

**Duke Support for Interdisciplinary Graduate Networks (D-SIGN)**  
2017-2018 REPORT



## Background

*Together Duke*, the university's 2017 strategic plan, includes a goal to [provide a transformative educational experience for all students](#) and sets forth increased opportunities for graduate and professional school students to prepare for a wide array of career options.

One of these opportunities is [Duke Support for Interdisciplinary Graduate Networks \(D-SIGN\)](#). By enabling graduate students to build or extend their networks and to integrate collaborative, cross-school experiences into their programs, D-SIGN increases the number of individuals whose graduate training reflects Duke's commitment to interdisciplinarity and knowledge in the service of society. Such experiences deepen our students' exposure to interdisciplinary collaboration, key preparation for both academic positions and nonacademic career trajectories.

D-SIGN grants are available to graduate student groups to propose an interdisciplinary project, training, or experience lasting up to a year. All current graduate students (including master's, professional, and Ph.D. students) in any program at Duke University are eligible. Preference is given to proposals that include participation across schools and that include professional students as well as doctoral students.

Proposals require a lead faculty sponsor who agrees to mentor the group; an organizational sponsor (preferably a department, school or institute/initiative) willing to handle funds and provide logistical support; endorsement from an additional faculty member from a different discipline or school; a plan of work; and anticipated outcomes. Where appropriate, these activities should count toward curricular requirements.

This grant program began in 2016-2017; for more information about the first cohort, please see the [2016-2017 D-SIGN report](#).

## Applicant Pool

For the 2017-2018 academic year, a [January 2017 request for proposals](#) (RFP) invited all current Duke graduate students to propose an interdisciplinary project, training, or experience lasting up to a year. We received 14 proposals, which were reviewed by an ad hoc committee convened by the Vice Provost for Interdisciplinary Studies with representation from faculty, institute directors, and graduate students.

## 2017-2018 D-SIGN Recipients

Six groups received [2017-2018 D-SIGN grants](#), forming the second cohort of D-SIGN recipients. The 16 student organizers (10 women and 6 men) came from Arts & Sciences, Pratt School of Engineering, Nicholas School of the Environment, Sanford School of Public Policy, and the Duke Global Health Institute. Twelve were doctoral students; four were master's students. The average award was \$8,605.

Group	Purpose	Student Organizers	Faculty Sponsor(s)
<b>Desarrolla México</b>	Help a rural community develop a renewable energy strategy and a business plan for its ecotourism business; advance a study on obstacles to reinvesting funds from Payments for Ecosystem Services programs	<b>Ruxandra Popovici</b> , Ph.D. in Environment; <b>Emilio Blanco Gonzalez</b> and <b>Adam Cullen</b> , M. Eng. in Mechanical Engineering	<a href="#">Elizabeth Shapiro-Garza</a>
<b>Global Energy Access Network (GLEAN)</b>	Elevate the prominence of the global energy access challenge on campus; foster an interdisciplinary community of graduate and professional students wanting to engage with this challenge in their work	<b>Yating Li</b> and <b>Faraz Usmani</b> , Ph.D. in Environmental Policy; <b>Muye Ru</b> , Ph.D. in Earth and Ocean Sciences; <b>Heidi Vreeland</b> , Ph.D. in Civil and Environmental Engineering	<a href="#">Subhrendu Pattanayak</a> , <a href="#">Brian Murray</a>
<b>The Global South after 2010</b>	Explore the aesthetics, ethics, and politics of transnational violence in the Global South; organize seminars and a graduate student conference	<b>Renée Michelle Ragin</b> , Ph.D. in Literature; <b>Giulia Riccò</b> , Ph.D. in Romance Studies	<a href="#">Deborah Jenson</a> , <a href="#">miriam cooke</a>
<b>Lowndes County Sanitation Access Network</b>	Contribute to a community research project to improve wastewater treatment; diagnose the interlaced physical and financial barriers to sanitation access and evaluate potential solutions	<b>Emily Meza</b> , M.E.M.; <b>Katy Hansen</b> , Ph.D. in Environmental Policy; <b>Ryan Juskus</b> , Ph.D. in Religion	<a href="#">Erika Weinthal</a> , <a href="#">Elizabeth Albright</a>
<b>Modeling Health &amp; Environment Graduate Working Group</b>	Design an undergraduate course on systems thinking and modeling in health and environment; acquire system dynamics modeling skills as well as relevant subject matter knowledge on global health, the environment, and interconnections between the two	<b>Shashika Bandara</b> , M.Sc. in Global Health; <b>Varun Mallampalli</b> , Ph.D. in Civil and Environmental Engineering	<a href="#">Kevin A. Schulman</a> , <a href="#">Mark Borsuk</a>
<b>Network to Enrich GALS Summer Science Program</b>	Improve the training of Girls on outdoor Adventures in Leadership and Science (GALS) leaders to strengthen a free summer camp for girls from underrepresented backgrounds to encourage them to pursue STEM fields	<b>Jacqueline Gerson</b> , Ph.D. in Ecology; <b>Emily Levy</b> , Ph.D. in Biology	<a href="#">Erika Weinthal</a> , <a href="#">Nicolette Cagle</a> , <a href="#">Naomi Kraut</a> , <a href="#">Megan Mullin</a>

## Selected Activities and Accomplishments

### *Desarrolla México*

Playa Grande is a Mexican *ejido*, where land is jointly owned by a group of 70 community members. Residents participate in government-funded conservation programs where community members receive compensation in exchange for their involvement in the sustainable management and



stewardship of natural resources. Playa Grande decided to invest its conservation program earnings into an ecotourism business, jointly owned by community members.



Ruxandra Popovici, a Ph.D. student in Environment, teamed up with Emilio Blanco Gonzalez and Adam Cullen, master's students in Mechanical Engineering, to help this rural community develop a renewable energy strategy and a business plan for sustainable ecotourism. In the summer of 2017, the three graduate students traveled with undergraduate Matheus Dias to Playa Grande.

Cullen and Gonzalez evaluated three renewable energy options to power the tourist center, and recommended additional solar panels as the most cost-effective option. Community leaders have already acted on this recommendation.

Dias, an economics major, created a report documenting the community's business structure and activities, which members can use to apply for loans and government grants. In addition, he conducted research on the region's ecotourism market and provided suggestions for improving the ecotourism business and developing future services.

Popovici interviewed microentrepreneurs and facilitated a partnership with NC State's P1tLab to provide guidance on the community's marketing and business strategy. [Learn more.](#)

### ***Global Energy Access Network (GLEAN)***

The Global Energy Access Network (GLEAN) is an interdisciplinary group of more than 50 Duke graduate and professional students who aim to advance sustainable solutions to address the world's energy access challenges. Housed at the Duke University Energy Initiative, GLEAN received a D-SIGN grant in 2016-17 and a follow-on grant in 2017-18.

Through the group's Energy Access Speaker Series, GLEAN sponsored and organized the visits of Shu Tao (Peking University), Akanksha Chaurey (ITP India), and Jill Baumgartner (McGill University).

Expected to be ready by the end of Summer 2018, GLEAN's second volume of case studies will present research takeaways from members on a diverse range of topics—from the implications of improving energy finance for India's solar industry to measurement of the impacts of cleaner cooking technologies in rural Madagascar. The volume aims to inform researchers, practitioners, students, and others working on energy access and energy transitions.



Recognizing that visual media can highlight the reality of energy poverty in remote settings, GLEAN organized the ImaginEnergy Photo Contest and received over 40 submissions. Winners—selected via a social media campaign led by the Energy Initiative—displayed their photos as part of a DUU VisArts exhibition at Duke’s Brown Art Gallery. Their photos were also on display during the annual meeting of the Sustainable Energy Transitions Initiative (SETI) at Duke in May 2018. [Learn more.](#)

*GLEAN members have contributed to a wide range of energy-relevant research applications across the world. The case studies collection will compile these experiences for policymakers, practitioners and researchers, who frequently find themselves 'reinventing the wheel' when engaging with unfamiliar contexts or communities.*

—Heidi Vreeland

### *The Global South after 2010*

Are there trends in the types of sociopolitical violence that have characterized social movements after the Arab Spring? How has this violence been represented in the media and in popular culture? What are the legal and political consequences of such representations? These questions fascinated doctoral students Renée Ragin (Literature) and Giulia Riccò (Romance Studies). Inviting other graduate students to join them in an interdisciplinary exploration, they created a working group called The Global South after 2010: Epistemologies of Militarization.



The group held three meetings in the fall and began coordinating with the Global South Lab at the Institute of the Humanities and Global Cultures at the University of Virginia. In collaboration with Sylvia Miller, director of the Publishing Humanities Initiative at the Franklin Humanities Institute, Ragin and Riccò organized a day-long symposium.

Invited to give a talk at UVA, Ragin and Riccò used the opportunity to pilot ideas for a cowritten research article and received positive feedback. In the spring, the group supported a Duke conference

on Emergency Legal Cultures; hosted a workshop with Shahla Talebi and Diana Coleman from Arizona State University; and organized a two-day colloquium. One of the colloquium respondents, Duke Professor Michaeline Crichlow, offered the opportunity to curate a special issue of *Cultural Dynamics: Insurgent Scholarship on Culture, Politics, and Power*. Forthcoming in June 2019, “Epistemologies of Militarization in the Global South” will include two papers from the colloquium, contributions from several working group collaborators, and an introduction from Ragin and Riccò. [Learn more](#).

*The different disciplinary backgrounds allowed us to work toward an interdisciplinary understanding of issues surrounding militarization in the contemporary world. Indeed, as the working group progressed, we realized how important it was to focus on ensuring that our understanding and interpretation of militarization encompassed its myriad forms in the contemporary moment. Through these workshops we were able to identify what militarization looks like today, and where we encounter it.*

—Renée Ragin and Giulia Riccò

### **Lowndes County Sanitation Access Network**

Graduate students Emily Meza (M.E.M.), Katy Hansen (Ph.D., Environmental Policy), and Ryan Juskus (Ph.D., Religion) sought to contribute to a community-based research partnership between the Duke Human Rights Center and the Alabama Center for Rural Enterprise (ACRE). The D-SIGN team included doctoral and professional students from the Divinity School, Law School, Nicholas School of the Environment, and Sanford School of Public Policy.



In collaboration with ACRE, the students focused on improving access to wastewater treatment in Lowndes County, Alabama, where up to 90% of households have either no or inadequate access to sanitation.

The D-SIGN project started with a site visit in July 2017. The students hosted community meetings to discuss the initial research and diagnosis the problem, and visited several homes without adequate access to sanitation.

Meza spent the year assessing likely predictors of seeing raw sewage on the ground, as well as broadly defining the scale and scope of the struggles with wastewater treatment faced by Lowndes County. Her analysis drew on an EPA-funded community survey conducted by ACRE and community volunteers in 2011-12. She presented her results to congressional staffers and industry representatives in Washington, D.C.

Hansen worked with six undergraduates to track the sources and distribution of federal and state funding for wastewater treatment infrastructure. This team is writing an article and policy brief about the distribution of federal funding for wastewater infrastructure in Alabama. Hansen and Danielle Purifoy presented this work at the American Associations of Geographers meeting in New Orleans.

For Juskus, participating in the project enhanced his dissertation research by improving his understanding of how race and history intersect with environmental concerns in Alabama. He mentored a graduate student in Theology and Environmental Management, and together they are proposing a panel on Lowndes County at Baylor University's Symposium on Faith & Culture. Juskus is part of a follow-on D-SIGN grant for 2018-19 along with Katherine Pringle and Emma Lietz Bilecky.

[Learn more.](#)

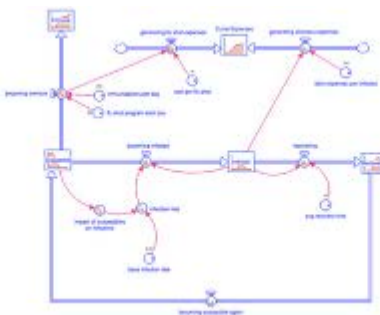
*The wastewater issue is more than technical and political in nature. It is also a deeply human story. I learned that the water problem is also a soil problem; the septic technology approved by the health department doesn't work largely because of the soil structure of the "Black Belt" region of Alabama. Even more, it was the black, fertile soil of the Black Belt that proved so attractive to the cotton planters who drove demand for the domestic slave trade from the Upper South to the Black Belt. This is a story of soil, souls, and society. Since last summer, I deepened initial connections between the wastewater issue, the Equal Justice Initiative, and theology.*

—Ryan Juskus

### **Modeling Health & Environment Graduate Working Group**

For students exploring policy research, skills in systems thinking and computer modeling can be a valuable asset. However, many modeling tools are only accessible to those with advanced mathematical backgrounds.

The Modeling Health & Environment Graduate Working Group, organized by Shashika Bandara (M.Sc. in Global Health) and Varun Mallampalli (Ph.D. in Civil and Environmental Engineering), provided an opportunity for Duke students from multiple disciplines to learn about system dynamics modeling and build complex models relevant to their research.



Bandara and Mallampalli provided basic training on STELLA software, which they selected because it is suitable for use by students who don't have the advanced math background required by many modeling software programs.



One working group session centered on an interactive exercise where students collaborated on a model to ward off a hypothetical flu epidemic. Participants responded positively (e.g., “I would take a course on this” and “This was very useful.”) Several sessions featured guest lecturers from Duke to outline the practical aspects of policymaking and modeling. The final session was a webinar with Georgia Mavrommati, Assistant Professor of Ecological Economics at the University of Massachusetts, Boston.

Based on the feedback from the working group and requests from undergraduate students, Bandara and Mallampalli decided to create an online resource with instructional videos, guest lectures, and other resource materials. [Learn more.](#)

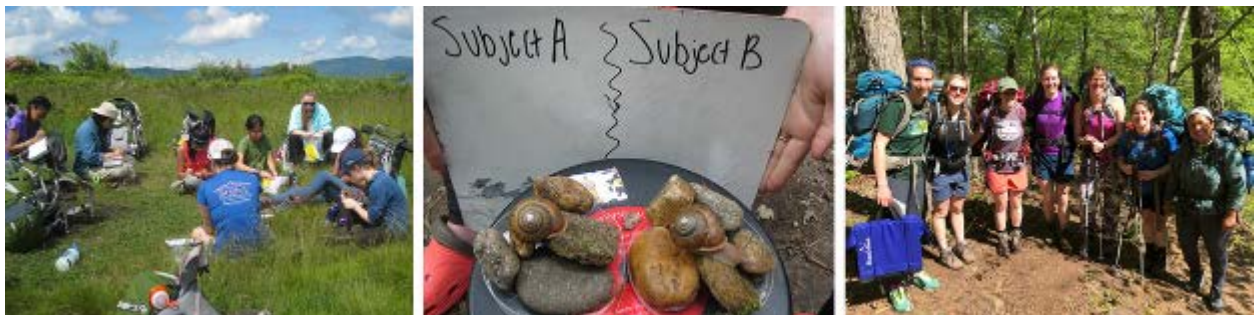
*As a global health master’s student, it was a great opportunity to consider how I can use modeling as a powerful policy advocacy tool. As a group, we benefited not only by the technical modeling-related knowledge sharing but also by the advice given by guest lecturers on communication, research, and careers. It was rewarding that even students outside the working group expressed interest in learning modeling due to the guest lectures. This is why we hope to make the learning tools available online for all students.*

—Shashika Bandara

### **Network to Enrich GALS Summer Science Program**

Doctoral students Jacqueline Gerson (Ecology) and Emily Levy (Biology) wanted to increase hands-on science opportunities for young women and other groups that are underrepresented in science, technology, engineering, and math. With fellow Duke students Emily Ury and Alice Carter, they created a free summer program called GALS (Girls on outdoor Adventure for Leadership & Science). High school students who identify as female or gender nonconforming, students of color, and students from low socioeconomic backgrounds are welcome to participate.

For the inaugural program in 2017, the founders created a science curriculum and taught eight young women about the scientific method, environmental science, and backpacking. While it was a success, they identified two areas that would strengthen the program: a standardized curriculum, and a humanities component to complement the environmental science focus.



To further this work, Gerson and Levy established a network to enrich the GALS program and received a D-SIGN grant. They worked with a master’s student in Teaching and Environmental Management, Katrina Herrera, to overhaul the curriculum. The lessons are now matched to state and national educational standards, and they include more hands-on and place-based learning activities.



Gerson and Levy held four network meetings with graduate students and postdocs from the Sanford School of Public Policy, Medical Physics Graduate Program, Center for Cognitive Neuroscience, Economics, University Program in Ecology, Nicholas School of the Environment, and Biology. Through these meetings, they created four new lessons and documents that will enhance the GALS curriculum, as well as an instructor guide for sensitive science topics. They also used the grant to attend diversity trainings, purchase educational materials, and organize a backpacking training weekend for instructors. [Learn more.](#)

*I can't stress enough how beneficial the D-SIGN-supported network has been to this program. I am especially thankful for the time and effort of colleagues outside of the fields of biology and ecology who added a new level of thoughtfulness, intentionality, and depth to our curriculum. The connections we made will continue to strengthen our program and help us accomplish the GALS mission.*

—Emily Levy

## Looking Ahead

A January 2018 [RFP](#) invited all current Duke graduate students to propose interdisciplinary groups and activities for 2018-2019. We received ten proposals for the third D-SIGN cohort. Proposals were reviewed by a panel of faculty and graduate students from across the university.

Six graduate student groups [received D-SIGN grants for use in 2018-2019](#). The 24 student organizers (nine women and 15 men) came from Arts & Sciences, Divinity School, Nicholas School of the Environment, Pratt School of Engineering, and Sanford School of Public Policy. Twenty are doctoral students; four are master's students. The average award was \$9,210. Student organizers will report on their activities by June 30, 2019.

Group	Purpose	Student Organizers	Faculty Sponsor(s)
<b>Duke-ACRE Partnership</b>	Address wastewater treatment in Lowndes County; evaluate strategies to address the problem and creatively represent the human face of the issue	<b>Katherine Pringle</b> , M.A. in Economics; <b>Ryan Juskus</b> , Ph.D. in Religion; <b>Emma Lietz Bilecky</b> , M.E.M.	<a href="#">Erika Weinthal</a>
<b>Fostering Community Participation in the Arts</b>	Promote equal role between creator and community member; present four performative works to Duke and Durham communities	<b>James Budinich</b> and <b>Brooks Frederickson</b> , Ph.D. in Music Composition; <b>Rebecca Uliasz</b> , Ph.D. in Computational Media, Arts, and Cultures	<a href="#">Scott Lindroth</a> , <a href="#">Bill Seaman</a>
<b>Riding the Belt and Road</b>	Ignite discussion among students and faculty members on multiple facets of China's new Belt Road Initiative, with a focus on environmental impacts	<b>Yating Li</b> and <b>Seth Morgan</b> , Ph.D. in Environmental Policy; <b>Travis Dauwalter</b> , Ph.D. in Public Policy; <b>Zainab Qazi</b> and <b>Santiago Sinclair Lecaros</b> , M.E.M.	<a href="#">Billy Pizer</a> , <a href="#">Elizabeth Losos</a> , <a href="#">Indermit Gill</a> , <a href="#">Kathinka Fürst</a>

Group	Purpose	Student Organizers	Faculty Sponsor(s)
<b>Social Science Methods Network</b>	Create an environment in which graduate students working on social scientific projects can engage in methodological debates and collaboration as they work on turning research findings into publishable outputs	<b>Valerie-Jean Soon</b> and <b>Kobi Finestone</b> , Ph.D. in Philosophy; <b>Peng</b> , Ph.D. in Political Science	<a href="#">Kevin Hoover</a> , <a href="#">Timur Kuran</a>
<b>Theology, Religion, and Qualitative Methods Network</b>	Employ methodological tools from the social sciences to better understand how cultural groups talk about holy figures and navigate ritual engagement with the sacred	<b>Michael Grigoni</b> , <b>Emily Dubie</b> , and <b>Ryan Juskus</b> , Ph.D. in Religion; <b>Dustin Benac</b> and <b>Sarah Jobe</b> , Th.D.	<a href="#">Luke Bretherton</a>
<b>Water, Sanitation, and Hygiene Interdisciplinary Network of Graduate Students (WaSHINGS)</b>	Establish a platform allowing engineers, policy makers, educators, and entrepreneurs to share their perspectives and collaborate on strategies to improve water sanitation	<b>Lucas Rocha Melogno</b> , <b>Stewart Farling</b> , <b>Siddharth Kawadiya</b> and <b>Billy Gerhard</b> , Ph.D. in Civil and Environmental Engineering; <b>James Thostenson</b> , Ph.D. in Electrical and Computer Engineering	<a href="#">Marc Deshusses</a>

## Learn More

- [2018-2019 D-SIGN Grantees](#)
- [2017-2018 D-SIGN Grantees](#)
- [2016-2017 D-SIGN Report](#)
- [2016-2017 D-SIGN Grantees](#)

The next RFP will be released in early 2019. Any current Duke graduate student may submit a proposal for interdisciplinary projects, trainings, or experiences during the 2019-2020 academic year. If you have any questions, please [contact](#) the Office of the Vice Provost for Interdisciplinary Studies (216 Allen Building, 919-684-1964, [interdisciplinary@duke.edu](mailto:interdisciplinary@duke.edu)).