



The Academy of
Natural Sciences
of DREXEL UNIVERSITY

Annual Report
2018/2019

A Force for Nature



Dear Friends,

For over 200 years, the Academy has been leading critical research to better understand our planet and its challenges. With some of the world's outstanding researchers seeking answers to the most critical environmental issues of our time, the Academy is forming partnerships within our community to share our findings and make our way of life more sustainable and equitable. Over the past few years, we have been taking a stand on issues that matter to us, including climate change, evolution, preserving water resources and protecting our biodiversity. Through our recent strategic planning efforts, we explored ways the Academy can diversify our programming, connect with our audiences, integrate the perspectives of those we serve and inspire stewardship of our natural world.

As advocates for our planet, we know that now is the time to act. Our earth is facing the fastest rising global average temperatures in modern times, plus extreme storms, sea level rise, heat waves, wildfires, floods and more. These changes are causing an alarming loss of biodiversity, and they also will leave behind a different world for our children, our grandchildren and our great grandchildren. If we work now to research, identify and implement changes that make ecosystems healthy, future generations will have cleaner water, air, soil and food. They will have the natural resources they need to operate strong economies. And, they will follow our lead in becoming a force for nature so that those that come after them can continue to enjoy the beautiful nature that surrounds us today.

At the Academy, we celebrate our natural world every day through informing, initiating and convening critical conversations about our planet. We believe science matters, and we take daily action to connect people with nature in impactful ways. We are deeply grateful for everyone on the Academy team, including our wonderful scientists, educators, administrators, volunteers and others who propel this institution forward every day. As you will see in this annual report, in just the past year we have taken great strides to bring science education to under-represented communities in Philadelphia, study the safety of our water, explore how even the tiniest diatoms serve as environmental indicators, travel to the ends of the earth in search of our evolutionary history and utilize scientific collections to understand how our oceans are changing. And it is thanks to you, our most loyal contributors, for making our work possible.

Thanks to our collective Academy community, we are able to inform and build a movement of environmentally engaged communities for a healthy, sustainable and equitable planet. We welcome you to share your questions, thoughts and ideas with us both at the email addresses below, as your input is critical to our mission. Together, we are a force for nature.

Regards,



Scott Cooper
President and CEO
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David E. Griffith
Chair, Board of Trustees
deg68@drexel.edu



A Force for Nature

At the Academy of Natural Sciences, we connect people with nature in impactful ways, seeking to inspire everyone to care for the environment through fun, interactive programs and exhibits focused on the natural world.

Academy Learning Partnerships Thrive

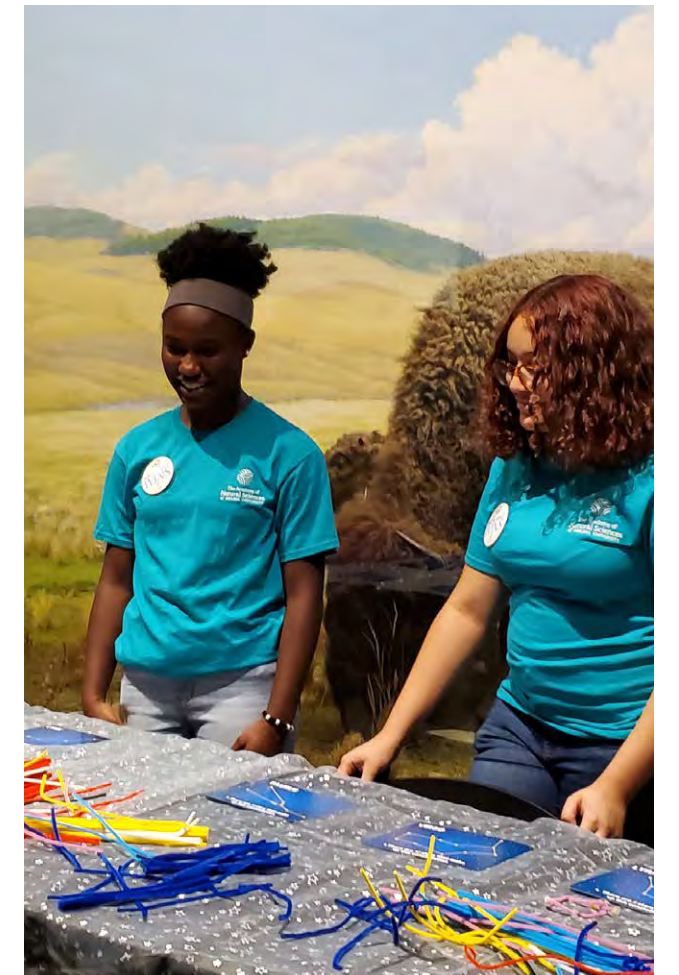
The Learning Department received \$200,000 from the William Penn Foundation to continue Discover! Play! Share!, its partnership with ASPIRA and Congreso de Latino in early literacy and STEAM development. The partnership focuses especially on sustainably integrating literacy and STEAM activities into each organization and providing quality bilingual family programming focused on literacy and science skills for Latino families from these communities.

We also continued work on Science and Literacy for Success, a program that provides teachers of 3- to 5-year-olds in West Philadelphia with training and teaching tools they need to encourage and expand on the natural curiosity and abilities of young children in science, technology, engineering and math. The program serves early-childhood learning centers through a three-year, \$685,600 grant from the William Penn Foundation and through a three-year, \$432,094 grant from the Institute of Museum and Library Services. We thank our funders, including Boeing, which provides \$50,000 in support of our learning programs, for their generosity!

Engineering and WINS



An Academy and Drexel team was awarded a \$1.2 million grant through the iTEST (Innovative Technology Experiences for Students and Teachers) program at the National Science Foundation to fund a new Engineering Women In Natural Sciences program. In collaboration with Drexel's College of Engineering, School of Education, the Philadelphia Education Fund and industry partners, the Engineering WINS program will guide working engineers and faculty through a full year of training in mentoring under-represented students. Specifically, these professionals will learn culturally relevant pedagogies and ways to combat stereotype barriers and implicit biases as they work to design a new engineering curriculum that sparks and sustains the interests of women of color in grades 9–12. The team's ultimate goal is to investigate how a largely homogeneous group of working engineers can enter into mentoring relationships that increase participation in their field by under-represented populations.





Public Experience Expert Joins Academy Leadership

Niki Ciccotelli Stewart, a New Jersey native, joined the Academy following 10 transformative years in Bentonville, Arkansas, where she helped conceptualize, establish and advance one of the country's most progressive art museums — Crystal Bridges Museum of American Art. She has spent most of her career in the arts world and joined Crystal Bridges in 2008, three years before the museum opened to the public. As a member of the opening team, Stewart helped take the museum concept from idea to reality, simultaneously building the physical site, operations and programming. In her most recent position as chief engagement officer, she worked closely with all museum departments to deliver an outstanding, meaningful and engaging experience for more than 600,000 guests each year.

Joining the Academy last spring, Stewart is revitalizing the Academy experience through a host of new and upgraded initiatives being announced this year. She will be guiding the Academy team as we upgrade the front-of-house space, re-focus our educational efforts on adults and families and position ourselves to be the place where communities, scientists and change agents can come together to have critical conversations needed to help save the planet.



36

YEARS OF SUCCESS
for the **WOMEN IN NATURAL
SCIENCES PROGRAM**

204,978

TOTAL VISITORS
DURING FISCAL
YEAR 2019

22,274

SCHOOLCHILDREN
VISITED THE
MUSEUM
during
FIELD TRIPS

69%

of **EARLY-CHILDHOOD PROVIDERS**
served by **THE ACADEMY**
IMPROVED THEIR QUALITY
RATING with **SUPPORT** from our
LEARNING PARTNERSHIPS



Protecting Our Waters

Measuring Toxic Chemicals in our Water

We may not be able to see them with the naked eye, but we know they are ever-present. PFAS (short for per- and polyfluoroalkyl substances), a family of toxic chemicals linked to an array of serious illnesses, are widely found in drinking water and consumer products. Produced since the 1940s, they have been used in a wide array of industrial, commercial and consumer applications and products, including firefighting foams, dental floss, former formulations of Teflon™ and Scotchgard™ and food packaging.

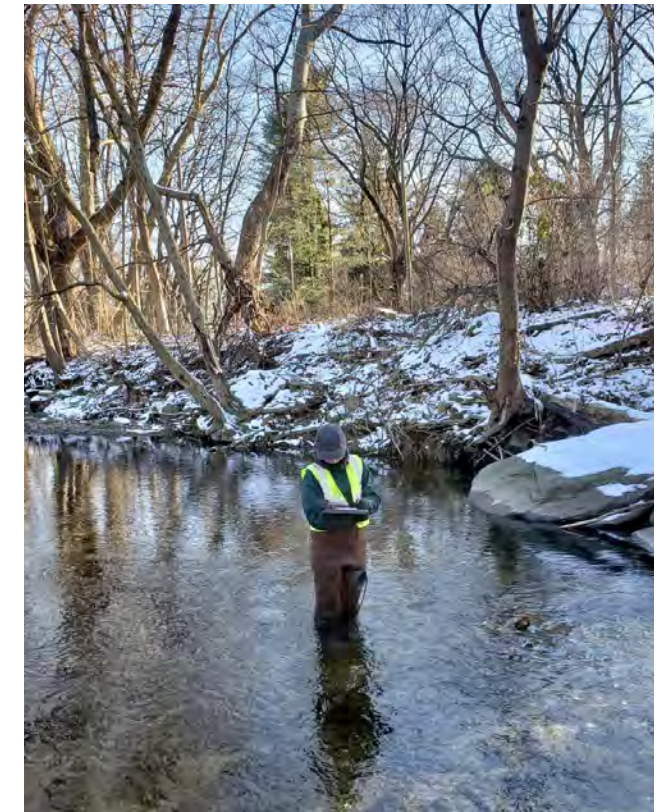
Dubbed “forever chemicals,” PFAS don’t degrade easily and have been accumulating in the environment. PFAS have been found in the drinking water of over 16 million Americans across 33 states, and it is estimated that the water supplies of 110 million Americans may be contaminated with PFAS.



In the Philadelphia region, PFAS have been detected in public tap water systems and even in the eggs of osprey nesting in the Delaware Bay.

In the Philadelphia region, PFAS have been detected in public tap water systems in Montgomery, Bucks, Gloucester, Camden and New Castle counties, in water, sediment and fish from the mainstem Delaware River, and even in the eggs of osprey nesting in the Delaware Bay. Known and suspected sources for this regional contamination include manufacturing plants and localized use of PFAS-containing firefighting foams by airports and military installations in Pennsylvania, New Jersey and Delaware.

The production and use of some PFAS compounds have been voluntarily phased out over the past 12 years. However, new PFAS compounds are still being developed, the toxicity and persistence of which are largely unknown. The federal Toxic Substances Control Act of 1976, which regulates new and existing chemicals, does not require applicants to provide toxicity data for new chemicals, leaving the burden of proof on the EPA to demonstrate a significant risk. Last year the EPA rolled out an action plan to address PFAS but, to the disconcert of many scientists, it does not formally classify PFAS as regulated hazardous substances, establish a legally enforceable limit for PFAS in drinking water, nor set a timeline for formal regulatory action.



In response, Academy scientists Marie Kurz, PhD, and Rich Horwitz, PhD, have begun studying how PFAS compounds accumulate in plants and animals in Philadelphia area streams. With funding from the United States Department of Defense's Strategic Environmental Research and Development Program and in collaboration with colleagues at Drexel, Temple and Lock Haven Universities and the U.S. Geological Survey, the study will help support the prediction and assessment of ecological risks of PFAS to aquatic ecosystems and to humans. In particular, Kurz, Horwitz and the team will study the extent, pathways and rates by which PFAS are taken up by aquatic organisms and transferred through aquatic food webs, as well as their potential for consumption by humans.

What Is a Watershed?

A watershed is an area of land that drains rainfall and small streams to a common outlet, such as a larger stream or river, that eventually ends up at the mouth of a bay.



The Delaware River Watershed is a source of drinking water for 15 million people in Pennsylvania, New Jersey, Delaware and New York.

In the last six years, the Academy has served as a key member of the coordinating committee of the Delaware River Watershed Initiative, a partnership of 50 environmental organizations funded by the William Penn Foundation. Through the Initiative, our scientists strive to monitor, protect and restore conditions in the streams, rivers and landscapes in targeted regions within the watershed.



500

WATER SAMPLES PROCESSED by ACADEMY SCIENTISTS for the DELAWARE RIVER WATERSHED INITIATIVE

\$200K

AWARDED to the Academy by the WILLIAM PENN FOUNDATION to develop new programming that will LINK COMMUNITY DEVELOPMENT to GREEN STORMWATER INFRASTRUCTURE

3,000+

MUSSELS GROWING AT GREEN LANE RESERVOIR Academy scientists help to raise mussels into hearty adults, which play a critical role in the health of nearby waterways

502

AMERICAN EELS COLLECTED from DELAWARE RIVER TRIBUTARIES and released into the PICKERING CREEK WATERSHED for the PICKERING CREEK AMERICAN EEL RESTORATION STUDY

Recording Environmental Conditions

Additions to Diatom Collection Shed Light on our Changing Climate

Deep in the wilderness of Kodiak Island, Alaska, lies the isolated, 9-mile-long Karluk Lake. Known for its abundance of sockeye salmon and surrounding populations of Kodiak brown bears and bald eagles, the lake is also home to a rapidly changing population of diatoms — single-celled algae that have walls made of silica — essentially shells of glass. The lake is also the site of a scientific mystery that captured the attention of an Academy scientist and her volunteers.



“Warming changes everything, including what the fish eat,” says Potapova. “Everything starts with diatoms, because they are at the base of the food chain.”

In 1961, French scientist Emile Manguin described 55 species of diatoms from Karluk Lake. The samples, many of which were considered the types, or perfect examples, of the new species, have never been found, so scientists around the world can't consult them for research. Manguin left behind only drawings of the diatoms, which are not reliable enough to identify specimens.

Several diatom species that Manguin described from Karluk Lake are common in arctic and subarctic ecosystems, where they serve as important indicators of environmental conditions due to their sensitivity to temperature fluctuations and pollution. Scientists studying human-induced climate change in these areas must be able to consult type specimens of these species from scientific collections. Without Manguin's type specimens, however, researchers may misidentify species, lowering the quality of ecological models aimed at understanding past conditions and tracking current environmental changes.

The first “fix” to the problem of missing types is to travel to the location where the original specimens were collected to recollect new ones for study. Marina Potapova, PhD, the curator of the Academy's Diatom Herbarium, knew that the only way to re-establish an understanding of these vital species was to return to Karluk Lake and collect them again. So Potapova's volunteer, Greg Aaron, sponsored and organized an expedition to Karluk Lake to collect more local diatom species. After collection, Potapova would properly identify the collected specimens and designate epitypes, or additional, clarifying type specimens provided when the original materials are missing, ambiguous or insufficient. She would also sequence their DNA, photograph the specimens and study their morphology, with the eventual goal of publishing these findings for further study by researchers around the world.

In summer 2019, Potapova, Aaron and Aaron's teenage daughter, Cate Aaron, a junior at Merion Mercy Academy High School, traveled to Kodiak Island. There they were joined by the Refuge's Deputy Manager, Tevis Underwood, for the floatplane trip to Karluk Lake. During the team's time at the lake, Underwood provided access to the Fish and Wildlife Service's research cabin, operated the boat the Academy team used to collect samples and provided



Is it possible that changes to the diatom population in Karluk Lake are occurring because of climate change? It's possible, the scientists say, but much more research is needed to make a clear determination. By identifying what species occur in a region, tracing population changes over time and storing their finds in scientific collections, taxonomists like Potapova provide the tools for applied biologists who study species as indicators of environmental change.

security, keeping a trained eye out for the local bears. His constant presence enabled the team to focus on their search for diatoms.

What the team found at the lake surprised Potapova. They discovered that the lake, which was always considered to have scant diatom populations, was full of benthic (bottom-living) diatoms — the basis of the lake's food chain. More importantly, she established that some of the diatom species that lived in Karluk Lake in the 1950s are no longer there. Kodiak Island has been warming in recent years, which has been affecting the feeding patterns of the bears and other wildlife.

“Warming changes everything, including what the fish there eat,” says Potapova. “Everything there starts with diatoms, because they are at the base of the food chain.”



Volunteers Play Vital Role in Scientific Discoveries

From working in the galleries to assisting with fieldwork and collections care, Academy volunteers are critical to our success. Without volunteer Greg Aaron, Diatom Herbarium Curator Marina Potapova would not have traveled to Kodiak Island, Alaska, in search of diatoms that could illuminate a mystery of missing type specimens 60 years in the making.



With an extensive teaching and research schedule, Potapova did not have time to organize and plan a trip to the remote Karluk Lake to try to find them again. Aaron, an Academy member who had been volunteering in the Herbarium for two and a half years at the time, took up the challenge — an undertaking that ultimately included hundreds of hours of planning and expedition logistics.

Aaron established a relationship with the staff of the Kodiak National Wildlife Refuge, which administers the lake, and he helped Potapova secure a research permit. He also planned the expedition logistics, including the rental of a floatplane that could land on the remote lake. His daughter Cate Aaron spent the summer volunteering at the Diatom Herbarium and assisted with the preparations.



Both Aarons accompanied Potapova on the expedition, collected samples, took photographs and prepared specimens for inclusion in the collection.

“Without Greg, none of this would have happened,” Potapova says. “It’s a great example of how much volunteers can contribute to science.”



The Academy is grateful for the dedication of our volunteers. Thank you to Greg Aaron, Cate Aaron and the many other individuals whose generous contributions make our work possible.



24,413

COLLECTIVE HOURS of SERVICE CONTRIBUTED by 268 ACADEMY VOLUNTEERS during fiscal year 2019

33

DREXEL UNIVERSITY STUDENTS HIRED FOR CO-OP POSITIONS in departments ranging from ENTOMOLOGY and BIOGEOCHEMISTRY to our WOMEN IN NATURAL SCIENCES PROGRAM in fiscal year 2019

25

YEARS of SERVICE by VOLUNTEER JOHN NARK, who also received the AL VISCO AWARD FOR EXCELLENCE IN VOLUNTEERISM to support research for his 14 YEARS OF CONTRIBUTIONS in VERTEBRATE PALEONTOLOGY



Studying Our Natural World

Breathing New Life Into the Invertebrate Paleontology Collection

Sitting in suspended animation under layers of dust, 1 million invertebrate fossils were all but abandoned on the Academy's fourth floor for decades. What could be proudly called the oldest Invertebrate Paleontology collection in North America had been forgotten under dim, flickering, fluorescent lights. The collection had not had a curator for 40 years or a collection manager for 20 years. But last year, the department took on new life with the hiring of three staff and a host of new students and volunteers.

Joining the Academy team in 2017, Assistant Curator of Invertebrate Paleontology Jocelyn Sessa, PhD, is one of many scientists at the Academy researching how ecosystems are responding to our changing environment. Sessa studies the “canary in the coal mine” for acidification of the ocean — pteropods. Pteropods are tiny snails with thin, translucent shells. Although they’re the size of the head of a pin, they’re an incredibly important indicator of what is happening in an ecosystem because their shells are especially prone to dissolution by ocean acidification.

Ocean acidification has been occurring since the industrial revolution. As ever more CO₂ is pumped into our atmosphere, the ocean absorbs it and becomes more acidic, making it harder for organisms like pteropods to grow their shells. Pteropods are a crucial part of the marine food web — a staple for whales, cod, shrimp, krill and more — and changes that impact them impact the entire ocean ecosystem.

Sessa and Academy Gallagher Fellow Rosie Oakes, PhD, analyze both modern and historical specimens from museum collections. Their goal is to determine a baseline of pteropod shell thickness over time and understand how ocean acidification may have affected shell growth. Oakes developed a method to quantify the thickness of the pteropod shell with the use of micro-CT scanning, which allows the team to reconstruct the climatic conditions that affected ecosystems historically. Understanding how these ecosystems responded to past events allows us to predict how they may respond to the changing conditions in today’s oceans.

Collection Manager Katy Estes-Smargiassi is responsible for caring for, cataloging and digitizing the Invertebrate Paleontology Collection, which is a founding collection at the Academy of Natural Sciences. With at least one founding member, Thomas Say, contributing fossils of mollusks and insects beginning in 1812, the collection has strong representation of Mesozoic and Cenozoic shallow



marine fossils from the east coast of North America and the Gulf Coastal Plain, as well as Mesozoic ammonites from the United Kingdom. The department has received four years of funding for collections improvements through the Hattersley Family Collections Care and Upgrade Fund and two years of funding from the National Science Foundation (NSF). The goal of the NSF grant is to digitize, or make available online, the collection’s marine invertebrate fossils from Eastern Pacific localities from the Cenozoic Era, a time during which several major global climatic shifts occurred. This digitization project will enable the Academy’s specimens to be analyzed by other researchers from around the world to better predict how these organisms may respond to similar events in the future.



Broadening Participation in Science

The Invertebrate Paleontology Department has partnered with Drexel University’s Louis Stokes Alliance for Minority Participation, an NSF-funded initiative to increase the number of under-represented minority students who complete STEM degrees, to help support student participation in the department. Through this initiative, they hired two co-op students from Drexel University’s Department of Biodiversity, Earth & Environmental Science — Alexis Wiley and Erin Wright — who took part in retrieving a donation of 540-million-year-old fossils from Lancaster, Pennsylvania, and who have been instrumental in inventorying the entire collection.



The team also mentors undergraduate students and young women participating in the Academy’s Women In Natural Sciences (WINS) program. Along with David Velinsky and members of the Academy’s educational staff, the Invertebrate Paleontology team raised funds from Drexel, the Paleontological Society and the American Geophysical Union to provide scholarships for six WINS students to attend a geoscience field camp in Montana and an environmental science field camp in the Poconos over the past two summers. This year, two WINS students will intern as part of the digitization team and will receive scholarships to attend a summer geoscience field camp in Montana via funding from the NSF digitization project described above.

38,515

SPECIMENS from the **CENOZOIC ERA** that **KATY ESTES-SMARGIASSI** has **DIGITIZED** to help **RESEARCHERS UNDERSTAND** how **MARINE ECOSYSTEMS** have responded to **CLIMATIC CHANGES** in the past

5,000

TYPE SPECIMENS in the **HISTORIC INVERTEBRATE PALEONTOLOGY TYPE COLLECTION**

440

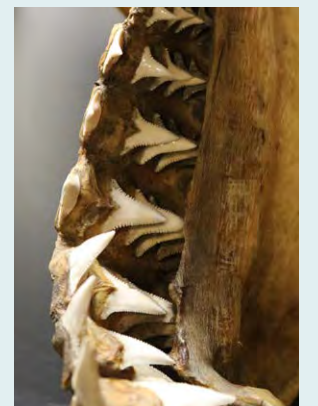
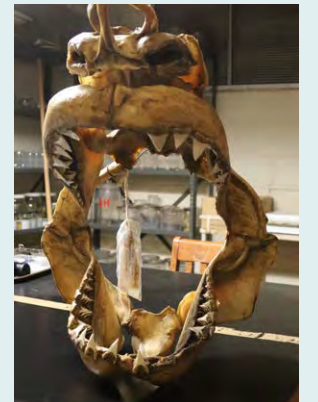
BIRD SKINS and **THOUSANDS OF PARASITES AND TISSUE SAMPLES** ADDED to the **ACADEMY'S ORNITHOLOGY COLLECTION** — the first *Brazilian birds* to be deposited at the Academy since the 1920s

52

PEER-REVIEWED PUBLICATIONS and **OVER 100 PRESENTATIONS** from **CENTER FOR ACADEMY SCIENCES STAFF**



The Academy Collection



The Academy houses one of the world's top natural history collections, with over 18 million specimens of plants and animals from around the world. These collections represent a veritable library of life on Earth.



Tracing Evolutionary Change

Loads of dark chocolate. Reams of toilet paper. Hundreds of hand warmers. Three snowmobiles and a leaf blower to blast snow off fossil-rich rocks.

Academy Curator of Vertebrate Paleontology Ted Daeschler didn't pack lightly for his 2018/2019 expedition to Antarctica.

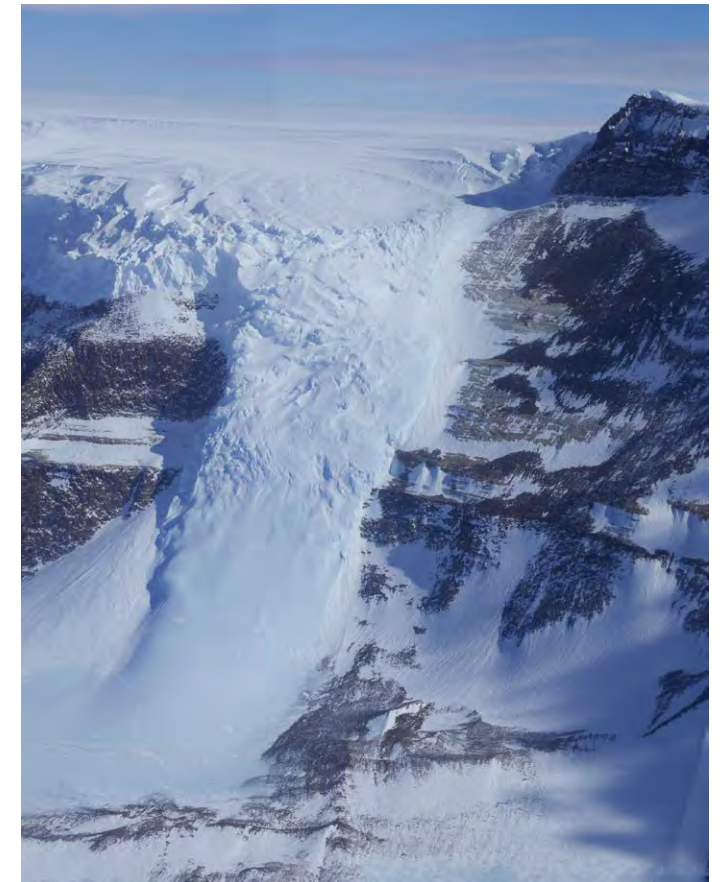
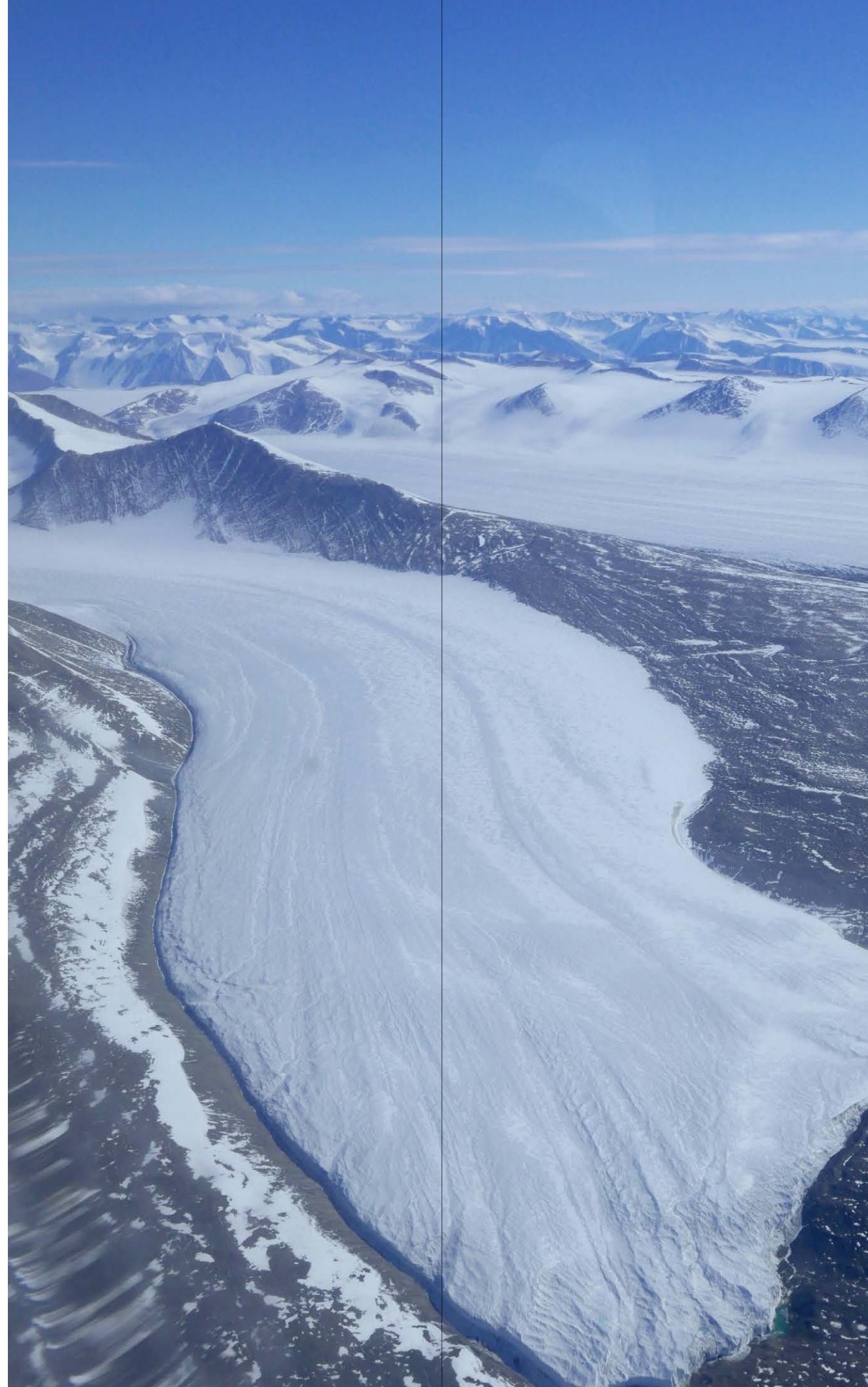
Finding Fossils at the End of the Earth

Funded by the National Science Foundation, Daescher co- led a team for fossil research and collecting in a targeted and extremely remote region in the Transantarctic Mountains of Southern Victoria Land. He was in search of 390-million-year-old vertebrate fossils from the Aztec Siltstone, specimens that will shed more light on the evolution and ecology of the earliest limbed animals.



The team spent the first weeks in Antarctica training for the intense fieldwork ahead. They settled at McMurdo Station, a bustling National Science Foundation research facility where they took classes in field safety, ice travel, crevasse rescue, snowmobile repair and operation, environmental impact mitigation and communications protocols, as well as other safety, waste management and emergency management training.

Unfortunately the expedition was not without its challenges — when they first arrived, blowing snow and “white-out” conditions kept the team in place for five days and left a thick blanket of new snow on the landscape, including obscuring the rock outcrops where they would be searching for fossil fish.



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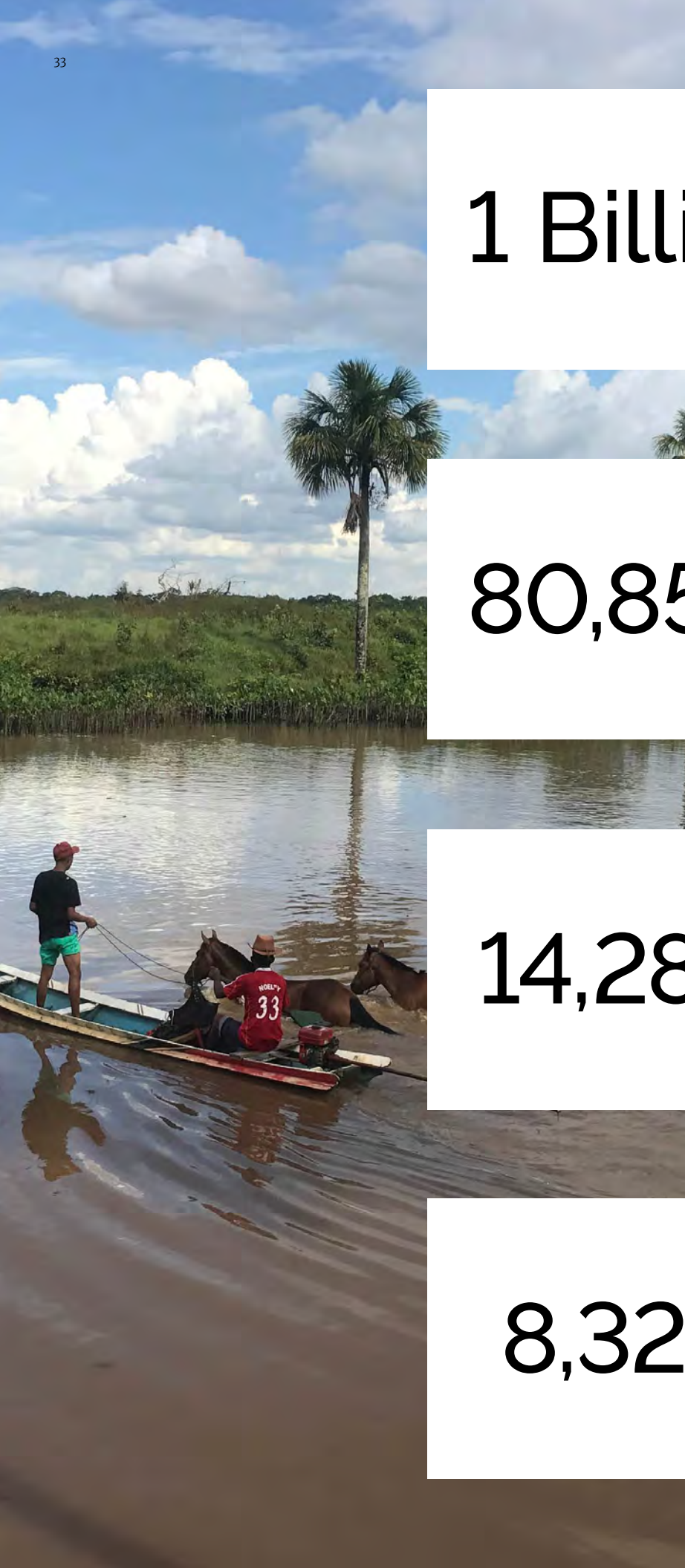
When conditions cleared, the team used snowmobiles to access ridges and peaks that protrude through the ice cap to form the Boomerang Range and the Warren Range. Some of those rock exposures included the Aztec Siltstone, the 385- to 390-million-year-old rock formation that has produced Devonian-age fossil fish. The team focused on these rocks and fossils more than previous scientists had been able to do. They found a number of fossiliferous layers within the 390-million-year-old stream deposits of the Aztec Siltstone, containing a wide variety of early sharks, acanthodians, placoderms and sarcopterygian fish. Their collections are being curated and studied at the Academy.

1 Billion+ **UNIQUE VISITORS**
to online media stories involving the Academy

80,858 **FACEBOOK FANS**

14,286 **TWITTER FOLLOWERS**

8,324 **INSTAGRAM FOLLOWERS**





Taking Responsibility for our Planet

Safeguarding a Stream

It was a sunny day in April 2018 in a peaceful section of Ridley Creek. Bass, trout, sunfish, fallfish, cutlips minnows and common shiners swam along a slow, rippling current. American eels slithered along the stream's muddy bottom, and mayflies buzzed along the reedy banks.

Suddenly, the water parted and a rubber boot appeared, followed by another, and another. A team of Academy scientists was wading into the river, gear in hand, to capture this tranquil moment in time. They were there thanks to Academy members Lynn and Tony Hitschler, who had invited the Academy to come assess the real health of the stream, how much life it supported, the quality of the water and the biodiversity within the stream.

Both Tony, who was previously involved with the Nature Conservancy, and Lynn, who is on the board of American Rivers, are members of the Academy's Lewis and Clark Circle of Giving. As avid fishermen and passionate naturalists, they have been supporting the Academy since the mid-1970s. The Hitschlers are adamant about being good stewards of the environment, including the waters that run through their property, which has been legally protected. They have learned how to plant properly along stream banks to maintain streamside insect populations and have avoided clear cutting to prevent stream bank erosion.



“Every stream goes to a river, and rivers go to the oceans,” Lynn says. “We understand the value of a stream that has been protected.”

The Hitschlers invited Academy fish scientists Rich Horwitz, Paul Overbeck and Mark Sabaj to assess and record the species in the stream. They invited friends and relatives to bring their children to participate in the stream electrofishing and to learn from the work. Everyone — from the scientists to the Hitschlers to the children — put on waders and gear and got into the water. The scientists explained how and why you electrofish a stream, which involves sending an electric current into the water to temporarily stun (but not injure) the fish to assess abundance, density and species composition. They made sure everyone understood what they were doing and why, and then they helped the children scoop fish into nets, handle them carefully, identify them, measure them and record the information for science.



“It was magical, sticking your hand into the belly of mother nature,” Lynn says. “What stood out to us were the teaching abilities of the scientists. They were so communicative and helpful at teaching everyone, from the very young to the very old.”



Even the scientists were surprised at the variety of life they found in the stream. With an abundance of American eels (some 2 feet long!), white suckers, rock bass, pumpkinseed and redbreast sunfishes, bluegills, minnows, common shiners and many more species, it took the scientists nearly a full day to assess and record their finds.



In Memory of Van Reiner

Academy Board of Trustees member Van Reiner passed away in June 2019. He joined the Board in 2014 and brought with him a remarkable reserve of knowledge and experience gained from a long and successful career in business and a transformative tenure as CEO of the Maryland Science Center. He offered boundless energy and endless enthusiasm. He was a delight to work with.

His influence can be seen in the museum today and will be felt for years to come.

In relating the news, his daughter Rebecca recalled that Van talked about the Academy “often and with great affection — he loved the place.” We will miss him very much. Our thoughts and prayers are with Van’s wife, Shirley, his children and his grandchildren.

1,300

MEMBERS attended
the 2018 MEMBERS'
NIGHT EVENT

6,028

MEMBERSHIP
HOUSEHOLDS
ACTIVE in 2018

54,828

VISITS by MEMBERS
using UNLIMITED FREE
GENERAL ADMISSION

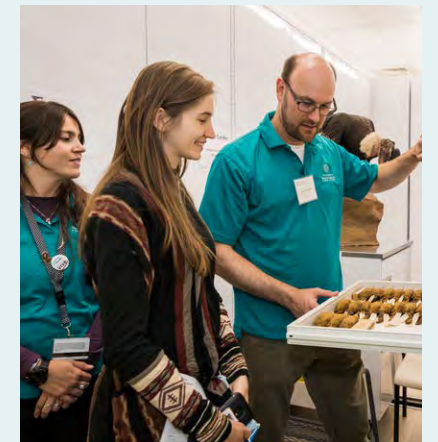
179

YEARS OF PUBLICATION for *THE
PROCEEDINGS OF THE ACADEMY OF
NATURAL SCIENCES*, the LONGEST RUNNING
SERIAL on NATURAL HISTORY and the
ENVIRONMENT published in the Americas



2018 Members' Night

For one night each year, our researchers, scientists and educators welcome members behind the scenes for exciting activities that showcase what the Academy's experts do every day. In 2018, members met our staff, saw our collections and experienced the breadth and depth of work taking place behind the scenes at the museum.



Botany at the Academy: Going Online!

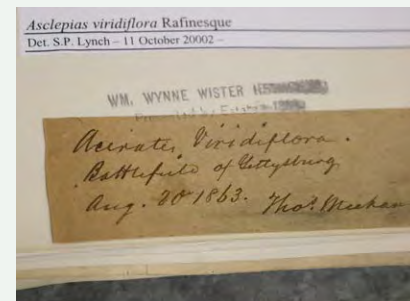
The Academy's herbarium holds some of the oldest and most historically important plant collections in the Americas, with about 1.4 million dried, pressed specimens. With funding from the National Science Foundation, staff, students and volunteers have photographed nearly one-third of the plants in our collection and are busy transcribing the data for each one to be posted online. Scientists worldwide will be able to access the images and data for their work in conservation, taxonomy and environmental science education.

210,000

BOTANICAL SPECIMENS PHOTOGRAPHED in fiscal year 2019

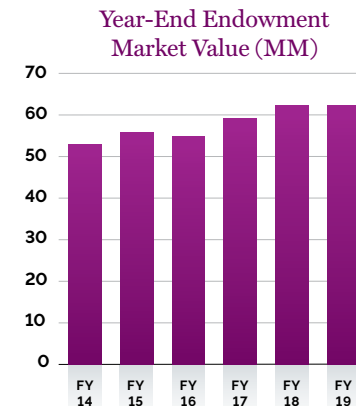
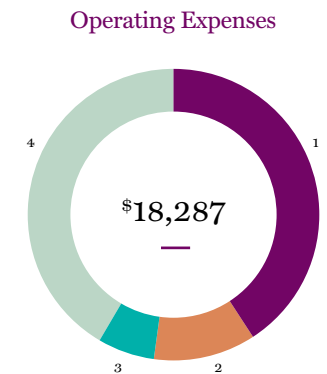
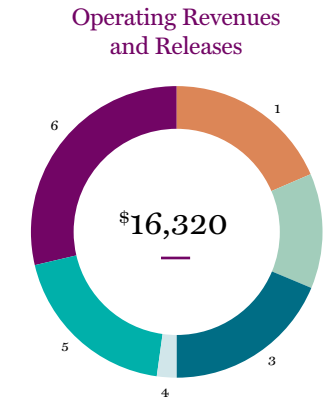
50,000+

HERBARIUM SPECIMENS TRANSCRIBED and ENTERED into ONLINE DATABASES in fiscal year 2019



Statement of Activities

for the Year Ended June 30, 2019
(in thousands)



Operating Revenues and Releases	Without Donor Restrictions	Without Donor Restrictions	Total
1. Grants and Contracts	\$1,448	\$1,594	\$3,042
2. Contributions	1,067	958	2,025
3. Allocations of Endowment Spending from Financial Capital	534	2,536	3,070
4. Investment Income, Net	328	9	337
5. Auxiliary Enterprises	3,145	-	3,145
6. Other Income	4,696	5	4,701
Total Revenues	\$11,218	\$5,102	\$16,320
Net Assets Released from Restriction	5,738	(5,738)	-
Total Revenues and Releases	\$16,956	(\$636)	\$16,320

Operating Expenses

1. Salaries and Wages	\$7,471	-	\$7,471
2. Employee Benefits	2,057	-	2,057
3. Depreciation and Amortization	534	-	534
4. Other Operating Expenses	7,628	-	7,628
Total Expenses	\$18,287	-	\$18,287
Decrease in Net Assets from Operating Activities	(1,331)	(636)	(1,967)

Non-operating

Contributions - Endowment and Other Gifts	-	\$7	\$7
Realized/Unrealized Net Gain on Investments, Net Endowment Payout and Expenses	(7)	47	40
Expenses Related to Frozen Defined Benefit Pension Plan	(1,789)	-	(1,789)
Other Decreases	(26)	-	(26)
Increase / (Decrease) in Net Assets from Non-operating Activities	(\$1,822)	54	(\$1,768)
Total Decrease in Net Assets from Operating Activities	(3,153)	(582)	(1,768)
Net Assets, Beginning of Year	\$5,726	\$79,735	\$85,461
Net Assets, End of Year	\$2,573	\$79,153	\$81,726

Endowment Growth (in millions)

2019	Jun 30	61.880
2018	Jun 30	62.198
2017	Jun 30	59.741
2016	Jun 30	55.032
2015	Jun 30	56.380
2014	Jun 30	53.612

The groundbreaking academic department, Biodiversity, Earth & Environmental Science (BEES), formed upon the affiliation of the Academy and Drexel University, had a full-time equivalent enrollment of 176 students in 2019.

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