

**Bass Connections Project Proposal:
ACRE-Duke Partnership to Improve Sanitation Access in Lowndes County,
Alabama**

1. PROJECT DESCRIPTION

Project title: ACRE-Duke Partnership to Improve Sanitation Access in Lowndes County, Alabama

Brief background/context: Over the past several years, stories of failing and inadequate water infrastructure in urban areas of United States – most notably, the lead crisis in Flint, Michigan -- have caught the attention of the media and the public. While attention has increasingly focused on the problem of dilapidated water and sanitation infrastructure in urban America, less attention has been paid to the ways in which the absence or poor quality of existing infrastructure can undermine health and economic opportunities in rural America. The latest American Community Survey found that 630,000 US households do not have a toilet, tub or shower, or running water in the U.S. Lowndes County, located along the historic Selma to Montgomery, Alabama march, is illustrative of a host of social and environmental inequalities facing rural communities of color in the American South including endemic poverty, lack of economic opportunity, hazardous health conditions, and inadequate infrastructure. Only two municipalities in the county maintain centralized wastewater treatment plants, while the remaining rural population is served by on-site septic systems or lack adequate sanitation. According to the UN Human Rights Council report (2011), “The Alabama Department of Public Health estimates that the number of households in Lowndes County with inadequate or no septic systems range from 40 to 90 percent; it has reported that 50 percent of the conventional, on-site septic systems are currently failing or are expected to fail in the future” (p. 6). Poor sanitation in the county poses serious health risks to residents of Lowndes. The Baylor College of Medicine (McKenna et al. 2017) recently found evidence of five tropical diseases, including hookworm (previously thought to be eradicated in the US), in fecal samples from Lowndes County residents.

Since Fall 2014, Duke University’s Human Rights Center at the Franklin Humanities Institute (DHRC@FHI) and the Alabama Center for Rural Enterprise (ACRE) have partnered to address the inadequacy of wastewater treatment infrastructure, an economic, racial, and environmental injustice entrenched in many communities in rural, black America. A multidisciplinary group of Duke faculty and students across all learning levels have engaged a wide variety of research projects to understand the problem of raw sewage in Lowndes County. As of Fall 2017, the team of researchers has expanded to include approximately eight faculty members, two Ph.D. students, three professional students, and ten undergraduate students from the Duke Human Rights Center@FHI, Nicholas School of the Environment (NSOE), the Nicholas Institute, Pratt School of Engineering, Arts & Sciences (including Religion), Law School, and Sanford School of Public Policy. Funding from Bass Connections would enable us to formalize the cross-level and interdisciplinary learning among the undergraduate, professional, and doctoral students while building stronger ties to the community in Lowndes County.

Project goals and objectives: Our overall goal is to: (1) continue technical, social science, and

humanities research to understand the reasons for the lack of proper sanitation in Lowndes County and moreover to improve sanitation access in Lowndes County and (2) provide a forum of project-based learning to engage students across learning levels in discussions of racial and economic justice in rural America. The research focuses on understanding the interlaced physical/technical, political, and legal barriers to sanitation access and evaluating potential technical and policy solutions. The support of Bass Connections would enable us to strengthen our connection with Lowndes County and support cross-discipline and learning-level research. While much attention has focused on the legal, political, and physical barriers to improving sanitation in Lowndes, our project also brings a humanist dimension to the question of access to clean water and proper sanitation. In particular, the project approaches the issue of raw sewage through a human rights lens and justice approach in order to place the issue of raw sewage within an historical context and to privilege the community members' experiences.

Building connections between Duke and Lowndes County: The project aims to strengthen connections between Duke and Lowndes County communities by working with ACRE, our community partner, to develop solutions for a more inclusive and sustainable economy, as access to water and sanitation are necessary for community members to be able to have viable economic livelihoods. More so, our proposed project aims to address environmental injustices that target low-income people and communities of color in Lowndes County whereby members of the community have been jailed owing to their inability to afford proper sanitation systems (Equal Justice Initiative, 2012). Bass Connections support will increase opportunities for collaboration between Duke researchers and students and ACRE by supporting research and edification projects.

Research across disciplines and learning levels: The multifaceted challenges undergirding lack of access to sanitation—from difficult geographic conditions and limited technology to structural poverty and institutional challenges—are best understood, and most effectively addressed, by integrating the expertise of natural, technical, and social scientists, as well as legal and environmental management professionals and humanities scholars. Through the lens of the provision of water services (clean water and adequate sanitation), we are examining three interdependent components: (1) physical component, (2) legal framework, and (3) political and financial dimensions that have enabled environmental injustices (lack of water services) in Lowndes County, Alabama. Through integration and synthesis across the three components, we will develop an overarching analysis of the barriers of access to water infrastructure that stem from a history of racial and economic inequities.

Undergraduate students will work with faculty and graduate students on a suite of projects that weave across the social sciences, natural sciences/engineering, and the humanities. Particular projects include teams of students examining (1) the legal and political factors for how government funds have been allocated or not allocated to improve sanitation in Lowndes County; (2) engineering projects to explore technologies that are both cost effective and suitable to the soil type in Lowndes County; (3) the role of water protectors and the emergence of water-based organizing; and (4) media and documentary work to understand how the story of environmental injustice has been understood in rural parts of the American South.

Anticipated outcomes:

The specific plan of the project activities and anticipated outcomes are described in the table below:

Team	Description of project component and tasks	Outcome(s) and output(s)
Physical Technical	1.1. Analyze physical, hydrological, regulatory, and economic data. Students may continue to sample drinking water supplies to see if any contamination.	<ul style="list-style-type: none"> • suitability maps for several types of infrastructure solutions including extension of piped municipal systems, cluster systems, and individual on-site systems • Report on water quality
	1.2 Conduct a cost-benefit analysis (CBA) of the most efficient options for sanitation by compiling and analyzing relevant physical, zoning, and economic data and developing and analyzing 3-4 options for infrastructure expansion	<ul style="list-style-type: none"> • Analysis comparing relative costs, risks, and distributional impacts of 3-4 options to meet sanitation needs in Lowndes County • Report and infographic summary of recommended zoning/growth plan for Lowndes County for community and policy makers
	1.3. Design more affordable individual and clustered wastewater treatment systems by surveying low-cost technologies that leverage easy-to-install, low-cost materials and tailoring these solutions for Lowndes County	<ul style="list-style-type: none"> • Template engineering design drawings and specifications for individual and clustered wastewater treatment systems • Report and short summary of estimated initial upfront costs for materials, installation, and ongoing maintenance
Social science	2.1 Determine the institutional barriers that prevent communities from applying for and receiving financial assistance by reviewing the literature, holding community conversations, and interviewing key stakeholders	<ul style="list-style-type: none"> • Report explaining how eligibility criteria, application and recipient requirements, and insufficient funding act as barriers • Synthesis of recommended policy solutions to share with the community and policy-makers
Humanities	3.1 Make visible the dynamic connections between ACRE’s wastewater work and (a) a larger hi/story of water, soil, and society in Lowndes County, and (b) the contemporary emergence of 'water protectors' and water-based organizing in a time of multiple threats	<ul style="list-style-type: none"> • Storying water & history of social life in Lowndes County history • Analysis of Water protectors & the emergence of water-based organizing

Project’s relevance to the selected Bass Connections theme(s) and special funding opportunities selected: Energy and Environment

Our proposed Bass Connections fits with the Energy and Environment theme. The project is explicitly about environmental justice and injustice in the American South. It focuses on water and sanitation, specifically the issue of environmental contamination from the flow of raw sewage in peoples’ yards. More so, the type of sanitation systems used in Lowndes – septic systems and lagoons are inadequate for ensuring that the community has access to proper sanitation.

Connection to team leaders’ other projects: The Duke Human Rights Center (DHRC) at the Franklin Humanities Institute (FHI) and the Alabama Center for Rural Enterprise (ACRE), a non-profit focused on infrastructure in rural communities, began a partnership to address the lack of access to wastewater treatment in Lowndes County, Alabama. The project builds on research interests and experiences of the team leaders. Team leader Albright’s work broadly focuses on local-level policy processes that stem from disasters and how these processes may encourage or inhibit recovery. Addressing failed water infrastructures are often central in these recovery processes. Albright has led a Bass project that focused on household-level recovery in predominantly low-resourced and communities of color in South Carolina. Team leader Weinthal’s work focuses on access to water and sanitation globally, especially understanding the effects of climate change on water availability. In addition, Weinthal has written several articles/chapters over the last few years about the Millennium Development Goals and Sustainable Development Goals that focus on access to water and sanitation. Both Weinthal and Albright are members of the DHRC@FHI faculty advisory board.

2. TEAM LEADERS AND CONTRIBUTORS

<i>Name</i>	<i>Title/Rank</i>	<i>Team Leader or Contributor?</i>	<i>Department(s)</i>	<i>Led a Bass Connections team before (if yes, how many)?</i>
Betsy Albright	Assistant Professor of the Practice	Team Leader	Nicholas School of the Environment	Yes, One, flooding in South Carolina
Catherine Flowers	Executive Director	Team Leader	Alabama Center for Rural Enterprise (ACRE)	No
Katy Hansen	PhD student	Contributor	Nicholas School of the Environment	No
Ryan Juskus	PhD student	Contributor	Department of Religion	No
Megan Mullin	Associate Professor	Contributor	Nicholas School of the Environment	No

David Schaad	Professor	Contributor	Civil & Env Engineering	
Emily Stewart	Program Coordinator	Team Leader and project manager	Duke Human Rights Center at the FHI	No
Erika Weinthal	Professor	Team Leader	Nicholas School of the Environment	Yes, UNEP Project on Film and Environmental Peacebuilding (2 years)

3. PROJECT APPROACH AND TEAM COMPOSITON

Project approach: The ACRE-Duke Partnership will facilitate *collaborative learning* through integrated research, coursework, and co-circular activities.

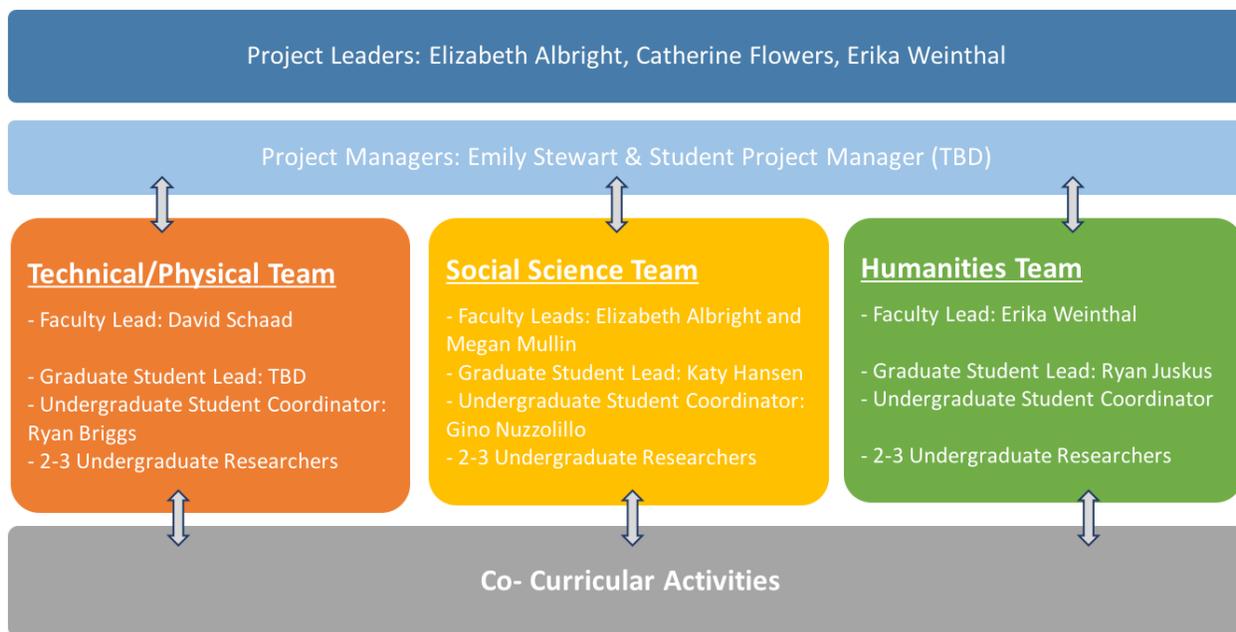
- Research: project meetings (co-led by different learner levels): Ph.D. students will play a leadership role in guiding MEM and undergraduate projects. Faculty will be integrated into the different project teams. While specific project teams will meet separately, the entire project team will come together once a month to discuss progress and challenges.
- Meetings with ACRE: FHI has provided funds to support Catherine Flowers as a practitioner in residence over the course of the Bass Connections Project. This will allow students to meet with Catherine several times each semester to present their research and receive feedback. As such, there will be continual engagement with ACRE.
- We will ask students to read particular pieces on environmental and economic justice in rural America over the course of the BC project so that everyone involved in the project has an understanding of the environmental justice issues in Lowndes County, but also more broadly in the US.
- Co-circular activities: We will organize several trips for students throughout the year, including a field trip to Warren County (i.e., the birthplace of the EJ movement), participation in the EJ Summit in NC, and a trip to Lowndes County. We also seek funds to bring Dr. Hasan Jeffries to Duke (author of *Bloody Lowndes*) during a visit of Catherine Flowers to have an event for the entire Duke population in which they are in conversation with each other.

The faculty leaders are Professors Erika Weinthal and Elizabeth Albright from the Nicholas School. Emily Stewart (Program Coordinator, DHRC@FHI) and a graduate student project manager will coordinate the logistics and content of the research and outreach. There will be graduate and undergraduate student team leaders for the technical, social science, and humanities research teams.

Team composition: The ideal composition of team members for this project includes 12-15 undergraduate students and 4-6 graduate/professional students across a range of majors and disciplines. We hope to recruit and continue working with students with the following:

- Skills: Engineering design, spatial analysis (ArcGIS, spatial analysis in R), econometrics/statistics, oral history, water analysis, environmental politics, policy analysis, and story telling.
- Backgrounds: We want a diverse student population that is interested in the American South and that is interested in interdisciplinary research.

Graduate students will have project management/mentorship roles at the project and team level. Because we have been building this project for a number of years, we expect that some of the undergraduates currently involved can play a leadership role too as undergraduate student coordinators, as shown in the figure below.



The learning objectives include: (1) increase knowledge of the history of environmental and economic (in)justices in Lowndes County; (2) gain research skills including data collection and analysis; (3) expand ability to work on an interdisciplinary research team; (4) improve written and oral communication skills.

In addition, students will develop skills in contributing to project outputs such as reports, publications, and multimedia outputs (e.g., documentaries). Graduate students could expect to work on research design, interdisciplinary collaboration, and project leadership and management.

Plan to evaluate team progress and performance: We will evaluate students on the quality of the products produced and participation in the project. Students will have the option to enroll in the Bass Connections for credit. During the first few weeks, we will work with the graduate student team leaders and undergraduates to develop a team charter that will lay out expectations over the course of the year. Teams will be required to present updates on a monthly basis.

4. TIMELINE AND MILESTONES

	Activity	Milestone
Aug-Sep 2018	Development of team charter and projects for each team. Review of past years' work with ACRE Meet with Catherine Flowers	Team Charter
Oct 2018	Team meetings on projects. Participate in EJ summit. Meet with Catherine Flowers	
Nov 2018	Work in disciplinary teams. Potential visit of Hasan Jeffries Meet with Catherine Flowers	Presentations
Dec 2018	Work in disciplinary teams	
Jan 2019	Revisit team charter and plan different outcomes – documentary film, timeline, academic publication, reports	

Feb 2019	Work in disciplinary teams Meet with Catherine Flowers	
Mar 2019	Present draft projects Meet with Catherine Flowers	Draft projects
Apr 2019	Develop trip to Lowndes and summer work plans	
May 2019	Present projects Meet with Catherine Flowers	Projects
May-Jul 2019	Student trip to Lowndes Present student projects	

5. BUDGET ESTIMATE

Bass Connections Project Budget Template

Cost Category	Bass Connections Project Funding Request for 2018-2019	Notes (e.g., name of personnel, activities supported)
Payroll-allowable Categories		
GRADUATE OR RESEARCH ASSISTANTSHIP (PHD)	\$ 7,500 for Ph.D. student in the NSOE for half semester stipend/tuition \$3,000 stipend for technical team leader (MEM) \$3,000 stipend for humanities team leader – Ph.D.	Technical team leader Social team leader Humanities team leader
Travel Expenses		
TRAVEL – DOMESTIC	\$7,000 \$2,000 \$500	Trip to Lowndes County: travel, lodging, stipend for local coordinator to facilitate site visits. Trip to EJ Summit (lodging, registration, car rental) Trip to Warren County (car rental and food)

Cost Category	Bass Connections Project Funding Request for 2018-2019	Notes (e.g., name of personnel, activities supported)
Invited Speaker		
Potential Hasan Jeffries Visit	\$2000	Travel and hotel plus honorarium
TOTAL Bass Connections Request	\$25,000	
<p>Other Sources of Project Funds (Projects that leverage or match funds are strongly encouraged and these funds —both awarded and currently proposed —should be noted so that we understand the comprehensive outlay for the project)</p>		
<p>We have submitted a letter of inquiry to the X Foundation and have submitted an X grant to engage in campus wide discussion on how to broaden our work in Lowndes in other rural communities.</p>		
<p>Your Unit/Business Manager who could administer funds for project, if requested: Valerie Bennett, NSOE</p>		

References:

Equal Justice Initiative. Poor Alabama Residents Fighting for Sewage and Wastewater Management, April 18, 2012, <http://eji.org/node/629>.

McKenna, Megan L., Shannon McAttee, et al. 2017. Human Intestinal Parasite Burden and Poor Sanitation in Rural Alabama. *The American Journal of Tropical Medicine and Hygiene*. September 5.

UN. 2011. Report of the Special Rapporteur on the human right to safe drinking water and sanitation, Catarina de Albuquerque A/HRC/18/33/Add.4. August 2.