



THE COMMONWEALTH OF VIRGINIA
ENGINEERING & SCIENCE POLICY FELLOWSHIP
A PROGRAM OF THE VIRGINIA ACADEMY OF SCIENCE, ENGINEERING, AND MEDICINE

INTRODUCING
THE NEXT
GENERATION OF
POLICYMAKERS



VASEM
VIRGINIA ACADEMY OF SCIENCE, ENGINEERING, AND MEDICINE



VASEM

VIRGINIA ACADEMY of SCIENCE, ENGINEERING, AND MEDICINE

The Virginia Academy of Science, Engineering, and Medicine is a nonprofit organization consisting of members of the National Academies of Science, Engineering, and Medicine who reside or work in Virginia as well as Virginians who are leaders in these fields. Through its nonpartisan network of experts, the Virginia Academy provides rigorous analytical, technical, and scientific support to inform policy on issues critical to the Commonwealth.

The Virginia Academy also promotes research, fosters interchange among individuals and organizations, and recognizes and honors Virginians who have made major contributions to science, engineering, and medicine.

Thank You

The Virginia Academy would like to thank our committed sponsors—Christopher Newport University, George Mason University, Old Dominion University, Virginia Commonwealth University, Virginia Tech, University of Virginia, and William & Mary—and our generous funders—The MITRE Corporation, Huntington Ingalls, and Virginia Innovation Partnership Corporation—for helping us provide a diverse and talented group of science and engineering graduate students with the opportunity to serve in policymaking positions at Virginia institutions.

FROM THE PROGRAM COORDINATOR

As program coordinator for almost four years, I have witnessed the steady growth of the Commonwealth of Virginia Engineering and Science (COVES) Policy Fellowship program. As word has spread about the great work COVES fellows do, more host offices have signed on, allowing us to increase our summer cohort size from six to around 15. To date, 28 host offices—state agencies, legislators’ offices, and nonprofits—have thrown open their doors to COVES fellows. Many now do so every year, counting on COVES fellows to take on projects they can’t carry out with available staff. To date, they have hosted 44 fellows from 10 universities.

As a member of the very first COVES cohort in 2020, I know from firsthand experience how the COVES program changes lives, helping students find a path forward that enables them to combine their love of science and engineering with policy. I am completing my PhD in biomedical engineering, exploring the use of focused ultrasound beams to create and collapse air bubbles within breast cancer tumors, breaking the mass apart and destroying cancer cells. I am also working as part of a collaborative team, called TEAM (Technology-Education-Advocacy-Medicine) Malawi, to bring this technology to southern Malawi as a sustainable means of treating cancer in this area.

My experience as a COVES fellow at Virginia Bio, a nonprofit advancing innovation in the life sciences, opened my eyes to the possibility that I could apply my engineering skills to science policy and diplomacy—and make a real difference. And as COVES program coordinator, I have been excited to see other young scientists and engineers come to the same realization. Even if COVES fellows decide to retain their focus on science and engineering, they come away from their COVES fellowship understanding how important it is that policy be grounded in fact.

My hope, as I move on, is that readers of this publication will do what they can to strengthen the COVES Policy Fellowship program. We invite your support.



Sarah Hall
COVES Policy Fellowship Program Coordinator

vasem.org/covesfellowship-program



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COVES POLICY FELLOWSHIP PROGRAM

“Each year, our COVES fellows exhibit open-mindedness, inquisitiveness, and dedication to the task.”

—**ALETHEA LAMBERT**, RECOVERY-ORIENTED SERVICES MANAGER, OFFICE OF RECOVERY SERVICES, DEPARTMENT OF BEHAVIORAL HEALTH AND DEVELOPMENTAL SERVICE

“Our COVES fellow’s work exceeded expectations. We extended her work to creating structures to help teachers with students’ socio-emotional health.”

—**ANNE PETERSEN**, SCIENCE COORDINATOR, DEPARTMENT OF EDUCATION, OFFICE OF STEM & INNOVATION

The Commonwealth of Virginia Engineering and Science (COVES) Policy Fellowship program aims to strengthen the scientific and technical capacity of state government, private industry, and nonprofit organizations in the Commonwealth of Virginia by encouraging and equipping young scientists and engineers to be effective advisors for public policy.

MAKING A VITAL CONNECTION

The challenges leaders face today—in such areas as health, climate, and security—are unprecedented in their scope, complexity, and urgency. All too often, however, decision-makers lack access to the accurate and impartial scientific and technical information needed to act decisively and wisely. The obstacle: a critical shortage of scientists and engineers with the necessary training to be effective policy advisors.

The Virginia Academy of Science, Engineering, and Medicine created the Commonwealth of Virginia Engineering and Science (COVES) Policy Fellowship program to help bridge that gap. Although many young scientists and engineers are eager to take a more active role in policymaking, the opportunities to gain the skills and experience to make meaningful contributions are limited during their graduate careers. Thanks to the fellowship, they can now have those opportunities.

The COVES Policy Fellowship program enables young researchers to spend 12 weeks during the summer months serving as science and technology advisors in legislative offices and executive agencies as well as with prominent Virginia companies and nonprofits.

The COVES Policy Fellowship program has already improved the capacity of institutions throughout Virginia to make policy. Fellows have served at the following organizations:

- Department of Behavioral Health and Developmental Services
- Department of Conservation and Recreation
- Department of Education
- Department of Environmental Quality
- Department of Forestry
- Department of Health
- Department of Planning and Budget
- Department of Transportation
- Dominion Energy, Public Policy Department
- Joint Commission on Health Care
- Joint Commission on Technology and Science

“Thanks to the work of our COVES fellow, we have a thorough documentation of the eight primary resources Virginia has to help balance Virginia’s budget. This is the first time they have been thoroughly documented, which is pivotal for agency succession planning and training.”

—CHRISTY BERRY, SENIOR BUDGET AND POLICY ANALYST, DEPARTMENT OF PLANNING AND BUDGET

A COMPELLING OPPORTUNITY

The fellowship program has been carefully designed to ensure that both fellows and host offices gain maximum benefit from the experience. It is modeled after successful programs developed by such organizations as the National Academies of Sciences, Engineering, and Medicine and the American Association for the Advancement of Science:

- **Fellows are current** graduate students from universities across the Commonwealth and are selected based on career interests, desire to learn, and scientific integrity.
- **They are matched** with offices involved in policy decisions based on mutual interests and the offices’ need for assistance researching policy proposals, drafting policy documents, or organizing policy meetings and events.
- **The program begins** with a science policy bootcamp and orientation, which introduces fellows to the fundamentals of science policy and communications as well as governance and policymaking in the Commonwealth of Virginia.
- **In addition to** their work in policy offices, COVES fellows are paired with a mentor from the Virginia Academy and participate in academy briefings, committee meetings, and an annual summit.
- **Fellows receive** a summer stipend.

SPONSORS, FUNDERS, AND HOSTS

Christopher Newport University, George Mason University, Old Dominion University, Virginia Commonwealth University, Virginia Tech, University of Virginia, and William & Mary currently sponsor fellows. In addition, The MITRE Corporation, Huntington Ingalls, and Virginia Innovation Partnership Corporation are funding students from Virginia’s historically black colleges and universities—including Virginia State University and Norfolk State University—as well as other minority fellows.

Host offices have been so impressed by the caliber of our fellows that they have continued working with many of them after they completed the 12-week program, and several host offices have extended full-time offers. In collaboration with their host offices, fellows have published blog posts, science policy documents, and reports highlighting challenges facing the Commonwealth.

- Office of Delegate Rodney Willett
- Office of Delegate Sally Hudson
- Office of Senator Ghazala Hashmi
- Office of Senator Jennifer McClellan
- Office of the Secretary of Education
- Office of the Secretary of Natural and Historic Resources
- Senate Finance and Appropriations Committee
- State Council of Higher Education for Virginia
- The Port of Virginia
- Virginia Bio
- Virginia Board for People with Disabilities
- Virginia Innovation Partnership Corporation
- Virginia Marine Resources Commission

CHANGING LIVES

The goal of the COVES program is to acquaint graduate students in science and technology with the process of policymaking and to enable them to explore career options in this area. In many cases, the COVES experience has confirmed their existing interest or encouraged them to shift career goals.

Of our first four cohorts, more than a third are now pursuing careers in policy. They include the following:

- **Ryan Chaban**, fellow at the Advanced Research Projects Agency–Energy (ARPA-E)
- **Janey Dike**, doctoral student in clinical psychology at Virginia Tech and research policy intern with the Louisiana Policy Institute for Children
- **Frankie Edwards**, researcher with the Washington State Department of Social and Health Services
- **Alissa Ganser**, doctoral student in fish and wildlife conservation at Virginia Tech
- **Chelsea Gray**, National Oceanic and Atmospheric Administration (NOAA) Knauss Marine Policy Fellow
- **Tara Illgner**, Client Engagement Lead with Global CCS Institute
- **Nikita Lad**, doctoral student in environmental science and policy at George Mason University
- **Allison Lepp**, NOAA Knauss Marine Policy Fellow
- **Margaret Nagai-Singer**, Science and Policy Fellow of the American Association for the Advancement of Science, serving at the National Institutes of Health
- **Erin Robartes**, research scientist with the Virginia Transportation Research Council
- **Yezi Yang**, doctoral student in geochemistry at Virginia Tech



MARGARET NAGAI-SINGER

COVES GRADUATE SECURES PRESTIGIOUS AAAS FELLOWSHIP

As a doctoral student at Virginia Tech, Margaret Nagai-Singer became increasingly aware that she was drawn to a career combining science and public policy, which is not, she realized, a simple proposition. “There is so much encapsulated in the phrase science policy and so many ways to get involved,” she says. Margaret credits her summer as a COVES fellow at the Virginia Department of Forestry with helping her begin to understand how she might find a path forward.

Margaret’s project was to summarize the latest findings on the role trees and forests play in protecting water quality and, after consultation with stakeholders, formulate policy recommendations consistent with state law that would encourage landowners to preserve their woodlands.

“The COVES fellowship was perfect for me,” she says. “I liked the idea of jumping from the local to the state level, and, although challenging, the fellowship was short enough that I could stay on track to graduate.”

The COVES fellowship also has helped her accomplish a cherished goal. From the start of her graduate career, Margaret had set her sights on earning a Science & Technology Policy Fellowship from the American Association for the Advancement of Science (AAAS). This year, after completing her PhD, Margaret was selected for this prestigious program, which places fellows across all three federal government branches. As a staff member of the National Institutes of Health Office of Dietary Supplements (ODS), she is helping to advance dietary supplement research and disseminate science-based information about supplements. Margaret also hopes to investigate sustainable agricultural methods that could be used to produce dietary supplements.

“The COVES fellowship was an important steppingstone for me,” she says. “It gave me a sense of the different ways to approach science policy and demonstrated that I could apply the mindset I gained as a graduate student conducting cancer research to other areas of science.”



COVES policy fellows showcased their summer projects at the 2023 VASEM Summit. Kaushal Kafle (shown with VASEM board member Anita Jones) presented a poster on “Expanding Computer Science Learning Opportunities in K-12 Instruction in Virginia Schools” while Nisat Ara Nipa’s poster was entitled “Recommendations for Founder Friendly Intellectual Property Licensing Policy.”

2023 COVES POLICY FELLOWS

The 2023 cohort of COVES policy fellows was a diverse group of young scientists and engineers from a variety of fields, united by the desire to apply their expertise for the common good. Among their many contributions this year, they identified sources of federal funding to ensure the safety of Virginia’s dams, shed light on the lack of perinatal services available to rural Virginians, and assessed the effectiveness of Virginia’s current efforts to address health care workforce shortages.

MOHAMMED ALREZQ

Host: Department of Planning and Budget

Home Institution: Mohammed is a doctoral student in industrial and systems engineering at Virginia Tech.

Summer Responsibilities: To ensure that Virginia accurately anticipates fluctuations in its General Funds revenues, Mohammed examined four decades of economic records and took initial steps to correlate decreases in Virginia’s General Fund with the national economy and cataloged eight options for balancing the state’s budget during economic downturns.

“This fellowship introduced me to science policy, and the tremendous support I received from the COVES director and my mentor helped me better leverage my skillsets.”





SHELITA AUGUSTUS

Host: Virginia Bio

Home Institution: Shelita is a doctoral student in applied science at William & Mary.

Summer Responsibilities: Shelita wrote a white paper reviewing innovative financing that could be used to encourage manufacturers to develop therapies for rare diseases. Her paper was part of Virginia Bio's efforts to defeat prescription drug legislation that would lead to price caps and potentially discourage innovation.

"My work tangibly furthered the nonprofit organization's mission of making innovative and life-saving care available and accessible to those in need."



JULI DUTTA

Host: Department of Conservation and Recreation

Home Institution: Juli completed a master's degree in computer science at Norfolk State University.

Summer Responsibilities: To help ensure the stability of Virginia's dams, Juli identified several sources of federal funding for dam safety. She documented their requirements, other states' use of these funds, and the possibility of securing FEMA funding under the National Dam Safety Program.

"COVES' weekly speakers were critical in allowing me to learn more about science policy, science communication, and jobs in these fields."



ZHENYI HUANG

Host: Department of Health, Office of Minority Health and Health Equity

Home Institution: Zhenyi is a doctoral student in statistical science at George Mason University.

Summer Responsibilities: To shed light on the lack of perinatal services available to rural Virginians and to encourage effective interventions, Zhenyi leveraged tools like ArcGIS, R, and Microsoft Access and discovered a significant correlation between longer travel times to health care providers and lower education levels with a higher likelihood of low birth-weight infants.

"I am profoundly grateful to the COVES Policy Fellowship, mentors, and colleagues who enriched this transformative journey. This experience ignited my passion for meaningful research."

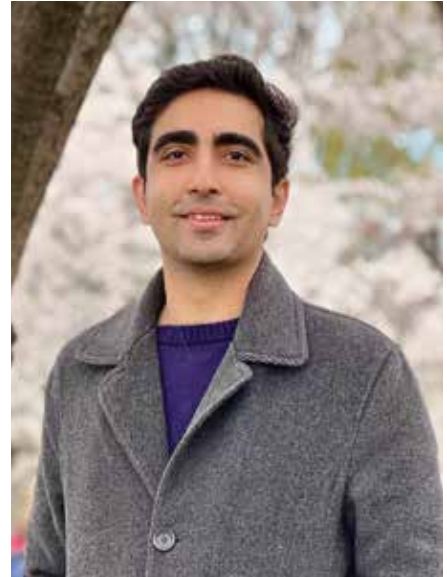
KAUSHAL KAFLE

Host: Department of Education, Office of STEM and Innovation, Computer Science

Home Institution: Kaushal is a doctoral student in computer science at William & Mary.

Summer Responsibilities: Kaushal's project was designed to help the Department of Education expand opportunities for teaching computer science in K–12 classrooms. He compared the computer science education policies of Virginia with other states, analyzed such factors as the types of computer science courses available, and provided data-driven recommendations.

“The fellowship has inspired me to think about my own research in a broader context of helping the public and the community at large.”



JASMINE LEWIS

Host: Department of Education, Office of STEM and Innovation, Science

Home Institution: Jasmine is a doctoral student in biological psychology at Virginia Tech.

Summer Responsibilities: Jasmine collaborated with the Virginia Department of Education's Science Instruction Team to review Standards of Learning (SOLs) and associated resources that support K-12 science education in Virginia. Among other activities, she reviewed the SOLs for Anatomy and Physiology and surveyed Virginia scientists on their career pathways.

“The COVES Policy Fellowship has shown me the importance of educational policy in shaping curricula, teaching methodologies, and student outcomes.”



SARAH MORTON

Host: Joint Commission on Health Care

Home Institution: Sarah is a doctoral student in health psychology at Virginia Commonwealth University.

Summer Responsibilities: Sarah assessed the effectiveness of Virginia's current efforts to address health care workforce shortages. Using publicly available data and interviews with stakeholders, she developed a detailed inventory of health workforce programs that included information about their goals, reach, costs, and overall effectiveness.

“The COVES Policy Fellowship exposed me to a variety of science policy career pathways and helped me develop the skills necessary to pursue a career in policy advisement.”





GEOVANI MUÑOZ

Host: Department of Behavioral Health and Developmental Services, Office of Recovery Services (ORS)

Home Institution: Geovani is a doctoral student in counseling psychology at Virginia Commonwealth University.

Summer Responsibilities: As a COVES fellow, Geovani helped ORS create a quality assurance measurement that could be used to assess recovery residences throughout the state. To produce his report, he researched government agencies with similar initiatives, examined national standards for recovery residences, and joined ORS staff for site visits.

“I greatly appreciated the opportunity of working alongside the ORS staff and hope to continue my journey in policy research.”



NISHAT ARA NIPA

Host: Virginia Innovation Partnership Corporation, Commercialization Division

Home Institution: Nishat is a doctoral student in electrical engineering at Old Dominion University.

Summer Responsibilities: Nishat contributed to a white paper on facilitating the commercialization of university-based intellectual property. This involved comprehensive research, interviews with stakeholders, and analysis of best practices. The outcome was a series of recommendations for founder-friendly IP licensing policies and practices in Virginia universities.

“My experience as a COVES fellow has been immensely rewarding, strengthening my desire to pursue a career that harmonizes academia, industry, and policy.”



TERI RAMEY

Host: Department of Forestry

Home Institution: Teri completed a master's degree in environmental science at Christopher Newport University and is currently a doctoral student in integrated life sciences at the University of Georgia.

Summer Responsibilities: While working directly with Assistant State Forester Terry Lasher on the Virginia Clean Economy Act, Teri attended several stakeholder meetings that provided insight into behind-the-scenes policymaking and conducted a literature review on the value of a carbon life-cycle analysis when evaluating the use of biomass as fuel.

“One of the most valuable parts of this fellowship is the opportunity to meet and work with so many like-minded individuals.”

REILLY STILES

Host: Department of Environmental Quality (DEQ)

Home Institution: Reilly is a master's student in climate science at George Mason University.

Summer Responsibilities: Reilly helped revise Virginia House Bill 206, which outlines the DEQ's Small Renewable Energy Permit-by-Rule program for solar projects of less than 150 megawatts. He researched such issues as the environmental impacts of solar farms, solar siting in adjacent states, agrivoltaics, and carbon emission offsets from solar energy.

"I learned that science policy is simultaneously a slow and fast process and that the future of renewable energy use depends on improved solar energy policy."



DUC TRAN

Host: Department of Conservation and Recreation (DCR), Floodplain Management

Home Institution: Duc is a doctoral student in civil engineering at the University of Virginia.

Summer Responsibilities: Duc focused on a new floodplain module, the Dam Safety Information System, which provides essential data for the National Flood Insurance Program. As part of his responsibilities, he reached out to stakeholders, collected essential data sets, reviewed ordinances, and updated DCR's templates and letters.

"This program has profoundly affected my research aspirations. I plan to continue my involvement with the policymaking community, drawing on the knowledge and skills honed during this fellowship."



DREON WHEATLEY-OWENS

Host: Office of the Secretary of Natural and Historic Resources

Home Institution: Dreon completed a master's degree in computer science at Virginia State University.

Summer Responsibilities: Dreon collected information from state agencies to create trackable metrics reflecting their implementation of Executive Order 17, which mandates that Virginia executive agencies implement recycling policies. As part of his work, he identified ways for them to comply more efficiently with the order.

"I am appreciative of the exposure I gained through the fellowship program and for the opportunity to interact with a range of state agencies."





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