Samuel Centre for Social Connectedness

Fellowship Program

Partner Organization: Data Driven Envirolab

Project Title: Urban Environmental and Social Inclusion Index

SCSC Fellowship 2023:

Project Proposal

Partner Organization: Data-Driven EnviroLab

The Data-Driven EnviroLab (DDL) is an interdisciplinary and international group of researchers, scientists, programmers, and visual designers. DDL uses innovative data analytics to distill signals from large-scale and unconventional datasets and develop policy solutions to contemporary environmental problems. Working with scholars and policymakers across the globe, DDL strives to strengthen environmental policy at all levels. We promote evidence-based approaches to problem-solving while boosting information disclosure and transparency among public institutions, private companies, civic organizations, and individual citizens.

DDL is based at the University of North Carolina Chapel Hill and is a joint initiative between the Department of Public Policy, the Environment, Ecology, and Energy (E3P) Program, and the Institute for the Environment at UNC. As an academic research lab headed by Angel Hsu, Assistant Professor at UNC-Chapel Hill, we have a particular mission to help train data-minded scholars and leaders in the field of environmental policy. Our group is primarily comprised of student researchers at the undergraduate and graduate levels.

DDL is currently working on projects related to tracking the climate commitments -- particularly net-zero targets -- of non-state and subnational actors, using new digital technologies such as remote sensing, artificial intelligence and machine learning to track climate emissions, studying urban heat and its differential impacts on low-income and minority communities, and growing the Urban Environment and Social Inclusion index, or UESI, which tracks the progress of 300 cities around the world on certain environmental and social indicators.

Learn more at: https://datadrivenlab.org/

Location of the Project: Remote

DDL is an academic research lab located at the University of North Carolina Chapel Hill. This position is remote; however, Fellows are welcome to access the lab space and library resources from UNC if they reside nearby.

PROJECT INFORMATION

Section 1: Description of the Project

Are you interested in exploring urban sustainability at the intersection of social inclusion and climate action?

The Urban Environment and Social Inclusion Index (UESI) is a research effort that aims to provide the data that urban residents, city managers, and policymakers need to understand their city's performance on critical issues at the intersection of social inclusion and the environment. Incorporating novel geospatial approaches, including remotely-sensed data and open-source datasets (such as OpenStreetMap), the Index spatially maps environmental performance in nearly 300 cities, and reveals how these cities perform on sustainable, inclusive urban growth.

The framework focuses on quantifying progress on the environmental dimensions of the United Nations Sustainable Development Goal 11, which aims to make cities inclusive, safe, resilient, and sustainable. It captures the spatial and socio-economic distribution of air pollution, urban heat island effects, urban tree cover, and public transportation access, amongst other environmental measures. This research aims to demonstrate the potential for innovative datasets to provide near real-time assessment of environmental performance in a replicable and scalable manner. Furthermore, the UESI highlights knowledge gaps and identifies research priorities that could help cities build an evidence-based approach to enhance the equity of urban environmental performance.

Section 2: Goals of the Project

In 2023, we plan to deepen various aspects of the UESI, where an SCSC fellow can contribute or add contextualization through in-depth case studies. Some of the key priorities during the summer 2023 for the UESI include adding more cities and indicators

to the Index, including expanding our climate policy indicator to focus on net-zero and decarbonization goals; improving our air quality indicators; and deepening our understanding of drivers of disproportionate heat exposure in US cities. In the past, we've had SCSC fellows contribute directly to the UESI by assisting with data collection, analysis, and computer programming. We've also had SCSC fellows deepen examination of a particular aspect of urban environment and social inclusion through case studies and multimedia content.

Previous projects from DDL Fellows have included explorations of [mapping play spaces in New York City](#), [Urban Heat Island effect in Montreal](#), [Inclusive Air Monitoring strategies for Urban Areas](#), and the [role of Public Transit systems in inclusive cities](#).

This year, DDL is seeking a SCSC Fellow to work on one of two projects:

1. **Tracking Subnational Decarbonization Policies and Progress:** Given the growing importance of cities to global climate mitigation efforts, we are seeking to update our climate policy indicator in the UESI. Since we are a primary partner of the Net Zero Tracker, we have access to data and a scorecard to evaluate major cities' decarbonization targets. The fellow would work with us to adapt this scorecard into an indicator for UESI cities, as well as develop content for the UESI website and Net Zero Tracker that would help our audience better understand the context and challenges for cities' decarbonization. For example, while a city may set its own net-zero target, it may not necessarily control all of the emission sources within its territorial boundary. Additionally, out of boundary or supply-chain emissions may comprise a majority of its carbon footprint, which a credible net-zero target would need to address. The fellow would work to develop web content, blogs, and other materials to deepen understanding of these issues.

2. **Improving the UESI's heat and air pollution indicators:** Climate change and air quality are two of the key components of the UESI. We currently rely on remote sensing data to develop our surface urban heat island (SUHI), fine particulate pollution, and nitrogen dioxide indicators. This year, we are seeking to improve these indicators, including adding a new air quality indicator on ozone and improving how we determine the UHI effect within cities. To better understand

the outdoor heat exposure to humans, and how vegetation may affect the air temperature distribution in urban extent, we plan to update the UHI indicator to include the Canopy Urban Heat Island indicator (CUHI) to measure air temperature differences under tree canopy and above them. The fellow would work with us to refine and update the methodology of CUHI with the global near-surface air temperature data and implement preliminary analyses for the UESI cities.

Section 3: Guiding Questions

Project One:

1. What are the contexts and challenges for cities' decarbonization efforts?
2. What is the role of community in decarbonization efforts?
3. What is the relationship between climate-conscious cities and social connectedness?
4. Are cities incorporating minority populations and environmental justice concerns when developing their climate plans and commitments?
5. What do citizens feel about their city's climate commitments – pride, frustration, political posturing, stress, burdened, etc? How could this be measured?

Project Two:

1. How do heat and air pollution impact people's experiences of cities? How can it impact social isolation and its inverse, social connectedness?
2. How does urban heat and air pollution create systemic divides and social marginalization?
3. What responses can governments (from local to federal) take in order to limit the impacts of urban heat and air pollution to create equitable cities?
4. What programs (citizen-led science, eco-hubs, native plant revitalization efforts, etc) foster a sense of ownership and empowerment for citizens?
5. What is the relationship between climate-conscious cities and social connectedness?

Section 4: Key Deliverables

- 1 blog post (500 – 1,000 word), posted to SCSC's website.
- A Community Engagement Initiative (CEI) in support of the Final Output

- The CEI will be lead by the Fellow and designed with the support of SCSC's program manager and the DDL team. This could include a social media campaign, interviews or surveys, or any myriad of externally facing community engagement events.
- A Final Output [2 options]
  - A 25 – 35-page research report supported by primary or secondary source data
  - A creative or practical output coupled with an accompanying written component. This could include several data visualizations intended for the broader public, a podcast series, or other creative outputs.
- A Final Presentation with the Cohort

Applicant Information:

About the Fellowship/What the Fellowship Offers

The Fellowship empowers young people, recent graduates, and community leaders to engage in meaningful research and community action. At the Samuel Centre for Social Connectedness our mission is to build connectedness within and between communities through partnerships, research, programming, learning initiatives, and advocacy. Belonging is central to our work, and the Fellowship offers the opportunity to apply the lens of 'Belonging' to intersectional issues, writing, and problem solving.

This is a paid full-time opportunity from May 8 – August 28, 2023 [16 weeks]. The Social Connectedness Fellowship is a research and community action summer program focused on understanding & integrating social connectedness.

SCSC Offers:

- Competitive wages
- Work with national & international community partners
- Capacity building, skills development, & mentorship
- Meaningful work where your research has impact

Equity Statement:

The Samuel Centre for Social Connectedness is an equal opportunity employer, and we encourage applicants to apply even if they do not meet all the criteria. We believe all candidates have something to bring to the organization and the role. If you have skills outside the job description that you think can benefit the project, let us know in your cover letter. We encourage all equity-seeking groups such as immigrants, Black people, Indigenous people, people of color, women, young people, 2SLGBTQ+ community members, and people with disabilities to apply. Please let us know if you need any accommodation throughout the application and interview process and we will be happy to support you.

Key Attributes and Skills in the Applicant:

- Background in environmental studies, statistics, computer science or a related field
- Strong qualitative (and preferably quantitative) research and writing skills
- Able to work independently and with remote team members
- Excellent time management skills
- Experience with statistical programming language (R or Python) – particularly R - is an asset

While not required, candidates who have a background in data science and computer science and are interested in practical programming experience can assist with a range of tasks, from big data mining to the development of front-end data visualizations and graphics. In the past, we've had programmers help build databases, scrape public data sources, and develop machine learning models. To focus on these types of projects, experience with statistical programming language – particularly R or python – is strongly preferred. The Fellow would share their experiences and insights, and if applicable, any analyses and visualizations on the UESI blog and/or in case study boxes featured as part of the report.