UNIVERSITY of VIRGINIA

ENVIRONMENTAL RESILIENCE INSTITUTE

Review Report, October 2021

Our Mission and Vision

The Environmental Resilience Institute (ERI) brings together faculty and students from across Grounds to do interdisciplinary sustainability and resilience research, with a focus on climate change. Effective and lasting solutions to problems as complex as climate change require collaboration and integration of science, technology, economics, law, policy, and cultural perspectives. Such research must explore the interactions of human society with natural systems, which is inherently interdisciplinary.

In this report we describe how ERI plays a central role at UVA as a bridge between schools, enhancing ongoing research activity and strengths. We give examples of how ERI's activities and seed funding have created new and productive interdisciplinary collaborations that would have otherwise not have existed. The capacity building that ERI provides is critical to advancing UVA's research preeminence in the sustainability and resilience research area, a priority of the President's 2030 Strategic Plan, and it enables UVA researchers to maximize their role in finding sustainability solutions. Our work across Grounds enhances UVA's research culture, student training, public impact, reputation, and ability to garner external research funding – all of which contribute to the "great and good" of UVA's mission.

ERI's programs focus on solutions-oriented research. We do this in two ways:

1. **Foster new interdisciplinary research**. We build collaborative teams to tackle the fundamentally interdisciplinary problem of sustainability and resilience. We do so by providing seed funding to jumpstart new team research, by leading significant new integrated research initiatives, by building an interdisciplinary community across Grounds, and by training the next generation of scholars in solutions-oriented research.

2. **Translate research into action.** We develop partnerships outside of the university to close the gap between academic research and solution adoption. Our partners include government agencies, non-profit organizations, businesses, community organizations, citizens, and more. These partnerships both identify research needs and help translate research findings so that they can be put to use.

Our vision is that ERI serves as the hub for sustainability and resilience research at UVA. We will continue to pull together new interdisciplinary teams through seed grant programs and build on the success of those teams by developing new, interdisciplinary research initiatives that break through the barriers between schools and search for solutions that make the interactions between humans and the planet more sustainable. Through fellowships and training programs, we also create a robust community of faculty, graduate students, and post-doctoral scholars from across grounds. Finally, by creating this "infrastructure" of interdisciplinary teams and communities, we position UVA for success in seeking center-scale grants federal grants and funding from a variety of other sources, including individual donors and foundations interested in the environment.

Our Value and Achievements

The University of Virginia (along with most other universities) faces structural barriers to conducting interdisciplinary and solutions-focused research. ERI has had remarkable success to date in creating pathways for effective collaborations across the University, but we have more work to do.

Many schools and departments do not value or provide incentives for the activities needed to do truly engaged interdisciplinary research. Funding for such activities is also difficult to obtain through traditional research grants. Larger grants that integrate research on human and natural systems require extensive and deep interdisciplinary collaborations in order to be competitive. ERI has broken down some of these barriers through a combination of effort and financial resources, as evidenced by a number of recent large-scale awards and publications, but it is essential that UVA continue to build on that progress to ensure it is self-sustaining moving forward.

ERI By the Numbers

118	Faculty Funded
400+	Faculty Network
27	CoLabs
10	Rapid Grants
3	Research Initiatives
$22.5M	ROI in External Funding
$800k	Private Philanthropy
66	Events
4400	Participants at Events
5	Post-doctoral Fellows
26	Student Research Fellows
94	Student Interns

We describe progress towards the institute's two goals: 1) fostering new interdisciplinary sustainability research, and 2) translating research into action. We give specific examples that highlight some of our successes to date and provide data that quantify our outcomes.

Fostering New Interdisciplinary Research

Convening and Community Building

In four years, ERI has built a diverse network of faculty members focused on environmental resilience and sustainability from 30 departments in 9 schools and two centers; 118 faculty have received seed funding and 400 have either participated in research teams or events (Figure 1). Our leadership is deeply interdisciplinary. The ERI Steering Committee consists of ten faculty members from five schools, including two chaired professors who were part of the six-faculty cluster hire in Environmental Resilience. The ERI Leadership team represents three schools.

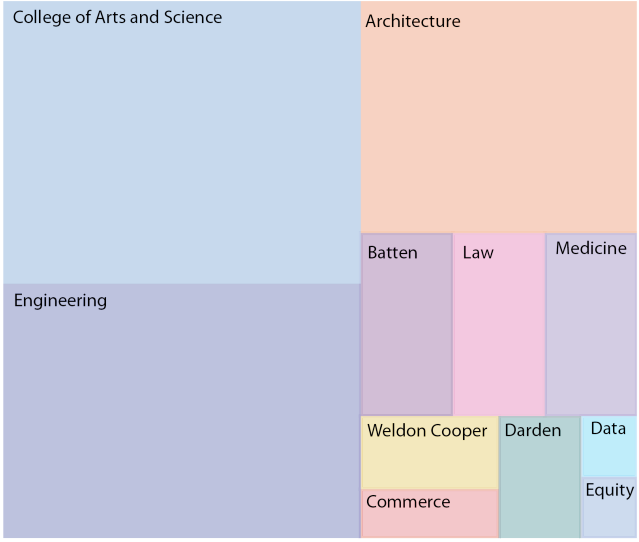

Figure 1. ERI has faculty from 9 schools and 2 institutes. The size of the blocks represents the number of faculty.

ERI hosts a wide variety of convening events including lunch symposia, lecture series, working groups, and larger events like the Climate Ambition Summit and the Environmental Futures Forum. To date, 4400 people have attended 66 ERI events; 3000 people participated in the Climate Ambition Summit in Spring 2021. The Summit was a 2-week series of events done in collaboration with UVA Engagement and was tremendously successful in reaching a broad swath of people both inside and outside of the University. Repeat participation and the expansion of our newsletter mailing list is evidence of our success in building a collaborative community focused on environmental resilience and sustainability. The ERI monthly newsletter now reaches 2500 people, including faculty, staff, students, alumni and others.

Our annual event, the Environmental Futures Forum, showcases ERI-sponsored research and brings the community together to discuss new ideas. One of the outcomes of the 2019 Forum was a successful proposal to the Jefferson Trust to support the development of a curriculum for "Accelerating Interdisciplinary Readiness." We are using this funding to develop online training modules for design thinking, team science, and community engagement, and to apply these modules to climate resilience research. We did not hold the Forum in 2020 due to COVID restrictions, and in 2021 we used it as an opportunity to generate ideas for the Grand Challenges process.

ERI's student training programs continue to be very popular. We have funded summer graduate research fellowships that also can include an undergraduate research assistant. In total, ERI has supported 26 student research fellows. In addition, ERI has worked closely with the UVA Career Center and the Office of Graduate and Post-doctoral Affairs to provide opportunities for 1-2 week volunteer externships during J-term and 6-week paid internships during summer. Nearly 700 students have applied for these

opportunities, and we have been able to support 94 of them. Host organizations include the House Select Committee on Climate, Climate Works, the Department of Energy, the Chesapeake Bay Foundation, the Environmental Defense Fund, The Nature Conservancy, Green Fin Studio, and the World Wildlife Fund, among others. Most recently as part of ERI's Climate Ambition Summit, we developed with the Career Center a project-based interdisciplinary experiential learning program for students with outside partners (e.g., Climate Registry, the U.S. Geological Survey, the Local Energy Alliance Program).

External to UVA, ERI is a member of the "Resilience Roundtable," a consortium of Virginia research universities that holds events to exchange knowledge and collaborate to build capacity to address urgent coastal issues. ERI also is represented on the Board of Directors of Resilient Virginia, a non-profit organization focused on accelerating planning to promote resilience in communities across the Commonwealth (Jonah Fogel, ERI Program Manager serves on board). In 2019, ERI co-hosted the 2-day Resilient Virginia Conference, involving 300 people from over 100 organizations.

Seed Funding through CoLab and Rapid Response Grants

ERI's seed funding through Collaboration Labs (CoLabs) and Rapid Response grants have sparked new collaborations across disciplines and schools that will grow capacity at the University to work toward sustainability solutions and to put faculty in stronger positions to garner external support. By actively building and funding a collaborative network, we foster new research endeavors that would not otherwise occur within traditional departments and individual schools.

Since its inception, ERI has funded 43 interdisciplinary projects with 118 faculty members. The return on investment in seed-funded project grants and initiatives to external funding has been 10:1, with $22.5 million in 119 awards to date from government agencies (e.g., NSF), private donors, and foundations to research efforts seeded by ERI grants (Figure 2). Much of the external funding for our CoLab teams has come from cross-directorate programs, for which ERI seed funding has positioned UVA researchers well for success (e.g., NSF's Navigating the New Arctic, Coasts and People, Smart and Connected Communities). Our CoLab funding model is to provide $30k for projects involving three or more faculty members from at least two departments or schools. In 2019, we allowed CoLabs to

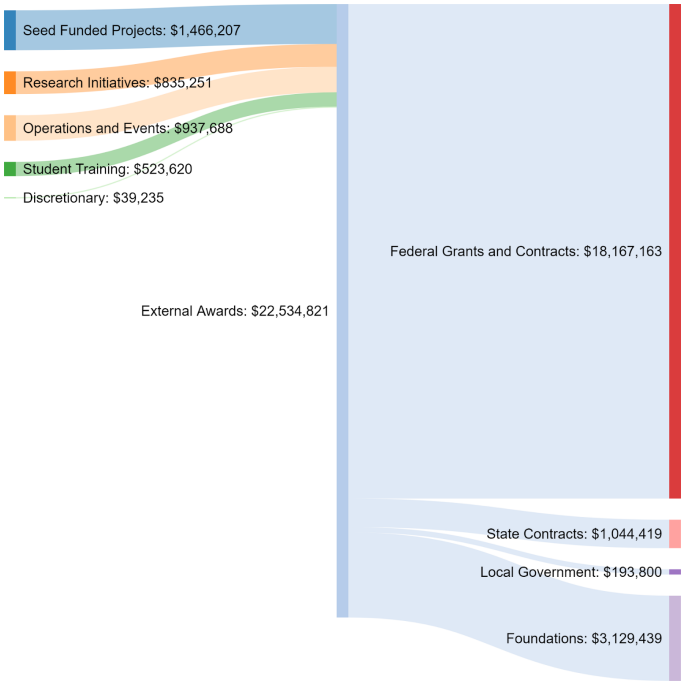

Figure 2. Return on investment for ERI seed funding for interdisciplinary projects.

request additional support for a post-doctoral fellow. We have also funded Rapid Response Grants that provide up to $15k to fund time-sensitive projects related to pressing events or to get timely information into the hands of decision makers. ERI funded six Rapid Response Grants in the wake of major hurricanes that hit the Caribbean and U.S. Atlantic coast in 2017 – 2018, and four Covid-related projects in 2020. CoLab and Rapid Response Grants typically involve students and provide excellent training in interdisciplinary team research.

Successes from ERI CoLab and Rapid Response teams include the following:

- In 2018, ERI provided CoLab funding (including for a post-doctoral fellow) to develop a project on climate resilience in the Arctic. That Collab project led to a $4 million in grants from the National Science Foundation. The team includes researchers from environmental sciences, engineering, the Arctic Design Group in the School of Architecture, and the School of Data Sciences who are working in the northernmost settlement in the U.S. Arctic, where climate warming is more than twice the rate of anywhere else on earth. They are designing and monitoring a network of environmental sensors to help the community better understand climate impacts and develop designs for buildings and infrastructure that increase community resilience and minimize environmental impacts. ERI was instrumental in both providing the initial funding to jumpstart the research and in connecting faculty across grounds to create the interdisciplinary team. The co-production of knowledge with the local community and multi-sector stakeholders (e.g., Army Corps of Engineers) is key for making the research and design elements actionable.

- ERI funded a CoLab team (in collaboration with the VPR's 3Cavs Program) that included faculty from engineering, economics, and environmental sciences to model how the most widely studied negative emissions technologies – bioenergy with carbon capture and storage, reforestation, and direct air capture – can be scaled at the global level to offset current CO_2 emissions. The team evaluated the effects of these technologies on global food supply, water use, and energy demand to come up with realistic scenarios of implementation. The work was published in *Nature Climate Change* and was the impetus for what has become one of ERI's central research initiatives, the Climate Restoration Initiative (see below). This team won $600k from the Sloan Foundation to model pathways toward decarbonization.

- A CoLab team from engineering, psychology, and policy developed a project studying how "subtraction blindness" leads people to apply an implicit bias to add rather than subtract when trying to bring about change or improvement. The idea is that this leads people to generate solutions that are objectively worse, for example, generating designs that waste resources. This work resulted in a *Nature* paper that was highlighted on the cover (Figure 3), a highly acclaimed book "The Untapped Science of Less," and extensive media coverage on how subtraction can find better solutions for climate change, racial disparities, and more.

- ERI brings new and more diverse voices to the table that are not always included in the resilience and sustainability dialogue (e.g., arts, religious studies, medicine). For example, in the wake of the two worst hurricanes in Puerto Rico's history, ERI funded a Rapid Response grant to study community resilience, focusing on the role of the arts to build community and political agency. Artists and musicians from Puerto Rico and throughout the Caribbean came to UVA to participate in a week-long series of events, "Convergences: Arts, Sciences and Humanities in Conversation." In November 2021, UVA will host "Coasts in Crisis," a digital exhibit of art after hurricanes, co-sponsored by ERI. Andres Clarens was able to connect with this project's network of arts, humanities, and social science scholars in Puerto Rico to enhance modeling he was doing on grid resilience. The result was a 2021 paper on predictive modeling for capacity expansion in grid design, featured on the cover of Nature Energy (Figure 3).

Figure 3. Publications from ERI funded work total more than 100 and growing. Examples of high-impact publications include two that have the cover of *Nature* and *Nature Energy* in 2021.

Integrated Research Initiatives

In addition to smaller seed grants, we have launched three larger and longer-term efforts in priority areas where UVA has faculty strength and where there are opportunities for external funding. ERI leadership has done the work to pull these efforts together and to obtain the necessary funding.

1. Water Futures Initiative

ERI launched the two-year Water Futures Initiative in May 2019 with a $300,000 donation from the Fiddlehead Fund. This pan-university initiative created interdisciplinary, multi-institution teams, each led by a pair of Faculty Fellows, one from UVA and one from a partner university. Each team included a post-doctoral fellow and student researchers. Teams focused on: 1) saltwater intrusion and coastal flooding; 2) resilient urban water systems; and 3) global water scarcity and water justice. The teams have had great successes. One team won a NSF award from the Dynamics of Integrated Socio-Environmental (DISES) program for a Research Coordination Network. Among the teams' publications is a high-profile review in *BioScience* on global water values that was co-authored by 14 researchers from six departments/schools at UVA and five partner universities in the U.S. and abroad. Two of the initiative's

post-doctoral fellows have secured highly competitive jobs – one at Stanford and another at the Pacific Northwest National Laboratory.

2. Climate Resilience Initiative

The Climate Resilience Initiative was launched in 2020 with a $100,000 grant from the Jefferson Trust matched by ERI funds. This initiative has brought together faculty and students from five UVA schools and is focusing on developing an integrated assessment of carbon removal ("negative emissions") strategies to help the state of Virginia meet its net-zero carbon goals by 2050. The project is the first of its kind to evaluate the full potential for carbon removal that can be implemented at realistic scales, including those that are both nature and technology based. With the team's progress to date, ERI was well positioned to write a $3 million proposal to expand and expand the work through a funding opportunity, which is now pending.

One of the unique aspects of this initiative is its focus on the societal effects of carbon removal strategies, most of which require large amounts of land. Researchers are looking not just at a level of reforestation (for example) that is theoretically possible in Virginia, but also at the impact on and perspectives of Virginia communities to locking up large amounts of land in new forest. This work will in turn provide feedback to national models and a more realistic estimate of what is achievable. The team includes faculty from engineering, environmental sciences, economics, planning, policy and law to assess the full range of relevant questions. If the additional funding is secured, we will expand the team to include more faculty in climate equity, policy and legal analysis, and social behavior and decision making. The initiative will give an estimate of the realistic potential CO_2 removal in Virginia, the impacts and co-benefits of implementing particular negative emissions strategies, and a set of policy tools for exploring, incentivizing, and governing carbon removal strategies. This will be done in collaboration with state agencies and other stakeholders and will be accessible to the public.

3. Coastal Futures Hub

ERI's newest initiative is the Coastal Futures Hub, recently funded by a $5 million grant from the NSF's new Coastal and People (CoPe) Program. ERI pulled together a team from environmental sciences, engineering, the Equity Center, Biocomplexity Institute, and Institute for Engagement and Negotiation, as well as William and Mary's Coastal Policy Center and Old Dominion University's Resilience Collaborative. This was the inaugural cycle of the new highly competitive funding opportunity; our proposal was one of only five proposals funded. The goal of the project is to build capacity for climate resilience in rural coastal communities where sea-level rise and storm flooding threaten water sustainability and impact basic needs of food production, transportation, and job security. Rural regions are hit disproportionately hard by the long-term impact of climate change. At the same time, they lack access to scientific information, and face challenges of geographic isolation, unstructured governance, lack of coordination among communities, and limited institutional capacity.

The project couples environmental and social science data and modeling with engagement of community stakeholders at every stage of the project. In doing so, it meaningfully broadens participation of traditionally underserved and vulnerable coastal communities, the result being the co-production of knowledge that will enable more effective planning for disasters that both minimize risk and facilitate recovery. The outcome of the project will be a Climate Equity Atlas, an interactive resource that will provide data, modeling and visualization tools. The Atlas will help communities make decisions that meet their needs, are equitable for all members of the community, and promote long-term sustainability.

Translating Research Into Action

To maximize impact, research results need to be effectively communicated to policy makers, businesses, communities, and others. To date, ERI has done this through participation in government advisory committees, development of decision-support tools, and community engagement. We describe some examples below.

Government Advisory Committees

ERI is recognized in the state as an important resource for sustainability policy expertise. The Institute is represented on two Governor's committees, the Climate Resilience Technical Advisory Committee (TAC) and the Governor's Carbon Sequestration Task Force, and an advisory committee for the Joint Commission on Technology and Science.

- The Climate Resilience TAC is developing the first Coastal Resilience Master Plan for the state of Virginia. Karen McGlathery serves on the TAC and is co-chair of the Studies, Research and Best Practices Subcommittee.

- The Carbon Sequestration Task Force is evaluating possible methods of increasing nature-based carbon sequestration in the state. This aligns squarely with ERI's Climate Restoration Initiative described above. ERI is in a unique position to influence state policy. Karen McGlathery serves on the Task Force, and is contributing ERI's initial findings to the report that will be presented to the General Assembly in January 2022.

- The Virginia General Assembly directed the Joint Commission on Technology and Science to study the consequences of weather and climate-related events in coastal Virginia. Jon Goodall, ERI Steering Committee member, was the lead author of the Virginia Academy of Science, Engineering, and Medicine report on this topic to the Commission. His research focuses on rainfall predictions and coastal flooding in Virginia's coastal cities and is central to the committee's analysis of climate risk.

Decision-Support Tools

ERI projects are creating open-source decision-support tools for stakeholders to use in assessing climate risk and climate actions. These on-line tools combine data, modeling, and visualization (e.g., maps) to help community stakeholders understand the consequences of particular adaptation or mitigation actions. As these tools are developed, we plan to invest in translation and dissemination, including stakeholder engagement workshops, training sessions, and public conferences. Two of the tools are described below.

- The Equity Atlas for the Eastern Shore of Virginia that is now part of the CoPe project described above, is a collaboration between ERI, UVA's Equity Center and Coastal Research Center, and community leaders on the Eastern Shore. The Equity Atlas is an interactive, data-visualization tool that shows socio-economic factors that influence community resilience. This is a first step in producing the Climate Equity Atlas for the CoPe project descrived above that will also include information on climate risk, social networks, and behavioral decisions.

- The Carbon Sequestration GIS-based mapping tool is being developed as part of the Climate Restoration Initiative described above. This tool will combine environmental, technological, and social data such as land use and land cover (e.g., forest, wetland, agriculture, residential), socio-economic information (e.g., population size, demographics), and public policy information (e.g., zoning) to allow stakeholders to realistically assess the potential for deploying negative emissions strategies in Virginia.

Community Engagement

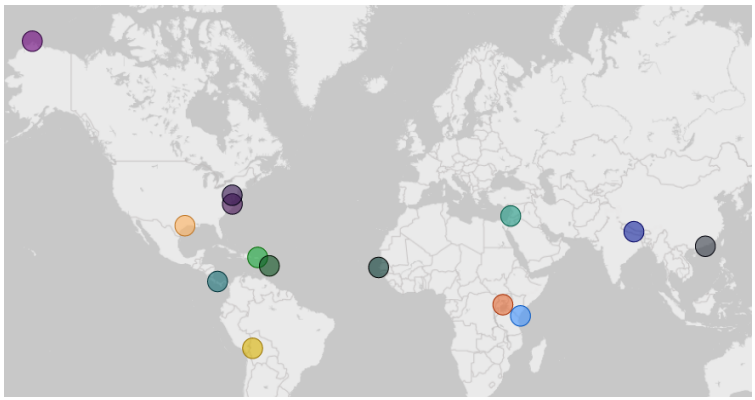

Figure 4. Global distribution of ERI- funded projects.

Effective community engagement is increasingly recognized as a critical component of sustainability research. NSF and other funding sources now frequently require local partner networks as part of winning research proposals. We know the community engagement and authentic co-production contributed to the success of both the Arctic and CoPe proposals. ERI's ability to maintain a network of community partners across the globe is an asset for UVA. Our researchers make findings more useful stakeholders by incorporating them and their communities from a project's start to finish. While some of our funded research focuses on the Commonwealth, we have supported many projects and communities throughout the world (Figure 4).

Highlights of ERI's community engagement work include:

- Interdisciplinary teams are connecting history and culture, land-use planning, human health, and environmental quality and are partnering with universities and cities in Africa (e.g., Kenya, Uganda, and Senegal). The collaboration has created locally sponsored activities with positive climate adaptation and health outcomes.

- Researchers are engaging with local partners to explore how religions in the Middle East and northern Alaska are shaping (and shaped by) the dynamics of global environmental change. Studying relationships between culture and environment through lived experience is crucial to making sustainability decisions in a changing climate.

- ERI hosted Virginia's first statewide Solar Summit in 2018 to explore policy and economic dimensions of renewable energy adoption. This led to $170k in funding from the Energy Foundation to co-host the Virginia Solar Initiative, technical assistance service for localities, in partnership with the Weldon Cooper Center.

Our Challenges

ERI was created in part to help overcome the institutional barriers to interdisciplinary research that is solutions focused and engaged with outside partners. We have had success in overcoming these barriers, but they still exist. Creating interdisciplinary teams requires both funding as an incentive, but more importantly constant effort to bring people together to share ideas and to explore new avenues of work, and to also to recruit researchers to teams for initiatives that are crystallizing. For example, the Climate Restoration Initiative arose out of a seed-funded project that ERI expanded by organizing a conference to explore whether and how to create a focused initiative on climate restoration at UVA. This was followed by several months of effort both pulling a team together to focus on the work and pursuing sources of funding, including a successful Jefferson Trust proposal and a pending $3 million cy pres proposal. We have built a collaborative network across grounds (Figure 5), but we recognize that we still need to broaden this and to do more work to bring in scholars in the social sciences, humanities, and medicine. We have close connections with the Environmental Humanities Consortium, the Coastal Futures Conservatory, the Democracy Institute's new Repair Lab on environmental justice, and with some faculty in public health, but we need to build more relationships that

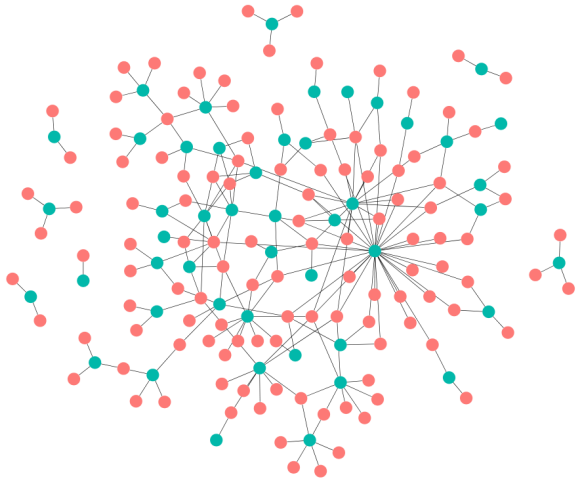

Figure 5. Network of ERI projects (green) and people (orange).

will foster collaborative projects. One example is the Climate and Public Health Conference we will be co-hosting in Spring 2022 with the School of Medicine.

The lesson from experiences like this, we believe, is that fostering research that is interdisciplinary and solutions-focused is an ongoing process that requires a long-term commitment of effort and resources. Without both of those most research would remain cabined in traditional departments. This is why so many universities have raised major gifts and created some form of long-term institutional commitment to sustainability related research. Our own biggest challenge and opportunity in overcoming the traditional incentive structure is, of course, resources. With more investment we could take advantage of more opportunities and provide more incentives for faculty to participate in research initiatives. In particular, a key to dramatically increasing faculty participation is adequate funding for faculty fellowships, post-doctoral fellows, and graduate students. Where we have been able to obtain that level of funding, we have been successful in fostering faculty commitment that is both deep and enduring.

A second challenge is that we have not had funding to devote enough effort to the translational components of ERI research. In the first two years, we hired a writer to produce *Issues in Brief* for each funded project that highlighted key outcomes for a public audience. We also maintain an active social media presence. Beyond that, writing summaries of research for policy makers, organizing workshops with partners, media-related communications, and engaging with policymakers have generally been conducted by faculty or faculty teams without expert support. With adequate resources there is much more we could do with a communications specialist to translate the scientific and technical findings of our research teams into accessible language and useful formats, and to disseminate information and tools to stakeholders.

A third challenge has been raising philanthropic dollars to support ERI activities beyond the funding we have received from the University. We have had modest success to date raising funds from donors and foundations ($800k), but this has been largely opportunistic (Figure 6). Our teams have secured significant external grants to support the research launched by ERI seed funding ($22.5 million), but no

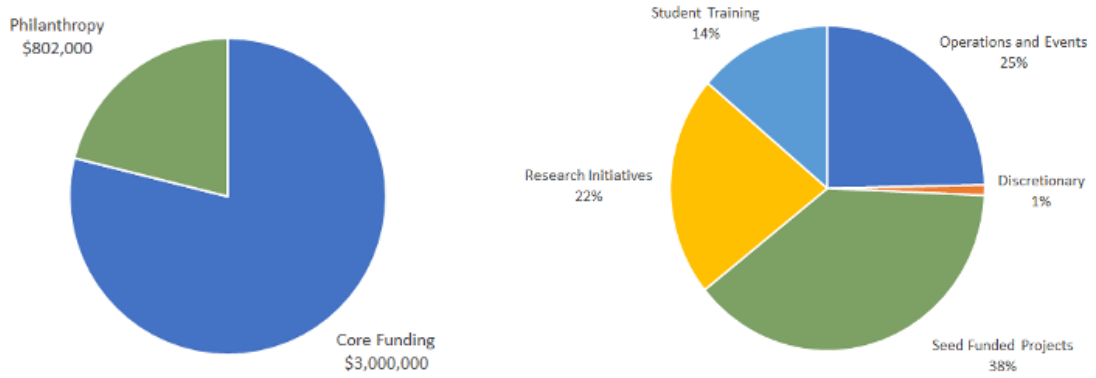

Figure 6. (Left) ERI income from university core funding and philanthropy. (Right) ERI expenditures on seed funding, operations and events.

overhead returns to ERI. Thus, despite our successes, there is no real mechanism in place to allow ERI to become self-sustaining. To maintain and increase our efforts to promote solutions focused, engaged, research, we need a longer-term funding source. Over the last year, we have begun to work with the advancement office to look for potential significant donors. Such a gift is necessary to provide some form of longer-term infrastructure that will continue to grow the University's capacity for interdisciplinary sustainability research. Our experience with donors is that they value the social relevance and solutions orientation of the research and the role the ERI plays in connecting research with policy and practice. They also value the role of ERI as a catalyst to seed and launch programs that will grow and establish environmental sustainability as a distinguishing and core value of the University, and that will have real societal impact.

Our Vision for the Future

To date, ERI has accomplished a tremendous amount in a short period of time with relatively modest funding. We have done so by investing in highly effective faculty teams that have then obtained more robust, longer-term funding, and through ongoing efforts by the ERI leadership and affiliated faculty to bring researchers together and to launch new initiatives. Our vision for the future is to truly make ERI the center for sustainability research at UVA in a way that pulls together even more researchers, draws a deeper commitment from faculty, attracts philanthropic funding from UVA donors with an interest in the environment, and engages fully in translating research into solutions for the planet and society. ERI is well positioned to play an important role in supporting and implementing the Environmental Resilience and Sustainability Grand Challenge, by creating the "soft infrastructure" to network individual faculty in different schools, pull interdisciplinary teams together, and provide seed funding and fellowships for students and post-docs to support that collaborative work.

To accomplish this vision, we need investment to increase our effort in three key areas:

1. Funding for interdisciplinary research teams. Our fairly small ($30k) CoLab grants have helped launch interdisciplinary research teams that would not have gotten together without this grant program. In these cases, the funding allowed researchers to identify new research questions at the intersection of their disciplines, explore new ways of doing research together, and pull together their initial efforts to then seek more robust external grant funding. We believe the program could be improved in two ways. First, increasing the size of the seed grants enough to allow the funding of a post-doctoral fellow or graduate student would dramatically leverage the amount of work these teams could accomplish. We envision increasing the CoLab funding to $60k - $200k. Training students as participants in interdisciplinary research is an important part of the work we do. Many students have launched their careers in sustainability research after being part of ERI teams. Second, we would like to make more funding available for "rapid" grants. These grants have been incredibly effective at allowing researchers to respond and adapt quickly to world events (e.g., hurricanes and COVID). Making this a larger, more visible program would pay huge dividends. We envision increasing funding to $20k for each Rapid Response project and funding more projects per year.

2. Development of keystone research initiatives. ERI has successfully launched and funded three significant research initiatives: water futures, climate restoration, and coasts and people. These initiatives have brought together large, interdisciplinary teams to address, over a period of several years, significant and pressing issues. Continuing to identify opportunities for such work and pulling together teams to do it is, we believe, potentially the most valuable use of ERI's time and resources and will build capacity at the university to seek large, center-level research grants (such as the CoPe funding discussed above). Based on the lessons we have learned from our first three initiatives, we have developed a strategically focused funding approach that will benefit future initiatives. This involves a conference and workshops to focus and launch the initiative; funding for faculty fellowships, post-doctoral fellows, and students; and communications and outreach support. The tiered mentoring of this model and the cohort approach are some of the keys to its success. The results of the ongoing Grand Challenge process should provide a major boost to one or more such initiatives. Our vision for the future is to launch at least one such initiative every two years and have three ongoing at any given point in time. We envision a funding level of $400k - $1 million per year for a major initiative.

3. Engagement and translation. Without effective communication and community engagement our university research will remain siloed and will not have the impact we envision as we aspire to be "great and good." To achieve our vision for ERI to serve as a central hub for translation of sustainability research to policy and practice, we must build strong and meaningful relationships with community partners. Also, to maximize their impact, research findings must be effectively communicated to policymakers, businesses, communities, and other stakeholders. We believe an investment in a person to manage our community engagement and strategic communications is critically important to making ERI research findings actionable. This will allow ERI to build essential relationships by identifying partners, acting as a bridge with collaborative teams, and developing meaningful experiential opportunities for students. This person will also develop multiple communication outlets for diverse audiences, including policy-relevant research briefs, news outlets, social media, and proposal preparation.

Since the first Environmental Resilience Forum in 2015, and the creation of the Environmental Resilience Institute in 2017, UVA has made tremendous strides in advancing interdisciplinary environmental resilience and sustainability research. As an institution, UVA is well positioned to rapidly grow its capacity and make significant advances in finding and translating solutions to environmental threats, particularly climate change, that affect all aspects of human wellbeing. The need for these solutions is extremely urgent.