



# 2022 Annual Report

# Letter from the President

One year ago, we joined Arizona State University (ASU) as part of the Julie Ann Wrigley Global Futures Laboratory.

This exciting affiliation with ASU opened up expanded research initiatives, education engagements, and shared global goals. A year later we celebrate this new association and look to a future of partnering for innovation.

## School of Ocean Futures

BIOS operates as a vital unit of ASU, working with partners in an innovative collaboration that combines our efforts in Arizona, Hawai'i and Bermuda, bridging research and education across the Atlantic and Pacific oceans in the School of Ocean Futures.

Our goal is to produce research of public value and to work with the public to address critical local and global environment issues and to develop best practices for marine conservation and ocean health.

For our research, we operate major facilities that are integral to monitoring both ocean ecosystems: The R/V Atlantic Explorer in Bermuda and the Airborne Observatory in Hawai'i, at ASU's Center for Global Discovery and Conservation Science. We continue to build on the planet's longest set of ocean observations, anchoring a unique part of a global ocean-observing system that monitors the real-time physical state of the Atlantic Ocean. And we continue to seek



better understanding of what affects the health of the ocean ecosystem.

For serving our communities, we have begun to work as closely aligned teams to engage the public, creating new management practices, and working to invent new technologies that will ensure that the future planet supports vibrant, biodiverse and sustaining ocean ecosystems.

Addressing real-world issues with direct human benefits and merging research results with societal issues; ASU BIOS represents the future of oceanographic research innovation, advancing understanding of the ocean's importance to the planet's overall health.

## Education programs

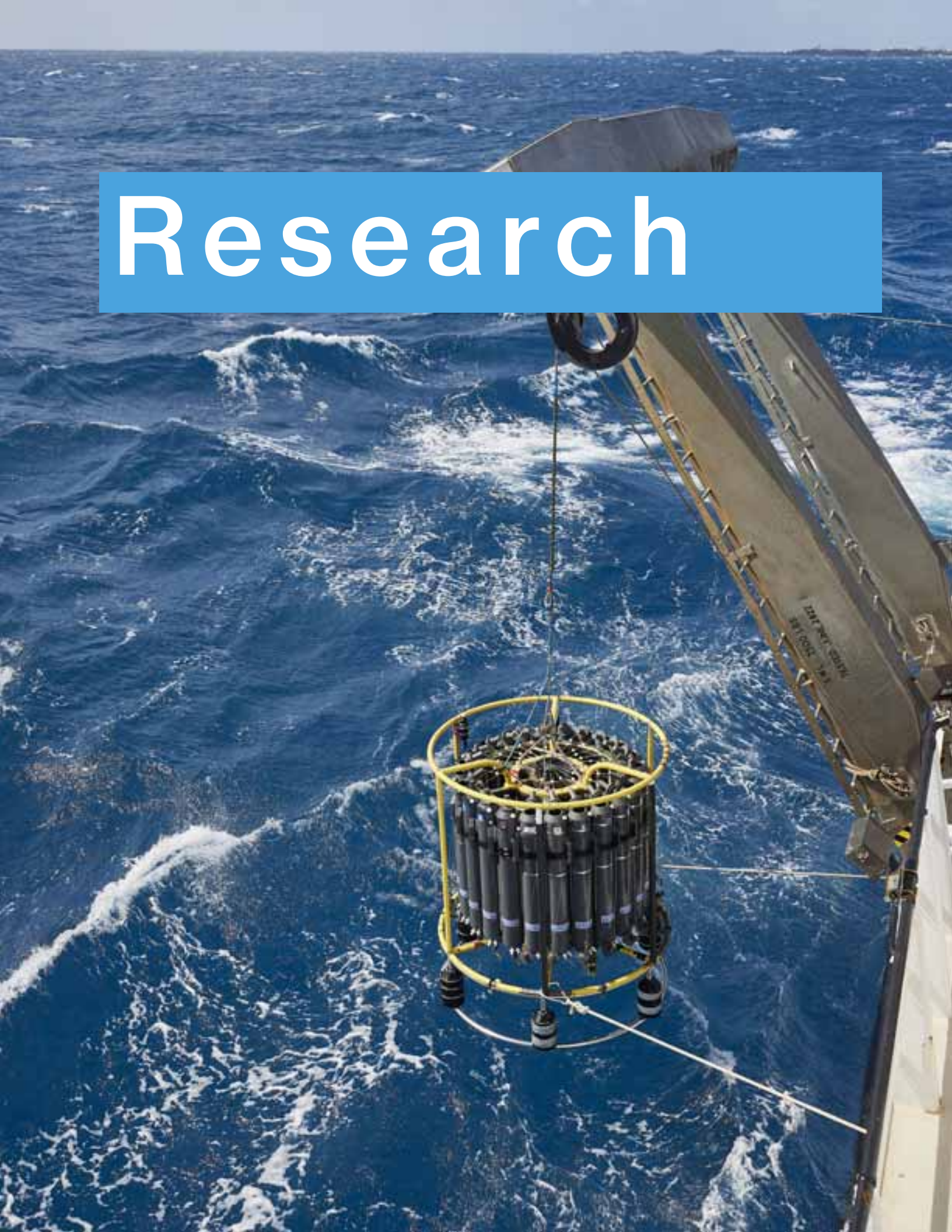
As one of the largest and most innovative universities in the U.S., ASU is com-

mitted to re-imagining education at all levels. We are dedicated to on-island teaching, education and research, and opportunities are expected to grow—meeting the needs of Bermuda's teachers and students as well as providing new opportunities for international students.

The past year has seen an exchange of researchers and faculty between our two institutions as we implement this affiliation. ASU scientists have visited us to participate in ongoing research investigations and our scientists have traveled to ASU to experience the breadth of the Global Futures Laboratory first-hand. Our faculty have begun teaching online courses for students and our education programs have leveraged the expertise of ASU engineers and scientists, introducing students to emerging technologies on the leading edge of ocean science.

William B. Curry  
President & CEO

# Research



# 2022 Year in review

With ocean temperatures rising, researchers say the project could provide clues regarding human interventions that can enhance corals' tolerance to heat. Specifically, the project aims to determine if subjecting corals to thermal "stress conditioning" could yield potential benefits and, if so, build cellular and molecular profiles of more stress-tolerant corals.

With respect to both specific projects and the broader framework that supports our research, the themes of adaptation and resilience permeated our work in 2022. Whether researchers were investigating the ocean's role in climate science and overall planetary health, or officials and staff were navigating components of a dynamic new affiliation with ASU, being resilient and capable of adapting well to shifting conditions were hallmarks of the past year.

As we marked the first full year of BIOS's official alliance with ASU, faculty and students conducted research that advances the scientific community's understanding of how marine chemical and biological systems are affected by changing environmental conditions, as well as how they may be able to adapt and mitigate various stresses.

## Ocean warming, coral resilience

Leveraging assets such as Hydrostation "S" and Bermuda Atlantic Time-series Study (BATS) and the Julie Ann Wrigley Global Futures Laboratory, researchers studied relationships among microbial communities, marine nutrient cycles, and ecosystem functioning, and as well as investigating the health and resilience of coral reefs both nearby and distant from Bermuda.

For corals, field work began in August 2022 on a Heising-Simons Foundation International-supported project investigating what natural capacity corals have for responding to marine heatwaves – defined as regional

events of five or more days of water temperatures above the 90th percentile for an area's historical conditions. Depending on their duration and severity, these short-term, acute events can cause deterioration of relationships between corals and their symbiotic algae, resulting in coral bleaching.

Involving reef-building corals in the Atlantic, Caribbean and Pacific, the project includes researchers from three international scientific and education institutions: marine ecologists Samantha de Putron and Yvonne Sawall, and adjunct faculty member Gretchen Goodbody-Gringley of the Central Caribbean Marine Institute, and ecophysiologicalist Hollie Putnam of the University of Rhode Island. With ocean temperatures rising, researchers say the project could provide clues regarding human interventions that can enhance corals' tolerance to heat. Specifically, the three-year project aims to determine if subjecting corals to thermal "stress conditioning" could yield potential benefits and, if so, build cellular and molecular profiles of more stress-tolerant corals.

## Climate change in Bermuda

Assessing marine organisms' resilience to the impacts of a warming climate and investigating possible adaptation strategies was the focus of two new endeavors during the first half of 2022, beginning with a climate change initiative undertaken in partnership with the financial services group HSBC. Led by Dr. Mark Guishard, adjunct faculty and director of the Bermuda





The project is compiling scientific observations and data into a two-part report highlighting critical climate risks facing Bermuda. The goal is to increase public understanding of the risks in support of building resilience.

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Compiled with the help of two interns, Caroline Alexander and Kendall O'Farrell, and released in July 2022, *Climate Change and Bermuda – Part I: Science and Physical Hazards* synthesizes current knowledge and understanding about Bermuda's climate, including historical trends and variations over the last several decades that will likely affect Bermuda's people, institutions and culture. In addition to documenting the warming of local upper ocean and surface air temperatures, Part I of the report presents scientific analyses and projections indicating continued acceleration of sea level rise and hurricane risk in Bermuda. Part II will explore the societal impacts of climate change locally.

In the same vein, ASU BIOS executives, scientists and staff took part in May in the first Bermuda Climate Summit, organized by the Bermuda Business

Development Agency in partnership with the Association of Bermuda Insurers and Reinsurers and Kroll Bond Rating Agency, LLC (KRBA). Drawing about 150 attendees, including over 70 overseas visitors, the two-day summit gathered business, science and public policy leaders to explore solutions and opportunities for addressing climate risk protection.

A panel on climate science and technologies featured remarks by CEO and President William Curry, along with ASU Vice President Peter Schollosser. Summit attendees also heard from ASU President Dr. Michael M. Crow, who highlighted the partnership between BIOS and his university. Other members of the community participated as session leaders and participants staffed an exhibit booth and led a post-conference tour of the Institute's grounds and research spaces.

Like many large climate meetings, the summit took a broad view of the climate challenge, covering the general science of climate change, as well as related regulatory, business and public policy issues. Meanwhile, 2022 saw scientists continue to delve



Based on 30 years of Sargasso Sea data, the study suggests that the surface ocean may adapt better to climate change than current scientific models take into account, providing insights into how ocean ecosystems respond to climate change

deeply – literally and figuratively – into the intricacies of climate change impacts on marine environments and adaptations that may occur.

### **Carbon cycle**

Faculty members Nicholas Bates and Rod Johnson and adjunct faculty member Mike Lomas of the Bigelow Laboratory for Ocean Sciences were among authors of a pioneering study revealing how microscopic ocean life that drives the carbon cycle in the Atlantic Ocean is adapting to warmer conditions. Published in *Nature Communications* in March 2022, the study found that microscopic organisms that regulate carbon can maintain these vital, life-sustaining processes despite the stress of warmer water associated with climate change.

Based on 30 years of Sargasso Sea data, the study suggests that the surface ocean may adapt better to climate change than current scientific models take into account, providing insights into how ocean ecosystems respond to climate change and highlighting the importance of research for predicting and preparing for environmental impacts.

Research into another major influence on the global carbon cycle, known as “the particle flux”, continued in 2022 thanks to a three-year grant awarded by the U.S. National Science Foundation Chemical Oceanography program in late 2021. One of the world’s longest-running time-series, the Oceanic Flux Program (OFP) has been collecting particle debris at depths up to 10,500 feet (3,200 meters) in the Sargasso Sea since 1978. Comprising a mix of sinking organic and skeletal remains of plankton, as well as microscopic minerals, particle flux deep in the ocean is closely linked to interactions between climate and the ocean’s biology, physics and chemistry. Twice in 2022, the OFP team retrieved flux samples that increase our understanding of the ocean’s sensitivity to a changing climate.

### **Molecular biology**

Also investigating properties of the ocean’s smallest organisms - but in pursuit of an entirely different type of resilience - is a study led by molecular biologist Julius Christopher Barsi into the use of marine bacteria to improve medical imaging outcomes for the millions of people who receive Magnetic Resonance Imaging (MRI) each year. Underway in 2022 and still ongoing, Barsi’s research has the potential to transform the field of medical imaging.

In 2022 we continued longstanding studies into the health of marine ecosystems and their roles in supporting the global environment. At the same time, we undertook novel research to expand knowledge and understanding of ways in which marine systems are affected by environmental change, as well as resilient and adaptive to it.



To enable doctors and technicians to clearly see internal body structures, particularly tumors, about a third of all MRI cases involve the use of a contrast agent requiring gadolinium, an element that is retained in chemotherapy patients' bodies and itself causes further damage. Barsi's research is studying the potential of microscopic organelles called gas vesicles within cyanobacteria (blue-green algae), which possess physical properties that can be harnessed for non-invasive imaging. The process envisioned would administer the mRNA of a gas vesicles encoded with a small protein that can be directly visualized with ultrasound and serve as a safe alternative to existing MRI con-

trast agents. When imaging is complete, vesicles could be collapsed and removed from a patient's body. This research will be advanced through Sargasso Sea surveys to discover which organisms have the desired characteristics.

While adapting to the scientific and administrative collaborations enabled by our new affiliation with ASU, in 2022 we continued longstanding studies into the health of marine ecosystems and their roles in supporting the global environment. At the same time, we undertook novel research to expand knowledge and understanding of ways in which marine systems are affected by environmental change, as well as resilient and adaptive to it.



Studying the ocean and its changes is humanity's best lens into the pace and impacts of global climate change, helping to inform solutions. With recent data indicating these changes are happening faster and more acutely than previously understood, the research, collaborations, and educational endeavors carried out by staff, with support from our forward-thinking funders and partners, is more crucial and urgent than ever before.

# Education





# 2022 Year in review

At the heart of all fields of scientific research is the pursuit of progress. The commitment of our researchers to the pursuit of scientific progress is mirrored by their commitment to advance the skill set of the next generation of scientists. Our education activities span the breadth of our research, and deliver a suite of experiential training opportunities designed to bolster student understanding of the oceanic environment.

## Bermuda Program

Each year more than 1,000 students, ranging from local K-12 pupils through to international graduates, visit ASU BIOS where they gain an advanced set of key skills outside the traditional classroom setting. The Bermuda Program, one training opportunity, offers a unique opportunity for Bermudian students to broaden their knowledge of marine and atmospheric sciences and learn about the daily operations of an active research station while advancing their career prospects.

Operating since 1976, the Bermuda Program has provided almost 300 internship opportunities to young Bermudians, aged 18 and older,

with many applying their summer experiences toward further university studies. Beyond that, some Bermuda Program graduates have successfully translated their summer internships into employment opportunities at ASU BIOS and other related organizations in Bermuda. One such student is Jessica Godfrey.

Growing up in Bermuda Godfrey developed a fascination with the local corals and other sea life. In 2018, Godfrey was accepted into the Bermuda Program where she worked to count coral larval release for research on coral condition and reproduction. Eager to explore other topics in marine science, she participated the following year in the Institute's Marine Plankton Ecology summer course instructed by zooplankton ecologists and faculty members Drs. Leocadio Blanco-Bercial and Amy Maas. She returned to the Bermuda Program in 2020 where she teamed up with Maas to investigate zooplankton found at the Bermuda Atlantic Time-series Study (BATS) site. BATS is one of the longest ocean observing time-series programs in the world, and has collected data on the physical, biological and chemical properties

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Kwe'Shon Woods-Hollis, like many Bermudian students, first discovered BIOS during an elementary school field trip. He has described BIOS as “the gateway that shaped my future” after taking part in a number of our education programs.

of the ocean every month since 1988. Today, Godfrey works alongside Blanco-Bercial and Maas in the Zooplankton Ecology Lab where she utilizes the skills learned as a Bermuda Program student and summer course attendee as she assists in researching zooplankton ecology, physiology, and diversity.

Kwe'Shon Woods-Hollis, like many Bermudian students, first discovered BIOS during an elementary school field trip. He has described it as “the gateway that shaped my future” after taking part in a number of our education programs. In 2014 and 2015 Woods-Hollis took part in the Bermuda Program where he received hands-on training, in the classroom and the field, both on and under the ocean. His participation in the program sparked a passion for the ocean which continues to this day. As a marine systems graduate of The Landing School in Arundel, Maine (U.S.), and a PADI Master SCUBA Diver Trainer, Woods-Hollis is ideally positioned to share his enthusiasm for the marine environment as ASU BIOS's small boats and dock supervisor. Through his role Woods-Hollis supports both research and education activities, pilot-

ing our small boats to areas of scientific interest for researchers to investigate in addition to ensuring safe passage for groups of interns, summer course students, and local learners as they explore Bermuda's marine environment.

A fellow Bermuda Program alum is Claire Fox who was born in Bermuda and has spent her life on the island, other than taking time to attend universities for environmental science studies in Canada and Wales. Her experience at ASU BIOS started in 2010, during the first of two summers spent attending the Bermuda Program. In the Institute's Phytoplankton Ecology Lab she worked with marine biogeochemist Michael Lomas, now at the Bigelow Laboratory for Ocean Sciences in Maine (U.S.). Her time in the lab, and conducting field work on board the research vessel Atlantic Explorer, helped her to forge the skill set required to pursue a career in environmental education.

Following her training at ASU BIOS Fox worked for a variety of island-based science education outlets before returning to ASU BIOS as a science education officer. Fox has progressed from the

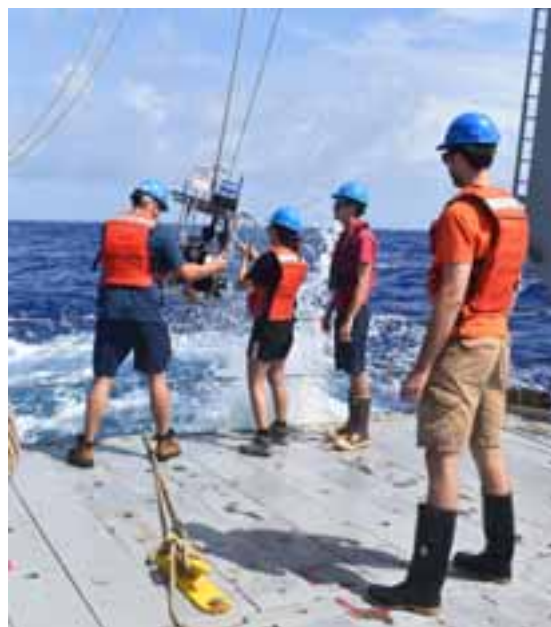
By sharing our world-class scientific research and environmental activities Fox successfully connects local people to their blue backyard through STEM fields. “My most rewarding moments are when I connect with students and show them that science is actually really fun and exciting,”



role of student to teacher and today she delivers a number of education programs for local students and visiting groups. Fox works to expose local students and teachers to science, technology, engineering, and math (STEM) concepts by delivering hands-on training. By sharing our world-class scientific research and environmental activities Fox successfully connects local people to their blue backyard through STEM fields. “My most rewarding moments are when I connect with students and show them that science is actually really fun and exciting,” Fox said.

For decades our educational offerings, such as the Bermuda Program, have served as a solid foundation for future career progression for local and international students. Moving forward as part of Arizona State University’s Julie Ann Wrigley Global Futures Laboratory, ASU BIOS will continue to leverage cutting-edge research to progress the education of learners from around the globe. GFL serves as the cornerstone of ASU’s commitment to sustainability and shaping a

thriving tomorrow for all of Earth’s inhabitants, a goal which requires the nexus between research and education to continue to progress.



# Financial Summary

Fiscal Year 2022 was the inaugural year we have been part of Arizona State University's Julie Ann Wrigley Global Futures Laboratory. Integration efforts focused on ASU and BIOS leadership developing pathways for full integration into the ASU Public Enterprise and exploring new possibilities to a shared vision. Furthering the mission, creating opportunities, and developing connections became the shared strategy for integrating the two entities to expand research and academic activities.

Significant milestones included ASU BIOS faculty accepting tenure-track professorship positions within the School of Ocean Futures (SOF) and School of Earth and Space Exploration (SESE). The SOF was established in mid-2022 with the goal of advancement of learning, discovery and partnerships to shape a thriving global future. As a critical component, ASU BIOS will serve as a strategic center of the SOF and provides to SOF a rich history of research and learning presence in the Atlantic Ocean with more than 120 years of excellence in ocean and atmospheric research.

## **FY 2022 financial developments and highlights include:**

- **Successful transition to conformity to GASB accounting standards as due to its affiliation with ASU.**
- **Cash and investments decreased by approximately \$1.1M due to liquidation of the credit facility and a reduction in significant receivables at year end. \$5.5M in debt principal was repaid during FY 2022, leaving one debt instrument totaling \$0.8M with a major local utility.**
- **Ended FY 2022 with a decrease in net position of \$1.6M primarily due to unrealized losses from endowment investments owing to poor market performances. Net investment losses were approximately \$3.0M.**
- **Operating revenues increased by \$2.2M with the most significant increase due to a significant grant-funded shipyard for the research vessel. Tuition and auxiliary revenues increased due to the addition of an additional summer course and return to in-person learning.**
- **Operating expenses increased by \$2.6M with the largest driver corresponding to the R/V Atlantic Explorer's shipyard expenditures. Instruction and plant costs increased due to resumption of post-pandemic operations.**

The FY 2023 economic outlook incorporates advancement of the integration plan by achieving synergies through collaboration and teamwork. Persistent challenges to full integration within ASU related to differences in legal frameworks and cultures continue to arise, however significant progress has been made to address legal and regulatory concerns regarding full employment of Bermuda-based staff as ASU employees. Expanded research programs for the SOF are currently underway and include the ASU BIOS facility as key participants.

We remain driven by our shared purpose with ASU and the SOF and thank our committed board, dedicated management team, faculty and operational teams who energize the institution. Our generous donors and collaborative teams have the ASU affiliation well-positioned for continued success.

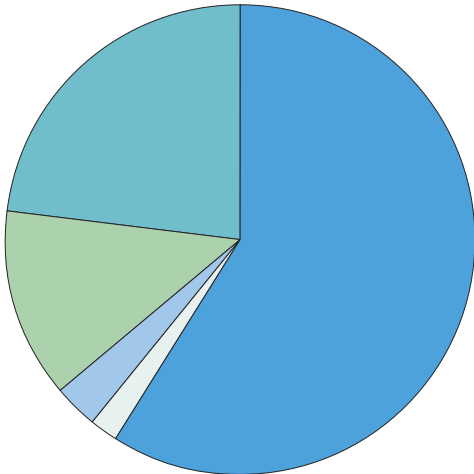
Victoria Millett  
CPA, Treasurer, and Controller

# Summary Financial Highlights

December 31, 2022

## 2022 REVENUES & SUPPORT

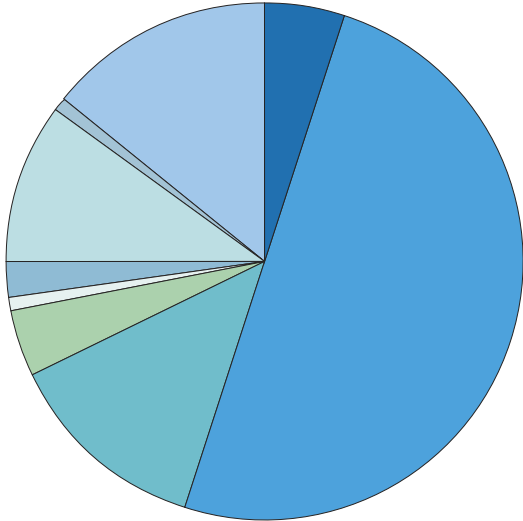
Operating revenue is derived from research grants and contracts (59%), tuition and fees (2%), and auxiliary enterprises (3%). All other sources of revenue are considered as nonoperating revenues.



- Research Grants and Contracts (59%)  
**\$11,470,578**
- Tuition and Fees (2%)  
**\$457,024**
- Auxiliary Enterprises (3%)  
**\$490,828**
- Contributions (13%)  
**\$2,541,071**
- Affiliation and Services Revenues (23%)  
**\$4,381,514**

## 2022 EXPENSES

Operating expenses include research (50%), instruction (5%), institutional support (13%), operation and maintenance of plant (4%), auxiliary enterprises (1%), academic support (2%), and depreciation (10%). All other expenses are considered nonoperating.



- Instruction (5%)  
**\$976,162**
- Research (50%)  
**\$10,594,041**
- Institutional Support (13%)  
**\$2,755,077**
- Operation and Maintenance of Plant (4%)  
**\$753,913**
- Auxiliary Enterprises (1%)  
**\$176,461**
- Academic Support (2%)  
**\$403,393**
- Depreciation (10%)  
**\$2,079,731**
- Interest on Debt (1%)  
**\$279,381**
- Investment and Other Loss (14%)  
**\$2,980,180**

# Summary Financial Highlights

December 31, 2022

## Statements of Net Position

<b>Assets</b>		
Current assets	\$ 7,350,392	\$ 8,436,524
Noncurrent assets	18,643,129	24,536,123
Capital assets, net	15,031,504	15,171,949
<b>Total Assets</b>	<b>41,025,025</b>	<b>48,144,596</b>
<b>Liabilities</b>		
Current liabilities	1,627,313	7,027,399
Noncurrent long-term obligations	807,287	869,445
<b>Total Liabilities</b>	<b>2,434,600</b>	<b>7,896,844</b>
<b>Net Position</b>		
Net Investment in capital assets	14,162,060	8,812,736
Restricted:		
Nonexpendable	10,194,641	10,169,141
Expendable	14,481,920	18,538,978
Unrestricted	(248,196)	2,726,897
<b>Total Net Position</b>	<b>\$ 38,590,425</b>	<b>\$ 40,247,752</b>

## Statements of Revenues, Expenses and Changes in Net Position

<b>Operating Revenues</b>		
Research grants and contracts	\$ 11,470,578	\$ 9,401,465
Tuition and fees	457,024	317,481
Auxiliary enterprises	490,828	463,478
<b>Total operating revenues</b>	<b>12,418,430</b>	<b>10,182,424</b>
<b>Operating Expenses</b>		
	<b>17,738,778</b>	<b>15,122,895</b>
Operating Loss	(5,320,348)	(4,940,471)
Total non operating revenues	6,922,585	7,020,380
Total non operating expenses	(3,259,565)	(508,621)
Total	<b>3,663,021</b>	<b>6,511,759</b>
<b>Net Position</b>		
Net position at beginning of the year	<b>40,247,752</b>	<b>38,676,464</b>
Net position at end of the year	<b>\$ 38,590,425</b>	<b>\$ 40,247,752</b>

A close-up photograph of a laboratory setting. A person wearing a white lab coat and black nitrile gloves is pouring a clear liquid from a glass beaker into a glass flask. The flask is held by the gloved hand and contains a clear liquid. The background is a blurred laboratory bench with yellow safety railings. A blue rectangular box is overlaid on the top left of the image, containing white text.

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Jonny Chapman  
Research Technician

Julius Christopher Barsi, PhD  
Assistant Scientist

Nicholas R. Bates, PhD  
Senior Scientist and  
Associate Director of Research

Leocadio Blanco-Bercial, PhD  
Assistant Scientist

Maureen H. Conte, PhD  
Associate Scientist

Ruth Curry  
Glider Program Manager

Samantha de Putron, PhD  
Senior Lecturer and Associate  
Scientist

Lucinda Derbyshire  
Research Technician

Matt Enright  
Research Specialist

Rebecca Garley  
Research Specialist

Jessica Godfrey  
Research Technician

Hannah Gossner  
Research Technician

Damian Grundle, PhD  
Assistant Scientist

Ali Hochberg  
Research Technician

Eric J. Hochberg, PhD  
Associate Scientist

Brett Jameson  
Postdoctoral Scientist

Rodney J. Johnson, PhD  
Assistant Scientist

Amy Maas, PhD  
Assistant Scientist

Rebecca May  
Research Technician

Claire Medley  
Research Technician

Sheryl Murdock, PhD  
Postdoctoral Researcher

Tim Noyes  
Research Specialist

Rachel J. Parsons  
Microbial Observatory Lab  
Manager

Andrew J. Peters, PhD  
Associate Scientist

Yvonne Sawall, PhD  
Research Fellow

Dom Smith  
Research Technician

Kevin Yongblah  
Research Technician



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Andreas J. Andersson, PhD  
Scripps Institution of  
Oceanography

Craig Carlson, PhD  
University of California, Santa  
Barbara

Steven Giovannoni, PhD  
Oregon State University

Gretchen Goodbody-Gringley,  
PhD  
Assistant Scientist

Michael W. Lomas, PhD  
Bigelow Laboratory for Ocean  
Sciences

Christa Marandino  
Asst Prof, GEOMAR  
Helmholtz  
Centre for Ocean Research  
Kiel

Philippe Rouja, PhD  
Custodian of Historic Wrecks,  
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Samia Sarkis, PhD  
Senior Marine Researcher,  
Department of Conservation  
Services

Struan R. Smith, PhD  
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tute, University of Bergen

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Assistant Director of University  
Programs and Senior Lecturer

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Director of Education and  
Community Engagement

Andrew Peters, PhD  
Director of University  
Programs  
& Associate Scientist

Audrey Pope  
University Programs Internship  
Coordinator, Communications  
and Data Manager

Claire Fox  
Science Education Officer

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Captain  
George Gunther  
Patrick Redmond

Port Captain  
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Lydia Sgorousl

Marine Technician  
Oban Jones

Marine Technician  
Emily Tate

## RV Atlantic Explorer

Relief Chief Mate  
Emily Jarris  
Elijah Herrman (now resigned)  
Richard Chase (one rotation only)

Relief Second Mate  
Jack Cano  
Cleo Reed (one rotation only)

Relief Chief Engineer  
Jens (Mike) Kierkegaard  
Eric Hahn

## RV Atlantic Explorer Crew, Bernhard Schulte Ship-Management Co

Relief Second Mate  
George Yu

Cook  
Dexer Ojano

Cook  
Carlos Calayo

Cook  
Riggie Sanqui

Bosun  
Jojo Paitone

Bosun  
Ronnie De Leon

Motorman 1  
Berlin Jamelo

Motorman 1  
Rodney Jumeras

Motorman 1  
Al Soliva

Able Seaman  
Jhun Mutas

Able Seaman  
Raymund Laureano

Able Seaman  
Joven De Guzman

Ordinary Seaman  
Henderson Cabading

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Joe McCabe  
George Aukon  
Laurie Roy  
Cambria Berger  
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Human Resources Generalist

Chris Flook  
Small Boats and Docks Supervisor

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Accountant

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Kevin Hollis  
Facilities Manager and Safety Officer

Malika Hughey  
Accounting Assistant

Mukesh Kumar  
Head Chef

Michael Lee  
IT Manager

Charlene Millett  
Kitchen Assistant

Victoria Millett, CPA  
CPA Treasurer and Controller

Donika O'Mara  
Office/Room Attendant

Jahlae Outerbridge  
Financial Accountant

Carol Pitcher  
Office/Room Attendant

Helena Simoes  
Chef

Kyla Smith  
Dive Safety Officer

Antar Smith  
Network and Systems Administrator

Kenneth Trott  
Truck/Bus Driver

LeeAnn Tuzo  
Accounts Payable Clerk

Gregory Wade  
General Maintenance

William Welton  
Chief Financial and Operating Officer

Georgianna White  
Laboratory Attendant

Bruce Williams  
Laboratory Operations Technician

Kwe'shon Woods-Hollis  
Small Boats, Docks Supervisor

## Advancement, Marketing, and Communications

Pam Amaral  
Development Officer

Ali Hochberg  
Science Writer and Webmaster

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