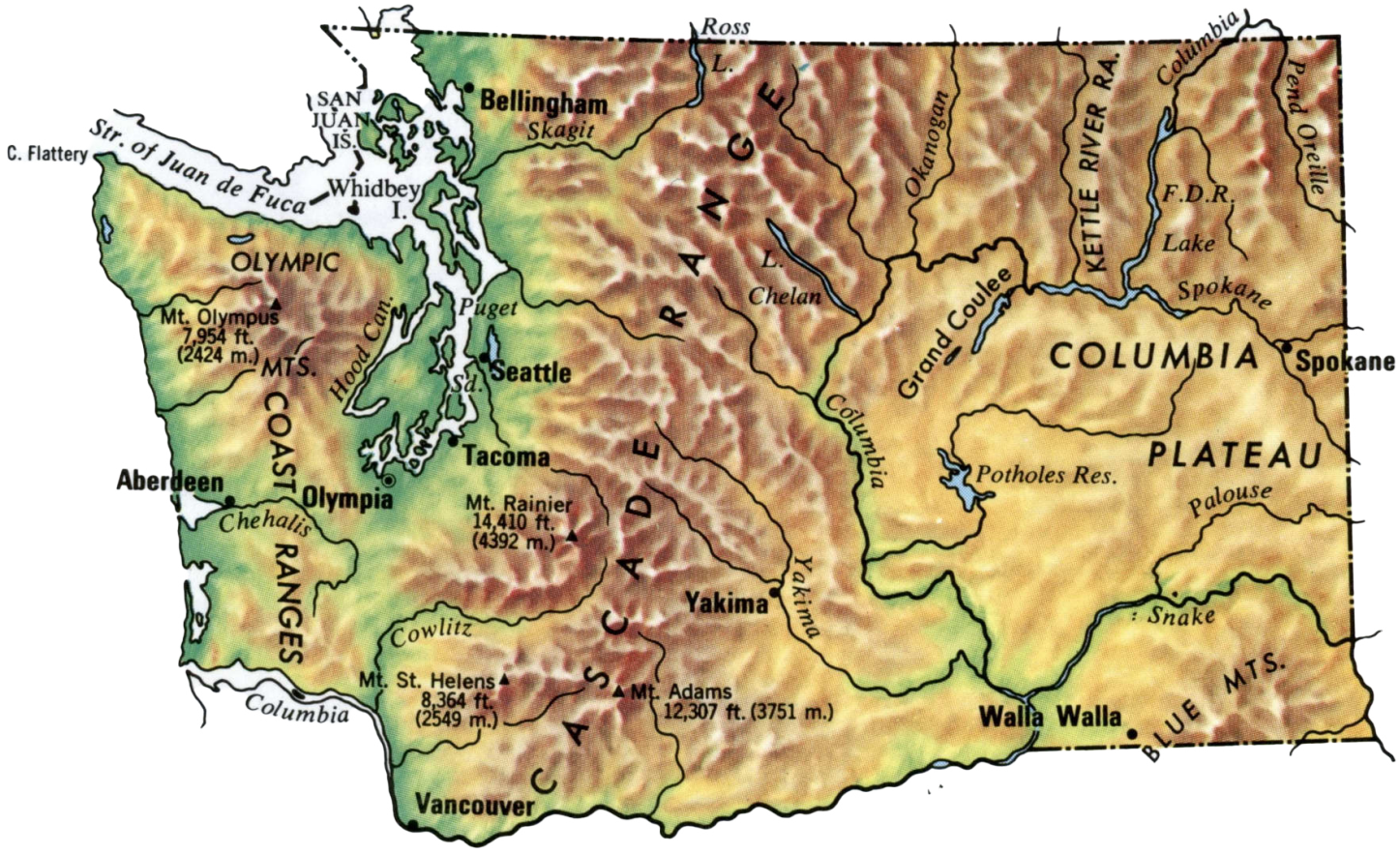
WASHINGTON STATE

Academy of Sciences

Science in the Service of Washington State



2023 ANNUAL REPORT

LETTER FROM THE **PRESIDENT**

Washington is among the few states in the nation served by an independent academy through which leading scientists volunteer in service to the state. In 2022, the Washington State Academy of Sciences' Board of Directors set forth five strategic priorities to strengthen the Academy and enhance our ability to fulfill our mission of 'Science in the service of Washington State'. Over the past year we have made significant progress in advancing these priorities. This progress was possible in large part thanks to an increase in our core funding from the state.

In FY23 we worked with new partners – such as the National Academies of Science, Engineering and Medicine and the University of Washington Mobility Innovation Center – to convene leading thinkers on critical issues. Participants included academic experts, public agency leaders and business community representatives. These meetings provided a unique opportunity for diverse stakeholders to discuss the challenges and opportunities that exist for the state in addressing issues like transportation resiliency and wastewater-based infectious disease surveillance.

For over ten years, the Academy has selected emerging scholars to serve as delegates to the American Junior Academy of Sciences. We have seen firsthand how important these transformational experiences can be in encouraging students to pursue STEM careers. We now have an opportunity to explore how we may use our platform to convene across sectors, disciplines and backgrounds to amplify or complement other science education efforts already underway in the state. To that end, we

WSAS Strategic Priorities

1. Expand WSAS service to Washington State
2. Explore how WSAS can further complement ongoing science education efforts in Washington State
3. Increase diversity, equity, and inclusion throughout the Academy and its activities
4. Increase member engagement
5. Evolve optimal organization structures and processes

are meeting with organizations engaged in this work to better understand the state's science education landscape.

As a leading scientific entity in our state, we recognize that we have a responsibility to champion diversity, equity and inclusion across all of our work. In particular, we believe it is important that Academy membership reflects the full breadth of expertise of scientists and engineers in our state, including those who have traditionally been excluded or underrepresented. This year we created a new board committee to focus specifically on increasing and diversifying the pool of candidates who are nominated for membership.

In FY23 we expanded our staff team – bringing on individuals with expertise in finances, operations and communications best practices – to effectively carry out our work. As a result, we now have greater bandwidth to engage policymakers and other stakeholders across the state to better understand their needs and how we might help. We have also brought on key consultants with extensive knowledge of the Washington State legislature to track science and technology issues currently of interest to policymakers in Olympia. This will help us identify where our members can bring their expertise to bear in support of evidence-based policymaking.

Members are the backbone of the work that we do. To better support members in communicating emerging issues and opportunities to state policymakers, we offered workshops to train members on how to effectively engage policymakers. In addition, now that we have adequate staff support, we are looking to host more activities on a range of topics identified by members from mitigation of environmental toxins to artificial intelligence.

There is no shortage of topics in need of scientific input. We believe that the Academy plays a key role as a nonpartisan, independent organization in bringing together scientists, policymakers and other interested parties to address complex issues by sharing the latest research and exploring new ideas and solutions.

New funding from the state has allowed WSAS to grow in our capacity to respond to the scientific and technological information needs of the state in a timely and ongoing basis. We are grateful for the state's continued support and commitment to policies informed by science, our outstanding staff who support the work that we do, and our members who volunteer their expertise and time for the benefit of our great state. ■

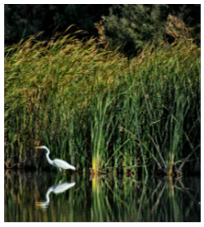
John Roll
President

Professor and Vice Dean for Research
Elson S. Floyd College of Medicine
Washington State University

ABOUT US







WHO WE ARE

The Washington State Academy of Sciences (WSAS) is a nonpartisan, nonprofit organization established by the legislature in 2005 to improve public policies and programs by engaging scientists and engineers in Washington State. Our mission is to provide expert scientific and engineering assessments to inform public policymaking and to increase the impact of research in Washington State.

OUR VALUE

Many issues facing society — from clean energy to artificial intelligence — hinge on science and technology. Effectively addressing these issues requires solid scientific input. WSAS mobilizes experts within and beyond the Academy to provide independent, unbiased, evidence-based scientific and engineering assessments on issues that impact the citizens, governments and businesses of Washington State.

WHAT WE DO

We accomplish our mission by drawing on our statewide pool of distinguished members, state government officials, and other key stakeholders and experts to address critical issues facing Washington State. We organize and conduct multidisciplinary roundtable discussions, workshops, and symposia to assess risks, identify technological opportunities, and define critical research gaps. We use peer review to ensure the studies we conduct, programs and projects we evaluate, and reports we provide are scientifically sound, unbiased resources for informing the development of Washington State policy.

BOARD OF DIRECTORS

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Elson S. Floyd College of Medicine
Washington State University

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Pacific Northwest National Laboratory

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Washington State University

DONNA GERARDI RIORDAN

Executive Director, *ex officio*

* New board member in 2023
† New officer in 2023
‡ Term ended in 2023

TAPPING INTO WASHINGTON STATE EXPERTISE

ACADEMY MEMBERSHIP

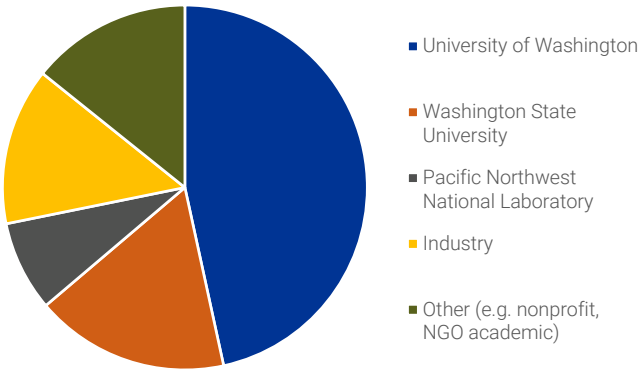
Washington is among the few states in the nation served by an independent academy through which leading scientists volunteer in service to the state. Our 375+ members are nationally recognized for their scientific and technical expertise across physical sciences and mathematics, engineering and technology, biology, agriculture, health, and human behavior.

Members are elected directly to the Academy or are members of the National Academies of Sciences, Engineering and Medicine who reside in Washington state. Members hail from academia, industry, and government research laboratories across the state and represent a variety of scientific and engineering fields.

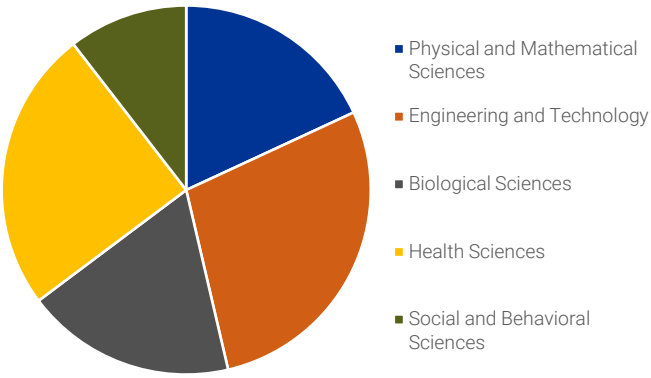
Building a diverse, equitable and inclusive academy

A key goal in WSAS's strategic plan is to increase diversity, equity and inclusion throughout the Academy, including membership. As one means to this end, we have created a new board committee, known as the canvassing committee, which is focused specifically on increasing and diversifying the pool of candidates who are nominated for membership.

Member Affiliation



Member Expertise



29 new members elected to WSAS

WSAS members elected 29 new members in recognition of their outstanding record of scientific and technical achievement, and their willingness to work on behalf of the Academy to bring the best available science to bear on issues within the state of Washington.

The 2023 class of new members is composed of 26 scientists and engineers elected by their WSAS peers and three members recently elected to the National Academies of Science, Engineering, or Medicine, who reside in Washington State.

"WSAS is proud to elevate these exceptional individuals for the many ways in which they have advanced scientific and engineering excellence. We look forward to engaging them in addressing complex societal challenges not only for the benefit of the citizens of Washington State but for all citizens of the world."

John Roll, WSAS President

AN INDEPENDENT RESOURCE FOR WASHINGTON STATE

Scientifically sound reports are a key mechanism through which we advise the state. In FY23 WSAS committees comprised of scientific and technical experts published two key reports. These reports assisted the Washington Department of Fish and Wildlife in considering a net ecological gain standard to improve critical habitats in the state and weighing actions to manage predation of salmon by seals and sea lions.

COMPLETED PROJECTS

Protecting Washington State species and habitats through scientifically informed Net Ecological Gain standards

WSAS convened a committee to advise the Washington Department of Fish and Wildlife on a net ecological gain standard for state land use, development, and environmental laws that could improve statewide performance on ecological health and endangered species recovery. The committee's report outlines a definition, goals, objectives, and performance metrics for a net ecological gain standard; assesses the sufficiency of existing standards in achieving endangered species recovery; and makes recommendations about monitoring and indicators for no net loss and net ecological gain.

View the committee's report.

COMMITTEE

Ronald Thom, Chair, Pacific Northwest National Laboratory (emeritus), WSAS President (2018-2020)

Heather Burpee, University of Washington

Ken Currens, Northwest Indian Fisheries Commission

Heida Diefenderfer, Pacific Northwest National Laboratory and University of Washington

Tim Essington, University of Washington

Anand Jayakaran, Washington State University

Mary Ruckelshaus, Stanford University

Katharine Wellman, Northern Economics, Inc. (retired)

The impact of seals and sea lions on salmon recovery

WSAS convened a committee to review predation of salmon by seals and sea lions. The resulting report, commissioned by the legislature, assisted the Washington Department of Fish and Wildlife in weighing actions to manage these predators.

The committee's report states that seals and sea lions are likely impeding salmon recovery in the Pacific Northwest, but the full impacts of predation on salmon may not be fully understood without lethal intervention.

View the committee's report.

View coverage of this report in the Seattle Times: Sea lions, seals might be hampering WA salmon recovery. What can be done?

COMMITTEE

Daniel Schindler, Chair, University of Washington

Alejandro Acevedo-Gutiérrez, Western Washington University

Mike Etnier, Burke Museum

Tessa Francis, Puget Sound Institute

Ray Hilborn, University of Washington

Megan Moore, National Oceanic and Atmospheric Administration

Jonathan Scordino, Makah Tribe

Kathryn Sobocinski, Western Washington University

Andrew Trites, University of British Columbia

THE POWER OF CONVENING

As a trusted and independent partner within Washington State, WSAS has a unique ability to bring together scientific experts, policymakers and other stakeholders to advance conversations around critical issues facing the state. During this reporting period, WSAS convened leading thinkers to share the latest research and explore new ideas and solutions on several important topics including mitigation of pandemic impacts, transportation resiliency and wastewater surveillance of infectious diseases.

Mitigation of pandemic impacts on children

The COVID-19 pandemic was especially hard on children. The pandemic dramatically interrupted K-12 education for students across the state leading to a range of academic, social, physical, and mental and behavioral health impacts. Moreover, although children generally display less severe symptoms from infection with the SARS-CoV-2 virus, the long-term health effects of infection remain largely unknown.

The 15th annual WSAS symposium brought together researchers, practitioners, and other experts to look at the impacts of COVID-19 on the physical health of children, children's education, and their mental health. The symposium was chaired by John Roll, WSAS President and Professor and Vice Dean for Research, at WSU's Elson S. Floyd College of Medicine.

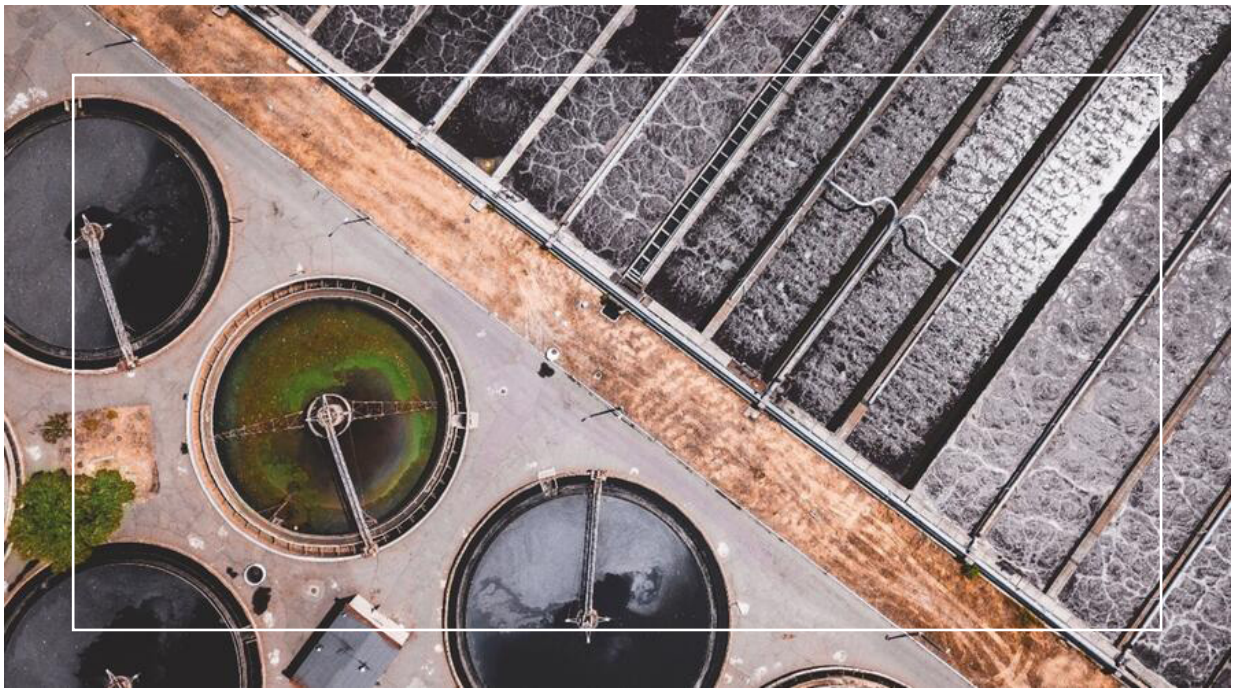
Following this convening, a new collaboration is emerging with the William D. Ruckelshaus Center to support researchers, policymakers, practitioners, and others in addressing the impacts of COVID-19 on Washington's children and applying lessons learned to future emergencies.

Read the symposia proceedings.

Building a resilient transportation system: challenges and opportunities

Together with the Mobility Innovation Center at the University of Washington, WSAS convened public agency leaders, business community representatives, and academic experts to discuss the key challenges and opportunities to creating a resilient transportation system in Washington State and how the research community can help. The meeting was co-chaired by Paula Hammond, Senior Vice President of WSP USA and François Baneyx, WSAS member, Vice Provost of Innovation at the University of Washington and Director of CoMotion.

Read the summary report.



Community wastewater-based infectious disease surveillance – view from the frontlines

WSAS collaborated with the National Academies of Sciences, Engineering and Medicine (NASEM), to convene stakeholders to explore lessons learned from the use of wastewater-based surveillance for COVID-19 in Washington State. The meeting was part of a series of activities being undertaken by the NASEM Committee on Community Wastewater-based Infectious Disease Surveillance to better understand the opportunities and barriers to increasing the use and utility of wastewater surveillance for the prevention and control of infectious diseases in the United States.

DEVELOPING THE FUTURE STEM WORKFORCE

INSPIRING THE NEXT GENERATION

American Junior Academy of Science

The American Junior Academy of Science (AJAS) recognizes America's premier high school STEM students for outstanding scientific research. Every year WSAS selects exceptional students who have demonstrated scientific excellence to serve as delegates representing Washington State at the AJAS conference, which is held in collaboration with the annual meeting of the American Association for the Advancement of Science. The 2023 conference was held in Washington DC on March 1-5. This conference provided AJAS delegates with a unique opportunity to share their research with their peers and other scientists, meet and network with world-renowned scientists and gain exposure to various STEM career paths.

This program is a transformational experience that both celebrates student success and encourages talented, emerging scientists to pursue careers in STEM fields.

View the original research done by these delegates here.

2023 Delegates

OURANIA-MARIA GLEZAKOU-ELBERT
A Comparison of Machine Learning Algorithms in Identifying Higgs Boson Events from the Background

RISHI HAZRA
Characterization of Enzymes by Xray Crystallography

NEHA KOMMAREDDY
A Detailed Statistical Analysis of Anterior Chest Wall Muscle Recruitment

PINYU LIAO
Exploiting Vectokrs of Resistance: In-Silico Discovery of Novel Antibiotic Targets in Plasmid R1 to Combat Antibiotic Resistance

YUYANG LOU
Vehicle Autonavigation System using 3D Machine Learning and SLAM

ASHLYN NEILSEN
13C/18O Isotopic Ratios from Pacific Northwest Fossilized and Present Day Mollusca as an Indicator for Climate Change

SPENCER PELOQUIN
Amazon Elastic Search for Ruby on Rails

ANJALI SREENIVAS
Blood-Based Biomarkers for Alzheimer's Disease

VEDANT SRIVINAS
Intelligent Driver Warning System to Stop Roadkill

RUTH WISE-MALDONADO
What is the Effect Sound Waves Have on Plant Root Physiology and Photosynthesis?

2023 AJAS delegates have gone on to attend the following universities:

- Princeton University
- Harvard University
- University of Washington
- Stanford University
- Old Dominion University

2023 AJAS delegate speaks with keynote speaker and nobel laureate Dr. Bill Philips

"Participating in AJAS was one of the best experiences of my life. Through AJAS, I got the opportunity to attend my first large, in-person scientific conference, while gaining a wealth of support and resources even before the event to refine my research skills and knowledge."

Pinyu Liao, AJAS Fellow '23

TRAINING EARLY CAREER SCIENTISTS TO SUPPORT POLICYMAKERS

CEI Torrance Scholars

WSAS works with the Clean Energy Institute (CEI) at the University of Washington (UW) to provide UW graduate students with an introduction to policymaking at the state level. Students learn about ongoing S&T issues of interest to the state and the role that scientists and engineers can play in advising state legislators. The 2022-2023 scholars carried out background research in support of the Academy's 16th annual symposium on Sustainable Aviation.

TREY PICHON, Bioengineering Graduate Student, University of Washington
JUSTIN POTHOOF, Chemistry Graduate Student, University of Washington

National Science Policy Network SciPol Fellows

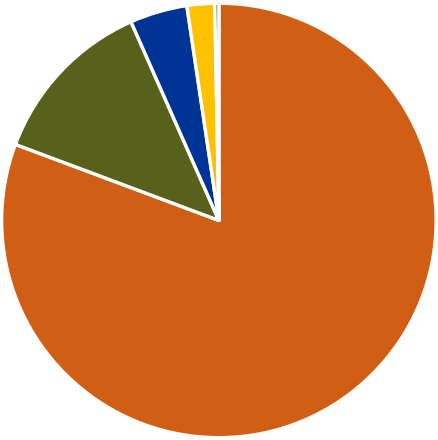
WSAS offers graduate students across the United States hands-on training in science policy through the National Science Policy Network's (NSPN) SciPol Scholars-in-Residence Program (SPSR). This program is designed to help early career scientists build some of the foundational skills and knowledge needed to work in science policy. This year's WSAS scholar-in-residence made significant contributions to a number of WSAS projects including those on transportation resiliency and artificial intelligence.

JOSH FROST, Graduate Student, University of North Carolina

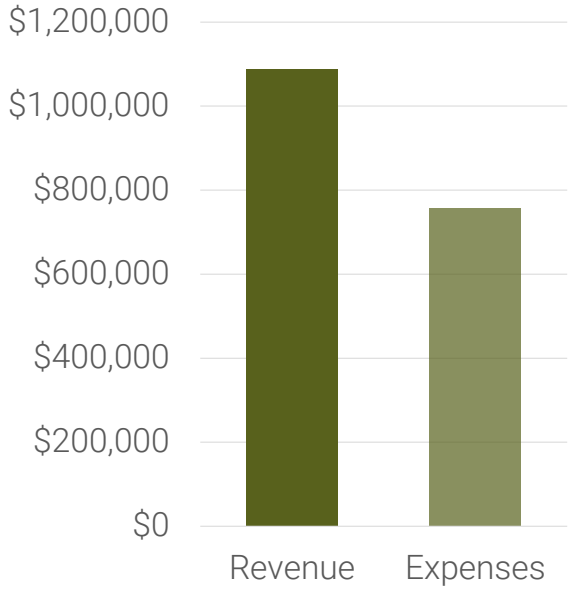
FINANCES FY 2023

REVENUE

State Funding	$876,847
Grants	$137,805
Member Dues	$46,400
Donations	$22,345
Other	$3,273
TOTAL REVENUE	**$1,086,670**



WSAS PERFORMANCE



With the increase in our core funding from the state in FY 23, we were able to begin recruiting new staff, resulting in lower expenses than revenue in FY 23.

THANK YOU!

Donors allow WSAS to:

- Support outstanding high-school students to participate as Washington state delegates in the annual American Junior Academy of Science meeting
- Explore emerging S&T topics of importance to Washington state with members and policymakers
- Interact with policymakers in Olympia and around the state to increase the impact of the WSAS's activities
- Provide paid internships for graduate students interested in S&T policy

$1000+

Brian Atwater
Anjan Bose
Ann Bostrom
Allison Campbell
Gary Foss
Michael Goodchild
Patricia Ann Hunt
Gordon Orians

$250-$999

Donald Baer
Celestina Barbosa-Leiker
Mark Bayer
Dianne Chong
Lee Huntsman
Samson Jenekhe
Henrique Malvar
Marc Mangel
Roger Myers
Ljiljana Pasa-Tolic
Buddy Ratner
James Winton

Up to $249

R. James Cook
Donna Gerardi Riordan
Margaret Heitkemper
Julie Kmec
Bruce Montgomery
Melanie Roberts
Jie Xiao
Anonymous

INCREASE THE IMPACT OF SCIENCE IN WASHINGTON STATE

Making informed decisions or policies on challenges related to energy, water, health, natural resources and more requires access to the best available scientific and technical information. The Academy serves as a nonpartisan, independent bridge between scientists, policymakers and other interested parties to address these challenges by sharing the latest research and exploring new ideas and solutions. Contributions to WSAS help us grow in our capacity to respond to the scientific and technological information needs of the state.

Donate today by visiting washacad.org/support-wsas.

Washington State Academy of Sciences
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