitation with dedication and a commitment to excellent customer service. The museum is grateful to all employees for a year of unmatched effort.

Attendance & Outreach Data



150,304

Annual visitation



3,907

Public program participants



88,679

Visitors to Museum traveling exhibits at other venues



807

Youth camp participants



5,333

Youth outreach participants



1,222

School field trip participants



Photo Camps

[READ MORE](#)



Survival of the Slowest exhibit

[READ MORE](#)

Thompson Earth Systems Institute

The [University of Florida Thompson Earth Systems Institute \(TESI\)](#) continued to advance communication and education about Earth systems science in a way that inspires Floridians to be effective stewards of our planet.

Through [digital outreach campaigns](#), we curated information about Florida's environment and natural resources and packaged it in a way that is digestible, understandable and solutions-oriented. TESI's workshops and paid internships focused on the art of sharing science with the public through effective science communication. We helped early-career scientists and aspiring science communicators hone their outreach skills to disseminate science-based information to broader audiences.

TESI's flagship [Scientist in Every Florida School Program](#), or SEFS, hosted professional development workshops, where teachers were able to work alongside scientists to develop novel, standards-based lesson plans focused on Florida's environment. The program also coordinated more than 1,700 scientist visits to classrooms in about 500 public schools throughout Florida, reaching 55,000 K-12 students.

TESI faculty, staff and students advanced our vision to lead the way to a healthier planet by cultivating a responsible and curious society that values, trusts and has access to science.

TESI Outreach Data



55,000

K-12 Students
representing 400
schools



1,700

SEFS scientist visits



8,000

K-12 students &
teachers attend 137
virtual events



1,100

Floridians learn
about earth systems
through 17 events



50

Professional
workshop attendees



\$116K

In private funding
acquired for SEFS &
outreach



Insect Effect

Produced in partnership with museum scientists from the McGuire Center for Lepidoptera and Biodiversity, this campaign used social media and educational videos to [spread the word on the problem of insect decline](#).



Science & Me

During this virtual summer workshop, 10 UF students from underrepresented communities learned how to develop, film and edit a short [video about their journeys to becoming scientists](#).



UF Environmental Justice Media Intensive

Hosted in collaboration with the UF Levin College of Law, six [science and journalism students teamed up](#) to write stories showing the connections between the environment and social justice issues.



TESI Environmental Communicators

Through this paid internship, [UF undergraduate students developed valuable science communication skills](#) while contributing to TESI's digital outreach and education about various topics related to the state's environment.



Know Your Florida and Earth to Florida

Through these two digital outreach platforms, TESI helped a [statewide audience better understand Florida's environment, natural history and outdoor wonders](#). The content for both platforms is primarily created by TESI's student environmental communicators.



Scientist in Every Florida School

TESI's [Scientist in Every Florida School Program](#) matched teachers with scientists who delivered lessons via classroom visits and served as role models for the next generation of Floridians.

Museum-wide Digital Engagement Data



8,590,867

Website Pageviews



3,373,110

Website Visitors



37,076

Main Facebook Likes



3,228

Science Facebook Likes



11,742

Twitter Followers



215,847

Pinterest Followers



10,135

Instagram Followers



4,666

YouTube Subscribers



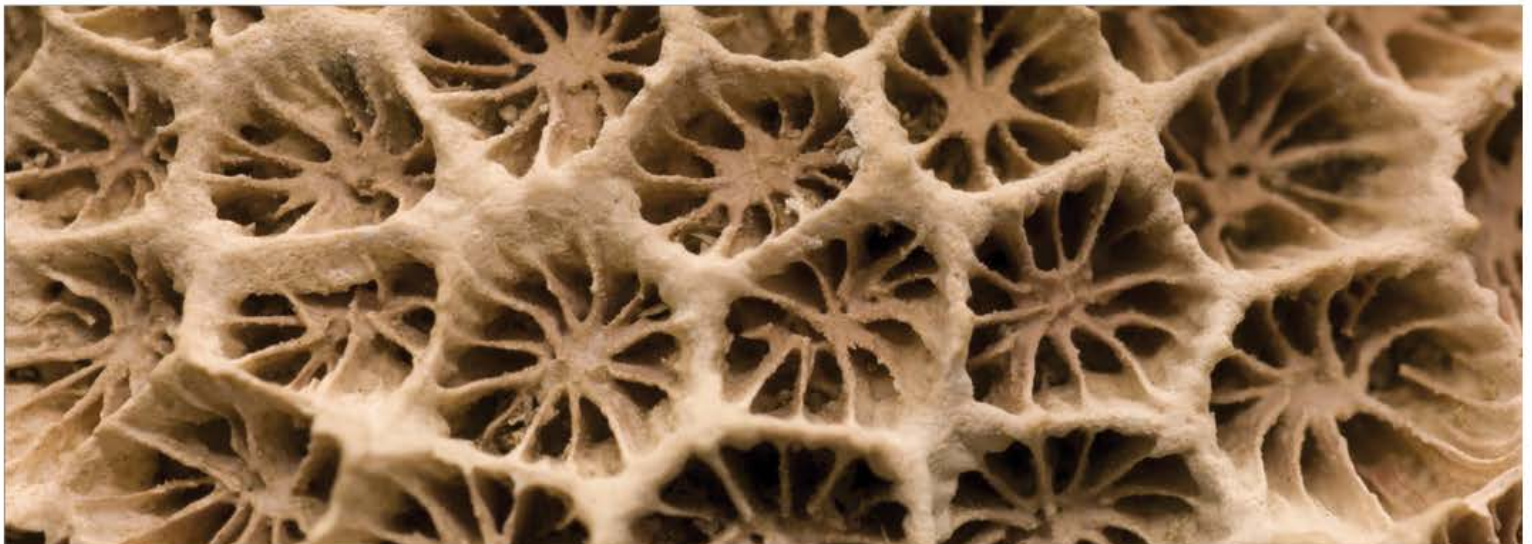
1,134

LinkedIn Followers



14,336

Email Subscribers



SUPPORT

Ann and Bob Powell Help Plant Seed for Museum Expansion Project

As longtime supporters of the Florida Museum of Natural History, Ann Powell and her late husband Bob have made a lead gift to support the Museum's expansion project, which will include a state-of-the-art education and communications hub to educate diverse audiences about Earth's air, water, land and life, collectively known as Earth systems. The new facility will house the UF Thompson Earth Systems Institute, an outreach-focused program launched in 2018, a learning theater, a high-tech classroom and an exhibition gallery.

"Since their leadership gift in the 1990s that paved the way for construction of Powell Hall, home to the museum's exhibits and public programs at the UF Cultural Plaza, Ann and Bob Powell have remained loyal supporters of the Florida Museum," said Florida Museum director Doug Jones. "Their most recent gift to support our expansion project reflects their belief that this institution is vital to the education and inspiration of the next generation of Floridians."

Bob grew up in Fort Lauderdale when it was a small beachside town, and Ann grew up in Gainesville. The two met at the University of Florida where Ann majored in education and Bob in civil engineering. After graduation, Bob joined the Air Force as a pilot before returning to Fort Lauderdale to work for his family's marine and bridge-building business, Powell Brothers, Inc. Ann taught high school for many years before becoming what she describes as a "professional volunteer," dedicating her time to programs that helped educate and inspire children.

As lifelong Floridians, the Powells have witnessed the environmental changes that continue to challenge the state.

"I love Florida because I was born here and I've lived here all my life, never considered living any place else," Ann said, explaining that Bob was an avid outdoorsman who loved hunting and fishing. The two often spent time in their cabin in the woods near Okeechobee. With Ann's passion for education and Bob's love of nature, the couple was enthusiastic about supporting this exciting endeavor.

With their gift, many more Floridians and visitors to the state will be inspired to be effective stewards of the planet, allowing future generations to cherish Florida's nature.



Bob and Ann Powell at the Florida Museum's 100th Anniversary Gala in 2017. ©Florida Museum/Jeff Gage

Volunteer Hours

6966

Hours donated

117

Total volunteers

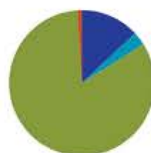
Fundraising Data

\$40,495,758

Total Gifts FY 20-21

\$35,056,865

Total Endowment Value



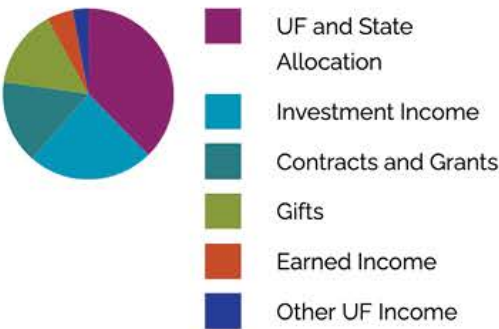
Cash Gifts
Gifts in Kind
Bequests
Other Pledges

Cash Gifts	\$5,279,012	13%
Gifts in Kind	\$1,310,881	3%
Bequests	\$33,425,865	83%
Other Pledges	\$480,000	1%



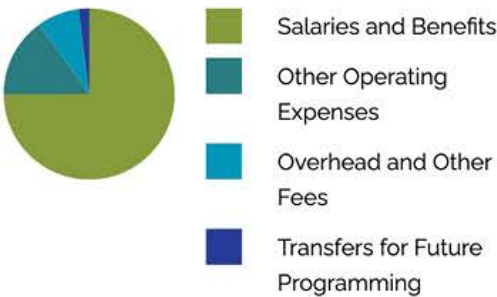
FINANCIALS

Revenue \$36.01M



UF/State Allocation	\$13.53M	37.56%
Investment Income	\$8.57M	23.81%
Contracts and Grants	\$5.76M	16.00%
Gifts	\$5.28M	14.66%
Earned Income	\$1.66M	4.61%
Other UF Income	\$1.21M	3.36%

Expenses \$22.08M



Salaries & Benefits	\$16.58M	75.10%
Other Operating Expenses	\$3.23M	14.65%
Overhead/Other Fees	\$1.75M	7.91%
Transfers for Future Programming	\$0.52M	2.34%



AWARDS & HONORS



Robert Guralnick



Lucas Majure



Roger Portell



Exhibits Team



Ian Ausprey



Ana Paula dos Santos de
Carvalho



Lisa Duffy



Communications Team



PUBLICATIONS

1. Agafonov, V.A., A.P. Laktionov, Yu.E. Alexeev, and **E.V. Mavrodiev**. 2020. A new species of *Alopecurus* (Poaceae) from Central European Russia. *Feddes Repertorium* 131:141-145. DOI:[10.1002/fedr.201900021](https://doi.org/10.1002/fedr.201900021).
2. Aiello, B., M. Tan, U.B. Sikandar, A.J. Alvey, B. Bhinderwala, K.C. Kimball, J.R. Barber, **C.A. Hamilton**, **A.Y. Kawahara**, and S. Sponberg. 2021. Adaptive shifts underlie the divergence in wing morphology in bombycoid moths. *Proceedings of the Royal Society B* 288:0677. DOI:<https://doi.org/10.1098/rspb.2021.0677>.
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4. An, J., Q. Xi, and **G. Paulay**. 2021. Two new species and a new record of Bopyrinae (Isopoda: Bopyridae) infesting Alpheidae and Hippolytidae, with comments on the genus *Bopyrina* Kossmann, 1881. *Systematic Parasitology* 98:155-165. DOI:[10.1007/s11230-021-09968-2](https://doi.org/10.1007/s11230-021-09968-2).
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9. Barry, S.C., A.C. Hyman, C.A. Jacoby, L.K. Reynolds, **M. Kowalewski**, and T.K. Frazer. 2021. Variation in seagrass-associated macroinvertebrate communities along the Gulf coast of peninsular Florida: An exploration of patterns and ecological consequences. *Frontiers in Marine Science* 8:596966. DOI:<https://doi.org/10.3389/fmars.2021.596966>.
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